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## THE NATURAL HISTORY OF RHEUMATIC CARDIAC DISEASE A STATISTICAL STUDY\*

I ONSET AND DURATION OF DISEASE

ALFRED C COHN, M D

AND

CLAIRE LINGG

NEW YORK

We are approaching the end of a study which has occupied us continuously for fifteen years. The task that was set was an attempt to describe the natural history of rheumatic fever, presumably a single disease. The results have been accomplished through the cooperation of many persons of good will.<sup>1</sup> The brief descriptions and the generalizations now possible could not have been made without the great labor or the continued reflection which have been devoted to this task.

It is not too much to say that we know the behavior of rheumatic fever, at least in this locality and at this time. It is possible now to separate knowledge which is complete and definitive from information which is partial and tentative. It is possible, furthermore, to interpret the latter in terms of the former. The length of time during which we have been familiar with this subject has made it possible to reduce the descriptions to relatively few categories. It has been as important to us to be explicit where knowledge is full as we have known it to be desirable to be circumspect where it is partial.

This study was made in collaboration with WPA Official Project No. 65197 WP 23 (N Y C)

This general paper was presented in outline before the Graduate Fort night of the New York Academy of Medicine Oct 23 1941

From the Hospital of the Rockefeller Institute for Medical Research and the Heart Committee of the New York Tuberculosis and Health Association Inc

Part II on the manifestations of rheumatic activity recurrence severity of infection and prognosis will appear in the next issue of THE JOURNAL

The statistical assistants on whom we rely for the collection and refinement of the original material as well as for the subsequent statistical analysis and arrangement comprise Rose Goldman Rita Goldsmith Lily Popper Eve Saper Harriet Steinhaber and Alice Whittemore. Without the devoted cooperation such as they gave us these studies could not have been made.

1 The Commonwealth Fund and the Metropolitan Life Insurance Company gave financial assistance in the early years of this investigation. The members of the Committees on Research on Clinics and on Criteria of the New York Heart Association gave technical advice and assistance. Many physicians and social service workers in the cardiac clinics recorded in detail week after week histories and physical examinations reports and abstracts of medical records were sent to us by hospital superintendents and record librarians convalescent homes social agencies and many physicians in private practice the directors of pathologic laboratories and the medical examiner's office of the health department of New York City made available copies of autopsy protocols and Dr Clarence E de la Chapelle reviewed postmortem reports the board of health of New York City made available to us death certificates the WPA provided clerical and statistical assistance and traced the whereabouts of thousands of patients no longer attending the clinics and obtained from them after histories which made it possible for us to complete the records up to the year 1938 1939 of 97 per cent of the patients both dead and living Miss Anne Spreemann of the staff of the New York Heart Association ably supervised this work. The Board of Education the Department of Public Welfare numerous other social agencies the New York City branch of the U S Post Office and the Consolidated Edison Company all aided in locating patients. The patients themselves and their friends supplied us with information essential to completing the life histories in the large number of cases

These introductory remarks would be incomplete unless emphasis was placed on the environment in which this study took place. Only an organization such as the New York Heart Association, a committee of the New York Tuberculosis and Health Association, formed of men and women of professional stature equal to theirs could have supplied the thought and guidance which served first as the basis and later as a background for these labors.

When this study was undertaken directly at the end of the first great war, alarm was beginning to spread at what seemed to be a rapid increase in deaths from cardiac diseases. At first it was impossible to find explanations for this appearance. It was necessary to explore avenues and to ask questions designed to clarify the situation. On the result depended the means to be employed in the care of the public health. The kind and nature of the diseases, the degree of their communicability, the kind and age of the persons affected, the duration of the phases of each kind of disease, the duration of the diseases, the numbers of persons subject to each variety of ailment, what institutional arrangements were necessary at the various stages and what equipment was desirable for diagnosis and treatment—all these needed to be canvassed.

The first contribution that illuminated any of these vexed questions was made by Wyckoff and Lingg,<sup>1a</sup> who described the distribution of cases in an adult cardiac clinic at the Bellevue Hospital in New York City. There was a thorough study of the incidence and classification of the cardiac diseases as a whole. They found that to the total rheumatic fever contributed one fourth, arteriosclerosis two fifths, syphilis one tenth, cases of unknown origin one tenth and cases of all other origins one tenth. They found also that 90 to 95 per cent of rheumatic cardiac diseases occurred before 50 years and more than half of them before 30, that half the cases of syphilis developed before 50, and that 80 to 95 per cent of cases of arteriosclerosis developed after 50 years of age. It was not difficult after their investigation to decide that cases of rheumatic origin deserved attention first. If there were no other reason for this selection, the fact of its occurring in young people and of being conceivably preventable would have been justification enough.

How the matter lay, then, is clear from this quotation.<sup>2</sup>

"No doubt we shall learn much from the changes in shape of specific death rate curves. We must study whether, if these changes have occurred they have

1a Wyckoff J and Lingg Claire. Statistical Studies Bearing on Problems in Classification of Heart Diseases. II Etiology in Organic Heart Disease. Am Heart J 1: 446 1926.

2 Cohn A E. Statistical Studies Bearing on Problems in the Classification of Heart Diseases. I Introduction. Am Heart J 1: 432 1926.

occurred as the result of efforts at prevention of infectious heart disease in early life or for causes related to the saving of life at other decades and from other diseases. We must learn what percentage (whether the number of cases remains stationary or increases or decreases) is prevented, what percentage cured, what percentage senescent. Only by analyses such as these shall we learn the nature of the problem with which we must deal, and on what aspect of it is the major emphasis most intelligently to be placed.

"There are many other problems for which our methods may yield solutions: studies in the natural history of these diseases, their duration, and whether this is modified, and how much, by differences in social and economic environment, does symptomatology vary with class and with age, what is the bearing of age on the possibility of recovery, what influences are exerted on their course by treatment, of what use are certain forms of treatment, such as rest, work, homes for convalescent patients, operations on portals of entry, such as teeth and tonsils."

Familiarity with the study of acute infectious illnesses has accustomed physicians to viewing processes of disease as taking place within short periods of time. The exanthemas, lobar pneumonia, typhoid, all fall into this group. The beginning, the middle and the end, together with the sequelae, fall easily within the purview of single observers. Even pulmonary tuberculosis does not fall outside this category. The situation is quite different in such other diseases as those which are the concern of these studies. They are all long drawn out and endure in rheumatic fever about thirteen years on the average, in syphilis perhaps half as long again and in the later arteriosclerotic forms, whether long or short, the onset often being difficult to define. In any case the whole of the life of persons afflicted by this group of ailments has not often been the subject of surveys by single physicians. Because of this fact episodes occurring in the course of such illnesses have attracted attention and study, rather than the processes themselves in long drawn out continuity. These have almost necessarily escaped description from the point of view of the whole of their natural history because a sufficient number of cases exhibiting such phenomena have not been investigated by properly trained and interested physicians.

Discussion of the natural history of rheumatic fever has accordingly been made difficult by the partial descriptions that have been available. The facts can be and indeed have been analyzed and presented from several more or less incompatible points of view. The view of private practitioners is necessarily limited by their personal experience. That of attending physicians of hospitals is circumscribed by the procedure of admission and discharge, often with incomplete knowledge of the subsequent history of patients. Public health officers describe the course of events naturally in terms of vital statistics.

The point of view in this study corresponds to none of these. It began and has continued to regard solely the natural history of this disease as exhibited by the continued histories of given individuals, from its onset until its end in these same individuals. This study is based accordingly not on cross sections, not on impressions, not on statistical averages but on histories literally representing courses of events. Because this was the plan, it has been possible to study aspects of the disease in their context. It is known, for example, that a certain phenomenon, if it appeared in a child, could subsequently

be observed as it evolved in the later history of that individual and so could be related causally to its presence at earlier stages. The development of rheumatic phenomena is known therefore in continuity. Truth can be discovered no doubt also by other technics, as for example by random sampling of phenomena but, if it is a virtue, this investigation can claim knowledge derived from close observation together with the management and treatment of the very individuals whose illnesses have been analyzed. From this point of view the cases studied have the kind of value to be found in descriptions of cases reported by private practitioners.

The methods that have been employed are in essence not new, but they have been scrutinized afresh in order to fit the current uses to which they were put. To collect information of so large a number of cases it was necessary to define carefully the terms that were used. The selection of the terms was itself a matter of prime consideration. The Committee on Criteria of the New York Heart Association made these selections. It decided on and published appropriate definitions.<sup>3</sup> This procedure eliminated vagueness and confusion. Since the number of cases to be studied was large, it was necessary to record the histories in ways that made enumeration readily possible. Charts were therefore designed in which answers were entered in accordance with properly formulated questions. The questions were so put that the answers were as nearly as possible unequivocal. The charts consisted of parts so as to provide the opportunity to enter for each patient his history, his physical examination and his subsequent course. These charts were made in duplicate, the originals being retained by the clinic in which a patient was treated, the carbon copy being brought for file and subsequent analysis to the central office.<sup>4</sup>

Besides criteria and methods of recording, the ends in view could not have been accomplished had not the Committee on Cardiac Clinics seen to it that suitable quarters and adequate equipment were available.<sup>5</sup> In the early years physicians who attended the cardiac clinics met frequently for consultation on all the methods used. These conferences made reasonable uniformity of view and usage possible. Physicians willing to accept these methods constituted the indispensable cornerstone of the enterprise. But none of this apparatus could have sufficed had it not been for the statistical assistants provided by the New York Heart Association. It was their duty to attend clinics, to see to the upkeep of the records and more especially to the uniformity in the use of nomenclature and symbols which had been decided on, and finally to assist in completing, editing and analyzing the data.

If there is doubt of the value of results such as these, the doubt must, it seems, rest on popular conceptions of the nature of statistics. What physicians require and what after all they must have in the practice of medicine is information twofold in nature. They must know about the general movements of diseases, or their natural history, but they desire also a knowledge of methods which make applicable to individual cases the general considerations to which reference has been made. The difficulty is here. Except as far as the former aids an

<sup>3</sup> Nomenclature and Criteria for Diagnosis of Diseases of the Heart. New York Heart Association (Heart Committee of the New York Tuberculosis and Health Association). New York, 1939.

<sup>4</sup> Clinical Charts Recommended by the Heart Committee of the New York Tuberculosis and Health Association. The Plans for Their Use. *Am. Heart J.* 2: 655, 1927.

<sup>5</sup> Standard Requirements for a Cardiac Clinic. New York Heart Association. New York, 1936.

understanding of the latter, it can scarcely be pretended that the statistical or general method can be a useful practical instrument. Why this is so demands perhaps some discussion.

"The search for law in biology and of course in medicine rests on the conception that the discovery of laws has served the physical sciences in extraordinarily useful ways. There can be no doubt of the soundness of this belief. But precisely what the analogy is between law and the individual in the physical world, and law and the individual in the biological one, requires precise definition—more precise indeed than is usually accorded to this matter. If there is a difficulty it lies, we believe, in misunderstanding this relation of law to the individual in the physical world. The view we take may be illustrated. In the case of the gas laws for instance, beginning with Boyle, a number of statements have been made which permit accurate predictions of the behavior of volumes of gas, that these laws do not describe the behavior of individuals within the volume is amply demonstrated by reflecting on the fact that the kinetic theory assumes violently diverse and unpredictable behavior on the part of the individual molecules in these volumes. The laws apply to the mass, the volume, the average, they make no statements concerning individual performance. And yet the laws are invaluable, they and their kind are the basis of calculation in the practical as well as in the theoretical world. In biology and in medicine, just as in physics, it is not to the individual that the laws, whatever they are or may be discovered to be, apply. Individuals represent deviations from any law both in biology and in physics. Deviation is the fate of the individual, uniformity in the sense of identity either of being or of behavior scarcely exists. The general behavior of patients afflicted by typhoid fever or the general behavior of mobs may be known, but to know these phenomena has relatively speaking little meaning in understanding or in predicting the conduct of any individual in a mob or in making an accurate prognosis, based on general experience in the case of any patient suffering from typhoid fever. And yet no one denies that general statements can be made and are useful in physics and in psychology, or that general statements on prognosis and on the natural history of diseases have value. General statements and inference in individual instances each have their domain of eminent usefulness. Harm results only when the nature and objects of the two are confused. Whether in the natural history of any one of the cardiac diseases, or in an estimation of prognostic values, or in the measure of success of a therapeutic agent, or of the degree of relevance of social or economic advice, the aim of such studies as this is the attempt to understand general movement. No other indeed is possible. Because it is the plain teaching of the history of science, the Research Committee of the New York Heart Association believes that the ability to attain orientation of this sort is indispensable in envisaging the probable course of any individual life or of any individual act. Thought and action would otherwise be chaos."<sup>6</sup>

#### LITERATURE

The problem of what reference should be made to the literature of this subject has been a source of some concern. It has a large extent and very great value. Particular aspects must necessarily receive mention and comment in the text. But since these researches con-

cerned an analysis of a large body of fact assembled in a somewhat novel fashion, it seemed more important to let the facts speak for themselves than to match them with data already available. Where there is conflict in interpretation this will of course take place.

Probably the earliest statistical report on this disease is to be found in Haygarth's<sup>7</sup> monograph on acute rheumatism published in England in 1805. "Among the higher and middle ranks of society," says the author, "I have noted and classed the cases of 10,549 patients from 1767 to 1801, also clinical reports of a large number of diseases among persons in the lower ranks of life, being cases of all in- and out-patients at the Chester Infirmary for thirty-one years." After eliminating cases of nodosity of the joints, tic douloureux, sciatica, lumbago and other conditions there still remained 470 cases of rheumatism. Since only 170 were febrile, these alone were included in his analysis of "acute rheumatism." In numerous tables he described the disease with regard to sex, age, seasonal incidence, latent periods, joints involved, pulse rate, urine and blood tests. This is probably the first accurate account of the natural history of polyarthritis.

Eighty-four years later, in 1889, Cheadle<sup>8</sup> published his lectures delivered before the Harveian Society of London on "The Various Manifestations of the Rheumatic State as Exemplified in Childhood and Early Life," in which he analyzed tables published in 1888 by the Collective Investigation Committee of the British Medical Association. These tables were based on reports of observations on 655 cases of acute rheumatism furnished by medical practitioners of the United Kingdom from 1882 to 1886. Among the factors considered were age, sex, occupation, locality and atmosphere, previous illnesses, influence of treatment, duration of fever, pain, extent of joint disease, complications, relapses, cutaneous eruptions, subcutaneous nodules, sequelae and deaths.

When after World War I it was pointed out that the death rate from cardiac diseases seemed to be rising, certain facts began to be subjected to more searching analysis in order to learn what actually was the situation in respect to these diseases. In 1927 a study of mortality curves for a period of fifty years made clear that the fall in rate in infectious diseases was intimately related with the rise in the cardiac ones.<sup>9</sup> But five years later,<sup>10</sup> in 1933, closer scrutiny of the data led to the inference that the increase in the cardiac death rate was relatively slight and that changing fashions in diagnoses were responsible for the apparently great increase.

In the years following the war many studies of rheumatic fever and rheumatic cardiac disease began to be reported. Among the more important statistical studies are those of the London County Council,<sup>11</sup> the Medical Research Council<sup>12</sup> and the Ministry of Health<sup>13</sup> in

7 Haygarth John. A Clinical History of Diseases. I. A Clinical History of the Acute Rheumatism. London 1805.

8 Cheadle W. B. The Various Manifestations of the Rheumatic State as Exemplified in Childhood and Early Life. Lectures delivered before the Harveian Society of London. London: Smith, Elder & Co. 1889.

9 Cohn A. E. Heart Disease from the Point of View of the Public Health. *Am Heart J* 2: 275, 1927.

10 Cohn A. E. and Lingg Claire. Heart Disease from the Point of View of the Public Health—1933. *Am Heart J* 9: 283, 1934.

11 London County Council. Annual Report of the Council, 1923. Public Health. London 1924. in 1937 3 part 2, 44.

12 Medical Research Council. Child Life Investigations. Social Conditions and Acute Rheumatism. London 1927.

13 The Incidence of Rheumatic Disease. Reports on Public Health and Medical Subjects No. 23. Ministry of Health. London 1924. Acute Rheumatism in Children in Its Relation to Heart Disease. *ibid* No. 44, 1927.

6 Quoted by Pearl Raymond. Introduction to Medical Biometry and Statistics. ed. 2. Philadelphia: W. B. Saunders Company, 1930. p. 24.

England, and the recent investigations of Hedley<sup>14</sup> of the United States Public Health Service. During the past two decades studies based on the clinical observation of series of patients, ranging in number from somewhat less than 100 to about 1,000, include in England and Wales the work of Poynton,<sup>15</sup> Coombs,<sup>16</sup> McSweeney,<sup>17</sup> Findlay,<sup>18</sup> Coates,<sup>19</sup> Campbell and Warner,<sup>20</sup> Miller,<sup>21</sup> Horder,<sup>22</sup> Brenner,<sup>23</sup> Dally,<sup>24</sup> Grant,<sup>25</sup> Hill<sup>26</sup> and Schlesinger,<sup>27</sup> and in this country the work of Mackie,<sup>28</sup> White,<sup>29</sup> Wilson,<sup>30</sup> Shapiro,<sup>31</sup> Sutton,<sup>32</sup> Jones,<sup>33</sup> Kaiser,<sup>34</sup> Paul,<sup>35</sup> Davis and Weiss,<sup>36</sup> Willius<sup>37</sup> Ash,<sup>38</sup> Clawson,<sup>39</sup> McLean,<sup>40</sup> Leonard,<sup>41</sup> Juster,<sup>42</sup>

Stroud,<sup>43</sup> Coburn,<sup>44</sup> Swift,<sup>45</sup> Taran,<sup>46</sup> Boas,<sup>47</sup> Thayer,<sup>48</sup> McCulloch and Irvine-Jones<sup>49</sup> and preliminary studies<sup>50</sup> made in collaboration with the Committee on Research of the New York Heart Association.

These studies deal with various aspects of the disease, notably its prevalence, familial and seasonal incidence, age at onset, its various manifestations and cardiac implications. Unfortunately this vast amount of data cannot be successfully pooled because of a lack of uniformity in observations and definitions, because the groups of cases analyzed are themselves limited either as to age, some having been selected from pediatric services only, and others from clinics and wards specified for adults, or as to source, comprising in some instances hospital admissions, in others ambulatory patients in public or private practice and in still others cases selected from postmortem records. Unfortunately too the criteria of statistical analysis that were employed have usually not been defined. The failure to take into consideration recognized, simple statistical procedure has often resulted in contradictory and controversial conclusions.

#### MATERIAL FOR STUDY

This study of rheumatic cardiac disease has been conducted on the basis of records of some 12,000 patients prepared by the New York Cardiac Clinics. Of these 3,129 are dead.<sup>51</sup> There were male and female patients

14 Hedley O F Mortality from Rheumatic Heart Disease in Philadelphia During 1936 Pub Health Rep 52 1907 1937 Incidence of Rheumatic Heart Disease Among College Students in the United States ibid 53 1635 1938 Trends Geographical and Racial Distribution of Mortality from Heart Disease Among Persons 5-24 Years of Age in the United States During Recent Years (1922-1936) A Preliminary Report, ibid 54 2271 1939 Rheumatic Heart Disease in Philadelphia Hospitals ibid 55 1599 1940

15 Poynton F J Paterson Donald and Spence J C Acute Rheumatism in Children Under 12 Years of Age Lancet 2 1086 1920

16 Coombs C F Rheumatic Heart Disease New York William Wood & Company 1924 The Incidence of Fatal Rheumatic Heart Disease in Bristol 1878-1913 Lancet 2 226 1920 Thirty Years Progress in the Study of Rheumatic Heart Disease Bristol Med Chir J 50 93 1933

17 McSweeney C J Acute Rheumatism in Childhood Lancet 1 959 1928 Studies in Juvenile Rheumatism Arch Dis Childhood 6 367 (Dec) 1931

18 Findlay Leonard The Rheumatic Infection in Childhood London Edward Arnold 1931

19 Coates Vincent and Thomas R E Rheumatic Infection in Childhood Lancet 2 326 1925

20 Campbell Maurice and Warner E C A Study of Rheumatic Disease in Children Lancet 1 61 1930

21 Miller Reginald Discussion on the Etiology and Treatment of Heart Disease in Early Life with Special Reference to the Prevention of Chronic Cardiac Insufficiency Brit M J 2 702 1923 Report on the Environmental and Other Predisposing Causes of Rheumatic Infection (suppl) Brit M J 2 5 (July 3) 1926

22 Horder T J Infective Endocarditis with an Analysis of 150 Cases and with Special Reference to the Chronic Form of the Disease Quart J Med 2 289 1908 1909

23 Brenner O Observations on Acute Rheumatism and Rheumatic Heart Disease Based on 227 Clinical Cases Occurring at the Queens Hospital in the Five Years 1924-1928 and on 133 Autopsy Cases Occurring in the Ten Years 1924-1933 Birmingham M Rev 9 193 1934

24 Dally J F H The St Marylebone Children's Rheumatism Supervisory Center London Reports 1926 1929 1929 1931 1938

25 Grant R T After Histories for Ten Years of a Thousand Men Suffering from Heart Disease A Study in Prognosis Heart 16 275 1933

26 Hill N G The Etiology of Juvenile Rheumatism Brit J Child Dis 27 161 1930

27 Schlesinger Bernard Public Health Aspect of Heart Disease in Childhood Milroy Lectures Lancet 1 594 1938

28 Mackie T T Prognosis and Treatment of the Rheumatic Infection Am Heart J 3 31 1927

29 White P D The Incidence of Endocarditis in Earliest Childhood Am J Dis Child 32 536 (Oct) 1926

30 Wilson May G Rheumatic Fever Commonwealth Fund New York 1940 Ingerman Eugenia and Wilson May G Rheumatism Its Manifestations in Childhood Today J A M A 82 759 (March 8) 1924

31 Shapiro M J The Natural History of Childhood Rheumatism in Minnesota J Lab & Clin Med 21 564 1936

32 Sutton L P Observations on Certain Etiologic Factors in Rheumatism Am Heart J 4 145 1928 Sutton L P and Dodge K G Relationship of Sydenham's Chorea to Other Rheumatic Manifestations Am J M Sc 195 656 1938

33 Jones T D and Bland E F Clinical Significance of Chorea as a Manifestation of Rheumatic Fever J A M A 105 571 (Aug 24) 1935

34 Kaiser A D Factors That Influence Rheumatic Disease in Children—Based on a Study of 1,200 Rheumatic Children J A M A 102 886 (Sept 22) 1934

35 Paul J R Age Susceptibility to Familial Infection in Rheumatic Fever J Clin Investigation 10 53 1931 The Epidemiology of Rheumatic Fever A Preliminary Report for the American Heart Association New York Metropolitan Life Insurance Company 1930 Paul J R and Leddy P A The Social Incidence of Rheumatic Heart Disease A Statistical Study in Yale University Students Am J M Sc 184 597 1932

36 Davis David and Weiss Soma The Relation of Subacute and Acute Bacterial Endocarditis to Rheumatic Endocarditis A Study of 66 Cases with Necropsies New England J Med 208 619 1933 Rheumatic Heart Disease I Incidence and Role in Causation of Death A Study of 5,215 Consecutive Necropsies Am Heart J 7 146 1931 II Incidence and Distribution of the Age of Death ibid 8 182 1932 IV The Life History of the Severe Form of the Disease ibid 10 486 1935

37 Willius F A A Study of the Course of Rheumatic Heart Disease Am Heart J 3 139 1927

38 Ash Rachel Prognosis of Rheumatic Infection in Childhood—A Statistical Study Am J Dis Child 52 280 1936 Influence of Tonsillectomy on Rheumatic Infection Am J Dis Child 55 63 (Jan) 1938

39 Clawson B J An Analysis of Two Hundred and Twenty Cases of Endocarditis with Special Reference to the Subacute Bacterial Type Arch Int Med 33 157 (Feb) 1924

(Footnotes 40, 41 and 42 in next column)

40 McLean C C Early Manifestations of Rheumatic Infections in Young Children Ann Int Med 6 1357 1932 Early Rheumatic Infections of Childhood Arch Pediat 10 657 (Nov) 1929

41 Leonard Marion Puberty and Prognosis in Rheumatic Fever Am Heart J 14 192 1937

42 Juster I R The Significance of Rheumatic Activity in Chronic Rheumatic Heart Disease Part I Intensity and Extent Am Heart J 15 1 1938 Part II A Method of Classification ibid 17 669 1939

43 Stroud W D Goldsmith M A Polk D S and Thorpe I Q Ten Years Observation of Children with Rheumatic Heart Disease J A M A 101 502 (Aug 12) 1933

44 Coburn A F The Factor of Infection in the Rheumatic State Baltimore Williams & Wilkins Company 1931

45 Swift H I Rheumatic Fever in Cecil's Textbook of Medicine ed 4 Philadelphia W B Saunders Company, 1936 Rheumatic Fever, Am J M Sc 170 631 1925

46 Taran I M Rheumatic Cardiac Disease in Childhood A Statistical Study Am J Dis Child 50 840 (Oct) 1935

47 Boas E P Rheumatic Fever in Adult Puerto Rican Immigrants Am J M Sc 182 25 1931

48 Thayer W S Analysis of Eight Hundred and Eight Cases of Chorea with Special Reference to Cardiovascular Manifestations J A M A 47 1352 (Oct 27) 1906

49 McCulloch Hugh and Irvine Jones Edith I M Role of Infection in Rheumatic Children Am J Dis Child 37 252 (Feb) 1929

50 Wilson May G Lingg Claire and Crawford Geneva Statistical Studies Bearing on Problems in the Classification of Heart Disease Heart Disease in Children Am Heart J 4 164 1928 Tonsillectomy in Its Relation to the Prevention of Rheumatic Heart Disease ibid 1 197 1928 DeGraff A C and Lingg Claire Course of Rheumatic Heart Disease in Adults I Factors Pertaining to Age at Initial Infection Development of Cardiac Insufficiency Duration of Life and Cause of Death ibid 10 459 1935 II Influence of Valvular Lesion on Course of Rheumatic Heart Disease ibid 10 478 1935 III Influence of Auricular Fibrillation on the Course of Rheumatic Heart Disease ibid 10 630 1935 Roth I R Lingg Claire and Whittemore A Heart Disease in Children Rheumatic Group ibid 13 36 1937

51 The patients were treated in clinics over a period of years ranging from 1923 to 1938. Of the records analyzed 30 per cent were derived from clinics in city hospitals and 70 per cent from clinics in voluntary hospitals. About 70 per cent were contributed by clinics in the borough of Manhattan thirteen for adults and twelve for children. The hospitals represented were Bellevue, Beth Israel, Fifth Avenue, Joint Diseases, New York Nursery and Childs, New York New York Infirmary for Women and Children, New York Post Graduate, New York Polyclinic, St. Mark's, Babies, Lenox Hill, as well as the Cornell Medical School and New York University Medical College cardiac clinics and clinics attached to the Bowling Green Neighborhood House and Greenwich House Settlement. In addition 15 per cent were contributed by two clinics for adults and three for children in the borough of Brooklyn, Brooklyn Jewish, Cumberland and Kings County hospitals, 8 per cent by two clinics for adults and one for children in Morrisania City and Montefiore hospitals in the Bronx, 5 per cent by a clinic for adults and one for children in St. John's Hospital, Queens, the clinic for after care conducted by Irvington House contributed records from clinics in all the boroughs of New York City. Of these 6 per cent were derived from clinics not cooperating with the New York Heart Association. Clinics in Philadelphia—in the Graduate Women's Philadelphia General Presbyterian, Lankenau, Misericordia, St. Christopher's and Abington Memorial hospitals—contributed 4 per cent of the records. Altogether only 8 per cent of the patients were treated in more than one clinic.

ranging in age from early childhood throughout the span of their surviving lives. It is in the interest of simplicity to describe the course of events in rheumatic fever first as exhibited by those who have died. Completed lives such as these render unequivocally reliable the inferences which are drawn concerning them—their course and prognosis. To these results may be added those modifications which apply to the living.

When they first came under observation in the clinics, 22 per cent of the patients were less than 10 years old, 45 per cent were under 15, and 53 per cent under 20, 13 per cent were in their twenties, 16 per cent in their thirties, 12 per cent in their forties and 6 per cent 50 years or older. About half, in short, were under 20 and half over 20.

**Race**—The hospitals in New York City from which 94 per cent of the records came are situated in districts in which there is no large Negro population. Only 5 per cent therefore of the records analyzed were of Negroes. This study concerns itself consequently primarily with the occurrence of rheumatic fever in the white races.

**Sex**—The supposition is general that girls are more often afflicted than boys, but when so large an experience as this is available it appears that this is not the

It is clear (chart 1) that there is a slight difference between the sexes in the age at onset. The mean age for males is  $14.5 \pm 0.3$  years and for females  $15.0 \pm 0.3$  years. The difference  $0.5 \pm 0.136$  may be considered statistically significant. The age at onset is on the average slightly higher in females than in males.

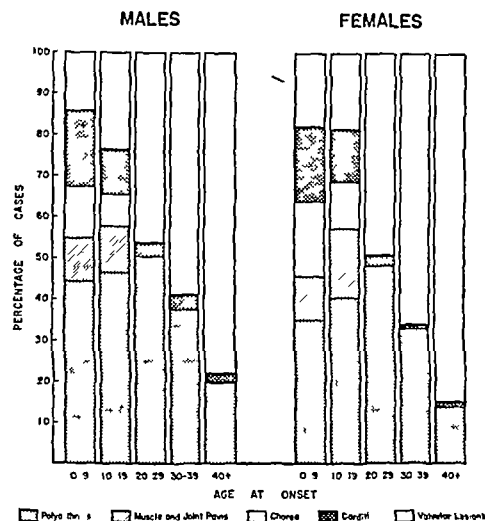


Chart 2—In the young onset of rheumatic cardiac disease is characterized by polyarthrit. in about one half and by carditis and chorea in about one third each. In adult life onset is characterized chiefly by polyarthrit. and with advancing age by appearance of valvular lesions alone.

Rheumatic fever may begin at any age, but it begins more often at about 8 years than at any other age. At 15, the mean age at onset, 70 per cent of persons afflicted have already acquired the disease.

**Year of Onset**—The calendar years in which these patients acquired the disease ranged from 1870 to 1938. In 7 per cent the onset occurred before 1900, in 11 per cent between 1900 and 1909, in 24 per cent between 1910 and 1919, in 45 per cent between 1920 and 1929 and in 13 per cent after 1930.

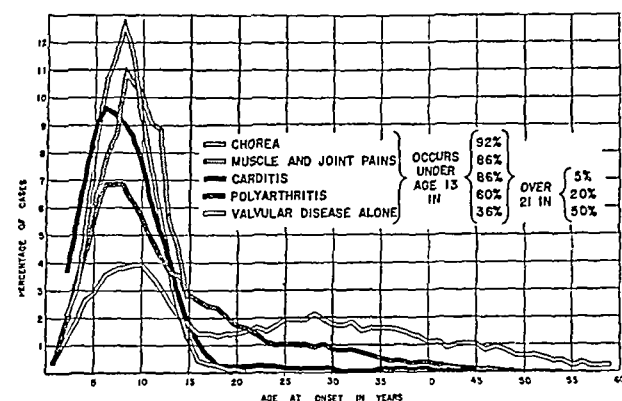


Chart 3—Rheumatic cardiac disease. Age distribution of first manifestations.

#### INITIAL MANIFESTATIONS

In studying the manifestations of rheumatic fever, whether in the young or in the old, the similarity between males and females is close enough so that a description of one will do for the other (chart 2). If the usual manifestations of rheumatic fever are taken to be inflammation of the joints, muscle and joint pain, chorea and carditis, and if these taken together are regarded as infectious manifestations, it is evident that

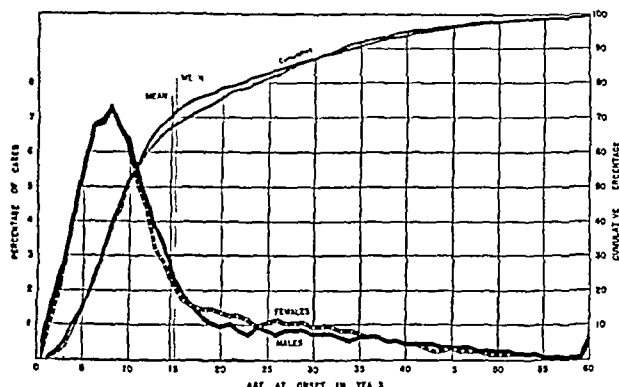


Chart 1—Rheumatic cardiac disease. Onset usually in childhood especially between the ages of 5 and 10 years, with maximum rate at age 8.

case—the two sexes are afflicted in equal numbers. There were 1,566 males and 1,563 females.

**Age at Onset**—The ages found in this study at which rheumatic fever begins deserves credence because on close scrutiny the records exhibit a high degree of probable correctness. In the absence of a specific diagnostic test it is often difficult to be certain of the presence of rheumatic infection. By onset is meant, therefore, the first clinical manifestation of the disease. Since many patients first came under observation in the clinics some time after the onset (one fourth within less than a year and one half within three years thereafter), in order to date it correctly, every effort was made to obtain a reliable history. Past medical records were investigated in order to try to confirm the patient's recollection and so to lessen the chances of regarding a recurrence as the initial disorder.

In most of the published reports dealing with the age at onset, the cases analyzed are grouped according to age. If the analysis is based on children's clinics, the onset cannot escape being regarded as early, if based on adult clinics, late. In this study there is no loading in favor of any age.



among those in whom the disease is acquired before the age of 10 infection is the characteristic form of onset in over 85 per cent of cases. After 40 a little more than 20 per cent exhibit this form of the disease. Before 20 muscle and joint pains and chorea account for 20 per cent of cases, but after 20 these forms tend to disappear

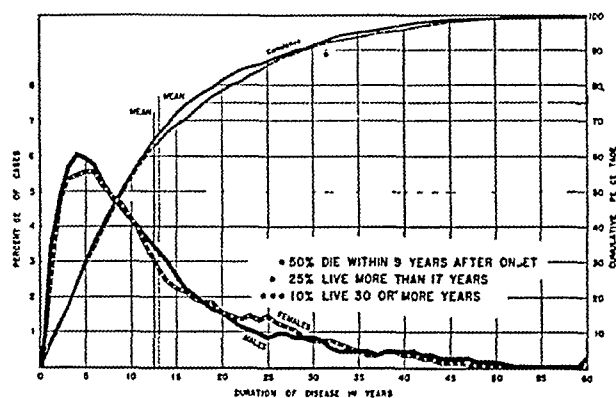


Chart 4—The mean duration of rheumatic cardiac disease is about thirteen years from onset to death

Instead, polyarthritis or valvular lesions alone are found. The picture becomes totally reversed. Before 10, valvular lesions alone are the first manifestation in only about 15 per cent of cases, after 40 in almost 80 per cent.

It need scarcely be pointed out that, though this is the distribution of first manifestations, numerically the group after age 40 is small and amounts to not more than 5 per cent of the total.

As initial phenomena for dating the onset of rheumatic fever the meaning of muscle and joint pains has often been called in question. How to be certain when they are significant is difficult and requires definition. In this study they are so regarded (in 281 cases or 9 per cent, table 1) only when additional evidence appeared later. It did so within one year in one third and within three years in almost half of the cases.

That acute inflammation of the joints is almost twice as common as active carditis in young persons is contrary to the general impression. An explanation for this

not an uncommon experience to discover that what impresses physicians are valvular lesions. But in the mothers and in patients it is the multiple disorders of the joints. No doubt carditis is often present as well.

Although it is clear that rheumatic fever is a disease occurring predominantly in childhood and early adolescence, and although the relative frequency of its manifestations is as has been described, the age distribution of these manifestations as first phenomena permit a somewhat more detailed analysis (chart 3). It has already been said that chorea comes practically to an end at the age of 20. In point of fact there are few cases after 15. The greatest number actually occur at about 8 years of age. Indeed, no other manifestation is so centered on a single age. Carditis takes its maxi-

TABLE 1—Type of Onset

Type of Onset	Both Sexes		Males		Females	
	Num-ber	Per-Cent	Num-ber	Per-Cent	Num-ber	Per-Cent
Carditis	359	17.4	198	12.6	161	12.0
Murmur	846	28.3	476	27.2	470	29.4
Polyarthritis	1,671	40.3	682	47.5	589	37.1
Muscle and joint pains	281	9.0	178	8.7	103	9.8
Chorea	311	9.9	112	8.4	179	11.4
Total	3,176	100.0	1,563	100.0	1,613	100.0

TABLE 2—Onset of Disease by Age Sex and Manifestation

First Mani-festation	Sex	Num-ber of Cases	Age					
			Range	Mean	Standard Deviation	Median	Q <sub>1</sub>	Q <sub>3</sub>
Carditis	♂	198	2-45	9.0 ± 0.5	7.1 ± 0.4	8.0	5.5	11.5
	♀	161	2-40	8.6 ± 0.4	6.3 ± 0.3	8.5	6.0	11.0
Valvular lesion	♂	476	1-67	22.0 ± 0.8	15.6 ± 0.5	19.0	10.5	27.0
	♀	470	1-73	23.0 ± 0.7	15.4 ± 0.5	22.0	9.5	37.0
Polyarthritis	♂	682	1-54	13.0 ± 0.4	9.9 ± 0.3	11.0	6.0	17.5
	♀	589	2-2	14.4 ± 0.4	9.7 ± 0.3	12.5	7.0	20.0
Muscle and joint pains	♂	178	2-15	8.7 ± 0.3	3.5 ± 0.2	9.0	6.5	13.0
	♀	103	2-15	9.3 ± 0.3	3.5 ± 0.2	10.5	7.0	13.5
Chorea	♂	112	2-17	8.0 ± 0.3	3.4 ± 0.2	8.5	6.0	11.5
	♀	179	3-19	8.2 ± 0.2	3.2 ± 0.2	8.5	6.5	11.5
Total	♂	1,563	0-73	14.5 ± 0.3	10.0 ± 0.2	11.0	7.0	18.5
	♀	1,563	0-73	15.0 ± 0.3	11.0 ± 0.2	11.5	7.5	20.5

In tables 2 and 3 Q<sub>1</sub> means first quarter and Q<sub>3</sub> third quarter

mum toll at about 6 years, polyarthritis from 6 to 8 years and muscle and joint pains from 8 to 10 years. When valvular disease occurs alone it is most commonly recognized at 9 and 10 years. As incipient manifestations only polyarthritis and valvular lesions are to be found in any considerable number after 15 (chart 3, table 2). Rheumatic fever appears, then in various forms and each form has statistically an age distribution of its own.

#### DURATION OF DISEASE

In discussing the duration of rheumatic cardiac disease with emphasis on expectancy it is necessary to speak in statistical terms, although a risk is involved. Such terms have unfortunately been the occasion frequently for much misunderstanding, especially among patients and the families of patients, unless the statistical meaning of the figures is carefully explained. It is the meaning of the word "average" which is important. Average

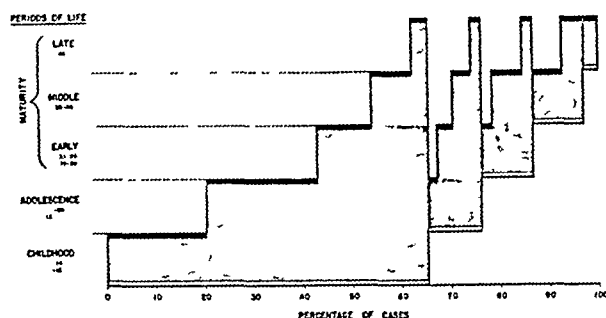


Chart 5—Rheumatic cardiac disease. Two thirds of all cases begin in childhood, one tenth in adolescence. 20 per cent are fatal in childhood, another 25 per cent in adolescence. Less than 25 per cent begin in adult life, about 15 per cent of the patients survive age 45. Periods of life: late maturity 46+, middle maturity 30-45, early maturity males 21-29 and females 19-29, adolescence males 15-20 and females 13-18, childhood males 1-14 and females 1-12. The light barred line indicates the age period in which disease began and the heavy line that in which death occurred. The vertical distance between the two indicates the duration of life.

is the fact that many cases were recorded first not during but shortly after the first attack of rheumatic fever. In the matter of recollection and emphasis it is



figures are misinterpreted and are taken as applicable to individual cases. Fortunately the outlook is not unfavorable. It is a fact that 10 per cent of patients live for more than thirty years (chart 4, table 3). There are, furthermore, records of survival for at least sixty years. In many cases, probably in most, survival is however, less long. But even here the account need not be as gloomy as it is often made to appear, for a fourth of the patients live more than seventeen years. Half, however, die within nine years. If the experience is taken as a whole, the mean duration from onset to death is about thirteen years. There seems to be no essential difference between the sexes. The mean duration of life is  $12.5 \pm 0.3$  years for males and  $13.0 \pm 0.3$  years for females, a difference of  $0.5 \pm 0.37$ , which lies within the range of chance variation.

#### DURATION OF DISEASE RELATED TO ONSET

There is a difference in duration of expectancy as related to age at onset. It may be seen (chart 5) that two thirds (65.3 per cent) of the cases begin in childhood, taken arbitrarily to extend from ages 1 to 12 in females and 1 to 14 in males. On further analysis it appears that nearly a third, 31 per cent, of the patients with onset in childhood (20.1 per cent of total) do not survive this age period, that about another third with onset in childhood, 34 per cent (22.5 per cent of total), do not survive adolescence (18 in females and 20 in males), and that early and middle maturity, taken to end in both males and females at 29 and 45, each claims about one sixth, 17 per cent and 13 per cent (11.0 per cent and 8.2 per cent of total), about 5 per cent go on beyond the age of 45.

Sixty-five per cent of cases begin accordingly in childhood and 10 per cent approximately each in adolescence, early maturity and middle maturity. Three per cent begin after 45.

When the onset of disease is in adolescence and early maturity, only about 15 per cent and 19 per cent of the patients do not survive their own age period and in each group there is a relatively large percentage who live even to advanced age.

There is another way of illustrating the phenomena which have just been analyzed (charts 6 and 7). This method is reported also because different presentations impress different people with varying degrees of vividness. In this form of representation 70 per cent of cases among males occur in childhood. Each figure in the chart represents 2 per cent of the total group. Twenty-three figures survive the age period of onset and 12 figures succumb. Twenty-three surviving figures pass on into adolescence. Ten and a half of them go

on into maturity,  $12\frac{1}{2}$  die. Of the  $10\frac{1}{2}$  who go on to maturity only  $5\frac{1}{2}$  are alive in middle maturity and  $1\frac{1}{2}$  live on into late maturity. Or it may be said that of cases beginning in childhood 66 per cent survive childhood, 30 per cent survive adolescence and 16 per cent early maturity and only 4 per cent go into late maturity. A similar account can be given of the cases which begin in adolescence and in early, middle and late maturity.

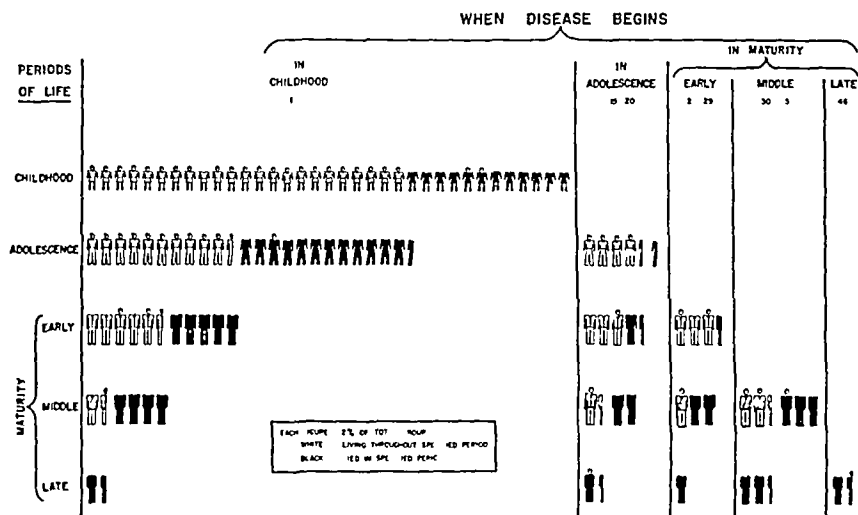


Chart 6—Duration of life in series of patients with rheumatic cardiac disease (males). Each figure represents 2 per cent of the total group. White indicates patients living throughout specified period and the black those who died in specified period.

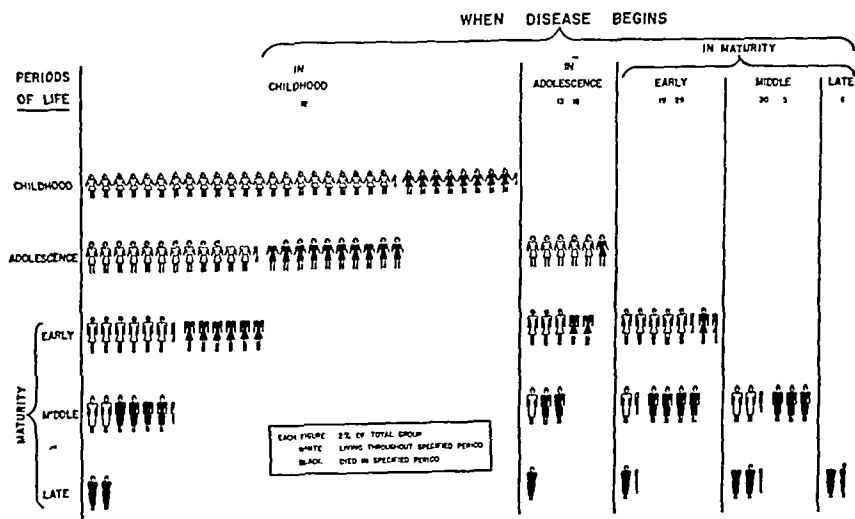


Chart 7—Duration of life in series of patients with rheumatic cardiac disease (females). The symbols are explained in the legend to chart 6.

A statement almost exactly similar to the one just made for male patients can be made for females except that when the disease is acquired in childhood the survival rate is slightly higher in females. As the age at onset advances, it is somewhat more favorable in males (table 4).

#### DISTRIBUTION OF CASES AT VARIOUS AGE PERIODS

In any view of the distribution of cases of this disease it is desirable to know the numbers to be found at various age periods (chart 8). From the point of view of one whose experience is gained from life in medical clinics, the result is as follows. Sixty-five per cent of all cases are to be found in childhood. In adoles-

cence are found the survivors of those afflicted in childhood (45 per cent) plus the new cases (11 per cent) occurring, of course, in adolescence. This sum amounts to 56 per cent. The number of cases occurring in adolescence is 9 per cent less than in childhood. In early maturity the number afflicted is 42 per cent embracing, of course, the survivors from childhood (23 per cent) and adolescence (9 per cent) plus the new cases which occur at this age period (10 per cent). They amount to 42 per cent of the rheumatic population and exhibit a drop of 14 per cent below the number in adolescence. In middle maturity, constituted of the survivors of the first three classes (26 per cent) to which new cases developing in this age period are added, the percentage has fallen another 6, to 36 per cent. Finally, in late maturity the percentage of survivors from the previous periods (13 per cent) plus the new cases has dropped conspicuously, so that only 16 per cent of all patients with rheumatic fever alive at that time are to be found in this category. It is obvious, therefore, that of the total rheumatic population, the greatest number is found in childhood and that at succeeding age levels the number progressively diminishes the greatest drops being between adolescence and early maturity and between middle and late maturity. Rheumatic fever, in short, is a disease of childhood and early adult life.

## SUMMARY

The method employed by the New York Heart Association for gathering data on the natural history of cardiac diseases and for their subsequent statistical treatment shows the value of statistical technique as a tool in the analysis of clinical medicine, with reference, especially, to the public health.

In this study 3,129 patients with rheumatic cardiac disease have been observed, until death, over a period of fifteen years.

There is no important difference between the sexes in the age at onset. The mean age for males is  $14.5 \pm 0.3$  years and for females  $15.0 \pm 0.3$  years.

Rheumatic fever may begin at any age, but it usually begins in childhood, especially between the ages of 5 and 10 years. At 15, 70 per cent of persons afflicted have already acquired the disease.

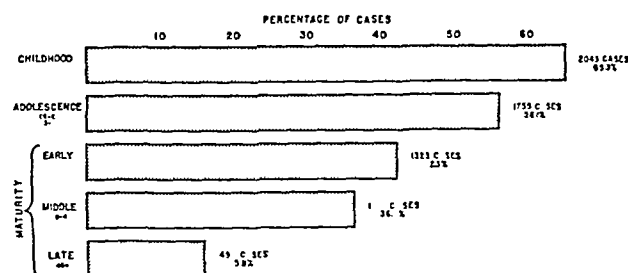


Chart 8—Rheumatic cardiac disease can be found at all ages. Sixty-five per cent of all rheumatic cardiac disease is found in childhood less is found in adolescence and still less in each subsequent period of life. The periods of life are specified in the legend to chart 5.

In youth, the onset of the disease is characterized by polyarthritis in about half and by carditis or chorea in about one third. In adult life, the onset is characterized chiefly by polyarthritis and, with advancing age, by the appearance of valvular lesions alone.

The mean duration of the disease is about thirteen years ( $12.5 \pm 0.3$  years for males and  $13.0 \pm 0.3$  years

for females), 50 per cent of patients die within nine years after onset but 25 per cent live more than seven years and 10 per cent for thirty or more years.

There is a difference in duration or expectancy as related to age at onset. When the disease begins in childhood, 69 per cent survive childhood, 35 per cent

TABLE 3—Duration of Illness

Sex	Number of Cases	Duration in Years				
		Range	Mean	Standard Deviation	Median	Q <sub>1</sub> Q <sub>3</sub>
Males	1,668	<1-67	12.5 ± 0.3	10.0 ± 0.2	10.0	5.0 17.5
Females	1,461	<1-60	13.0 ± 0.4	10.0 ± 0.2	10.0	5.0 19.0

TABLE 4—Survival Rate by Sex

Period of Onset	Sex	Survival Rate Through			
		Childhood	Adolescence	Early Maturity	Middle Maturity
Childhood	Male	69%	20%	16%	4%
	Female	71%	40%	20%	7%
	Total	69%	30%	18%	5%
Adolescence	Male		89%	61%	26%
	Female		83%	50%	14%
	Total		86%	56%	21%
Early maturity	Male			81%	27%
	Female			78%	18%
	Total			81%	22%
Middle maturity	Male				45%
	Female				44%
	Total				44%

survive adolescence 18 per cent reach the age of 30 and 5 per cent go on beyond the age of 45. When the disease begins in adolescence 85 per cent survive this age period 55 per cent reach the age of 30 and 21 per cent the age of 46 or more. When the onset is in the twenties 23 per cent and when it is after 30, 44 per cent survive the age of 45.

Of all cases of rheumatic cardiac disease 65 per cent are to be found in childhood. In the remaining 35 per cent the disease is acquired at later age periods. In adolescence are to be found 56 per cent, the survivors from childhood plus those who have acquired the disease in this age period. In the age group past 45 are to be found only 16 per cent of whom 13 per cent were first afflicted before and 3 per cent after age 45.

**Blind Belief in Laboratory Data**—As one who has taught them [medical students] for many years I can see no change in their ability to learn and hold facts that are new to them. That ability is a quality of the trained mind, and it makes little difference how the mind is trained, whether it be in science, or in the humanities or otherwise. Indeed, their scientific training may rise to plague them for it engenders an abiding faith in so-called methods of precision and a blind belief in laboratory data. Just inform the modern student of what the patient complains—never mind about a careful history or physical examination—tell him about the Wassermann, the blood pressure, the blood count, and the urinalysis, give him the results of the stomach wash, the sputum examination, the x-ray of the chest and the gastrointestinal series, and the lumbar puncture, let him know what the blood chemistry—including the plasma proteins and the cholesterol—shows and it may not even be necessary for him to see the patient. He will diagnose your case as quickly as did the doctors of a century ago, who in 1832 knew nothing about these tests and almost as accurately—Iring Frederick C. Safe Deliverance Boston, Houghton Mifflin Company 1942.

## CHANCROIDAL INFECTION

## TREATMENT AND DIAGNOSIS

MAJOR EUGENE GREENWALD

MEDICAL CORPS, ARMY OF THE UNITED STATES

Chancroid, or *ulcus molle*, is a local, nonindurated, tender ulcer, usually venereal, which is caused by inoculation with *Hemophilus ducreyi*, a gram-negative bacillus, which appears singly or in short chains and is easily obtainable by smears from the ulcer. It is fairly easy to culture if first inoculated into defibrinated rabbit blood and may then best be grown aerobically on dextrose-cystine blood agar slants.<sup>1</sup>

## INCIDENCE

Chancroid is a relatively common venereal lesion and as such presents problems in diagnosis and treatment to the Army Medical Corps. Of its relative incidence during the World War, the Surgeon General Reports show that though it was the least common of the more frequent venereal diseases comprising 11 per cent of the total, there were 39,044 primary admissions for chancroid in 1917-1918.<sup>2</sup> The calculated noneffective rate was 0.65 per thousand. Its greatest frequency was among Indian and colored troops, being 34.68 per thousand annually.

The rate for enlisted troops in the United States in 1918 was reported as shown in the accompanying table.<sup>3</sup>

Rauschkolb<sup>4</sup> in a civilian clinic found a 66 per cent colored incidence.

The incidence of chancroidal ulcers in females is much less frequent than in the male. Levin<sup>5</sup> believes that the bacillus may exist in the vagina as a nonpathogenic saprophyte, with the female acting as a symptomless carrier of the disease.

A review was undertaken of all cases of chancroidal infection that had been admitted to the Genitourinary Service, Station Hospital, Fort Belvoir, Virginia, from Jan 1, 1942 to Sept 1, 1942, a nine month period. At this army post, which is an engineer replacement training center, there is an average normal complement of more than one division. The ratio of colored soldiers to white is about 1 to 5. Analysis of the incidence of Ducrey infection reveals 73 colored to 3 white primary admissions during this period, or a ratio of approximately 120 to 1. This disproportion is not carried over to gonorrhea or to syphilis admissions to as great an extent, though the colored rate for the latter diseases is also disproportionately high.

## INCUBATION PERIOD

Following sexual contact a three to twelve day incubation period elapses before the onset of the ulcerations, as generally reported. In the cases which we have observed 18 gave histories of sex contacts twenty-two to ninety days prior to onset of clinical symptoms. Little credence was given to the statements of

14 patients because of low intelligence or apparent unreliability. In the remaining 55 cases the incubation period varied between two and fourteen days.

## DIAGNOSIS

Clinically, chancroid infection manifests itself as irregular, nonindurated ulcers with a granular, dirty grayish base, covered with a small amount of grayish purulent discharge. The edges are slightly undermined and irregular. The base bleeds easily on manipulation. The ulcers are more frequently multiple than single, this characteristic apparently being dependent on its autoinoculability. It is therefore to be expected that patients with single lesions have had a shorter period from onset to observation. This was found to hold true in this series. Those with single lesions averaged five to eight days before entering the hospital as compared to 10.4 days in cases in which there were multiple lesions.

Most of the chancroidal ulcers appear at the edge of a phimotic prepuce or, in circumcised males, on the frenum and in the coronal sulcus. These areas are those that are most apt to be traumatized during intercourse. Fifty-four per cent of our patients presented themselves with involvement of the inguinal lymph nodes, which are painful in the more advanced stages and are occasionally associated with constitutional symptoms of fever and anorexia.

The diagnosis of chancroid is not difficult. The clinical picture is fairly typical but should be very care-

*Rate of Syphilis, Gonorrhea and Chancroid for Enlisted Troops in the United States in 1918*

	White	Colored	Ratio W/C
Syphilis	18.83	129.90	1:6.90
Gonorrhea	78.07	514.68	1:6.58
Chancroid	4.98	44.5	1:8.94

fully differentiated from primary syphilis. It is our procedure to do dark fields on four consecutive days, and only after four negative dark field examinations do we feel justified in ruling out syphilis. In only 2 cases have we, during a subsequent four month observation period, had the serologic test for syphilis become positive. In these cases we had failed to identify *Treponema pallidum* on repeated dark field examinations.

In addition to clinical features we have two excellent laboratory aids: the smear and the Ito-Reenstierna skin test. Kornblith and his co-workers<sup>6</sup> in a series of 175 cases reported that the smear was the best single criterion of diagnosis, positive identification being possible in 88.57 per cent of their cases. In our laboratory the smear is stained by the Gram method. However, other workers prefer Wright's stain or methyl green pyronine. We have found these to be relatively simple procedures and very reliable. In our hands the smear was positive in 65 per cent of the cases.

The skin test is without doubt a specific test, as most investigators agree, though there is some disagreement as to the duration of infection before the skin will manifest an allergic response to the antigen. Becker and Obermayer<sup>8</sup> state that five weeks is a minimum time

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<sup>1</sup> Dienst R. B. New Preparation of Antigen for Intracutaneous Diagnosis of Chancroidal Infection. *Am J Syph Gonorr & Ven Dis* 26:20 (March) 1942.

<sup>2</sup> Medical Department of the U. S. Army in the World War vol 9 p 287.

<sup>3</sup> Report of the Surgeon General of the U. S. Army 1919 part I pp 955-959.

<sup>4</sup> Rauschkolb J. E. Circumcision in Treatment of Chancroidal Lesions of Male Genitalia. Further Observations. *Arch Dermat & Syph* 39:319 (Feb) 1939.

<sup>5</sup> Levin E. A. Diagnosis of Chancroid. *Urol & Cutan Rev* 45:587 (Sept) 1941.

<sup>6</sup> Kornblith B. A. Jacoby Adolph and Chargin Louis. Chancroid Treatment with Sulfathiazole and Sulfanilamide. *J A M A* 117:2150 (Dec 20) 1941.

<sup>7</sup> Greenblatt R. B. and Sanderson E. S. Intracutaneous Test for Chancroidal Infection. *J M A Georgia* 27:218 (June) 1938. Kornblith Jacoby and Chargin. *Speiser*.

<sup>8</sup> Becker S. W. and Obermayer M. E. *Modern Dermatology and Syphilology*. Philadelphia: Montreal and London: J. B. Lippincott Company, 1940. p 350.

before the skin test becomes positive. Speiser,<sup>9</sup> however, feels that the test becomes positive within six to ten days following the onset of ulceration.

In performance of the skin test we used a commercial antigen,<sup>10</sup> of which 0.1 cc is inoculated intradermally. It has been our experience that the skin test was positive in 75 per cent of the cases. In the 20 cases in which the test was either negative or doubtful the duration of infection was short. The lifelong character of a positive Ito-Reenstierna test must, however, be kept in mind and, like the tuberculin reaction, a negative test may be as useful as a positive test in the differential diagnosis.

#### PROPHYLAXIS

Mechanical as well as chemical prophylaxis following sexual intercourse is frequently urged on each soldier. He receives many lectures by medical and line officers and is exposed to training films concerning sex hygiene at frequent intervals. The chemical prophylaxis which is recommended by the Army consists of (1) initial thorough cleansing of the genitalia with green soap, (2) thorough washing of the parts with 1:1,000 mercury bichloride, (3) urethral injection of 5 per cent mild protein silver and (4) thorough application of ointment of mild mercurous chloride to the parts.

With this method of prophylaxis we find very few failures with respect to syphilitic or gonorrheal infections. However, chancroidal infections are apparently more resistant and we were much surprised on reviewing our prophylactic failures to observe that a disproportionately large number of these had developed chancroid. Whether this disproportion reflects the more chemoresistance of the organism as compared with the gonococcus and *Treponema*, whether the prophylaxis is not being adequately applied to the "danger zones" of Ducey infection or whether this is a chance circumstance in a relatively small number of cases we are not prepared to state. If this experience is generally corroborated throughout the Army, further investigation is indicated.

In our series 38 per cent of the patients had had a chemical prophylaxis, 29 per cent within one hour or less from the time of exposure. This experience is contrary to the experience of most reports. Thomas<sup>11</sup> feels that soap and water thoroughly applied within one hour of the contact is effective. This rate of failure compares very unfavorably with results in gonorrhea and syphilis, in which it comprises no more than 0.8 per cent.

#### TREATMENT

Until the advent of the sulfonamides the treatment of chancroidal infection was symptomatic rather than specific. During the World War treatment consisted of good local hygiene, under which many chancroids healed spontaneously. However, in progressive cases or very early infections the thermocautery or the chemical cautery were used with varied success as definitive or abortive treatment. Frequently there was extreme tissue destruction and scarring. In 1918 the average non-effective days or time lost from duty represented 24.9 days.<sup>2</sup>

Since 1918 many therapeutic measures have been recommended, running the gamut from complex mixtures to surgical excision. All of these have been

replaced by the sulfonamide drugs, surgery being indicated only when drainage and exposure of the lesion is extremely poor because of phimosis or paraphimosis. The prognosis has undergone a great change in recent years, since sulfonamides have been found useful.<sup>12</sup>

Prerequisite to the intelligent treatment of penile lesions is the recognition of the frequency of mixed infections. It is our practice to search for *Treponema pallidum* repeatedly in penile lesions subsequent to the positive diagnosis of Ducey infection, withholding all local therapy until a minimum of four consecutive dark field examinations have been found negative. During this period treatment with sulfathiazole is initiated by mouth. In our experience, often necrotic and heavily secondarily infected lesions become clean and *Treponema* is then more easily found in the expressed serum.

In this series we have found a chancroidal lesion coincident with syphilis in 10 instances. These cases presented, however, no problem in therapy for no adverse reaction marked the simultaneous use of sulfathiazole and daily full doses of mapharsen as used in our clinic in the treatment of primary syphilis.<sup>13</sup>

Once the diagnosis of Ducey infection is made our routine consists in the administration of sulfathiazole in 4 Gm daily doses, the initial dose being 2 Gm. The drug is continued in these doses for a minimum of seven days with careful observation for toxic phenomena. In no case in this series was there indication for withdrawal of the drug because of toxicity.

After a minimum of four negative dark field examinations, during which local application of saline dressings was used, the lesions were treated twice daily with soaks of 1:8,000 potassium permanganate followed by the application of sulfanilamide powder.

#### RESULTS

Under this regimen all patients rapidly improved with an average of 7.6 days of time lost from duty. No patient was discharged from the hospital until the lesions had completely epithelized.

Ten per cent of our cases were admitted with fluctuant buboes and surgical intervention was necessary in all of these, since treatment by sulfathiazole alleviated none. In 3 cases it was noted that on admission the nodes were discrete and in spite of favorable response of the ulceration to treatment the nodes went on to supuration and had to be incised and drained.

There were six recurrences in this series, four of which had received less than seven days of treatment. One of these patients had received only local treatment for five days on his primary admission. Another had a mixed infection with primary syphilis. One case listed as a recurrence was probably a reinfection since there was a time lapse of ninety-two days between his first and his second admission. On readmission all of these responded well to combined local and systemic therapy as outlined.

It is customary in our clinic to follow all cases of genitoinfectious disease not diagnosed as syphilis by weekly serologic tests for syphilis for one month and monthly Kahn tests for three months thereafter. However, since this post is a training center, many of the patients are transferred to other stations and field organizations. About 32 per cent of our patients were thus lost. The remaining 68 per cent have remained

<sup>9</sup> Speiser, Mortimer D. Infectious Lesions About External Genitals with Special Emphasis on Diagnosis. *Am J Obst. & Gynec* 43: 681 (April) 1942.

<sup>10</sup> Lederle Ducey Vaccine.

<sup>11</sup> Thomas, W. L. Present Day Diagnosis and Treatment of Chancroidal Infection. *North Carolina M J* 1: 104 (Feb.) 1940.

<sup>12</sup> Kornblith, B. A., Jacoby, Adolph and Wishengrad, Michael. Treatment of Chancroid with Sulfanilamide. *J A M A* 111: 523 (Aug.) 1938.

<sup>13</sup> Pelzman, I. A. and Greenwald, Eugene. Preliminary Intensive Treatment of Primary Syphilis by Daily Injections of Arsenicals. *Am J Syph. Gonorr. & Ven. Dis* 26: 637-640 (Sept.) 1942.

consistently seronegative except for 2, who within four weeks returned with a positive blood test and were subsequently treated for early syphilis. Of these 2 patients 1 had had a negative smear and negative skin test but was repeatedly negative on dark field examination and clinically was considered to have an early chancroidal ulcer. The second patient gave negative smear and positive skin tests and also healed rapidly with sulfathiazole therapy. The diagnosis of chancroid in these 2 cases is open to question despite the fact that the lesions healed without antisyphilitic treatment.

## SUMMARY

1 The ratio of colored to white soldiers having Dickey infection is much higher than the similar ratios for syphilis and gonorrhea.

2 The diagnosis of chancroid is aided by reliable procedures of smear and skin test.

3 Primary syphilis must be carefully differentiated from chancroid by multiple dark field examinations.

4 In our experience, prophylaxis by army routine fails to protect against chancroid as well as it does against syphilis and gonorrhea.

5 Treatment with sulfathiazole in 4 Gm daily divided doses for seven days is reliable and free of dangerous complications.

## CHEMOTHERAPY IN CHILDHOOD SEPSIS

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The literature of the past five years has been rich in papers describing all phases of sulfonamide therapy. The pharmacology of these compounds has been ably reviewed by Marshall<sup>1</sup> and by Goodman and Gilman.<sup>2</sup> Long and his associates<sup>3</sup> have thoroughly described the clinical uses and toxic manifestations. In the pediatric literature, Silverman<sup>4</sup> has contributed a critical review of the subject and Bigler and Haralambie<sup>5</sup> have published an exhaustive article particularly excellent for its historic and pharmacologic background.

Very few of these papers have been devoted specifically to the chemotherapy of septicemia. The most complete article is that of Herrell and Brown,<sup>6</sup> which, however, deals with adult cases. Hamburger and Rueggesser<sup>7</sup> have described 12 cases, and Rammelkamp and Keefer<sup>8</sup> have reported 7 cases of staphylococemia treated with these drugs. Others who have

reported small series of cases of staphylococcal septicemia treated with the sulfonamides have been Thornhill, Swart and Reel,<sup>9</sup> Goldberg and Sachs,<sup>10</sup> Weisman and Russell,<sup>11</sup> Carroll and his associates<sup>12</sup> and Herrell and Brown.<sup>13</sup>

The chemotherapy of pneumococcal septicemia has been described by Dyke,<sup>14</sup> and many such cases were included in the comprehensive report on the treatment of pneumococcal infections in children by Barnett, Hartmann and Perley.<sup>15</sup> No article has been devoted solely to streptococemia but individual case reports have been plentiful in various articles<sup>16</sup> and in the symposium on the subject which appeared in the *Journal of Pediatrics*.<sup>17</sup>

The present paper is a study of the effects of the sulfonamide drugs on the mortality, morbidity and incidence of septicemia in the pediatric service of the Jewish Hospital of Brooklyn. Since 1937 we have treated 104 patients with the following drugs: sulfanilamide, sulfamethylthiazole, sulfapyridine, sulfathiazole and sulfadiazine. In making this study we have used as controls a series of 320 septicemia patients treated before the advent of the sulfonamides. This older series was shown in an exhibit at the New York Academy of Medicine in 1940. The purpose of our exhibit then was to demonstrate that the prognosis in septicemia depends not only on the infecting organism but also on certain other factors.

## FACTORS INFLUENCING OUTCOME

The factors influencing the outcome in septicemia are the age of the patient, the type of pharyngitis accompanying the sepsis, the size of the bacterial invasion, the shift to the left in the count of the polymorphonuclear blood cells, the presence of localizations in certain organs and enlargements and the severity of the particular infection at the time the patient happens to be sick.

We should like to explain what we mean by three of these factors.

1 *Type of Pharyngitis*—We have placed sore throat, in accordance with its severity, into two divisions.

(a) *Severe Pharyngitis* (pharyngitis predominating or presenting). In this type the throat is acutely and severely inflamed, with the pharyngeal wall and tonsillar fauces severely congested and red at the time that the bacteremia is found.

(b) *Mild Pharyngitis* (pharyngitis nonpredominating, nonpresenting). In this type the throat, though diffusely red, does not appear angry or severely inflamed.

The charts were prepared by Mr. Henry Moore from the Department of Pediatrics of the Jewish Hospital. Read before the Section on Pediatrics at the Ninety-Third Annual Session of the American Medical Association, Atlantic City, N. J., June 10, 1942.

1 Marshall E. K. Jr. Bacterial Chemotherapy. The Pharmacology of Sulfanilamide. *Physiol. Rev.* 19: 240 (April) 1939.

2 Goodman Louis and Gilman Alfred. The Pharmacological Basis of Therapeutics. New York: The Macmillan Company, 1941.

3 Long P. H., Bliss Eleanor A. and Feinstein W. H. Mode of Action, Clinical Use and Toxic Manifestations of Sulfanilamide. *J. A. M. A.* 112: 115 (Jan. 14) 1939.

4 Silverman A. C. Treatment of Hemolytic Streptococcal Infections. *J. Pediatr.* 10: 249 (Aug.) 1941.

5 Bigler J. A. and Haralambie J. G. Sulfanilamide and Related Compounds. *Am. J. Dis. Child.* 57: 1110 (May) 1939.

6 Herrell W. E. and Brown A. E. The Treatment of Septicemia: Results Before and Since Advent of Sulfamido Compounds. *J. A. M. A.* 116: 179 (Jan. 18) 1941.

7 Hamburger Morton and Rueggesser J. M. Treatment of Staphylococcal Septicemia with Sulfamethylthiazole and Sulfathiazole. *Ann. Int. Med.* 14: 1139 (Jan.) 1941.

8 Rammelkamp, C. H. and Keefer C. S. Sulfathiazole Therapy of Staphylococcus Aureus Bacteremia, *New England J. Med.* 223: 877 (Nov. 28) 1940.

9 Thornhill W. A., Swart H. A. and Reel Clifton. Sulfanilamide in Staphylococcus Septicemia. *J. A. M. A.* 113: 1638 (Oct. 28) 1939.

10 Goldberg S. L. and Sachs Allan. Sulfapyridine in the Treatment of Staphylococcus Aureus Bacteremia. *J. A. M. A.* 113: 1639 (Oct. 28) 1939.

11 Weisman Donald and Russell Hollis. Treatment of Acute Staphylococcal Infections with Sulfamethylthiazole. *J. Pediatr.* 17: 31 (July) 1940.

12 Carroll Grayson, Kappel Louis, Jones Lloyd, Gallagher F. W. and DiRocco F. W. Sulfamethylthiazole. Report of Its Clinical Use in Staphylococcus Septicemia with Apparent Success. Report of Animal Experiments. *South. M. J.* 33: 83 (Jan.) 1940.

13 Herrell W. E. and Brown A. E. Clinical Use of Sulfamethylthiazole in Infections Caused by Staphylococcus Aureus. *Proc. Staff Meet., Mayo Clin.* 14: 753 (Nov. 29) 1939.

14 Dyke S. C. Pneumococcal Septicemia Treated with M & B 693. *Lancet* 2: 621 (Sept. 10) 1938.

15 Barnett H. L., Hartmann A. F., Perley Anne M. and Ruhoff Mary B. The Treatment of Pneumococcal Infections in Infants and Children with Sulfapyridine. *J. A. M. A.* 112: 518 (Feb. 11) 1939.

16 Scal J. C. Septicemia Following Acute Sinusitis Treated with Sulfonamide Compounds. *New York State J. Med.* 37: 1147 (June 15) 1937. Silverthorne Nelles, Brown Alan and Auger W. J. Sulfanilamide and Sulfapyridine in Treatment of Diseases of Children. *Canad. M. A. J.* 41: 16 (July) 1939.

17 Various authors. Symposium on Sulfanilamide Therapy, *J. Pediatr.* 11: 157 (Aug.) 1937.

The practical and theoretical implications of this point of view have been discussed in a previous paper,<sup>18</sup> but here it is sufficient to state once more that the type of accompanying pharyngitis has a decided influence on the mortality rate

TABLE 1—Year by Year Mortality in Sepsis

Year Ending July 31	Death from		
	Staphylococcal Septicemia	Streptococcal Septicemia	Pneumococcal Septicemia
1931	40%	48%	40%
1932	62%	44%	28%
1933	75%	70%	15%
1934	75%	70%	55%
1935	90%	50%	50%

2 *Size of Invasion*—We should also make clear what we mean by this factor. In a small invasion the broths are positive but the plates remain sterile. In a medium invasion the plates show a growth but

of treatment will not be presented in terms of gross mortality. Rather, the mortality will be given for each subgroup when treated with sulfonamide and when not thus treated.

#### CHEMOTHERAPY IN STREPTOCOCCUS HEMOLYTICUS SEPTICEMIA

Chart 1 shows that the use of the sulfonamides has reduced the gross mortality rate to one fifth its previous level. Moreover, it shows that in these 15 treated cases of streptococcemia the difference in mortality between subgroups is still present but that in each subgroup the mortality is less in the sulfonamide treated patients.

Table 2 lists the details of treatment in these cases.

Six of these patients are especially interesting because they are children who probably would have died in the presulfonamide days. Among them were a 3 and a 6 weeks old infant, with streptococcal meningitis and streptococcemia. One of the 2 also showed sacral edema, a finding which, as is shown by chart 1, was invariably

TABLE 2—Streptococcemia Treated with the Sulfonamides

Case	Age	Drug	Administration			Highest Blood Concentration	Final Result	Size of Invasion	Drug Reaction	Comment
			Oral	Subcutaneous	Intravenous					
1	3 wks	Sulfanilamide	+	0	0	13.5 total	Recovered	Large	Cyanosis	Concentration in cerebrospinal fluid was 3 mg. per 100 cc.
2	9 yrs	Sulfanilamide	+	0	0	4.5 free 6.0 total	Recovered	Large		
3	4 yrs	Sulfanilamide	+	0	0	4.5 free 5.5 total	Recovered	Large	Cyanosis	
4	3 yrs	Sulfanilamide	+	+	0		Recovered	Large		
5	20 mos	Sulfanilamide	+	0	0	4.1 free	Recovered	Large		1 free sulfanilamide pleural effusion + 2
6	9 mos	Sulfanilamide	+	0	0	18.6 free 18.6 total	Recovered	Large		
7	6 wks	Sulfanilamide	+	+	Into cerebrospinal fluid		Recovered	Small		Meningitis
8	7 yrs	Sulfanilamide	+	0	0		Recovered	Large		Lymphatic leukemia
9	1 yr	Sulfanilamide	+	+	0		Died	Medium		Dose very small
10	3 yrs	Sulfapyridine	+	0	0	12.6 total 9.8 free	Recovered	Small		
11	10 mos	Sulfapyridine	+	0	0		Died	Large		Died within 8 hours
12	4 yrs	Sulfapyridine	+	0	+		Recovered	Medium		Also received sulfanilamide into open wound
13	2 wks	Sulfathiazole	+	0	0		Recovered	Medium		
14	2 mos	Sulfadiazine	+	0	0	14.0 free	Recovered	Large	Hematuria	
15	4 1/2 yrs	Sulfadiazine	+	0	+	15.6 total	Recovered	Small		

there are less than ten colonies per cubic centimeter of blood. If there are more than ten colonies per cubic centimeter of blood on the plates we call it a large or massive invasion.

3 *The Yearly Invasion in the Mortality*—The importance of this factor is shown in table 1.

Our conclusion at that time was that the gross mortality percentage is not a satisfactory expression of prognosis in septicemia. Study of chart 1, for example, will show that whereas the gross mortality in streptococcemia was 55 per cent, the mortality in certain subgroups was as low as 14 per cent and in others as high as 100 per cent. The gross mortality in pneumococcal sepsis was 46 per cent (chart 2), but some subgroups had a mortality of 16 per cent while other subgroups of pneumococcal septicemia suffered 100 per cent mortality. In staphylococcal sepsis the mortality varied between 23 per cent in one subgroup and 93 per cent in another (chart 3).

In the present paper the results of chemotherapy are analyzed with these principles in mind. The results

fatal. Two other children had lymphatic leukemia with septicemia as a complication. Under chemotherapy, both children recovered from the bacterial invasion, their total white count dropped and the polymorphonuclear cells disappeared. The leukemic picture reappeared when the drug was discontinued. The fifth patient was a 9 month old baby who though he had considerable distention, numerous petechiae and Cheyne-Stokes respirations nevertheless recovered. The sixth recovered despite the presence of pneumonia, pericarditis, considerable distention, hematemesis, icterus and edema of the abdominal wall, forearms and clavicular regions.

Of the 2 children who died, 1 was treated in the early days of sulfonamide drug therapy. He received doses of sulfanilamide which we now consider inadequate, and such complications of the septicemia and pneumonia developed as emphysema, appreciable hepatic enlargement, repeated convulsions, induration of various parts of the skin, considerable distention and cyanosis. The other child who died was a 10 month old baby with pneumonia, mediastinitis and paralytic ileus who was not treated with sulfapyridine until eight hours before his death.

## CHEMOTHERAPY IN STAPHYLOCOCCIC SEPTICEMIA

Chart 3 shows the influence of the sulfonamides on the prognosis in staphylococemia. Forty-five patients were treated. The gross mortality in this treated series was 46 per cent as against 69 per cent in the untreated patients. Study of this figure leads to certain striking observations applicable to both treated and untreated patients. It shows that some subgroups are affected by chemotherapy while others are refractory to such therapy. These observations may be summarized as follows:

1 The mortality of both treated and untreated patients remained extremely high when there were foci in the bone and viscera.

2 The mortality also remained extremely high in patients who had involvement of the lungs and foci in other viscera.

3 However, when the bone alone was involved the mortality was 23 per cent in untreated patients and zero in the treated group.

4 When the lung alone was involved the mortality was 82 per cent in the untreated and 28 per cent in the treated group of patients.

Chemotherapy reduced the mortality also in those groups of patients with staphylococemia who had diarrhea. Specific drug therapy was beneficial also in patients under 1 year of age, those having large invasions, abdominal distention, subcutaneous abscesses or pustules or a blood which showed a polymorphonuclear shift to the left and those whose temperature curve was persistently below 103 F.

The patients treated with sulfathiazole or sulfadiazine showed the best results. Twenty-three were treated and 7 (30 per cent) died. Three died soon after admission and before adequate blood concentrations could be established. The only fatality under sulfadiazine therapy was among these 3. The fourth child died with myelogenous leukemia despite sterilization of the blood stream. Of the 16 who recovered on sulfathiazole or sulfadiazine therapy, 12 were under 1 year and several had multiple localizations. One was a 5 day old child with icterus gravis neonatorum and omphalitis with septicemia.

The mortality rate was 73 per cent among 15 patients treated with sulfanilamide or sulfapyridine or the two combined. The 4 who did recover had localizations that made for a good prognosis even in the presulfonamide days: 2 had cellulitis, 1 had osteomyelitis and 1 had pneumonia.

The 7 patients treated with sulfapyridine combined with sulfamethylthiazole fared better. 4 recovered. Moreover, all 4 who recovered were under 1 year of age and had a large blood stream invasion. Two of the recoveries were quite dramatic. One occurred in a 6 week old infant who had a large blood stream invasion with multiple lung abscesses and empyema. The other occurred in a 3 day old child with erythroblastosis, pneumonia and staphylococemia. This child was first treated with sulfapyridine, but the blood did not become sterile until sulfamethylthiazole therapy had been employed.

There were also 2 patients in whom a change from sulfathiazole to sulfadiazine seemed to influence the course of the disease. One was a 10 day old infant with acute pharyngitis, diarrhea and dehydration and generalized furunculosis. He was given sulfathiazole for nine days, but new lesions continued to appear daily and the blood culture remained positive. Shortly after sulfadiazine therapy was begun recovery took place. The second infant, 18 days old, with osteomyelitis of the femur and multiple cutaneous and subcutaneous foci, did not respond to sulfathiazole but recovered promptly after administration of sulfadiazine.

There are indications that the prognosis in staphylococemia will improve as our experience in the handling of the older sulfa drugs increases and as new drugs of this group are discovered. Chart 4 shows that each year since 1937 the prognosis in staphylococemia has improved. Of the last 23 patients treated with sulfathiazole or sulfadiazine only 30 per cent died.

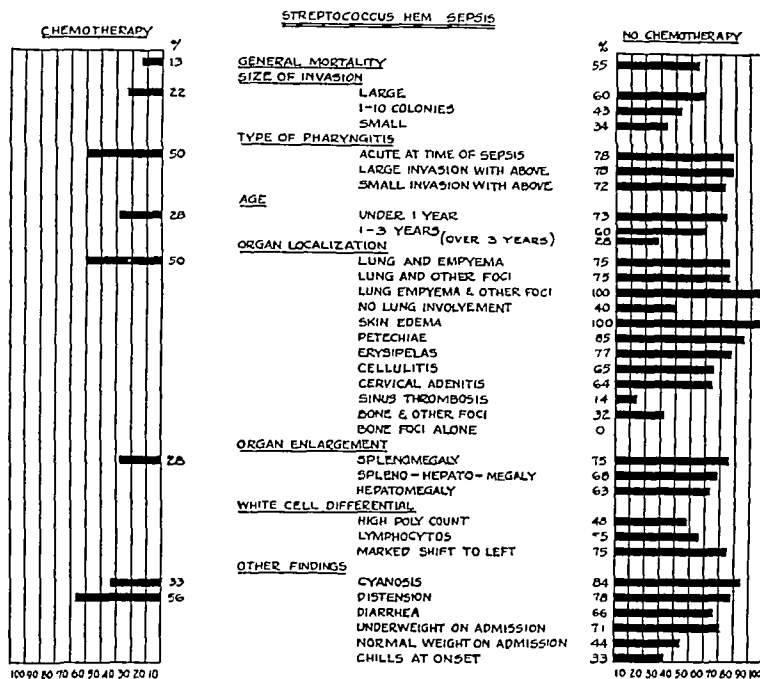


Chart 1—Factors in the prognosis of streptococemia in treated and untreated cases. The following factors seem to have no influence on the prognosis: tonsillectomy, loss or gain in weight during illness, previous illnesses, pathologic urinary findings, convulsions (without organic lesions), meningismus, anemia, and type of temperature curve.

## CHEMOTHERAPY IN PNEUMOCOCCIC SEPTICEMIA

Chart 3 shows the mortality in pneumococcal septicemia. Sixteen patients were treated with the various sulfonamides. Thirty-one per cent died as against 46 per cent in the group of untreated patients. This does not seem a great improvement until one considers that since the use of the sulfonamides a greater portion of the pneumococemia patients suffered from large invasions (table 2). Before sulfanilamide, 38 per cent of patients with pneumococemia had a large invasion. In the present series 68 per cent had a large number of organisms in the blood. Of the pneumococemia patients with large invasions, 84 per cent died in the presulfonamide era, in the treated series only 25 per cent died.

In chart 2 one sees that only 50 per cent of the patients with severe pharyngitis died, as against 100 per cent in the untreated group. Furthermore, in the



treated series only 1 of 3 patients with erysipeloid or petechiae died, while in the earlier series 89 per cent died. Finally, of 7 patients in the new series who had a shift to the left, only 42 per cent died, while in the untreated series there was a fatal outcome in 67 per cent of the group.

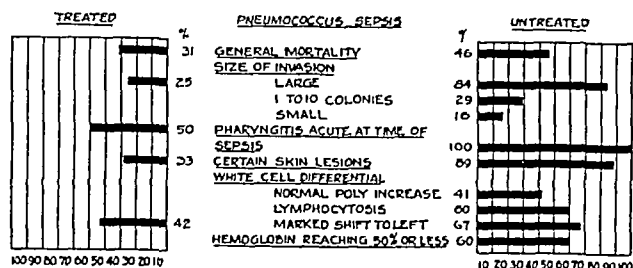


Chart 2—Factors in the treatment of pneumococemia. Certain skin findings include petechiae, edema, necrosis, erysipeloid and deep hemorrhages. The lung is so predominantly the localization in pneumococemia that there are too few cases from which to judge the influence of other types of localization, when such others appear it is usually in association with a large invasion and a fatal outcome. The age of the patient is no factor in the prognosis of pneumococemia; neither is the state of nutrition, splenomegaly or hepatomegaly, birth weight, previous illnesses, tonsillectomy or pathologic urinary findings.

One of the patients died within twenty-four hours after admission, before the full effect of sulfapyridine therapy could have been established. Two patients in the series who had meningitis died, in contrast with the 2 patients with streptococemia who survived this complication.

The details of these cases are shown in table 3.

#### ESCHERICHIA COLI SEPTICEMIA

We have had 8 patients with *Escherichia coli* septicemia who were treated with these drugs. Three died and five recovered. One of those who recovered was only 5 days old. One was 2 months old and also had *Staphylococcus aureus* in the blood stream. We have shown that before the sulfonamide era patients with two organisms in the blood stream invariably died.<sup>19</sup>

#### EBERTHELLA TYPHOSA SEPTICEMIA

Two patients with *Eberthella typhosa* septicemia were given the benefit of chemotherapy. They were 9 and 10 years of age, 1 died (treated with sulfanilamide) and 1 recovered (treated with sulfapyridine).

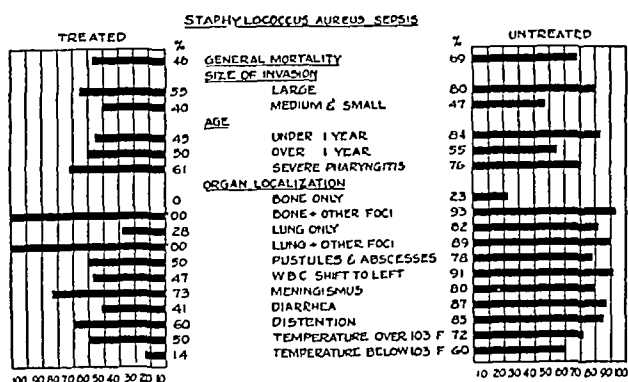


Chart 3—Factors in the treatment of staphylococemia.

One patient 2 weeks old with *Salmonella paratyphi* septicemia died despite treatment with sulfanilamide.

One child aged 10½ years, with *Proteus vulgaris* septicemia recovered on sulfanilamide therapy. One with *Pseudomonas aeruginosa* in the blood recovered on sulfanilamide therapy.

<sup>19</sup> Kanof Abram and Kramer Benjamin. Multiple Invasion of the Blood Stream. *J Lab & Clin Med* 27: 173 (Nov) 1941.

A patient aged 18 months with *Salmonella typhi* murium and *Staphylococcus aureus* in the blood stream recovered with sulfathiazole and sulfadiazine.

Three patients with *Hemophilus influenzae* sepsis and meningitis, all about 3 years of age, received sulfanilamide, 2 died and 1 recovered. One patient extremely sick with meningitis and meningococemia recovered with sulfanilamide therapy.

Two patients suffering from subacute bacterial endocarditis with *Streptococcus viridans* in the blood died despite treatment with sulfanilamide. One received sulfapyridine in huge doses and 1 received sulfapyridine and sulfadiazine in conjunction with fever therapy. We have had 8 patients with *Streptococcus gamma* septicemia, but these presented so variegated a clinical picture that we have not attempted to analyze the results. Three of these patients died.

#### THE EFFECT OF CHEMOTHERAPY ON MORBIDITY

Chart 5 shows the influence of these drugs on the morbidity as measured by the duration of fever. Of the untreated patients with septicemia who recovered, 80 per cent were sick for more than two weeks and 42 per cent for more than thirty days. Of the treated patients, 30 per cent were sick longer than two weeks but only 6 per cent for more than thirty days.

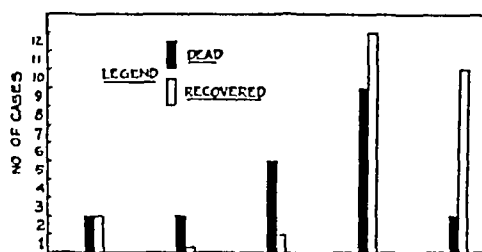


Chart 4—Improving mortality in cases of staphylococemia with sulfonamide therapy. Year by year mortality.

#### ROLE OF THE SULFONAMIDES IN THE PREVENTION OF SEPSIS

The role of the sulfonamides in the prophylaxis of septicemia has been reported in only a few instances. Thomas, France and Reichsman<sup>20</sup> have reported its use in the prophylaxis of rheumatic fever. Gray and Gear<sup>21</sup> found sulfapyridine of some value in reducing the number of carriers during an epidemic of cerebrospinal meningitis, while Hochberg and his associates<sup>22</sup> found it of value in reducing postoperative pneumonia in dogs. Smith<sup>23</sup> found these drugs of no value in preventing acute tonsillitis during an epidemic, though the drugs were of definite value in combating the disease. Hoare<sup>24</sup> did not find them of value in preventing postpartum infections.

We have been interested in the possible effects of the widespread use of the sulfonamides in relatively mild infections on the prevention of septicemia. We have attempted no systematic, citywide survey, but we have relied on tabulations of the incidence of septicemia in proportion to the total number of admissions at the

<sup>20</sup> Thomas Caroline B, France Richard and Reichsman Franko. The Prophylactic Use of Sulfanilamide in Patients Susceptible to Rheumatic Fever. *J A M A* 116: 551 (Feb 15) 1941.

<sup>21</sup> Gray F C and Gear James. Sulfapyridine as Prophylactic Against Cerebrospinal Meningitis. *South African M J* 15: 139 (April 12) 1941.

<sup>22</sup> Hochberg L A, Hersenson B B, Winkelman Louis and Rivkin Daniel. Prevention of Postoperative Pneumococcus (Type I) Pneumonia by Means of Prophylactic Use of Sulfapyridine. *Surg Gynec & Obst* 73: 40 (July) 1941.

<sup>23</sup> Smith Alexander. Chemotherapy of Streptococcal Infection Particularly Streptococcal Tonsillitis. *Lancet* 2: 1064 (Nov 6) 1937.

<sup>24</sup> Hoare E D. The Case for Prophylaxis with Sulfanilamide and M & B 693. *Lancet* 1: 76 (Jan 14) 1939.



Jewish Hospital of Brooklyn This has been done for each type of sepsis for the years preceding and the years following the introduction of the sulfonamide drugs. In addition, we have also studied the differences in the clinical picture of sepsis before and since the use of these drugs in infectious illnesses.

Table 4 shows the yearly incidence of the three major forms of septicemia at the Jewish Hospital since 1931. It shows that from 1937 onward there was a decided drop in the incidence of streptococcus hemolyticus septicemia and pneumococcal septicemia. However, there was no drop in the incidence of staphylococcal septicemia, and in 1940 and 1942 there was actually a rise in the occurrence of this form of sepsis. The table shows that there was no important variation in the total number of pediatric admissions throughout these years.

There have been two important changes in the clinical picture of staphylococemia as seen in our service since the sulfonamides have been in general use. The first has been a shift in the age incidence. Table 5 shows

Before the use of the sulfonamides, 41 per cent of the patients had bone foci and 27 per cent had pulmonary localizations. Since the sulfonamides have been in

TABLE 5—Percentage of Total for Each Organism Occurring in Each Age Group

Age Group	Before the Use of the Sulfonamides		Since the Use of the Sulfonamides	
	Staphylococcus Aureus	Pneumococcus	Staphylococcus Aureus	Pneumococcus
0 to 1 year	40%	27%	68%	27%
1 to 2 years	5%	14%	10%	27%
3 to 5 years	10%	11%	0	0%
5 to 9 years	7%	11%	10%	40%
10 to 12 years	19%	24%	4%	0
	19%	11%	8%	0

general use only 16 per cent of the patients have had bone localizations. On the other hand, the incidence of pulmonary localizations has risen to 47 per cent. We

TABLE 3—Pneumococemia Treated with Sulfonamides

Case	Age	Drug	Administration			Highest Blood Concentration	Final Result	Size of Invasion	Type of Pharyngitis	Immature Cells	Drug Reaction	Comment
			Oral	Subcutaneous	Intravenous							
1	2 mos	Sulfanilamide	+	0	0	41 total 39 free	Recovered	Large	Mild	++	0	
2	4 yrs	Sulfanilamide	+	0	0	79 total 67 free	Recovered	Large	Severe	++++	0	89% immature polymorphonuclears 5% mat 6% lymphocytes
3	3½ yrs	Sulfapyridine	0	0	+	74 total 83 free	Died	Large	Mild	++	0	Died in 4 hours of meningitis
4	3½ yrs	Sulfapyridine	+	0	0	87 total 83 free	Died	Large	Severe	+	0	Meningitis blood and cerebrospinal fluid sterilized
5	1 yr	Sulfapyridine	+	0	+	233 total 151 free	Recovered	Large	Mild	0	0	
6	4 mos	Sulfapyridine and sulfanilamide	+	0	0	102 free pyr	Died	Medium	Mild	0	0	
7	3 yrs	Sulfapyridine	0	0	+		Died	Large	Severe	0	0	Nephrosis erysipeloid patient died in 24 hours
8	2 yrs	Sulfanilamide and sulfadiazine	+	0	+	1975 total	Recovered	Large	Mild	0	Hematuria	Petechiae purpura
9	6 mos	Sulfadiazine	+	0	0	83 total	Recovered	Small	Mild	0	0	
10	1½ yrs	Sulfadiazine	+	0	0	96 total	Recovered	Small	Mild	0	0	
11	3 yrs	Sulfadiazine	+	0	0	75 total	Recovered	Small	Mild	++	0	Nephrosis
12	1½ yrs	Sulfadiazine and sulfathiazole	+	0	+	274	Died	Large	Severe	++	0	Nephrosis
13	9 mos	Sulfathiazole	+	0	0		Recovered	Large	Mild			Osteomyelitis
14	4 yrs	Sulfathiazole	0	0	+	130 total	Recovered	Large		+++		Nephrosis
15	2½ yrs	Sulfathiazole	0	0	+	54 total	Recovered	Medium	Severe	0	0	Erysipeloid nephrosis
16	7 mos	Sulfadiazine	+	0	0		Recovered	Large	Severe		Leukopenia	

that before 1938 40 per cent of the patients with staphylococcal bacteremia had been infants under 1 year of age and that 40 per cent had been children over 6 years of age. Since 1938 68 per cent of the cases of

TABLE 4—Yearly Incidence of Septicemia (1931-1942)

Year Ending July 31	Staphylococcus Aureus	Pneumococcus	Streptococcus Hemolyticus	Total Cases of Sepsis	Total Admissions to Pediatric Service
1931	5	5	19	29	561
1932	8	7	15	30	765
1933	8	8	27	43	594
1934	4	9	19	32	600
1935	10	20	40	70	504
1936	10	4	16	30	612
1937	9	3	6	18	628
1938	5	3	6	14	574
1939	5	2	2	9	669
1940	23	3	5	31	688
1941	12	3	1	16	508

staphylococemia have occurred in children under 1 year, and only 12 per cent in children of school age.

The other variation has been a change in the frequency of certain localizations in this form of sepsis

have found no change in the incidence of localizations in the skin, peritoneum, intestinal tract, brain or kidneys.

We have also found a change in some of the clinical aspects of pneumococcal septicemia. We<sup>18</sup> reported in the presulfonamide period that in a group of patients we studied 60 per cent of pneumococcal sepsis consisted of a small transient invasion of the blood stream by the pneumococcus in the course of a severe pneumonia. In only 35 per cent of the total was the invasion a large one, with localizations in the meninges, heart or bone. In this group, moreover, the patients were often suffering from a predisposing illness such as chronic glomerular nephritis, congenital heart disease, prematurity or celiac disease. A study of table 3 will show that this particular picture has changed. Among 15 patients with pneumococemia encountered since the general use of sulfonamides only 2 had pneumonia. Furthermore, 68 per cent of these patients had large invasions in contrast to 38 per cent reported<sup>18</sup> in the presulfonamide era. There has also been a change in the age incidence of pneumococemia. Table 5 shows

that before 1938 the cases of pneumococcemia were evenly distributed throughout the years of childhood. Since 1938, however, we have not seen pneumococcemia in children over 6 years of age. This may perhaps be attributed to prompt and effective treatment of children suspected of having pneumonia in this age period.

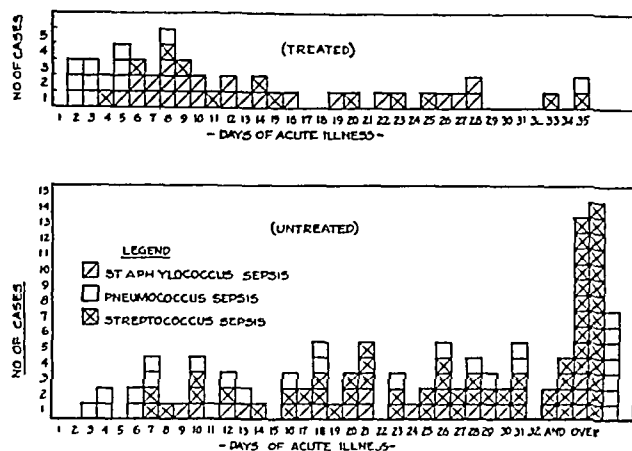


Chart 5—Morbidity among patients who have recovered from septicemia with and without chemotherapy

#### REACTIONS AND BLOOD CONCENTRATIONS

We have encountered only 5 patients who have had an adverse reaction to drug therapy. Two of these had severe cyanosis while being treated with sulfanilamide. Two patients on sulfadiazine therapy developed hematuria. One patient on sulfadiazine therapy developed leukopenia. All these untoward symptoms subsided when the drug was withdrawn.

Chart 6 shows the concentrations of the sulfonamides in the blood reached in the treatment of these patients. Two facts are worthy of note. First there is no correlation between the concentration of the sulfonamide and the outcome. Second, the highest concentrations were consistently reached when sulfadiazine was used.

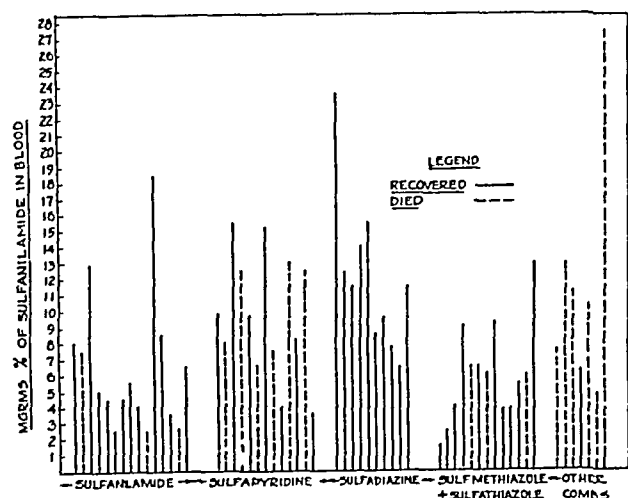


Chart 6—Blood concentrations in patients treated with various drugs

#### COMMENT AND SUMMARY

In this study we have emphasized the importance of certain clinical factors in establishing the prognosis in childhood septicemia. The prognosis in a particular case depends not only on the organism causing the infection but also on the age of the patient, the type of pharyngitis accompanying the sepsis, the size of the bacterial invasion, the reaction of the hemopoietic sys-

tem as judged by the shift to the left in the count of the polymorphonuclear white cells, the presence of localizations in certain organs and the virulence of the infection in the particular year.

Using as controls a series of patients in whom the influence of these factors was studied in the years previous to sulfonamide therapy, we have established that there is a definite reduction of mortality in patients treated with the sulfonamide drugs. However, there is still a difference in the mortality of different subgroups of the same type of septicemia. We have found, further, that the duration of illness has been sharply reduced in the treated series.

A further finding of importance is that coincident with the use of the sulfonamide drugs there has apparently been a lowered incidence of admissions to our service of patients with pneumococcemia and streptococcemia. Surprisingly, however, there has been no decrease in the frequency of staphylococcal septicemia.

Before 1938 most cases of pneumococcal sepsis presented a bacteremia, transient and small, which was merely an incident in the course of a severe pneumonia. With the use of the sulfonamides the cases of pneumococcemia which still are seen have most often been represented by severe nonpulmonary infections with large blood invasions and multiple localizations. Moreover, it seems now to have become a disease of infancy rather than an illness of the school age child.

Staphylococcal septicemia has changed in two important respects. Before the sulfonamide period the disease was most often associated with localizations in the bone. Recently this has not been true, the most frequent localizations have been in the lung. A second development has been in the shift of age incidence to the first year of life.

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#### ABSTRACT OF DISCUSSION

DR. REUBEN OTTENBERG, New York. I want to point out the wide variation in mortality from year to year in the statistics. That must warn us to go carefully in interpreting improvement. On the other hand I have to agree with the general trend of everything Dr. Kanof said. Every one who has used the sulfonamides has found a vast improvement in the results in septicemia due to the streptococcus and to the pneumococcus, and some improvement when it is due to the staphylococcus. The overall reduction in the case of the staphylococcus, as the authors pointed out, is a small figure. A third of the staphylococcus cases were treated with sulfanilamide or sulfapyridine, which we now know are relatively inefficient. In the latter part of the series which, I presume, received sulfathiazole, there was a much better result and in the cases treated with sulfadiazine there was only one death; it is apparent that the result depends to a considerable extent on the drug. Septicemia is not a single disease, it is a multitude of diseases, all of which are characterized by bacterial invasion of the blood. Before we had the sulfonamides, the most important point in treatment was the eradication of the infecting focus. The introduction of the sulfonamides must not make us omit the attempt to find and remove the focus which is feeding bacteria into the blood. Our failures with sulfonamides were due mostly to the impossibility of finding the focus or of treating it surgically. The fact that frequently today we cure cases without doing anything to the focus should not make us forget that there are still failures with the sulfonamides and that the focus is there. We thought, three or four years ago, that failure was due to inability of the sulfonamides to penetrate the lesion. We now know, as the result of the work of Lockwood and particularly of D. D. Woods of England, that the failure to cure the local lesion is due to the presence of protein breakdown products in the local lesion or possibly, although that has not yet been proved, of para-aminobenzoic acid. The most important observation in

the paper is not the diminished mortality but the diminishing incidence of streptococcal and pneumococcal septicemia in the years since we have had the sulfonamides. Perhaps this is going to be an instance in which the instincts of the general practitioner were right. The experts, for the most part said "You must not give sulfonamides in ordinary ear aches and ordinary sore throats, the danger of hemolytic anemia and agranulocytosis is too great." The general practitioner has gone his way and given the drug to most of these patients. We shall need more evidence, but it looks as though the general practitioner may have been justified.

DR GEORGE J BOINIS, Wilmington, Del. About two years ago Dr Osgood of Oregon suggested that in cases of *Staphylococcus aureus* septicemia, in which the sulfonamide drug was not effective recovery might result if neoarsphenamine was added. We had such a case in a boy 12 years of age who had *Staphylococcus aureus* septicemia and meningitis and the sulfonamide drugs sulfapyridine and sulfathiazole were not effective, but as soon as neoarsphenamine was given along with these drugs prompt recovery occurred. I should like to ask the authors if they had any such cases.

DR BENJAMIN KRAMER, Brooklyn. Statistically, it is wrong to compare the mortalities of one year with another year and conclude that, because a certain drug has been used, the result is necessarily attributable to the drug. However, the results here in certain groups of cases are so striking that there can be no doubt as to the general effectiveness of these drugs not only in adult sepsis but also in childhood sepsis. One of the particular contributions of this paper is that it calls attention to certain conditions other than specific therapy which influence prognosis and therefore indicates that in any study of the effectiveness of the sulfonamide drugs one has to break down the entire series of cases in order properly to evaluate the effects of treatment. When you do that, it is obvious that there are certain conditions which interfere or completely negate the effects of the treatment. This is important because it constitutes a challenge in that it indicates that the drug itself is not effective, that the drug is not reaching the focus of infection, that the bacteria produce some chemical substance which neutralizes the drug or that some other factor as yet unknown is operating. What some of these factors may be, Dr Ottenberg has indicated. Another important contribution is the study of the effect on morbidity. This, while it is one of the interesting phases of the paper, is yet one of the weakest, considering the conditions under which we had to work, namely to limit our study to the types of cases admitted to the service, their severity in relation to the total number of cases admitted and to the types of cases previously admitted. However, the results are sufficiently suggestive, perhaps, to warrant a more systematic, more comprehensive and perhaps a better controlled study along the same lines. Anybody who has practiced pediatrics or even medicine in the presulfonamide days and is still active today must realize the striking change in the incidence of certain types of infections. While we have no convincing evidence that the change has been produced by the use of sulfonamide drugs, the evidence that we have is certainly suggestive.

DR ABRAHAM KANOF, Brooklyn. Dr Ottenberg and Dr Kramer emphasized that there are natural factors which influence the mortality and morbidity. This is the important part of the paper. Just to say that the mortality in staphylococcal sepsis is 60 per cent before treatment and 30 per cent after treatment does not tell the story. It varies without sulfanilamide or sulfathiazole from year to year, and with different subjects, and that is a point which we wanted to emphasize. Dr Ottenberg brought up the question of multiple blood stream invasions. Dr Kramer and I reported a series of cases of multiple blood stream invasions about six months ago and classified multiple blood stream invasions into four groups. In the first group one gets two organisms in the same culture. In our experience, those cases were invariably fatal. In our second group there is one organism on one occasion and another one in a subsequent culture. For example, one may see a youngster who has a staphylococcal septicemia, who goes along for three or four weeks, has an occasional positive staphylococcus blood culture and then suddenly develops an erysipeloid rash, and one takes a blood culture and finds a

hemolytic streptococcus. Most of those patients died, although some recovered. A different type of multiple blood stream invasion is one in which a variant of the first organism appears in a subsequent culture. One may have a patient with a *Streptococcus hemolyticus* septicemia who shows two or three positive cultures with that organism. Then one day a culture of the blood reveals *Streptococcus viridans* or gamma streptococcus. Those are also considered multiple blood stream invasions, but they usually end in recovery. The fourth is the type in which the second organism is a casual invader. A youngster has a positive typhoid in the blood on one or two occasions and then when nearing convalescence one finds that he has a gamma streptococcus in the blood. In the first group, in which there are two organisms in the same blood culture, the patient invariably died before the era of the sulfonamides. Now we have 2 such patients who recovered on sulfathiazole.

## TESTOSTERONE PROPIONATE PELLET IMPLANTATION IN GYNECIC DISORDERS

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AUGUSTA, GA

The employment of so-called "male" sex hormone in the treatment of certain gynecic disorders may appear paradoxical but it is not unphysiologic. Androgenic hormones are not peculiar to the male, for they are elaborated also by the female. The Callows,<sup>1</sup> Womack and Koch<sup>2</sup> and others have isolated from the urine of normal women the same two androgens identified in the urine of normal males. It is reasonable to suppose that in woman's hormonal economy androgens play some physiologic role.

In recent years there has been an increasing trend to use androgens in gynecologic therapy. This practice has received much support, much condemnation. The schism is wide. Two diverse opinions, each crystallized from a wealth of experience, are found in the statement of Geist and Salmon<sup>3</sup> that "the use [of androgens] as therapeutic agents has a sound rationale" and the contention of Hamblen<sup>4</sup> that "androgens have no place in rational gynecologic therapy."

A rapidly accumulating literature has established many therapeutic uses for these steroids in woman.<sup>5</sup> The parenteral, oral or percutaneous route of administration may require massive doses to assure therapeutic results, and this may not be attended always by balanced physiologic reactions. It must be admitted that after large parenteral doses (500 mg a month) undesirable side reactions such as temporary or permanent virilism may develop.<sup>6</sup> Such doses used parenterally have

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Read before the Section on Obstetrics and Gynecology at the Ninety Third Annual Session of the American Medical Association Atlantic City, N. J. June 10, 1942.

The pellets of testosterone propionate used in this study were furnished by Ciba Pharmaceutical Products Inc. Drs E. Oppenheimer and R. A. MacBrayer cooperated and gave suggestions.

1 Callow, N. H. and Callow, R. K. Isolation of Androsterone and Transdehydro Androsterone from Urine of Normal Women. *Biochem J.* 32: 1759 (Oct.) 1938.

2 Womack, E. B. and Koch, F. C. Testicular Hormone Content of Human Urine. *Endocrinology* 16: 273 (May/June) 1932.

3 Geist, S. H. and Salmon, U. J. Androgen Therapy in Gynecology. *J. A. M. A.* 117: 2207 (Dec. 27) 1941.

4 Hamblen, E. C. Rationale of Androgen Therapy in Gynecology. *J. Clin. Endocrinol.* 1: 180 (Feb.) 1941.

5 Salmon, U. J. Rationale for Androgen Therapy in Gynecology. *J. Clin. Endocrinol.* 1: 162 (Feb.) 1941.

6 Greenhill, J. P. and Freed, S. C. Virilism in Women Caused by Androgenic Therapy for Menstrual Disturbances. *J. A. M. A.* 112: 1537 (April 22) 1939.

given cause for protestation that androgens are contrasexual. It may well be that the dose and not the hormone is contraphysiologic.

It has been noted by many investigators<sup>7</sup> in both animal experimentation and clinical investigation that implantation of pellets of crystalline steroids results in

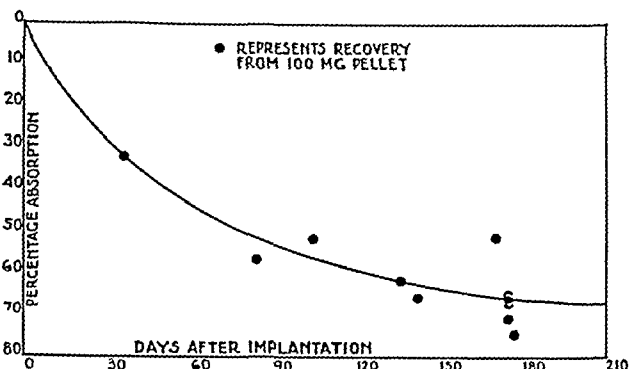


Fig. 3—Percentage absorption curve for 100 mg pellets of testosterone propionate obtained by plotting percentage absorption of eleven pellets recovered at intervals varying from thirty six to one hundred seventy seven days.

a slow and more physiologic absorption of the substance than that observed after parenteral administration. Since the amount of hormone released to the organism is continuous though minute in quantity, it is conceivable that by this method all the beneficial effects of larger doses of androgens may be obtained without the arrhenomimetic phenomena. This paper deals with my observations following the implantation of pellets of testosterone propionate for the therapy of various gynecic disorders.

#### MATERIAL AND METHODS

Sixty-four women ranging in age from 19 to 53 had pellets of testosterone propionate implanted subfascially. From 1 to 4 pellets were implanted at one time. The pellets varied in weight from 22 mg. to 200 mg. Though the average dose was about 100 mg., nevertheless as little as 22 mg. and as much as 400 mg. was employed. Sixty-eight implantations were performed on 64 patients, of whom 61 had but one implantation. One patient had three and 2 had two implantations. Studies were conducted on patients presenting a variety of gynecic disorders, namely functional uterine bleeding, uterine fibromyomas with or without menstrual disturbances, dysmenorrhea, menopausal syndrome and nervous tension states. Attention was given to coincident disturbances of micturition and the status of the patient's sexual libido before and after implantation.

Vaginal smears, endometrial biopsy studies and blood chemistry determinations were obtained in the majority of cases before implantation and were repeated at various intervals after implantation. Many vaginal biopsy studies were also taken before and after implantation. The patients were seen, as a rule, at weekly to monthly intervals and have been under observation from four to twenty-two months.

#### PROCEDURE

All implantations were made under sterile conditions in the operating room. The skin of the abdomen was prepared and then an area between the pubis and the

umbilicus 3 cm. long was infiltrated with 1 per cent procaine hydrochloride down the midline to the rectus sheath. An incision was made through the skin and subcutaneous fat and the rectus sheath was visualized. A small incision was made in the sheath exposing the rectus muscle. The pellet, or pellets, were then inserted under the sheath to lie on top of the muscle belly. The fascial sheath was closed with No. 1 chromic catgut and the skin and subcutaneous fat approximated by silk stay sutures.

#### FUNCTIONAL MENOMETRORRHAGIA

Eight patients with severe functional menometrorrhagia of from three months' to two years' duration had submitted to curettage and/or a variety of therapeutic procedures with disappointing results. Implantation of testosterone propionate pellets in doses varying from 96 to 205 mg. was soon followed by cessation of bleeding in every case (fig. 7). It is noteworthy that in 5 of the patients bleeding was known to be associated with cystic glandular hyperplasia or persistent estrogenic endometria. In 3 cases, in spite of the control of flooding episodes, repeated suction curettages revealed persistent hyperplasia or estrogenic endometria for many months after pellet implantation. Stabilization of the menses was the rule, though temporary cessation of the menses or an increase in the interval between periods frequently occurred. In 2 cases menorrhagia was associated with an imperfect progesterational endometrium. Following implantation normal cyclic bleeding occurred from an improved progesterational endometrium. Two patients with menorrhagia not benefited by this procedure were excluded from this group because of concomitant pelvic inflammatory disease.

#### MENOMETRORRHAGIA ASSOCIATED WITH UTERINE FIBROIDS

Twelve patients with severe menometrorrhagia associated with uterine fibroids had been hospitalized but were considered poor risks for major surgery. Pellets of testosterone propionate were implanted in doses of

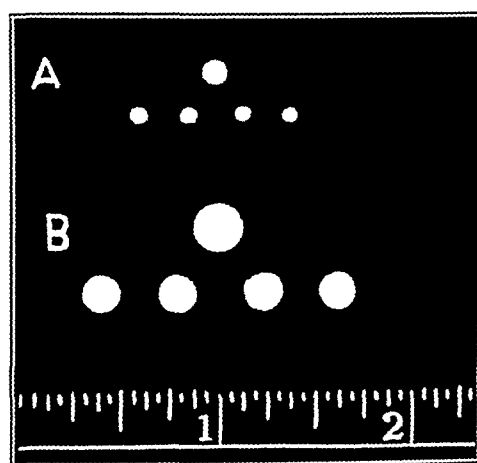


Fig. 5—Compare original size pellet with size of recovered pellets. A four 25 mg. pellets recovered one hundred and thirty-three days after implantation. B four 100 mg. pellets recovered one hundred and seventy-seven days after implantation.

from 25 to 302 mg. Subsequently, though the degree of flooding was less in all but 1 case, nevertheless the results were very poor in 3 cases (8, 9, 11) and hysterectomy was performed six to seven months later. Of the 3, 2 presented submucous fibroids and 1 multiple fibroids with pelvic inflammatory disease. In a fourth

<sup>7</sup> Deansley R. and Parkes A. S. Factors Influencing the Effectiveness of Administered Hormones. *Proc. Roy. Soc. London* S. B. 121: 279, 1937. Thorne G. W., Howard R. P., Emerson Kendall Jr. and Piror W. M. Treatment of Addison's Disease with Pellets of Crystalline Adrenal Cortical Hormone (Synthetic Desoxycorticosterone Acetate) Implanted Subcutaneously. *Bull. Johns Hopkins Hosp.* 64: 339 (May) 1939.

(case 7) there was moderate improvement in the degree of menorrhagia for thirteen months, then bleeding episodes began to recur. In the remaining 8 cases satisfactory alleviation resulted, and in some of these for as long as eighteen to twenty-two months. Testosterone propionate pellet implantation proved of value as a

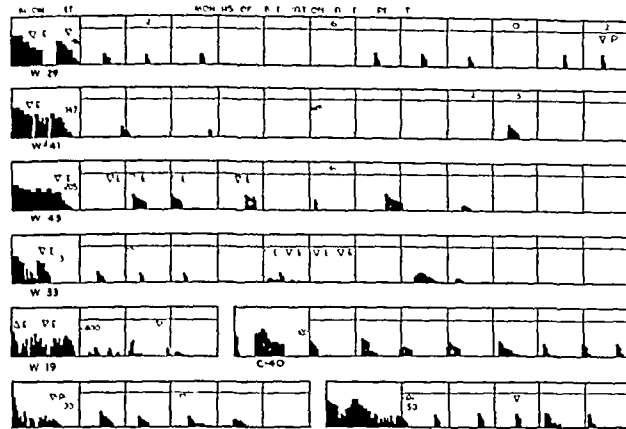


Fig 7—Influence of implanted pellets of testosterone propionate on 8 patients with functional menometrorrhagia

temporary measure, affording an opportunity for enough improvement in the patient's physical condition to permit ultimate major surgery (cases 3 and 12). It was not meant as a substitute for surgery. The endometrial studies in case 5 are of interest, for this is the only instance in the series in which testosterone propionate pellets suppressed further ovulation. The patient was 45 years of age and had flooded for two to three weeks in every month for about two years. At the time of implantation of a 100 mg testosterone propionate pellet, suction curettage revealed an imperfect progestational endometrium. One month later she bled from a progestational endometrium. Thereafter the interval between the menses increased and repeated suction curettages at various intervals revealed an estrogenic or hypoestrogenic endometrium. She has not menstruated in the past year. This may be coincidental. On the other hand, this may be an example of premenopausal bleeding being tided over a crucial period by pellet implantation (fig 8).

#### HYPERMENORRHEA-POLYMENORRHEA

Hypermenorrhea or polymenorrhea occurred in 18 cases, in eleven of which there were uterine fibroids. In 7 the disturbance was functional. Testosterone propionate pellet implantation proved of value in ameliorating this disturbance in the functional group and in all but 2 of the group with uterine fibroids. Of these 2, 1 was temporarily alleviated and in the other the pellets sloughed out shortly after implantation.

#### UTERINE FIBROIDS WITHOUT MENSTRUAL DISTURBANCES BUT WITH PELVIC DISCOMFORT OR DEBILITY

Pellets of testosterone propionate were implanted in 7 patients because of massive uterine fibroids. These patients were anemic and complained of pelvic discomfort, general weakness and pressure symptoms. As a rule, following pellet implantation these patients felt stronger, pelvic discomfort was lessened and the anemia showed some improvement. Within a few months many of the patients with uterine fibroids in this and the other groups volunteered the fact that they were certain

that regression in size of the tumor had occurred. Subjectively there was recession of the level which the tumor had gained. Respiration was easier when the patient was reclining, and the girth of the abdomen decreased (the belts on their dresses served as a measure) in spite of a moderate gain in weight. Objectively it was felt that, with the exception of 2 cases, there was a definite decrease in the size of the palpable tumors.

#### MENOPAUSE

Eight women in this series had pellets of testosterone propionate implanted for the amelioration of the menopausal syndrome (table 2). It was found that the best results were obtained with large doses, and the patient who responded most satisfactorily was one in whom four 100 mg pellets had been implanted (case 8). This patient had been treated with estrogens for some fifteen months with satisfactory though transitory results requiring continuous therapy. Another patient (case 5) required 5 mg of estradiol dipropionate parenterally every two weeks to keep her free from the hot flashes that kept her awake at night. With the implantation of two 200 mg pellets of testosterone propionate she has remained reasonably free from her menopausal syndrome for the seven months since their implantation.

#### DYSMENORRHEA

Nine women with functional dysmenorrhea were selected for pellet implantation because of the severity of their symptoms. On each patient various therapeutic procedures had been tried with disappointing results. Physicians had suggested hysterectomy or presacral nerve resection to 5 of these patients. The patients

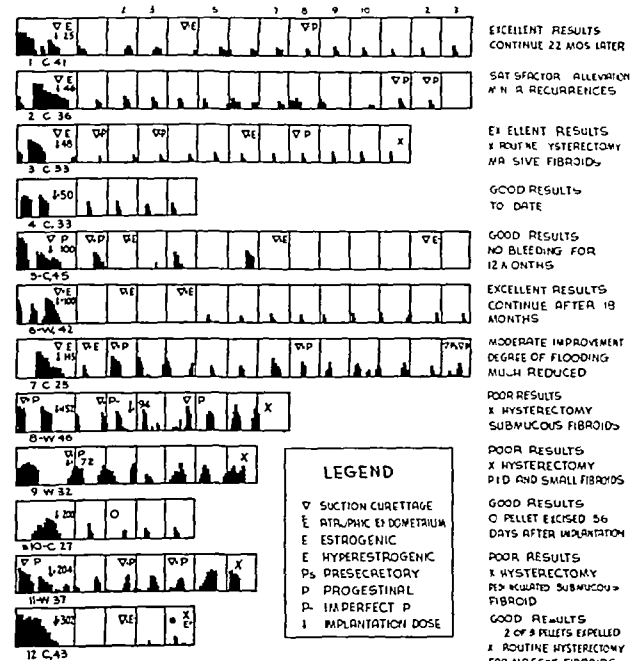


Fig 8—Influence of implanted pellets of testosterone propionate on menorrhagia associated with fibromyomas in 12 cases

ranged in age from 19 to 38 years and the dose of the pellets implanted in each varied from 150 to 400 mg. No decided disturbance in the regularity of the cycles occurred in spite of the fact that two 200 mg pellets were implanted at one time in 5 of the patients in this group. In 1 patient extrusion of the pellets occurred thirty-six days after three pellets totaling 200 mg had

been implanted. She experienced satisfactory alleviation of pain during the menses while the pellets remained in situ, and only that period was included in the statistical data. Of the observations noted on forty consecutive cycles it was found that 75 per cent relief or better was obtained in 48 per cent of the cycles and approximately 50 per cent relief followed in 27 per cent of the cycles. Results were unsatisfactory in 25 per cent of the cycles. In another group of 14 patients whose dysmenorrhea was not primary or functional but associated with uterine fibroids, the results appeared to be better. These patients were observed from eight to twenty-two months, a much longer period than for the group with functional dysmenorrhea. In 11 patients the pain was considerably ameliorated. In several there were recurrences after variable lengths of time coincident with absorption of the greater part of the implanted pellet.

#### INFLUENCE OF TESTOSTERONE PROPIONATE PELLET IMPLANTATION ON NOCTURIA

In the group of women under consideration it was noted that many of them had coincidental disorders of micturition to which no pathologic basis could be ascribed. Thirty women had uterine fibromyomas and

sexual desire. On the other hand, restoration of the libido readily occurred following implantation in those women who at some time had known libido. Many married women volunteered the information that their loss of sexual desire led to marital discord. Following pellet implantation there was a return of coital pleasure which often terminated in orgasm. A reawakened interest on the part of the husband usually followed and husband and wife once more fell in love. Among those women who had a strong to moderate degree of sexual desire before implantation, all noted either no significant change or further increase in sexual pleasure. Two women with normal libido had a temporary decrease in sexual desire for several weeks immediately after pellet implantation and then a resurgence of the libido to a greater degree than that before the implantation. In several instances it was noted that the libido returned to the preimplantation status by the end of the third to the eighth month. In the majority, however, it persisted long after the pellets had been absorbed.

#### BLOOD CHEMISTRY STUDIES

Before pellet implantation and at various intervals afterward blood samples were taken and quantitative analyses were made of the following components: Non-

TABLE 2—Influence of Pellet Implantation on Menopausal Syndrome\*

Case	Race	Age	Dose Mg	Menopause	Before Pellet	Months Observation After Pellet					
						1	2	3	4	5	6
1	W	30	75	Post radiation	+++	+	—	—	—	—	—
2a	W	29	98	Post radiation	++++	—	—	—	—	—	—
2b	W	29	900	Post radiation	+++	—	—	—	—	—	—
3	W	29	66	Castration	+++	—	—	—	—	—	—
4	W	29	30	Castration	++	—	—	—	—	—	—
5	W	27	400	Castration	+++	—	—	—	—	—	—
6	W	53	75	Natural	+++	—	—	—	—	—	—
7	W	50	98	Natural	+++	—	—	—	—	—	—
8	N	42	400	Natural	+++	—	—	—	—	—	—

\* — satisfactory alleviation ± occasional hot flashes + mild ++ moderate +++ severe ++++ very severe

in 19 instances nocturia of two to ten times a night was present. Frequently diurnal frequency and dysuria were associated with the nocturia. After pellet implantation there was partial to complete amelioration of this syndrome. Because of this observation it is felt that the belief perpetuated in textbooks and in teaching may well be fallacious—that nocturia associated with uterine fibromyomas is due to pressure on the bladder.

In another group of 10 women with stigmas of endocrine imbalance, such as functional menorrhagia (5 cases), the menopause (4 cases) and dysmenorrhea (1 case), there was a similar syndrome of nocturia with or without diurnal frequency or dysuria. Routine urinary findings were negative or of little significance. The syndrome was partially or wholly alleviated following pellet implantation. Of the remaining 34 patients in this series without urinary disturbances, nocturia developed in 2 following pellet implantation (fig 9).

#### LIBIDO

Information as to the status of the sexual libido before and after implantation was obtained from 54 women. The patients were classified as follows: (a) 8 women who never had any libido or had very little of it, (b) 22 women who had once known libido but lost it, (c) 14 women who had a moderate amount of libido, and (d) 10 women in whom libido was good or very good.

It was impossible to increase the libido of 2 psychologically frigid women who never had experienced

protein nitrogen, sugar, uric acid, creatinine, sodium, potassium and calcium. Although the values obtained fluctuated for each individual sample from the same patient and from different patients, there was no decided deviation from the normal fluctuations. The clinical picture observed before and after implantation of testosterone propionate pellets cannot be ascribed to any disturbance of those constituents of the blood that were studied, since the blood analyses showed them to be within the limits of normal values. On the other hand, Albright<sup>10</sup> has shown that testosterone propionate is capable of restoring and maintaining a positive nitrogen balance, and promoting phosphorus and some calcium retention.

#### ENDOMETRIAL STUDIES

In 39 cases of this series endometrial biopsies were available for study. In the larger number of these there had been at least one biopsy made before pellet implantation and from one to seven afterward. After pellet implantation biopsies were usually done on the first day of the menses and as close to the expected onset of menses as possible. Occasionally biopsies were done in midcycle or during an amenorrheic episode to study the effect if any, of the implanted pellet on the endometrium. The biopsy specimens were stained routinely with hematoxylin and eosin, and frequently alcohol fixed tissue was subjected to Best's carmine stain and rechecked by the iodine reaction for glycogen.

<sup>10</sup> Albright, Fuller, Parson, Williams and Bloomberg. Esther. Therapies in Cushing's Syndrome. J. Clin. Endocrinol. 1: 375 (May) 1941.

An analysis of the histologic studies of these biopsy specimens permits of an answer to the obvious query: What is the effect of implantation of testosterone propionate pellets on the endometrium of the adult woman? In general implantation of pellets in doses up to 400 mg of testosterone propionate does not interfere with development of progestational endometrium in the woman with a normal cycle. Moreover in some cases pellet implantation enhanced the development of a more mature progestational endometrium in the women who had previously bled from an imperfect progestational endometrium.

On the other hand, it appeared that testosterone propionate in doses used in this study was capable of maintaining the endometrium in the status attained before the implantation. For instance, cystic glandular hyperplasia or a persistent estrogenic endometrium was maintained in the majority of cases for many months after pellet implantation. It might be argued that such a finding is proof of the ineffectiveness of the hormone. The clinical improvement of the patient precludes such a conclusion. Furthermore, in many instances the anovulatory bleeding episodes were stabilized and bleeding recurred cyclically from a progestational endometrium. In only 1 case, and that in a woman aged 45, did suppression of ovarian function occur as reflected in the endometrial pattern. This incident may have been in consonance with the hypophysial gonadal relationship expected at or near the menopause. The continuous and gradual absorption of androgenic substances from the testosterone propionate pellets implanted in doses up to 400 mg does not inhibit the rhythm of hypophysial activity. Fresh corpora lutea were often observed in patients submitted to laparotomy (hysterectomy) several months after pellet implantation. Furthermore, interference with glycogen deposition in the secretory endometrial glands was not found.

#### VAGINAL SMEARS AND VAGINAL MUCOSA

Routine vaginal smears were taken before implantation and at frequent but irregular intervals after implantation. The smears were stained routinely by carbol fuchsin and occasionally by the Shorr technic. The vaginal pH was determined by the use of nitrazine paper and a routine study of the vaginal secretions was made in search of monilia or trichomonads. Vaginal biopsy specimens were taken in many cases before implantation and at various intervals after implantation. In general, pellet implantation in the dosages employed did not interfere with the deposition of glycogen in superficial layers of the vaginal mucous membrane in those with functional ovaries (fig 10). Occasionally temporary regression of the vaginal mucosa exhibiting castration effects (fig 11A) were noted soon after implantation, but maturation toward normal (fig 11B) soon followed. In castrate or menopausal patients with moderately mature vaginal smears, pellets of testosterone propionate in small or moderate doses did not suppress or enhance the maturation of the vaginal epithelium. In 2 menopausal patients with castrate smears in whom larger doses (400 mg) were employed it was noted that testosterone propionate had an estrogenic effect, maintaining on the average a 3 plus reaction. In the menopausal cases with castrate smears similar estrogenic effects were not observed when smaller doses were employed.

#### ARRHENOMIMETIC PHENOMENA

Arrhenomimetic phenomena were not observed in any patient in this series. Particular attention was given to the patients as to changes in voice, hirsuties and enlargement of the clitoris. In spite of the fact that some patients had a moderate degree of masculine crines before implantation no further exaggeration of hairy distribution was noted following pellet implantation. Many patients felt that their voices were stronger and sang with more resonance. Definite lowering of the pitch or persistent hoarseness was not observed. Slight hypertrophy of the clitoris was noted in but few patients and in none was there pathologic enlargement.

#### MISCELLANEOUS OBSERVATIONS

In general, patients experienced a sense of well-being and increased strength. They did not fatigue as easily. Appetites were better. In patients under observation

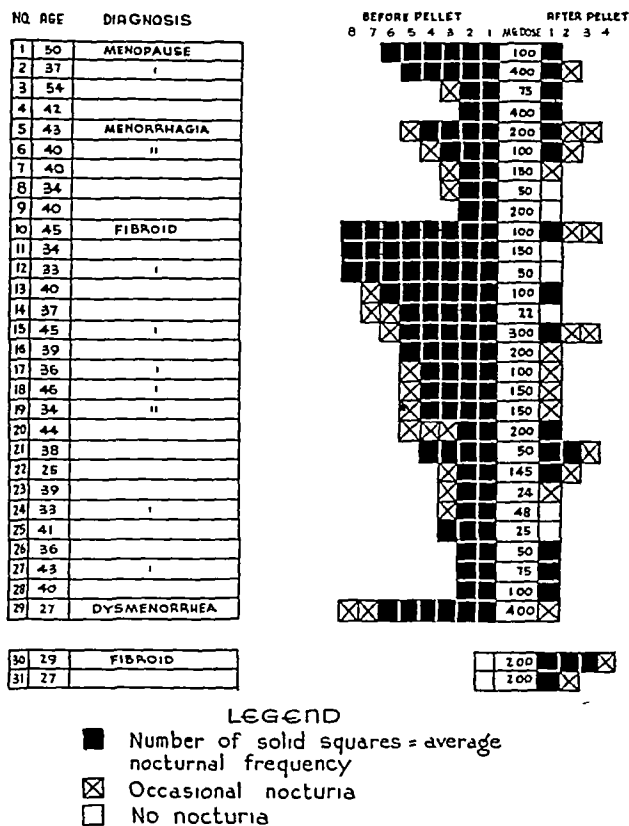


Fig 9—Influence of implanted pellets of testosterone propionate on nocturia.

from four to twenty-two months an increase in weight of 1 to 20 pounds (453 Gm to 91 Kg) was noted. Blood pressure values remained stationary. Some of the patients with menstrual migraine noted diminution in the frequency and severity of attacks. Premenstrual tension was diminished when a smaller dose (150 mg or less) was used but was noted occasionally with larger dosage. Patients with premenstrual mastalgia and lumpiness of the breast obtained relief in all but a few instances. Nausea and vomiting associated with severe functional dysmenorrhea was arrested. Dyspareunia due to dryness of the vagina was partially alleviated because of increased mucoid vaginal secretions following pellet implantation. Pain or induration at the site of implantation occurred when in some instances one



or more of the implanted pellets were extruded from their subfascial locus and were harbored in the subcutaneous fat

#### COMMENT

There is no way to study human physiology other than to study human beings. Present concepts of the physiologic role played by androgens are based on the antigynecogenic responses obtained through the employment of massive and probably unphysiologic doses. The voices that have been raised against the use of androgens in female patients result from the concept that gonadal hormones should be sex specific, as well as on the observation that defeminizing and "ovarian-negating" effects are produced by androgens following massive parenteral doses. The parenteral use of massive doses of testosterone propionate in the female is contraphysiologic and "ovarian negating", however, the use of comparatively large doses of estrogens is also "ovarian negating". It must be recognized that in many aberrations of gynecic function the therapeutic effectiveness of androgens cannot be matched by the employment of estrogens. Moreover, some women respond unfavorably to estrogenic therapy. Estrogens may produce severe nervous tension states, uterine bleeding, breast pain, abdominal bloating and pelvic discomfort. In such cases androgens frequently yield gratifying results without undesirable side reactions.

Since it has been shown by Deansley and Parkes that the implantation of hard pellets permits of a continuous and prolonged hence nearly physiologic action of the fat soluble hormones, it was felt that the action of androgens in female therapy might best be studied by the subfascial implantation of pellets of testosterone propionate. In this way more nearly physiologic doses of androgens would be employed and some of the complex biologic properties of testosterone propionate might be clarified. Since arrhenomimetic phenomena were not observed in any one of the 64 patients in this series by the use of subfascial implantation of testosterone propionate pellets in doses varying from 22 to 400 mg, a reconsideration of the physiologic properties of testosterone propionate thus employed might be in order.

The doses used in this therapeutic venture were at first and perhaps still are empiric. In March 1941 we recommended implantation of pellets in doses from 22 to 145 mg of testosterone propionate for the palliative therapy of uterine bleeding associated with fibromyomas.<sup>8</sup> The doses were gradually increased to insure therapeutic effectiveness in patients with dysmenorrhea and menopausal syndrome. Virilism was not observed with doses up to 400 mg. Larger doses were not used, since Loeser<sup>10</sup> had implanted with therapeutic effectiveness testosterone and testosterone propionate pellets in doses of 600 to 1,650 mg but observed transitory signs of masculinization in every one of 8 patients in his series. Geist<sup>11</sup> implanted pellets containing from 150 to 500 mg of testosterone propionate subcutaneously in 9 cases (8 with functional bleeding and 1 with menopausal syndrome) and reported in February 1941 that he found no therapeutic effect or evidence of effective absorption. It is difficult to reconcile this observation with a later opinion expressed in June 1941 by Geist and Salmon<sup>3</sup> that androgens administered by subcutaneous pellet implantation in doses of 50 to

675 mg were now believed to be therapeutically effective but that arrhenomimetic symptoms followed after a few weeks. Abarbanel<sup>12</sup> and Geschickter<sup>13</sup> have used testosterone propionate pellets in much smaller doses with satisfactory results.

An evaluation of my results indicates that testosterone propionate pellet implantation is capable of alleviating many aberrations of gynecic function without suppression of hypophysial gonadotropic function or interference (antagonism) with the action of endogenous estrogen or progesterone on the uterus and vaginal mucosa. Ovulation and cyclic maturation with glycogen deposition of both the secretory endometrium and the vaginal mucosa was not interfered with. Experimentally, Hartman<sup>14</sup> made similar observations on the endometrium of the monkey. In menometrorrhagia the therapeutic results cannot definitely be ascribed to the influence on the hypophysis or the ovary, since the endometrial pattern which reflects hypophysial gonadal relationship was frequently maintained in the status it had attained before implantation. Excessive bleeding was arrested in spite of the persistence, for instance, of the cystic glandular hyperplasia.

Since morphologic regression in the endometrium in general was not attained the therapeutic effect of testosterone propionate may be achieved through its inhibitory action on the vascular and muscular factors involved in menstruation.<sup>5</sup> Because of the observation that uterine fibroids decreased somewhat in size, a myotrophic property perhaps may be attributed to testosterone propionate. In this respect it is of interest to recall the work of Lipschutz and Vargas,<sup>14a</sup> who were able to offset the fibromatogenic effect of estrogens in the guinea pig by androgens. Abarbanel<sup>15</sup> attributed the therapeutic effect of testosterone propionate in menorrhagia to the sum total of the twofold effects of testosterone propionate, i. e. inhibition of intermittent uterine contractions and direct stimulation (constricting) action on myometrial elements.

The relative though temporary effectiveness of implanted testosterone propionate pellets in menopausal patients is difficult to explain. The action cannot be due to inhibition of the pituitary activity, since in women with a normal cycle the rhythm was not disturbed even with doses up to 400 mg. The action may be due to estromimetic properties of testosterone propionate. Salmon has attributed such properties to testosterone propionate when used in sufficient dosage, since castrate vaginal smears were converted to normal. This was confirmed by our studies. It was found that testosterone propionate in 400 mg doses satisfactorily relieved the menopausal syndrome and in 2 patients prevented atrophic changes of the vaginal mucosa. However, when smaller doses were used the therapeutic effectiveness was less and of shorter duration and did not suppress vaginal maturation or prevent vaginal atrophy. Silberman and his associates<sup>16</sup> found

12 Abarbanel A. R. Therapeutic Rationale for the Use of Testosterone Propionate in the Immediate Treatment of Functional Uterine Bleeding. *Tr. Am. Obst. & Gynec. Soc.* 52: 163, 1939.

13 Geschickter C. F. Personal communication to the author.  
14 Hartman C. G. The Effect of Testosterone on the Monkey Uterus and the Administration of Steroidal Hormones in the Form of Deansley Parkes Pellets. *Endocrinology* 26: 449 (March) 1940.

14a Lipschutz Alexander and Vargas Luis Jr. Prevention of Experimental Uterine and Extrauterine Fibroids by Testosterone and Progesterone. *Endocrinology* 28: 669 (April) 1941.

15 Abarbanel A. R. Rationale for the Use of Testosterone Propionate in the Immediate Treatment of Excessive Uterine Bleeding. *Am. J. Obst. & Gynec.* 39: 243 (Feb.) 1940.

16 Silberman D. Radman H. M. and Abarbanel A. R. The Use of Testosterone Propionate in the Treatment of the Menopausal Patient. *Am. J. Obst. & Gynec.* 39: 332 (Feb.) 1940.

10 Loeser A. A. Subcutaneous Implantation of Female and Male Hormone in Tablet Form. *Brit. M. J.* 1: 479 (March 23) 1940.

11 Geist S. H. Androgen Therapy in Gynecology. *J. Clin. Endocrinol.* 1: 154 (Feb.) 1941.



that the subcutaneous implantation of pellets of testosterone propionate in doses of 25 mg was the most satisfactory method of treating the menopausal patient.

In dysmenorrhea the action of testosterone propionate by pellet implantation can be only speculative at this time. The action, when therapeutically effective, may be due to a modification of uterine contractions. Both Robson<sup>17</sup> and Leonard<sup>18</sup> have shown that testosterone propionate suppresses uterine contractions in the rabbit. The anesthetic properties of certain steroids such as testosterone propionate have been stressed recently by Selye<sup>19</sup> and may account for some of the results obtained in dysmenorrhea, menorrhagia, pelvic discomfort and mastalgia.

The alleviation of the syndrome of nocturnal frequency in these patients was due to some specific action of the implanted steroid and cannot be attributed to the minor decrease in size of the tumors which frequently occurred.<sup>20</sup> There are many indications that the genitourinary tract is under hormonal influence. This may be adduced from the following facts: 1 One of the first symptoms associated with early pregnancy is a disorder of micturition. 2 In pregnancy, hypertrophy and dilatation of the ureters and other genitourinary disturbances may occur. 3 In the climacteric, urinary frequency, urgency and incontinence are common accompaniments of the menopausal syndrome. Mocquot and Moricard<sup>21</sup> were the first to employ compounds of testosterone for the alleviation of disorders of micturition in menopausal patients. Recently, Salmon and his associates<sup>22</sup> were able to keep menopausal patients with disorders of micturition symptom free by large doses of estrogenic hormone. These patients appeared refractory to orthodox treatment. 4 Experimental data prove that certain components of the genitourinary tract are under hormonal influence. Castration of the male rat is followed by a decrease in weight of the kidneys. This reduction in weight can be prevented by the administration of chemically pure androgenic substances. Selye<sup>23</sup> believed that testosterone exerts a specific action on kidney tubules. Korenchevsky<sup>24</sup> has claimed that androgens are nephrotrophic, causing an increase in the weight of kidneys and in the size of tubules in both normal and castrate female rats.

Libido is a highly complex function in which psychologic, anatomic, neurologic, sentimental and hormonal components play important roles. The role of the hormonal component has not received due attention.<sup>25</sup> The increase in libido in the female following the administration of chemically pure androgenic substance

in one form or another must be the result of a specific pharmacologic effect. Libido may be spoken of as a phenomenon depending on well defined chemical substances. The action may be mediated through minor changes in electrolyte balance or the effect may be directly on specific organs. In some patients frigidity was due to dyspareunia because of dryness of the vagina. Following testosterone propionate pellet implantation libido returned and increased mucification of the vaginal epithelium was noted with resultant improvement in sexual relations. Hartman<sup>14</sup> noted that the action of testosterone on the sex skin of the female monkey invariably was estrogenic. The sex skin was always brilliant red.

#### CONCLUSION

It appears that the pellet method of implantation has more nearly approached the endogenous mechanism of hormone secretion in the normal female organism. It is entirely rational to suppose that the exogenous administration of male hormone in this manner adequately and satisfactorily restored the normal ratio of androgenic and gynecogenic hormones. Clinical manifestations of disruption of this ratio were corrected without the untoward effects observed after administration of unphysiologic doses of androgenic substances by parenteral means.

#### ABSTRACT OF DISCUSSION

DR WILLARD M ALLEN, St Louis Excessive bleeding which occurs from the uterus during the menstrual period in some women with a myomatous uterus or in patients with functional bleeding has been variously explained, but any explanation must consider the condition of the blood vessels. The reduction of bleeding which Dr Greenblatt has observed following the use of testosterone propionate must therefore be explained by some effect on the uterine vessels. One of the outstanding effects of estrogens is increased cyanosis and congestion of the uterus. Androgens are known to inhibit many of the effects of estrogens. I assume, therefore, that the reduction of bleeding was brought about by inhibition of the effect of estrogens on the vessels of the uterus. This is in accord with Dr Greenblatt's observation that myomas have decreased in size while the patient is under the influence of testosterone. The question which arises is whether this effect is a direct inhibitory action of the normal effect of estrogen or whether the supposed change is due to an actual diminution in the amount of estrogen produced by the ovary. Testosterone does affect the anterior lobe of the pituitary and thus indirectly leads to ovarian atrophy. This is not likely to be the explanation of his results, since many of his patients had essentially normal cycles afterward. We all know that when the ovary is unduly inhibited the menstrual cycle is liable to be affected. Dr Greenblatt has observed, I believe, that most of the patients getting testosterone had a considerable increase in libido. I think we are inclined to believe that estrogen is responsible for such sexual desire in the female, and, conversely, that androgen is the motivating agent in the male. This is not entirely correct. In some mammals progesterone is a much better agent for the induction of sexual receptivity than is estrogen. Mating, for instance, can be induced with regularity in castrated female rats and guinea pigs which have been primed with estrogen by a single injection of progesterone. The increased libido in these women under the influence of androgen may, in fact, be directly due to changes in the clitoris and the vulvar region brought about by the use of testosterone. We know that if large doses of testosterone are given there is hypertrophy of the clitoris.

DR UDALL J SALMON, New York Androgen therapy has been a major interest of mine for the last six years. As regards the value of androgen therapy in gynecology, there is a divergence of opinion. The group with which I am associated at the

17 Robson J M. Reactions of Uterine Muscle and Endometrium in Rabbits to Testosterone. *Quart J Exper Physiol* 26: 355 (May) 1937.

18 Leonard S L, Sager V and Hamilton J B. The Effect of Male Hormone on Uterine Motility and the Uterus. *Proc Soc Exper Biol & Med* 27: 362 (Nov) 1937.

19 Selye Hans. Correlations Between the Chemical Structure and the Pharmacological Actions of the Steroids. *Endocrinology* 30: 437 (March) 1942.

20 Greenblatt R B. A New Syndrome of Nocturnal Frequency Due to Endocrine Imbalance. J M A Georgia to be published. Syndrome of Nocturnal Frequency Alleviated by Testosterone Propionate. *J Clin Endocrinol* 2: 321 (May) 1942.

21 Mocquot P and Moricard R. Etude preliminaire des effets provoques par l'hormone male sur les troubles fonctionnels urinaires de femme et de l'utilisation males en gynecologie. *Bull Soc Obst et de gynec* 25: 787 (Dec) 1936.

22 Salmon U J, Walter R I and Geist S H. The Use of Estrogens in the Treatment of Dysuria and Incontinence in Postmenopausal Women. *Am J Obst & Gynec* 42: 845 (Nov) 1941.

23 Selye, Hans. On the Protective Action of Testosterone Against the Kidney Damaging Effect of Sublimite. *J Pharmacol & Exper Therap* 68: 454 (April) 1940.

24 Korenchevsky, V, and Ross M A. Kidneys and Sex Hormone. *Brit M J* 1: 645 (April 20) 1940.

25 Greenblatt R B, Mortara F and Torpin R. Sexual Libido in the Female, *Am J Obst & Gynec*, to be published.

Mount Sinai Hospital feels that androgen therapy has a sound rationale based on experimental studies in women and supported by a wide clinical experience. Last year, before this section in Cleveland, Dr Geist and I presented our experience with androgen therapy in a variety of gynecologic disorders. The series of cases totaled over 400, the period of observation varying from six months to more than four years. That series included a group of 40 cases in which testosterone and testosterone propionate were implanted both in the form of loose crystals and in the form of pellets, varying in dosage from 50 mg to 675 mg. Our studies revealed that, if one administers more than 500 mg of testosterone propionate to women during the course of one cycle, certain striking biologic effects result. The hypophysis is inhibited, ovulation fails to occur, estrogen and progesterone formation is suppressed, and, as a result of that, involutional (estrogen deficiency) changes occur in the endometrium and in the vagina. The threshold for these effects is about 500 mg. It is also, incidentally, the threshold for the induction of the virilization symptoms. Fortunately the hormone is clinically effective in much smaller doses, so that it is possible to exploit the therapeutic properties of this hormone in the female without risking the danger of inducing any of these virilization phenomena. One aspect of androgen therapy that Dr Greenblatt did not have time to elaborate was the effect of androgen on libido. Dr Geist and I have completed a study on the effects of testosterone propionate on the sexual reactions of women. Our observations led to the following conclusions: Androgens (a) cause a heightened susceptibility to psychic and somatic sexual stimulation, (b) produce an increased sensitivity of the external genitalia and (c) induce a greater intensity of sexual gratification. This property of the androgens is, however, not an unadulterated virtue, since if administered in excess to women with normal libido it may cause abnormal intensification of desire and may lead to marital complications. Our experience with the implantation of androgens has not been as satisfactory as Dr Greenblatt's. In a few instances, chiefly cases of premenopausal menometrorrhagia, we have had good therapeutic results, but in the majority the implantations were either ineffective or produced hypertrichosis or acne, necessitating excision of the pellets. Administration of androgens by implantations we feel, unnecessarily complicates the procedure of androgen therapy without offering any advantages over the intramuscular or oral methods.

DR L. F. HAWKINSON, Oakland, Calif. In 1935 I pointed out that the menopausal syndrome was usually much more severe in patients who had hysterectomy or intrauterine radium. These patients often require five times the dose of estrogen to control the symptoms. The uterus probably plays a very important role in the maintenance of ovarian function. Although I have used few testosterone pellets in the female, in those patients in whom pellets were used the results were very satisfactory. For the past four years I have used testosterone propionate by hypodermic injection in the female and have never seen any virilism or effects that might be considered harmful. I have adopted a regimen in menopausal women who have menometrorrhagia, particularly those who have a tendency to bleed profusely when given estrogens. This regimen alternates estrogens with androgens. Two thousand rat units or 10,000 international units is given for two or three doses and then a dose of 10 or 25 mg of testosterone propionate. The ratio between the estrogens and androgen is balanced so that the bleeding is controlled. The frequency of the dose of androgen is increased if the bleeding persists. In regard to libido, I find that the majority of patients who receive sufficient amounts of testosterone notice an increase in libido. The alleviation of menopausal symptoms by androgen alone requires large doses. A combination of estrogen and androgen relieves both the symptoms and excessive bleeding.

DR CHARLES F. GESCHICKTER, Baltimore. I have been using pellet implantation for cancer cases for some years and have had a similar experience to that of Dr Greenblatt. I have never given more than 100 mg in the form of a pellet. Most of these patients receiving 20 mg pellets have been treated at intervals of one to two months for periods as long as three

years. I have never had any effects of virilism in these patients. The use of pellets is condemned by some. On scientific grounds I believe that it is certainly worth while in order to learn what is the role in therapy of the androgens, because experience in the laboratory teaches us that the hormone is about three times as efficient in the form of a pellet as it is by injection. Therefore, if we are to explore the field of androgen therapy, pellets properly used offer the hormone the most efficient chance to demonstrate what it can do. There are some words of caution. I think, that should be expressed when one discusses pellet therapy. I do not approve of the large pellets, which are more often extruded and, if not, will enable both the physician and the patient to take a three hundred day holiday. Particularly when one is treating myomas of the uterus or menorrhagia one must remember that bleeding from the uterus is a symptom of a great many conditions, and to mask it successfully with a form of pellet therapy and then to have that therapy last over a period of months is not without its danger. If one uses the smaller pellets one practically never gets extrusion. I do not have to use sutures, I never go down to the fascia, I do not have to use the operating room. A small wheel of procaine hydrochloride is used. I have never used more than 2.5 cc. of procaine. I use the bistoury scalpel and the mosquito forceps to spread. I try not to make the incision quite large enough, I make it small enough so that it has to be spread with the clamp in order to get the pellet in. I never put in a suture but seal with a strip of flamed adhesive plaster. Using that technique I have never had an extrusion or an infection. I think the pellet therapy could be made extremely simple and it certainly is the efficient way to find out what the hormone can do.

DR CARLOS A. P. LAMAR, Miami, Fla. I have used implantation of pellets of pure testosterone instead of testosterone propionate, with results that parallel those of Dr Greenblatt. The definite role of androgen in the treatment of excessive menstrual bleeding has been amply demonstrated. The implantation of pellets can be done without operative procedure as the previous discussor has said. That is the routine that I ordinarily use. I have been observing the effect on libido for some time. I have noticed that the increase in libido is much more pronounced in women near the menopausal age than in younger women. Some women in the early twenties have been treated with parenteral doses of testosterone propionate as high as 1,200 mg in one month without producing any symptoms of virilism and without increasing the libido. I have 2 of those cases at present.

DR ROBERT B. GREENBLATT, Augusta, Ga. I should like to say another word about libido, since limitation of time did not afford the opportunity to say much in my paper. Libido is a complex phenomenon depending on physiologic, sentimental and anatomic factors. We have neglected the hormonal aspects. In fact, it might be said that love, marital harmony and libido are influenced by blood chemistry. One might be bold enough to suggest that libido is purely a chemical test tube equation but that would be going too far. Certainly libido may be increased in patients who have little or no libido and particularly in patients who once knew libido but have lost it. In this respect testosterone propionate probably has a specific pharmacologic action. In general I found that after pellet implantation the clitoris was not very much enlarged. However, when androgens were administered parenterally I found that enlargement of the clitoris was much more frequent. The amount of testosterone propionate that is made available to the organism by implantation of a 100 mg pellet is small, for I found the average absorption that takes place over a period of eight months' time is only 0.3 mg a day—a comparatively small amount. Mrs. Culminizing effects were not observed in any of the patients. Limitation of time prevents me from discussing the problems raised by the various speakers who were kind enough to discuss my paper. However, I agree with Dr Geschickter that the technique can be improved. I recommend the method presented when large dosages are to be employed but when small amounts of hormones are to be administered I see no objection to using his method of subcutaneous implantation.

## THE EVALUATION OF ANTISEPTICS

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WASHINGTON, D C

The discovery or development of the "ideal" antiseptic is an objective much sought by research workers in the fields of bacteriology, chemotherapeutics and preventive medicine. Although this objective obviously has not yet been attained, it is apparent that diligent search continues for a chemical compound which has the characteristics of an ideal antiseptic, namely: high germicidal or inhibitory properties, no tissue toxicity or at most a very low toxicity, freedom from specificity, efficiency in the presence of organic matter, power to penetrate, stability and perhaps other characteristics, including low cost. Efforts to produce useful, if not ideal, antiseptics have resulted in offering to the medical profession and to the public a wide variety of chemical substances, including mercurials, phenolic compounds, silver preparations, products of the liquor antisepticus type, dyes, halogen compounds and many others with staggering organic chemical designations. Most of these preparations are offered for general antiseptic purposes, although in some cases there is recognition among the informed, but not always disclosed on the label, that the compounds are relatively specific in their action on certain bacterial groups. Some preparations claim to be and are, efficient germicides, others make no claim beyond the power to inhibit bacterial growth. A few preparations are offered for the "sterilization" of surgical and dental instruments. Substances proposed for the prevention and cure of certain mycotic infections are not uncommon.

The task of appraising the merits and demerits of such a group of substances with diverse properties becomes one of increasing magnitude and one possessing grievous obstacles to satisfactory evaluations by both the laboratory worker and the clinician. A review of the literature reveals a tendency to attempt to develop one universally applicable *in vitro* test, standardized in all of its details and yet with all its niceties, set up under conditions not in any way resembling those under which the antiseptic is expected to function in actual practice. In contrast to the investigator who chooses to evaluate solely on the basis of the laboratory test is the person who scorns *in vitro* procedures in their entirety and sees merit only in clinical results. Appraisals arrived at completely from clinical practice may too often be based on the acceptance of empirical observations as valid evidence of antiseptic efficacy without due consideration to all the uncontrolled factors.

United States Department of Agriculture circular 198<sup>1</sup> has often been cited as the source of a "standard" or "official" method favorable response to which classes a substance as efficacious for the purpose recommended and consequently demonstrates its compliance with the requirements of the law. To the extent that the circular described procedures as those adopted by the Food and Drug Administration and suggested tests that could be applied to specific types of preparations, some justification has probably existed for such an opinion. However, this was not the intent of the document and is not a proper interpretation of its con-

tents. Much has been written<sup>2</sup> to point out the fallacy of applying phenol coefficients to antiseptics as differentiated from disinfectants directly comparable with phenol. The so-called F D A test utilizing *Staphylococcus aureus* as the test organism at its best provides information concerning the ability of the compound tested to destroy staphylococci only under the conditions of the test. Furthermore, Brewer<sup>3</sup> has called attention to the faulty interpretations which may follow too great dependence on *Staph. aureus* as a test organism for all types of preparations, some of which may be intended for the destruction of organisms of entirely different resistance. The F D A test, the agar-plate tests and the wet filter-paper and dry filter-paper tests described in circular 198, within their limitations, serve a useful purpose. However, rather than to accept the results of any of these procedures as a sufficient measure of efficacy a more logical approach to the job of appraisal appears to lie in a broader concept of evaluation, which because of its difficulties of application has not been universally adopted, even though its principles have from time to time been outlined by those who specialize in this field.<sup>4</sup> To quote Browning "Antiseptics intended for therapeutic use must not be considered *en bloc* or selected solely on the basis of their ability to kill rapidly some test organism *in vitro*. Each must be examined as regards selective action on various bacteria in protein as well as watery media *in vitro*, and as regards effects on tissues *in vivo*. Such tests give valuable indications, but the chemotherapeutic efficacy of a substance is finally determined by its influence on the pathogenic action of organisms in an infected host." This point of view, entirely sound in its expression, admits the impracticability of reaching a conclusion as to true efficacy from the results of a single *in vitro* test. The problem then becomes one of fitting together the results of old established procedures with clinical observations and with the results of additional tests, some recently developed and some not yet conceived, to form a complete picture of the properties of a substance under scrutiny.

In determining whether or not a product represented as an antiseptic meets the requirements of the Federal Food, Drug and Cosmetic Act of 1938<sup>5</sup> the question of efficacy under conditions of use becomes a matter of paramount importance. All articles intended for use in the diagnosis, cure, mitigation, treatment or prevention of disease in man or other animals are classed as drugs within the meaning of that act and if shipped or offered for shipment in interstate commerce must comply with the provisions of the statute. Section 201(o) of the act states "The representation of a drug, in its labeling, as an antiseptic shall be considered to be a representation that it is a germicide, except in the case of a drug purporting to be, or represented as, an antiseptic for inhibitory use as a wet dressing, ointment, dusting powder, or such other use as involves prolonged contact with the body." It is then pertinent to give heed to the requirement of 502(f), which defines a drug as misbranded unless its labeling bears adequate directions for use. Furthermore, 201(n) of the law provides that

<sup>2</sup> Reddish G F. Limitations of the Phenol Coefficient. *Indust. & Engin. Chem.* **29**, 1044-1047, 1937. Ruehle and Brewer<sup>1</sup>.

<sup>3</sup> Brewer C M. Use and Abuse of *Staphylococcus Aureus* as a Test Organism. *Am J. Pub. Health* **32**, 401-405 (April) 1942.

<sup>4</sup> Browning C H. The Value of Antiseptics in the Control of Bacterial Infections. *Brit. M. J.* **2**, 579 (Sept. 29) 1934. Reddish G F. Recent Developments in Methods of Testing Germicides, *Indust. & Engin. Chem. (Anal. Edition)* **10**, 425 (Aug. 15) 1938.

<sup>5</sup> Federal Food, Drug and Cosmetic Act and General Regulations for Its Enforcement. Federal Security Agency Service and Regulatory Announcements. F D C 1 August 1939 revised August 1941.

From the United States Food and Drug Administration.  
Read before the Section on Pathology and Physiology at the Ninety Third Annual Session of the American Medical Association Atlantic City N. J., June 11, 1942.  
<sup>1</sup> Ruehle, G L A, and Brewer C M. United States Food and Drug Administration Methods of Testing Antiseptics and Disinfectants Circular 198. United States Department of Agriculture 1931.

"in determining whether the labeling is misleading there shall be taken into account (among other things) not only representations made or suggested but also the extent to which the labeling fails to reveal facts material in the light of such representations."

A self-imposed standard of performance is thus set up for each product by its labeling claims. Failure to function in conformity with those claims renders a product adulterated or misbranded within the meaning of the act.

In evaluating the efficacy of preparations in the light of these legal requirements the single *in vitro* test may be applicable to one class of products, namely those which fail to exhibit any inherent germicidal or bacteriostatic properties even under the most favorable laboratory conditions. Obviously they are without value and need not be tested further.

Dissatisfaction with the old procedures is apparent from the contributions to the bacteriologic and medical literature made in the past decade, proposing methods designed to provide information to facilitate evaluation of antiseptics under conditions of use. Browning,<sup>1</sup> Hunt,<sup>6</sup> Kempf and Nungester<sup>7</sup> and Sarber,<sup>8</sup> among others, have proposed *in vivo* methods. In some of the proposed methods lesions on laboratory animals are produced and treated *in situ*, while in others the animal is used as a culturing medium to test the pathogenicity of the test organisms surviving treatment with the antiseptic on or within the infected host. The method of Price<sup>9</sup> involving the examination of skin washings following treatment has received attention. Animal tests of the type proposed have been generally subject to criticism based on the variability of the individual and on the lack of control possible over all elements of the test. Regardless of the validity of the criticisms in specific cases, merit must be ascribed to any reasonable *in vivo* procedure on the theory that such tests provide some information concerning performance of an antiseptic in the presence of living tissue and contribute some evidence to supplement that obtained by other procedures.

Notable among the advances made in this field are those methods designed to determine the toxic effect of antiseptics on tissue as contrasted with their effect as germicides. While essentially *in vitro* tests, these methods depart radically from the strictly cultural procedures and provide valuable data to throw light on reactions that may be expected under conditions of body use. In 1935 Salle and Lazarus<sup>10</sup> proposed a method of evaluation based on a comparison of the resistance of bacteria and embryonic chick heart tissue to germicidal substances. By dividing the highest dilution of an antiseptic required to prevent growth of embryonic tissue embedded in plasma diluted with Tyrode's solution by the highest dilution required to kill the test organism, Salle and his associates<sup>11</sup> computed toxicity

indexes for a number of well known substances used as antiseptics. From their tests they concluded that in general the simple inorganic substances rated higher than the newer and more complex compounds. The factor of tissue toxicity in the evaluation of antiseptics was also discussed by Nye,<sup>12</sup> who gave consideration to the harmful effects of antiseptics on white blood corpuscles. In reports<sup>13</sup> dealing with the toxicity of antiseptics, Welch and his associates, after describing a method for determining the effect of chemical antiseptics on phagocytosis, explained the mechanism of the toxic action of germicides on whole blood by stating that impairment of the phagocytic function of the leukocytes is a primary effect exerted by the antiseptic against the humoral, in contrast to the cellular, elements of the blood. In pursuing toxicity tests based on determination of the loss of activity or actual destruction of the leukocyte, recognition is granted to the part normally played by such cells in protection against invading organisms. It is reasonable to conclude that a substance used as an antiseptic should augment rather than interfere with the activity of these cells and that any compound strikingly more toxic for leukocytes than for bacteria should thereby acquire demerits as an antiseptic. Applying the toxicity test using whole blood as a tissue, Welch, with others, reported the toxicity indexes of a number of antiseptic substances, including preparations containing soap and alcohol, particular attention being directed to mouthwashes.<sup>14</sup> Of eighty-seven mouthwashes tested, sixty-two in 1:5 dilution exerted a toxic effect on blood as measured by impairment of phagocytosis, the remainder were toxic in higher dilutions. By comparison with their power to function as germicides in the presence of whole blood, toxicity indexes greater than 2 were determined in every instance. The authors of the report referred to frankly recognize the impossibility of evaluating antiseptics for all their uses by application of the toxicity test alone. On the other hand they do point out the value of data derived from that test in supplementing other data to arrive at a proper appraisal of an antiseptic.

Bronfenbrenner, Hershey and Doubly<sup>15</sup> also utilize tissue in a procedure proposed as helpful in the evaluation of germicides. By their method the concentration of disinfectant necessary to cause 50 per cent reduction in the rate of oxygen uptake by mouse liver cells in saline suspension is determined and is compared with the concentration causing 50 per cent inhibition of the rate of oxygen consumption by a suspension of *Escherichia coli*. The authors report that data for tissue toxicity obtained with several disinfectants are in satisfactory agreement with values obtained by intraperitoneal injection into the mouse.

Perhaps in some of their aspects the newer tests do not lend themselves to the rigid "standardization" of

6 Hunt G. A. The Use of Cutaneous Staphylococcus Lesions in Mice for the Evaluation of the Germicidal Activity of Disinfectants. *J. Infect. Dis.* 60: 232-237 (March-April) 1937.

7 Kempf A. H. and Nungester W. J. An *In Vivo* Test for the Evaluation of Skin Disinfectants. *J. Bact.* 43: 49-50 (Jan.) 1942.

8 Sarber R. W. An *In Vivo* Method for the Evaluation of Germicidal Substances Used for Skin Disinfection. *J. Bact.* 43: 50 (Jan.) 1942.

9 Price P. B. The Bacteriology of Normal Skin. A New Quantitative Test Applied to a Study of the Bacterial Flora and the Disinfectant Action of Mechanical Cleansing. *J. Infect. Dis.* 63: 301-318 (Nov. Dec.) 1938.

10 Salle A. J. and Lazarus A. S. A Comparison of Resistance of Bacteria and Embryonic Tissue to Germicidal Substances. *Proc. Soc. Exper. Biol. & Med.* 32: 665-667 (June) 1935.

11 Salle A. J., McOmie W. A. and Shechmeister I. L. A New Method for the Evaluation of Germicidal Substances. *J. Bact.* 34: 267-273 (Sept.) 1937. Salle A. J., McOmie W. A., Shechmeister I. L. and Foord D. C. The Evaluation of a Group of Germicides by the Tissue Culture Technique. *ibid.* 37: 639-646 (June) 1939.

12 Nye R. N. The Relative *In Vitro* Activity of Certain Antiseptics in Aqueous Solution. *J. A. M. A.* 108: 280-287 (Jan. 23) 1937.

13 Welch Henry and Hunter A. C. A Method for Determining the Effect of Chemical Antiseptics on Phagocytosis. *Am. J. Pub. Health* 30: 129-137 (Feb.) 1940. Welch Henry. Mechanism of the Toxic Action of Germicides on Whole Blood Measured by the Loss of Phagocytic Activity of Leukocytes. *J. Immunol.* 37: 525-533 (Dec.) 1939.

14 Welch Henry, Brewer C. M. and Hunter A. C. Toxicity of Antiseptics. Experiments with Hemolytic Complement. *ibid.* 38: 273-282 (April) 1940.

15 Bronfenbrenner J., Hershey A. D. and Doubly J. Relative Toxicity of Certain Antiseptics Containing Soap and Alcohol with Special Reference to Mouthwashes. *Am. J. Pub. Health* 32: 261-267 (March) 1942. Welch Henry and Brewer C. M. The Toxicity Indexes of Some Basic Antiseptic Substances. *J. Immunol.* 43: 25-30 (Jan.) 1942. Welch Henry, Stocum, G. G. and Hunter A. C. A Method for Determining the Toxicity of Antiseptics as Measured by the Destruction of Human Leukocytes. *J. Lab. & Clin. Med.* 27: 1432-1438 (Aug.) 1942.

15 Bronfenbrenner J., Hershey A. D. and Doubly J. Evaluation of Germicides by a Manometric Method. *J. Bact.* 37: 583-597 (June) 1939.

the phenol coefficient procedure. However, it is not unreasonable to permit some relaxation on that point. In actual practice the user of antiseptics is not confronted with standard subjects for treatment nor is the infectious agent to be combated a standard factor. It may be suggested that in searching to learn the true merits of an antiseptic under conditions of use some of the niceties of standardized procedure might profitably be sacrificed.

Between the laboratory test and the results to be obtained in practice exists a gap which should be bridged by clinical observations and practical experience. If the laboratory studies are to be useful to the practitioner, they must be interpretable in terms of actual use. It is pertinent to point out the fallacy, for instance, of accepting as evidence of their efficacy as sterilizers of surgical and dental instruments chemical preparations which have been tested in the laboratory only against vegetative forms of bacteria. Reviews of that subject by Knighton<sup>16</sup> and Brewer<sup>17</sup> have thoroughly discussed the ineligibility of preparations to the designation of "sterilizer" until it has been proved that they are efficacious in the destruction of resistant bacterial spores. With respect to antiseptics for use on the body, if the laboratory tests for their evaluation do not take into consideration tissue toxicity and the interfering factors present in the living host, and not in the test tube, the conclusions drawn may be quite misleading. Speaking for the government agency charged with the enforcement of the Food, Drug and Cosmetic Act, there is no single "standard" or "official" test for the evaluation of antiseptics. The objective in testing a preparation claimed to be an antiseptic with prescribed directions for use is the collection of related parts of a picture to show not only the inherent germicidal or inhibitory properties of the compound but the degree of efficacy with which these properties are applied under the conditions of use.

#### ABSTRACT OF DISCUSSION

DR WARD J. MACNEAL, New York. In evaluating antiseptic and germicidal agents a distinction should be drawn between three groups of these agents: (1) those acting at a distance from the human host, (2) those acting on epithelial surfaces or on superficial wounds and (3) those designed to act after absorption into the circulating fluids. These may be designated respectively as (1) disinfectants, (2) antiseptics in the narrower sense and (3) anti-infectious therapeutic agents, chemical and biologic. There is no single easy and simple method of evaluating all these agents. For those acting at a distance the harmful property may be wholly vitiated before reaching the host. An agent to be used for quick action on a body surface should be effective against the germs and should not be dangerously toxic in the amounts absorbed. Local tissue toxicity, which has been featured by Fleming and also by Welch and Hunter in previous papers, seems to have been too greatly stressed by these authors. As Professor Garrod has said, the local destruction of tissue is a small price to pay in consideration of the control of the infectious agent. Remote toxicity after absorption is of greater moment, as for example in the nervous system after alcohol or sulfamethylthiazole, in the myocardium after sulfonamides in general, in the liver after arsenicals, in the kidneys after mercurials. Direct experimental tests on animals would seem most logical. Such tests present difficulties, and not all microbes are adapted to such examination. All kinds of *in vitro* tests should be welcomed. We need to be on guard against accepting a

tricky result obtained by some special procedure designed to extol or to condemn some particular agent. By omitting the well known step of inactivation, one may exaggerate the apparent germicidal action of iodine, and by testing alcohol or liquor antisepticus in too dilute form one may easily cast discredit on their germicidal value. Errors of this sort were current thirty years ago but should hardly be expected at present. Infectious agents are many in nature, and one drug may not be effective against all. It has recently been shown that viruses of vaccinia and influenza are quickly inactivated by liquor antisepticus although relatively resistant to some other antiseptics. I would plead, therefore, for a broadminded approach which welcomes all obtainable information about the properties of any antimicrobial agent.

DR ALBERT C. HUNTER, Washington, D. C. The first class of products that Dr. MacNeal mentioned is classified as disinfectants, since they are to be used on inanimate objects. I did not mean to include them in the paper at all. In our work we have an arbitrary division, because disinfectants for use on inanimate objects are subject to control by another law. When one says antiseptics one is thinking of drugs for use in or on the body. I agree with the statements Dr. MacNeal made about not applying the toxicity test to disinfectants. Furthermore, the toxicity test on antiseptics is not used as a universal test to the exclusion of all others. My point is that there is no universal test. What we propose to do is like the assembling of the pieces of a jigsaw puzzle. We determine the inherent killing and inhibitory powers in test tube culture and the tissue toxicity and obtain other pertinent data. If we put the pieces together and they make a good picture the product has merit accordingly. If it is a bad picture that is what we want to find out too. I should like to leave it clear that officially we are not presenting the toxicity test or any other single test as the sole measure of the efficacy of an antiseptic.

#### CIRCULATORY ADJUSTMENTS DURING HIGH SPINAL ANESTHESIA

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It is generally agreed among experienced surgeons and anesthesiologists that hypotension is a corollary of high spinal anesthesia. However, any discussion of the cause, the significance to the patient's welfare or the optimum treatment for the fall in blood pressure so regularly observed while operation is in progress during high spinal anesthesia would provoke many arguments. Theoretical discourses, data from laboratory experiments and clinical investigations of spinal anesthesia have multiplied with the years since the method was first advocated, and no small fraction of this accumulated literature is devoted to the problems concerned with the circulatory adjustments. Despite these efforts, the problems await solution and, notwithstanding the fact that a decided fall in blood pressure from whatever cause must be considered unphysiologic, this complication during spinal anesthesia has not been evaluated satisfactorily in terms of morbidity and mortality.

It is important to evaluate accurately the effects of spinal anesthesia on the circulation, since the procedure has such a prominent role in present day abdominal surgery. The flaccid relaxation of abdom-

16 Knighton, H. T. Significance of Tests for the Evaluation of Antiseptics and Germicides. *J. Am. Dent. A.* 26: 2047-2055 (Dec.) 1939.  
17 Brewer, J. H. The Antibacterial Effects of the Organic Mercurial Compounds. *J. A. M. A.* 112: 2009-2018 (May 20) 1939.

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inal muscles and the strong intestinal contractions produced by spinal anesthesia have a fascinating and legitimate appeal to many surgeons. Moreover, with the methods available for anesthesia there is no agreement among anesthetists as to the relative merits of spinal and inhalation anesthesia in the anesthetic control of the abdomen. In this discussion, therefore, the laboratory and clinical data which have been prominently displayed to determine and explain the factors concerned in the circulatory adjustments to spinal anesthesia will be briefly but critically reviewed. Additional clinical data are presented also, and their significance in surgery during high spinal anesthesia is suggested.

Among the theories advanced, and in most instances supported, by laboratory investigations as the pathogenesis of the fall in blood pressure during spinal anesthesia are (1) hematogenous intoxication, (2) direct action on the medulla, (3) paralysis of adrenal nerves with reduced secretion of epinephrine, (4) the anoxia theory, (5) paralysis of the vasoconstrictor fibers in the anterior spinal roots and (6) the theory of stagnation in the postarteriolar bed.

#### HEMATOGENOUS INTOXICATION

It was proposed that the rapid absorption into the blood stream of anesthetic drugs injected subdurally might precipitate the hypotensive effects observed.<sup>1</sup> This was held untenable when it was conclusively demonstrated that intravenous injections of such drugs do not produce the severe or protracted disturbances in circulation that occur after intraspinal injection.<sup>2</sup> The theory is without support at the present time.

#### DIRECT ACTION ON THE MEDULLA

The theory of direct action on the medulla presupposed that the vital centers in the brain stem are more sensitive to the anesthetic agent than are the nerve roots emanating from the spinal cord. There is substantial evidence that such is not the case.<sup>3</sup>

#### PARALYSIS OF ADRENAL NERVES WITH REDUCED SECRETION OF EPINEPHRINE

Since the adrenal glands derive their innervation from the celiac plexus and the splanchnic nerves, paralysis of these nerves during high spinal anesthesia might be expected to reduce the supply of epinephrine to the body and thus produce a fall in blood pressure.<sup>4</sup> There are two objections to this thesis. First, Bazett<sup>5</sup> and Durant<sup>6</sup> point out that ligation of the adrenal veins or bilateral adrenalectomy is not accompanied by a fall in blood pressure. Second, Smith<sup>7</sup> maintains that the administration of epinephrine to man causes considerable arteriolar dilatation and produces, if anything, a fall in diastolic pressure and a well maintained or increased systolic pressure. It is difficult to understand, therefore, how absence of the adrenal hormone could produce vasodilatation if the converse is true. This theory no longer enjoys any degree of popularity.

1 Klapp R. cited by Schubert<sup>10</sup>  
2 Bower J O. Clark J H. Wagoner G. and Burns J C. Spinal Anesthesia Surg. Gynec. & Obst. 54: 882-897 (June) 1932.  
3 Vehr, G. R. Spinal Anesthesia. Techniques and Clinical Application St. Louis C. V. Mosby Company 1934.  
4 Perl J. I. Intra Abdominal Use of Epinephrine in Hypotension During Spinal Anesthesia. Am. J. Surg. 17: 275-278 (Aug.) 1932.  
5 Bazett, H. C. Time Relations of Blood Pressure Changes After Excision of Adrenal Glands with Some Observations on Blood Volume Changes. J. Physiol. 53: 320-338 (Feb.) 1920.  
6 Durant R. R. The Blood Pressure of Adrenalectomized Rats. Am. J. Physiol. 85: 364-365 (April) 1928.  
7 Smith H. W. Rovenstine, L. A. Goldring W. Chasis H. and Ranges H. A. The Effects of Spinal Anesthesia on the Circulation in Normal Unoperated Man with Reference to the Autonomy of the Arterioles and Especially Those of the Renal Circulation. J. Clin. Investigation 18: 319-341 (May) 1939.

#### THE ANOXIA THEORY

The anoxia theory as promulgated by Gray and Parsons<sup>8</sup> is based on observations on man and dogs that the blood pressure falls in proportion to the amount of intercostal muscle paralysis. Thus the circulatory changes are secondary to anoxia produced by decreased pulmonary ventilation. Seevers and Waters<sup>9</sup> supported this theory and demonstrated the return of blood pressure to normal or above normal by the administration of oxygen during artificial respiration in animals anesthetized to the fifth thoracic vertebra or above.

The thesis of anoxia as the cause of hypotension in spinal anesthesia is subject to criticism on several counts. The correction of hypotension in dogs under high spinal anesthesia may be accomplished by change in position, as shown by Burstein,<sup>10</sup> who noted the usual fall in blood pressure in the supine position in dogs whose subarachnoid space was continuously perfused with a 3 per cent solution of procaine hydrochloride and an immediate return to normal blood pressure by being placed in the right or left lateral position despite the maintenance of anesthesia to the cervical cord. It is thus quite probable that the fall in blood pressure noted in the experiments of Seevers and Waters may be due to the embarrassment of venous return by an increase of the aspiration of blood into the thorax during artificial respiration and passive massage of the vessels in the abdomen and chest. Since measurements of cardiac output were not made and artificial respiration without oxygen was not done the interpretation of these data is open to question and might profitably lend itself to further study.

Further objection to the anoxic theory is made because of the use of anesthetized and premedicated animals. These objections will be elaborated on more fully in a consideration of the theory of arteriolar dilatation.

#### PARALYSIS OF THE VASOCONSTRICTOR FIBERS IN THE ANTERIOR SPINAL ROOTS

The theory of vasoconstrictor paralysis in spinal anesthesia producing hypotension by arteriolar dilatation has among its adherents most investigators of spinal anesthesia. It is supported by Babcock,<sup>11</sup> Burch and Harrison,<sup>12</sup> Ferguson and North<sup>13</sup> and many others. Because of the wide support of this thesis, which we do not accept, the evidence for the importance of tonic activity of the vasoconstrictor fibers in maintaining blood pressure must be examined critically.

The concept of vasotonic activity in the sympathetic nervous system in normal animals is based largely on the fact that the blood pressure falls or the peripheral blood flow increases immediately after surgical section of the splanchnic fibers in anesthetized cats and dogs. The major criticism of all this work and of the conclusions drawn is that observations were made in almost all instances on anesthetized animals.

8 Gray H. T. and Parsons L. Blood Pressure Variations Associated with Lumbar Puncture and the Induction of Spinal Anesthesia. Quart. J. Med. 5: 339-367 (April) 1912.  
9 Seevers M. H. and Waters R. M. Respiratory and Circulatory Changes During Spinal Anesthesia. J. A. M. A. 99: 961-968 (Sept.) 1932.  
10 Burstein C. L. Postural Blood Pressure Changes During Spinal Anesthesia. A Preliminary Experimental Report. Anesth. & Analg. 18: 132-139 (May-June) 1939.  
11 Babcock W. W. Blood Pressure in Relation to Spinal Anesthesia. Anesth. & Analg. 4: 222-228 (Aug.) 1925.  
12 Burch J. C. and Harrison T. R. The Effect of Spinal Anesthesia on Arterial Tone. Arch. Surg. 22: 1040-1044 (June) 1931.  
13 Ferguson L. K. and North J. P. Observations of Experimental Spinal Anesthesia. Surg. Gynec. & Obst. 54: 621-634 (April) 1932.



Knoefel<sup>14</sup> has shown evidence for widespread sympathetic excitation in man during ether anesthesia. As further evidence for sympathetic stimulation from ether and also urethane, the work of Elliott<sup>15</sup> may be cited in which the intact adrenal glands of anesthetized cats may be depleted of its content of epinephrine. Ether also causes constriction of the spleen<sup>16</sup>. In fact, so effective is the pressor action of ether that it has been used to elevate the blood pressure during spinal anesthesia<sup>11</sup>. However, ether has been shown also to have vasodilator effects<sup>17</sup>. Thus it is impossible to predict the net effect on observations pertinent to the circulation during spinal anesthesia in previously etherized animals.

Criticism of the use of morphinized animals in studies on spinal anesthesia is equally valid, since morphine promotes anoxia and hypercapnia by depressing the respiratory center. Although there is no evidence that anoxia and hypercapnia contribute to the hypotension observed during spinal anesthesia or sympathectomy, the possibility cannot be omitted that morphine also promotes muscle relaxation and may thus cause or aggravate venous stagnation. Seevers and Waters<sup>18</sup> admit that morphine, scopolamine, barbiturates and other anesthetic agents contribute to the hypotension observed during spinal anesthesia.

In view of these facts and the lack of attempt to evaluate the effects of laboratory and surgical manipulation in the experiments supporting the principle of vasoconstrictor paralysis as the cause of hypotension in spinal anesthesia, experimental work on anesthetized and traumatized animals cannot be accepted as valid support for this thesis.

#### THEORY OF STAGNATION IN THE POSTARTERIOLEAR BED

If vasodilatation is the cause of the fall in blood pressure in spinal anesthesia, there should be an increased venous pressure and cardiac output, provided the reduction of blood pressure is moderate in degree. However, if venous stagnation is the cause, it should be accompanied by a decreased stroke volume and decreased cardiac output. Schubert<sup>19</sup> reports cardiac output in 14 cases determined by Grollman's technic with anesthesia as high as the xiphoid or nipples. In 10 of these the cardiac output fell as compared with the control value before anesthesia, and the blood pressure was noted to decrease in proportion. In the other 4 cases, the cardiac output increased with increased systolic pressure in 2, no change in 1 and a slight fall in 1. He also noted clinically that the veins were collapsed and interpreted this as evidence for decreased venous pressure. The arteriovenous oxygen difference was increased. These data led the author to conclude that the fall in cardiac output resulted in a decreased arterial pressure and that decreased cardiac output was due to an impaired return to the heart. This, in turn, was attributed to paralysis of the vasoconstrictor nerves. The difficulty

of reconciling decreased venous pressure, decreased cardiac output and increased arteriovenous oxygen difference with arteriolar dilatation short of circulatory collapse is not explained. If the blood pressure changes are due to arteriolar dilatation, the reverse should be the case, that is, an increased cardiac output, increased venous pressure and decreased arteriovenous oxygen difference.

Other data supporting the notion of venous stagnation as the causative factor in the production of hypotension in man are available in the literature. Investigations of Burch and Harrison<sup>20</sup> and of Koster<sup>21</sup> and investigations presented here have demonstrated a fall in cardiac output of greater or less degree during spinal anesthesia. Schubert<sup>19</sup> has shown an increased arteriovenous oxygen difference. The effects of high spinal anesthesia on venous pressure in man have been studied<sup>22</sup>. A fall in venous pressure of 25 per cent and a parallel fall in arterial pressure in anesthesia of the fourth thoracic vertebra or above was recorded. It was also pointed out that the venous pressure will fall in high spinal anesthesia irrespective of arterial pressure changes. As a corollary to venous stagnation, the circulation time should increase. An increase has been observed in man during high spinal anesthesia<sup>23</sup>. Finally, if arteriolar dilatation is not the important factor in the hypotension of spinal anesthesia, the diastolic blood pressure and the over-all peripheral resistance will be relatively unaffected. Smith and his associates<sup>24</sup> demonstrated remarkably little change in the diastolic blood pressure during high spinal anesthesia in man, and it has been pointed out that peripheral resistance decreased significantly in only 1 of 7 patients, decreased slightly in 2 others, was unchanged in 2 and increased in 2<sup>24</sup>. Thus the preponderance of evidence controverts the thesis of arteriolar vasodilatation as the cause of hypotension during high spinal anesthesia and supports the principle of postarteriolar bed stagnation as the most important factor. In this connection, in order to evaluate the response to spinal anesthesia seen in the operating room, it is interesting to point out the effects of high spinal anesthesia on the circulation in normal man under standard conditions not given premedication or operated on and to contrast the results with those seen during surgical manipulations.

Smith and his associates<sup>24</sup> studied 18 subjects in whom anesthesia reached at least as high as the fifth thoracic with motor paralysis to the lower extremities, abdomen and thorax. In 2 of these subjects the systolic and diastolic pressures were well maintained. The remaining subjects had some decrease in either the systolic or the diastolic pressure or both. However, the systolic pressure fell more than the diastolic and in all but 5 instances the diastolic did not fall below 60 mm of mercury and frequently maintained its control level. The average fall in mean pressure was only 14 per cent in all cases. Since the heart rate was reduced only slightly, it was postulated

14 Knoefel P K. Anesthesia and the Sympathetic Nervous System. *Anesth & Analg* 15 137-149 (May-June) 1936.

15 Elliott T R. The Control of the Suprarenal Glands by the Splanchnic Nerves. *J Physiol* 44 374-409 (July) 1912.

16 Hausner E, Essex H E and Mann F C. Roentgenologic Observations of the Spleen of the Dog Under Ether Sodium Amytal Pentobarbital Sodium and Pentothal Sodium Anesthesia. *Am J Physiol* 121 387-391 (Feb) 1938.

17 Craig W M, Horton B T, and Sheard C. Thermal Changes in Peripheral Vascular Disease During Sympathetic Ganglionectomy Under General Anesthesia. *Proc Staff Meet Mayo Clin* 7 537-540 (Sept 14) 1932.

18 Seevers M H and Waters, R M. Circulatory Changes During Spinal Anesthesia. *California & West Med* 35 169-173 (Sept) 1931.

19 Schubert O O. On the Disturbance of the Circulation in Spinal Anesthesia. *Acta chir Scandinav (supp)* 43 78 177, 1936.

20 Burch J C and Harrison T R. The Effect of Spinal Anesthesia on the Cardiac Output. *Arch Surg* 21 330-332 (Aug) 1930.

21 Goldfarb Walter, Provizer Benjamin and Koster, Harry. Circulation During Spinal Anesthesia. *Arch Surg* 39 429-434 (Sept) 1939.

22 Adriani J and Roventine E A. Effects of Spinal Anesthesia upon Venous Pressure in Man. *Proc Soc Exper Biol & Med* 45 415-417 (Oct) 1940.

23 Doud E A and Roventine E A. Changes in the Velocity of the Blood Flow During Spinal Anesthesia. *Anesthesiology* 1 82-88 (July) 1940.

24 Roventine E A, Papper E M and Bradley S E. Circulatory Adjustments During Spinal Anesthesia in Normal Man with Special Reference to the Autonomy of Arteriolar Tone. *Anesthesiology* 3 421-428 (July) 1942.

that the fall in arterial pressure (which was not pronounced) was due to a fall in stroke volume occasioned by a decreased venous return because of pooling of blood in the paralyzed musculature. These observations were strengthened by studies<sup>21</sup> which showed that there was a reduction in cardiac output measured by the ballistocardiographic method in all of 7 instances. We observed relatively minor changes in heart rate and demonstrated that the reduction in cardiac output was due to a fall in stroke volume. We also observed an average fall in mean pressure of 14 per cent as measured by the Hamilton optical manometer after direct arterial cannulation, with anesthesia to the fifth thoracic or above.

The data cited were obtained in the presence of adequate denervation of the vasomotor fibers in the anterior spinal roots by spinal anesthesia. Information on this point was obtained by a comparison of the responses to postural change and the inhalation of low oxygen atmospheres and excess carbon dioxide in normal and anesthetized subjects. Hypercapnia in the normal subject produces an instantaneous and

*High Spinal Anesthesia in Two Hundred and Forty-Three Cases*

Complications	Hypotension			
	Severe 30 per Cent	Moderate 40 per Cent	Slight 1 per Cent	None 9 per Cent
During surgery (listed according to blood pressure changes)				
Nausea	13	10	11	17
Nausea and emesis	11	12	8	4
Syncope	6	1	0	0
Postoperative				
Nausea and emesis	5	3	0	0
Headache	2.5	4	0	0
Shock	4	1	0	0
Pneumonia	2.5	2	4	4
Death	5.5	5	4	0

\* The index for hypotension used: a fall in mean pressure of 40 per cent plus is severe; 20 to 39 per cent moderate; and 1 to 19 per cent slight.

decided rise in systolic and diastolic pressure. This response was absent in spinal anesthesia to the fifth thoracic vertebra or above. Anoxemia likewise produces some hypertension in normal man but does not in high spinal anesthesia. Finally, the normal person responds to the upright posture with a well maintained blood pressure owing to vasoconstriction. The erect position, on the other hand, when high spinal anesthesia is given, causes a fall in blood pressure with the systolic falling faster than the diastolic, a bradycardia, vertigo and syncope. These effects are not instantaneous but occur gradually over one to three minutes. The evidence cited demonstrates the effectiveness of sympathetic denervation in high spinal anesthesia.

#### CLINICAL STUDIES

To illustrate the contrast in hemodynamic activity of patients in the clinic with man not operated on, 243 consecutive clinical patients on whom operation had been performed during spinal anesthesia were analyzed in an entirely unselected manner. The only criterion was the requirement that anesthesia was at the sixth thoracic vertebra or above. Various drugs commonly used in spinal anesthesia, such as procaine hydrochloride, nupercaine, pontocaine hydrochloride, intracaine and monocaine, were employed. Most patients

had previously been given small amounts of morphine and scopolamine and some had been given soluble pentobarbital also. A prophylactic injection of epinephrine sulfate was given intramuscularly to some patients before the anesthetic, and others received the drug to combat a fall in blood pressure during the course of the procedure. Various operations were performed but the majority were intra-abdominal manipulations. Criteria as to severity of blood pressure fall were arbitrarily selected. A fall in mean pressure of 40 per cent or more was considered severe, a reduction of 20 to 39 per cent moderately severe, and one of 1 to 19 per cent slight. In addition, there were patients who had no reduction or had a definite rise in blood pressure.

It is apparent from the accompanying table that 30 per cent of the patients had a severe fall in blood pressure and 21 per cent a slight fall and for 9 per cent no fall was recorded. A total of 70 per cent of patients exhibited significant hypotension. These findings contrast strongly with the effects of spinal anesthesia on the blood pressure of normal man in the supine position not given premedication or operated on. Smith and his associates<sup>22</sup> and we<sup>21</sup> found no instance of severe fall in blood pressure as defined here and a moderately severe fall in mean pressure in only 25 per cent of the cases studied as compared with 40 per cent in the operative series. In round figures, almost three fourths of the clinical patients exhibit significant hypotension whereas less than one fourth of the subjects not operated on show such changes.

Another extremely significant fact is not shown in the table. The fall in blood pressure, regardless of the type of surgery performed, occurred after the beginning of surgical manipulations in practically all instances. The manipulation may be rapid change of position, abdominal incision, leaning against the patient's thorax, handling of viscera, hemorrhage or the use of abdominal packs. That surgery in its various aspects is an important factor in producing a fall in blood pressure in spinal anesthesia seems obvious. The patient whose sympathetic nervous system is extensively denervated by spinal anesthesia (sixth thoracic vertebra or above) is competent from the point of view of the circulation to handle his needs in the resting state in the supine position, but trauma of any sort concomitant with operative manipulation in the face of vasomotor paralysis and loss of vasomotor defense may precipitate a significant reduction in blood pressure and, if severe enough, complete circulatory collapse.

It is interesting to note the effect of major disturbances of the circulation and respiration preoperatively on the course of blood pressure changes when surgery is being done during spinal anesthesia. Preoperative pulmonary complications have no noticeable influence on the maintenance of blood pressure during spinal anesthesia. The effect of arteriosclerotic cardiovascular disease is uncertain, since it was present preoperatively in 13 per cent of cases showing no fall in blood pressure and had the same incidence in the group exhibiting severe falls in blood pressure as in any other group.

It is noteworthy that the incidence of nausea as a complication during high spinal anesthesia is unaffected by the extent of the fall of blood pressure, whereas the incidence of emesis decreases with decreasing falls in blood pressure. Another interesting fact is the occurrence of syncope in 6 per cent of the cases



showing severe falls in blood pressure, 1 per cent in the moderately severe group and in no cases in which blood pressure fell only slightly or not at all. The postoperative complications as listed are self explanatory. Emphasis should be placed on the absence of postoperative shock in the groups showing little or no change in blood pressure and the absence of mortality in the group exhibiting no fall in blood pressure.

The problem of treatment of the hypotension observed during spinal anesthesia is important. Treatment should be directed toward increasing venous return to the heart to maintain adequate cardiac output and increasing the oxygen tension of partially unsaturated arterial and venous blood. The administration of oxygen provides a means for satisfying the latter need. Clinically and experimentally, oxygen administration is of definite benefit in combating hypotension and the nausea and vomiting which may occur with spinal anesthesia.

Hypotensive episodes during spinal anesthesia have been treated clinically with various pressor drugs such as ephedrine, paredrinol and neosynephrin hydrochloride. The mechanism of the beneficial effects produced by these substances is often difficult to evaluate. Paredrinol<sup>25</sup> and neosynephrin hydrochloride<sup>26</sup> initiate an elevation of blood pressure as a result of increased peripheral resistance. Ephedrine apparently produces a pressor effect by increasing venous return, right auricular venous pressure and cardiac output. This pressor response to ephedrine may occur in spite of decreased or unchanged peripheral vascular resistance.<sup>27</sup> Therefore, on the basis of the facts outlined ephedrine is the drug of choice to counteract the hypotension of spinal anesthesia. The clinical findings support this concept, since alleviation of the symptoms of circulatory depression is readily accomplished with ephedrine.

The problem of prophylaxis for the hypotension of high spinal anesthesia is of no less importance than treatment. A severe fall in blood pressure cannot be considered physiologic, and its occurrence and duration during anesthesia adversely affect the morbidity and mortality of the surgical procedure being completed. The selection of patients is the primary consideration. Those with circulatory disturbances will respond poorly to further embarrassment of this function. The use of oxygen to prevent hypoxia and of pressor drugs, particularly ephedrine, to maintain blood pressure within normal limits is as definitely prophylactic as therapeutic. The other factor in prophylaxis is the role of the surgeon. This has escaped emphasis in discussions on the subject. Indubitable evidence that in man who has not been operated on the fall in blood pressure does not parallel that observed during surgery points to surgical manipulations as a factor of primary consideration. The patient with high spinal anesthesia and the major portion of his vasomotor defensive mechanisms paralyzed should have the need for such response minimized. Unnecessary surgical trauma is never justified. During high spinal anesthesia it should be eliminated and in addition the unavoidable manipulations carried out with extreme care. High spinal anesthesia is not the procedure of choice for an operation which must be completed with severe loss of blood, abdominal positional changes or

excessive trauma. The surgeon whose technics include rough handling of tissues, their wide exposure and other traumatic factors will not find his results improved with high spinal anesthesia despite the more uniformly convenient operating conditions.

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#### ABSTRACT OF DISCUSSION

DR SIDNEY C WIGGIN, Boston. I agree with Dr Papper that we have been able to control circulatory changes for the most part by the use of vasoconstrictor drugs, together with the use of many other agencies, such as preparation of the patient, recognition of variations in technic and action of different agents, chiefly maintenance of oxygenation and minute by minute observation of the effects of the drugs and surgery with the early treatment of complications. Spinal anesthesia can be the safest and most efficient method for operations below the diaphragm in selected cases. In the relief of pain in the present worldwide conflict it will be used more than any other method, especially when it has been estimated that over 50 per cent of wounds occur below the hips. To explain satisfactorily the physiology of spinal anesthesia, we must consider the theories mentioned by Dr Papper. Although perhaps conflicting and not complete in themselves, each theory contributes to our knowledge of the effects of spinal anesthesia on the vital centers, and structures of the body which control the physiologic functions. Thus, SeEVERS and WATERS in 1931 described the local diffusion of procaine hydrochloride in the subarachnoid space resulting in paralysis of the accessory muscles of respiration, and they recommended oxygen for the ensuing anoxia. NOWAK in 1932 demonstrated central absorption of procaine from the spinal canal by dyes introduced into the spinal fluid and isolated in the urine. He then introduced lethal doses of procaine into the veins of a series of cats and intraspinally below the second lumbar vertebra into another series and showed a similar development of toxic symptoms and death in both groups, with the detection of procaine in the urines. I agree with Dr Papper that the most serious complications in spinal anesthesia are principally the result of the lack of individualizing the patient and the recognition of the factors related to surgery itself. ROVENSTINE's description of traction reflexes has clearly shown the part overstimulation of vital nerve centers plays in the disturbance of the patient's physiologic balance in spinal anesthesia and surgery.

DR STUART C CULLEN, Iowa City. The lack of conformity of opinion in explaining the hypotension associated with spinal anesthesia and the diametrically opposed interpretations of data obtained in studies of this subject seem to indicate an incomplete understanding of some fundamental factor. That the fundamental derangement in circulatory stability is a consequence of the absence of sympathetic control is a theory fairly well accepted. The nature of the sites of action of this control, their extent and the degree of autonomous integrity of the peripheral vascular system in the absence of sympathetic control are the real problems to be answered. Dr Papper's theory of maintained arteriolar competence with venocapillary stagnation is logically considered. It is difficult, however to reconcile this arteriolar competence with incompetent postarteriolar capillaries. Must one assume that sympathetic impulses are nonessential to the maintenance of tone of the arteriole and essential to the maintenance of tone in the postarteriolar capillaries? The evidence presented does not exclude relative degrees of arteriolar incompetence. By the criteria employed such as reduced venous pressure, decreased cardiac output and increased difference in arteriovenous oxygen saturation, to establish arteriolar competence, relative degrees of arteriolar atonicity are not revealed. The moderate degrees of lowering of diastolic pressure can be interpreted to indicate some decrease in peripheral resistance due to loss of arteriolar tone. Dr Papper has emphasized the significance of mechanical interference with the dynamics of a peripheral vascular system under the influence of spinal anesthesia. This is a contribution of much practical importance. It does not seem logical to assume that "vasomotor defense" is lodged entirely in the postarteriolar bed in view of anatomic evidence that arterioles are

<sup>25</sup> Ranges H A and Bradley S E. Personal communications to the authors.

<sup>26</sup> Keys Ancel and Violante Antonio. The Cardiovascular Effects in Man of Neosynephrin. *J Clin Investigation* 21: 112 (Jan) 1942.

richly supplied with sympathetic nerve fibers. It does seem logical, however, to assume that in the maintenance of normal tension by integration of the peripheral vascular system through the sympathetic system the arteriole, as well as the capillary bed, plays a significant role. In the absence of sympathetic integration, autonomous arteriolar control is sufficient to maintain relatively normal tension in the resting supine state, but not sufficient to effect the proper distribution of blood in other positions and in response to unusual demands.

DR HENRY K BEECHER, Boston. The views that Dr Papper has presented have a considerable basis in the papers that Smith, Rovenstine, Chasis, Goldring and that group recently presented. Those papers and Dr Papper's presentation suggest that a question might be raised here as to how far conclusions can go when based on studies of a single organ or system. I believe we all agree that it is not wise to draw many general conclusions about the circulatory effects of spinal anesthesia from observations of the circulation of the skin. We all appreciate the fallacies inherent in that and I want to call attention to a similar question in regard to the paper presented today, and the earlier papers, namely, the hazards of drawing too many conclusions from the kidney. It is well to speak of this in the light of recent observations by Dr R H Smithwick, who has found that the kidney is to some extent innervated through pathways that come from well above the level that is reached by the high spinal anesthesia of the study under discussion. The kidney innervation is certainly widespread and extensive, it may arise as high as the second or third dorsal region. Furthermore, acute denervation as accomplished with local anesthetics may not give an accurate picture of persistent denervation effects. Such studies as these should include the behavior of the kidney under various reflex stresses and strains as Smithwick has pointed out.

DR E M PAPPER, New York. In answer to Dr Cullen I would state that the thesis maintained is that arteriolar dilatation is not an important factor in normal man, not operated on, under the standard conditions of our investigation, and that all the evidence indicates that whatever hypotension occurs is due to a fall in cardiac output, which is, in turn, attributed to failure of circulation in the postarteriolar bed. Concerning the question Dr Cullen raised about the individual's vasomotor defense during surgery, I agree that other factors might play an important part in the hypotension during clinical surgery. In fact, that is one of the strong points of our thesis in this argument, that the patient who is operated on is a different individual from the one who is not. Since he is adequately denervated as far as the sympathetic nervous system is concerned, he cannot compensate for the changes that occur during manipulation, trauma, hemorrhage and change of position. Whether that is due to superimposed arteriolar dilatation during surgery or whether it is due to failure of arteriolar constriction beyond normal tone, I don't think we can say at the present state of our knowledge. In answer to Dr Beecher's question, the systemic circulation has been studied with direct arterial cannulation for arterial pressure and by the ballistocardiac method for cardiac output. We are able by these methods to measure the actual cardiac output and the actual mean pressure and thus to determine the overall peripheral resistance which must lie largely in the arterioles. Therefore, the work does not rest entirely on renal blood flow but on direct observations in the general circulation.

**Tuberculosis in Old Age**—It is erroneous to assume that tuberculosis occupies a subordinate position in old age. Compared with the number in the younger age groups fewer senile persons fall sick or die from the disease, but there is no percentage decrease of tuberculosis in the aged. The mortality rate of the infection for all white persons (1 to 74 years) insured by a large company for the years 1931 to 1935 was 68.4 for males and 98.6 for females. Between the ages of 20 and 24 the rate was 54.8 for men and 84.8 for women. In the group 64-74 years there was a striking rise and a reversal of sex differences, 130.5 for males and 66.7 for females.—Mueller-Deham, Albert, and Rabson, S. Milton. *Internal Medicine in Old Age*, Baltimore, Williams & Wilkins Company, 1942.

## SPINAL ANESTHESIA

### FACTORS INFLUENCING ITS SUCCESS

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The success of any anesthesia is dependent on three general factors: (1) the patient and his disease,<sup>1</sup> (2) the choice of agent and method of administration<sup>2</sup> and (3) the skill and experience of the person administering the anesthesia. This is especially true when anesthesia by means of the subarachnoid route is elected.

My purpose in this paper is to mention or review some of the objective findings, observations, points in technique and corrective steps instituted that have an important influence on the success of anesthesia by the subarachnoid route. For purposes of coherence, these specific clinical factors will be presented under the following subtitles: (1) preparations of the patient including preoperative medication,<sup>3</sup> (2) choice of agent and method, and (3) administration of the agent and its supervision.

#### PREPARATION OF THE PATIENT

The preparation of a patient for spinal anesthesia not only necessitates a thorough knowledge of the objective findings which may influence its course but also includes an intimate knowledge of the patient's emotional status toward or past experience with this or allied methods of anesthesia. Patients in shock<sup>4</sup> are known to be poor candidates for spinal anesthesia. Recent experiences<sup>5</sup> among war casualties have further strengthened this observation. Patients with moderate to severe anemia tolerate the usual doses of agent poorly. Patients with anemias, cachexias or other blood dyscrasias should receive blood transfusions prior to the day of operation. Also it is inadvisable to elect spinal anesthesia in the presence of neuropathologic findings within the cerebrospinal system. Occasionally spinal pain following anesthesia has been attributed to the anesthesia when subsequent examination has revealed evidence of a concomitant neuropathologic condition.

A preoperative interview acquaints the patient with the anesthetist and the contemplated method. It also elicits valuable information from the patient as to his reactions to an anesthesia or his past experience with a similar anesthesia. Many patients are not receptive to spinal anesthesia for one of the following reasons: 1 The patient prefers to be asleep. 2 From hearsay, usually grossly exaggerated, the patient has been warned against spinal anesthesia. 3 The patient's local physician warns him against spinal anesthesia. 4 The patient has had a previous, decidedly unpleasant experience with an inadequate spinal anesthesia. 5 The patient tells the anesthetist of untoward reactions when this method was employed on a former occasion. Of these five reasons, the one requiring the most attention and investigation is the last—that is, the ques-

<sup>1</sup> From the Department of Anesthesia, the Liley Clinic. Read before the Section on Anesthesiology at the Ninety Third Annual Session of the American Medical Association, Atlantic City, N. J., June 10, 1942.

<sup>2</sup> Woodbridge, P. D. *Operative Risk in Anesthesia* in Piersol, G. M. and Bortz, E. L. *Cyclopedia of Medicine, Surgery and Specialties*. Philadelphia: F. A. Davis Company, 1939, vol. 1, pp. 476-483.

<sup>3</sup> Sise, L. F. Choice of Anesthesia. *Am J Surg* 34: 419-427 (Dec) 1936.

<sup>4</sup> Sellman, P. Preoperative Medication. *S Clin North America* 20: 621-631 (June) 1940.

<sup>5</sup> Woodbridge, P. D. Indications and Contraindications of Spinal Anesthesia. *S Clin North America* 20: 615-620 (June) 1940.

<sup>6</sup> Beecher, H. L. Personal communication to the author.

tion of idiosyncrasy. The most difficult to counteract is the fourth—a "gun shy" patient. The most annoying is the careless, thoughtless or officious remarks of an inexperienced physician. The easiest to cope with is the first—the desire to be asleep.

As a result of this preoperative visit and review of objective findings, the anesthetist is better able to evaluate the anesthetic risk of the patient. Depending on this information and grade of risk, the dose of preoperative medication is determined. The doses of preoperative medication usually ordered for good risk adult patients are pantopon  $\frac{1}{3}$  grain (0.02 Gm), scopolamine hydrobromide  $\frac{1}{150}$  grain (0.4 mg) subcutaneously two hours before the scheduled time of operation and soluble pentobarbital 3 grains (0.2 Gm) by mouth one hour before the operation. The soluble pentobarbital is given by rectum when oral medication is contraindicated. Patients with this medication usually arrive in the operating suite in a drowsy or euphoric state of mind, ideal for surgery on a conscious patient. Occasionally patients show little effect from this medication, in such instances medication is reinforced just before spinal puncture with varied doses of morphine  $\frac{1}{12}$  to  $\frac{1}{6}$  grain (0.005 Gm to 0.011 Gm) and scopolamine hydrobromide  $\frac{1}{100}$  to  $\frac{1}{200}$  grain (0.2 to 0.3 mg) intravenously.

#### CHOICE OF AGENT AND METHOD

The agent and method to be employed in spinal anesthesia depend on the contemplated operation. The more commonly employed agents are procaine hydrochloride, pontocaine hydrochloride and nupercaine. The respective indications for these three agents as employed at the Lahey Clinic have been reported in detail elsewhere.<sup>6</sup> Pontocaine hydrochloride combined with dextrose, as originally reported by Sise,<sup>7</sup> is most commonly used. By the use of the Sise technic (gravity method), the maximal concentration of the drug in the subarachnoid space is deposited at or around the nerve roots supplying the site of operation. This results in maximal concentration of anesthetic in these areas. This heavy solution with the patient in a supine position tends to result in a high sensory or posterior root anesthesia and an appreciably lower, and thus safer, motor or anterior root anesthesia.

Recent developments in the method of administration or technic have eliminated the former objection of limited or too short duration of anesthesia. Present day methods may be divided into the conventional or single dose method<sup>8</sup> and the continuous or fractional method<sup>9</sup> with repeated doses of an agent as needed. It is the opinion of the members of this department that fractional spinal anesthesia<sup>10</sup> will not completely supplant the conventional method of administration. In our opinion, indications for the fractional method are (1) operations in which the anticipated duration will exceed the duration usually obtained by the single dose method and (2) operations of unpredictable duration.

6 Hand L V and Sise L F Nupercaine Anesthesia Surg Gynec & Obst 71 921 (July) 1940 Nicholson M J Eversole U H and Hand L V Fractional Spinal Anesthesia, Am J Surg 53 403 411 (Sept) 1941

7 Sise L F Pontocaine Glucose Solutions for Spinal Anesthesia S Clin North America 15 1501 1511 (Dec) 1935 16 1707 1711 (Dec) 1936

8 Saklad M Spinal Anesthesia, New England J Med 213 1226-1235 (Dec 19) 1935

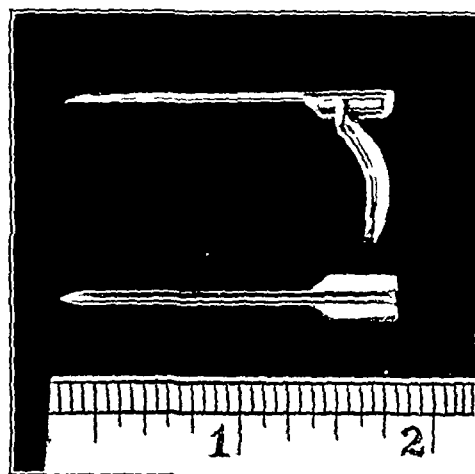
9 Lemmon W T A Method for Continuous Spinal Anesthesia Ann Surg 111 141 144 (Jan) 1940

10 Hand L V Spinal Anesthesia by Fractional (Continuous) Method of Administration Anesth & Analg 121 189 199 (July Aug) 1942

#### ADMINISTRATION OF AGENT AND ITS SUPERVISION

To some anesthetists the review of minor points of the technic of lumbar puncture may hold some interest. To a few it may be instructive. The administration and supervision of an agent is essentially technical and is governed by three components (a) the equipment, (b) the agent and (c) the administrator.

The syringe and its size are dependent on the agent elected and the quantity deemed sufficient for anesthesia. The type and gage of needle have an influence on the success of spinal anesthesia. Clinical investigations<sup>11</sup> by the late Dr Sise suggest that the gage of the needle has a definite influence on the incidence of postlumbar puncture headache. For patients with a planned, very short bed stay, that is six to twenty-four hours, we employ a No 24 gage needle. For routine conventional spinal anesthesia we use a No 21 gage needle. This 21 gage needle has a flexible, seamed, gold shaft and nickeloid hilt. Since its introduction we have not had a needle break within the body tissues during lumbar puncture. For fractional or continuous



Moore introducer

spinal anesthesia we use a special No 19 gage lumber nickeloid needle.

An introducer is employed to guide this flexible, soft needle through the interspinous ligament. The new introducer illustrated, devised by Dr George C Moore<sup>12</sup> on the principle of a groove director, has been an invaluable aid in facilitating accurate, speedy lumbar puncture when the flexible continuous spinal needles are used. This introducer can readily be removed without disturbing the indwelling needle. The combination of indwelling introducer and needle should be avoided. To my knowledge the only needle used for continuous spinal anesthesia broken within a patient's back was when a rigid walled introducer acted as a shearing blade when the patient was turned from a lateral flexed to a supine extended position.

When the pontocaine-dextrose technic is employed, the patient's head is always flexed so that the most dependent area of the spinal column is approximately between the second and the fourth thoracic segment. This tends to prevent upward cervical and medullary

11 Sise L F and Swinton N W A Method for the Prevention of Postpuncture Headache in Cases of Low Spinal Anesthesia S Clin North America 19 695-698 (June) 1939

12 Moore G C Personal communication to the author

progression of anesthesia With this technic the upward progression of anesthesia is obtained by gravity The patient is placed in a 10 degree Trendelenburg position for a very short period (one to two minutes) The degree of the Trendelenburg position is to be judged not by the degree of table slant but rather by the actual slant of the spinal column An obese person with narrow shoulders and broad buttocks will actually be in a 15 degree Trendelenburg position when a table tilt is recorded at 10 degrees It is in such instances that the complication of severe respiratory embarrassment occurs most frequently

The usual site of election for lumbar puncture is the third lumbar interspace In operations in which the contemplated procedure will be entirely in the upper part of the abdomen, a better concentration of anesthesia<sup>13</sup> is obtained and maintained when lumbar puncture is made in the second lumbar interspace The spinal needle should not be introduced with any degree of roughness When so employed the usual result is not only a painful lumbar puncture but also traumatization of periosteum Lumbar puncture in some obese persons may be a difficult procedure In such instances the introducer or needle may be used to locate the interspace If puncture is not obtained after one or two attempts, the employment of geometric principles will always facilitate midline puncture This is easily accomplished by introducing the needle toward the left side until radiating pain is elicited in the left knee, then repeating the procedure toward the right side until similar radiation of pain results in the right knee Having thus determined lateral nerve emergence one bisects this angle and a painless successful puncture is obtained These steps save unnecessary, haphazard repeated attempts, usually accompanied by considerable periosteal traumatization and pain Again, in patients requiring lumbar puncture twenty-four to forty-eight hours after encephalography or spinography, the decided diminution of spinal fluid usually results in a dura readily displaced and difficult to puncture In such instances the following steps facilitate puncture (a) a drop of fluid in the hub of the needle will be sucked in when the epidural space is entered—thus an important landmark of the proximity of the dura and (b) a needle with a bevel angle of less than 90 degrees and a sharp cutting point facilitates this dural penetration

With the special needle for continuous spinal anesthesia it is advisable to persist in lumbar puncture manipulation until fluid can be aspirated readily with the patient in the supine position, even if this necessitates a repuncture In instances in which this precaution was ignored, invariably attempts to maintain high anesthesia by subsequent injections were either difficult or unsuccessful

The accurate determination of heights of anesthesia is an important step It informs the anesthetist of approaching, unnecessary and potentially dangerous heights of anesthesia It determines the adequacy of the height of anesthesia An inadequate anesthesia without a supplemental remedy results in a disturbed patient as well as exceedingly poor operating conditions When testing, the more accurate response is obtained by negative suggestion For instance, it is preferable to say "You do not feel" rather than to ask "Do you feel?" The patient's response to the usual type of questioning will depend on his tolerance to pain and his

emotional status When the suggestive negative form is employed, the patient will quickly and emphatically correct you in the presence of definite pain stimuli In patients with language difficulties or excessive medication, objective responses, particularly facial wincing to test stimuli, are good indexes of the upward progression of anesthesia

After satisfactory anesthesia has been obtained, the clinical course is checked frequently and recorded at at least five minute intervals From the information obtained, the anesthetist is better able to safeguard against or institute early corrective measures to combat operative complications These observations consist in blood pressure, pulse and respiratory recordings, determination of the presence or absence of intercostal breathing and a close watch for early signs of beginning loss of anesthesia

In all operations of a serious nature or when there is a question of long duration an intravenous infusion is started and maintained throughout the operation This infusion affords a ready access for corrective measures, such as blood and intravenous medication, to combat certain operative complications and is a channel by which complementary intravenous agents may be employed

#### COMMENT

In many operations in the upper part of the abdomen, a complementary agent,<sup>13</sup> either inhalation or intravenous in nature is employed for the following reasons The first and most important is to lessen objective response to traction stimuli, thus lessening the severity of certain potential operative complications The second is that many patients prefer to be asleep The third is that it permits greater freedom of discussion of the pathologic conditions and contemplated treatment

The immediate postoperative orders for sedation and fluid are usually the responsibility of the anesthetist He is better qualified to judge and is familiar with the physiologic state of the patient resulting both from anesthesia and from the operation

The operative complications associated with and most likely caused by traction reflexes are appreciable falls in blood pressure with little to no pulse disturbances, usually accompanied by nausea and retching in a conscious patient This circulatory depression is not as severe and the gastrointestinal response is eliminated with the patient asleep In instances of nausea and retching oxygen is routinely administered When the blood pressure recordings approach 50 per cent of the original preanesthetic systolic levels, a vasodepressor drug is given to inhibit further falls in blood pressure and to treat the present depressed state The pressor drug combination usually employed is an intramuscular injection of pitressin<sup>14</sup> 5 units and ephedrine  $\frac{3}{8}$  gram (0.024 Gm) With this combination not only is blood pressure improved but this improvement is sustained for an appreciable period in the nature of a plateau effect

Transfusions of whole blood plus oxygen and pressor drugs are given in instances of shock or impending shock No substitute such as plasma or albumin is as effective as whole blood, particularly in instances of shock due to loss of blood

Second in frequency to circulatory depression is loss of anesthesia With the continuous spinal method this complication is eliminated The single dose administra-

<sup>13</sup> Hand L V and Sise L F Anesthesia for Gastric Surgery, S Clin North America 21 803 815 (June) 1941

<sup>14</sup> Raginsky B B The Present Status of Analeptics in Anesthesia Tr Am Coll Surgeons 1 66 73 (July) 1938

tion necessitates a supplementary anesthesia of sufficient depth to obtain motor relaxation. The following signs are indicative of beginning loss of anesthesia. The earliest is a vasomotor change manifested by perspiration. Next the patient complains of vague discomfort. Simultaneous with this discomfort, the abdominal viscera tend to balloon up and fill the incisional opening. The last is beginning loss of relaxation. Through inexperience or careless supervision signs of loss of anesthesia are not recognized until beginning loss of relaxation. In such instances the transition to an inhalation anesthetic results in a very stormy and disturbing period for the patient.

Occasionally spinal anesthesia may become too high, with resultant progressive respiratory signs of ascending anesthesia. These progressive signs are absent intercostal to reversed intercostal action accompanied by suprasternal notch tugging and a progressive increase in accessory respiratory muscle action to absence of respiration. The treatment of this complication will depend on the degree of respiratory involvement. The mental state of the patient plus the objective degree of paralysis usually influence further procedure. Usually light supplementary anesthesia will suffice to alleviate the disturbed mental state of the patient. If the patient is kept abundantly supplied with oxygen it is remarkable how little disturbance is caused him even by a considerable degree of intercostal paralysis. In instances of complete respiratory paralysis it is necessary to resort to passive breathing and to insure a patent and clear airway. A patent airway is best obtained by means of intratracheal intubation. The duration of intercostal paralysis is dependent entirely on the duration of anesthesia.

No method of anesthesia can excel spinal anesthesia in regard to the relaxation obtained especially in abdominal surgery. Certain physiologic pharmacologic and technical precautions or specific factors influence its success.

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#### ABSTRACT OF DISCUSSION

DR R J WHITACRE, East Cleveland, Ohio. Dr Hand's presentation should do much to stimulate our interest in obtaining a better understanding of certain factors essential to the safe and satisfactory use of spinal anesthesia. The relatively high morbidity and mortality rates of spinal anesthesia are inconsistent with the impression that spinal anesthesia is a simple mechanical process of injecting drugs into the subarachnoid space. It requires as much experience, knowledge and skill as any other type of anesthesia. The progress in spinal anesthesia has been so rapid that the number of complications can be materially reduced if the available information is properly utilized. Dr Hand has called attention to the advisability of using less than the ordinary dose of the anesthetic agent for the impaired risk patient. Although this factor is generally recognized in inhalation anesthesia, it is frequently ignored in estimating the dose of the spinal anesthetic. Certain other cases such as full term pregnancy also require less than the ordinary dose. The concentration of the anesthetic solution when injected into the spinal canal must be rigidly controlled. With agents of different potencies it is necessary to vary not only the dose but also the concentration of the drug. I should like to emphasize the need of preventing hypoxia during spinal anesthesia. Dr Hand has stressed the means of maintaining circulation so that an adequate supply of oxygen may be transmitted from the lungs to the tissues. Simultaneous circulatory and respiratory depression occurs so frequently during spinal anesthesia that one cannot assume that every patient is ade-

quately oxygenated when breathing air. To many patients it is of advantage to administer oxygen with a gas machine. This provides a positive means of not only increasing the tension of oxygen but also evaluating the patient's actual respiratory exchange at all times. This is a more reliable index of pulmonary efficiency than the presence or absence of intercostal activity. The three factors adequate oxygen in the inspired atmosphere, adequate pulmonary ventilation and adequate circulation require particular attention during spinal anesthesia. When intentionally supplementing spinal anesthesia, it is frequently possible in selected cases to use less than the usual dose of the agent. This is another important means of increasing the safety of spinal anesthesia. In reference to continuous spinal anesthesia it is reasonable to say that the time or length of operation is not the only indication. It is equally important to use continuous spinal anesthesia for certain poor risk patients regardless of the duration of the operation.

DR VIRGINIA APGAR, New York. Dr Hand has summarized well the main problems concerned with the proper management of a patient under spinal anesthesia. There are three points on which I wish to comment. 1. The method he describes to locate the spinal canal in difficult situations depends on the production of paresthesia. I think any regional method which relies on paresthesia as a definite landmark is to be discouraged. It is bad enough to produce it accidentally. May I suggest in such cases that entrance to the spinal canal by way of the paravertebral route, passing the needle cephalad to the transverse process, is frequently easier than by the midline approach and is usually not accompanied by pain. 2. One reliable method for determining the descending level of spinal anesthesia has been implied by Dr Hand but not mentioned specifically. As with all techniques a careful observation and interpretation of respiration is indispensable. The encroachment of the intestine on the operative field after it has supposedly been well packed off is due to the increased tidal volume of the patient as well as to the loss of the hypertonic state. In my experience an increase in respiratory exchange usually precedes vasomotor changes or complaints by the patients or surgeon. 3. No one can predict accurately the future place of the continuous spinal method. I have a feeling that its use will be more widespread than suggested by Dr Hand. In general I believe that it will be used in cases of spinal anesthesia in which 100 mg of procaine hydrochloride is not considered sufficient. We are permitted to use the least toxic regional drug—at present procaine—in all cases, and in much more accurate and individualized doses. The complete absence of the most serious spinal complication, respiratory paralysis, overweighs the occasional hypotensive state which is difficult to control.

DR F ELMORE HUBBARD, Montclair, N J. I want to ask Dr Hand the name of the groove introducer and where one can procure it.

DR GEORGE C MOORE, Boston. Regarding the grooved introducer, I want to say that it has been found to be just as satisfactory to use it with a small needle, 21 or 22 gage, as with the needle for continuous spinal anesthesia. With the smaller needle, of course, it may or may not be removed. I am not sure I am entitled to priority in originating it because I learned this morning that Dr Batten of the Methodist Hospital of Brooklyn has devised a somewhat similar instrument. I haven't seen his, so I can't describe it. If I may answer Dr Hubbard the McGregor Instrument Company of Needham Mass., is making the instrument.

DR LEO V HAND, Boston. In regard to Dr Appgar's suggestions, I agree with her relative to the method of paresthesias in developing anesthesia. That is not advisable, but frequently of necessity we employ it. For a particularly obese individual and when I do not care to have him sit up or follow the usual procedure it frequently proves in my hands to be a quicker method of locating the spinal canal. As to the future of continuous spinal anesthesia, that is a question. In the hands of surgeons a continuous spinal anesthetic may supplant the conventional dose method. I fear the situation may arise when all they have to do is turn to the nurse or intern or whoever is supervising and say "More relaxation" irrespective of the physiologic state of the patient.

# MICROAEROPHILIC HEMOLYTIC STREPTOCOCCUS INFECTION CAUSING DESTRUCTION OF NOSE

MAURICE J. COSTELLO, M.D.

NEW YORK

Prior to 1924, hemolytic streptococcus gangrene was reported under various clinical titles which included contributions by Seeman,<sup>1</sup> by Hawkins<sup>2</sup> and by Stirling<sup>3</sup> under the title of "gangrene of the scrotum and penis" and as "streptococcus scrotal and penile gangrene" by Campbell.<sup>4</sup> In 1924 Frank L. Meleney<sup>5</sup> reported 20 cases of hemolytic streptococcus gangrene from the clinic of the Peking Union Medical College in China, where he stated that the disease was fairly common. Fedden<sup>6</sup> in 1909 and Pfanner<sup>7</sup> in 1918 described cases of acute infective streptococcus gangrene of the extremities which Meleney thought were similar to those he studied in the Orient.

Since 1924 reports have appeared on the clinical recognition, on the bacteriologic studies, and on the treatment of an infection from which it is to be differentiated, namely that caused by the microaerophilic hemolytic streptococcus. The majority of these articles are the lucid contributions of Meleney and his co-workers. Unfortunately microaerophilic hemolytic streptococcus infection of the skin is seldom diagnosed early because of ignorance of its existence—the disease is admittedly rare—and also because of failure to order anaerobic as well as aerobic cultures of all infections of the skin of an obscure nature.

The request for anaerobic culture studies is so infrequent that many bacteriologic laboratories are not equipped to perform them properly.<sup>8</sup> The causative organism of this infection has been called microaerophilic because it grows best under slightly reduced oxygen tension.<sup>9</sup> It is for this reason that specimens for bacteriologic study should be taken from the sinuses and the undermined edges of the wound.

From a study of the literature it appears that any portion of the skin may be affected by this disease, but it occurs most frequently on the extremities, especially in men. The perineum, scrotum and penis are often affected. This is probably due to the proximity of these organs to the anal orifice, the hemolytic streptococcus being often found in the intestinal tract.<sup>10</sup>

Meleney's clinical description of this disease, repeated in all his writings, should make it as recognizable as erysipelas, from which it is to be differentiated. His further studies on the bacteriology of the causative organism—the microaerophilic hemolytic streptococcus—should make confirmation of the diagnosis a relatively simple matter, if this infection is kept in mind. Effective treatment then can be instituted promptly, preventing suffering, loss of time, money and life itself.

The organisms causing this infection may enter the body following superficial injury to the skin, a scratch, an abrasion, a boil, a herpetic lesion, a hypodermic injection, a severe injury or a minor or major surgical procedure.<sup>11</sup>

Prolonged suppuration leads to the development of ulcers having undermined borders and sinuses which burrow into the deep tissues. Muscle and bone are not often affected unless injured at the time of the original trauma. Severe hidradenitis suppurativa of long standing involving the axillas and inguinal regions may be complicated by this type of infection. Several of the cases reported suggest this possibility.<sup>10</sup>

This disease may be mistaken for erysipelas, cellulitis, pyoderma gangrenosum, tertiary syphilis, tuberculosis and varicose ulcers when it occurs on the extremities. When the lesions occur on the face and especially around the nose, almost invariably a diagnosis of syphilis, tuberculosis, carcinoma or rhinoscleroma is entertained. It is during this period of mistaken diagnosis that valuable time is lost and mutilating destruction occurs.

The case I am about to report exemplifies the difficulty in diagnosing this serious infection.

## REPORT OF CASE

M. J., a woman aged 59 when first seen by me on Dec. 20, 1937, had an ulcer on the right side of the nasal septum and the floor of the right nasal cavity for thirteen months which had increased in extent in spite of many types of local and general therapy. The extensive ulceration involved the mucous membrane of both nasal cavities with an irregular vertical perforation of the anterior portion of the nasal septum. The floor of the ulcer was covered with tenacious seropurulent exudate. The skin of the bulbous portion of the nose was dull red, edematous and tender on pressure. There was no pain but numbness was a prominent feature. The redness faded gradually into the normal skin. During the first weeks of observation by me the patient had a moderately elevated temperature 101-102 F., had frequent sweats while sleeping and complained of fatigue and shortness of breath. Frequent microscopic examinations of smears did not show Vincent's organisms or tubercle bacilli. The Gram stain showed occasional gram positive cocci which resembled pneumococci. Cultures showed hemolytic streptococci. The Wassermann reaction of the blood and the Kline precipitation test were negative on three different occasions. The sugar content of the blood was 114 mg. per hundred cubic centimeters. Urinalysis showed no abnormality, and the leukocyte count was between 12,000 and 16,000 on a number of occasions. Roentgenograms of the maxillary bones showed no abnormality. A roentgenographic study of the chest revealed numerous calcifications and a general peribronchial thickening throughout each lung particularly in the inferior lobe of the right lung. Several biopsies were performed. The first showed "chronic suppurative inflammation." A specimen of the nasal mucous membrane showed a "hyperkeratotic papilloma," and a specimen from the skin showed "hyperplastic inflammatory tissue."

During the first six weeks the patient received five intravenous injections of neorarsphenamide each 0.45 Gm., two of bismarsen and daily oral administration of 4 fluidrachms (15 cc.) of saturated solution of potassium iodide. There was no improvement in the lesion during this treatment. Local therapy consisted of irrigations with solution of boric acid and 1 per cent aqueous solution of brilliant green and 1 per cent aqueous solution of methylrosaniline.

The patient was tested with old tuberculin by graded intradermal injections on the forearms in dilutions of 1:100,000, 1:1,000,000 and 1:10,000,000. The areas of the skin injected became erythematous and swollen, and in forty-eight hours

Read before the Section on Dermatology and Syphilology at the Ninety Third Annual Session of the American Medical Association, Atlantic City, N. J., June 12, 1942.

1. Seeman D. *Ztschr. f. Chir.* 150:145, 1919.  
2. Hawkins J. A. *Mil. Surgeon* 50:419 (April), 1922.  
3. Stirling W. C. Jr. *Case of Gangrene of Scrotum and Penis* J. A. M. A. 80:622 (March 3), 1923.  
4. Campbell M. F. *Surg., Gynec. & Obst.* 34:780 (June), 1922.  
5. Meleney Frank L. *Hemolytic Streptococcus Gangrene* Arch. Surg. 60:317-364 (Sept.), 1924.  
6. Fedden W. F. *Proc. Roy. Soc. Med.* 2:213 pt. 1, 1909.  
7. Pfanner W. *Deutsche Ztschr. f. Chir.* 144:108, 1918.  
8. Meleney Frank L. *Hemolytic Streptococcus Gangrene* J. A. M. A. 92:2009-2012 (June 15), 1929.  
9. Meleney Frank L. and Johnson B. A. *Surgery* 1:169, 1937.  
10. Meleney Frank L. and Harvey Harold D. *Ann. Surg.* 110:1067-1094 (Dec.), 1939.  
11. Shallow Thomas A., Fry Kenneth E. and Pulaski Edwin J. *Surg., Gynec. & Obst.* 70:987-995 (June), 1940. Meleney and Harvey.



2 bullae developed at the site of each injection. These bullae were followed by ulcerations, which were of equal size despite the difference in dilution of tuberculin.

I presented the patient at the Manhattan Dermatologic Society in February 1938 with the diagnosis of pyogenic ulceration of the nose.<sup>12</sup>

She was again presented before the same society in April 1939 because of an exacerbation of the infection.<sup>13</sup> The infection had been dormant from June 1938 to January 1939. The period of remission was ascribed to the therapeutic effect of the iodides or tuberculin.

At that time she had an extension of the ulceration of both nasal cavities with complete destruction of the lower half of the septum. The skin of the bulbous portion of the nose was dusky red, swollen and tender, and the involved area was not sharply margined. An infectious eczematoid dermatitis appeared on the upper lip. During the following five months the infectious process destroyed the columella. The patient was again given large doses of the saturated solution of potassium iodide, this time without benefit. She received adequate doses of sulfanilamide, azosulfamide and sulfapyridine without favorable effect on the infection. Prior to the onset of the disease the patient's general health had always been good except for an eruption on the palmar surfaces of the tips of the fingers during the winters of 1903, 1906, 1912 and 1913, which consisted of deep indolent ulcerations, probably papulo-necrotic tuberculid. The resulting scars are still visible.

After the diagnosis of microaerophilic hemolytic streptococcus infection was confirmed by the bacteriologic studies performed by Dr Frank L. Meleney, the application of zinc peroxide cream caused gradual arrest of the infection. When the patient was last seen the disease process appeared to be controlled.

#### COMMENT

Treatment should be instituted immediately after the clinical diagnosis of microaerophilic hemolytic streptococcus infection is confirmed by proper anaerobic bacteriologic studies. If the infection involves a small area it should, if possible, be excised and the operative wound should then be treated with zinc peroxide paste. Skin grafting should be performed if necessary after the infection has been eradicated. Meleney advises surgical incision to encourage adequate drainage and relief of tension of the swollen tissues especially if the infection involves the extremities. Forty per cent zinc peroxide cream is made by mixing equal amounts of the potent sterilized powder and distilled water.<sup>14</sup> Since the microaerophilic hemolytic streptococcus is an anaerobic organism living in the recesses of the burrowing ulcers and the undermined edges of the wound, zinc peroxide cream must be applied thoroughly to these areas. Every part of the infected surface must be in continuous contact with the medicament. Since not all lots of the powder are effective, they must be tested for potency,<sup>15</sup> as the powder is therapeutically efficient only by virtue of its ability to produce oxygen when it is in contact with water. When the infected area is treated with the paste, it should be covered with wet gauze to insure constant liberation of oxygen. The gauze in turn should be widely covered with zinc peroxide ointment. The cream should never be permitted to become dry.

The sulfonamide drugs have been somewhat effective in combating this infection if administered early, before fibrosis prevents the necessary contact with the organ-

isms.<sup>16</sup> Too much reliance must not be placed on them if after a short trial the advancing disease warrants intelligent surgical intervention.

#### SUMMARY AND CONCLUSIONS

1 A case of microaerophilic hemolytic streptococcus infection causing destruction of the nose was observed.

2 Infections of this type may persist for an indefinite period before their true causation is determined because of remissions which are erroneously attributed to various forms of therapy.

3 Anaerobic as well as aerobic bacteriologic studies should be made as a means of arriving at a correct diagnosis early in the course of the disease.

4 Treatment by excision, incision and zinc peroxide cream is the best means of managing this serious infection.

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#### ABSTRACT OF DISCUSSION

DR FRANK L. MELENEY, New York. I did not realize until Dr Costello's paper was received a few days ago that he had confused the hemolytic streptococcus gangrene, which I saw frequently in China and described in 1924 in the *Archives of Surgery*, with the undermining, burrowing, chronic ulcer due to the microaerophilic hemolytic streptococcus, which I have described more recently. This gives me the opportunity to point out the fundamental differences in the two, which should be clearly differentiated. This case falls into the microaerophilic hemolytic streptococcus undermining ulcer group. The hemolytic streptococcus gangrene is an acute, fulminating, rapidly extending infection of the subcutaneous tissues. The pathognomonic sign of this disease is a purplish area in the center of an extensive erythema. This appears on the fourth or fifth day and goes on rapidly to gangrene. The infection spreads in the subcutaneous tissues, producing an extensive slough of the subcutaneous fat, but it does not spread down into the deeper tissues. This is due to an aerobic hemolytic streptococcus. Probably there is an element of hypersensitivity in this infection, which may be the explanation for its appearing more frequently in China than in this country. In the last eighteen years I have seen fewer than fifteen of these infections. The chronic, undermining, burrowing ulcer, on the other hand, is a slowly developing chronic infection, characterized by ulceration of the skin without gangrene. It not only spreads in the subcutaneous tissues but burrows down along the muscles and along lymphatic channels, and it frequently gets into bone. When this happens it is very difficult to eradicate. It frequently erodes into blood vessels, and death may ensue from severe secondary hemorrhage. Zinc peroxide is not effective in the acute hemolytic streptococcus gangrene because the extent of inflammation in the subcutaneous slough prevents contact with the periphery of the infection. In the treatment of this disease the sulfonamides should be used in maximum doses and incision made beyond the area of subcutaneous tissue involvement, followed by treatment with diluted solution of sodium hypochlorite to aid in the liquefaction of slough. With the chronic, undermining ulcer the sulfonamides are not as effective and here the treatment of choice is zinc peroxide. The two may be combined if the drug is tolerated. If the undermining is so extensive as to prevent adequate contact with zinc peroxide, the underlying tissues must be removed by preliminary operation. Another condition which is sometimes confused with both of these lesions is the progressive bacterial synergistic gangrene, which is less acute than the hemolytic streptococcus gangrene but more rapid in its spread than the chronic, undermining burrowing ulcer. This is due, as I have shown, to the symbiotic action of the microaerophilic nonhemolytic streptococcus and *Staphylococcus aureus*.

DR LOUIS A. BRUNSTING, Rochester, Minn. In describing the character of these ulcers with their burrowing qualities and liquefying necrosis I believe the use of the term "gangrene" is justifiable. Some of the earliest descriptions of these pyogenic

<sup>12</sup> Costello, Maurice J. A Case for Diagnosis (Pyogenic Ulceration of the Nose). *Arch. Dermat. & Syph.* 38: 106-107 (July) 1938.

<sup>13</sup> Costello, Maurice J. Tuberculous Ulceration of the Nose. *Arch. Dermat. & Syph.* 40: 1062-1063 (Dec.) 1939.

<sup>14</sup> Meleney, Frank L. and Johnson, Balbina. *Surg. Gynec. & Obst.* 64: 387-392 (Feb. 15) 1937.

<sup>15</sup> Meleney, Frank L. in Nelson, New. *Loose Leaf Surgery*, chapter V B pp. 476K-476.



ulcerations are recorded in the Medical History of the Civil War. Infections occurred at the sites of wounds and amputations in debilitated individuals under conditions of poor hygiene. The various types of gangrenous ulcerations described by Meleney and others can be made out in the earlier writings, but with the lack of present day bacteriologic knowledge there was no systematic classification. When these lesions occur in the axillas and in the region of the genitalia and the perineum they are apt to be based on the condition known as hidradenitis suppurativa. In some instances conservative treatment with the use of antiseptics and roentgen therapy is sufficient, but when there is extending infection over a considerable site it is better to excise the field and apply skin grafts. I have been interested particularly in the type of burrowing infection called pyoderma gangrenosum, which occurs chiefly in the patient who is debilitated by chronic ulcerative colitis. In those patients the bacteriologic findings are variable including either hemolytic streptococci or staphylococci or both. Many times the abscesses are sterile, especially when they occur at the site of an injection of vaccine or bruise, which leads me to believe that there is an element of hypersensitivity of the skin of such patients. As a general rule there is no response to treatment of any type unless the widespread infection in the colon is brought under control by attention to the general health of the patient. The use of multiple blood transfusions and repeated courses of the milder sulfonamide drugs is a helpful adjunct to the building up of the general resistance.

DR MORRIS H GOODMAN, Baltimore. Ulcers of the type described by Dr Meleney should be differentiated from an ulcer which I first described and reported in THE JOURNAL Oct 15, 1938 with the designation chronic streptococcic ulcer of the skin. I have seen a number of cases since the date of my original report, and my observations have been confirmed by others, principally by Taylor (*ibid*, April 4, 1942), who treated 31 cases. The lesion which I described makes its appearance following a slight injury in the form of a reddish, well defined edematous area usually on the extremities and soon ulcerates. The ulcer slowly enlarges and persists as a chronic low grade process. The borders are red and edematous and more or less tender and the edge is somewhat boggy and frequently undermined to a slight degree. The base of the ulcer shows a fairly intact granulation tissue, and a copious serous exudate is usually present. Taylor confirmed the impression that the ulcer which I described represents a distinct disease entity quite different from the chronic undermining and burrowing ulcers discussed by Dr Meleney. Aside from a low grade transitory lymphadenitis, the ulcers of my description are uncomplicated by any systemic effects. Dr Meleney has stated that in his cases in the early stages one recovers an aerobic streptococcus but later this organism develops anaerobic properties. In the chronic streptococcic ulcers of the skin which I described, the organism is a beta hemolytic streptococcus which is grown in pure culture under aerobic conditions throughout their entire course which ranged in duration, in 6 cases which I recently observed from three months to one and a half years. In the ulcers which I described, the use of any special local treatment is unnecessary because response to sulfanilamide, as emphasized in Taylor's report and in mine, is prompt and excellent.

DR MAURICE J COSTELLO, New York. This patient was seen by a number of dermatologists, otolaryngologists and surgeons, all of whom failed to entertain the diagnosis as presented. The difficulty was further enhanced by the fact that this lesion occurred on the nose, which, as far as I can tell from the literature, is an extremely unusual location. Dr Meleney has frequently stressed the importance of the early clinical recognition, confirmed by anaerobic cultures, before secondary organisms appear which make it more difficult to evaluate the role played by each. It is also important to differentiate this from tuberculosis, syphilis and carcinoma, which it simulates. Frequently the dermatologist is the first to see this type of case and I hope in the future will probably be the first one to recognize it. I thank Dr Meleney and Dr Brunsting for discussing this paper, and I will make the correction that Dr Meleney referred to at the outset.

## Clinical Notes, Suggestions and New Instruments

### RESULTS WITH LOCAL HEATING IN PELVIC INFLAMMATORY DISEASES

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We are presenting the results of heating tissue locally in the treatment of pelvic inflammatory diseases. The types of apparatus used consisted of the Elliott machine, the short wave machine and the conventional diathermy machine. One hundred carefully selected patients were taken for the study. The three most prevalent factors causing the pelvic conditions were gonorrhea, postabortal infections and postoperative complications. Our aim was not to 'sterilize' the pelvis of gonorrheal organisms by long continued high temperatures but to assist in the resolution and absorption of inflammatory tissue in all chronic pelvic inflammations.

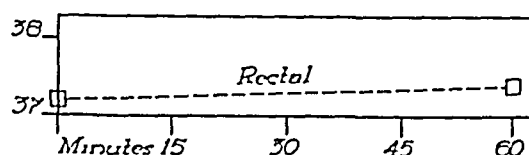


Chart 1—Short wave diathermy pad method. This graph shows the greatest change in temperature recorded by use of external pads. The majority of patients taking this type of treatment terminated their hour of therapy with a rectal temperature lower than that at the beginning of treatment. The recording is of a woman aged 30 whose chief complaint was pain in the suprapubic region radiating down the anterior aspects of both thighs. In 1930 an appendectomy had been performed. Several years later she was operated on again for the release of adhesions and a right salpingectomy and puncture of bilateral cysts on ovaries were executed. The diagnosis was extensive postoperative adhesions. Results from the diathermy were quite good. Relief from pain and a much freer pelvic cavity resulted. The patient was last seen in August 1938.

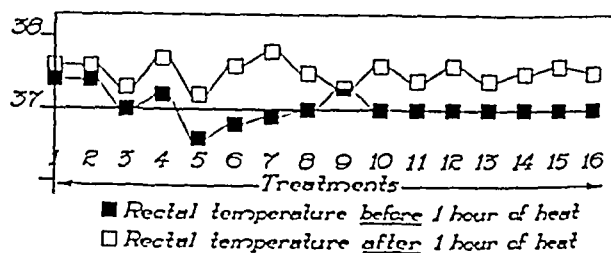


Chart 2—Results of sixteen successive treatments with short wave diathermy pad method. These were carried out on the patient described in chart 1. If as is generally thought a moderately high temperature plays a dominant role in the treatment of an inflammatory disease of the pelvis then this patient derived little benefit. The clinical result however, was satisfactory as has been pointed out.

The principal aim of any piece of therapeutic apparatus is to attempt to heal tissue and not to kill it or render the cells incapable of regeneration from disease processes or of further physiologic growth. Roentgen rays if improperly used are capable of irreparable damage to tissues, but placed in competent hands they are of inestimable value. The same is true of diathermy.

For the sake of brevity, the charts will show the results obtained and the comparisons between the three methods used. In the evaluation of such records many facts must be sifted and segregated. Several histories were excluded from this study because in our opinion the diagnosis was incorrect. For example, a woman had a retrodisplaced uterus in the third degree position. When we examined her after her first treatment we were able to bring the uterus into position quite readily, and with the help of a pessary an excellent result has been obtained. Naturally we feel that this case and similar ones should not be included in the small series presented here.

Surgical intervention is still the only method used to eradicate the results in all too many women who show pelvic disorders as the aftermath of some infection. We cannot stress too strongly the fact that if surgery only has been resorted to then the best interests of the patient have not been served. Quite frequently when a younger woman has been operated on for the usual pelvic sequelae of a gonococcal infection, the surgeon must of necessity remove several structures which are necessary to the generative system, and frequently a "clean sweep" is the result. Once tubes or ovaries are removed, the woman becomes barren so far as the reproductive phase is concerned. This is a particularly significant fact when we say that the great majority of our patients were under 30 years of age, i. e., in the full maturity of their reproductive cycle. This should clarify the allocation of responsibility, for if the age group fell more closely to the menopausal line there might be more reason for an operative termination of the processes of the pelvic disorder. However, we are still faced with the painful truth that the majority of these pelvic conditions are the result of a gonorrheal infection and that the highest incidence for this infection falls between the eighteenth and the twenty-fourth year. Our duty is quite clear. We should constantly seek to eradicate the inflammatory infection due to some youthful indiscretion on the part of the female and still try to maintain the reproductive processes intact, so that fertilization may later ensue and a healthy baby and mother be the ultimate happy outcome. The other two causal agents

infectious process must all be evaluated. The threshold for pain tolerance likewise varies considerably in different women. However, we believe that, other factors being equal, we obtain better results when the pelvic cellular reaction is minimal even though the pain experienced may be severe. The greater the inflammatory masses present, the longer time perforce must

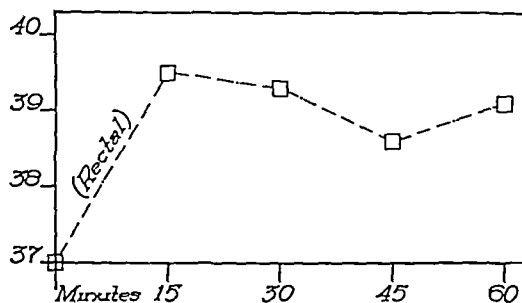


Chart 4—Elliott treatment. A more pronounced temperature rise is seen than in the preceding charts with other methods. Frequently however the treatments had to be postponed because of vaginal burns sustained during the administration. If a bubble of air becomes trapped in the rubber applicator owing to the necessary manipulation incident to the pressure and suction changes the chances of the underlying vaginal tissue sustaining a burn are increased. The method is not so easily carried out as with the conventional diathermy and certainly more pain is experienced by the patient. Patients with intact hymens are unable to take this form of therapy. End results generally were satisfactory.

#### Complete Temperature Chart in Series of Twelve Treatments

Conventional diathermy approximately 2100 milliamperes of current dispersed through 60 square inch metal plates and Chapman type vaginal electrode carrying thermometer

Date	Oral					Rectal					Vaginal				
	0 I	15 II	30 III	45 IV	1 Hr V	0 I	15 II	30 III	45 IV	1 Hr V	0 I	15 II	30 III	45 IV	1 Hr V
July '28	37	37.3	37.5	—	—	37.5	39.4	39.7	—	—	—	41.7	41.1	—	—
July 31	36.8	37.5	37.7	37.8	37.8	37.5	41.8	41.8	40.5	40.8	—	42.3	41.7	42.3	42.3
August 3	37.1	37.6	37.8	37.9	37.9	37.0	40.0	40.7	40.9	40.7	—	42.9	42.3	42.9	41.7
August 7	37.1	37.5	37.7	37.8	37.8	37.7	41.3	40.6	40.2	40.8	—	42.3	41.7	42.3	42.3
August 17	37.1	37.3	37.4	37.3	37.3	37.3	41.8	41.9	40.2	40.0	—	41.7	41.7	41.1	41.1
August 21	37.2	37.2	37.6	37.7	37.7	37.3	40	37.6	40.7	41.0	—	41.7	41.7	41.7	41.7
August 24	37	37.3	37.5	37.6	37.6	37.3	40.5	40.3	40.7	40.1	—	42.3	41.7	41.7	41.7
August '28	37	37.5	37.6	37.7	37.7	37.5	41.7	41.3	41.1	40.7	—	41.1	41.7	41.7	41.7
August 31	37.3	37.3	37.6	37.6	37.6	37.4	39.7	39.1	40	40.4	—	41.1	42.3	42.3	42.3
September 11	36.6	37	37.2	37.4	37.4	37.3	39.4	40	41	41	—	41.7	41.1	41.7	41.1
September 14	37	37	37.1	37.5	37.5	37.1	39.8	40.3	40.3	40.3	—	41.1	41.1	41.1	41.7
September 18	37	37.1	37.4	37.5	37.0	37.3	40.9	41.2	41.1	41.1	—	42.3	41.7	42.3	41.1
Series mean	37.0	37.3	37.5	37.4	37.6	37.0	40.6	40.4	40.6	40.7	—	41.8	41.6	41.9	41.8

First treatment 30 minutes only

that make up the impressive triad responsible for so much pelvic trouble are postoperative adhesions and disorders and postabortal complications.

The degree and extent of a pelvic inflammation appears to have little relationship to the pain suffered. Quite frequently a woman presents a pelvis filled with inflammatory masses and yet does not complain of severe discomfort, while some

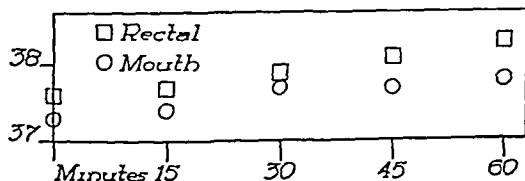


Chart 3—Short wave diathermy, cable method. The cable was spaced completely around the pelvis. Patients taking this type of treatment complained about the generalized heating of the body. A woman aged 23 whose temperatures are charted had been subjected to three operations. An appendectomy was performed in 1937, a sinus tract which developed was explored several months later and in 1938 a pus sac in the pelvis and the sinus tract were removed. The left ureter was constricted by the inflammatory mass and a hydronephrosis resulted. The diagnosis was massive postoperative and infectious adhesions and the development of a hydronephrosis on the left side. The patient was discharged from the gynecologic and genitourinary clinics after twelve treatments and has not been seen for four months.

slight motion to the cervix in another patient showing very little reaction causes decided pain. Different causative invading organisms, different sites attached and different stages of the

the diathermic measures be continued. Absorption and resolution of exudate takes time, and if there is a purulent condition present the time factor will of necessity be prolonged. However, the presence of accumulations of pus in the pelvis does not contraindicate diathermy and certainly does not presage a failure for the method. An acute abscess in the cul-de-sac is treated best by colpotomy drainage. As a general statement we can say that our results show that postabortal and gonorrheal infections do remarkably well under diathermy but that postoperative complications do not respond so readily.

One must be on guard for evidences of psychic trauma in women presenting pelvic symptoms. Particularly is this mental imbalance seen in the postoperative patients who have not been aided by the first operation. Several patients in our small series have had notations made in their charts by the psychiatrists to the effect that further surgical intervention might have a permanent effect on the already imperfectly functioning nervous system. We have all seen women who constantly besiege the doctor to operate on them when their real complaints might better have been dispelled by a psychiatrist. Our modern, complex, rapidly moving environment takes its toll of human economy and women frequently show their disharmony to this rushing age by vague pelvic distress. The uncertainties of wartime, with the resultant disruption of family life, has now imposed a further strain on the human system.

There are many men who would withhold diathermic measures in chronic conditions of the pelvis and would use it only in cases of subacute involvement. We know that many

chronic disorders of the pelvis have been aided materially and we have seen some old infections literally melt away under treatment. Clinically, however, the chronic condition is more stubborn of cure than the subacute, and a longer series of treatments must be anticipated. Some patients, it is true, cannot be helped at all, and it is these who must derive aid from surgery.

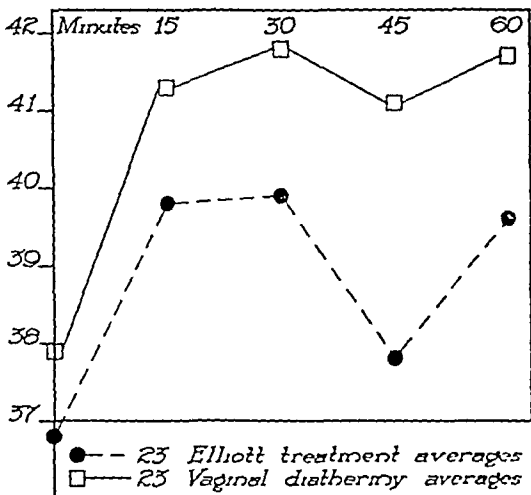


Chart 5—Elliott and vaginal diathermy. This graph shows the average temperature of a patient who presented herself with a subacute vaginal gonorrheal infection. The Elliott machine was used first and then vaginal diathermy was used for the second series of treatments. There is a difference of approximately 2 degrees centigrade between the two methods. Asked which treatment she preferred she emphatically declared in favor of the vaginal diathermy. The clinical response to the Elliott machine was excellent for a while but later on hydrophilus developed on the left side which under the vaginal diathermy responded extremely well. To date she has been free of symptoms.

Such important details as building the patients up physically so that the tired bodily defenses can best take advantage of the assistance offered should really not need stressing, but most of the patients with such infection fall in the poorly nourished stratum of society, and their resistance is quite low. In most instances it is found that there are several unrelated factors, all of which tend to provoke and aggravate the debilitated state of the patient. The most frequent conditions encountered outside of the pelvic infections proper were abscessed teeth, infected tonsils, chronic constipation, varicose veins, visceroptosis, malnutrition, poor posture, anemia and various stages of vi-

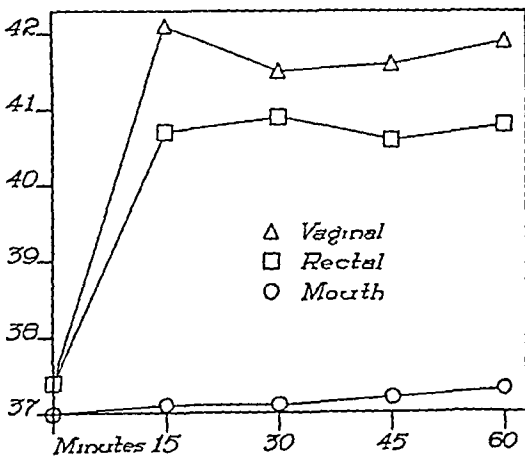


Chart 6—Vaginal diathermy showing the average temperatures obtained. Vaginal, rectal and mouth temperatures were recorded. Treatment by this method was smooth with only an infrequent complaint being made about the treatment causing vaginal pain. There was a local sensation of warmth as contrasted with a generalized sense of heat when the short wave pad or cable was utilized. In treating 58 women with this technique we had 10 clinical failures 6 for postoperative complications. Forty of the 58 patients were definitely helped by the treatment and 24 showed a decided decrease in the size of the pelvic inflammatory exudate. There were 8 clinically cured (the criterion being complete absence from pain and a pelvis free from inflammatory exudate). Of these 8 only 1 had a postoperative complication. Four women became pregnant and carried safely through to term and delivered without mishap.

tamnosis. We firmly believe that a complete general examination is imperative, for only by irradiation of such nagging conditions and foci of infection can one hope to obtain amelioration of the larger issue. Chemotherapy, referring particularly to the sulfonamide derivatives should be adequately used, occasions arise in which these drugs can be used to advantage during treatment by diathermy.

The accompanying graphs represent a composite picture of the patients treated. The women were attended by the same technician (G. B.), so that uniformity of treatment was established and a more accurate check made possible. Follow-up examinations were likewise made by one of us (J. R. U.), and progress notes were standardized as far as possible.

#### SUMMARY AND CONCLUSIONS

- 1 Local pelvic heating should be used more extensively in the treatment of subacute and chronic pelvic inflammatory diseases.
- 2 Surgery should be withheld until more conservative measures have been given a trial.
- 3 The ideal outcome would be complete absorption of the inflammatory tissue leaving the patient capable of reproduction and able to carry through to term.

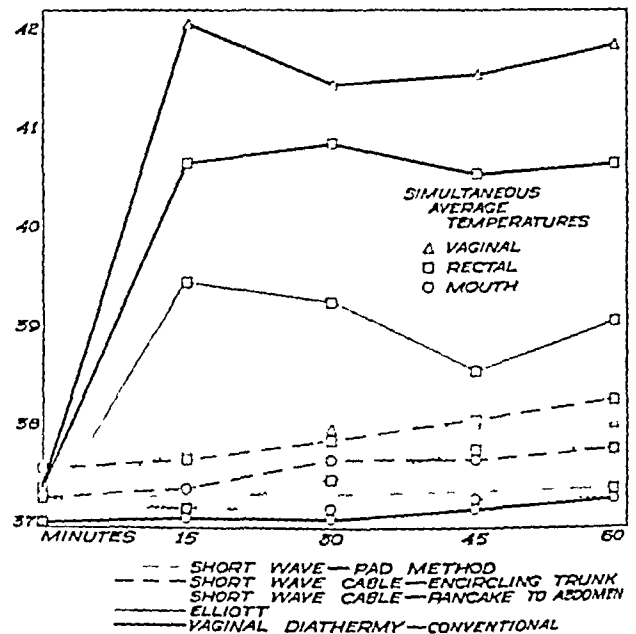


Chart 7—Composite set of graphs illustrating the greatly varying range of temperature readings obtained by the use of the preceding method and in addition by the use of the short wave cable in the form of a pancake on the abdomen.

- 4 The best clinical results were obtained with the conventional diathermy for which the vaginal electrode was used.
- 5 The best clinical results were obtained when a moderately high temperature was sustained.
- 6 Short wave diathermy with the vaginal electrode gave equally good results. Fair effects were noted with the pad or coil method.
- 7 We encountered a number of vaginal burns when the Elliott machine was used.
- 8 Skin tolerance to diathermy appears still to be the best indicator in preventing damage to the tissues.
- 9 Gonorrheal and postabortal infections respond more readily than postoperative complications. No attempt was made to kill the gonococcus in any of our cases in which local protracted high fever therapy was given.
- 10 Psychic factors must be closely evaluated in women complaining of pelvic discomfort.
- 11 Noteworthy features of conventional diathermy are ease of treatment, local as contrasted with a generalized heating much more comfort for the patient, relief from pain decrease in size of inflammatory exudate, less chance of damage to

issues, fewer treatments necessary and possibility of fertilization at a later date is contrasted with the usual operative barrenness when surgery is resorted to

## CAUTION

The federal law requires all persons using short wave diathermy apparatus to register their equipment with the local authorities. This is a war measure.

384 Post Street

## PNEUMONIA CAUSED BY MICROCOCCUS TETRAGENUS

WALTER R. TOBIN, M.D. CHICAGO

The organism *Micrococcus tetragenus* was first described by Koch<sup>1</sup> and Gaffky<sup>2</sup> in 1881. It is commonly found in long standing progonic processes in association with a variety of other organisms and in this connection is thought to be a secondary invader and a saprophyte. It has also been reported frequently as a primary cause of infection in various parts of the body, such as meningitis, otitis media postpartum infections, acute endocarditis, septicemia and arthritis. A search of the literature, however, failed to find this organism attributed to the cause of pneumonia except in 3 instances all of which were reported in foreign literature. The following is a brief summary of these cases.

Delearde<sup>3</sup> in 1897 reported in detail a case of bronchopneumonia due to *M. tetragenus* in a man aged 49. He recovered the organism in great abundance in practically pure culture. He made note that the disease was severe and characterized by repeated chills. The patient survived but remained in the hospital for six weeks. Castaigne<sup>4</sup> in that year also identified *M. tetragenus* in a case of pleurisy with effusion, but no mention was made of pneumonia.

Bosc<sup>5</sup> in 1900 reported a case of suppurative bronchitis and bronchopneumonia in a 21 year old patient with autopsy findings. *M. tetragenus* was recovered from the bronchial secretions in pure culture. This patient also had enterocolitis and suppurative peritonitis at the time of death and these processes also yielded pure cultures of this organism. Detailed description with illustrations are given embracing the gross and microscopic as well as the bacteriologic aspects.

Byers and Houston<sup>6</sup> in 1913 described a case of severe bronchopneumonia in a 10 year old child that followed in the wake of a comparatively mild infection of the middle ear and upper respiratory tract. Cultures made from the sputum, pharynx, ear discharge and urine were of a mixed variety, but in each case colonies of *M. tetragenus* were found. *M. tetragenus* grew from the blood in pure culture. They concluded that this organism was the cause of the pneumonia and not others that were found in the sputum, because the patient's blood gave a high opsonic index to this organism and not to the others as compared to normal blood serum, also because an autogenous vaccine prepared from the cultures of this organism injected subcutaneously gave a pronounced reaction even in small doses and had a decidedly favorable effect on the clinical course of the disease, whereas a stock vaccine previously administered gave neither reaction nor therapeutic response.

The case presented here was considered worth reporting because the organism was isolated from the sputum, blood and urine early in the disease in pure culture, and because the disease was otherwise uncomplicated.

From the Department of Northwestern University Medical School. The case reported here was referred to the author by Dr. Stanislaus Novak.

<sup>1</sup> Koch, Robert. Zur Untersuchung von pathogenen Organismen. Mitt. a. d. k. Gsndtsamte 1: 1-48, 1881.

<sup>2</sup> Gaffky, Georg. Experimentell erzeugte Septicämie mit rucksicht auf progressive Virulenz und accommodative Züchtung. Mitt. a. d. k. Gsndtsamte 1: 80-133, 1881.

<sup>3</sup> Delearde, A. Bronchopneumonie a tetragenus purs. Gaz. heb. de med. et chir. 54: 637, 1897.

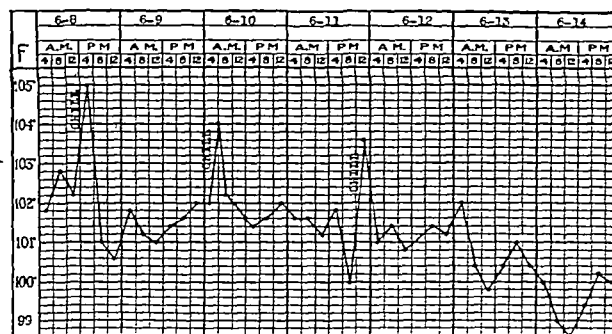
<sup>4</sup> Castaigne, J. Pleurésie purulente et septicémie mortelle produites par la tetrage, Bull. Soc. anat. de Paris 11: 394-400, 1897.

<sup>5</sup> Bosc, F. J. Contribution a l'étude des infections produites chez l'homme par le micrococcus tetragenus septicus. Arch. de med. exper. 12: 159-181, 1900.

<sup>6</sup> Byers, Sir John and Houston, T. Tetragenus Septicemia. Lancet 1: 1723-1725, 1913.

## REPORT OF CASE

Mrs. S. M., aged 43, a housewife, had a mild chest cold for about a week and on May 28, 1941 entered the hospital with symptoms of chills, fever, pain in the chest and vomiting. Her temperature was 103.4 F, pulse 126 and respiratory rate 40 to 46 per minute. The white blood count was 13,450 with 96 per cent polymorphonuclear neutrophils. The red cell count was 3,370,000 and the hemoglobin 11 Gm per hundred cubic centimeters. She appeared very ill and was mildly cyanotic. No definite consolidation was found, but the breath sounds were impaired. Moist rales were heard scattered over the lower half of both lungs, anteriorly and posteriorly. A diagnosis of bronchopneumonia was made and confirmed with x-ray examination. After several unsuccessful attempts to obtain sputum for analysis, a specimen was recovered by means of a tracheal catheter. The cytologic examination of the sputum thus obtained revealed only cocci, few in number, which were not characteristic of pneumococci and did not show capsular swelling by the Neufeld method. Culture of this specimen resulted in the abundant, almost pure, growth of an organism which proved to be *Micrococcus tetragenus*. A blood culture, taken on entrance to the hospital, revealed the same organism. A few days later the patient complained of frequency and burning of urination, and examination of the urine showed 50 to 100 pus cells per high power field. A pure culture of *M. tetragenus* was also made from a catheterized specimen of urine. In order to confirm our contention that *M. tetragenus* was the responsible organism repeat cultures of the blood, urine and sputum were made and in all 3 instances the results were



Temperature during the second week of the disease showing malaria like record.

identical. The sputum was examined for acid fast bacilli, but none were found. The blood Wassermann and Kahn reactions were negative.

The course of the illness was stormy, characterized by repeated chills every one to three days, which were followed by an increase of fever, up to 103 or 104 F. Sulfapyridine was administered by mouth in doses varying from 1 to 2 Gm every four hours, which maintained the blood level at 9.5 to 11.5 mg per hundred cubic centimeters. The drug, as is reflected in the temperature curve, appeared to have little effect on the course of the disease. For one forty-eight hour period sulfathiazole was substituted for the sulfapyridine without obvious clinical change in the patient. Potassium iodide was administered by mouth for its supposed effect in disintegrating the capsule, but without effect. Other standard therapeutic measures used consisted of oxygen, frequent blood transfusions, adequate caloric intake, sedatives and the maintenance of water, electrolyte and vitamin balance. Vaccine therapy was not tried. Recovery was gradual and the patient was discharged from the hospital June 22, twenty-five days after entrance.

## SUMMARY AND CONCLUSIONS

A case of bronchopneumonia complicated by bacteremia and urologic infection was due to *Micrococcus tetragenus*. Sulfonamide derivatives in this case failed to produce a therapeutic response. In view of Byers and Houston's report of successful treatment of a similar case with an autogenous vaccine it would seem advisable to give this method a trial when other readily available measures have failed.

6 North Michigan Avenue

## Special Article

### HANDBOOK OF NUTRITION XX

#### FEEDING THE AGED

EDWARD L. TUOHY, M.D.

DULUTH, MINN.

*These special articles on foods and nutrition have been prepared under the auspices of the Council on Foods and Nutrition. The opinions expressed are those of the authors and do not necessarily reflect the opinion of the Council. These articles will be published later as a Handbook of Nutrition.—Ed.*

At the outset I present five reasons why practicing physicians should become interested in the problem of feeding the aged. When they convince themselves that overindulgence and needless restriction in food are both wrong, then will their patients gradually conform. They always have conformed and on many occasions have accepted guidance far less scientifically sound than that outlined in this series on nutrition.

1 Those living over 60 are now so numerous that their individual needs call for an active aggressive medical approach. The individual, instead of his disease is our problem. We must become guides or umpires rather than healers and on a long term, rather than a temporary, basis.<sup>1</sup> The treatment of diabetes with balanced diets and insulin, of pernicious anemia with liver extracts, illustrates the technique. We have asked repeatedly that we be allowed to keep the "physician-patient" relationship. Here is our opportunity.

2 Mass efforts (for preventable diseases) and specifics (for certain infections) have nearly eliminated many common diseases (diphtheria, typhoid). We are on the way to control pneumonia if seen early. Less young people die, more attain advanced age unhampered by a holdover of morbidity from earlier nonfatal encounters that nevertheless leave their scars.

3 The competence of healthy older people is largely a matter of nutrition. Doctors also have an age problem. They also age. America is at war. There is no turning back. Physicians attain their fourth decade before they become active in their respective fields. They need more years of activity after 60 than most are favored with. Coronary disease is all too common with doctors. I shall refer to it at some length because food excesses (fat) may be a factor involved.

4 Population is an asset. Human beings must never be classed as liabilities. Guiding the aging may be made a stimulating medical field. It is not a "second childhood" affair, as the uninformed facetiously imply. Geriatrics is less a science than an art. It is not an isolated specialty comparable to pediatrics. The pediatrician tells the mother or nurse what to feed the child. If the food is available, the child usually gets it. The geriatrician (I do not aspire to be one) usually finds his older subjects neither acquiescent nor especially cooperative. Food habits have become fixed, those

under or over eating enjoy their self determination. Accordingly it is not sufficient to tell off average menus suitable for the old. This simple assignment I leave to the scores of available diet manuals. Some argument must be presented to give the whys and wherefores of the need of balance in various foodstuffs and vitamins. The overrefinement of starch and excessive use of sugar must be warned against and the reasons made clear enough so that appetite is not the sole guide to eating. All specialists and general practitioners giving service to the old should familiarize themselves with the researches in nutrition now contributing so effectively where understood and applied.

I shall attempt to assemble the evidence establishing adequate nutrition as the present day primary need of the older age group. The previous chapters in this series have authoritatively outlined the increment in knowledge of nutrition that has come since the turn of the century. McLester in the introductory chapter expressed the fear that, despite all these advances there may follow an undue lag before this nutritive beneficence becomes a part of our life and heritage. It rests with practicing physicians to limit this lag, to bring about within as few decades as possible (especially for the older age group) something comparable to the improvement in nutrition that has already come to two generations of babies since pediatricians have put the balanced nutrition into effect.

5 We have the present war emergency. There is much salvage within the old age group. No portion of the present nutritional program should be denied the aged on any basis dictated by their years. Age is hard to define. It is known best by what it does. It limits outlook and capacity; it adds its aches and qualms; all too readily attributed to ingested food. The food left out may contain the elements that complete the vicious circle so that less food, more infirmity, more symptoms, less efficiency pile up. Age conceals a vast reservoir of talent, skills, wisdom and experience, not to mention much muscle and brawn if proper food maintains reserve. There could not be a better time to plan a purposeful nutritional program for the peace that must follow war. Doctors must take part in it.

This is a machine war—the product of a machine age. In our depression years unemployment, broken homes, improvident children, impractical subsistence relief or pensions, robbed the old of employment position, honor and a place in the community. With such crying need for all possible man and woman power it is now or never for us to give back to this group some of what they have lost.

#### LIFE EXTENSION FOOD AVAILABILITY EMPLOYMENT

Life extension has brought great social and economic problems (table 1). I shall add but few of the figures now so freely quoted. The most striking prediction concerns that "22,000,000 people in the United States over 65 years of age" within another generation. Up to the time of our engagement in the war efforts and for ten previous depression years, youth was held back from production. Those discharged over 50 found industry hesitant to reemploy them. Now we face a condition where retirement after 65 promises less and less as taxes and living costs mount as investment possibilities grow and pensioners multiply. In the offing there is always the specter of inflation. At present few people think of leisure or retirement, it is timely to

From the Department of Internal Medicine, the Duluth Clinic  
1. Causes of Death, Statistical Department, Metropolitan Life Insurance Company, 1940. Of children born

	1900	1940
Acute deaths	1 of 3	1 of 6
Chronic disorders	2 of 4	3 of 4

<sup>1</sup> The only chronic malady showing striking decrease is tuberculosis.

emphasize the great advantage of cultivating health, mental poise and technical skills and avoiding obsolescence. Since the turn of this century the life expectancy of white babies has been advanced sixteen years for females and fourteen for males. This totals up to 67.31 for the former and 62.94 for the latter. The immediate and pressing issue is: How may these years be made worth while? Food is a basic requirement, the amount and proportion depend on the individual and where and how he lives. It may be said, with few exceptions, that to deny people work is to deny them food. Now, when production is so much in the forefront of our national demands, we must salvage everything possible, and certainly not the least item in this effort is the group concerning which I write. If justice is ever to obtain, the appeal "Give us this day our daily bread" must exclude none. The way to give it is to plan that all able shall work, doles and subsistence are mockeries. This is a peace program with which a war schedule must be implemented. Otherwise we shall still be at war, for with the military peace we shall continue economic war.

#### THE FALLACY OF FOOD RESTRICTION FOR THE AGED

A stupendous literature dealing with nutrition accumulates. I append references to certain authors where some may wish to know the source material. The resurgence of interest in dietetics has come at the same time with a reviving interest in medical geriatrics. Many<sup>2</sup> have written articles based on the medical needs of the aged. There is a new edition by Thewlis<sup>3</sup> bringing up to date the pioneering of Nascher, a recent handbook by Boas<sup>4</sup> dealing with the treatment of the patient after 50 is well arranged and documented, and considerable attention is paid to diets. Cowdry's<sup>5</sup> compendium from various authors, including physiologists, biochemists and psychologists, is most readable and informative. Some readers will be displeased that so few positive factual statements may be made. People around the world live well on the most varied diets, each satisfactory as decreed by custom and availability. If the reader would like an American menu for elderly people, there are available countless articles where these may be consulted and individual tastes consulted. Some statements might be "factual" if more were known about aging as a process.

For reasons hard to understand there is the widest belief that the elderly should be abstemious. The few gluttonous and obese have visited this inhibition on the many who are overconscientious and underweight. We should start with the dictum of Piersol and Bortz<sup>6</sup> "To add life to years rather than years to life." That is the basic motive for campaigning for better nutrition

for the aging. What we are looking for is not a dragging out of vegetative almshouse existence but the promotion of real efficiency. The human being attains his full bodily development, let us say, by 40, the beginning of his fifth decade. His next decade and a half pits him against the most stressful period of his life: the time in which early rheumatic and other infections mature and cripple, when arterial hazards (coronary disease) add their tragic interruptions, when metabolic perversions (obesity, diabetes and gout) appear—all when his business, his insurance plans, his educational and family responsibilities are at their height. And this is the period when we ask him to prepare himself for the seventh, eighth and ninth decades which present life extension tables plainly tell him are "just around the corner." This is no longer a promise or objective, it is with us here and now and in very formidable proportions. Dominant as heredity is known to be, we may just as well leave it out of the discussion. Each individual must accept the genetic complement fate has assigned him. He must make the most out of what he has. It must be clear that no one may expect the most from the later age decades when no preparation has been made in adjusting habits, cultivating something of a philosophical attitude toward life and its respon-

TABLE 1—Age Level Extensions\*

	1900	1937	1940
Average age at death	26.79†	58.65	62.00
Death under 1 year	24%	5%	5.2%
Death over 75	4%	2.4%	32.1%
Death at 45 or over	24%	79%	83%

\* Statistics furnished through Dr. Mario Fischer, Duluth Health Commissioner.

† There was at that time a high death rate from typhoid and tuberculosis as well as from complications of all the contagious diseases of childhood. In the summer time there was the traditional high death rate from feeding disturbances in children and pneumonia was prevalent in the winter. Many woodsmen and miners came into Duluth for terminal hospitalization.

sibilities and at least looking about among friends and neighbors for object lessons or examples of men and women who are succeeding in various stations and walks of life in arriving at what we call a comfortable and serene old age. Age is feared much more for the restrictions it may impose than the promise of death. The body as well as the mind must be trained to accept aging. The time to acquire the physical and mental deportment with which to get the most out of life in its later decades is in middle age. The neurosurgeon cannot acquire his skill for the successful removal of a brain tumor when the patient with a terrific headache enters his consulting room. The cultivation of proper food habits early in life is too obviously advantageous to call for further discussion or elaboration. We must learn to grow old skilfully as well as gracefully.

Perhaps "the less food for old people" fallacy hinges on the supposition that for them energy for current expenditure is the chief item and therefore carbohydrate and some fat with a minimum of protein suffice. In any case, that is the way many old people exist but do not live. All living creatures are interrelated and follow universal laws in their metabolism and growth. Life and its products are handed back and forth between living creatures (plant and animal). Nature has provided these laws of balance and coordination. Simpler organ-

2 Tuohy E. L. A Proper and Adequate Protein Diet for Elderly People, *Minnesota Med.* 25: 313 (May) 1940. Norman J. F. Our Aging Population *ibid.* 24: 1066-1071 (Dec.) 1941. Christian H. A. Some Limitations in Preventive Medicine *Ann. Int. Med.* 12: 1499-1506 (March) 1939. Dublin, Louis I. Medical Problems of Old Age. University of Pennsylvania Bicentennial Conference Bulletin. Metropolitan Life Insurance Company of New York. Wilder R. M. Nutrition in United States. Program for Present Emergency and Future. *Ann. Int. Med.* 14: 2189-2198 (June) 1941. McCay C. M. Diet and Aging. *J. Am. Dietet. A.* 17: 540-545 (July) 1941.

3 Thewlis M. W. Geriatrics a Special Branch of Medicine. *M. Rec.* 153: 433-435 (June 18) 1941. The Care of the Aged (Geriatrics). St. Louis C. V. Mosby Company 1941.

4 Boas Ernest P. Treatment of the Patient After Fifty. Chicago Year Book Publishers 1941.

5 Cowdry E. V. Problems of Aging. Baltimore: Williams and Wilkins Company, 1939. (Josiah Macy Jr. Foundation Publications).

6 Piersol G. M. and Bortz E. L. The Aging Process. *Medical Social Problem. Ann. Int. Med.* 12: 964-977 (Jan.) 1939.

isms accept them, but man has varied notions of his own. He chooses primitively with the least cultivated of his tastes. The result is a diet over-rich in refined flours and sugar. He misses the balanced assemblages plant life has integrated and domestic animals have concentrated for him. They do it better than he can plan it. Hence the appeal for natural foods, including animal products. Human growth is not terminated when adult stature is attained. Witness the manner in which the atrophic smooth tongue of Addisonian anemia assumes normal size and coating after optimal exhibition of liver. The Lawrences have shown with Geiger counters how rapidly tagged iodine is picked up by the thyroid. Tagged calcium has been located promptly in tooth enamel, long supposed to be fixed, inert and final for the duration of life. Rates of growth vary, but the process endures with life. Repair within the body is a continuous process and in such organs as the liver may be stupendous. Fixed and overspecialized cells (retina) must also be undergoing some change, as is disastrously connoted when the blood supply is even temporarily interrupted. In that sense reproduction of the individual as a unit is limited by age, but, in the cellular domain, active living processes demand nitrogenous equilibrium continuously. The tea and toast schedule for grandma is outmoded. No old person is a walking museum piece—a holdover from last year's crop—and for the same good reason must not be treated like a barnacle on the ship of state.

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#### FOOD AND THE CARDIOVASCULAR SYSTEM

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by overeating? Does abstemiousness promise a long life? The answers to these and many similar questions are not forthcoming but the statement by Simms that many useful years may yet be added through life extension when science discovers how to prove the aforementioned dissociations and produce specific inhibitors points the way. In the meantime we may learn something by looking about us and, while clinical observations may be loose and indefinite, Spies has significantly commented that our knowledge of the avitaminoses has been substantially advanced by such observations and by testing out the newer pharmaceutical vitamins and ordering better foods.

There is also considerable difference of opinion as to just how much over or under nutrition exists in our country, in different states and among different classes of people. Chapter XXII (Stiebeling) will discuss that issue based on her extensive observations and studies in association with the United States Department of Agriculture.<sup>13</sup> I think undernutrition produces more physiologic disturbances, but overnutrition (fat) may hasten the development of more pathologic change.

Living in a rich agricultural state, I do not see very many people needlessly undernourished. By proper planning and marketing and with attention to the methods discussed in chapter XVI (Cowgill) most of the borderline or marginal degrees of undernutrition which we uncover are economically unnecessary and stem from social maladjustment, anxiety states and outmoded medical advice. Undernutrition reduces vitality and well-being much more than it hastens decline or senility. It is hard to believe that "optimum nutrition" could endanger anybody's vascular system. The trouble lies in finding an "optimum diet"—because it varies with every locale, every people, employment and individual purpose, and nature has distributed around the world the widest assortment of adequate food sources. Some may like a "short life and a merry one"—at least at middle age that is their choice. Whatever the process by which it is brought about, 70 per cent of our Duluth Clinic<sup>14</sup> patients are dying of cancer and cardiovascular-renal disease (including cerebral hemorrhage). This figure for cancer (18 per cent) is higher than the Minnesota State Board of Health figures (14 per cent) for 1941 and represents a higher than average of older people in our clientele. The approximate 50 per cent of cardiovascular renal disease<sup>15</sup> is the same as Simms's claim for all deaths over age 10. I have checked these figures from four old line life insurance companies, and I present in table 2 the results from one of them. The others are almost identical. This detail of end results tells little, of course, relative to incapacity and sickness among the group I am discussing. From many studies dealing with the prognosis in degenerative heart disease it would be fair to state that there is an average illness (partial or complete) of about two years. During that time diet is a part of the treatment and is subordinated thereto. Unless some newer food components (biotin) can be proved to be carcinogenic, preventive measures (diet) in terms of about three fourths of our deaths are very much in that current state of "too

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Deaths certified from	
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repeating itself. Hunger is a natural instinct with the young, it is often a luxury with the old. Food must be made attractive. The atmosphere should be conducive to liveliness and some approximation of what Edwin Markham calls man's primary needs: bread, brotherhood and beauty. We need a modern Brillat-Savarin<sup>16</sup> with ability to popularize the nutritional nuggets today's science provides us in the manner in which he popularized esthetic living and dining.

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fecting faculties of protein in their experiments with dogs poisoned by chloroform. Whipple's<sup>18</sup> thesis that animal protein buffers the liver for blood plasma restoration is being augmented each month by various reports, all supporting the conclusions that protein safeguards the normal liver,<sup>19</sup> even as dextrose (Mann and Bollman)<sup>20</sup> tides over the damaged liver. Philip Brown<sup>21</sup> advises a high protein diet in ulcerative colitis in order to protect the liver. The papers by Patek<sup>22</sup> and Butt and Snell<sup>23</sup> show the trend. Starvation edema is a matter of inadequate protein and liver efficiency. Space permitting, I could illustrate some of the follies of "arthritis," "colitis" and nondescript diets that decried the use of meat. A neglected and abused liver sets the individual toward a toppling over of his homeostasis. We may put down then, as our first duty to the aging, Teach them the importance of protein and how to get their quota, no matter how old they are, 1 Gm per kilogram of body weight. The pellagrim and the alcoholic addict with tremens prove how dependent the brain<sup>24</sup> is on the liver.

Unfortunately, animal protein is expensive. Preservation and refrigeration add further costs. (Consult chapter XV, Kohlman.) Those purveying food are in full accord with the present nutritional program.<sup>25</sup> Utilizing the cheaper cuts of meat and making them palatable is a task for properly advised cooks, taught to develop an American goulash, but with a seasoning suitable to the American palate and without too much fat. (Consult chapter XVI, Cowgill.) We may, if harder put, learn to appreciate soy beans. It is a matter of education. It is distinctly possible to be a well fed vegetarian if milk, butter and eggs and cheese are plentiful and time is no object. Primitive peoples of our own times could teach us how the better to utilize the vitamin rich viscera. The occasional azotemic patient and the gouty, at some stage in their imbalance, should have a low protein intake, nearly every other indication, so much a part of books on diet, is a relic of a period in which attention was paid to the appearance and consistency of food and very little to its mineral, vitamin and chemical content.

2. *Fat* (consult chapter III, Bloor).—This is the food with which excess may well be dangerous, but leaving out what is needed is fatal. Burr<sup>26</sup> has demonstrated the essentialness of certain fatty acids particularly in terms of growth, milk production in cattle and vitamin B economy. Hansen, working with him, has been able to clear up some very trying instances of eczema and dermatitis in children through feeding of certain selected fatty acids. Fat improves the taste of everything. It is the good cook's delight. For the vigorous it invites

overindulgence, even if it does not "burn in the flame of the carbohydrate" both are very compatible (as the obese well know) and energy is released without the specific dynamic action loss characteristic of protein. Fat spurs all reserves, including vitamin B and protein. But when it isn't properly utilized, it clogs up the liver.

Biochemists and physiologists are baffled in attempts to trace fat through the human body and understand its interrelations with other food elements. In contrast, a lay knowledge which coined the phrase "living on the fat of the land" acclaims a great and popular appreciation of fat. The housewife chooses the beef where the muscle is well interlarded with white fat. Her husband chooses brown ties to match the gravy. For heavy work in low temperatures where much energy is expended, fat is the chief resource. Finnish woodsmen in northern Minnesota have shown me how they choose the fattest of salt pork, with amazingly sharp knives they sliced this off and sandwiched slabs of it between the bisected halves of firm, hard loaves of bread. As they took a bite through this sandwich, I was told that some with inadequate teeth used the same sharp knife to sweep the mouth free from the segment without displacing a single whisker! With copious draughts of well sweetened coffee and condensed milk these men<sup>27</sup> could work prodigiously in subzero weather, feel comfortable and maintain their weight. "How about venison?" I asked. They looked very sad and replied "No good." "Eat big hunks, just like hay." Nature herself augmenting the efforts of the game warden!

The results of Leary's rabbit experiments, in which he fed large amounts of cholesterol, have not been entirely refuted. He did prove that in the rabbit it seeped through the intima. Interest centers in the background of what cholesterol phagocytosed into the subintimal layers of the coronaries may later do in encouraging coronary inadequacy, sclerosis and thrombotic pluggage. Hurst<sup>28</sup>, who has given much study to the subject of cholesterol (myxedema and related states), offers no especial support to Leary's theory. From Isidore Snapper<sup>29</sup> comes a lively observation apropos of his recent experience in Japanese invaded China. He agrees with many other Occidental exchange professors who have reported from the Orient that the incidence of hypertensive disease and coronary complications is much less there than with us and implies that we have too much butter and cream at our plates. Snapper made a significant and naive observation to the effect that the very polite Chinese imparted to him the news that we Occidentals exude an unmistakable bovine aroma. Lest this be taken as a facetious implication, a recent report by Crohn and Drosd,<sup>30</sup> dealing with the mechanism whereby garlic taints the breath, showed that it is a matter of absorption and reaches the blood stream via the liver and thence to the lungs. Perhaps certain systems are surfeited with fat, and strawberry gallbladder and stones may not be the greatest insult resulting.

18 Whipple, George H. Production, Utilization and Significance of Blood Proteins, annual lecture of the Minnesota Pathological Society. *Journal of the American Medical Association* 59: 482 (Nov.) 1938.

19 The liver deserves a respect comparable to the fabulous Uncle Sam—his resources are ever drained but never exhausted.

20 Brown, Philip W. Suggestions as to Diet in Certain Gastrointestinal Conditions. University of Minnesota Continuation Course in Dietetics. Feb. 20 to 22, 1941 (page 1 of notes).

21 Patek, A. J. Jr. Treatment of Alcoholic Cirrhosis of the Liver with High Vitamin Therapy, *Proc. Soc. Exper. Biol. & Med.* 37: 329-330 (Nov.) 1937.

22 Butt, H. R. and Snell, A. M. Recent Trends in Treatment of Cirrhosis of the Liver, *Proc. Staff Meet. Mayo Clin.* 17: 250-254 (April 22) 1942.

23 It is estimated that one person in five living beyond 65 will need segregation for mental aberrations.

24 It was announced recently that fifteen leading food dispensing corporations had established a million dollar fund with Karl Compton of the Massachusetts Institute of Technology in charge to make sure that their researches and plans were right.

25 Hansen, A. E. and Burr, G. O. *Proc. Soc. Exper. Biol. & Med.* 30: 1201 (1933).

26 This concentrated diet was really an outpost ration two men occupy a shack for ten days at a time then go back to their homes.

27 Hurst, H. M. and Simpson, H. N. Hypothyroidism. Hypercholesterolemia. *J. Clin. Endocrinol.* 1: 450-452 (May) 1941.

28 Snapper, Isidore. Chinese Lessons to Western Medicine. Interscience Press, 1941.

29 Crohn, Burrill B. and Drosd, Rudolph. Halitosis. *J. A. M. A.* 117: 2242 (Dec. 27) 1941.

Recently, at a large clinical panel discussion, the question was put to Lindsay Harrison "If you had a patient with a family history of coronary disease, especially with thrombosis, would you advise the limitation of fat in the diet?" He answered affirmatively. I agree with him. Patients with gout (attacks precipitated by rich fatty foods) are very liable to coronary sclerosis. Such clinical evidence should not be undervalued, at least until more is known about fat metabolism. It is my opinion that, if 10 per cent of the necessary calories for the inactive elderly person are derived from fat, the bodily needs will be safeguarded. Some criticism of the higher caloric intake now advised for our recruits and practiced by our athletes is heard. There is the immediate effect (weight and mobility of recruits) and the remote effect (habits of eating during forced exercise) incompatible with later sedentary lives.

3 *Carbohydrate, Vitamins and Minerals*—Under this heading I choose to say little about their obvious virtues. I have tried to weave into this discussion a pattern that implies the great advantage of keeping nature's nutritional formulas intact, by avoiding overrefinement or processing, by getting a balanced ration and all the bodily needs will be contained therein. Age imposes certain deprivations—appetite, digestion, absorption—so that, even when a reasonable diet is consumed, certain deficiencies result. This may well occur even when obesity is present. The mouth (including the tongue, lips and fauces) has become the nutritional barometer. Ivy<sup>30</sup> states that gastric acidity slows up after 20, achlorhydria increases considerably after 40, by 65, 35 per cent of people do not secrete acid<sup>31</sup> after a meal and 28 per cent show no response to histamine. Those losing their teeth (often without good reason, focal infection) frequently go through a period of adjustment to dentures when appetite slumps and subnutrition ensues. Lower plates are rarely secure. Sturdy square jawed people accommodate well to dentures, whereas neurotic and anxious individuals with natively poor bites or narrow receding mandibles find themselves unhappy. The former, with dental plates, say "These store teeth are better than my own." The latter try one dentist and denture after another. The prophylaxis for their dilemma goes back two to five decades. Is diet at fault? Weston Price<sup>32</sup> thinks so. All nutritionists should read his book. He has gathered information from all around the world. The illustrations alone would seem to prove his thesis: native peoples (on the most varied source foods), when they get a balanced food and avoid overrefinement of flours and sugar excesses, bear children with properly formed jaws, the teeth are regularly spaced and both gums and teeth survive. On the contrary, as soon as they move to a region where overrefined carbohydrate in excess is available they promptly lose their teeth. The story is the same whether it concerns the cloistered group in the upper valleys of the Swiss Alps, the Hebrides Islands, African jungle tribes or our Eskimos and Indians. On the other hand, this thesis has so far little support from our leading dental colleges. Irwin<sup>33</sup> has collected a questionnaire from eight teachers holding professorships in basic university departments of medi-

cine and dentistry in the United States. Five questions were posed bearing on caries and pyorrhea alveolaris, resistance thereto, the effect of diets on pregnant women, the babies' teeth, dentition and general development. Opinion or belief that diet was of little import shined into the belief expressed by a few that nutrition was the basis of all caries and pyorrhea. I believe that this is one of the most pressing nutritional problems before us today. The lack of unanimity I mention is little short of alarming. The dental and medical professions have drifted too far apart. Harvard University's plan to remerge them is opportune.

Twenty per cent of the first draft<sup>34</sup> recruits could not qualify because of inadequate teeth. Surely something is wrong, and the best lead we have involves diets. Bleeding gums are controlled in most people by adequate citrus fruits, so-called trench mouth is an avitaminosis when tissue dies the Vincent's organisms multiply. The deeper deprivations that come from faulty absorption from the gastrointestinal tract or from diarrheas are pathologic. At the same time we do not know to what extent the age factor produces alterations of absorption and metabolism for which it isn't feasible to get all the essential vitamin and mineral even from a diet that is adequate. There is a good field here for vitamin reinforcement.

Vitamins have not been overemphasized, but the public (at least fifty million dollars' worth of vitamin preparations was sold in the United States last year) and doctors have taken the vitamin detour to supposed nutritional sufficiency and are using various vitamin compounds as they would "bitter tonics." THE JOURNAL (through the Council on Foods and Nutrition and the Council on Industrial Health<sup>35</sup>) has given a clear statement of that fallacy, and it applies in part to the field of my discussion. Among segregated groups of the elderly there is a place for evaluating the benefit of certain selected vitamins, food enforcement with scientific controls. This has been reported on by Stephenson and his co-workers<sup>36</sup> in England. There was an advantage of such enforcement. I have found many situations and reported on a few in which such utilization in the old induced a health transformation.

Closely related to the tooth problem is that of calcium and phosphorus ratios in the body. Among the elderly (women more than men) senile osteoporosis frequently is found. Albright, Smith and Richardson<sup>37</sup> have linked this up with an endocrine (internal vitamin) estrogenic deficiency. Gardner and Black have reported less dense bone shadow (x-rays) in many nervous and underfed individuals with irritable colons. Hip fractures are common and often fatal, telescoping of the vertebra (with root pains and confusion with angina) occurs after insignificant trauma. By whatever method we try to recalcify such bones, the results are discouraging. I stress this to question the use of milk as a source of calcium for old people. They do not need the fat in whole milk, skim milk is constipating if

30 Ivy cited by Cowdry

31 Achlorhydria predisposes to decalcification enteritis diarrhea and general deficiencies

32 Price Weston A. Nutrition and Physical Degeneration New York: Paul B. Hoeber Inc. 1939

33 Irwin Vern D. Nutrition and the Teeth Northwest Dentistry 20: 201 (Oct.) 1941

34 Among our families in the highest income bracket many young girls need orthodontic adjustment of their teeth and jaws. Teeth thus pulled by braces are in my experience apt to be short lived.

35 Indiscriminate Administration of Vitamins to Workers in Industry Council on Foods and Nutrition and the Council on Industrial Health J. A. M. A. 118: 618-621 (Feb. 21) 1942

36 Stephenson W., Penton C. and Korenchevsky V. Some Effects of Vitamins B and C on Senile Patients Brit. M. J. 2: 839-844 (Dec. 13) 1941

37 Albright Fuller, Smith Patricia H. and Richardson Anna M. Postmenopausal Osteoporosis: Its Clinical Features J. A. M. A. 116: 2465-2474 (May 31) 1941

taken in large amounts and bulky foods promoting residues are left out. Cheese, buffered with vegetables, is more practical.

Water is too often neglected. Coffee and tea are preferable to chocolate, and aside from encouraging insomnia, few suffer from their abuse. When not too strong, even in advanced years, these help greatly to keep up fluid intake. They are too often left out on rather poor excuses.

#### OPERATIONS AFTER SIXTY-FIVE

Surgery for the elderly (cancer, gastrointestinal, genitourinary and central nervous system) is a test that many elderly must meet. Few prepare for it. Emergencies shorten the period of possible preparation. The medical attendant has a heavy responsibility which the surgeon should share with him. At the same time necessary surgery must not be withheld, because many of the elderly do astonishingly well even when the severest operations are done.

Wilcox and Clagett,<sup>38</sup> reporting from the general surgical sections of the Mayo Clinic for 1939 and 1940, listed 1,204 such patients over 65 operated on. The mortality was not high (8 per cent) for benign disease and operable cancer and 16 per cent for inoperable cancer and palliative operations. However, only 20 per cent (one in five) failed to have some significant postoperative complication. Naturally these were in the nature of cardiovascular insults (thrombophlebitis, embolism, pulmonary atelectasis and cerebral and kidney complications). This is what we all see within this group. What better preparation could they have had than even a fair nutritional balance? Added incentive to "keep your body as fit as you can as long as you can" arises from the great likelihood that some major operation or infection is in the offing. These operations are part of the price we shall pay for both the fuller and the longer life.

#### GENERAL SUMMARY OF DIETARY SUGGESTIONS FOR THE OLD

1 Elderly people should start the day with a good breakfast. It should include some substantial protein, and whatever else depends on body weight and activity. Protein adequacy must be maintained at all ages.

2 As effort lessens and sedentary life supervenes, weight rise or fall should dictate the proportion of carbohydrate taken, and as much of this as possible should be from whole grain. While bran is objectionable cracked wheat products are not. Enriching flour may be a good expedient but the objection to dark breads should be lived down. Potato is the next best starch.

3 For the obese, vegetables and fruits should act as the "fillers" and provide appetite and zest for eating by meticulous preparation and serving.

4 The elderly should eat fat sparingly, even as the middle aged should use it cautiously. The high cholesterol sources (egg yolk, cream and animal fats) should probably be curtailed wherever body build, family history and other indications portend atherosclerosis. It is the one decisive indication for dietary restriction after full stature has been attained. The danger of high blood cholesterol is not universal.

5 Tea, coffee and alcohol are useful stimulants. The abuse of alcohol places it for some people in the category of both refined carbohydrate and animal source fat. As a vasodilator it inspires as well as flushes the aged.

One cannot say as much for tobacco. It soothes and cuts off circulation. The quiet postprandial puff is rapidly becoming a continuous process. Tobacco is safer after 60 than before, because age has by that time made the blood vessels less elastic and labile.

6 Food and water (hot drink) taken at regular intervals revive the old. Food becomes the best sleep producer even though early wakefulness follows. Fruit juices add the needed vitamin content.

7 Hunger lessens as age advances. Foods useless calorically (condiments, broth, relishes) have a place. The teeth, gastric acidity, probably absorptive powers, vitamin storage—all begin to fail with age. We are able to compensate for these losses with vitamins, iron, calcium hydrochloric acid and a balanced diet. The mouth becomes the nutritional barometer of health.

## Council on Physical Therapy

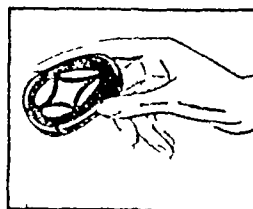
THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING ARTICLE

HOWARD A. CARTER, Secretary

### MAICO HEARING AID, ACE MODEL, ACCEPTABLE

Manufacturer: The Maico Company, Inc., 2632 2636 Nicollet Avenue, Minneapolis.

The Maico Hearing Aid, Ace Model is a vacuum tube instrument. The dimensions and weights of the various parts are as follows:



Microphone and amplifier unit, ovoid shape, 2 1/4 by 1 1/4 by 1 inches, weight 2 1/10 ounces.

A and B batteries in leather case 4 1/2 by 4 by 1 inches, weight 13 1/2 ounces. Crystal receiver, 1 inch diameter by 3/16 inch thick.

#### BATTERIES

Maico Hearing Aid, Ace Model

The A battery is a 1.5 volt cell, Maico A No. 728. The current drain is 70 to 80 milliamperes. The B battery is an Eveready 45 volt unit and shows a current drain of 2.30 milliamperes. The two are assembled in a single unit by a well designed connection.

#### INTERNAL NOISE

With customer fitted ear mold the instrument can be turned to full volume without feedback squeal.

#### ACOUSTICAL GAIN

The following figures give the order of magnitude of the increase of sound intensity level at the ear of the wearer over that at the microphone under normal conditions of use as shown by audiometric measurements. They are not the same as the electrical amplifications shown by measurement of electrical input and output. Measurements were made only at octave intervals.

Frequency	125.756	512.248	4096
Volume setting full on	Nil	24.43	10 decibels

#### ARTICULATION

The usual syllable and sentence lists were used with hard of hearing subjects at a distance of 5 feet in a quiet room, with instrument set for comfortable hearing. The articulation tests showed satisfactory results.

The Council voted to accept the Maico Hearing Aid, Ace Model, for inclusion in its list of accepted devices.

38 Wilcox, L. E. and Clagett, O. T. Surgical Procedures on Patients of Advanced Age. Proc. Staff Meet., Mayo Clin. 16: 75 (Dec. 10) 1941.



## Council on Pharmacy and Chemistry

### REPORTS OF THE COUNCIL

THE COUNCIL HAS AUTHORIZED PUBLICATION OF THE FOLLOWING  
REPORT  
AUSTIN E SMITH M.D. Secretary

#### HUMAN CONVALESCENT MEASLES SERUM and HUMAN CONVALESCENT SCARLET FEVER SERUM

##### HUMAN CONVALESCENT MEASLES SERUM

Measles (morbilli) is an important public health problem because of its universal distribution, the susceptibility of both sexes, and because no age group appears to be exempt, although the majority of the attacks occur in children under 5 years of age. The disease is extremely infectious and may spread rapidly in unprotected communities, there appearing to be little evidence that natural immunity ever occurs<sup>1</sup>. Although the acute manifestations may be extremely mild, the possibility of complications must always be considered, and it is now generally agreed that in many instances children, especially, should be afforded some degree of protection. Other factors requiring special consideration are malnutrition, debilitating diseases and pregnancy. The control of measles from a public health point of view appears to have met with little success<sup>2</sup> and isolation of the sick has not been generally effective in protecting others from the disease<sup>3</sup>. At the present time there appear to be two agents which have shown some success in the prophylaxis and modification of an attack of measles: these are Immune Globulin (Human), which has been accepted by the Council on Pharmacy and Chemistry for inclusion in New and Nonofficial Remedies, and Human Convalescent Measles Serum.

The use of human convalescent measles serum dates back about twenty five years, and encouraging reports have appeared in many parts of the world. Harries<sup>4</sup> reported that five doses of 10 cc of recently prepared convalescent serum given intramuscularly would protect an exposed child for a period of about three to four weeks. This investigator could obtain an attenuation of an attack of measles by using lesser amounts or delaying the injection for four to eight days after exposure. Attenuation did not appear to prevent the development of immunity against subsequent attacks. Again Harries claimed that the serum had no effect when injected after the eighth day following exposure, unless given intravenously. Price<sup>5</sup> states that the intramuscular injection of human convalescent measles serum produces a passive immunity lasting about one month; if the injection is given after the sixth day the attack will persist but in a modified form which nevertheless results in a lasting active immunity. He suggests an average dose of 5 cc for a child, the dose being increased as needed and he believes that all children under three years of age exposed to measles should be given preventative therapy.

Grod<sup>6</sup> studied the use of mixed serum in 170 children and reported the serum was tolerated even on repeated administration. Doses of 15 to 20 cc, usually injected on the fourth or fifth day of incubation, afforded apparently complete protection in 47.7 per cent of 44 children who were closely observed. In 36.3 per cent the severity of the attack appeared to be reduced, and in 16 per cent there was no perceptible effect. According to Grod, the results were about the same as those obtained with placental immune globulin, human, but the serum seemed to be better tolerated. A communication by Timmerman<sup>7</sup> indicated that he obtained partial or complete protection in the majority of 98 Dutch children who were at home and in various

institutions. In discussion of the prophylactic work which the physician may undertake, de Ruiter<sup>7</sup> recommends administration of the serum on the fourth or fifth day of incubation to obtain an attenuated attack. Hoynes<sup>8</sup> discussed the use of convalescent serum, and while emphasizing the value of the prevention in hospitals and other institutions, suggested that intramuscular injection of 5 to 10 cc within three days of the date of exposure would result in protection for three weeks. If an attenuated form of the disease is desired, serum or immune globulin may be employed later in the incubation period, although a warning was issued against employing this procedure in a hospital since the modified disease may still be contagious and susceptible individuals may develop severe attacks. This article also discusses the use of 10 to 30 cc of serums on patients in the preeruptive stage by Gunn in 1934, the intravenous injection of 5 cc in children by Kohn, Klein and Schwartz in 1938 with alleviation of the disease in about 85 per cent of the cases, and the work of Connor reported in 1939, giving a total of 50 treated cases. The text of Hoynes' paper was substantiated in the accompanying discussion by one clinician who had used convalescent serum in a number of cases with beneficial results.

In reporting on the use of serum in an outbreak of measles in Wellington in 1938 Champaloup<sup>9</sup> claimed he has been able to prevent or attenuate the attacks in exposed children and to decrease the time for recovery and the complications. Bull<sup>9</sup> used adult pooled serum in an outbreak of measles in Melbourne, and his observations were in agreement with those of Champaloup in that the severity of the attacks appeared to be lessened and the evidence of complications decreased. Champaloup began his injections with a minimum of 5 cc but later increased this to a minimum of 7 cc, Bull used 10 to 20 cc according to the age and condition of the patient. Thalheimer<sup>10</sup>, Lempriere<sup>11</sup> and Loewenberg<sup>12</sup> also have issued favorable reports.

While the evidence on the use of human convalescent measles serum in the treatment of the full blown disease is not impressive, the results from its use for prophylaxis or early modification of measles are favorable in many cases and they appear to be about equal to those resulting from the use of Immune Globulin (Placental Extract). The Council on Pharmacy and Chemistry has declared this serum acceptable for inclusion in New and Nonofficial Remedies and several brands are now described in N N R 1942.

##### HUMAN CONVALESCENT SCARLET FEVER SERUM

Like measles scarlet fever (scarlatina) is a disease which is highly infectious and no age group appears to be exempt, although the majority of the attacks occur in the young. Agents for prophylaxis and modification of the course of the disease are scarlet fever streptococcus toxin, scarlet fever streptococcus antitoxin and human convalescent scarlet fever serum. The use of serum for prophylaxis and treatment has been discussed by Hoynes, Levinson and Thalheimer (1935), Hyland and Anderson (1937) and Moore and Thalheimer (1939). The latter authors<sup>13</sup> cited the work of the aforementioned and various other investigators when reporting on the bactericidal substances and antitoxin found in the serum of patients convalescing from scarlet fever. These authors advise pooled specimens for a polyvalent serum. A later communication by Thalheimer<sup>10</sup> discussed dosage and use of serum intravenously as well as intramuscularly, the former route being recommended for the treatment of the disease. Platou, Dwan and Hoyt<sup>14</sup>

1 A Textbook of the Practice of Medicine edited by F W Price ed 4 Oxford University Press 1934  
2 Hoynes A L Measles in 1938 Analysis of 400 Cases—Twenty Eight Instances of Encephalitis Illinois M J 76 136 (Aug) 1939  
3 Holroyd F J The Prevention and Modification of Measles West Virginia M J 35 121 (March) 1939  
4 Harries G E The Treatment of Whooping Cough and Measles Practitioner 142 711 (June) 1939  
5 Grod H Moderne Merknophylaxe Med Welt 13 1192 (Aug 26) 1939  
6 Timmerman W A Serum from Convalescents in Combating Mortality Nederl tijdschr v geneesk 83 1346 (March 25) 1939

7 de Ruiter H I Prophylaxis of Measles Nederl tijdschr v geneesk 83 1356 (March 25) 1939  
8 Champaloup M A Adult Serum in the Prevention of Measles New Zealand M J 38 206 (June) 1939  
9 Bull H W Pooled Adult Serum in the Prophylaxis of Measles M J Australia 1 228 (Feb 17) 1940  
10 Thalheimer William Convalescent Measles and Scarlet Fever Serums Canad Pub Health J 31 51 (Feb) 1940  
11 Lempriere L R Adult Serum in a School Epidemic of Measles Brit M J 1 1136 (June 3) 1940  
12 Loewenberg E Etude epidemiologique de la rougeole (modifications subies par l'application de serum de convalescent), J de med de Paris 60 12 (Jan 10) 1940  
13 Moore Elizabeth and Thalheimer William Immunologic Properties of Scarletina Convalescent Serum Am J Dis Child 58 1039 (Nov) 1939  
14 Platou E S Dwan P F and Hoyt R E Streptococcus Convalescent Serums (Scarlatina) The Potentialities of Type Specific Pools, J A M A 116 11 (Jan 4) 1941



have also commented on the value of pooled convalescent serum. Viole<sup>15</sup> claims that any reactions are easily controlled.

Thalhimer,<sup>16</sup> Fox and Hardgrove<sup>17</sup> and Rascoff and Nussbaum<sup>17</sup> have made some comparison between sulfanilamide and human convalescent scarlet fever serum. Thalhimer advises that statistical evidence on the concurrent use of sulfanilamide is lacking, whereas Rascoff and Nussbaum suggest its concurrent use in severe and moderately severe scarlet fever until evidence to the contrary is produced.

Lucchesi and Stein<sup>18</sup> compared the effect of four types of treatment on fever and complications in 1760 patients: one group was treated symptomatically, another received scarlet fever antitoxin, another group was given foreign protein in the form of diphtheria antitoxin and the fourth group received convalescent serum. The authors concluded that convalescent serum in the doses used (30 to 90 cc) had no effect on the reduction of the febrile state or of complications. Like Lucchesi and Stein, Toomey<sup>19</sup> is not enthusiastic over the results which follow the use of convalescent serum. However, Schultz practices passive prophylaxis in his clinic chiefly with human serum, and Bejarano<sup>21</sup> after studying the use of serum in soldiers, concludes that it is of value in the prevention and treatment of scarlet fever.

The Council has recognized the use of this serum for prophylaxis but since opinion was somewhat divided on its merit in the treatment of scarlet fever inquiries were addressed to professors of pediatrics and recognized investigators in the field of serum therapy in an effort to obtain a representative judgment. The replies of the authorities consulted are quoted in part.

Dr. Francis G. Blake, New Haven, Conn.: "Ever since 1924 we have found the horse scarlet fever antitoxin satisfactory, provided adequate dosages are used; we have not had any real experience with human convalescent serum. While it is true that an occasional patient highly sensitive to horse serum has been treated with human serum, the number is too small to be of any statistical significance. In my opinion the major if not the sole value of human serum depends on its antitoxin content. This is of course relatively low compared with horse antitoxin. In severe cases I think it would require anywhere from 300 to 500 cc of human serum to get the same effect expected from 20,000 to 40,000 units of antitoxin, which is the general range of dosage that we use in patients sick enough to be treated. The criteria for benefit are first rapid fading of the rash, second critical fall of temperature and pulse rate, provided the case is not too far advanced and complicated by sepsis. It is my opinion that the septic aspects of scarlet fever are perhaps now better treated by chemotherapy than by so-called convalescent immunotransfusion."

Dr. Murray B. Gordon, Brooklyn: "In answer to your recent letter with reference to the use of convalescent serum in scarlet fever I wish to advise you that I do not use it in my private practice or at the Kingston Avenue Hospital. I am enclosing a reprint of some recent work done at the hospital with scarlet fever antitoxin (Gordon, Murray B., Litvak, Abraham M. and Caronna, Victor, *Streptococci, Meningitis and Abscess of the Brain Complicating Scarlet Fever*, *Am. J. Dis. Child.* 53: 1447 [June] 1937).

Dr. Archibald Hoyne, Chicago: "For approximately twenty years we have used human convalescent scarlet fever serum for the treatment of scarlet fever at both Cook County Contagious Disease and at Municipal Contagious Disease hospitals. Originally it was given only to a comparatively few patients who

were suffering from severe types of the infection. After the serum center at Michael Reese Hospital was established, the supply of convalescent scarlet fever serum was made available in much greater quantity and its use was extended to an increased number of patients. Since 1931, when the Samuel Deutsch Serum Center was founded, more than 23,025 patients with scarlet fever have been treated at Municipal Contagious Disease Hospital. Approximately one third of that number received scarlet fever convalescent serum, which was administered as a rule only to patients with the most severe types of the disease. Our reasons for believing that this form of therapy is of value are based on the following:

The customary sharp decline in temperature within twelve hours after the administration of serum.

The voluntary statement of patients with regard to their improved well being the day after serum administration.

The marked improvement in throat symptoms, the rapid fading of the rash and the small number of complications in serum-treated patients.

We also give convalescent scarlet fever serum late in the course of scarlet fever regardless of the duration of the disease if the patient has serious complications or is in a critical condition. Moreover, our mortality rates are usually extremely low for hospital patients.

In my opinion there is little if any difference between the therapeutic results attained with human convalescent scarlet fever serum and scarlet fever antitoxin in the early acute stages of scarlet fever. I feel convinced this is true notwithstanding that convalescent serum may possess far less scarlet fever antitoxin than scarlet fever antitoxin serum.

For your convenience I am forwarding a reprint relating to this subject which you may care to place through (Hoyne, Archibald I., Levinson, Sidney O. and Thalhimer, William, *Convalescent Scarlet Fever Serum*, *Har. Jour. Med.*, Sept. 7, 1935, p. 783).

Dr. P. I. Lucchesi, Philadelphia: "In 1933 we studied a series of 1740 scarlet fever patients with various types of treatment including convalescent serum and concluded that it is neither practical nor of value in the treatment of scarlet fever."

I am enclosing a reprint in which the exact number of cases treated by various methods is given (Lucchesi, Prescal F., and Stein, Bernard B., *A Comparison of Therapeutic Agents in the Treatment of Scarlet Fever*, *Pennsylvania M. J.* 44: 162 [Nov.] 1940). I am of the opinion that scarlet fever antitoxin is of greater value for the treatment of this disease than convalescent serum, since most of the symptoms and signs in the early stages are due to the absorption of the scarlet fever streptococcal toxin.

In my experience I have found convalescent serum in the treatment both therapeutically and prophylactically helpful in only one disease, that is, measles.

Dr. Edwin H. Place, Boston: "I can say with complete definiteness that convalescent scarlet fever serum has a striking effect on the toxemia of the disease practically without exception. The effects produced are the relief of fever, central nervous system effects when present, and disappearance of the exanthem and emanthem. In about 50 per cent of the cases there is relief of the more obvious bacterial damages and, although this may be due to antibacterial bodies, I am strongly inclined to believe this is a secondary effect from neutralization of the toxin. These opinions are based on several thousand cases with concomitant controls over the past twenty years."

We have not been able to find any better results from scarlatinal (horse) antitoxin. For several years we have used almost wholly the convalescent serum instead of horse serum antitoxin, as the antitoxin has been associated with frequent and at times severe serum disease. The state laboratory has not yet been able to produce a serum as free from after effects as that for diphtheria. The Lederle serum, and from Toomey's results Parke-Davis serum are extremely satisfactory but no better than the convalescent serum.

Dr. John Toomey, Cleveland: "Human scarlet fever convalescent serum has a place in the treatment of toxic individuals who are allergic."

Treatment involves a consideration of many factors, the first of which is who should be treated by specific therapy, either human or animal. The mortality rate from scarlet fever is extremely low (almost negligible), and the majority (nearly

15. Viole, Pierre. Use of Human Convalescent Scarlet Fever Serum in Streptococcal Infections Involving Ear, Nose and Throat. *Ann. Otol. Rhin. & Laryng.* 49: 639 (Sept.) 1940.

16. Fox, Max and Hardgrove, Maurice. Scarlet Fever Therapy. Comparison of Convalescent Serum and Sulfanilamide. *Am. J. M. Sc.* 199: 495 (April) 1940.

17. Rascoff, Henry and Nussbaum, Sydney. Therapeutic Procedure for Scarlet Fever. *Comparative Studies*. *Am. J. Dis. Child.* 60: 552 (Sept.) 1940.

18. Lucchesi, P. I. and Stein, P. B. Comparison of Therapeutic Agents in Treatment of Scarlet Fever. *Pennsylvania M. J.* 44: 162 (Nov.) 1940.

19. Toomey, J. A. The Management of Scarlet Fever and Its Complication. *Pennsylvania M. J.* 44: 749 (March) 1940.

20. Schultz, W. Prophylaxis of Scarlet Fever. *Deutsche med. Wochenschr.* 66: 396 (April 12) 1940.

21. Bejarano, J. F. R. Empleo del suero de convalescente de escarlatina en el Ejercito Argentino. *Prensa med. Argentina* 27: 306 (Feb. 7) 1940.

90 per cent) of those who die do so not from toxicity but from sepsis, long after plenty of antitoxin has been formed in the blood stream. Therefore it would seem that specific therapy of any kind should be used only where clinically there is a marked amount of toxicity, and only at the start of the disease.

"When antitoxin was first brought out by the Dicks, we used some of the first lot of antitoxin they made but stopped after treating 14 cases. We lost 3 patients after intravenous injections of this material with protein shock ending in pulmonary edema, the symptoms starting about twenty minutes after the antitoxin was given. We refused to use antitoxin further and from 1925 to 1931 used convalescent scarlet fever serum in hundreds, in fact a few thousand cases—the exact number I haven't at hand. However, we know that the temperature does drop when a pooled yield of human serum is used and, it is my impression, although I haven't proved this, that the complications were lessened.

"Several years ago the old scarlet fever antitoxin was concentrated and, instead of using 20 cc as was once the dose one could use the newer material concentrated from 20 cc to 3 cc, the albumin fraction having been removed (Lederle and Parke, Davis & Co). We had so few reactions and the response was so uniform that we saw no further need to use human convalescent serum in the majority of instances because we now had a standard product which could be checked and which did not vary. The results are on record, and they are excellent. Since we have reported these, we have used it (Lederle Laboratories, Inc., and Parke, Davis & Co) in over a thousand more cases and have no reason to change our mind, in fact, we feel that the complication rate has definitely decreased. This latter is difficult to estimate, however, because as you know we have the added factor of sulfonamide therapy to consider. In 1936 and 1937 we had 13 cases of streptococcal meningitis with one recovery, and in 1938 and 1939 12 cases, all of which recovered. Thus the effects of the dye on complications has to be remembered in the general picture.

"It is our impression, however, that there has been a definite decrease in complications with the use of specific serums where sulfonamides have been used. Our practice is to use sulfonamides late, not early, because we have found them to be of no value in toxic conditions.

"It is my opinion that human convalescent serum does have a place in treatment of allergic types of individuals, although I will admit that the existence of these cases is more apparent than real. We have not found it necessary to use human convalescent serum except in 2 instances in the past two years."

Dr Franklin Top, Detroit: "I am enclosing two reprints which serve to summarize the experience of this service with respect to treatment of moderately severe scarlet fever, not only with convalescent serum, but comparing its use with scarlet fever antitoxin and a control serum consisting of 1,000 units of diphtheria antitoxin. In a subsequent study reported in THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, convalescent serum was compared with scarlet fever antitoxin and sulfanilamide in alternating cases of moderately severe scarlet fever. Definite criteria of evaluation were set up for both studies, and the results are given in the papers. (The reprints sent are Top, F H, and Young, D C. Specific and Non-specific Serum Treatment of Scarlet Fever, *Am J Pub Health* 29 443 [May] 1939; Top, F H, and Watson, E H. Reduction of Serum Reactions, *Am J Dis Child* 62 548 [Sept] 1941; Top, F H, and Young, D C. The Treatment of Moderately Severe Scarlet Fever, *THE JOURNAL*, Dec 13, 1941, p 2056).

"Briefly, 30 cc of convalescent serum given intramuscularly appears to be as good as a therapeutic dose (6,000 units) of scarlet fever antitoxin, and both appear to be slightly better than sulfanilamide given by mouth in a dose approximating roughly  $\frac{3}{4}$  to 1 grain per pound of body weight daily for an average of six and a half days during the acute stage.

"In the first study it was apparent that the use of a non-specific (1,000 units of diphtheria antitoxin) made a marked difference, and the effects, with respect to the number and proportion of cases which needed augmented treatment, on the temperature pattern, number of complications and dismissal status are noted.

"We have also used convalescent serum by the intravenous route in doses of 30 to 100 cc in borderline septic cases and in some instances of moderately severe scarlet fever. Used by this route, effects are often dramatic, as much so as the use of scarlet fever antitoxin intravenously in cases of toxic scarlet fever.

"I believe that convalescent serum, when available, is of distinct value because therapeutic effects are obtained without sensitizing a person to horse serum which follows the use of the scarlet fever antitoxin. I realize that during the past several years antitoxins have been despoiled to such an extent that serum reactions are much less frequent, but serum sensitization still occurs. When available, therefore, I prefer to use scarlet fever convalescent serum for the moderate or moderately severe case. It is wholly inadequate in the treatment of the septic or toxic types."

Dr Bernard B Stein, Philadelphia: "In my experience of eight years as chief resident physician of Philadelphia Hospital for Contagious Diseases, where I saw and treated upward of 100,000 cases of scarlet fever, I believe the pooled scarlet fever convalescent serum has a definite place in treatment—in the patient who is very septic or toxic and is extremely allergic to antitoxin (horse serum)."

Dr Conrad Wesselhoef, Boston: "The efficacy of human convalescent scarlet fever serum in the early treatment of scarlet fever was established prior to the introduction of the Dick antitoxin. I have in mind a composite chart to that effect shown at several meetings by Dr Edwin H. Place of the Boston City Hospital. Since the introduction of the Dick antitoxin, and even since its great improvement whereby serum sickness has been greatly reduced, pooled convalescent serum has a distinct place in the therapy of scarlet fever.

"From a purely theoretical point of view, the attitude that because convalescent serum is not standardized it is always inferior to standardized antitoxin is not in keeping with the limitations of our present knowledge of the disease. Furthermore, it is obvious that a commercial antitoxin, which must be polyvalent to meet the possible needs of different strains, may be lacking in a certain direction quite as much as an unstandardized pooled serum. The advantage of human serum as a means of avoiding serum sickness has been reduced by the refinement of antitoxin, but such refinement has not as yet overcome this advantage.

"Time does not permit me to produce exact figures. Roughly, my experience in scarlet fever covers 20,000 cases at the Haynes Memorial Hospital. The number treated with convalescent serum was increasing up to the introduction of the Dick antitoxin. As the first Dick antitoxin results gave 35 per cent serum sickness, the convalescent serum was again preferred. Three bad Arthus reactions caused us to give up antitoxin entirely. Then as the antitoxin was improved it again came into favor. It would take too much time from my secretarial staff to give you the number of cases in which convalescent serum has been used, but I continue to use it in about one fifth of the cases. As we have had an average of 100 cases of scarlet fever on the daily census for the past six months, it would seem that over this period 120 cases have been given convalescent serum.

"The criteria of benefit are the abrupt drop in the fever and the blanching of the rash. In the past ten years I have rarely lacked such cases to show at clinics. The dramatic results are so well known when the serum is given early and in adequate dosage that I am not inclined to yield my preference for convalescent serum. Such preference is not by any means absolute, as there are situations in which I prefer antitoxin."

In view of the evidence available, the Council recognized this serum as being of value in transferring passive immunity to a patient exposed to scarlet fever. Existing evidence does not appear to indicate that it is wholly adequate in the treatment of septic or toxic types of scarlet fever, but the consensus seems to be that this serum may have a place in the treatment of individuals sensitive to horse serum and where it is desired not to sensitize a person to horse serum. The Council on Pharmacy and Chemistry has declared this serum acceptable for inclusion in New and Nonofficial Remedies, and several brands are now described in N N R 1942.

# THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY JANUARY 2 1943

## INSULIN RESISTANCE

Many cases in which insulin has failed to lower the blood sugar in the normal manner have been recorded since insulin first came into use in 1922. Glassberg, Somogyi and Taussig<sup>1</sup> observed a diabetic patient who was relatively refractive to insulin for some months and who responded only to enormous doses, as much as 1,100 units in twenty-four hours. The diabetes in this case was due, the authors suggest, not only to a lack of pancreatic secretion but also to a lack of some substance which activates insulin, probably a muscle enzyme (phosphatase, insulin complement, glycomutin). Apparently there may exist two types of diabetes: one due to pancreatic disease, which responds to insulin, the other due to a deficiency in the production of a substance which activates insulin. Marble<sup>2</sup> reported observations on a woman with chronic rheumatoid arthritis and diabetes whose insulin requirement varied from 240 to 675 units daily. Evidence failed to indicate that a pituitary, adrenal, thyroid or gonadal influence was in any way responsible for the resistance. Wiener's<sup>3</sup> patient was rescued from coma by large doses of insulin. He had received as much as 3,250 units in twenty-four hours, probably the largest amount ever administered to a human being. The patient required large doses during the subsequent course of observation (five months). Glen and Eaton's<sup>4</sup> patient was given from 900 to 1,059 units daily for a period of twenty-seven days without appreciable effect on the blood sugar or glycosuria. Martin and his co-workers<sup>5</sup> treated a diabetic patient whose insulin resistance was apparently precipitated by hypersensitivity to protamine zinc insulin. He had received 6,375 units of insulin in eleven days, with

1,205 units as the highest dose in twenty-four hours. These authors, who collected 26 cases of insulin resistance from the literature up to 1941, call attention to the frequency with which allergy has been recorded in association with this condition. In the case reported by Regan, Westra and Wilder<sup>6</sup> a definite cause for resistance was not found. Administration of dihydroxyestrin was without effect. Glass and his associates<sup>7</sup> gave 85,000 units of insulin to a patient in a five and one-half month period. During episodes of ketotic acidosis it was necessary to give 2,360, 2,500 and 2,795 units of insulin in twenty-four hours before adequate control was accomplished. A definite cause for the insulin refractory state could not be determined. Therapeutic procedures included roentgen irradiation over the pituitary and the administration of hypocaine. However, it was not possible to establish a definite relation between these forms of therapy and the improvement which followed their use. The excessive need for insulin subsided six months after its onset and the patient remained mildly diabetic for the subsequent six months. Wayburn and Beckh's<sup>8</sup> patient was given from 500 to 2,460 units of insulin daily for four months. Although the patient was highly resistant to insulin he nevertheless utilized insulin to some degree. A substance capable of elevating the blood sugar levels of rabbits was repeatedly demonstrated in the patient's blood. The authors assume the presence in the blood of this patient of an insulin antagonist substance.

Factors known to cause insulin resistance include acidosis, infections, sepsis, overactivity of physiologic antagonists of the pancreas, namely the pituitary, the thyroid and the adrenal glands, and liver diseases, in particular hemochromatosis. From the amount of insulin required to keep a depancreatized dog fed on ordinary diet Root calculated that a man of average weight would require 200 to 300 units of insulin daily. Patients who require more insulin than this amount probably lack some factor other than insulin. The conception of insulin inadequacy as the cause of hyperglycemia, glycosuria and ketonuria has received much support from the success of insulin therapy. Although insulin has made it possible to restore diabetic patients to a normal state of carbohydrate metabolism, this substance may be only one of several factors in the complicated mechanism of the regulation of the carbohydrate metabolism. More recent researches, in particular those of Housley and his co-workers, have established the role of the so-called diabetogenic factors of pituitary origin resulting in a disturbance of the normal regulation of carbohydrate metabolism.

<sup>1</sup> Glassberg B Y, Somogyi M, Michael and Taussig A E. Diabetes Mellitus. Arch Int Med 40: 676 (Nov.) 1927.

<sup>2</sup> Marble Alexander. Insulin Resistance. Arch Int Med 62: 432 (Sept.) 1938.

<sup>3</sup> Wiener H J. Diabetic Coma Requiring an Unprecedented Amount of Insulin. Am J M Sc 196: 211 (Aug.) 1938.

<sup>4</sup> Glen, Alexander and Eaton J C. Insulin Antagonism. Quart J Med 7: 271 (April) 1938.

<sup>5</sup> Martin W P, Martin H E, Lyster R W and Strouse Solomon. Insulin Resistance. J Clin Endocrinol 1: 387 (May) 1941.

<sup>6</sup> Regan I F, Westra J J and Wilder R M. Insulin Resistance. New England J Med 223: 745 (Nov. 7) 1940.

<sup>7</sup> Glass W I, Spingarn C L and Lottick Herbert. Unusually High Insulin Requirements in Diabetes Mellitus. Arch Int Med 70: 221 (Aug.) 1942.

<sup>8</sup> Wayburn Edgar and Beckh Walter. Insulin Resistance in Diabetes Mellitus. J Clin Endocrinol 2: 511 (Aug.) 1942.

The anterior pituitary and the pancreas apparently act antagonistically in the control of the carbohydrate metabolism

Wesselow<sup>9</sup> showed that the blood plasma of some elderly obese glycosuric patients, when injected into rabbits, would diminish the hypoglycemic action of insulin in a manner closely resembling that observed by other workers with extracts of the anterior pituitary gland. The plasma of young diabetic patients and of normal control subjects gave entirely negative results. This result suggests that the blood contains a substance with a diabetogenic action in certain cases of diabetes. Apparently lack of insulin is not always responsible for the disturbances of carbohydrate metabolism of the diabetic. Himsworth<sup>10</sup> has established, on the basis of his dextrose-insulin test, the existence of two types of diabetes mellitus, one in which the patient is insulin sensitive, apparently for lack of insulin, the other in which the patient is insulin insensitive for lack of an unknown factor which sensitizes the body to insulin. These patients are abnormal in being unable to react to an increase in dietary carbohydrates by an increase in their insulin sensitivity as the result of a lack of some unknown factor which in the normal subject produces sensitivity to insulin. In the case reported by Glen and Eaton, insulin tended to decrease sugar tolerance. Injection of the patient's serum into rabbits diminished their response to insulin and induced a degree of insulin antagonism. They therefore prefer the term "insulin antagonist" with reference to their case. The favorable effect of dihydroxyestrin was probably due to the antagonistic effect of this hormone on the anterior lobe of the pituitary, which then counteracted the production of the insulin antagonistic substance. It was logical to assume that the patient's blood contained a specific insulin antagonistic substance.

Insulin resistance and insulin antagonism are thus only one aspect of the complex problem of carbohydrate metabolism, involving as it does the liver with its glycogenic and glycolytic functions, and the synergistic and antagonistic effects of the various endocrine glands.

### THIAMINE REQUIREMENT OF MAN

Several investigators have shown that the extent of urinary excretion of thiamine is an index of its status in the nutrition. In thiamine clearance studies in man Melnick and Field<sup>1</sup> demonstrated that all the subjects in their normal group, but none in the deficient group, excreted in excess of 50 micrograms of total thiamine during the four hour period following parenteral administration of 540 micrograms of thiamine.

Objective thiamine balance studies were made by Melnick<sup>2</sup> in man to detect the requirements for thiamine and the incidence of inadequate intake among apparently normal subjects. A study on 39 male and 33 female persons subsisting on adequate diets indicated good correlation between the urinary excretion of thiamine and the adequacy of the dietary level prior to conduction of tests. The normal person who consumes an adequate diet apparently tends to excrete part of the extra dietary thiamine in the urine. The deficient subject tends to conserve dietary thiamine to replenish depleted stores in the tissues and does not waste it by urinary excretion. When a test dose of thiamine was superimposed on the dietary intake, the extra vitamin was utilized like that obtained from the diet, it was conserved or wasted depending on the nutritional status of the subject.

This tendency of the depleted subject to conserve thiamine was observed in both the clinical and the experimental deficiency of thiamine. Thus the addition of thiamine to the inadequate diet to raise the level of intake to that of the normal group does not effect a parallel increase in the urinary thiamine excretion for a considerable period of time. Prompt response of normal subjects to variations in thiamine intake occurred while they were subsisting on their usual diets, which furnished approximately 1 mg of thiamine daily. Apparently a constant daily intake of 1 mg is sufficient to saturate the subject to such an extent that there is no necessity to conserve extra dietary thiamine. The recommended daily intake of thiamine is approximately 500 micrograms per thousand calories.

In a collateral study on 116 persons at the University Hospital, Ann Arbor, and at the Food Research Laboratories, Melnick showed that only 73 per cent of those apparently normal excreted in the normal range. The persons studied included mainly staff members of the hospital or laboratory personnel, whose diets were not restricted.

This high incidence of failures among so-called normal subjects to pass all the clearance tests, Melnick believes, is explained by the observations of Lane, Johnson and Williams at Summit, N. J., that the average American diet prior to the advent of enriched bread and flour furnished only 320 micrograms of thiamine per thousand calories. The observations of Melnick suggest that thiamine subnutrition is probably common even among persons who subsist on what is considered a normal diet. The correction, as was pointed out by Cowgill<sup>3</sup> as early as 1938, lies principally in improved diet. The problem calls for particular attention by the practicing clinician and students of preventive medicine, public health and nutrition.

<sup>9</sup> de Wesselow O. L. V. and Griffiths W. J. On the Possible Role of the Anterior Pituitary in Human Diabetes. *Lancet* **1** 991 (May 2) 1936

<sup>10</sup> Himsworth H. P. Diabetes Mellitus. *Lancet* **1** 127 (Jan. 18) 1936

<sup>1</sup> Melnick Daniel and Field Henry Jr. Thiamine Clearance as an Index of Nutritional Status. *J. Nutrition* **24** 131 (Aug.) 1942

<sup>2</sup> Melnick Daniel. Vitamin B<sub>1</sub> (Thiamine) Requirement of Man. *J. Nutrition* **24** 139 (Aug.) 1942

<sup>3</sup> Cowgill G. R. Human Requirements for Vitamin B<sub>1</sub>. *J. A. M. A.* **111** 109 (Sept. 10) 1938

## Current Comment

### STRUCTURE OF BIOTIN

Success seems to have crowned the attempts of du Vigneaud of Cornell University Medical College and his collaborators to determine the exact chemical nature of biotin. The structural formula of this substance has now been published.<sup>1</sup> The compound is bicyclic and possesses a five membered urea ring, a ring containing sulfur in thio-ether linkage, and a fatty acid side chain. This chemical agent exerts a biologic effect in extremely great dilution and may be classed as one of the most active substances known. The growth promoting effect of biotin on an appropriate strain of yeast is noticeable when the factor is present in a concentration of only 1 part in 400 billion.<sup>2</sup> This may be compared with the dilating effect of epinephrine on the pupil of the frog eye, which can be demonstrated in a concentration of 1 in 20 million, and with the effect of thyroxin on the metamorphosis of the tadpole which is demonstrable in a dilution of 1 to 5 billion.<sup>3</sup> This great potency alone makes biotin of unusual interest. However the substance is also involved in animal metabolism and is recognized as a member of the vitamin B complex. Although human beings apparently require biotin,<sup>3</sup> this phase of the biotin problem has been relatively little studied and requires further investigation. Kogl and Tonnies, who first isolated biotin, obtained only about a milligram of the crystalline material from a fourth of a ton of dried egg yolks. While better methods of obtaining it from natural sources are now available the substance is still difficult to prepare and is most costly. A more plentiful supply of biotin would facilitate further study and would undoubtedly lead to a fuller understanding of its function. The elucidation of the chemical makeup of biotin is an initial step in the direction of making the vitamin more readily available through synthesis.

### MICROCEPHALY AFTER PELVIC IRRADIATION DURING PREGNANCY

The possibility that exposure of the human ovary before conception or of the fetus in utero to radium or roentgen irradiation might be injurious has long been a matter of concern. Three types of exposure are recognized: therapeutic roentgen and radium irradiation of the ovaries prior to conception, diagnostic roentgen exposure of the fetus in utero and therapeutic roentgen and radium exposure of the fetus in utero. The therapeutic irradiation may be without effect on ovulation or it may cause temporary or permanent sterility. Evidence does not indicate, however, that such treatment has a deleterious effect on the health or development of infants if there is subsequent conception. During pregnancy the chief use for diagnostic roentgen irradiation lies in the field of pelvic mensuration. Thousands of such exposures have been made and evidence indicates that such irradiation is not detrimental to the infant. Finally, therapeutic amounts of radium and roentgen exposure are

likely to be employed early in the life of the embryo, usually for the purpose of producing abortion. Such exposures have been followed by the birth of both normal and malformed offspring. Now Murphy and his colleagues<sup>1</sup> report a case in which embryonic irradiation was intentionally performed for the purpose of interrupting pregnancy. Previous to this occasion the mother had given birth to four bright, normally developed children. Irradiation did not produce abortion and the infant subsequently born, apparently at term and after normal labor, was microcephalic and at 14½ months was generally underdeveloped with an average mental age of 54 months. These workers point out that when pregnancy is not terminated in consequence of irradiation the physician or roentgenologist should insist that it be actually terminated—if not by the roentgen exposure then by some infallible means. From this study and the information previously available it is concluded that the human fetus should not receive large amounts of radium or roentgen irradiation. If fetal death or abortion does not follow such exposure immediately the pregnancy should be terminated at the earliest suitable moment.

### THERAPEUTIC USE OF RADIOACTIVE SUBSTANCES

As pointed out by Low-Beer, Lawrence and Stone<sup>1</sup> in a study of the therapeutic effect of radiophosphorus, radiostrontium and radioiodine the problem of evaluation becomes difficult when one is dealing with chronic leukemia, since in this condition there is such great variation in length of life regardless of treatment. The distribution and metabolism of radioactive phosphorus in animal and human tissues indicate they point out, that it should prove to be valuable as a therapeutic agent for some diseases, particularly chronic leukemia and polycythemia vera. In reporting its use on a carefully observed group of patients seen between 1937 and 1941 they conclude that radioactive phosphorus in sodium acid phosphate has proved to be of great value in the treatment of chronic lymphatic and myelogenous leukemias, polycythemia vera and lymphosarcoma. Its use in the treatment of Hodgkin's disease is not yet established by experience. Its place in the treatment of multiple myeloma and other conditions is also not well established, although the inevitably fatal outcome of these diseases justifies its experimental trial. The use of other radioactive elements such as strontium, iodine, element 85 and phosphorus in chromium phosphate appears to be of some value in certain conditions. Radioactive strontium, for example, is selectively taken up by the bones and its role in the treatment of neoplastic disease of bone deserves to be and is being investigated. Likewise radioactive iodine 131 has proved effective in the treatment of hyperthyroidism but has not yet been tried on many patients. The further possibilities of using radioactive elements in various compounds which might localize in certain tissues, these investigators conclude, is unexplored territory with great potentialities.

<sup>1</sup> du Vigneaud, Vincent. The Structure of Biotin. *Science* **96**: 455 (Nov. 20) 1942.

<sup>2</sup> Kogl, F. and Tonnies, B. Leber das Biotin Problem. *Ztschr. f. physiol. Chem.* **242**: 43, 1936.

<sup>3</sup> Biotin Deficiency in Man. *Current Comment* J. A. M. A. **119**: 183 (May 9) 1942.

<sup>1</sup> Murphy, D. P., Shirlock, Margaret L. and Doll, E. A. Microcephaly following Maternal Pelvic Irradiation for the Interruption of Pregnancy. *Am. J. Roentgenol.* **48**: 356 (Sept.) 1942.

<sup>2</sup> Low-Beer, B. V. A., Lawrence, J. H. and Stone, R. S. The Therapeutic Use of Artificially Produced Radioactive Substances. *Radiology* **39**: 573 (Nov.) 1942.

# MEDICINE AND THE WAR

*In this section of The Journal each week will appear official notices by the Committee on War Participation of the American Medical Association, announcements by the Surgeon Generals of the Army, Navy and Public Health Service, and other governmental agencies dealing with medicine and the war and such other information and announcements as will be useful to the medical profession*

## NEW PLANS FOR MEDICAL EDUCATION

### Specialized Training Programs of the Army and Navy

The armed forces have need of the services of men with specialized training. They will utilize available facilities of certain American colleges to institute the training. Those receiving the training will be on active duty in uniform receiving pay and general military discipline. Arrangements will be made with various selected institutions for housing and messing facilities as well as for the actual training.

The plan here described has resulted from conferences between the Army, Navy, War Manpower Commission, and American Council on Education. The plan will be undertaken by the first three of these through a joint committee, with the final decisions in controversial matters being settled by the War Manpower Commission. Although it has been stated that the Army and Navy plans are similar, all data available at present indicate that there is considerable variation in the two programs.

### THE ARMY

Selection will be governed by standards used for officers' candidate schools and some additional standards of the American Council on Education. Selection will be made from enlisted men who have completed or are completing basic military training and, except for some of the advanced courses, are under 22 years of age.

There are also eight special groups the members of which will be given training under this plan, including the following:

1. Medical students in the enlisted reserve, who will be called to active duty and detailed to continue instruction.

2. Medical students commissioned in the Medical Administrative Corps who may resign commissions and enlist as privates, to be detailed in the same manner as medical students in the enlisted reserve.

3. Premedical students in the enlisted reserve corps, who will continue on inactive status until the first semester of 1943 and will then be detailed as above.

4. Medical and premedical students not in the enlisted reserve who are taking approved courses, who will be inducted in Selective Service before the first semester of 1943, will be placed on inactive duty for a semester and then detailed for further training as above.

Colleges will be selected on the basis of standards, equipment, adequacy of housing and messing facilities, and minimum Army overhead. The standard of adequate proficiency is to be determined by the Army and the American Council on Education. Initial tests to predetermine the suitability of selectees will be evolved. Standard curriculums will be set by the Army and the American Council on Education. Military training will be given to these students during these courses of instruction under a cadet system. The plan will go into effect in February 1943 under the Commanding General of the Service of Supplies.

### THE NAVY

Selection will be made of those having potential officer qualifications. Selections will be from high school graduates or the equivalent, from the seventeenth to the twentieth birthday, and enrolled or inducted men from the seventeenth to the twenty-third birthday. They will become apprentice seamen or privates in the U. S. Marine Corps on active duty with pay and will be assigned to designated colleges. Some other groups will also enter the training program, including V-1 or V-7 reservists who are undergraduates and qualify as medical, dental and theological students, who will continue on active duty as apprentice seamen under instructions in an accelerated curriculum in approved schools and seminaries until the completion of their professional studies.

Selectees can indicate the preference of their colleges and the branch of the service which they wish to join, including the Marine or the Coast Guard. Adequate arrangements for such students will be provided by the colleges under contract with the Navy, which will designate the number of students for the institution and the cost of maintenance of each student. The plan will be carried out under one naval officer in each institution who will issue instructions as to discipline and routine. Outlines of curriculums will be released by the Bureau of Navy Personnel. Credits will be allowed for scheduled courses which have already been completed and substitution of courses permitted.

A special required minimum for premedical students is similar to standard premedical requirements of medical schools. If the students are qualified at the termination of their course, they will be commissioned in the appropriate reserve. The Navy has issued special details for the correlation of this program with existing programs and specific directions for those who are now in V-1, V-5 and V-7 reserves, Naval ROTC, or who are probationary commissioned students.

## ARMY

### TROPICAL MEDICINE SPECIALISTS

More than a hundred medical officers were graduated from the Specialists' Course in Tropical and Military Medicine at the Army Medical School, Washington, D. C., Dec. 12, 1942. Col. Richard P. Strong, director of the course and emeritus professor in tropical medicine of Harvard University, delivered the address. The diplomas were presented by Lieut. Col. Thomas T. Mackie, executive officer of the course. Col. George R. Callender, director of the Army Medical School, presided. The subcommittee on tropical medicine of the National Research Council of the National Academy of Sciences, of

which Dr. Henry E. Heneveld is chairman, cooperated in preparing the curriculum and in presenting a list of names of qualified specialists from which to select lecturers. This is one of many such courses recently completed at the Army Medical School. The next class, which will begin the course at once, will comprise more than a hundred medical officers as well as a group of civilians who are on the faculty of various medical schools and have been granted special permission to attend this course. The Markle Foundation is underwriting the expenses of the visiting medical school faculty members and is also assisting in making available to the

medical colleges instructional material for use in the undergraduate teaching program in tropical medicine

The faculty for this course comprises especially qualified officers from various corps in the Army Medical Department, the Navy Medical Department, the U S Public Health Service and a civilian group appointed by the Secretary of War. The group from the Navy Medical Corps includes Rear Admiral Edward R. Stitt, retired, formerly Surgeon General of the Navy, Capt Paul W. Wilson and Comdr Leroy D. Fothergill. The group from the Public Health Service includes Drs. Edward Francis, Rolla E. Dyer, Louis L. Williams, Charles Armstrong, William G. Workman and Carl Larson. The civilians who thus far have participated as lecturers were Drs. Marshall A. Barber, Fred C. Bishopp, Mark F. Boyd, Walter Clarke, Lowell T. Coggeshall, William W. Cort, Ernest C. Faust, Thomas Francis Jr., William M. Mann, Henry E. Meleney, Elmer D. Merrill, Aristides A. Moll, Drs. John Scudder, Tom D. Spies, Max Theiler, Fred D. Weidman, Herbert C. Clark, E. Harold Hinman, Karl F. Meyer, George C. Shattuck, William H. Tahaferro, Ernest E. Tyzzer and Mr. William E. Riter.

In addition, special lectures were included in these courses when possible, and these have been given by Col. Frank S. Gillespie, British medical liaison officer, Medical Field Service School, Carlisle, Pa.; Major Gen. Alexander Gordon Biggam, chief adviser to the Director General, Medical Services, British Army; Col. N. Hamilton Farley, director of medicine, Australian Army; and Dr. C. G. Pandit, Kings Institute, Madras, India.

#### COORDINATION OF INTERNSHIPS WITH THE ACCELERATED MEDICAL PROGRAM

The Surgeon General, U S Army, has issued general suggestions and recommendations pertinent to closer cooperation between hospitals approved for internship and the medical colleges under the accelerated medical program. The Surgeon General is loath to recommend that a graduate physician of an approved school be called to active duty with the armed forces prior to completion of a twelve months general rotating internship. It is obvious that if the hospitals approved for internships do not cooperate with the accelerated program it would lose its effectiveness in releasing men for duty with the Medical Corps as soon as anticipated. There is now an urgent need for young, physically qualified medical officers for field troop duty.

Original directives from the War Department indicated that graduates were allowed twelve to eighteen months for completion of essential internships. In many instances interns have interpreted this directive as being authority to utilize the additional time for hospital training before beginning the twelve month rotating internship. This has also allowed hospitals which customarily start their intern classes on or about July 1 of each year to maintain original schedules. It is believed that each hospital should establish a schedule of internships commencing on or about April 1, 1943, available to those who graduate in March 1943 under the accelerated medical program and thereafter as students graduate.

This obviously results in the doubling up of those who have not yet completed their twelve months beginning July 1, 1942, but it is hoped that these interns can be used in approved affiliated internships or in the capacity of subresidents to assist in the orientation of medical school graduates of March 1942. The most recent information available of the interns' situation indicates that there are excessive position vacancies over the supply of available interns.

Unless the situation demands it, the War Department does not desire to shorten the period of internship to less than the twelve months required. However, under the increasing pressure of our military needs it is necessary to expect graduates to be immediately available, if physically qualified, twelve months from the time of their graduation. The War Department does not feel that the eighteen months is necessary for completion of a twelve months internship, and this time will therefore no longer be allowed.

It is hoped that all interns will be trained in the rotating type of internship for the twelve months period, that is, one which

provides training in medicine, surgery, pediatrics and their related subspecialties together with experience in laboratory and roentgenologic diagnosis. It is desired that house officers' positions be filled by those individuals not physically fit for military duty and those who are over age for troop duty. By following this procedure and increasing the duties of house officers and the essential staff membership, it is believed that a greater proportion of each year's intern class will be made available for active military duty.

Attention is invited to the new War Department directive precluding the appointment of senior medical students or interns as medical officers, Army of the United States, until within sixty days of their proposed active duty date. Such students and interns are protected from call to active duty by the War Department by:

- 1 Selective Service agreement
- 2 Medical Administrative Corps commissions
- 3 Commissions as Reserve Line officers, which they will

receive on graduation from college. This is accomplished under the authority of the War Department, A G O letter dated May 8, 1942, subject "Commissions for Medical Students," the main purpose of which is to protect the essential medical training program.

#### RANK ON INITIAL APPOINTMENT

The Surgeon General of the Army has published from time to time detailed information concerning policies governing the initial appointment of physicians as medical officers, and dentists as dental officers.

##### FIRST LIEUTENANT ONLY FOR MEN UNDER 35

Because of changes occurring in the military situation and in the civilian requirements, it is contemplated that changes will be required in the standards for the initial grade of appointment of medical officers. It is anticipated that in the near future eligible physicians under the age of 38 years will be appointed in the grade of first lieutenant only and that physicians in the age group 38 to 45 will be appointed in numbers and in the grades for which position vacancies exist.

There is an acute need for medical officers under the age of 38. Applications are being solicited in those localities where physicians may be designated by the Procurement and Assignment Service as available for military service.

Appointments of medical and dental officers by medical officers recruiting boards have been discontinued, however, the boards now active are to continue soliciting applications. All applications are forwarded to the Surgeon General for final recommendation of appointment.

#### MEDICAL INSPECTION OF SOUTHWEST PACIFIC AREA

Rear Admiral William Chambers, M C, U S Navy, recently returned from a tour of inspection in the South and Southwest Pacific. In his thirty-six day trip made entirely by air, Admiral Chambers visited dressing stations on Guadalcanal, saw marines under treatment at hospitals in the New Hebrides and viewed the activities of the hospitals which the Navy has erected in New Zealand. The Surgeon General of the Navy, Rear Admiral Ross T. McIntire, M C, recently disclosed that the mortality rate among wounded evacuated from the Solomons to mobile hospitals in the South Pacific was only 1 per cent for the first thousand men, which compares favorably with the normal expectancy of at least 5 per cent. The major share of credit for the low mortality in the Solomon campaign is given to the well equipped hospitals, the efficiency and fortitude of doctors and hospital corps men, blood plasma, sulfonamide compounds, tetanus toxoid and the speedy evacuation of the wounded. Ambulance planes also were given credit by Admiral Chambers, who said that each load carries as many as 11 litter patients and 4 or 5 sitting patients in addition to a medical officer, a pharmacist's mate and the crew. The situation is encouraging. The incidence of true dysenteries is low, and only 1 case of gas gangrene occurred on Guadalcanal while Admiral



Chambers was there. To illustrate that Navy doctors and hospital corpsmen attached to the Marines go where the fighters go, he said that two hands could be used to number our troops on Guadalcanal who have to use individual first aid dressings on themselves. Almost invariably when a Marine is wounded there is a surgeon or pharmacist's mate nearby. Admiral Chambers paid high tribute to Capt T Brown, Medical Corps of the Navy, Marine divisional surgeon on Guadalcanal, and Capt Joel J White, Medical Corps of the Navy, Commander of the advance hospital at Espiritus Santo, in the New Hebrides. This evacuation hospital, one of several in the Southwest Pacific to which wounded are flown, he said, is a stopover pending transfer of casualties to mobile hospitals southward by hospital ship.

## EVACUATION HOSPITAL NO 14 ON ACTIVE DUTY

THE JOURNAL, Dec 12, 1942, page 1221, published an item entitled "Eight New York City Hospital Units on Active Duty" in which it was erroneously stated that U S Evacuation Hospital No 14 (City Hospital Unit) was not on active duty. The information on which this item was based was from the New York Times of November 22. The commanding officer of Evacuation Hospital No 14, Lieut Col Paul K Sauer, writes that this hospital is at present on duty at Camp Claiborne, Louisiana, and that during the maneuvers, lasting one hundred and five days, this hospital, which is established completely in tents, treated 4,664 cases, among which were 221 major operations and 533 minor operations.

## NAVY

### EXPANSION OF PROGRAM FOR TRAINING NAVAL MEDICAL OFFICERS

Recommendations on expansion of the program for training naval medical officers in special fields were taken under advisement by Rear Admiral Ross R McIntire, Surgeon General of the Navy, after a two day conference held December 10-11 at the Bureau of Medicine and Surgery. Submitted by the board of honorary consultants at the conclusion of the meeting, the report proposes:

1 Training of brain surgeons in naval hospitals, under Navy surgeons, with civilian hospitals and teaching personnel being utilized only if limited facilities make this step necessary.

2 Increasing the number of skilled anesthetists, to be achieved in part by training and utilizing medical officers of the Women's Reserve. (The commissioning of sixty women medical officers in the Waves has been authorized, such officers to be assigned to Women's Reserve training schools and stations.)

3 Supervision of optometrists by ophthalmologists—naval surgeons whose specialty is the eye.

Training of more medical officers in chest surgery, continued emphasis on physical therapy and the exercise of care in diagnosing neuroses also were urged by the consultants, whose report was drafted by Dr Frank H Lahey, Boston, head of the Lahey Clinic and chairman of the Procurement and Assignment Service.

Others attending the conference were Dr Donald Church Balfour, director, Mayo Foundation, Rochester, Minn., Dr George W Crile, director, Cleveland Clinic Foundation, Dr Walter E Dandy, professor of neurosurgery, Johns Hopkins Medical School, Dr Oswald L Lowsley, New York, and Dr Willis B Morse, Salem, Ore., Dr Wilbur A Sawyer, New York, director, International Health Division, Rockefeller Foundation, and Dr Meyer Wiener, St Louis, professor of clinical ophthalmology, Washington University School of Medicine. Dr George W Crile was the only member of the board not present, because of illness.

## MISCELLANEOUS

### BRITAIN THANKS UNITED STATES DOCTORS FOR THEIR AID

At a luncheon given in honor of the heads of the United States and Canadian army medical services in England at St Dunstan's, famed British home and training center for the blind, the minister of health, Ernest Brown, expressed Britain's gratitude to those American doctors who generously gave their services to Britain during the early days of the war. He described how a number of American doctors came at their own expense and without remuneration to help in British general and special hospitals in the earliest days of the war, and more arrived after the collapse of France. British medical facilities were open to the United States forces when they began to reach Britain, and it was arranged that any service personnel and other American nationals needing treatment should be accommodated in British emergency hospitals. Five new fully equipped hospitals were given over to the Americans and eight hospitals to the Canadians by the Health Ministry. Mr Brown said that arrangements have been made at St Dunstan's for its hospital and training center to care for blinded American soldiers awaiting evacuation, while Americans would treat British casualties across the Atlantic similarly.

### ASCORBIC ACID (VITAMIN C) PLACED UNDER ALLOCATION CONTROL

Ascorbic acid (vitamin C) was placed under allocation control, December 15, through the issuance by the Director General for Operations of General Preference Order M-269. Development of the use of vitamin C in food and medicinal production for the armed forces was the primary cause for the action, as production was formerly geared to meet pharmaceutical needs. The present production does not meet current

estimated requirements, and, although production capacity is being increased, demands for 1943 probably will be more than double the 1942 figures. Enough will be available, however, for essential civilian use. Vitamin C is used both by the armed forces and by civilians in the prevention and treatment of scurvy and other deficiency diseases caused by lack of sufficient quantities of this vitamin. The Quartermaster Corps is using large quantities in K and Jungle rations, and there is also a substantial demand for lend lease requirements. Sorbitol, recently placed under allocation control, is one of the principal raw materials needed for the production of vitamin C.

### ARMY-NAVY E AWARDED TO WINTHROP CHEMICAL COMPANY

About a thousand employees and distinguished guests attended ceremonies at the plant in Rensselaer, N Y, and at the offices in New York of the Winthrop Chemical Company, at which the Army-Navy E was presented to the Winthrop Chemical Company, which is manufacturing many vital drugs for the armed forces, among which is atabrine, synthetic substitute for quinine in the treatment of malaria. Atabrine is being manufactured in the United States today, said Dr Theodore G Klumpp, president of the company, at a rate of nearly one billion tablets a year. The flag was accepted for Winthrop's plant at Rensselaer by the plant superintendent, Dr A E Sherndal. Dr Klumpp in New York accepted the flag on behalf of the management. The principal speakers at the ceremonies were Brig Gen Charles C Hillman of the Surgeon General's Office, Washington, D C, Rear Admiral Charles S Stephenson of the Bureau of Medicine and Surgery, U S Navy, Dr Morris Fishbein, editor of THE JOURNAL, and Lowell Thomas.

# ORGANIZATION SECTION

## OFFICIAL NOTES

### ABSTRACT OF MINUTES OF MEETINGS OF BOARD OF TRUSTEES, NOV. 19 AND 20, 1942

A two day meeting of the Board of Trustees was held in November, preceded by a full day meeting of the Executive Committee.

A considerable part of the first day was devoted to a conference with representatives of the three national hospital associations for a discussion of problems of mutual interest. At this conference a committee consisting of Dr. James A. Hamilton and Dr. Bert W. Caldwell representing the American Hospital Association, Mr. Edgar Blake Jr. representing the American Protestant Hospital Association, Rev. Alphonse M. Schwitalla representing the Catholic Hospital Association and Dr. Ernest E. Irons and Dr. R. L. Sensenich of the Board of Trustees was appointed to prepare a preliminary draft of principles differentiating between the services that may be included in plans and in hospital bills and those that may not be so included.

#### ELECTIONS AND APPOINTMENTS

Dr. Mont R. Reid was elected to the Committee for the Protection of Medical Research and to serve as vice chairman.

Dr. R. A. Hatcher was appointed an honorary life member of the Council on Pharmacy and Chemistry with the privilege

of the floor but without vote, and Dr. R. P. Herwick, chief of the Drug Division of the Food and Drug Administration, Washington, D. C. was elected to succeed Dr. Hatcher as a voting member of the Council.

A Committee on Student Health was appointed comprising Dr. J. E. Rivercroft, Princeton, N. J. (chairman), Dr. A. V. Bock, Cambridge, Mass., Dr. Ruth E. Boynton, Minneapolis, Dr. Frank B. Kelly, Chicago and Dr. Oswald Nicholas Andersen, Stanford University, Calif.

#### WAR DAMAGE INSURANCE

The Board approved the purchase of war damage insurance to cover the headquarters of the Association, including buildings, machinery, equipment and inventories.

#### DATE OF MEETING OF HOUSE OF DELEGATES

The Board confirmed its prior vote that the first meeting of the House of Delegates be held on June 7, 1943.

#### MISCELLANEOUS

Considerable time was devoted to the matter of investments, and to other matters on which no definite action was taken and which will without doubt, receive further consideration at a later date.

## MEDICAL ECONOMIC ABSTRACTS

### EXPANSION OF CALIFORNIA PHYSICIANS' SERVICE

The California Physicians' Service is steadily expanding the scope of its work into new fields. Some of these new fields are described in *California and Western Medicine* for November. The services had already undertaken the medical care of migrant agricultural workers, which is financed and its nonmedical features managed by the Farm Security Administration. The development of war industries has created a new migratory problem involving at least 150,000 workers. The Federal Public Housing Authority has constructed housing projects for these workers mostly in new areas which formerly had only a small population. Naturally physicians, hospitals and other medical facilities were lacking in these areas.

"The California Physicians' Service has been considering the problem for several months, and has offered a plan to the Federal Public Housing Authority to meet this need. In approaching the subject, several fundamental factors had to be considered:

- '1 How to conserve the time of the already busy physicians
- '2 How to bring in more physicians to care for the increased population
- '3 How to relieve the load on the already overburdened hospitals

"In May of 1942 the California Physicians' Service experimented with a plan in the Linda Vista Project in San Diego. The entire responsibility for developing a medical care program was assumed by C. P. S. Through its sales force an attempt was made to enroll families throughout the project in a prepaid medical care program. When a sufficient number had enrolled

and adequate financing was in sight then doctors and nurses would be placed on the project to serve the residents."

The sales cost in this experiment was found to be excessive and the demand for prepaid medical care was lacking. Nevertheless the placing of additional physicians by the California Physicians' Service did relieve the emergency load on the San Diego physicians.

"When the need for medical care became apparent in other projects throughout the state and C. P. S. was asked to suggest ways and means of meeting the situation. Members of C. P. S. staff have been in constant consultation with the staff of the Federal Public Housing Authority and with representatives of the United States Public Health Service.

The new plan includes the responsibility of the Federal Public Housing Authority to enroll members in California Physicians' Service on a voluntary prepaid basis. Dues are collected when rent is paid. This permits the California Physicians' Service to concern itself with supplying necessary physicians and nurses and to arrange for hospitalization with Blue Cross Hospital Associations. This plan is now being developed in the new housing project in Marin City. There are only two physicians and no hospital closer than 15 miles to this area, in which approximately 7,000 new residents will be introduced. This is another example of the collaboration of the medical profession and various governmental agencies.

The California Medical Service is also cooperating with a rural health program involving farm families with a net income of \$2,000 or less. It is expected that about four thousand farm families in Tulare County may be included in this program. Steps are also being taken to establish a similar plan in Fresno County.

## Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST SUCH AS RELATIVE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH)

### CALIFORNIA

**Changes in Faculty at Stanford**—Dr William E. Stevens recently returned from the faculty of Stanford University School of Medicine, San Francisco, with the title associate clinical professor of obstetrics and gynecology emeritus. Dr Stevens graduated at the Medical Department of the University of California in 1899 and has been a member of the faculty at Stanford since 1919. New appointments to the faculty include those of Drs Henry Dean Brainerd as clinical instructor in medicine and pediatrics, James B. Irwin as instructor in neuropsychiatry and Robert P. Watkins as clinical instructor in bone and joint surgery, all of San Francisco.

**"Impostor Phillips" Sentenced to Five Years**—Arthur Osborne Phillips was sentenced to a term of five years in a federal penitentiary, December 10, after pleading guilty to falsifying government records to secure employment as a CCC physician. According to the San Francisco *Call Bulletin*, Federal Judge Martin I. Welsh meted out terms of five, three and three years on the three of four counts in a grand jury indictment to which Phillips pleaded guilty but ruled that the sentences should run concurrently. Phillips had been in the Sacramento county jail since his release on November 27 from the Butte county jail where he had been serving a nine months sentence for practicing medicine without a license at Enloe Hospital, Chico, and for being a former convict in possession of a gun. He had been paroled to federal authorities after the Butte County board had decided to withdraw their hold on him since he was sought by the federal government. Phillips, who was reported to have admitted that he performed thirty-two appendectomies since September 1941, was classified as a surgeon at the Brush Creek CCC camp before joining the staff of Enloe Hospital. It was stated. A complete record of Phillips's activities was published in *THE JOURNAL*, Sept. 12, 1942, page 145.

### DELAWARE

**Cancer Work Extended**—At a meeting of the executive committee of the Delaware State Committee of the American Society for the Control of Cancer the constitution of the state group was amended to broaden the scope of its activities. In addition to its educational purposes the group will now aid patients in financial straits to receive proper diagnosis or treatment, assist in the establishment, development or maintenance of hospital clinics, laboratories or other facilities for the care of cancer patients, and generally carry on cancer control activities except the actual treatment of patients or actual operation of hospitals, clinics, laboratories or other facilities for such treatment. Rather than launch new projects at this time, particular attention will be given to the plan to render financial aid to special cases started more than a year ago. A simple method of procedure has been evolved whereby county commanders of the field army have been given a drawing account, and cases referred to them will receive immediate attention. Cases must be presented by accredited physicians and receive the approval of either the county chairman or some other medical member of the executive committee. Physicians are asked to cooperate with the state committee by investigating causes of delay in cancer treatment. The state medical journal points out that if it is financial worry which deters the patient the case should at once be reported to the county commander of the field army. The three county commanders are Kent Mrs. Lincoln Clayton, Dover; New Castle Mrs. William N. Cann, Wilmington; Sussex, Mrs. Topp M. Heath Frankford. The county chairmen of the executive committee are Drs. Clarence J. Prickett, Smyrna; Charles E. Wagner, Wilmington; and John Roscoe Elliott, Laurel. The state headquarters are located at the Delaware Academy of Medicine, Wilmington.

### GEORGIA

**Pediatric Meeting**—The Georgia Pediatric Society held its annual scientific meeting in Atlanta, December 10. The afternoon session will be in the Biltmore Hotel and the evening session at the Academy of Medicine. The speakers included:

- Dr. Alexander A. Weech, Cincinnati: Significance of Protein in the Diet and Cortical Maturation and the Development of Behavior in Infants.
- Dr. Meredith T. Campbell, New York: Persistent Urinary Infection in the Young and Surgical Treatment of Certain Common Urologic Conditions in Children.
- Dr. Abraham Levinson, Chicago: Neurologic Disturbances of the Newborn and Value and Limitations of Spinal Puncture in Children.

### ILLINOIS

**Dr Pettitt Named Chief of the Emergency Services**—Dr. Herbert L. Pettitt, Morrison, who recently resigned as assistant state health director to resume private practice (*THE JOURNAL*, Nov. 7, 1942, p. 774), has been appointed chief of emergency medical services in the Illinois Defense Council. The position was formerly held by Dr. Roland R. Cross, Springfield, state health director. Dr. Pettitt will devote only part time to the position.

### Chicago

**Society News**—The North Shore Branch of the Chicago Medical Society will be addressed on January 5 by Dr. Douglas N. Buchanan and Charles Anderson Aldrich, on "Diagnosis of Acute Cerebral Conditions in Children" and "Color Photography in a Pediatric Clinic" respectively. At a meeting of the Chicago Laryngological and Otological Society on January 4 the speakers will be Drs. Lawrence J. Lawson, Evanston, Ill., on "Carcinoma of the Eustachian Tube", Leopold B. Bernheimer, "Otolaryngological Neoplasms—Clinical report of cases," and Paul H. Holinger and H. James Bara, Hinsdale, Ill., "Bronchogenic Carcinoma—Diagnostic Studies in 150 Cases."

**Lectures at Institute for Psychoanalysis**—A series of lectures and seminars will be held at the Institute for Psychoanalysis. Registration should be made prior to January 5. The lectures for professional or lay groups will consist of "Introduction to Fundamental Principles of Psychoanalysis and Psychosomatic Medicine" by Dr. Franz G. Alexander and "Personality Development in Childhood and Adolescence" by Helen Ross, B.S., and Dr. George J. Mohr. For members of the Chicago Psychoanalytic Society and students of the institute the topics to be considered are mechanisms of the individual neuroses, Freud's interpretation of dreams, selected problems of technique, clinical conferences on children's cases, review of psychoanalytic literature and clinical conferences. Lecturers will be Drs. Alexander, Thomas M. French, Edward Weiss, Margaret W. Gerard and Helen Vincent McLean.

### KENTUCKY

**Addition to Tuberculosis Sanatorium**—A 96 bed addition to the Waverly Hills Sanatorium, Waverly Hills, is now under construction at a cost of about \$160,000. The addition will serve to bring the beds available for Negroes with tuberculosis up to a level of about 2 per annual Negro death. This ratio is already achieved for white patients; it is reported. Funds are being supplied jointly by the city of Louisville and by Jefferson County. The sanatorium is administered by the Louisville and Jefferson County Health Department.

### MASSACHUSETTS

**Personal**—Dr. Winthrop B. Osgood, Boston, has been appointed medical superintendent of the Memorial Hospital, Worcester, succeeding Dr. George H. Stone, who has resigned because of ill health.

**Students to Serve as Hospital Aids to Relieve Shortage**—Boston University students will serve as interns, kitchen workers and nurses' aides in Boston hospitals on a part time basis while attending college during the new year to help relieve the serious shortage of help in local institutions through a "hospital emergency service" sponsored by the University Student Defense Board. Students will register with the board indicating the hours they can spare each day for hospital work and will be assigned to institutions in Boston through the Boston Red Cross headquarters.

### MISSOURI

**Personal**—Dr. John L. Myers, Kansas City, was presented with a wrist watch during the meeting of the American Academy of Ophthalmology and Oto-Laryngology in appreciation of his sixteen years' service as a section secretary of the academy.

**Special Society Election**—Dr. Elmer E. Glenn, Springfield, was recently chosen president of the Missouri Tuberculosis Association at its meeting in St. Louis and Drs. Herbert L. Mantz, Kansas City, and Newell R. Ziegler, Columbia, were named vice presidents. Drs. Jesse E. Douglass, Webb City, James Stewart, Jefferson City, and Jesse A. Stocker, Mount Vernon, were elected members of the executive committee.

**State Board Reorganized**—The Missouri State Board of Health was reorganized at a meeting in Jefferson City, December 7. Dr. Cleveland H. Shutt, St. Louis, was elected president and Dr. Charles H. Neilson, St. Louis, was elected president and Dr. James Stewart, Jefferson City, state

commissioner, was elected secretary. Prior to the reorganization of the board Dr Stewart and Drs Hardin M. Henrickson, Poplar Bluff, and Howard B. Goodrich, Hannibal, were chosen members of the board.

## NEW JERSEY

**New Rehabilitation Center for Women with Venereal Diseases**—The state department of health has approved plans to use the former home of Mr and Mrs Charles A. Lindbergh, Hopewell, as a hospital and rehabilitation center for women infected with venereal diseases. The state accepted the Lindbergh home as a gift more than a year ago.

**Society News**—Dr Clarence R. O. Crowley, Philadelphia, discussed 'Anomalies of the Kidneys and Polycystic Disease of the Kidneys' before the Passaic County Medical Society on December 15. Major Henry A. Cotton Jr., Trenton, discussed 'Psychiatric Problems in the Armed Forces' before the Morris County Medical Society at Greystone Park, October 15.

**Intestinal Outbreak Among Infants**—An intestinal infection attributed to a virus has affected 30 infants in the maternity ward in Holy Name Hospital. Teaneck newspapers reported December 16. Two deaths occurred. The chief result of the ailment appeared to be dehydration. The infants were transferred to the pediatrics department of the hospital which has been isolated and closed to new cases but the maternity ward is accepting new cases under restrictions.

## NEW YORK

**Age of Physicians Attending Meetings**—The Medical Society of the State of New York has issued a release on the comparison of attendance this year with last at district branch meetings covering the entire state and comprising postgraduate educational activities. In 1941 the attendance at corresponding meetings of physicians between 45 and 54 years of age consisted of 25.21 per cent of the total in 1942, 30.81 per cent from 55 to 64 years, 16.15 per cent in 1941 and 22.56 in 1942. Among those from 65 to 74, 9.79 per cent in 1941 and 15.66 in 1942. In the group 75 to 84, 1.56 per cent in 1941 and 2.53 in 1942.

**The Kenny Technic**—Dr Philip M. Stinson, New York, will deliver a lecture, January 5, on 'The Early Treatment of Poliomyelitis with a Description and Evaluation of the Kenny Technic.' The meeting will be a joint session of the Onondaga County Medical Society and the Syracuse Academy of Medicine under the auspices of the state medical society and the state department of health. On December 15 the Albany County Chapter of the National Foundation for Infantile Paralysis sponsored a free demonstration of the Kenny method. Dr Don W. Gudakunst, medical director of the National foundation, New York, was the principal speaker.

**Safeguard Against Accidents**—The New York State Public Welfare Council has adopted an amendment to the sanitary code effective March 1, prohibiting the sale, distribution or use of any poisonous substance as an exterminator or insecticide unless the container bears a label legibly and conspicuously printed with the words 'Poison' and the symbol of the skull and crossbones in red ink followed with the words 'Caution—this exterminator or insecticide contains [state the name of the poison] a deadly poison together with the antidote and treatment therefor and the name and address of the manufacturer or packer, and the words 'poison', 'caution' and 'antidote' in block type of a larger size than the other wording. Insecticides or exterminators containing a fluoride shall be colored milk blue as designated by Ridgeway's Color Standards and Nomenclature and if sold at retail in quantities of 5 pounds or less the container thereof shall be of a nonrefillable type. The amendment was adopted as a safeguard against accidents such as the one that occurred recently at the Oregon State Hospital, Salem (THE JOURNAL, Nov. 28, 1942, p. 1050). Other examples cited to account for the new amendment were an outbreak in an upstate institution of 69 cases of food poisoning, which was traced to the accidental introduction of sodium fluoride into chocolate pudding and twelve fatal poisonings in the state of Maryland, which were the result of mistaking sodium fluoride for pancake flour.

## New York City

**County Society Approves Plan to Examine High School Boys**—The Medical Society of the County of Kings has approved a plan inaugurated by the board of directors of the Society of New York whereby high school boys 16½ years and older, the preinduction age group, are expected to go to their family physician for a thorough physical examination preparatory to permitting these pupils to engage in a physical fitness program. Every effort will be made by the high schools

to induce these boys to obtain the physical examination from their family physician, but, in the event that some boys have no private physician and cannot pay the usual examination fee, volunteer physicians will be asked to make the examination in their offices. The plan is only for older boys and only for the duration. A roster of physicians offering to participate in the plan is being prepared by the director of medical activities of the Medical Society of the County of Kings. Each high school will be given a copy of this roster and each boy will be given an opportunity to select his own physician. Each high school will assume the responsibility for the follow-up care of defects discovered in the physical examination, through referral to the boy's own physician wherever possible, and if not possible to municipal clinics.

**Health Education Conference**—The 1942 Health Education Conference of the New York Academy of Medicine was held on November 17 with Dr. Malcolm Goodridge, then president of the academy presiding. Among the speakers were:

- Dr. Cassius H. Watson: The Wartime Intensive Industrialization in the Community and Its Health Implications
- Otto A. Bessey, Ph.D.: Food and Nutrition in the Home and in the Work Place
- Dr. Leonard Greenburg: Disease and Handicap Detection and Control in Industry
- Dr. Lydia C. Baber: Mental Problems and Morale in Industry
- Mr. Harold R. Bixler: Educational Methods and Control of Accidents in Industry
- Dr. F. J. Cullen: Summary and Review of Conference

**Friday Afternoon Lectures**—The regular series of Friday afternoon lectures which opened November 6 at the New York Academy of Medicine will include the following speakers:

- Dr. Russell C. Croze: January 8: Present Concepts and Treatment of Sinusitis
- Dr. David M. B. Swarth: January 15: Shoulder Pain and Disabilities
- Dr. Milton C. Fetter: January 22: Indications and Contraindications for the Newer Anesthetic Agents
- Dr. S. Bernard Wortis: January 29: Modern Treatment of the Psycho-cerebral
- Dr. Byron I. Stokely: February 5: Intractable Pain—Surgical and Medical Treatment
- Dr. Robert I. Levy: February 19: Clinical Types of Coronary Insufficiency and Their Recognition
- Dr. Maurice Brumer: February 26: Recent Advances in the Clinical Interpretation of Laboratory Data
- Dr. Philip Levine, Newark, N. J.: March 5: The Role of the Rh Factor in Erythroblastosis, Transfusion and Accidents and Its Importance to the Obstetrician
- Dr. Albert H. Alfridge: March 12: Toxemias of Pregnancy
- Lieut. Comdr. Harold J. Harris, M. C. U. S. Naval Reserve, Westport, N. Y.: March 19: Brucellosis: Diagnosis, Differential Diagnosis and Treatment
- Dr. M. Henry Dow: March 26: Rheumatoid Arthritis and Its Treatment Including Cold Therapy
- Dr. Ralph Colp: April 2: Polychloestestromy Syndrome
- Dr. Henry I. Jaffe: April 9: Phosphatase Values in Relation to Bone Diseases
- Dr. Maurice Lenz: April 16: Value of Roentgen Therapy in Inflammatory Conditions

## OHIO

**Megral Collection at School of Medicine**—Friends of the late Dr. Emerson Megral, associate professor of hygiene and bacteriology at Western Reserve University School of Medicine, Cleveland, are invited to contribute books to the Megral Collection which has been placed in the students' room of the medical school. An appropriate bookplate has been designed by Dr. Louis J. Karnosh, associate clinical professor of nervous diseases at Western Reserve. Reprinted classics of medicine, monographs, biographies of physicians and scientists and semipopular books on medical subjects are especially desired. To avoid duplication donors are requested to phone or write to the secretary of the department of hygiene and bacteriology at the school. Dr. Megral had been a member of the staff of Western Reserve from 1919 until his death on Oct. 21, 1941.

**Night Service Plan Adopted by Medical Society**—The Montgomery County Medical Society recently approved a plan for improving the night emergency medical care for patients, especially to take care of the emergencies arising at night among persons who have newly arrived in the locality or patients of the physicians who have joined the armed forces and have no medical connection. It is a war emergency plan only. Steps have been taken to have a night clerk in the city building to obtain all personal data between the hours of 10 p. m. and 6 a. m. the call to be referred by the clerk to the physician. Physicians will be stationed at the receiving ward of each hospital to receive the necessary hospital cases or to make house calls where absolutely necessary. This service is to be independent of the regular routine hospital service. Special stipulations cover the returning of the physician making the call. Written reports are to be made out for reference.

for the hospital, the Montgomery County Medical Society and the doctor who has to take care of the patient in the future. The society approved special minimum rates to care for every emergency. According to an announcement it is hoped that all physicians will be willing to participate in the plan, but the county society voted that the service of the physicians should be on a voluntary basis. The method of supervision and directing the program is to be under the guidance of the executive council of the society.

**Lawyer Named Head of Cleveland Clinic Foundation**—Edward C. Droust, for more than twenty-five years a member of the firm of Garfield Daoust Baldwin & Vrooman, retired from the practice of law on January 1 to become the full time executive head of the Cleveland Clinic Foundation, which owns the Cleveland Clinic and its hospital. As foundation president Mr. Droust will succeed Henry S. Sherman, president of the Society for Savings who will become president of the board. A. C. Ernst will continue as vice president and G. W. Gill and Remington Peck are secretary and treasurer, respectively. The clinic foundation is chartered as a nonprivate institution, operated for scientific, charitable and educational purposes. It employs 656 persons, including a staff of 69 physicians and surgeons. The principal properties are a 275 bed hospital and an eight story building that is devoted to experimental medicine and research. The cost of buildings and equipment exceeds \$3,500,000 and the foundation's endowment funds for medical research and charitable service are close to \$1,500,000. After the war the foundation plans to erect additional stories on the new Cleveland Clinic Building, which has foundations to support fourteen floors. The clinic was founded in 1921 by Drs. George W. Crile, William E. Lower and the late Drs. Frank E. Bunts and John Phillips. Mr. Daoust began the practice of law in Cleveland following his graduation from Yale University, New Haven, Conn.

### OKLAHOMA

**Personal**—Dr. Hugh M. Galbraith, Oklahoma City has been named a member of the medical advisory committee of the state medical association to the state department of public health, succeeding Dr. Moorman P. Prosser, Norman, who has entered military service.

**Circuit Course in Internal Medicine**—The fifth circuit in postgraduate medicine will open in Oklahoma City, Norman, Pauls Valley, Shawnee and Wewoka or Holdenville the week of January 11, according to the state medical journal. Dr. Luke W. Hunt, Oklahoma City, has been giving these courses throughout the state under the auspices of the Commonwealth Fund of New York. (THE JOURNAL, Feb. 21, 1942, p. 658). The lectures will cover the subjects of chronic arthritis and allied conditions, gastrointestinal diseases, disorders of the heart, cardiovascular renal disease, the anemias and blood dyscrasias, chronic nontuberculous pulmonary disease, diabetes mellitus, the uses and abuses of the sulfonamide compounds, nutritional diseases and deficiency states and endocrine disorders.

### PENNSYLVANIA

**Outbreak of Smallpox Among the Amish**—A quarantine has been placed on an area of 40 square miles of Kishacoquillas Valley in an effort to halt an outbreak of smallpox believed to have stemmed from an Amish wedding, the New York Times reported on December 26. Seven Amish children, including 3 year old twins, were reported on December 25 to be suffering from smallpox, the first children stricken in the Amish farm section. On December 24 twenty adults between the ages of 50 and 70 were reported with the disease and all had been present at the Amish wedding several weeks ago. None of the child victims had been vaccinated and all are under school age. Many of the Amish adults had not been vaccinated. The inoculation is compulsory for their children, however, under state school laws. All social gatherings and Christmas church services were canceled in the valley of 8,200 inhabitants. State police guarded all roads leading from the area. The Lewiston farmers' market was forced to close leaving unfilled hundreds of orders for turkeys from Amish farmers. A woman guest from Ohio was suspected of having been the carrier. An Associated Press dispatch from Columbus, December 25 indicated that the woman was the wife of a minister who had been in good health before taking a three week trip with her husband into Pennsylvania, Delaware and Maryland to attend several weddings. She became ill with smallpox on her return late last month, it was stated. While members of the Ohio sect opposed vaccination, they submitted to immunization after 4 cases of smallpox were reported.

### Philadelphia

**Lectures on Legal Medicine**—The Philadelphia County Medical Society announces a series of lectures on legal medicine, January 8 to March 12, to be conducted by the office of the coroner of Philadelphia County. The series includes:

Drs. Benjamin A. Gouley and Edward B. Krumhaar: Causes of Sudden Death.  
William J. Connolly and Edward J. Burke: Identification.  
Lieut. George R. Spangler: Ballistics.  
Dr. Edward A. Strecker: Suicide.  
Charles J. Swalm and James W. Tracey, Jr.: Criminal Assault.  
Dr. Elizabeth D. Wilson: Asphyxiation, Drowning and Burns.  
Ivor Griffith, Ph.M. and Helen Ingleby, M.B.: Ancient and Modern Poisons.  
Dr. Frank W. Konzelmann: Ancient and Modern Poisons (continued).  
Dr. Abraham M. Ornstein: Insanity.  
Judge Byron A. Milner: The Government and the Physician.

### Pittsburgh

**Society News**—Dr. Joseph T. Beardwood, Jr., Philadelphia addressed the Allegheny County Medical Society, December 15 on "Management of Diabetic Emergencies" and Dr. Angelo L. Luchi, Wilkes-Barre, Diabetic Diets and Food Habits of the Nationalities.

**Industrial Health and Hygiene**—The University of Pittsburgh School of Medicine and the Allegheny County Medical Society are cooperating in a series of lectures on industrial health and hygiene. The series opened on December 10 and will continue on successive Thursdays. Drs. Frank S. Rosser, Swissvale, Pa. and Dr. Lawrence G. Beinhauer gave the first lectures on "Carbon Monoxide Poisoning" and "Occupational Dermatitis" respectively. On December 17 the speakers were Henry F. Smith, Jr., Ph.D., on "Volatile Solvents" and Dr. George J. Busman, "Differential Diagnosis and Treatment of Occupational Dermatoses." The third pair of lectures will be given on January 7 by Drs. Charles F. Engel, Homestead, Pa., on "Electricity, Physiological Effects, Systemic and Local Treatment" and Charles F. Kutscher, Eye Injuries, Diagnosis and Treatment.

### SOUTH CAROLINA

**Faculty Changes at South Carolina**—William A. Prout, Ph.D., has been named acting director of the school of pharmacy of the Medical College of the State of South Carolina, Charleston. He will continue as professor of operative pharmacy. Morris Belkin, Ph.D., formerly at Yale University School of Medicine, New Haven, Conn., has been appointed instructor in pharmacy at the school.

**Founders Day Exercises**—The Founders Day Exercises at the Medical College of the State of South Carolina, Charleston, were held November 4-5 in connection with a refresher course sponsored by the alumni association. Visiting lecturers included Drs. Robert B. Greenblatt, Augusta, Ga., John B. Youmans, Nashville, Tenn., Dr. Udo J. Wile, Ann Arbor, Mich., Luther E. Holt, Jr., Baltimore, William B. Porter, Richmond, Va., Reginald Fitz, Boston, and James Heyward Gibbs, Columbia. Major George K. Lewis and Captain Alfred J. Suraci, M.C., U.S. Army. Dr. Howard T. Karsner, Cleveland, delivered the Founders Day Lecture at the annual banquet, on "Aortic Stenosis."

### TENNESSEE

**New Hospital in Memphis**—The Thomas Frank Gailor Psychiatric Hospital and Diagnostic Clinic was recently officially dedicated as part of the John Gaston Hospital, Memphis. It will be staffed by the University of Tennessee College of Medicine and except for staff salaries operating expenses will be handled through the Memphis and Shelby County Health Department. City, county and state funds were used to finance the cost of \$515,000. Four floors of the six story building will be used as an outpatient clinic and two as a psychiatric hospital. Three floors of the hospital have 40 beds available 30 to be used for the care of temporary patients and 10 for teaching purposes. Dr. Theron S. Hill, professor of psychiatry at the University of Tennessee College of Medicine is director of the new hospital. Dr. Arthur F. Cooper, Memphis secretary of the Memphis and Shelby County Medical Society has been named the first full time director of the outpatient portion of the new unit.

### TEXAS

**Professor of Dermatology Appointed**—Dr. Chester N. Frazier, recently engaged in venereal disease control work at the Johns Hopkins School of Hygiene and Public Health, Baltimore, has been appointed professor of dermatology and syphilology at the University of Texas Medical Branch, Galveston. Dr. Frazier was formerly professor of dermatology and syphilology at Peiping Union Medical College, Peiping, China, where he had been a member of the staff since 1922.

**University News**—Dr Owen H. Wangensteen professor of general surgery, University of Minnesota Medical School Minneapolis, delivered the Alpha Omega Alpha lecture at the University of Texas Medical Branch, Galveston recently on the "Secretary Functions of the Appendix as a Factor in Appendicitis." At the banquet Dr Wangensteen discussed "Surgical Aspects of Peptic Ulcer." The staff and students at the medical branch were recently addressed by Dr Meyer Wiener, Coronado Calif. professor of clinical ophthalmology emeritus, Washington University School of Medicine St. Louis on "War Injuries to the Eye."

### GENERAL

**Katharine Lenroot Awarded Medal**—The Rosenberger Medal for "notably great service in the promotion of human welfare" was awarded to Katharine Lenroot Washington chief of the Children's Bureau U. S. Department of Labor during the two hundred and eleventh convocation of the University of Chicago in Rockefeller Memorial Chapel December 18.

**Academy of Pediatrics Opens Membership to Latin Americans**—At the annual meeting of the American Academy of Pediatrics in Chicago, November 4-7 it was decided to develop region 5 of the academy to consist of the Latin American countries, members to be taken in practically on the same basis as members from the United States. On November 6 fifteen Mexican pediatricians who had applied were accepted to form the basis of a group in Mexico. According to Dr Clifford G. Grulee, Evanston Ill. secretary of the academy steps are now being taken to develop groups in each of the Latin American countries from which communications have already been received. The names of the Mexican pediatricians who were recently elected to membership are Drs. Alfonso G. Alarcon, Rigoberto Aguilar, Pico Alejandro Aguirre, Torres Enriquez, Baz Dresch, Hermilo Lamberto Castañeda, L. Federico Gomez Santos, Deñofilo Gonzalez, C. Carlos Herrera Romero, Fernando Lopez Clues, Jesus Lozoya Solis, Ismael Martinez Sotomayor, Jorge Muñoz Turnbull, Agustín Navarro Hidalgo, Roberto L. Sanchez Messick and Rafael Soto Allande all of Mexico, D. F.

**Reorganization of International Society of Surgery**—The headquarters of the International Society of Surgery has been provisionally transferred from Brussels to the United States and set up in the Inter-American Division of the New York Academy of Medicine in accordance with recent action of the council of delegates. In explaining the need for the change, Dr Rudolph Matas, New Orleans acting secretary and treasurer, stated:

The German occupation of Belgium and the Nazi devastation of the rest of Europe and all the other war-torn nations had virtually restricted the international relations of the society to the Western Hemisphere where its fellowship is widely spread through its affiliated branches in North Central and South America.

The Executive Committee of the United States Division the largest most active contributor to the transaction felt it their duty conjointly with their Latin American colleagues to rescue the society from the perils of the European configuration. The first steps were taken in November 1941 at Boston but no final action could be taken to transfer the official sanction in Brussels to America without the concurrence and approval of all the affiliated branches in America.

The transfer was voted by the delegates from all the affiliated societies of the Americas representing Argentina, Brazil, Canada, Cuba, Ecuador, Guatemala, Mexico, Paraguay, Peru, the United States, Uruguay and Venezuela. The affairs of the society will be administered by an executive committee composed of Colonel Elliott C. Cutler, M. C. U. S. Army, chairman in absentia, Dr Eugene H. Pool, New York, Dr Arthur W. Allen, Boston and Dr Matas. Dr Pool is acting chairman for Colonel Cutler and Dr Jose Arce, dean of the University of Buenos Aires is acting president in the absence of Prof. Leopold Mayer, Brussels, detained in Belgium by Nazi compulsion, according to *Science*. A revision of the constitution prepared by Dr Matas was adopted in November and a representative group of fellows from New York and elsewhere signed the act of reorganization as witnesses of the signing of the act by the delegates of the governing council. The Inter-American Division of the New York Academy of Medicine is under the direction of Dr Mahlon Ashford, New York. Dr Enrique J. Cervantes, New York, assistant secretary-treasurer of the executive committee of the international society, editor of *América Médica*, the official organ of the society and secretary of the Hispanic-American Medical Society is available in the division's offices to render service to the fellows of the society and to medical visitors from the Latin American countries.

**Examinations in Obstetrics and Gynecology**—The next written examination and review of case histories (part I) for all candidates will be held in various cities of the United States

and Canada on Saturday, February 13, at 2 p. m. Arrangements will be made so far as possible for candidates in military service to take the part I examination (written paper and submission of case records) at their places of duty, the written examination to be proctored by the commanding officer (medical) or some responsible person designated by him. Material for the written examination will be sent to the proctor several weeks in advance of the examination date. Candidates for the February 13 part I examination who are entering military service or who are now in service and may be assigned to foreign duty may submit their case records in advance of the aforementioned date by forwarding the records to the office of the board secretary. All other candidates should present their case records to the examiner at the time and place of taking the written examination. The Office of the Surgeon General of the U. S. Army has issued instructions that men in service, eligible for board examinations be encouraged to apply and that they may request orders to detached duty for the purpose of taking these examinations whenever possible. All candidates will be required to take both the part I examination and the part II examination (oral clinical and pathology examination). Candidates who successfully complete the part I examination proceed automatically to the part II examination which will be held in Pittsburgh, May 1943. Notice of the exact time and place of the examinations will be sent all candidates well in advance of the examination date. Candidates in military or naval service are requested to keep the secretary's office informed of any change in address. If a candidate in service finds it impossible to proceed with the examinations of the board determined without time penalty will be granted under a waiver or published regulations applying to civilian candidates. Applications are now being received for the 1944 examinations of the board. For further information and application blanks address Dr Paul Jatus, secretary, 1015 Highland Building, Pittsburgh, Pa.

**Activities at North China Drug Factory**—During the first eight months of the current year 350,000 tubes of smallpox vaccine were manufactured at the "guerrilla drug factory" in Northwest China according to a release from the United China Relief, New York. Credit is given largely to the work of this drug factory for averting a major smallpox epidemic, the release states. The factory was opened four years ago in the center of a plague belt where epidemics of typhus, diphtheria and typhoid are common. The plant is assisted financially by United China Relief. The smallpox serum is one of seventeen different serums now being produced in large quantities by the drug factory which also produces ten kinds of tablets, seven kinds of tinctures and twenty kinds of Chinese compounds. The drug factory is constantly expanding, its list of drugs and medicines increasing its output to provide the four International Peace Hospitals of the Northwest with necessary supplies many of which up to this time had to be smuggled through enemy lines. In Shensi where the drug factory is located, the area is rich in medicinal herbs and the factory's department of Chinese medicine is producing two hundred medicines based on native products. Many of the native herbs commonly used by herb doctors have been found to have the healing and corrective qualities claimed for them by these traditional medical men of China. In the department of western medicine ampules for injection are prepared from imported raw materials at a saving of 60 per cent over the cost of foreign finished supplies. The third division, the manufacturing department last year produced 5,000 pounds of absorbent cotton and 4,000 pounds of fine gauze. In addition to other products 1,000 pounds of tinctures have been produced monthly. Sodium chloride, sodium sulfate and other sulfur products much needed by the hospitals and mobile units, are now available. Besides preventive serums and life saving drugs, the drug factory is producing such products and by products as cod liver oil, phenol solutions and medicinal soaps. Most of the medicines are being prepared in tablets, pills, powders, solutions and tinctures instead of the ancient and bulky form of aqueous extracts. A search for substitutes for imported drugs is being carried on in the laboratory since one of the main problems of the Northwest has been and still is its inaccessibility because of blockades. Of the two hundred workers employed by the factory, China Aid Council reports that approximately one fourth are regularly instructed in chemistry, physics and pharmacology by the chemical engineers and the technical staff. All the part in management training and the aim is the establishing of other such cooperative centers throughout the area. The most urgent problems to be met are lack of sufficient technicians, adequate machinery and funds for maintenance and training.



## Foreign Letters

### LONDON

(From Our Regular Correspondent)

Nov 28, 1942

#### London During a Year of Attacks from the Air

The report of the county of London medical officer of health and school medical officer for 1941, which has just been published, covers the second whole year of the war and for the first time gives a complete account of health conditions under the strain. During the heavy bombing of London in the first five months of 1941 the public health services were carried on under conditions of difficulty, but despite destruction of life and property they were never disorganized. No matter where the blow fell, new arrangements were speedily made and the work went on. When a hospital was partly or wholly put out of action, patients and staff were promptly transferred elsewhere. Temporary ambulance stations and school clinics appeared within a few days or hours after a loss. During the period of heavy air attacks the population of London fell considerably by evacuation. This, with the absence of any serious epidemics, made the reduced hospital accommodation quite sufficient. The practice of rapidly evacuating air raid casualties and other acutely ill patients from the London hospitals to others outside London was of great assistance in keeping beds available for casualties.

The aggregation of large numbers of persons in air raid shelters led to apprehension that epidemics would develop, but they did not. The number of deaths from all causes in 1941 was 43,537, against 57,459 in 1940. Diseases due to droplet infection might have been expected to increase, but the deaths from influenza, pneumonia and bronchitis were in each case less than in the previous year. Cerebrospinal fever also showed a reduction. It is remarkable that there were only 2 deaths from scarlet fever. In 1893 these numbered 1,415. Scarlet fever has now become a mild disease with a case mortality\* below 1 per thousand. There was some increase in diphtheria. According to the usual biennial cycle there should have been an epidemic of measles in the winter of 1939-1940 but dispersal or some other cause broke the rhythm and the deaths numbered only 29, compared with 235 in 1938. Whooping cough deaths increased from 10 in 1940 to 111. Typhoid caused only 17 deaths, and no case was attributable to infection by water, despite frequent disturbances of the drainage systems by bomb explosions. There was a definite decrease in the number of admissions to mental hospitals, as in the last war. Inspections of school children and comparison with the same age groups in the prewar years showed no evidence of mental or physical deterioration.

#### Medical Aid to Russia

Mrs Churchill, president of the Red Cross Aid to Russia Fund, announces that despite many other demands on their charity the public has subscribed \$10,000,000. On returning from his visit as head of a British medical mission to Moscow, Sir Charles Wilson, president of the Royal College of Physicians, brought back a tremendous list of needs. Among the articles dispatched were blankets, first aid pouches, children's clothes, 2 tons each of chloroform and ether, 10,000 Kg of sulfamidamide, 50,000 Kg of chloramine, 150,000 dissecting forceps, 77,000 hypodermic syringes, 200,000 ampules of strophanthin, 18,000 scalpels, 60,000 surgical scissors, 54,000 tourniquets, 523,000 yards of rubber sheeting, 100 portable X-ray sets, 30 tons of blood transfusion tubing and 30 tons of cocoa butter. For many of the articles special methods of production had to be introduced, and some instruments were manufactured for the first time in this country. The call for cocaine and procaine

hydrochloride, which had to be and was met, was for quantities which equaled three years' normal use in Britain. In addition to medical supplies, at the request of the British government, 400,000 woolen garments were sent to Russian refugees restored to regained territory.

#### Women Medical Students

During the academic years 1940-1941, of the 5,265 students of medicine and dentistry in the University of London 117 per cent were women. Three fifths of these were at the London School of Medicine for Women. In the other schools only 5 per cent were women. In the remaining universities of Great Britain, of 7,687 students of medicine and dentistry 21.4 per cent were women. During the war the total number of students has only slightly diminished—from 13,636 in 1938-1939 to 12,952 in 1940-1941, and the number of women has only slightly increased—from 2,013 to 2,261. In a letter to the *Times*, Prof A V Hill (physiologist and member of Parliament) states that medicine and dentistry are professions particularly suitable for women especially in the coming important developments of public health services, maternity and child welfare, school medical and dental services and the women's services, and that many women are anxious to enter them but are rejected, particularly in London, not for any other reason than that they are women. The majority of the London schools refuse to accept them at all. If they took them in the same proportion as the provincial schools, there would now be five hundred more women students in London. Even the present shortage of manpower has not led the London schools to modify their policy. They have taken a large number of young men who had better be in the fighting services. Protesting against this position, Professor Hill suggests that the minister of labor should refuse to reserve any more men to begin the study of medicine in schools which do not accept women.

#### Medical Education in Municipal Hospitals

London already has twelve undergraduate medical schools as well as postgraduate schools. These are all attached to voluntary hospitals (so called because supported by voluntary subscriptions). But in recent years another important hospital system has arisen—the municipal hospitals, under the control of the London County Council, which are supported not by subscriptions but by taxes. They have no undergraduate medical schools attached to them, though they constitute the largest hospital system in the world, but they have already established an important postgraduate school. In a report submitted to the council by its general purposes committee the establishment of an undergraduate medical school is proposed. The report takes the form of the evidence given by the council to the interdepartmental committee on medical schools recently set up by the minister of health. The new school would be set up at one of the council's larger general hospitals and would utilize other hospitals and schools as required. It would become an internal school of the University of London, which would provide the teaching staff, or alternatively the council itself would be responsible for the direction of the school. It is claimed that the experience which the council has gained in seven years of administration of the British Postgraduate School should be of great value in the new scheme. The new school, unlike the other London schools, would be open to women as well as to men.

The council's interest in medical education arises from its position as the major health authority of London and the largest civilian employer of medical staff in the country and from the facilities offered by its hospitals, which number one hundred. For some years it has provided for certain clinical teaching—in obstetrics, fevers, psychiatry, venereal diseases and others—by the affiliation of its hospitals with the voluntary ones. Up to the outbreak of war, eleven of the medical schools were



linked with sixteen of the council's "acute" general hospitals, in which classes and demonstrations were conducted by the council's medical staff. Teaching in obstetrics is already given at ten of the council's hospitals to students from nine London schools. Plans are in hand for the teaching of psychologic medicine after the war in the council's mental health services. It is suggested that the service performed by the field of public health and social welfare should be brought more closely to the notice of medical students as a means of teaching them the wider aspects of social and preventive medicine and that the council's schools can do this. Finally, the report calls for greater coordination of postgraduate medical education in London.

#### Arrangements for the Care of Children of War Workers

The large number of women engaged in war work many of whom are married and have children, has created a new problem. To enable mothers with young children to undertake war work, about a thousand wartime nurseries have been established and five hundred more are in preparation. There are also four hundred special nursery classes for the children of war workers and nearly three hundred in preparation. In addition over a hundred thousand children under the age of 5 years are in ordinary elementary schools, and there are sixty-three nursery schools. But there are still many women whom industry wants for whose children there is no provision. The Ministry of Labor's solution is "child minder" schemes, which were brought forward some months ago, but few were started as there was a prejudice against them from fear that the children would be neglected. However, they have been a success in Birmingham, where they are known as the Children's Home Service. They are based on child welfare centers where the mother and the prospective "minder" are brought together. The latter has usually children of her own. The ministry pays her \$1.50 a week for each child on condition that it is brought to the center when required, and the mother pays \$2.50 and provides the rationed foods.

#### The Electroencephalogram in Criminal Trials

In 1929 Berger observed that electrodes applied to the normal scalp gave oscillations of potential of 10 per second on a recording instrument. This was subsequently confirmed by other observers. The oscillations are due to electrical activity of the cortical cells. It was subsequently shown that characteristic changes of rhythm occur in epileptic patients not only during the fits but between them. This fact has led to the electroencephalogram being used as evidence on the question of responsibility in criminal trials. A soldier who fired a rifle at a corporal pleaded that he had no knowledge of the affair and suffered a head injury a few hours previously. The attack was apparently without motive. An electroencephalogram showed abnormalities compatible with the head injury and he was discharged. In another case, in which a brutal and apparently purposeless murder was committed, the defense was that it was done in a period of postepileptic confusion. The evidence of epilepsy was tenuous but an abnormal electroencephalogram was produced. The medical witnesses said that an absolute diagnosis of epilepsy could not be made on this, as no subclinical attacks were seen, but it made the diagnosis likely. The man was found 'guilty but insane' and so escaped capital punishment.

#### Fungi as Food

Before the war we imported two thirds of our food supply. The need to devote as much shipping as possible to the transport of munitions has reduced the amount of imported food to one third of our total supply, and the loss of the other third has been compensated by extension of our agriculture. We are

looking to sources of food growing wild which are ordinarily neglected, such as the edible fungi. Dr. John Ramsbottom, keeper of botany in the Natural History Museum, South Kensington, has called attention to them in a letter to the *Times*. This has led to more than four hundred letters, often accompanied by specimens, being received at the museum, and evidence has been obtained on the eating of forty different kinds, though the general public knows and uses only two kinds. The museum is anxious to spread a knowledge of the best and most easily recognizable edible species. To this end an exhibit of fresh specimens of both edible and poisonous fungi, supplemented with colored plates, is on view. Moreover, lectures are being delivered on the subject. It is emphasized that the popular traditional tests as to what is edible and what is not are quite unreliable. Such for example, is the belief that if a mushroom can be peeled it is edible. The deadly *Amanita phalloides* peels beautifully. Also the belief that all species which grow under trees are poisonous is wrong. If people would learn to recognize the best edible fungi and also the poisonous, a palatable food such as is commonly eaten on the European continent, would be saved from going to waste.

#### Sailors Leave Their Sick Beds to Fight

The epic story of the greatest convoy ever sent to arctic Russia which withstood a battle of four days, in which it was attacked by airplanes, surface vessels and submarines, has been told in the press. The principal medical officer stated that when the alarm sounded all the patients in the sick bay leaped from their beds to their action stations at the guns and, when the situation eased, returned to their beds. One of them who had some badly damaged ribs manned a gun forward. After the first attack he was asked by the medical officer how he felt. "Bit of a headache, sir, I could do with a couple of tablets," he replied.

#### Surveys of Hospital Services

As shown more than once previously in *THE JOURNAL*, the calm confidence with which the country regards the outcome of the war is proved by the various forms of planning for the future. The Ministry of Health is now carrying out its third survey of hospital services which covers northeastern England. The survey is in the hands of the Nuffield Provincial Hospitals Fund which was established as one form of the munificence of the automobile magnate Lord Nuffield. The trust has appointed Mr. H. I. Erson chairman of the General Medical Council, Dr. Vetch Clark, late health officer of Manchester, and Mr. W. H. Harper, house governor of Wolverhampton Hospital, to carry out the survey. Other surveys are to follow until the whole country is covered. Mr. Ernest Brown, minister of health, has stated that the first object of the surveys is to see how far each patient can as easily as possible obtain the best treatment of the kind he needs.

#### New Uniform for Nurses

For the first time in over sixty years the nursing uniform of the London Hospital has been changed. The new dress became necessary because the old one took about 6 yards of material, and today war rationing allows only 4½ yards. The familiar large Victorian "leg of mutton" sleeve has given place to a small puff sleeve. Soft collars and cuffs stitched with mauve or blue to match the frock and made from apron material take the place of starched collars and the sisters' cuffs. There is a new hat with the hospital badge stitched on the left band and new overcoat in place of the old 'London' cloak. Aprons will be worn only by sisters and nurses when on ward duty. During the war the sisters will wear their yard long cap tails only on special occasions. The changes mean that 1,680 fewer aprons and 10,686 fewer detachable sleeves will be worn during the year.

## BRAZIL

(From Our Regular Correspondent)

Oct 31, 1942

### American Trypanosomiasis in Brazil

Oswaldo Cruz and Carlos Chagas described in 1909 a new human trypanosomiasis affecting some poor peasants in the state of Minas Gerais, Brazil. The parasite has been named *Schizotrypanum cruzi*, and the new disease has been known as Chagas' disease or American trypanosomiasis. Since then acute and chronic cases of the disease have been described in almost all the countries of the Western Hemisphere, with the principal exceptions of Canada and the United States. However, naturally infected vectors (blood sucking bugs of the family Reduviidae) have been found in the states of California, Texas and Arizona, and a bug of the state of Florida (*Tritoma sanguisuga* Ambigua) was experimentally infected two years ago by A. Pritcherman of the National Institute of Health. At the recent meeting of the eleventh Pan American Sanitary Conference, held in Rio de Janeiro, Dr. Carlos Chagas Jr. read a paper on the situation of American trypanosomiasis in Brazil. The evolution of the parasite in vertebrates (armadillo, opossum, dog, cat, guinea pig and rat) has recently been restudied and developed by Dias and Freitas, whose researches on the life cycle of *S. cruzi* have definitively established that, in the bug, the evolution takes place mainly in the posterior intestine, a fact of the greatest importance because it permits the normal transmission of the disease by the feces of the bug, full of the metacyclic forms of the trypanosome. After many negative results, some workers have succeeded in the transmission of the parasite through the bite of the insect, but this exceptional fact is explained by Dias as a consequence of the regurgitation of infective forms from the stomach. Dr. Carlos Chagas Jr. has established that the intracellular evolution lasts about five days. The initial focal proliferation of the trypanosomes has enabled Romãña, from Argentina, to raise the hypothesis of the entry of the parasites through the conjunctival membranes of the eye, a fact now considered well proved. The most recent studies have also demonstrated that *Schizotrypanum* has a great affinity for the reticuloendothelial system, and thus the protozoon is considered a primitive parasite of this system.

As *S. cruzi* cannot live in the exterior world through the direct transmission from bug to bug, because the insects are not naturally given to coprophagism and to cannibalism nor is there hereditary transmission of the trypanosomes in the bugs, the presence of infected insects in any area is a sure indication of the existence of vertebrate reservoirs of the parasites. Out of the twenty states of Brazil, in thirteen the natural infection of reduviids has been proved. The most numerous examinations have been made in the state of Minas Gerais, where, up to the present, 3,855 insects have been found naturally infected out of a total of 12,336, or 31.3 per cent. In Brazil, more than thirty different species of reduviids have been found naturally infected, and several vertebrates have been found as reservoirs of the trypanosomes. Among the domestic animals acting as reservoirs, the dog and the cat are important, since they are so closely connected with the poor peasants in the adobe and other primitive houses infected by the bugs. Among the sylvatic reservoirs the most important are the armadillos (*Dasypus novemcinctus*, *Dasypus hybridus* and *Euphractus sexcinctus*), which harbor parasites with nuclear index identical to that of the trypanosomes from man.

The majority of the human cases of the American trypanosomiasis observed by Carlos Chagas were chronic cases but in a few children he was able to recognize the acute form of the disease. The exact diagnosis was difficult, because it was necessary to base it on the finding of the trypanosomes in the peripheral blood, and the parasites are rather rare in this

medium. The xenodiagnosis carried out by allowing uninfected reduviids to suck the blood in the suggestive cases and later trying to ascertain the presence of the parasite in the bugs, became an important diagnostic tool, but it was somewhat difficult to use. Some progress had also been made by the use of the complement deviation test, as devised by Machado and Guerreiro of the Oswaldo Cruz Institute. Some years ago Mazza and Romãña described what is now commonly named the Romãña sign, i. e. the unilateral strong palpebral edema and conjunctivitis, with definite ganglionic reaction, an important sign for the detection of acute cases. The cardiac form of the disease (the most common chronic clinical form) is characterized by a strong Machado-Guerreiro reaction and tachycardiac, bradycardiac, extrasystolic and arrhythmic symptoms. In no other disease is the myocardial process so intense as in the American trypanosomiasis. A striking fact is the finding of many cases of sudden death in small towns, in the areas affected by the disease. It is now well recognized that there is no connection between Chagas' disease and goiter, contrary to what Chagas himself emphasized in his early writings. In the state of Minas Gerais the geographic distribution of trypanosomiasis coincides with that of simple goiter, but in Argentina, for instance, these areas of prevalence of the two diseases are entirely different.

### Dogs as Healthy Carriers of Brazilian Typhus

The São Paulo state strain of typhus fever was related in 1932 by cross immunization by Lemos Monteiro, by Parker and Davis and by Dyer of the United States to Rocky Mountain spotted fever. The state of Minas Gerais type of endemic typhus, first recognized in 1934 by J. A. Monteiro and Octavio Magalhães, was proved in 1939 to be identical with the spotted fever virus (THE JOURNAL, Jan 10, 1942, p. 159). Thus there is only one strain of Brazilian typhus, and that one is identical with the United States spotted fever. Prof. Octavio Magalhães and Dr. Adyr Rocha of the University of Belo Horizonte, Minas Gerais, who have actively continued to work on the Brazilian typhus, profiting by several massive domiciliary foci of the disease, with 2, 4, 7, 9 and even 12 severe or slight cases in the same dwellings in rural areas around Belo Horizonte city. Their ideas about the epidemiology of the Brazilian disease are that it is quite different from the disease prevalent in the United States. They have insisted (*Brasil-med* 49:465 [May 25] 1935) that the Brazilian typhus has a different epidemiology, and among the particular epidemiologic features they have pointed to the importance of the dog as a carrier. They point to the fact that, since 1930, the dog has been shown to act as a healthy reservoir for the virus of the Mediterranean littoral typhus fever (fevre boutonneuse). In this case the vector is a tick (*Rhipicephalus sanguineus*) which also transmits the disease hereditarily. Also Salles Gomes of São Paulo reported in 1933 that a tick (*Amblyomma ovale*), taken from a pet dog of a house where a few cases of Brazilian typhus had occurred, was infected, but no further significance was given to the fact. Magalhães showed that in Minas Gerais about 25 per cent of the patients had strictly domestic occupations, and many of them were young children. In September of last year Magalhães published a report of a small focus in a suburban house of Belo Horizonte, where, during the course of a few months, he recognized 1 severe and fatal case of typhus, 3 mild cases and 1 labeled "inapparent case," i. e. with no symptoms but presenting the virus in the blood. In 2 dogs and in several bedbugs (*Cimex rotundatus*) the presence of the virus has been recognized, and, what is more important, 1 of the dogs remained infective for forty days.

To investigate this subject fully, Magalhães and Rocha devised an extensive experimental study, the conclusions of which have been published in the *Brasil-medico* (56:370 [Aug 1] 1942). They worked with 139 dogs from different places in the state

of Minas Gerais 4 have been inoculated experimentally and 135 were naturally infected. The Weil-Felix test has been done with OX 19, OX 2, OX L, and OX K strains with the maximum results of 1:280 for the OX 19 and 1:640 for the other strains. The results of the Weil-Felix tests were as follows for the 135 cases of natural infection: 54 dogs from houses of the urban zone of Belo Horizonte 79 per cent positive, 76 dogs from houses of the suburban zone 90 per cent positive, 5 dogs from rural areas 87 per cent positive. Three of the 4 inoculated dogs gave a positive Weil-Felix reaction. It was possible to try to recover the virus from only 31 dogs. The blood of the dogs has been injected into guinea pigs and into rhesus monkeys with 11 positive results or 35.5 per cent. These studies emphasize the importance of pet dogs as natural carriers of Brazilian typhus, and the results are worth trying again in other places of the Americas as the virus of Brazilian typhus is not different from that of Rocky Mountain spotted fever.

#### Primary Bronchial Diphtheria

A case of rare localization of diphtheria has been reported by Dr. Celestino Santos of the J. C. Rodrigues Hospital of Rio de Janeiro in a child 2 years old. The patient was feverish, seeming to have a simple cold. On the following day he became asphyxiated, with a stridulous cough. The examination of the respiratory apparatus disclosed no abnormalities through percussion and auscultation. A careful examination of the throat, the tonsils and the uvula was also entirely negative except for a slight hyperemia. Early on the third day the state of the patient became still worse and another physician suspected diphtheria, injected 20,000 units of antitoxin and sent the child to an otorhinolaryngologist, who could find nothing more. The examination of specimens taken from the throat and from the nose was negative. The patient was subjected to tracheotomy but died a few hours later. The necropsy disclosed an extensive diphtheric patch in the bronchi, beginning to invade the pulmonary parenchyma. This is an extremely rare localization of diphtheria difficult to diagnose.

#### Alcoholization of the Mesoappendix

As a result of observations on 407 patients operated on for appendicitis in which the alcoholization of the mesoappendix was employed, Dr. Henrique Smith concluded that this new method is a means of obtaining a painless period after the operation. The alcoholization produces no complications for as long as three years after the operation, according to the observations of Dr. Smith. The method is being used by many Brazilian surgeons. It is not necessary to use more than 2 or 3 cc. of alcohol to obtain good alcoholization.

#### Inter-American Congress of Surgery

The first Inter American Congress of Surgery will be held at Santiago, Chile, on November 14 with the cooperation of the surgical societies of Argentina, Brazil, Bolivia, Paraguay, Uruguay and Chile.

The treatment of acute peritonitis will be the principal theme of the discussions. Also to be discussed are the sequels of pyogenic pleuritis of nontuberculous origin and fractures of the humerus. This congress was organized to commemorate the centenary of the University of Chile.

#### Immunization Against Tuberculosis

According to the data just now published by the prefecture of Rio de Janeiro, there were registered in that city 33,082 births in 1941. Forty-four per cent of these children, or 14,582, were immunized against tuberculosis by BCG.

#### Sulfanilamide During Cesarean Section

In a recent paper read before the São Lucas Society, Dr. Jose Saldanha Faria reported the results from the use of sulfanilamide during cesarean section. He pointed out the benefits of

this technique, saying a few words about intraperitoneal sulfanilamide when a cesarean section is necessary. He advocated the use of this medicament in the practice of gynecology and in myomectomies when the enucleation may accidentally open the uterine cavity.

## Marriages

FURMAN TOWNSEND WALLACE, Chester, S. C., to Miss Virginia Records of Indianapolis in Charleston, S. C., August 29.

WILLIAM HERBERT PARSONS to Mrs. Victoria Blanchette Gaddy, both of Ellerbe, N. C., in Florence, S. C., July 20.

JOHN OVERBURY WATKINS to Mrs. Mary Leigh Johnstone, both of Spartansburg, S. C., in New Orleans, October 2.

DAVID E. BACHSHAW, Sigman, Mich., to Mrs. Lena Helms Brittain of Atlanta, Ga., in Toronto, Ont., Canada, July 18.

CHARLES E. CROINGER, Claremont, N. C., to Miss Alice Larkin of Cortoppe, Ala., in Washington, D. C., recently.

GIVEN CLARKE WOLF, Naperville, Ill., to Miss Marianne Simonson of Dayton, Ohio, in Chicago, September 30.

CHARLES HOWARD IVANS, JR., Rochester, Minn., to Miss Mary Jane Richolt of Holgate, Ohio, September 20.

ARCHIBALD C. RANDOLPH, Upperville, Va., to Mrs. Theodore Aver Wintroppe in Washington, D. C., September 3.

EDWARD R. BARBER, Cho, S. C., to Miss Eleanor Thompson of Salem, N. J., at Chicopee Falls, Mass., recently.

HENRY RUTHERFORD BUTLER, JR., Atlanta, Ga., to Miss Rheba May Ashmore at Fort Huachuca, Ariz., October 9.

JOHN MCGILL PRATT, Hickory Grove, S. C., to Miss Dorcas Cromer at Carlisle Barracks, Pa., September 29.

BEVERLY TODD TOWERS, Bowling Green, Ky., to Miss Jane Ethel Raborg of Nashville, Tenn., September 3.

EDWIN MASON ROBERTSON, Durham, N. C., to Miss Eliza Isabelle Buckles of Bristol, Va., September 19.

REX DECKER HAMMOND to Miss Barbara Tyler, both of Chicago, in Little Rock, Ark., October 10.

HENRY PRICE DEVERIE, Harrisonburg, Va., to Miss Mary Elizabeth Savage at Franklin, August 25.

HERBERT WILLIAM BONDIANT, JR., to Miss Ann Kennedy Irby, both of Atlanta, Ga., September 15.

HUBERT C. PATTERSON, JR., Albemarle, N. C., to Miss Elizabeth R. Fox of Philadelphia, August 14.

ALAN ESTES WALKER, Warrick, Texas, to Miss Erma Murphy at Ardmore, Okla., August 6.

CHARLES PETERSON MAHIN, St. Paul, to Miss Lucia Carole Bullinger of Atlanta, Ga., October 1.

IRVING I. COVAT, San Diego, Calif., to Miss Joan Clirice Reydman of Milwaukee, October 30.

FUGATE DANIEL GUSTON to Miss Eloise Bether McCall, both of Marion, S. C., September 3.

FRANCIS A. MARINO, Springfield, Ill., to Miss Margery Bond in New Orleans, August 17.

LUTHER WARREN CHILNEY to Miss Marion Margaret Moore, both of Knoxville, Tenn., recently.

JOHN B. BIRCH, Maywood, Ill., to Miss Gladys Risley of Onarga, at Watseka, in September.

JOHN M. SLAUGHTER, Millersville, Md., to Miss Molly Powell of Florence, September 7.

ISIDORE FRILL, Champaign, Ill., to Miss Rosa Lee Rose in Washington, D. C., October 13.

JOHN E. MOSS, Mobile, Ala., to Miss Eva Jean Williams of Charlotte, N. C., September 9.

THOMAS WORTH CROWELL, Seattle, to Miss Jean Shorkley of Carpinteria, Calif., recently.

ARTHUR DENTON JONES to Miss Mercy Lee Farris, both of Jacksonville, Fla., October 4.

RUDOLPH TINSER, Vot to Miss Catherine Clark Duffy, both of Louisville, Ky., recently.

RONALD E. CORKEP, Natchitoches, La., to Miss Ruby Jones at Franklinton, recently.

LAWRENCE S. SIEGEL to Miss Sandra Coe, both of Los Angeles, November 8.

WILL W. STRANGE to Miss Charline Googe, both of Booneville, Miss., in July.

EDWIN B. BILCHICK to Miss Ruth Coleman, both of New York, July 30.

## Deaths

**Rossner Enders Graham** \* Oakland, Calif. Tulane University of Louisiana School of Medicine New Orleans 1914, Army Medical School, Washington, D C, 1917, specialist certified by the American Board of Psychiatry and Neurology, Inc, a first lieutenant in the medical reserve corps at Base Hospital, Fort Sam Houston, Texas, in 1916 commissioned a major in the medical corps of the U S Army in 1918, regimental surgeon with the 27th infantry, American Expeditionary Forces, in Siberia in 1919 chief of the neuropsychiatric service at the Jettanman General Hospital, San Francisco, from 1919 to 1922, station surgeon and psychiatrist in the U S Disciplinary Barracks at Alcatraz in 1922 consultant at Mills College in the neuropsychiatric service of the Oakland Health Center from 1923 to 1928, served on the staffs of the Peralta, Highland and Alameda County and Providence hospitals, aged 54 died, October 6

**William John Dougherty** \* Brownsville, Texas, Bellevue Hospital Medical College, New York 1898, member of the Medical Society of the State of New York and of the National Gastroenterological Association, specialist certified by the American Board of Psychiatry and Neurology, Inc also a lawyer, formerly on the surgical staff of St Vincent's Hospital New York, attending neurologist at the Broad Street Hospital, New York, and an assistant alienist in the psychopathic department at the Bellevue Hospital, New York at one time on the staffs of St John's Riverside and St Joseph's hospitals, Yonkers N Y, and the U S Veterans Hospital, New York in 1937 was appointed consultant psychiatrist for the Catholic Archdiocese of New York, aged 64, died, November 26, in the Mercy Hospital of chronic myocarditis

**Samuel Hanford McKee**, Montreal, Que, Canada, McGill University Faculty of Medicine, Montreal 1900, specialist certified by the American Board of Ophthalmology formerly professor of ophthalmology at his alma mater member and past president of the American Academy of Ophthalmology and Otolaryngology, member of the American Ophthalmological Society and the Association for Research in Ophthalmology Inc, formerly vice president of the Pan American Congress of Ophthalmology, past president and secretary of the Montreal Medico Chirurgical Society, on the staff of the Montreal Maternity Hospital from 1906 to 1914 served with the Canadian Expeditionary Forces during World War I, on the staffs of the Montreal General and Alexandra hospitals aged 67 died, November 25

**John Harold Morris** \* New York, Cornell University Medical College, New York, 1914, specialist certified by the American Board of Surgery, assistant clinical professor of surgery at the New York University College of Medicine formerly assistant professor of clinical surgery at the New York Post Graduate Medical School, Columbia University, fellow of the American College of Surgeons, served as a major overseas with the New York Post Graduate Hospital unit during World War I, visiting surgeon at the Welfare Hospital for Chronic Diseases and St Vincent's Hospital, associate visiting surgeon Bellevue Hospital, assistant visiting surgeon, Willard Parker Hospital, aged 53, died, November 24 in the New York Hospital

**Frank W Cregor** \* Indianapolis, Medical College of Indiana, Indianapolis, 1894, retired as head of the department of dermatology and syphilology at the Indiana University School of Medicine in 1942, specialist certified by the American Board of Dermatology and Syphilology, member of the American Dermatological Association, member of the Judicial Council of the American Medical Association from 1923 to 1933 and member of the House of Delegates 1925-1926 and from 1929 to 1934 past president of the Indiana State Medical Association, formerly a member of the state board of health, at one time state senator, on the staffs of the Indianapolis City, Indiana University and Methodist hospitals, aged 69, died, Dec 9 1942

**George Skinner McCarty**, Walla Walla, Wash University of Maryland School of Medicine, Baltimore 1905 formerly a passed assistant surgeon in the U S Public Health Service Reserve and on the staff of the Veterans Hospital number 50 Whipple Barracks, Prescott, Ariz, served with the American Expeditionary Forces in France during World War I, aged 60, served as a specialist in tuberculosis on the staff of the Veterans Administration Facility, where he died, November 19 of acute glomerular nephritis due to acute prostatitis with abscess and active pulmonary tuberculosis

**Joshua Allen**, Philadelphia, Hahnemann Medical College of Philadelphia, 1878 aged 91 died November 8

**Charles Arburn**, Wadesville, Ind, Kentucky School of Medicine, Louisville 1889, member of the Indiana State Medical Association, aged 84, died, November 27 of hypostatic congestion of the lungs and chronic myocarditis

**Henry Bagully**, Brooklyn Long Island College Hospital Brooklyn 1900, member of the Medical Society of the State of New York, aged 74, died, September 25

**Stanley A Baranowski**, Milwaukee Milwaukee Medical College, 1910, member of the State Medical Society of Wisconsin chairman of the advisory board of the Johnston Emergency Hospital, a member of the staff of St Luke's Hospital and a house physician at St Joseph's Orphanage, aged 57, died, November 1, of acute cardiac dilatation and chronic myocarditis

**George H Barbour**, Helena, Mont, Medical College of Ohio, Cincinnati, 1886, member of the Medical Association of Montana, member of the state board of medical examiners from 1899 to 1906, surgeon for the American Smelting and Refining Company for forty years, aged 79, died, November 19, in St Peter's Hospital of chronic myocarditis

**Samuel S Barrett**, Nevada Ohio, Western Reserve University Medical Department, Cleveland, 1895, aged 80, died, November 5

**Edward M Bench** \* Galena, Ill, Northwestern University Medical School, Chicago, 1898, recently served on the draft board and during World War I on the staff of the Mercy Hospital, Dubuque, Iowa, aged 70 died November 27, of cerebral thrombosis

**William Bernard Burns**, Boston, Maryland College of Eclectic Medicine and Surgery, Baltimore 1914, aged 54, died November 15, in Mills of coronary thrombosis

**Allen Melville Carpenter**, Carmel Calif, Cooper Medical College, San Francisco, 1895, aged 72, died November 18 in the Roosevelt Hospital, New York, of carcinoma of the colon and renal insufficiency

**James S Cleland**, Chicago Missouri Medical College St Louis, 1898, aged 64, died, November 15, in the Veterans Administration Facility, Hines, of coronary heart disease and angina pectoris

**Bert Daniel Clutch**, Booneville Ark, Kansas City (Mo) College of Medicine and Surgery, 1919, aged 61 died, November 22 of a cerebral hemorrhage

**John Moore Crump**, Oakland Calif, University of the City of New York Medical Department, New York, 1879, aged 88 died recently of congestive heart disease

**Frederick M Eaton**, Oakland, Calif Hahnemann Medical College and Hospital of Philadelphia, 1889, aged 80, died recently of chronic myocarditis

**John Ralph Ferguson**, Monroe, La, University of Nashville (Tenn) Medical Department, 1908, aged 63, died, October 31

**Charles Webster Hamm** \* Troy, N Y, Albany Medical College, 1893, past president and vice president of the Rensselaer County Medical Society, aged 73, died, October 3

**Baynard Lawton Harris**, St Charles S C, University of Nashville (Tenn) Medical Department, 1897, aged 69, died November 5

**James Harris**, Lakeland, Fla, Cincinnati College of Medicine and Surgery, 1893, for two years taught pathology at his alma mater, aged 80, died, November 15 in the Morrell Memorial Hospital of senility, renal insufficiency and prostatic infection

**Cephas Cole Hill**, Darlington, S C, University of Maryland School of Medicine, Baltimore, 1904, member of the South Carolina Medical Association past president of the Tri-County Medical Association and of the Darlington County Medical Society, for many years surgeon for the Atlantic Coast Line and Seaboard railroads, recently served as a medical examiner for the draft board and in the same capacity during World War I, aged 64, died, November 8, in the McLeod Infirmary, Florence

**Charles Addison Hurd**, Northwood, Iowa State University of Iowa College of Medicine, Iowa City 1888, member of the Iowa State Medical Society, for many years health officer commissioner of insanity and coroner, a member of the Selective Service System during World War I organized and for many years president of the Worth County Historical Society aged 81 died, November 9

**Blyford B Jackson**, Lawrence Kan Melharry Medical College Nashville Tenn, 1909, aged 64, died November 7

**Egerton Sowerby Jackson**, Bronxville N Y Trinity Medical College Toronto, Ont, Canada 1888 formerly assistant attending physician at the Bellevue Hospital New York

and clinical assistant at the New York Hospital, New York, aged 73, died recently of hemorrhage into the cerebrum, arterio sclerosis and cerebral endarteritis

**Hampar Boghoss Kazanjian**, Los Angeles Baltimore Medical College, 1898 member of the Massachusetts Medical Society, aged 68, died, September 20, of cerebral hemorrhage due to arteriosclerosis

**William Charles Keettel**, Lyons, Neb., John A. Creighton Medical College Omaha 1901, aged 67 died November 12, in a hospital at Omaha of paralysis agitans and bronchopneumonia

**Marion Luther Klinefelter** \* St. Louis Washington University School of Medicine, St. Louis 1903, member of the Clinical Orthopaedic Society and of the American Academy of Orthopaedic Surgeons, fellow of the American College of Surgeons, aged 69 consulting orthopaedic surgeon, Frisco Employees' Hospital orthopaedic surgeon to the Evangelical Deaconess Home and Hospital and the Missouri Baptist Hospital, where he was shot and killed by a former patient November 28

**Knute Andreas Kyvig**, Poulsbo, Wash. College of Physicians and Surgeons of San Francisco 1905, aged 74, died, October 27

**John William MacMullen**, South Mountain Pa., College of Physicians and Surgeons, Baltimore, 1904 member of the Medical Society of the State of Pennsylvania served with the American Expeditionary Forces in France during World War I, chief of the state tuberculosis clinic at Harrisburg from 1907 to 1934, aged 63, since 1934 senior resident physician on the staff of the Pennsylvania State Sanatorium number 1, where he died, November 17 of cardiovascular disease

**Jerry James McFarland**, Lebanon, Tenn. Vanderbilt University School of Medicine Nashville, 1893, member of the Tennessee State Medical Association, formerly bank president, aged 71, on the staff of the McFarland Hospital where he died, November 11, of myocarditis and hypertrophy of the prostate

**William Rennie McKinnon**, Detroit University of Michigan Medical School, Ann Arbor 1918 aged 57 on the staff of the Highland Park (Mich.) General Hospital where he died, November 23 of cardiorenal vascular disease

**Arnold Edwards Mulford**, Bridgehampton N. Y. University of Georgia Medical Department Augusta 1915 aged 56, died, October 26

**Deo Clifton Munger**, Ellsworth, Wis., Rush Medical College, Chicago, 1888, aged 79, died October 24

**Henry H. Nast**, Los Angeles University of Denver Medical Department, 1897, aged 83, died November 3, of coronary thrombosis and arteriosclerosis

**Norman Pearson**, Pontiac Ill. Northwestern University Medical School, Chicago, 1901 aged 64 died, November 19 in a hospital at Peoria of bronchopneumonia

**John Joseph Price**, Oliphant, Pa., Baltimore Medical College 1896 member of the Medical Society of the State of Pennsylvania served during World War I, aged 68, died, October 28 in Wilkes-Barre

**Lucien Henry Arthur Ranger**, Montreal Que. Canada Laval University Faculty of Medicine Quebec 1919, served during World War I, on the staff of the Hospital Ste. Jeanne d'Arc aged 49, died, November 14

**Alexander H. Redding**, Cedar Falls N. C., College of Physicians and Surgeons, Baltimore, 1887, member of the Medical Society of the State of North Carolina aged 85, died, November 16, of heart disease

**Henry David Reed** \* Pottstown Pa. Jefferson Medical College of Philadelphia, 1903, past president of the Montgomery County Medical Society, recently a member of draft board number 9, on the staff of the Pottstown Hospital aged 62, died, November 17, of coronary occlusion

**Harry Campbell Reynolds** \* Passaic, N. J., New York Homeopathic Medical College and Hospital, New York, 1899 served in France as a major in the medical corps of the U. S. Army during World War I, fellow of the American College of Surgeons, recently became a director of the city's emergency hospital service, in charge of organizing medical and nursing units, aged 67, member of the board of governors and on the staff of the Passaic General Hospital, where he died, November 21, of pneumonia

**Peter Anthony Ritchie Jr.**, North Little Rock, Ark. University of Arkansas School of Medicine, Little Rock, 1940 aged 27, died, November 10 in a hospital at Little Rock as the result of a fall when pushed from an automobile while trying to detain a drunken driver

**John Morrow Robb**, Blind River, Ont., Canada, University of Toronto Faculty of Medicine 1903, first elected to legislature of Ontario for constituency of Algoma in 1915, reelected in 1926 and in 1929, minister of health, province of Ontario, from 1930 to 1934 and minister of labor in 1934, built and equipped own private hospital at Blind River, aged 66, died, December 11

**Charles Henry Robbins**, Altadena, Calif., Baltimore Medical College 1895, aged 73, died, September 9, of myocarditis due to chronic nephritis

**James F. Rupe**, Smithville, Mo., Emsworth Medical College, St. Joseph 1886 member of the Missouri State Medical Association, aged 79, died, November 7, in the Trinity Lutheran Hospital Kansas City, of uremia

**Charles Frederick Seafers**, Palestine, Texas, Kentucky School of Medicine, Louisville 1897, served as a medical examiner on the Jefferson County draft board during World War I, formerly member of the school board of Port Arthur, superintendent of St. Mary's Hospital, Gates Memorial, Port Arthur, from 1911 to 1917, aged 70, died November 16, of coronary occlusion

**Eloise Augusta Sears**, Boston, Boston University School of Medicine, 1888, aged 88 died November 5

**Clarence Mars Selfridge**, Oakland, Calif. Hahnemann Medical College and Hospital of Philadelphia, 1887, aged 82, died September 11, of bronchopneumonia

**Harsh Hyman Shiell**, Los Angeles Detroit College of Medicine and Surgery, 1916 aged 53 died November 9, of a cerebral vascular stroke due to hypertensive heart disease

**John Spicer**, Goldsboro N. C. Bellevue Hospital Medical College New York, 1889 aged 72 died, November 15, in Winston Salem of pulmonary thrombosis

**Henry Storgaard**, Seattle Chicago Hospital College of Medicine 1916 formerly assistant surgeon in the U. S. Public Health Service Reserve, assistant health officer of King County, aged 49 died November 7

**Charles Mathias Tinsman**, Adm. Calif., College of Physicians and Surgeons Keokuk Iowa 1898 at one time associated with the Indian Service, aged 76, died, November 6

**William Arthur Trevena**, Ocala, Tenn. Atlanta (Ga.) School of Medicine 1911, served as a member of the county court and of the county school board for many years, aged 61, died November 14 in the Newell and Newell Sanatorium Chattanooga of intestinal obstruction following an old appendicitis operation

**Harry Abram Walker** \* Somerville, Mass. Cornell University Medical College, New York, 1905, served during World War I, on the staff of the Somerville Hospital, aged 61, died October 30

**James Edward Wallace** \* Biloxi Miss. Medical Department of Tulane University of Louisiana New Orleans, 1909, served as a captain in the medical corps of the U. S. Army during World War I, on the staff of the New Biloxi Hospital, aged 62, died, October 28

**Harold Homer Webb** \* Ottumwa, Iowa, University of Maryland School of Medicine Baltimore 1912 specialist certified by the American Board of Radiology, Inc., member of the Radiological Society of North America, Inc. and the American College of Radiology, on the staffs of the Ottumwa Hospital, St. Joseph Hospital and the Sunnyslope Sanatorium, aged 52, died, November 4

#### DIED WHILE IN MILITARY SERVICE

**Cyrus Cathey Brown** \* Medical Inspector Commander, U. S. Navy San Diego Calif., Johns Hopkins University School of Medicine Baltimore, 1912, U. S. Naval Medical School, Washington, D. C., 1921 entered the medical corps of the U. S. Navy Jan. 6 1921, aged 56 died, November 9 at the Naval Air Station Dutch Harbor, Alaska, of acute enteric tuberculosis and hypernephroma of the right kidney

**John Richard Hatfield** Orlando Fla. University of Tennessee College of Medicine Memphis, 1935 member of the Florida Medical Association, entered the Army of the United States as a first lieutenant Jan. 7, 1941 and was stationed at Fort Jackson S. C. until May 5 1942, was a major with the Johns Hopkins unit at the time of his death somewhere in the Pacific, October 22, of coronary thrombosis aged 38

## Bureau of Investigation

### STIPULATIONS

#### Agreements Between Federal Trade Commission and Promoters of Various Products

The following items are abstracts of stipulations in which promoters of "patent medicines," medical devices and cosmetics have cooperated with the Federal Trade Commission to the extent of agreeing to discontinue certain misrepresentations in their advertising. These stipulations differ from the "Cease and Desist Orders" of the Commission in that such orders definitely direct the discontinuance of misrepresentations. The abstracts that follow are presented primarily to illustrate the effects of the provisions of the Wheeler-Lea Amendment to the Federal Trade Commission Act on the promotion of such products.

**Elip**—This preparation contained potassium bitartrate, sulfur and emodin according to the Federal Trade Commission, with which agency Edmond W. Caforio trading as Hempstead Selipon Company, Hempstead, N. Y., signed a stipulation in August 1942. In this Caforio agreed to discontinue the following misrepresentations: that Elip is a harmless remedy or cure for hemorrhoids or will dry them up; cause the suffering that attends hemorrhoids to cease or relieve itching, inflammation or bleeding caused by this condition; Caforio further agreed to discontinue any advertisements which did not reveal that the product should not be used when the patient suffers from stomach ache, cramps, colic, nausea, vomiting or other symptoms of appendicitis, provided however that the advertisements need contain only the statement: "Caution: Use only as directed when directions on the label include a warning to the same effect."

**Giolamo Pagliano Syrup**—In a stipulation signed in August 1942 with the Federal Trade Commission, the Alpinol Corporation, New York, agreed to cease making these misrepresentations for their product: that it has a purifying effect on the blood or bodily humors, eliminates noxious substances, is a remedy or cure for any disease or possesses any therapeutic value except as a cathartic. Further, they agreed to discontinue any advertisements which did not clearly reveal that this syrup should not be used when abdominal pain, nausea, vomiting or other symptoms of appendicitis are present and that its frequent or continued use may result in dependence on laxatives, provided however that it would be sufficient for the advertisements to state: "Caution: Use only as directed if the directions for use on the label contain a warning to the same effect."

**Isidore Rosen, Distributor of Cosmetics of Various Manufacturers**—Under the name of Howard Wig Company, located in New York, Rosen sells hair goods, toilet preparations and related products, some of which are mentioned below. In October 1942, Rosen stipulated with the Federal Trade Commission that he would discontinue making the following misrepresentations: that healing will be accomplished by use of Nadine Flesh Soap; that Nadinola Bleaching Cream will clear away freckles or muddy, sallow skin or is capable of whitening the skin; that High Brown Cold Cream is a skin food; that 'Overtons High Brown Bleach Ointment' is an effective treatment for pimples, blackheads, eczema or other skin diseases; that Aida Hair Pomade 'encourages the growth of hair or is a competent treatment for dandruff; that High Brown Hair Grower' will grow hair or be a competent treatment for dandruff; that Apex Hair Preparation is an effective treatment for dandruff or thin or falling hair or that Apex Pomade' is an effective treatment for short thin or falling hair, thin temples or scalp eruptions, generally.

Rosen further agreed to cease representing that 'Mme. C. J. Walkers Hair Preparation', 'Mme. C. J. Walkers Tetter Salve' and 'Mme. C. J. Walkers Temple Grower' are hair growers or effective in promoting the growth of hair; that either 'Overtons High Brown Bleach Ointment' or 'New Herolin Double Strength Skin Whitener' is an effective treatment for ringworm or indicated as an application for all cases of ringworm, generally, unless in connection with such representation and in equally conspicuous type, it shall be made clear that the effectiveness of such application is limited to that of temporarily affording relief from the symptoms thereof.

**Kitfab**—This was put out by one Anna Plotz, Chicago, and consisted of an iodine salve according to the Federal Trade Commission, with which Miss Plotz signed a stipulation in August 1942. In this she agreed to cease representing that her product is a cure or competent treatment for scrofula or goiter, generally, or any kind of goiter other than the simple type resulting from iodine deficiency. She further agreed to cease making representations which attribute to her product any action on goiter, scrofula or conditions similar to them in excess of what it actually possesses.

**Prunlax**—In September 1942, the Adams Laboratories, Inc., St. Louis, stipulated with the Federal Trade Commission that it would discontinue these misrepresentations in its advertising: that Prunlax is a remedy or cure for constipation, aids in toning up the liver or the kidneys or is effective in the treatment or prevention of backaches, headaches, biliousness, colds and swollen joints; that it renews or strengthens lost energy and keeps children full of energy; arrests colitis or the formation of

hemorrhoids or fissures; or that prune juice is the basis of this preparation. The concern further stipulated that it would cease representing through the use of the brand name 'Prunlax' or with other words or pictorial representations that its product derives its laxative properties from prunes and agreed to stop using the word 'Laboratories' in connection with its business when it does not own, control or direct a laboratory where research work is conducted in connection with manufacturing this nostrum. The concern further agreed to discontinue any advertisements which represented that Prunlax is safe to use or which failed to warn that it should not be used when abdominal pain, nausea or other symptoms of appendicitis are present and that the frequent and continued use thereof may result in dependence on laxatives. It was permitted however to limit these warnings to the statement: "Caution: Use only as directed if the label contained directions for use which included this warning."

**Red Hearts**—That this product would restore youthful vigor or sex vitality or act as an aphrodisiac or stimulant were misrepresentations which the Reese Chemical Company, Cleveland, agreed to discontinue according to a stipulation which they signed with the Federal Trade Commission in August 1942. In March 1936, this concern was prosecuted and fined in a district federal court for violating the Pure Food and Drugs Act in selling two products, one of which was 'Red Heart Blood Tab' under false and fraudulent claims. In this connection, government chemists reported that the Blood Tabs were pills coated with sugar and lime carbonate and containing chiefly an iron compound, small amounts of zinc phosphide and plant extractives including nuttallia, capsicum and an emodin bearing drug.

**Speedo Headache Powders**—These are a product of the Standard Sales Company, Birmingham, Ala., which concern in October 1942 stipulated with the Federal Trade Commission that it would discontinue the following misrepresentations: that these powders will have any effect on colds in excess of such relief as they may afford for the pain and discomfort of head colds; that they will eliminate remedy or cure head colds, minor muscular aches, simple neuralgia or jittery nerves; that they are a stimulant or contain special ingredients that dissolve in a hurry or that they are safe to use. The concern further agreed to discontinue any advertisements which did not clearly reveal that these powders should not be used in excess of the recommended dosage since such use might cause dependence on the drug, skin eruptions, mental derangement or collapse and that they should not be taken by or administered to children. It was provided however, that it would be sufficient for such advertisements simply to state: "Caution: Use only as directed if and when a warning to the same effect appears with the directions on the labeling."

**Sphinx (Dr.) Sarsaparilla and Iron with Iodide Potash**—This nostrum was the subject of a stipulation signed with the Federal Trade Commission in September 1942 by C. E. Prescott, trading as Prescott Drug Company, Memphis, Tenn. In this he agreed to cease representing that his product is an effective treatment for bad blood, rheumatism, malaria, general run-down condition or stomach trouble and cleanses the blood, liver and kidneys. He further agreed to cease representing by the use of the prefix 'Dr.' in the brand name that his product is made or offered for sale by a doctor of medicine and to stop using the word 'Sarsaparilla' to refer to any preparation which does not contain sarsaparilla in sufficient quantity to possess therapeutic value. Further, Prescott agreed to discontinue any advertisements which did not reveal that his preparation should not be used by persons suffering from tuberculosis or thyroid diseases or when abdominal pains, nausea or other symptoms of appendicitis are present, provided however that such advertisements need contain only the statement: "Caution: Use only as directed if the directions for use on the label contain a warning to the same effect."

**Sulfo Bath**—That this gives relief from nervousness, colds, insomnia, eczema, hives or poison ivy, is health giving, provides radiant health, imparts energy or has any effect on rheumatism, neuritis, sciatica, arthritis or lumbago except to relieve their accompanying pains were misrepresentations to be discontinued in the advertising according to a stipulation which B. G. Pratt Company, New York, signed with the Federal Trade Commission in October 1942. This concern further agreed to cease representing that 'Sulfo Bath' by causing the skin to absorb sulfur would give one a healthy or beautiful complexion or correct the conditions which cause dandruff, itching, scalp falling hair, skin troubles and severe cases of athlete's foot.

**T Lax**—This product was the subject of a stipulation made in September 1942 between the T. Lax Products Company, Birmingham, Ala., and the Federal Trade Commission. In this the concern agreed to cease representing that its product can be relied on to bring about or maintain good health; that it is effective in treating stomach, liver or kidney disorders, indigestion, biliousness or similar ailments; that it will act as a laxative or have any effect on the liver or act as a diuretic or aid to the kidneys or that it will remove the poisonous accumulation from the blood stream or is different from all other products sold for the same purpose. The company further stipulated that it would discontinue any advertisements which represented that T. Lax is in all cases safe or harmless or which did not warn that it should not be used when abdominal pains, nausea, vomiting or other symptoms of appendicitis are present, provided however that such advertisements need contain only the statement: "Caution: Use only as directed when the same warning appears in the directions for use on the label."

**Vaseline Hair Tonic**—In September 1942, the Chesebrough Manufacturing Company, Consolidated and the McCann-Erickson, Inc., advertising agency, both of New York, stipulated with the Federal Trade Commission that they would cease representing that this preparation prevents or tends to prevent the recurrence of dandruff, scales, affects the cause of dry scalp or goes to the root of that disorder.



## Correspondence

### THE FIRST CARDIAC CLINIC

*To the Editor*—On Oct 7, 1942 Mary E Wadley died in Albany, N Y, in the fulness of her 90 years. Her passing off the scene ought not to fail of being recorded. In the history of the development of interest in cardiac diseases Miss Wadley played an important even if not a conspicuous part. She was the first one to recognize the fact that cardiac patients were receiving less care than they deserve or than it was possible to give to them. Miss Wadley was head of the Social Service Department of the Bellevue Hospital in New York City. What she did was to create for the Bellevue Hospital Social Service a cardiac clinic for working adults. She saw the need and stimulated Dr Hubert V Guile to undertake the creation of the Friday evening clinic. The movement which she brought into being can most fittingly be described in her own words in a letter written by her on Feb 9 1938:

"It is quite true," she tells me, "that the initial move in establishing this clinic belongs to Bellevue Social Service. Scores of cardiacs discharged from the wards were referred to Social Service for convalescent care and for assistance in finding suitable employment. This we could do, but continued medical oversight was imperative if they were to carry on. For most of them this oversight was obtainable only in the day clinics, and day clinics and jobs were incompatible. The situation was most distressing to patients, to physicians and to the hospital. We social workers knew that the solution for a large proportion of cases could be found in a special evening clinic, but there was prejudice against evening clinics. Dr Hubert Guile was deeply interested in these cases and he agreed to give his time to directing an evening clinic if the hospital authorities would consent to the innovation. They did consent to it as an experiment [A Survey of the Bellevue Experiment in Preventive Work for 'Cardiacs' by Katharine Tyng, in *Bellevue and Allied Hospitals Social Service Reports 1910-1914* is available at the New York Academy of Medicine]. This was in 1911, and there has practically been no Friday evening at Bellevue since then without a Cardiac Clinic Session. We chose Friday for the clinic as that would give the patient a two day rest, if needed, with the loss of only half a working day, and he could be back on the job Monday morning before a new worker could replace him. Our Social Service Committee was greatly interested and contributed the salary of a full time special worker. After devoting his time for several years to this clinic, Dr Guile felt he must retire. He had interested many young physicians in the opportunity the clinic afforded for an intensive study of heart disease. Dr John Wyckoff had been one of the most interested assistants and he was persuaded to take Dr Guile's place. He threw himself into the further development of the work with great zeal and was influential in the establishment of many similar evening clinics elsewhere."

In order to complete the record, it is desirable to quote the course of subsequent events:

"There is good evidence that with this account of the role played by the Social Service in this movement Wyckoff would wholeheartedly have agreed. He insisted on designating this clinic 'Bellevue Hospital Social Service Cardiac Clinic for Working Adults' for this was the title of the clinic when it was turned over to him in 1919 by Dr Guile. In his plan of organization the Social Service was the center to which all action moved and to which all action returned. In 1925 when he described the organization of cardiac clinics to the Medical Society of the State of New York ['The first clinic in this country for ambulatory cardiacs was established in 1911 by Dr Hubert V Guile in Bellevue Hospital. It was begun

because the Social Service Department of the Hospital felt that the number of returns of cardiac patients to the wards could be diminished if the patients could, on discharge, be cared for in a clinic less crowded than the General Medical Clinic, and manned by physicians who would have time to become interested in the special problems of the heart patient," *New York State J Med* 25 996, 1925] the position of the Social Service at the center of things was conspicuously indicated. And he repeated these statements in 1929:

"The first cardiac clinic in the United States as a matter of fact was organized at Bellevue Hospital in 1911 by Dr H V Guile at the request of Miss Wadley, the head of the Social Service Department, who felt the pressing need for the medical supervision of the ambulatory cardiac. In 1919 I took over this clinic, having during the preceding eight years worked in it at various times [A Consideration of Causes of Heart Disease from the Standpoint of a Social Worker, *Hosp Social Service* 19 514, 1929]." John Wyckoff, 1881-1937, by Alfred E Cohn *Bulletin of the Institute of the History of Medicine* 6, No 7 [July] 1938)

One of the pitics in recording the lives of persons and the history of movements is frequently the paucity of information that is available. But in this instance by good chance the beginning is known of an important matter. The care of patients suffering from cardiac diseases moved through Miss Wadley's insight and interest, into a new era. If there were cardiac clinics at all or cardiac clinics having a purpose such as this one before the one at Bellevue Hospital it is unknown to us. And so both to record the beginning of a valuable movement as well as to commemorate the name of Mary E Wadley a distinguished worker in this vineyard of the Lord it is gratifying to record this piece of history.

ALFRED E COHN, M.D. New York

Member, Rockefeller Institute for Medical Research,  
Chairman, Committee on Research

### "WAR AND THE SPREAD OF EPIDEMIC DISEASES"

*To the Editor*—No doubt you recall your editorial entitled 'War and the Spread of Epidemic Diseases' in *THE JOURNAL* Aug 2, 1941, page 368. This was written in view of reports in regard to plague.

Because of certain recent positive findings of plague in rodents and their accompanying insects in Marin County, across the Bay from San Francisco, the question of reported plague was investigated. From the *Public Health Reports* of the United States Public Health Service for the last six months April to October 1942 and the reports of the California State Board of Health, January to November 1942 plague has been demonstrated in rodents and their accompanying insects in twenty counties of California but not in San Francisco. Likewise it has been reported from the territory of Hawaii and the states of Montana, Nevada, Idaho and Oregon. Plague was demonstrated in these communities in fleas, lice and ticks and in tissue organs of ground squirrel, rat pack rat, wood rat, brush rabbit, chipmunk and marmot.

This should demonstrate the magnitude of the problem of rodent plague, which happily is not being transmitted to human beings at the present time. The possibilities of transmission, however from rodents and their accompanying insects in rural areas to the rodents and their accompanying insects particularly rats and fleas in cities has many dangerous angles.

J C GEIGER, M.D. San Francisco

Director of Public Health



## EPIDEMIC KERATOCONJUNCTIVITIS

To the Editor —Among some of the growing problems which have confronted both health officers and industrial physicians in the country during the past year has been that of epidemic keratoconjunctivitis, called by some "shipyard conjunctivitis." The disease is apparently new to this country, but it has appeared in epidemic form both on the West Coast and in the East (and perhaps elsewhere) during the short space of a few months. During this period, however, much has been learned, to which recent articles testify (Hogran, M. J., and Crawford, J. W. Epidemic Keratoconjunctivitis, *War Med* 2 984 [Nov] 1942; Sanders, Murray. Epidemic Keratoconjunctivitis, *Arch Ophth* 28 581 [Oct] 1942. Isolation of a Virus of Epidemic Keratoconjunctivitis, Current Comment, *THE JOURNAL*, Oct 17, 1942, p 538). This information is not general as yet and apparently epidemic situations can develop insidiously in factories before the nature of the conjunctivitis in its potential seriousness is recognized.

To my knowledge the disease is not reportable in this country, and because of this and other obvious reasons it seems wise to bring it to the attention of *THE JOURNAL*. It is earnestly requested that if new outbreaks, or suspected outbreaks, of this disease (epidemic keratoconjunctivitis) should occur, notification of this fact be made to Dr. Murray Sanders (Department of Bacteriology, College of Physicians and Surgeons 630 West 168th Street, New York City).

Dr. Sanders has been assigned by the Board for the Investigation of Epidemic Diseases in the U. S. Army to study this problem and to assist in the control of this disease.

JOHN R. PAUL, M.D.

Director, Commission on Neurotropic Virus Diseases,  
Board for the Investigation and Control of Influenza  
and Other Epidemic Diseases in the Army

THE RETAN TECHNIC OF  
SPINAL DRAINAGE

To the Editor —The editorial on forced spinal drainage in acute poliomyelitis in *THE JOURNAL*, September 26, should be corrected in the part describing my technic. Your description is erroneous. It begins with the statement "Since then the suggested technic has been simplified by Retan, who reported equally beneficial effects on omitting the accompanying lumbar or cistern puncture." The treatment period is of five hours instead of eight. The suggested rate of injection of the hypotonic salt solution is 10 cc per pound hourly, never giving over a liter an hour and reducing the rate of injection during the last two hours of treatment, also decreasing the rate of injection if the blood pressure rises. Free drainage of cerebrospinal fluid is never allowed for fear of cerebellar herniation. The technic in relation to drainage of cerebrospinal fluid follows: At one half hour intervals the nurse in charge of the case should remove the stylet from the needle and allow 5 cc of cerebrospinal fluid to drain if the fluid flows from the needle in a stream, if it flows in a rapid drop, she is to remove 2 cc, if in a slow drop she is to replace the stylet in the needle without removing any fluid. It has been shown that the drainage of cerebrospinal fluid is not related to the therapeutic result. These small amounts of cerebrospinal fluid are removed to prevent possible increase in intracranial pressure.

GEORGE M. RETAN, M.D., Syracuse, N. Y.

## Medical Examinations and Licensure

## COMING EXAMINATIONS AND MEETINGS

ANNUAL CONGRESS ON MEDICAL EDUCATION AND LICENSURE  
CHICAGO Feb 13-16 1943. Sec. Council on Medical Education and Hospitals Dr. H. G. Weiskotten 555 North Dearborn Street Chicago

## BOARDS OF MEDICAL EXAMINERS

## BOARDS OF EXAMINERS IN THE BASIC SCIENCES

Examinations of boards of medical examiners and boards of examiners in the basic sciences were published in *THE JOURNAL* Dec 26 page 1422

## NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS Parts I and II Various centers Jan 20-22 and March 1-3 Part III Chicago Jan 5-7 Exec Sec Mr. Everett S. Elwood 225 S. Fifteenth St. Philadelphia

## EXAMINING BOARDS IN SPECIALTIES

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY *Written Part I* Various centers Feb 13. Candidates in military service may take Part I at their place of duty. *Oral Part II* Pittsburgh May 19-25 Sec. Dr. Paul Titus 1015 Highland Bldg. Pittsburgh

AMERICAN BOARD OF OPHTHALMOLOGY *Oral* June Sec. Dr. John Green 6830 Waterman Ave. St. Louis

AMERICAN BOARD OF OTOLARYNGOLOGY *Oral* New York May or June. Final date for filing application is March 1. Sec. Dr. Dean M. Lierle 1500 Medical Arts Bldg. Omaha, Neb.

AMERICAN BOARD OF PEDIATRICS Starting July 1 1943 Group I will be abolished. Sec. Dr. C. A. Aldrich 707 Fullerton Ave. Chicago

AMERICAN BOARD OF PSYCHIATRY & NEUROLOGY Detroit prior to the meeting of the American Psychiatric Association. Final date for filing application is March 1. Sec. Dr. Walter Freeman 1028 Connecticut Ave. N.W. Washington D. C.

AMERICAN BOARD OF SURGERY Part I March 4. Final date for filing application is Jan 25. Sec. Dr. J. Stewart Rodman 225 S. Fifteenth St. Philadelphia

AMERICAN BOARD OF UROLOGY Chicago Feb 12-14. Sec. Dr. Gilbert J. Thomas 1409 Willow St. Minneapolis

## Wyoming October Report

The Wyoming State Board of Medical Examiners reports the written examination for medical licensure held at Cheyenne, Oct 5, 1942. Six candidates were examined, all of whom passed. The following schools were represented:

School	PASSED	Year Grad	Number Passed
University of California Medical School		(1929)	1
Johns Hopkins University School of Medicine		(1930)	1
St. Louis University School of Medicine		(1940)	1
Columbia University College of Physicians and Surgeons		(1939)	1
University of Oklahoma School of Medicine		(1914)	1
Osteopath *			1

\* Examined in surgery only

## New York Endorsement Report

The New York State Board of Medical Examiners reports 81 physicians licensed to practice medicine by endorsement from June 1 through July 26, 1942. The following schools were represented:

School	LICENSED BY ENDORSEMENT	Year Endorsement Grad	of
Leland Stanford Junior University School of Medicine	(1914)	California	
University of Southern California College of Medicine	(1902)	California	
University of Southern California School of Medicine	(1938)	California	
George Washington University School of Medicine	(1929)	Penna	
(1940) N. B. M. Ex.			
Georgetown University School of Medicine	(1941) 2	N. B. M. Ex.	
University of Illinois College of Medicine	(1941) N. B. M. Ex.		
Johns Hopkins University School of Medicine	(1933) N. B. M. Ex.		
(1938) Maryland			
University of Maryland School of Medicine and College of Physicians and Surgeons	(1938) (1940) 2	Maryland	
Harvard Medical School	(1935) (1939) (1940) N	B. M. Ex.	
Tufts College Medical School	(1938) N	B. M. Ex.	
University of Michigan Medical School	(1925) (1939)	Michigan	
University of Minnesota Medical School	(1932) N	B. M. Ex.	
Albany Medical College	(1939) (1940) 2	(1941) 4	N. B. M. Ex.
Columbia University College of Physicians and Surgeons	(1938) (1939)	(1940) N	B. M. Ex.
Cornell University Medical College	(1939)	(1940) N	B. M. Ex.
Long Island College of Medicine	(1939) 2	(1941) N	B. M. Ex.
New York Medical College Flower and Fifth Avenue Hospitals	(1937) (1940) 4	(1941) 3	N. B. M. Ex.
New York University College of Medicine	(1939) 2		
(1941) 2	N. B. M. Ex.		
Syracuse University College of Medicine	(1940)	(1941) N	B. M. Ex.
University of Buffalo School of Medicine	(1939)		
(1940) 3 (1941) 9	N. B. M. Ex.		
University of Rochester School of Medicine and Dentistry		(1940) N	B. M. Ex.

Duke University School of Medicine	(1939) N B M Ex
University of Cincinnati College of Medicine	(1939) N B M Ex
University of Oregon Medical School	(1937) Oregon
Hahnemann Medical College and Hospital of Phila	(1934) Penna
Jefferson Medical College of Philadelphia	(1916) W Virginia
Temple University School of Medicine	(1936) N B M Ex
University of Pennsylvania School of Medicine	(1927) Penna
(1933) Louisiana	
Woman's Medical College of Pennsylvania	(1907) Penna
University of Vermont College of Medicine	(1940) N B M Ex
Medical College of Virginia	(1940) Virginia
Karl Franzens Universität Medizinische Fakultät Graz	(1938) N B M Ex
Medizinische Fakultät der Universität Wien	(1926) N B M Ex
Université de Paris Faculté de Médecine	(1936) (1940) N B M Ex
American University of Beirut School of Medicine	(1941)
(1942) N B M Ex	

## Bureau of Legal Medicine and Legislation

### MEDICOLEGAL ABSTRACTS

**Autopsies Right of Employer's Insurance Carrier to Require Autopsy on Body of Employee**—Simpkins had been employed by the Jones Construction Company, but prior to actually assuming the duties of employment he died of a heart attack. Following the death, the defendant, the insurance carrier of the employer, with the permission of the industrial commission of South Carolina, had an autopsy performed on the body. Subsequently the plaintiff, the deceased's wife, sued the insurance carrier to recover damages for the performance of the autopsy. She alleged that she had neither filed nor intended to file a claim under the workmen's compensation act and that the autopsy was performed against her will and with no notice to her or any hearing whatever. The defendant demurred on two grounds: (1) that the plaintiff was not the proper party to maintain the suit, and (2) that the autopsy was authorized by the workmen's compensation act of South Carolina. The trial court overruled the first ground of demurrer but sustained the second ground and the plaintiff appealed to the Supreme Court of South Carolina. The Supreme Court adopted in toto the opinion of the trial court, and it was published as the opinion of the Supreme Court.

With respect to the first ground of demurrer the trial court held that in the absence of testamentary disposition, the surviving spouse if living with the decedent at the time of death is the proper party to maintain an action based on the mutilation of a corpse. If there is no surviving spouse the court said, then the next of kin would be the proper party to maintain such a suit. But here the plaintiff, being the surviving wife of the deceased, is the proper person to maintain the action, and the first ground of demurrer interposed by the defendant was overruled.

As to the second ground of demurrer the widow argued first that the fact that the deceased had not actually commenced work under his contract of employment precluded the application to this case of section 27 of the workmen's compensation act which provides that the employer or the industrial commission, shall have the right in the case of death to require an autopsy. The court concluded, however, that that provision was applicable and that the mere fact of a hiring or of a contract for employment makes it applicable even though there had been no assumption of the duties of employment by the employee. The widow next argued in effect, that the workmen's compensation act was inapplicable as granting authority for an autopsy because she had neither filed any claim under the act nor intended to file any. The act, however, said the court, does not require an employer to wait until the claimant has filed with the commission a written claim for compensation before making his demand for a physical examination of the claimant. Such requirement would defeat the purpose of such examination. The employer is entitled to know the condition of the claimant at the time of the injury. He may take steps to minimize the effects of the

injury and thus reduce his liability. To say that the claimant may delay the physical examination for so long a time after the injury as he wishes is to put it in his power to defeat the benefit to the employer of such examination. Accordingly, continued the court, the filing of a claim or the indication of the filing of a claim has no bearing on the operation of the act. The widow then argued that the autopsy was performed at the instance of the insurance carrier rather than of the employer. In answer the court pointed out that an insurer certainly stands in the shoes of its insured employer, having his rights and being subject to his obligations.

The widow contended that since the deceased died as the result of a heart attack, not as the result of an industrial accident the right to an autopsy conferred by the act on the employer or on the industrial commission did not apply. We cannot, said the court, impose the restriction on the act contended for. The language of the act is plain and unambiguous. The act confers the right to an autopsy "in any case of death" of an employee. There is no specification as to the nature of the deaths to which the autopsy right applies. It was undoubtedly realized in the enactment of this law that there are and always will be deaths to employees which present a borderline between accidental and natural origins.

In the complaint the widow alleged that she had objected to and refused to consent to the autopsy, that she was not given an opportunity to be heard by any judicial or quasi-judicial body that there was no hearing by such body or as required by law and that the autopsy was had by a request, without notice to her, to the secretary of the industrial commission, without a hearing before the commission or an order of the commission therefor. These facts, she claimed, indicated a high-handed illegal and unlawful autopsy in violation of her rights. But said the court the provision in question provides:

The employer shall have the right to require an autopsy. It does not state "may", it does not qualify, it is unequivocally mandatory. There are no provisions relating to notice consent or objections. The statute specifically provides that the employer, or the Industrial Commission, shall have the right to require the autopsy. There is no ambiguity. We are not at liberty to insert any requirements as to consent or notice regardless of whether or not we think such requirements advisable. Accordingly the court held, in effect, that because of the provisions of the workmen's compensation act the insurer had a right to require an autopsy and that an autopsy so performed was not in contravention to any rights of the widow. The judgment in favor of the insurance company was affirmed.—*Simpkins v. Lumbermens Mutual Casualty Co.*, 20 S. E. (2d) 733 (S. C. 1942).

## Society Proceedings

### COMING MEETINGS

Annual Congress on Industrial Health Chicago Jan 11-13 Dr Carl M Peterson, 535 North Dearborn St., Chicago, Secretary.  
Annual Congress on Medical Education and Licensure Chicago Feb 15-16 Dr H. G. Wiskotten, 535 North Dearborn St., Secretary.

American Academy of Orthopedic Surgeons Chicago Jan 17-21 Dr Myron O. Henry, 825 Nicollet Ave., Minneapolis, Acting Secretary.  
Annual Forum on Allergy Cleveland Jan 9-10 Dr Jonathan Forman, 956 Bryden Road, Columbus, Ohio.

Clinical Orthopedic Society Chicago Jan 18-21 Dr Myron O. Henry, 825 Nicollet Ave., Minneapolis, Secretary.

Eastern Section American Laryngological, Rhinological and Otolological Society Hartford Conn Jan 15 Dr Edward J. Whirlen, 750 Main St., Hartford, Conn., Chairman.

Middle Section American Laryngological, Rhinological and Otolological Society Detroit Jan 20 Dr Voss Harrell, 2539 Woodward Ave., Detroit, Chairman.

Southern Section American Laryngological, Rhinological and Otolological Society Chattanooga Tenn Jan 28 Dr Francis B. Blackmar, 1301 Broadway, Columbus, Ohio, Chairman.

Western Section American Laryngological, Rhinological and Otolological Society, Portland Ore Jan 31 Dr Irving M. Lupton, 1020 S.W. Taylor St., Portland Ore, Chairman.

## Current Medical Literature

### AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1932 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (\*) are abstracted below.

#### American J Obstetrics and Gynecology, St Louis 44 553 742 (Oct) 1942 Partial Index

- Uterian Obstetrics. Plan Promoting Efficiency to the Obstetrician and Service to the Patient. J. A. Bartholomew. Atlanta. Gr—p 553.
- Detailed Technique of Modified Local Anesthesia for Cesarean Section. A. C. Beck. Brooklyn—p 558.
- \*Etiologic and Pathologic Factors in Series of 1741 Fibromyomas of Uterus. R. Torpin, L. Pund and W. J. Peoples. Augusta. Gr—p 569.
- Anencephalus (with Acute Hydranmios) Diagnosed by X-Ray. W. R. Payne and H. G. Blind. Newport News. Va—p 593.
- \*Changes in Female Genital Tract During Puerperium Induced by Sex Hormone Therapy. R. N. Rutherford. Seattle—p 595.
- Clinical Experiments in Relation to Excretion of Estrogens. II. Functional Flowing Urinary Estrogens Before, During and After Progesterone. I. Striol and Cyclic Administration of Progesterone and Estradiol Benzoate. G. Van S. Smith, O. W. Smith and Sara Schiller. Brookline. Mass—p 606.
- Glomerular Filtration and Renal Blood Flow in Hypertensive Woman and in Post-Toxicemic Hypertension. C. E. Robinson, L. V. Dill, J. F. Cadden and C. E. Isenhour. New York—p 616.
- \*Spontaneous Abortion and Its Treatment with Progesterone. L. W. Mason. Denver—p 630.
- Uses and Abuses of Radiation Therapy in Obstetrics and Gynecology. H. F. Trout. New York—p 635.
- Nutrition Study in Pregnancy. Food Habits of 514 Pregnant Women. P. F. Williams and Florence C. Truitt. Philadelphia—p 647.
- Sexual Libido in the Female. R. B. Greenblatt, F. Mortara and R. Torpin. Augusta. Gr—p 658.
- Electroencephalogram in Pregnancy. F. A. Gibbs and D. E. Reid. Boston—p 672.
- Convulsions Following Intravenous Administration of Pituitary Extract. C. L. Sullivan and R. J. Heffernan. Boston—p 675.
- Treatment of Pelvic Inflammatory Disease with Intradermal Administration of Bacillus Coli Vaccine. Supplementary Report. E. G. Krieg. Detroit—p 681.
- Estrogen Withdrawal Bleeding. Study of Comparative Activity of Various Estrogens. S. D. Soule. St. Louis—p 684.
- Colostrum Test for Pregnancy in Prenatal Clinic. M. Pulver and L. B. Posner. New York—p 690.
- Artificial Pyrexia in Four Pregnant Women. W. F. Mengert and W. D. Paul. Iowa City—p 702.
- Allergic Shock Caused by Synapoidin. E. W. Phillips. Phoenix. Ariz—p 706.

**Fibromyomas of Uterus.**—Of the 1,741 fibromyomas that Torpin and his colleagues report on, 575 were in white and 1,166 in Negro women from 17 to 76 years of age. In the majority of the patients the tumors were multiple. In 301 white women the tumors were smaller than 5 cm in diameter and 197 had tumors larger than 5 cm, 302 Negro women had tumors smaller than 5 cm while in 586 they were larger. Not only were the Negro women affected three and one third times as often as white women, but they also had one and a half times the incidence of the larger tumors. As regards pelvic infection, 93 of the 575 white women had salpingitis, while it was present in 633 Negro women, that is in 54 per cent of the 1,166. Forty per cent of all patients operated on for chronic salpingitis had fibromyomas. In the 575 white women 67 follicular and 43 luteal cysts were found, among the Negro women there were 225 follicular and 117 luteal cysts. Adenomyosis occurred in 21 white and in 18 Negro women. Necrosis was found in 45 white and in 190 Negro women. The incidence of necrosis was not greater in the earlier reports when operations were deferred longer than in recent years. Likewise calcification was more frequent in the Negro women. Pure myomas were found in 11 white and in 37 Negro patients. In addition to the follicular and corpus luteum cysts there were 11 cystadenomas in the white patients, in 3 they were malignant. Twelve such cysts, 5 of which were malignant occurred in the Negro women. Dermoid cysts of the ovaries occurred in nearly 1 per cent of the white patients (5 cases) and in 2 2/3 per cent of the

Negro women (26 cases). A comparison of the endometrial changes in 100 fibromyomatous uteri and in 100 nonfibromyomatous uteri revealed that 20 per cent of the fibromyomatous uteri in white women and 10 per cent of those in Negro women were hyperplastic. For the nonfibromyomatous uteri (removed for chronic salpingitis or for bleeding late in the reproductive life associated with chronic cervicitis) the respective figures were about 15 and 20 per cent. This definitely indicates that there is no special association of endometrial hyperplasia with fibromyomas.

**Changes in Female Genital Tract.**—The changes in three groups of 12 patients (normal postpartum puerperas, normal postpartum women given 10 mg of diethylstilbestrol for twelve days and normal postpartum women given 10 mg of methyl testosterone for twelve days) were studied by Rutherford by endometrial biopsy and vaginal smear. The endometria and vaginal smears of the patients treated with the synthetic preparations demonstrated definite variations from the normal processes of involution repair and regeneration. Involution was delayed by the diethylstilbestrol but not by methyl testosterone, but repair was hastened by the one and definitely retarded by the other. Regeneration, that is, covering of the surface epithelium, was hastened by the diethylstilbestrol but stromal regeneration was delayed. The methyl testosterone delayed regeneration. The effects of diethylstilbestrol were no longer present after one week and the effects of methyl testosterone three weeks after their withdrawal.

**Spontaneous Abortion.**—Mason discusses the nineteen abortions that occurred among three hundred and eleven consecutive pregnancies cared for by him in private practice. Six of the abortions occurred in 2 patients, who had three each. This incidence of 6 per cent is considerably less than is generally reported. All the women were in comfortable circumstances, usually reported early for antepartum care, had adequate diets and received thyroid or iodine if it was indicated by a basal metabolism test or the history, and foci of infection were cared for as soon as possible. If 50 to 80 per cent of abortions are pathologic and if the chief cause is defective germ plasm, somatic factors should play no part. However, if the maternal environment is a major etiologic factor a comfortable life and preventive treatment ought to make considerable difference. The low abortion rate in the present series, together with an apparent considerable success in the treatment of abortion in these women, would seem to lend confirmatory evidence to the latter view. Among the series of pregnancies, thirty-four 'threatened' abortions were treated. In 30, or 82 per cent, the abortion did not occur and the patients were carried to term. Four aborted in spite of treatment, but 1 of these went to term in her next pregnancy, prophylactic treatment was begun shortly after the first missed menstrual period. The other 3 of the 4 were lost sight of. In addition there were 17 patients who were treated prophylactically from the beginning of their pregnancies. These patients gave a history of having had one to three previous consecutive abortions. Of these 17 patients, 15 were carried to term the first time such prophylactic treatment was given. All gave birth to normal babies, who continued to develop normally thereafter. The two failures are represented by the 2 patients who figured in six of the total nineteen abortions. In addition to all other measures which constitute good antepartum care the only other agent used in the treatment was progesterone (proluton). Morphine was not used. The progesterone was given in 5 mg doses (intramuscularly in oil) to patients with threatened abortion. If the symptoms were slight, this dose was given once a day but, if the symptoms were more severe, 5 mg was given twice a day for several days. When cramps and/or bleeding ceased the progesterone was not discontinued immediately, but the 5 mg dose was usually given every other day for several days. The dose was then reduced to 2 mg and continued for a week or more, then the intervals were lengthened and the injections were continued for perhaps two more weeks. Patients with a history of recurrent abortion were given progesterone therapy as soon as pregnancy was diagnosed. The patient with a history of two previous abortions and no successful pregnancy should be treated through the seventh month of pregnancy.

## Am J Roentgenol & Rad Therapy, Springfield, Ill 48 425-570 (Oct.) 1942

- Roentgen Diagnosis and Treatment of Primary Pulmonary Neoplasm G W Holmes Boston—p 425
- Lymphosarcoma with Special Reference to Reticulum Cell Type E L Jenkinson R E Kinzer and W H Brown Chicago—p 433
- Value of Roentgen Therapeutic Test Dose in Differential Diagnosis of Mediastinal Tumors L Reynolds and T Leucutia Detroit—p 440
- \*Roentgen Therapy of Pituitary Adenomas H D Kerr and W K Cooper Iowa City—p 467
- Radiation Treatment of Cerebellar Medulloblastoma Report of Thirty One Cases E P Pendergrass P J Hodess and E W Godfrey Philadelphia—p 476
- Low Back Pain Resulting from Arthritis and Subluxations of Apophyseal Joints and Fractures of Articular Facets of Lumbar Spine W C Scott St Louis—p 491
- Spontaneous Pneumomediastinum (Mediastinal Emphysema) D S Kellogg El Paso Texas—p 510
- \*Patella Cubiti Report of Four Cases J E Habbe Milwaukee—p 513
- Problem of Tubal Sphincter and of Intramural Portion of Fallopian Tube P Schneider New York—p 527

**Roentgen Therapy of Pituitary Adenoma**—Kerr and Cooper have observed 25 patients from a year to ten years or until death after they were given roentgen therapy for their pituitary adenoma. The results in 14 of the 25 are considered excellent, good in 5 and poor in 6. Twenty two of the 25 were given irradiation alone and 2 who first received roentgen therapy and failed to benefit were later found to have cystic tumors. The poor response of these 2 demonstrates the inadequacy of roentgen therapy for this type of tumor. The chief criteria for judging progression or regression of the disease are the visual field changes and loss of headache. Success or failure must be judged not on survivals but on preservation or restoration of vision and the general well being of the patient. Irradiation appears to do this, especially if relatively heavy doses are employed. However, if the disease progresses during three to four months after roentgen therapy, surgical exploration should be carried out because the tumor is likely to be cystic. The relatively large doses employed by the authors resulted in untoward effects only once. The patient had arteriosclerosis and hypertension, and mental deterioration developed. These changes they attribute to the effects of irradiation on arterio-sclerotic cerebral vessels associated with hypertension.

**Patella Cubiti**—Habbe reports 4 cases of patella cubiti each of which occurred as a unilateral abnormality. In the third case trauma was the chief if not the only etiologic factor, the abnormality, in a patient aged 15, was found about five weeks after trauma. This condition was followed for six months, when a relatively mature state of patella cubiti was present. In the first case there was a definite history of trauma to the right elbow when the patient was 14, the only recalled diagnosis was that of 'fracture'. It was supposed that an avulsion of the olecranon epiphysis occurred together with periosteal stripping on the proximal diaphysis of the shaft by the mechanism of muscle pull, which was then followed by closure of the epiphysis and new bone formation along the distal projection. The minor trauma which occurred at 22 brought the patella cubiti to light and had no bearing on the development of the bony abnormality and apparently none on the immediate or subsequent functional status of the elbow joint. The second and fourth cases are similar as regards the history of a childhood trauma occurring at or about the time the olecranon epiphysis begins to ossify. However, the fourth patient had a relatively satisfactory clinical recovery without benefit of examination or treatment. While an etiologic relationship between childhood trauma and the formation of the patella was obtainable there may still be some doubt as to trauma being the only etiologic factor. The similarity of the so called epiphysitis in other regions, from the standpoint both of normal growth of these secondary epiphyses and of their roentgen appearance in the presence of a growth disturbance, is emphasized. In true patella cubiti any traumatic factor to be significant in the development of the condition must occur in childhood or adolescence. Hence trauma occurring in an adult employee who shows such an abnormality is not a causative factor in its appearance and the misinterpretation of fracture or 'pathologic fracture' should not be made.

## Archives of Ophthalmology, Chicago 28 767 958 (Nov.) 1942

- Nature Scope and Significance of Anisometropia W B Lancaster Hanover N H—p 767
- Eye Dominance Its Nature and Treatment I S Wile New York—p 780
- Neuropsychiatric Geriatrics H W Woltman Rochester Minn—p 791
- Simple Posterior Sclerotomy and Sclerectomy Adjunct to Operations for Glaucoma S A Fox New York—p 802
- Modification of Dickey Operation for Ptosis S R Gifford and I Puntenney Chicago—p 814
- Cyclic Oculomotor Paralysis (Spasmus Mobilis Oculomotorius) O Iowenstein and I Givner New York—p 821
- Binocular Vision Normal and Abnormal H Werner Northville Mich—p 834
- Use Abuse Theory of Changes in Refraction versus Biologic Theory I V I Brown Chicago—p 845
- Color Discrimination in Industry J Tiffin Lafayette Ind and H S Kuhn Hammond Ind—p 851
- Ancient Medical Jurisprudence with Special Reference to Eye B L Gordon Atlantic City N J—p 860
- Transplantation of Superior Oblique Muscle for Oculomotor Nerve Palsy S R Gifford Chicago—p 892
- \*Retinopathy in Juvenile Diabetes Mellitus F J Bloch New York—p 891
- Articles of Steel Within Globe of Eye Cause Damage Prevention Technique of Removal and Results I D Gulliver New York—p 896
- Irregular and Multiple Homonymous Visual Field Defects M B Bender and I S Wechsler New York—p 904
- Recent Contributions to Localization of Vision in Central Nervous System Marion Hines Baltimore—p 913

**Retinopathy in Juvenile Diabetes**—Bloch reports 2 cases of retinal changes in juvenile diabetes in which there was no renal pathologic change or abnormal blood pressure. A number of cases in the literature suggest that diabetes itself may produce the disease known as diabetic retinitis or diabetic retinopathy. The author believes that the controversial question as to whether diabetic retinopathy proper or the retinal changes are secondary to hypertension or arteriosclerosis can be decided on the following three bases. Clinical observation will show that there is a difference between the decided changes in the fundus in diabetes in arteriosclerosis and in hypertension especially with reference to the optic nerve and the macular region. Study at necropsy of the pathologic changes in eyes from persons known to have had diabetes may reveal that the retinal changes developed independently (Koyama). Also information will be obtained from study of the retinal changes in diabetic persons especially young patients whose renal and blood vascular systems are normal. Many of the previous case reports are valueless because description is lacking.

## Archives of Pathology, Chicago 34 791 936 (Nov.) 1942

- Spontaneous Coccidioid Granuloma in Tissues of Wild Rodents I I Ashburn and C W Emmons Bethesda Md
- Reduction of Pulmonary Resistance to Infection by Circulating Toxins D H Sprunt and W Camaleri Jr Durham N C—p 801
- Elastic Tissue I Description of Method for Isolation of Elastic Tissue C M Hays New York—p 807
- Heart Weight I Weight of Normal Human Heart Pearl M Zeek Cincinnati—p 820
- Papillary Cystadenoma Lymphomatous M Lederer and D M Gravel Brooklyn—p 813
- Pancreoduodenal Cystostomy and Experimental Production of Gallstone H G Aronson Chicago—p 843
- \*Sudden Death Following Injection of Foreign Protein B M Vance and C Strassmann New York—p 849
- Bilateral Cortical Necrosis of Kidney Report of Two Cases W H Sheldon and A T Hertig Boston—p 866
- Relationship of Heart Size to Cholesterol Content in Experimental Atherosclerosis of Rabbit M Hurwitz and I Friedberg Chicago—p 875
- Experimental Studies in Cardiovascular Pathology VI Pectin Atherosclerosis and Thrombosis in Rabbits and in Dogs W C Hueper New York—p 883
- Effects of Radiation on Normal Tissues S Warren Boston—p 917

**Death from Foreign Protein**—Vance and Strassmann found in the office of the chief medical examiner of the city of New York reports of 7 instances of sudden death following injection of foreign protein. They have correlated these cases with 19 similar cases reported in the literature in which necropsies were also made. Five of the seven sudden deaths were of persons presumably nonasthmatic. They died after injections of antivenom. The other 2 were known to have bronchial asthma; they died after injections of foreign protein. At

necropsy there were pronounced inflation of the lungs and signs of asphyxia due to bronchial spasm in all the patients. The brain of 2 was edematous and under compression. In 2 there was edema of the submucous layer of the upper portion of the trachea. Microscopic study of 6 demonstrated varying numbers of eosinophilic leukocytes in the bronchial wall, suggesting that the reactions were hypersensitive in nature. Of the 19 patients who were the subjects of the reports in the literature 13 were presumably nonasthmatic and 6 were known to have asthma. Six of the 18 nonasthmatic patients had received injections of antivenom or some other foreign protein from six to fourteen days to a number of years prior to the one causing death. The remaining 12 had received only the one injection. The product injected immediately preceding the onset of the fatal symptoms was some derivative of horse serum in 17 and a typhoid vaccine in 1. It appeared that the greater the amount of protein administered the more rapid was the fatal reaction. Ten patients, 7 of whom were children, had difficulty in breathing soon after the injection and died within ten minutes. Death was due to asphyxia caused by muscular spasm of the smaller bronchi. The death of 4 occurred in twenty to seventy minutes; the symptoms began soon after the injection or after twenty to thirty minutes. The symptoms were asthmatic in type, and the lungs at necropsy were inflated. Four patients lived for several hours after the fatal injection of horse serum. Four of the 8 asthmatic patients received horse serum derivatives, 2 pollen extract, 1 a mixture of silkworm, sheep's wool and kapok and 1 guinea pig serum. Six of these patients had not received any previous injections of protein and 2 had had regular injections of pollen extract. The symptoms at the time of death were typical of an asthmatic attack and at necropsy the lungs were inflated. The duration of the clinical course in these 8 cases varied from five to forty five minutes.

### Arkansas Medical Society Journal, Fort Smith

39 129-156 (Nov.) 1942

- Importance of Spas in Military and Defense Program W S McClellan  
Saratoga Springs N Y—p 129  
Arterio sclerotic Heart Disease J A Compton Little Rock—p 136

### Bulletin of Johns Hopkins Hospital, Baltimore

71 191-252 (Oct.) 1942

- Successful Construction of an Extrathoracic Esophagus J S Davis  
and E S Stafford Baltimore—p 191  
Comparative Activity of Sulfonamide Against Coliform Bacteria in  
Intestines of Mice H J White Baltimore—p 213  
Myocardial Necrosis in Rat on Potassium Low Diet Prevented by  
Thiamine Deficiency R H Folles Jr Baltimore—p 235  
Note on Absence of Syphilitic Peigin and Antigenic Substance in Urine  
V Scott Baltimore—p 242

### Bulletin of Los Angeles Neurological Society

7 107-156 (Sept.) 1942

- Cranial Injuries of the Pre-Columbian Incas with Comments on Their  
Mechanism Effects and Lethality C B Courville Los Angeles and  
K H Abbott—p 107  
Quadrilateral Space of Marie J M Nielsen and A P Friedman  
Los Angeles—p 131  
Hemorrhages into Lateral Basal Ganglionic Region Their Relationship  
to Recovery from Cerebral Apoplexy C B Courville and A P Friedman  
Los Angeles—p 137

### California and Western Medicine, San Francisco

57 227-282 (Oct.) 1942

- Objectives of Institutes on Wartime Industrial Health R T Legge  
Berkeley—p 233  
Industrial Hygiene in War Production J J Bloomfield Washington  
D C—p 233  
Industry's Manpower Its Conservation C P McCord Detroit—p 237  
San Francisco Management Looks at Industrial Health F P Foise  
San Francisco—p 238  
Los Angeles Management Looks at Industrial Health A R Nabors  
Los Angeles—p 239  
San Diego Management Looks at Industrial Health W F Persons  
San Diego—p 241  
Physicians' Legal Responsibilities in Industrial Medicine C H Fry  
San Francisco—p 242  
Problems in Industrial Surgery N J Howard San Francisco—p 242  
Industrial Injuries Their Surgical Management B M Frees Los  
Angeles—p 243

### Cancer Research, Baltimore

2 739-810 (Nov.) 1942

- B Vitamins in Cancerous Tissues I Riboflavin M A Pollack  
A Taylor Jean Taylor and R J Williams Austin Texas—p 79  
Id II Nicotinic Acid A Taylor M A Pollack Margaret Jane Hofer  
and R J Williams Austin Texas—p 744  
Id III Biotin M A Pollack A Taylor Alethea Woods R C  
Thompson and R J Williams Austin Texas—p 748  
Id IV Pantothenic Acid A Taylor M A Pollack Margaret Jane  
Hofer and R J Williams Austin Texas—p 752  
Possible Types of Mammary Gland Tumors in Mice J J Bittner Bar  
Harbor Maine—p 755  
Morphology and Development of Testicular Tumors in Mice of a Strain  
Receiving Estrogens C W Hooker and C A Pfeiffer New Haven  
Conn—p 759  
Relation of Diet to Development of Gastric Lesions in Rat K Sugiyama  
New York—p 770  
Studies on Rous Sarcoma Cells Cultivated in Vitro I Cellular Com-  
position of Pure Cultures of Rous Sarcoma Cells L Doljanskii  
and E Tenenbaum Jerusalem Palestine—p 776  
Further Experiments on Extraction of Carcinogenic Factor from Human  
Cancerous Tissues J F Menke San Francisco—p 786  
Effect of a Estradiol Benzoyl on Response of CH1 Mice to 20 Methyl  
cholanthrene A Segaloff Detroit—p 794  
Phospholipids of Tumor Cells and Nuclei Frances L Haven and Sylvia  
R Levy Rochester N Y—p 797

### Connecticut State Medical Journal, Hartford

6 839-910 (Nov.) 1942

- \*Prevalence of Sporotrichosis in Connecticut Review of Three Cases  
and Report of New Case E C Weise Bridgeport—p 841  
Physical Therapy in Medical Practice F H Krusen Rochester Minn  
—p 848  
Medical Social Work One of Many Resources Available to the Physi-  
cian Edith M Baker Washington D C—p 853  
The Antisocial Child J M Cunningham Hartford—p 856  
Cyclic Changes in Human Vaginal Epithelium Preliminary Report  
L Newton Bridgeport—p 862  
Chemical Casualties H W Haggard New Haven—p 864

**Prevalence of Sporotrichosis**—Weise reports his third case of sporotrichosis, the fourth to occur in Connecticut. The disease may be mistaken for syphilis, as the ulceronodular and gummatous lesions may bear a close similarity to cutaneous gummas. Certain types of cutaneous tuberculosis and, at times, low grade streptococcal lymphangitis may be imitated. The general practitioner should consider it as a possible diagnosis in obscure ulcerative ulceronodular and gummatous conditions particularly when the lymph nodes appear to be involved. Cultures from areas which have broken through the skin either will not reveal the fungus or they will be grossly contaminated with staphylococci and other organisms. Pure cultures can almost invariably be obtained by utilizing previously unopened lesions. The 3 other culturally proved cases of sporotrichosis which have occurred in Connecticut are reviewed. The physician should familiarize himself with the various manifestations of the disease so that its true incidence may be ascertained and its otherwise prolonged period of disability avoided by appropriate management.

### Florida Medical Association Journal, Jacksonville

29 153 196 (Oct.) 1942

- Burns Various Types Treatment and Prognosis from Military as Well  
as Civilian Viewpoint R S Widmeyer Jacksonville—p 165  
Endocrinology and Metabolism Excerpts from Current Studies in  
Endocrinology and Metabolism A J Bicker St Petersburg—p 169  
Management of Duodenal Ulcer J E Vaines Jr Gainesville—p 171  
Treatment of Bacillus Pyocyanus Infection of Cornea with Sulfon-  
amides H D Solomon St Petersburg—p 174  
Abnormal Electrocardiograms M S Saslaw Coral Gables and K A  
Brewer Oklahoma City—p 175

### Georgia Medical Association Journal, Atlanta

31 381-408 (Oct.) 1942

- New Syndrome of Nocturnal Frequency Due to Endocrine Imbalance  
R B Greenblatt Augusta—p 381  
Incidence and Management of Carcinoma of Prostate Gland E G  
Ballenger and H P McDonald Atlanta—p 383  
Crawford Williamson Long (1815-1878) T J Collier Atlanta—p 387  
Primary Pneumococcal Peritonitis Report of Case W W Bradley  
Macon—p 392  
Parietitis Nodosa Report of Case Diagnosed Ante Mortem I P  
Wolff Atlanta—p 394

## Illinois Medical Journal, Chicago

82 241-324 (Oct.) 1942

- Surgery of Biliary Tract V S Counsellor Rochester Minn.—p 257  
 Improved Methods in Diagnosis and Treatment of Protozoan Infections of Intestine A A Knight Chicago—p 263  
 Observations on Psychosomatic Treatment of Peptic Ulcer in Women D W Propst Chicago—p 267  
 Health Planning J H Beard Urbana—p 269  
 Engines of the Body F G Norbury Jacksonville—p 274  
 Comments on Allergy R G Mills Decatur—p 278  
 Male Climacteric C H Boswell Rockford—p 280  
 Prize for Good Health Extending 4 H Principles to Adolescent Youth M L Blatt Chicago—p 282  
 Some Visual Problems in Modern Industry H S Kuhn, Hammond Ind.—p 286  
 Graduate Education in Neuropsychiatry Proposal for Chicago Plan R R Grinker Chicago—p 289  
 \*Treatment of Hereditary Glaucoma W G Ackerman and T D Allen Chicago—p 295  
 Subdural Hematoma P C Bucy Chicago—p 300  
 Differential Diagnosis and Surgical Care of Jaundiced Patients C B Puestow Chicago—p 311

**Treatment of Hereditary Glaucoma**—Ackerman and Allen diagnosed hereditary glaucoma in 6 of 14 descendants of the originally affected member representing three generations. The average age at onset of all 7 affected members was 11.6 years with a span from 7 to 15 years. There was no tendency to anticipation. There was difficulty in controlling the condition with miotics and surgery. A single goniotomy was effective in controlling the tension in four eyes. Two goniotomies were required to control the tension in three eyes, and in an eighth eye an iridencleisis was finally required to control the tension after five goniotomies, two cyclodialyses and a deep root iridectomy failed. From the results in the 7 cases it appeared that although miotics by themselves were relatively ineffective in controlling the tension before surgery they may aid to maintain the lowered tension following surgery. The finding of glaucoma at an early age is an indication to search for a tendency to glaucoma in every other member of the family so that it can be treated before much vision is lost.

## Journal of Aviation Medicine, St Paul

13 161-232 (Sept.) 1942

- Indoctrination of Flying Personnel in Physiologic Effects of High Altitude Flying and Need for and Use of Oxygen L D Carson Washington D C—p 162  
 \*Erythrocytes and Hemoglobin Values in Acclimatization Produced by Discontinuous Anoxia J C Stickney and E J Van Lierc Morgantown W Va—p 170  
 Studies on Effects of Adding Carbon Dioxide to Oxygen Enriched Atmospheres in Low Pressure Chambers II Oxygen and Carbon Dioxide Tensions of Cerebral Blood H Hummel J Fuzekas H Herrlich A L Johnson Albany N Y and A L Barach, New York—p 177  
 Influence of Certain Antimalarials and Related Agents on Fetal Effects of Anoxia E J Van Lierc and G A Emerson Morgantown, W Va—p 182  
 Effect of Preoxygenation on Newborn Rats Exposed to Simulated Altitude of 55,000 Feet (Barometric Pressure of 67.8 mm Hg) Preliminary Report A L Barach N Molomut and S Landy, New York—p 190  
 Color and Composition of Light in Relation to Blackout C E Ferree and G Rand Baltimore—p 193  
 Color and Color Perception A J Herbolsheimer Washington D C—p 201  
 Clinical Test for Dark Adaptation V P Flynn Pasadena Calif—p 216  
 Observations on Pilots of Eastern Air Lines H K Edwards Miami, Fla—p 219

**Erythrocytes and Hemoglobin Values and Acclimatization to Discontinuous Anoxia**—Aviators are subjected to discontinuous anoxia, as they spend but relatively short periods aloft. Stickney and Van Lierc tried to determine in dogs how long it would take for distinctive signs of acclimatization to develop in an animal subjected to a given degree of anoxia for a certain period each day. The dogs were placed daily (except on Sunday) in a low pressure chamber in which various altitudes were simulated. Hemoglobin and erythrocyte determinations were usually made every week. At or after the third week the hemoglobin values rose, subsequently rising more or less uniformly until discontinuous exposure to anoxia was terminated. A distinct increase in the erythrocyte count did not occur before the fifth week, and thereafter it was practically uniform throughout the six months of discontinuous anoxia. Following the period of the anoxia the hemoglobin and erythrocyte values

decreased uniformly to the original values in about eight to nine weeks, respectively. The original levels were attained as though there had been an overshooting of the mark. The plotting of the color index shows that the hemoglobin values tended to increase faster than the erythrocyte values until exposure to the simulated 18,000 feet had well begun, when there was a greater gain in erythrocytes. This was indicated by the reduction in the color index. This reversal was fairly constant throughout the rest of the anoxia period, and before the values returned to normal the color index tended to be even lower before it finally regained its initial value. The erythrocyte count was increased 84 per cent by the end of the sixteenth week after exposure to a simulated altitude of 18,000 feet. Acclimatization apparently does follow discontinuous exposure to anoxia, the degree being directly proportionate to the severity of the anoxia and the length of exposure.

## Journal of Bone and Joint Surgery, Boston

24 739 1012 (Oct.) 1942 Partial Index

- \*Wounds in Modern War J A MacFarlane Toronto Canada—p 739  
 Primary Genetic Dysplasia of Hip With and Without Classic Dislocation V I Hart Minneapolis—p 753  
 Repair of Complete Acromioclavicular Dislocation Utilizing Short Head of Biceps J Vargas Rio de Janeiro Brazil—p 772  
 Spastic Scoliosis and Obliquity of Ilium S L Harris San Francisco—p 774  
 \*Influence of Sodium Beta Glycerol Phosphate on Healing of Experimental Fractures I Sperling W D Armstrong and S Litow Minneapolis—p 781  
 \*Immersion Foot D R Webster F M Woolhouse and I L Johnston Halifax N S Canada—p 785  
 Localized Fibrocystic Disease of Bone Results of Treatment in 152 Cases R H Alldridge New Orleans—p 795  
 Arthroplasty for Congenital Dislocation of Hip Late Follow Up Report P C Colonna Philadelphia—p 812  
 Etiology of Aseptic Necrosis of Head of Femur After Transcervical Fracture I I Campbell Chicago and C Wallace Rochester Minn—p 831  
 Obturator Sign and Interest Roentgenography in Diagnosis of Septic Arthritis and Tuberculosis of Hip H W Heffle and V C Turner Milwaukee—p 857  
 Contributory Clinical Observations on Infantile Paralysis and Their Therapeutic Implications A Steindler Iowa City—p 912  
 Local Application of Sulfonamides to Synovial Surfaces L M Dick and H C Phelan Red Bank N J—p 937

**Wounds of Modern Warfare**—MacFarlane declares that for the wounds of modern mobile warfare it is of the greatest importance to evacuate the wounded by air or, failing this, to bring early surgery to the patient, that is, mobile medical units. The closed plaster treatment permits safe transportation over long distances without the necessity of changing dressings. Patients who had debridement and plaster fixation travel well and look fit on arrival. Furthermore, continued closed plaster treatment at the base hospital seems to be the method of choice. In Canadian hospitals the method is to be adopted as routine treatment. Experience in England and in Libya shows that war wounds should not be sutured. Sulfanilamide as a prophylactic measure is not sufficient to prevent gas gangrene and other infection in the contaminated wound. The author knows of no prophylactic against gas forming organisms other than early removal of devitalized muscle. With debridement and local chemotherapy he has not seen increased healing or lessening of infection as compared to similar surgical treatment without chemotherapy. On the other hand, sulfonamides given by mouth after injury may decrease the incidence of severe streptococcal infection, particularly when there is delay in reaching an organized operating center. The application of sulfonamides to superficial wounds, particularly burns, is of undoubted value, but their routine use in deep penetrating wounds does not lessen the urgency for surgical treatment.

**Sodium-Beta-Glycerol-Phosphate for Healing Fracture**—Sperling and his associates investigated the effect of intravenous injections of sodium beta-glycerol phosphate on the rate that fresh experimental fractures in rabbits healed. Twenty-seven animals received six to fourteen daily injections, by ear vein, of 0.1 Gm of the drug in 4 cc of solution. Twenty-two control animals with similar fractures were given injections of isotonic solution of sodium chloride. All rabbits were killed the day following the last injection. Roentgenograms of the limbs were taken before and after soft tissue was removed from them, they revealed an increase in callus about the fracture site.



in the group treated with sodium-beta glycerol-phosphate. Also the callus was more firm to palpation than that of the control animals. Healing appeared to have progressed further than in the control animals, the callus was larger, the fracture defect was more nearly bridged over and much more callus was adherent to the periosteum.

**Immersion Foot**—Webster and his associates have observed 142 cases of "immersion foot," a condition produced by long immersion of the feet in cold water. As the condition may occur in feet exposed for long periods in subtropical waters, it cannot be classed as true frostbite. Almost all of the cases were the result of enemy action in the North Atlantic. The feet when the patients were removed from the open lifeboats or rafts on which they had been for varying periods were cold, swollen and very white, with scattered cyanotic areas. The patients complained that their feet felt heavy "woody" and numb. The feet were anesthetic to pain, touch and temperature. Soon after the patients were removed from their craft the swelling increased rapidly, the feet became red, hyperemic and hot without sweating, and the pulse in the vessels of the feet was full and bounding. The mitral anesthesia and hypesthesia were replaced by intense paresthesia on the eighth to the tenth day after removal from the traumatizing agent. A trial of treating the feet by dry refrigeration was made at Camp Hill Hospital, Halifax, N. S. With the feet elevated, dry cooling and refrigeration were achieved by the application of ice bags (changed every four hours), dry cooling by exposure to a fan and dry cooling at room temperature. A few hours after the ice bags were applied the patients were completely comfortable, the edema subsided and blebs filled with straw-colored fluid and those filled with extravasated blood were resorbed without breaking. The blebs refilled if cooling was discontinued prematurely. The 127 patients with minimal, mild and moderate involvement, with 1 exception recovered completely after superficial desquamation over the entire foot and reeducation necessitated by an abnormal gait. Their average hospital stay was thirty and four-tenths days. Of the 15 patients with severe involvement 7 have been discharged after the loss of small areas of superficial tissue which healed rapidly and did not require grafting. Of the 8 still confined to the hospital, 5 have gross tissue defects across the mid dorsum of both feet, in 2 the superficial skin over the distal aspect of both feet has become mummified but is being shed and replaced by healthy tissue with epithelial islands throughout and in 1, to whose feet ice bags were applied for four weeks, the tissues of the feet had a healthy pink color, but in eight hours at room temperature a large quantity of blood was extravasated into the subcutaneous tissues. The feet became greenish gray, and a sharp line of demarcation between healthy and damaged tissue encircled the midtarsal region of both feet and tissue breakdown occurred. This will probably progress ultimately to extensive tissue loss over the distal aspect of both feet. The rationale of the treatment rested on the presumption that if the metabolic demands of the part could be reduced until the edema subsided, the extravasated blood resorbed and the vasomotor tone reestablished the tissue damage would be greatly ameliorated. Strict asepsis is essential because if infection develops in the damaged tissue the process spreads rapidly through all layers of the feet.

### Journal of Experimental Medicine, New York

76 317-400 (Oct.) 1942

- Effects of Excess Dietary Cystic Acid, dl Methionine and Taurine on Rat Liver. D. P. Earle, Jr., Katharine Smull and J. Victor. New York—p. 317.
- Studies on Eastern Equine Encephalomyelitis. VI. Facilitation of Infection in Mouse. L. S. King. New Haven, Conn.—p. 325.
- Formation of Antibodies in Popliteal Lymph Node in Rabbits. W. E. Ehrlich and T. N. Harris. Philadelphia—p. 335.
- Simultaneous Renal and Hepatic Excretion of Water, Cyanol and Azofuchsins in Rabbits. W. E. Ehrlich. Philadelphia—p. 349.
- Induced Resistance of Central Nervous System to Experimental Infection with Equine Encephalomyelitis Virus. I. Neutralizing Antibody in Central Nervous System in Relation to Cerebral Resistance. Isabel M. Morgan, R. W. Schlesinger and P. K. Olitsky, New York—p. 357.
- Control of Renal Excretion of Water. I. Effect of Variations in State of Hydration on Water Excretion in Dogs with Diabetes Insipidus. J. A. Shannon. New York—p. 371.
- Id. II. Rate of Liberation of Posterior Pituitary Antidiuretic Hormone in Dog. J. A. Shannon. New York—p. 387.

### Journal of Investigative Dermatology, Baltimore

5 207-282 (Oct.) 1942

- Relationship Between Certain Physicochemical Changes in Cornified Layer and Endogenous Bacterial Flora of Skin. L. Arnold. Chicago—p. 207.
- Studies in Abnormal Human Sensitivity to Light. II. Light Sensitivity in Prurigo Aestivalis, Eczema Solare and Urticaria. Photogenica Report of Experiments. S. Epstein. Marshfield, Wis.—p. 225.
- Studies of Transmissibility of Syphilis. Role of Syphilitic Woman as Passive Carrier. H. Pariser. Philadelphia—p. 243.
- Removal of Divalent Cations from Solution by Beef Heart Antigens. L. F. Pierce. Los Angeles and E. L. Breazeale. Tucson, Ariz.—p. 249.
- Experimental Cutaneous Reactions of American Blastomycosis in Guinea Pig. L. M. Nelson. Minneapolis—p. 257.
- \*Problem of Treatment Resistant Syphilis. Further Studies on Treatment Resistant Strain of Spirocheta Pallida. H. Beerman and Marie Severac. Philadelphia—p. 269.

**Treatment Resistant Syphilis**—Beerman and Severac began in 1932 to investigate the problem of treatment resistant syphilis in rabbits. The resistant strain of *Treponema pallidum* was isolated from a patient whose primary and secondary lesions remained uninfluenced by a total of 54 Gm of various arsenicals but whose infection was later satisfactorily controlled by the prolonged use of bismuth salts intramuscularly and intramuscular injections of boiled milk. At first, takes in rabbits with this strain were difficult to obtain, but this decreased as the number of transfers increased, and from the sixteenth to the fifty-seventh animal passage practically every inoculated rabbit became infected. The incubation period, which was variable at first, finally averaged about four weeks. The response of this strain to arsphenamine was controlled by using the Nichols-Hough strain of *Treponema pallidum* in other rabbits and by using a standard lot of the drug, the minimal sterilizing dose of which has been 14 mg per kilogram of body weight. Thirteen of 51 rabbits treated with 14 to 30 mg of arsphenamine per kilogram of body weight failed to be "cured." This refractoriness was sporadic, it was more pronounced in the beginning of the study and occurred less frequently as the strain became adapted to the new host.

### Journal of Lab and Clinical Medicine, St. Louis

28 1-126 (Oct.) 1942

- \*Heart Disease and Liver Function. M. Bernstein, E. B. LeWinn and S. Simkins. Philadelphia—p. 1.
- Simplified Bedside Test for Latent Jaundice. A. Leslie. New York—p. 6.
- Observations on Additional Instances of Supernormal Phase in Human Heart. H. B. Burchell. Rochester, Minn.—p. 7.
- Pericardiac Typhoid Prophylaxis. A. Gelpert and D. Kessler. Cincinnati—p. 11.
- Acquired Drug Resistance in Hemolytic Streptococcus. M. Cutts and A. V. Troppoli. Providence, R. I.—p. 14.
- Clinical Experiences with Modification of Takata Reaction in Blood and Cerebrospinal Fluid. H. Ucko. London, England—p. 17.
- Effect of Ascorbic Acid (Vitamin C) on Sensitivity to Salicylates in a Case of Rheumatic Fever. L. Felner. Brooklyn—p. 28.
- Effect of Trasentin, A. Trasentin and Morphine on Respiration. N. Tobolsky, D. Slaughter, T. U. Johnson and R. E. Van Duzen. Dallas, Texas—p. 31.
- Further Studies on Glucophylline. A. H. Miloney. Washington, D. C.—p. 38.
- Carcinoma of Stomach Developing in Pernicious Anemia. L. H. Bronstein. New York—p. 44.
- \*Guanidine and Its Relationship to Muscular Dystrophy. R. P. MacFate. Chicago—p. 50.
- Comparative Study of Dextrose and Dextrin Tolerance in Patients with Chronic Ulcerative Colitis. R. C. Page, Z. Bercovitz and E. J. de Beer. New York—p. 66.
- Hyperbilirubinemia Following Administration of Sulfonamides. A. Cantarow and C. W. Wirts. Philadelphia—p. 71.

**Heart Disease and Hepatic Function**—The relationship of hepatic function to heart disease, as revealed by the bromsulphalein retention test and by the measurement of the velocity of the blood flow and the venous pressure, was determined by Bernstein and his associates in 29 men and 30 women aged from 19 to 79 years. Fifteen sets of determinations were performed on 15 noncardiac patients, in 14 the bromsulphalein hepatic function test was normal, while 1 had an abnormal bromsulphalein retention without a demonstrable cause. Twelve of thirteen demonstrations in 10 patients with fully compensated heart disease showed agreement and one disagreement between the cardiac status and the hepatic function. In eleven of thirteen determinations on 10 patients with mild cardiac compensation there was agreement and in three disagree-



fourteen determinations made on 14 patients, six showed the cardiac status and the hepatic function tests to be in agreement and eight showed disagreement. In 13 patients with decided cardiac decompensation eleven of fourteen determinations showed agreement between the cardiac status and hepatic function and three showed disagreement. The results indicate that the bromsulphalein excretion is normal in the absence of heart failure, in mild degrees of cardiac failure the impairment in bromsulphalein excretion is in close parallelism with the status of the circulation, in definite pulmonary congestion the correlation of hepatic function with the circulation is frequently paradoxical and in severe cardiac failure bromsulphalein excretion is usually impaired. Although there was a tendency to parallelism between the bromsulphalein excretion and the degree of cardiac failure, the authors could not determine any mathematical correlation between the two factors.

**Guanidine and Muscular Dystrophy**—MacFate studied the effects in guinea pigs of simple guanidine salts on creatine metabolism. The daily administration for several weeks of one third to four fifths of a minimal lethal dose of a toxic guanidine salt produced metabolic and muscular structural changes similar to those found in nutritional muscular dystrophy and in progressive muscular dystrophy. A loss of creatine and phosphoric acid from the muscle and severe disturbances in carbohydrate metabolism and the electrolyte balance occurred. It is suggested that guanidine may lower the permeability of the muscle cell producing these changes. However 1 mg of aminoacetic acid per gram of body weight, administered daily appeared to afford some protection against the small daily doses of the toxic guanidine salt. Aminoacetic acid seems to delay the progress of a nutritional muscular dystrophy. The abnormal metabolism of guanidine compounds may be an etiologic factor in the production of a progressive muscular dystrophy.

### Journal-Lancet, Minneapolis

62 355 388 (Oct) 1942

- Comparative Therapeutic Value and Toxicity of Various Types of Vitamin D C Reynolds New Orleans—p 372  
Tuberculosis Control Introduction J A Myers Minneapolis—p 376  
Id Present Status of Tuberculin Test E R Long Philadelphia—p 376  
Id Testing for Tuberculosis in Kentucky L E Smith Louisville Ky—p 379  
Id Significance of Tuberculin Test L I Collins Ottawa Ill—p 380  
Id Education About Tuberculosis in Teen Age Group Educational Project in Kanawha County Schools L H Myne Charleston W Va—p 381  
Id Summary of Ten Year Mantoux Program in Rural Minnesota L S Jordan Granite Falls Minn—p 384

### Journal of Pediatrics, St Louis

21 435 568 (Oct) 1942

- Diagnosis and Management of Severe Infections in Infants and Children Review of Experiences Since Introduction of Sulfonamide Therapy I Sepsis of Lateral Sinus Phlebitis A F Hartmann Dorothy Wolff and Frances Love St Louis—p 435  
Vitamin A Absorption and Its Relation to Intestinal Motility in Fibrocystic Disease of Pancreas L J Flax Marion Barnes and J I Reichert Chicago—p 475  
Obesity in Children I P Bronstein L J Halpern and A W Brown Chicago—p 485  
\*Enterobiasis in Children Incidence Symptomatology and Diagnosis with Simplified Scotch Cellulose Tape Technique A H Jacobs San Francisco—p 497  
Bone Development in Preschool Children C L Wilbur Jr Honolulu, T H—p 504  
Tetany in Newborn Infant E L Kendig Jr Richmond Va—p 510  
Weltmann Reaction in Respiratory Diseases in Children Susan C Dees Durham N C and H Morton Saratoga Ill—p 514  
Possible Hazards of Repeated Fluoroscopies in Infants T Buschke and H M Parker Seattle—p 524

**Enterobiasis in Children**—To save time in preparing the NIH swabs and cleaning the used glass rods and also to supply an adhesive surface to which *Enterobius vermicularis* is more likely to adhere, Jacobs decided to use Scotch cellulose tape. The only materials needed for the technique are a roll of tape, wooden tongue blades and glass microscopic slides. A piece of the tape about the length of the slide is folded over one end of a tongue blade with the nonadhesive surface of the tape against the tongue blade. The ends of the tape can be held in place by the examiner's finger. This is used as an applicator and applied to the perianal folds, the pinworm eggs are picked up

by the sticky surface of the tape, which is then removed from the tongue blade and spread out, adhesive surface down, on the slide and examined directly under the low power of the microscope without the use of a coverslip. The slides can be placed in a slide box and examined at one's convenience, they may be kept for many days without any change in the appearance of the ova. In positive cases at least one of the eggs should be examined under high power. The technique was used for the diagnosis of possible enterobiasis in 228 unselected clinic children, and pinworm eggs were found in 31.3 per cent. Of the infected patients, 41.3 per cent had reported abdominal pains, 49.4 per cent were nervous, 41.4 per cent were underweight, 38.6 per cent were poor sleepers, 38.6 per cent had anorexia, 21.3 per cent had pruritus ani and 17.3 per cent had enuresis. Of the 40 infected girls, 27.5 per cent had a vaginal discharge. During the study 14 girls were seen in the clinic with vaginal discharge and 11 of them had ova of *Enterobius* in both perianal and vulvar regions.

### Journal of Thoracic Surgery, St Louis

12 1-108 (Oct) 1942

- \*Further Experiences in Surgical Treatment of Subacute Streptococcus Viridans Endarteritis Superimposed on Patent Ductus Arteriosus A S W Touroff New York—p 1  
Surgical Anatomy of Pulmonary Lobes F M Kent and B Blades St Louis—p 18  
Cardiac Arrhythmias and Other Electrocardiographic Changes During Experimental Pneumectomy H L Cabott M D Altschule and N Zameck Boston—p 31  
Bronchography Use of Modified Intranasal Method and Movable Table B A Dormer J Friedlander and M Gibson Durham Union of South Africa—p 35  
Aspiration of Lower Air Passages Following Endotracheal Anesthesia C I Bird Providence R I—p 41  
\*Experimental Pulmonary Edema Following Lobectomy and Blood Transfusion J H Gibson Jr Mary H Gibson and C W Kraul Philadelphia—p 60  
Sniff Test in Thoracic Surgery Review of One Hundred and Nine Cases of Phrenic Nerve Interruption J Greenfield Cleveland and C M Curtis Columbus—p 78  
The Drainage of Residual Tuberculous Cavities W L Rogers S J Shipman and A C Daniels San Francisco—p 89  
Acute Pulral Abscess of Lung A Hyperacute Variety H Neuhof and A S W Touroff New York—p 98

**Streptococcus Viridans Endarteritis**—During the present year Touroff has operated (ductal ligation or division) on 4 additional patients suffering from a relatively early Streptococcus viridans endarteritis superimposed on patent ductus arteriosus. Chemotherapy was given each patient prior to operation. It did not sterilize the blood stream. The operation was ductal ligation in 3 and ductal division in 1. Following operation 3 patients received no chemotherapy and 1 received 10 Gm of sulapyridine (on the twelfth postoperative day) because of continuing fever of obscure etiology. However, six postoperative blood cultures had already been reported negative before the drug was given. The 4 patients have recovered and have remained free from infection since operation. Among the author's 8 patients (4 in a previous series) 5 were cured, 2 died from accidental hemorrhage and the fact that 1 patient was not cured is ascribable to the presence of vegetation on the aortic valve at the time of operation. Thus among the 6 who survived 5 were cured. Ductal ligation or division is most likely to be attended with a low morbidity and mortality and a high incidence of cure if it is performed during the early stages of the infection. Since this article was prepared for publication the author has operated on 2 more patients, who recovered.

**Experimental Pulmonary Edema**—Recently the Gibbons and Kraul observed 2 patients who died within twelve hours of a bilateral lobectomy. Necropsies were performed on both patients, and the only significant finding was edema of the remaining lobes. To determine whether the fluids administered during and after operation were in any way responsible for the pulmonary edema, the authors performed experiments on anesthetized cats. A blood transfusion of 15 cc per kilogram of body weight was given to 6 normal cats at a constant rate over a period of half an hour. The saturation of the arterial blood with oxygen was normal before and after the transfusion, and at necropsy no pulmonary edema was evinced. In 9 animals after lobectomy a blood transfusion of 15 cc per kilogram of body weight was given. Most of the animals exhibited varying

degrees of unsaturation of the arterial blood with oxygen, and 4 of them died shortly after the transfusion was completed. The oxygen capacity of the blood was determined in 14 cats, in 11 it was increased after all the lower lobes and the right middle lobe were removed. In 2 of the 3 remaining cats with no increased capacity subsequent blood transfusion failed to produce evidence of anoxemia and in 1 a mild anoxemia appeared some time after transfusion. They conclude that a blood transfusion of a size well tolerated by normal animals may produce pulmonary edema, a decreased saturation of the arterial blood with oxygen and death.

### Journal of Urology, Baltimore

48 343 458 (Oct) 1942

- \*Clinical Perinephritis and Its Effect on Blood Pressure W T Braasch and W W Wood Jr Rochester Minn —p 343
- Skin Metastasis from Bladder Tumors R C Atkinson San Francisco —p 350
- Cutaneous Ureterostomy in Active Renal Tuberculosis F H Colby Boston —p 357
- Roentgen Therapy of Carcinoma of Urinary Bladder Analysis of Fifty Two Patients Treated with 800 K<sub>v</sub> Roentgen Therapy F Buschke and S T Cantil Seattle —p 368
- Subcapsular Cystitis of Carcinoma of Prostate L W Riba Chicago —p 384
- Some Causes of Unsatisfactory End Results After Prostatectomy G A Humphreys New York —p 388
- Dermoid Cysts of Testis M B Dockerty and J T Priestley Rochester Minn —p 392
- \*Successful Treatment of Granuloma Inguinale with Special Reference to Use of Podophyllum G C Tomskey G W Vickery and P L Getzoff New Orleans —p 401
- Priapism and Sickle Cell Anemia Report of Three Cases P L Getzoff New Orleans —p 407
- Use of Vitallium Tubes in Urinary Tract of Dog J W Lord Jr and J H Eckel New York —p 412
- Streptococcus Salivarius in Infections of Urinary Tract and Its Susceptibility to Sulfonamides E Neter and Mary Louise Short Buffalo —p 422
- \*Theory and Application of Serum Acid Phosphatase Determination in Metastasizing Prostatic Carcinoma Early Effects of Castration T J Sullivan Ethel Benedict Gutman and A B Gutman New York —p 426

**Clinical Perinephritis and Blood Pressure**—Braasch and Wood studied the records of 70 cases of perinephric abscess observed at the Mayo Clinic in the past eleven years in order to determine its effect on blood pressure. Analysis revealed that 6 patients could be classed as hypertensive because of a systolic pressure above 145 mm and a diastolic pressure above 90 mm. This is an incidence of 8.6 per cent. In 2 of the 6 conclusive evidence was present that hypertension had existed prior to the onset of the perirenal disease. In a third patient other factors apparently were operating to influence the arterial blood pressure. Thus only 3 patients remain in whom association between perinephritis and an elevated arterial blood pressure might be present, an incidence of 4.3 per cent, which is less than half of the incidence of hypertension in a random sample of patients less than 50 years of age who register at the Mayo Clinic. In the authors' opinion this is so low that it should be relegated to chance.

**Successful Treatment of Inguinal Granuloma**—The various standardized methods of treating inguinal granuloma are evaluated by Tomskey and his co workers, who present a new mode of therapy. Complete cures were obtained by 102 patients who were treated with the local application of a mixture of 20 per cent resin of podophyllum in olive oil. The mode of action of the medication awaits further investigation, but the authors believe that the drug acts as a dehydrating agent on the infected granulating tissues and that it also exerts a cauterizing effect. Other active venereal infections (syphilis, venereal lymphopathia and chancroid) were found in 55 of the patients. The patients were previously treated by various accepted methods but no cures were obtained with antimony and potassium tartrate or a combination of antimony and potassium tartrate and surgery even after from two months to almost two years of treatment and hospitalization. Patients irrespective of the type or the extent of their lesions, treated with resin of podophyllum needed considerably less hospitalization and when discharged were completely healed and have remained so. After healing, no induration, fibrosis or keloid formations were present and the skin was often soft and of normal consistency. The patients treated with resin of podophyllum were also given

antimony and potassium tartrate. Several patients were cured with resin of podophyllum alone. Not only was the average hospital stay for those patients who received resin of podophyllum about 35 per cent less but also the favorable response was more than twice that of those who were also treated with antimony and potassium tartrate. In treatment, secondary infection should be eliminated by cleansing the lesion with hydrogen peroxide and hot sitz baths twice a day. The 20 per cent resin of podophyllum in olive oil is applied to the lesion after each bath for five to seven days. Local topical analgesics are recommended for any resultant burning or pain, applied about ten minutes before the resin of podophyllum. When the exuberant granulations have disappeared and a healthy base is evident, resin of podophyllum is discontinued and scarlet red ointment is applied following each bath to stimulate epithelization. The application of resin of podophyllum to any small resistant areas should be continued if a complete cure is to be obtained.

**Theory and Application of Serum "Acid" Phosphatase**—Sullivan and the Gutmans give additional data on the use of the serum "acid" phosphatase activity as an aid in the diagnosis of metastasizing prostatic carcinoma. They base their remarks on the results obtained on 200 patients with prostate carcinoma, on 33 of whom castration was performed. The method failed, i. e., values less than 3 units per hundred cubic centimeters were obtained in approximately 15 per cent of 130 patients with definite or suggestive roentgen evidence of metastasis, the remaining 85 per cent had increases in serum "acid" phosphatase, which in extreme cases exceeded 1,000 units per hundred cubic centimeters. Approximately in 89 per cent of 70 patients without roentgen evidence of skeletal metastasis the values were less than 3 units per hundred cubic centimeters. Of a control group of 570 patients with nonprostatic disease, 90 per cent had serum "acid" phosphatase levels of less than 3 units, 7.5 per cent between 3 and 4.9 units and 2.5 per cent more than 5 units. The conclusion drawn is that the method is consistent and specific enough to be a valuable though not an infallible supplement to clinical, roentgen and other studies for the diagnosis of metastasizing prostate carcinoma. The determination has proved useful in corroborating the diagnosis of metastasizing prostatic carcinoma when suggested by other methods, providing evidence of metastasis from prostatic carcinoma before it is demonstrable roentgenographically or by other methods, determining the prostatic or nonprostatic origin of tumors in patients known to have metastasis, differentiating Paget's disease from metastatic prostatic carcinoma, aiding in the selection of patients for prostatectomy, detecting recurrence in prostatectomized patients, aiding in the selection of cases for androgen control and evaluating and regulating androgen treatment. Case reports from the authors records are cited to illustrate these applications. The important work of Huggins and his associates concerning the effects of castration is confirmed and amplified. Most of the patients showed pronounced clinical improvement following castration.

### Kansas Medical Society Journal, Topeka

43 405-440 (Oct) 1942

- Intrathoracic Goiter C W Mayo Rochester Minn —p 405
- Interrelationships Between Medicine and Psychiatry Fundamentals of Psychiatry I W C Menninger Topeka —p 407
- Medical Defense in Kansas F C Beelman Topeka —p 412
- Kenny Treatment Note on Its Use in Kansas Twenty Years Ago K A Menninger, Topeka —p 414
- Intravenous Fluids J L Lattimore Topeka —p 416

### Kentucky Medical Journal, Bowling Green

40 393 426 (Oct) 1942

- Organic Factors in Etiology of Mental Disorders A Wikler Lexington —p 399
- Report of Case of Rabies I J Hoover Owensboro —p 404
- Diagnosis and Treatment of Epidemiologically Significant Syphilis C G Baker Lexington —p 405
- Industrial Medicine Physical Examinations of Workers E H Kremer Louisville —p 414
- Id Traumatic Wounds Primary Care W Helms Louisville —p 415
- Id Compensable Injuries Control and Evaluation of Disability C L Nichols Louisville —p 419
- Syphilis Stimulating Disease of Stomach P L Dent Louisville —p 421
- Epilepsy and Dementia Precox and a Few of Its Allegory J E Pinguely Melbourne —p 422

**Medical Annals of District of Columbia, Washington**

11 375-418 (Oct.) 1942

- Use of Succinylsulfathiazole in Treatment of Amebiasis Preliminary Report F L Knotts and J L Thompson Jr Fort Belvoir Va —p 375
- Surgical Treatment of Lymphogranuloma Inguinale (Lymphopathia Venereum) of Rectum R J Coffey and L J Goffredi Washington —p 378
- \*Thorotrast Hepatosplenography as Diagnostic Aid in Solitary Liver Abscess Report of Four Cases R H Meredith L F Cooper and W M Yater Washington —p 382
- Use of Blood Plasma in Surgery C S White and J J Weinstein Washington —p 388
- Sickle Cell Anemia and Cholelithiasis Report of Case B F Schreier Washington —p 392

**Diagnosis of Liver Abscess**—In the 4 cases discussed, Meredith and his associates made the diagnosis of solitary hepatic abscess by hepatosplenography with thorium dioxide solution as a contrast medium. The precise location of the lesion served as a guide for aspiration. The method appears warranted in all cases in which the diagnosis of hepatic abscess is suspected. The possible potential danger reported by animal experimenters, from the radioactivity of the thorium that remains in the body indefinitely has not been supported by clinical experience. The microscopic study of tissue from 65 patients injected by Yater and Whitmore with thorium dioxide solution for hepatosplenography revealed no evidence of injury to the tissue or any cellular reaction ascribable to the thorium dioxide present. Furthermore, a comprehensive survey of 286 cases covering ten years of experience with the medium in hepatosplenography has revealed no evidence of immediate or remote ill effects in the patients of Yater and Coe. The remarkable point concerning this series of patients was the fact that they have lived longer than was anticipated and have been in moderately good health.

**Michigan State Medical Society Journal, Lansing**

41 813-892 (Oct.) 1942

- Infections of Pharyngomaxillary Space. H Brunner Chicago —p 841
- Shoveler's Fracture (Schipperkrankheit) C H Snyder Grand Rapids —p 847
- Needs and Possibilities of Research in Mental Disease I Kolb Washington D C —p 849
- Embolectomy of External Iliac Artery Case Report W H Marshall and E P Vary Flint —p 856
- Treatment of Typhoid Fever with Typhoid Vaccine Skin Reaction Controlled Low Dosage Method Preliminary Report K E Townsend Detroit —p 859
- Mistakes Made in Diagnosis and Estimation of Deafness D E S Wishart Toronto Ont Canada —p 861
- Some Obstetric Opinions J R McCord Atlanta Ga —p 866
- Treatment of Parkinson's Disease Comparison of Atropine Sulfate and Wines of American and Bulgarian Belladonna S S Bohn Detroit —p 871

**Military Surgeon, Washington, D C**

91 379-498 (Oct.) 1942

- The Medical Soldier and the Infantryman E E Hume —p 379
- Outbreak of Jaundice in the Army Supplement to Circular Letter No 45 —p 386
- Malignant Tumors of Skin L H Warren —p 393
- Drivers Aptitude Tests of Third Armored Division W G Reid —p 401
- Coronary Heart Disease H P Marvin —p 411
- Salvaging the Nation's Man Power Helen S Willard —p 416
- Acrylic Jacket Crown Practical Technique F W Stevens —p 418
- Deep Infections of Neck M B Stewart —p 426
- Contact Reporting in Venereal Disease Control Function of the Medical Officer F W Reynolds —p 432
- Cases Rejected for Army Service on Basis of Chest Films Alone A R Koontz —p 440
- Preliminary Study Using Short Objective Measure for Determining Mental Deficiency in Selective Service Registrants F J Koeng and J Smith —p 442
- Discussion of Chigoe (Tunga Penetrans) Based on Experiences in British Guiana C O Bruce T D Knigin and S F Yolles —p 446
- Experiences in Military Psychiatry F P Pignataro —p 453
- John Mills Browne—Surgeon General U S Navy (1888-1893) L H Roddis —p 460

**Missouri State Medical Assn Journal, St Louis**

39 333-358 (Nov.) 1942

- Surgical Lesions of Ileum A P Stout New York —p 333
- Faith Hope and Cure Ails K W Brimmer Washington D C —p 335
- Infantile Paralysis in Missouri A O Reilly St Louis —p 338
- Modern Concepts in Treatment of Burns R O Pearmain and F G Thompson Jr St Joseph —p 342

**New Jersey Medical Society Journal, Trenton**

39 517-566 (Oct.) 1942

- \*Neuroses and Psychoses in Wartime C M Trippe, Asbury Park —p 524
- Nocturnal Angina Symptom of Coronary Insufficiency B Rubin South River —p 529
- Indications for Splenectomy in Grucher Splenomegaly A O Wilensky New York —p 531
- New Use for Wangenstein Suction Drainage C R Weinberg and I L Sperling Newark —p 538

**Neuroses and Psychoses in Wartime**—Trippe states that the chief predisposing causes of neurosis and psychosis in wartime as in peacetime are neuropathic or psychopathic inheritance and a previous nervous or mental breakdown. Had the 1917-1918 induction board examiners used present day methods, three billion dollars would have been saved the United States for the care and compensation of 97,000 preventable mental casualties. Now rejected neuropsychiatric selectees are returned to their communities to share with others who are easily emotionally dislocated benefits not afforded at the battle front. The preventive measures to be constantly employed among all civilians are play work and knowledge. Recreation should not be merely a side issue. It should be constructively planned to suit each individual. Work should be of the type in which people feel they are doing something for the cause in their all out effort directed toward future peace. Knowledge is an antidote against poisoned morale and too much can never be attained especially for confidence in the body politic against the wide extent of subtle enemy propaganda. The Association for the Advancement of Psychoanalysis best sums up the attitude America must recognize. Under war conditions an increase in anxiety and tension is natural and inevitable. Unless this is realized an individual might consider himself cowardly and contemptible when he is actually sharing a common experience. If anxiety incapacitates an individual then it is most probably not associated with the war and represents a personal problem. Foolhardiness and impulsiveness are not cures for fear. Isolation and isolation from the group heighten anxiety.

**New York State Journal of Medicine, New York**

42 1887-1982 (Oct.) 1942

- Epidemiology of Diarrhea in New York City S Grant New York —p 1911
- Diarrhea from Point of View of a Physician S Kimball Buffalo —p 1915
- Significance and Interpretation of Diarrhea Encountered in Proctologic Practice M S Kleckner Allentown Pa —p 1919
- Röntgen Ray Aid in Study of Diarrhea I M Flann Rochester —p 1926
- Pathogenesis of Fetal Erythroblastosis P Levine Newark N J —p 1928
- Movements of Body Water in Relation to Anesthesia H G Barbour New Haven Conn —p 1936
- Addison's Disease in the Negro Report of Three Cases and Review of Literature J R Liss C Solomon New York and E J Gordon Washington D C —p 1948
- Modern Aspects of the Hearing Aid Problem T H Halsted and F M Grossman New York —p 1944
- Sedimentation Rate in Gastrointestinal Disease W I Lipp and A H Aaron Buffalo —p 1951
- Congenital Tuberculosis G L Kobilard and S Z Impreora Brooklyn —p 1955

**North Carolina Medical Journal, Winston-Salem**

3 539-578 (Oct.) 1942

- General Surgery and Surgical Specialties H A Royster Raleigh —p 539
- Brief Discussion of Bronchiectasis M D Bonner Jamestown —p 543
- Bleeding Associated with Intrauterine Death of Fetus F R Lock Winston Salem —p 547
- Threatened Abortion R B Dunn Greensboro —p 549
- Immediate Postoperative Feeding in Abdominal Surgery A Webb Jr Raleigh —p 551
- Hookworm Etiologic Factor in Duodenitis C F Strosnider Goldsboro —p 554
- Harmful Effect of Tobacco on Course of Buerger's Disease Report of Case with Recurrence in Man of Unusual Height and Weight R H Owen Canton —p 555
- Recovery from Streptococcus Viridans Bacteremia After Sulfanilamide Report of Case W M Johnson Winston Salem —p 558
- Economy in Vitamin Medication J B Stevens Greensboro —p 560
- Hypnosis L Alexander Durham —p 562

## Ohio State Medical Journal, Columbus

38 989-1084 (Nov.) 1942

- Deficiency Diseases Incidence at Cincinnati General Hospital M A Blankenhorn Cincinnati—p 1005
- Chemistry of Pollen Extracts I Studies with Activated Charcoal and Refined Pollen Extract L A Brown and N Benotti Boston—p 1011
- Gallbladder Disease and Pregnancy L H Biskind and H H Pevaroff Cleveland—p 1013
- Management of Drug Eruptions A R Cukerbaum Youngstown—p 1016
- Preparation of Patient for Anesthesia J H Bennett Cincinnati—p 1019
- Cancer of Vulva J J McDonough Youngstown—p 1022
- Importance of Purposeful Splinting Following Injuries of Hand C D Hoy Columbus—p 1025
- Boron as Trace Element J Forman Columbus—p 1026
- Psychology of the Sick C W Sawyer, Marion—p 1028
- Examining for Life Insurance J Dittick Cleveland—p 1033
- Pulmonary Actinomycosis Case Record Presenting Clinical Problems I T Kapp Cleveland—p 1036

## Oklahoma State Medical Assn Jour, Oklahoma City

35 411-452 (Oct.) 1942

- Isolation as Aid in Treating the Mental Patient C E Leonard Oklahoma City—p 411
- Clinical Diagnosis of Ulcer of Meckel's Diverticulum J G Matt, Tulsa—p 414
- Phrenic Nerve F P Baker Tahlemta—p 417
- Fluoroscopic Survey of Postnatal Syphilis in Health Department Clinic D A Hudson and S C Venable, Tulsa—p 419

## Pennsylvania Medical Journal, Harrisburg

46 1-80 (Oct.) 1942

- \*Use of Sulfonamides in Local Treatment of Burns J E Rhoads W A Wolff and W E Lee Philadelphia—p 13
- Pathology Among Institutionalized Psychotics T K Rathmell and M M Lieber, Sharon—p 17
- Waters Extraperitoneal Cesarean Section Report of Three Cases C C Briscoe Philadelphia—p 19
- Delayed Wound Healing Associated with Scurvy Case Reports E L Housel and L H Clerf Philadelphia—p 21

**Sulfonamides and Local Treatment of Burns**—According to Rhoads and his associates, the use of sulfonamide compounds in the local treatment of burns has not, in their hands, obviated the necessity for skin grafting, but they believe that their use has reduced the amount of skin grafting necessary and that their value in preparing granulating surfaces for grafting and in effecting bacteriostasis while the grafts are taking has been immeasurable. They have employed sulfanilamide, sulfathiazole and sulfadiazine in powdered form as a primary and as a secondary dressing after other forms of treatment. The results have been superior to those that they obtained by other methods. Spontaneous epithelization without grafting took place more often and pinch grafts tolerated the sulfanilamide well. The drug has been helpful in depressing the infecting organisms during the five days between the application of the graft and the first dressing, thus successful grafting at an earlier stage was possible. The drugs are freely absorbed through large burns and may give rise to drug fever and other toxic effects. Therefore, in view of the hepatic injury in extensive burns and the occasional toxic hepatitis following some of the sulfonamides, the use of the drugs primarily in extensive burns should be approached cautiously. When an occlusive dressing and the sulfonamide effect is desired, sulfadiazine in triethanolamine, as introduced by Pickrell, should be considered.

## Public Health Reports, Washington, D C

57 1479-1518 (Oct 2) 1942

- Incidence of Pneumonia as Recorded in National Health Survey R H Britten—p 1479
- Infant Mortality in Rural and Urban Areas H J Sommers—p 1494
- Ornithodoros Parkeri and Relapsing Fever Spirochetes in Southern Idaho G E Davis—p 1501

57 1519-1558 (Oct 9) 1942

- Cultural Characteristics of Zoogaea Forming Bacteria Isolated from Activated Sludge and Trickling Filters Elsie Wattie—p 1519
- Chemotherapeutic Action of a N Phosphoryl Derivative of 4,4 Diaminodiphenylsulfone M I Smith, S M Rosenthal and E L Jackson—p 1534

## Surgery, Gynecology and Obstetrics, Chicago

75 547-674 (Nov.) 1942

- \*Analysis of Relationship of Surgery and Gastroscopy in Ninety Five Cases of Gastric Tumor R Schindler and P Letendre Chicago—p 547
- \*Post Traumatic Dystrophy of Extremities Sudeck's Atrophy D S Miller and G de Takats Chicago—p 558
- Improved Method of Measuring Potential Difference Across Human Gastric Membranes and Its Clinical Significance Preliminary Report E N Goodman New York—p 583
- Clothespin or Inclusion Graft for Spondylolisthesis or Laminal Defects of Lumbar Spine D M Bosworth New York—p 593
- Relationship Between Clinical and Roentgenologic Findings in Bone Metastases J Borak New York—p 599
- Prolapse of Efferent (Distal) Segment of Bowel After Colostomy J L Keeley Chicago—p 605
- \*Experimental Crushing Injury Peripheral Circulatory Collapse and Other Effects of Muscle Necrosis in Rabbit E G L Bywaters and G Popjak London England—p 612
- Routine Abdominal Panhysterectomy as Prophylaxis Against Cancer of Cervical Stump K H Martzloff Portland Ore—p 628
- Repair of Incontinent Sphincter Ani P C Blaisdell Pasadena Calif—p 634
- Complications of Inferoanterior (Axillary) Dislocation of Shoulder Joint as Demonstrated by Roentgenograms M D Sachs and H A Hill San Francisco—p 639
- Beaded Wires in Closed Reduction of Fractures of Leg C N Pease Chicago—p 647
- Combined Spinal and Intravenous Anesthesia for Operations on Colon B M Anderson L H Mousel and C W Mayo Rochester Minn—p 651
- Intravenous Amino Acid Administration in Surgical Patients Using Enzymatic Casein Digest C E Gardner Jr and J C Trent Durham N C—p 657
- Surgical Gloves and Wound Infections L A Weed and Jessie L Groves Indianapolis—p 661
- Unreliability of Blood Findings as Criteria of Burn Shock in Rabbits M D Bosse P Gross and M L Hagan Pittsburgh—p 665

**Surgery and Gastroscopy in Gastric Tumor**—Schindler and Letendre compare the gastroscopic with the surgical observations in 95 cases of gastric tumor, 91 of which were cancerous. In 5 of the 91 cases of gastric cancer the lesion was not seen gastroscopically and in 5 others the lesion seen was wrongly interpreted. Of the others, a sarcoma was mistaken for a polyposis, 1 benign submucosal tumor and 1 benign mucosal tumor were diagnosed correctly and 1 benign mucosal tumor was called cancer at gastroscopy. The number of gastroscopic errors can be reduced with increasing experience. In 4 of the 95 cases the gastroscopist did not commit himself as to the nature of the lesion. In 3 cases gastroscopy revealed lesions not palpated or seen by the surgeon at laparotomy. Further examination proved the lesions to be present. Roentgenography and gastroscopy will yield best results in the diagnosis of gastric tumors when used together. In the series of 91 carcinomas, fifteen failures at the first roentgen examination are compared with ten failures at the first gastroscopic examination. The size and the site of the tumor were determined satisfactorily by gastroscopy. The gross type of carcinoma should be diagnosed at gastroscopy only if the whole circumference of the tumor can be seen.

**Post-Traumatic Dystrophy of Extremities**—Miller and de Takats discuss the signs and alterations that may contribute to a better understanding and earlier treatment of Sudeck's atrophy. In its milder forms the syndrome is far from being rare. When a sprain or a blunt or minor injury does not show a normal course of events but is characterized by excessive pain, vasomotor phenomena and increased pulsations of peripheral vessels, an early reflex dystrophy should be suspected. The differentiation of an early Sudeck's atrophy from traumatic hysteria is often difficult, as the emotional status of many of these patients is often unstable. The "nervousness and excitability" in the late cases may just as well be the result of many months of suffering and not the cause of the syndrome, which most neurologists still maintain. The osteoporosis is not typical for the syndrome. It does not appear early. When it appears in its spotty form in the small bones of the hand and foot or in the lower metaphysis of the bones of the lower arm and leg four to six weeks after the injury, it is rather characteristic. A diagnosis then can be made but only in conjunction with the clinical phenomena. In the later stages, when the bone atrophy

is diffuse, a roentgen differentiation from other forms of atrophy hardly seems possible. Minor, partial injuries of peripheral nerves coursing superficially between the skin and the bone may sometimes be the initial stimulus for the vasomotor phenomena. The diagnosis of such partial nerve injury would be made more often in the dorsal interosseous nerve in Colles' fracture, the superficial radial and ulnar branches in twists and torsions of the wrist and in injuries to the superficial peroneal, posterior tibial and saphenous nerves (which are often stretched, contused or surrounded by a perineural hematoma) if the examination should be directed toward them in cases of severe pain following trauma. The best prevention for Sudeck's atrophy seems the early and complete fixation of all injuries, without interfering with motion and permitting weight bearing, as Boehler recommended, and infiltration of the site of injury with procaine hydrochloride. Whatever the explanation for vasomotor disturbance in Sudeck's atrophy (arteriolar dilatation coexisting with a capillary spasm), repeated sympathetic block in the earlier stages and sympathectomy in the later, more intractable, cases have been of decided benefit. The infiltrations can be followed by mild physical therapy, which, if used alone, often aggravates the pain and muscular spasm. When organic changes are present, such as shortening of tendons, shrinking of joint capsule, ankylosis and faulty position, orthopedic care is required for full functional recovery after sympathectomy.

**Experimental Crushing Injury**—Bywaters and Popjak describe a method of producing graded injury in the rabbit. It consists in winding a rubber band round the leg so as to produce an ischemia, which is maintained for four and five hours. The resulting course is hemoconcentration and loss of plasma into the injured area, which becomes swollen and doughy. Azotemia, which is thought to be due in part to the depressed circulation but mostly to the increased tissue breakdown, occurs. Other manifestations of the latter are creatinuria and a depression of the carbon dioxide combining power of the plasma, associated with an increased urinary acidity. There is no obviously gross impairment of renal function that could be measured by the power to concentrate urea although a few hyaline and granular casts, sometimes accompanied by a trace of proteinuria, appear. The condition differs from the human condition of "crush syndrome" only in that renal failure and myohemoglobinuria are absent and as there is ample anatomic reason in the rabbit for myohemoglobinuria to be absent it seems possible that these two negative "occurrences" may be causally related to each other.

### Surgery, St. Louis

12 523 684 (Oct.) 1942

- Internal Wiring Fixation of Facial Fractures W. M. Adams, Memphis, Tenn.—p. 523
- \*Bronchial Factor in Pulmonary Embolism J. H. Jesser and G. de Takats, Chicago—p. 541
- Regional Lymphatic Metastasis of Carcinoma of Gastrointestinal Tract E. B. Kay, Ann Arbor, Mich.—p. 553
- Double Tube Method for Drainage and Feeding Following Gastric Resection or Gastroenterostomy W. J. Mersheimer, New York—p. 563
- Potential Closed Duodenal Loop in Gastric Resection D. Lynn, Detroit, L. J. Hay and O. H. Wangenstein, Minneapolis—p. 566
- Treatment of Acute Appendicitis in Children as Influenced by Chemotherapy C. A. Wattenberg and P. Heinbecker, St. Louis—p. 576
- Unusual Anomaly of Bile Ducts in Adult with Obstructive Jaundice: Report of Case O. W. Niemeier, Hamilton, Ont., Canada—p. 584
- Treatment of Common Duct Stone Missed at Operation H. B. Morton, Lincoln, Neb.—p. 591
- Effect of Anesthetics on Gastric Tonus and Motility with Special Reference to Acute Gastric Dilatation C. R. Johnson and F. C. Mann, Rochester, Minn.—p. 599
- \*Traumatic Rupture of Pregnant Uterus Resulting from Automobile Accident R. B. Woodhull, Minot, N. D.—p. 615
- Epispadias with Incontinence in Male J. E. Dees, Durham, N. C.—p. 621
- New Skin Varnish for Maintaining Sterility of Operative Field A. D. Ecker, Syracuse, N. Y.—p. 631
- \*Consideration of Therapy in Staphylococcal Infections R. H. Rigdon, Memphis, Tenn., and P. F. Stookey, Kansas City, Mo.—p. 635

**Bronchial Factor in Pulmonary Embolism**—Jesser and de Takats observed the behavior of the bronchial tree when pulmonary embolism is produced in dogs weighing from 10 to 15 Kg. The embolus was produced by injecting 0.5 cc. of a mixture of equal parts of barium sulfate, iron perchloride and

isotonic solution of sodium chloride into the femoral vein. A powerful bronchoconstriction was produced during embolism. This could be abolished by bilateral vagal section and often by sufficient doses of atropine. Mechanical obstruction to the trachea did not produce bronchial spasm. Papaverine usually failed to protect the bronchial tree from this reflex spasm. Clinically the suppression of the widespread autonomic reflexes which occur within the distribution of vagal fibers would decrease the morbidity and mortality from pulmonary embolism, at least atropine did in the animal experiments. Its clinical use, in the presence of bronchial obstruction and hypersecretion, may be objected to by those who feel that the drug increases the viscosity of the bronchial mucus and hinders evacuation. The 28 patients with pulmonary embolism observed at St. Luke's Hospital received the atropine-papaverine mixture. It was given immediately after the embolus was recognized and for four to five days thereafter, three times a day. No massive or patchy atelectasis was seen in this group of patients, indicating that at least this medication does not increase bronchial obstruction to a harmful degree.

**Rupture of Pregnant Uterus**—Woodhull reports that the uterus of a pregnant woman was ruptured in an automobile accident, the erroneous diagnosis of premature separation of the placenta was made because the patient made a rapid recovery on only supportive treatment. It was assumed that uterine rupture occurred at the time of the accident as the result of a blow on the abdomen. After the fetus and a portion of the placenta were extruded into the abdominal cavity the uterus apparently clamped down very rapidly, causing only a minimal loss of blood. Fetal death must necessarily have taken place within several minutes after the accident. From the standpoint of diagnosis the patient did not exhibit the usual signs associated with rupture of the uterus, that is, evidence of intra-abdominal hemorrhage, shock, accumulation of blood under the diaphragm, abdominal rigidity from radiating to the shoulder or vaginal bleeding. The absence of these signs masked the true gravity of her condition and led to the early mistaken diagnosis. It was only after inflammatory reactions and toxic absorption were in evidence that operation was performed. Once a diagnosis of uterine rupture is made, the decision whether to remove the uterus or to attempt repair is influenced by the parity of the patient and her desire for future pregnancies. Although the outcome in his case was satisfactory, the author emphasizes the fact that early diagnosis and prompt operative treatment are of the utmost importance. First and foremost, shock should be controlled by intravenous fluids and blood transfusion, and a laparotomy should be performed as soon as the patient's condition permits. Clamping the uterine arteries through the vagina while preparations for adequate surgery are in progress has been attempted by some men with success.

**Therapy in Staphylococcal Infection**—Rigdon and Stookey used staphylococcus antitoxin in the treatment of 2 patients with staphylococcal septicemia. The dose of the antitoxin should always be sufficient to produce an excess of antitoxin in the circulating blood. The minimal dose should be 100,000 units preferably given intravenously. In severe infection with profound toxemia 300,000 to 400,000 units of the antitoxin may be required. One important way in which staphylococci may have an influence on the host is through the effect of their toxin on the parenchymatous tissue. Their exotoxin may be neutralized by specific antitoxin given before the toxin becomes fixed in the tissues. Toxin apparently is present in more than 90 per cent of patients with staphylococcal septicemia. It can produce death or it may be only of secondary importance in the pathologic processes. The effect of chemotherapeutic agents depends on their inhibitory influence on bacterial growth. They do not neutralize staphylococcal toxin. Combined chemotherapy and serotherapy may offer the best results in staphylococcal septicemia. The efficacy of any treatment is in direct ratio to the duration of the infection, the toxin-producing ability of the organism and the resistance of the host. The therapeutic response is best when treatment is instituted early. Chemotherapy and serotherapy are only adjuncts to surgery.

## FOREIGN

An asterisk (\*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

## Archives of Disease in Childhood, London

17 111-174 (Sept.) 1942

- Clinical and Bacteriologic Survey of Pneumonia in Childhood Esther Hendry—p 11  
Dementia Infantilis with Cortical Dysrhythmia A Kennedy and D Hill—p 122  
Hospital Diarrhea P Evans—p 130  
Micro Method for Estimation of Sedimentation Rate of Red Cells Hilda Trought—p 136  
Some Social Aspects of Infant Feeding I Cordon—p 139

## Brain, London

65 115-232 (June) 1942

- Studies in Human Vestibular Function I Observations on Directional Preponderance ("Nystagmushereitschaft") of Caloric Nystagmus Resulting from Cerebral Lesions G Fitzgerald and C S Hallpike—p 115  
Id II Observations on Directional Preponderance of Caloric Nystagmus ("Nystagmushereitschaft") Resulting from Unilateral Labyrinthectomy T E Cawthorne G Fitzgerald and C S Hallpike—p 138  
Id III Observations on Clinical Features of Meniere's Disease with Special Reference to Results of Caloric Tests T E Cawthorne G Fitzgerald and C S Hallpike—p 161  
\*Chronic Thyrotoxic Myopathy Report of Three Cases with Review of Previously Reported Cases D McEachern and W D Ross—p 181  
Primary Degeneration of Spinal Cord in Monkeys Study in Comparative Pathology A E Hamerton—p 193  
Aphasia in Children E Cuttman—p 205  
Cerebello Ocular Degeneration Example of Hereditary Familial Incidence F P Weber and J C Greenfield—p 220

**Chronic Thyrotoxic Myopathy**—McEachern and Ross report 3 cases of chronic thyrotoxic myopathy and review the 10 described previously in the literature. This disorder resembles progressive muscular atrophy but is unlike it as it is amenable to treatment. The chief features of the 13 cases are as follows. The sex was predominantly male (11 to 2). The age of 1 of the patients was 24 and the other 12 were between 39 and 62 years old. The main symptoms were weakness and loss of weight with muscular wasting, sometimes symptoms suggestive of hyperthyroidism. The onset was gradual usually leading to hospitalization in a year. The pulse rate was elevated and often the pulse pressure was increased. Tremor of the outstretched hands was prominent and general muscular wasting with fasciculation was pronounced in the shoulder and pelvic girdles and less so peripherally in the small muscles of the hands and feet. The basal metabolic rate was elevated from +14 to +68 per cent in 12 and to +100 in 1. The blood cholesterol was low or normal and the dextrose tolerance was normal or reduced. Creatinuria was present and glycosuria in some. Thyroidectomy resulted in complete recovery. The 3 patients who were not submitted to operation died 2 from respiratory paralysis. The muscular weakness and fatigability may temporarily respond to a prostigmine preparation. Fasciculation appears to be of peripheral origin suggesting that there is an increased concentration of acetylcholine at the neuromuscular junctions or a generally increased sensibility of muscle fibers to the chemical transmitter due to metabolic causes and not to denervation. The increased basal metabolism cannot be attributed to fasciculation, as cases of amyotrophic lateral sclerosis show no such increase despite equally active and widespread muscular twitching.

## British Journal of Ophthalmology, London

26 433-480 (Oct.) 1942

- Statistical Analysis of 3219 Persons Certified Blind at Regional Clinic for Certification of the Blind Glasgow and Southwest Scotland During Period 1929-1935 VI Summary and Conclusions J Marshall and H E Seiler—p 433  
Four Unusual Cases of Conjunctivitis E F King—p 467

## British Journal of Tuberculosis, London

36 99-152 (July) 1942

- Benign Serous and Purulent Pleural Effusions (Including Tuberculous Empyema) Plea for Conservative Treatment F G Chandler—p 103  
Extracapsular Apicolysis with Thoracoplasty Indications Technic and Complications C P Thomas and W P Cleland—p 109  
Treatment of Intestinal Tuberculosis by Pneumoperitoneum L Roberts—p 138

## British Journal of Urology, London

14 113-152 (Sept.) 1942

- Postprostatectomy Obstruction T Millin—p 113  
Primary Carcinoma of Ureter Case Report H A Daniel—p 124

## British Medical Journal, London

2 357-384 (Sept. 26) 1942

- British Tradition and the New Outlook B Whitehouse—p 357  
Malingering R Good—p 359  
Foreign Bodies in Alimentary Tract G O Chambers—p 362  
Periodic Medical Examination F Ellis—p 365

2 385-416 (Oct. 3) 1942

- War-time Arrangements for International Biological Standards and New Standard for Pituitary (Posterior Lobe) Preparations H H Dale—p 385  
Nontouch Technic Special Reference to Operative Treatment of Simple Fractures H A T Fairbank—p 388  
Surgical Amputations and Fitting of Artificial Limbs A W J Craft—p 389  
\*Renal Impairment Due to Crushing Limbs in Anesthetized Dogs M Grace Eggleton K C Richardson H O Schild and F R Winton—p 392  
Variations in Respiratory Rhythm of Prognostic Significance in Malignant Hypertension H O Gunewardene—p 393  
Vaccination in Glasgow Docks G Buchanan and S Laidlaw—p 394

**Renal Impairment Due to Crushing Limbs**—According to Eggleton and her colleagues impairment of renal function in dogs under soluble pentobarbital anesthesia ensues after four to five hours during which time both hind limbs have been tightly bound with rubber tubing from the ankle to the hip and the thigh muscles have been compressed in a vise and hammered for a few minutes. Removal of the compression is followed by a definite fall in arterial pressure and by anuria or severe oliguria. In the latter event the urine is deeply pigmented, presumably with myohemoglobin, and the creatinine clearance is low, which might be attributed in part to the low arterial pressure. Restoration of the arterial pressure with intravenous gum-saline solution of ox serum usually initiates or increases the urinary flow, but even if the flow is raised to its initial value with diuretics the creatinine clearance, and therefore the concentrating power of the kidney, recovers to only about one fourth of its original value. Microscopically, the kidneys contained a material within the lumens of the tubules which might have been capable of blocking some of the tubules. The material was particularly concentrated in the terminal portion of the proximal convoluted tubules. There was no consistent relation between the extent of the deposit and the impairment of renal function. In the only dog in which high doses of diuretics would not initiate urinary flow there were mitochondrial changes in the proximal tubule cells indicating the action of a poisoning agent. The available evidence from the study of the dogs appears to show that the renal damage is of the same kind as that in man after comparable prolonged crush injury to the limbs. The evidence suggests that the main factor in the injury may be concerned with an increased permeability of the renal tubules due to a toxic agent released from the damaged limbs.

2 417-444 (Oct. 10) 1942

- Tuberculosis in London in Wartime. W A Daley and B Benjamin—p 417  
\*Wartime Dermatology with Plea for Economy R W Carslaw—p 420  
Ligature of Innominate Artery for Right Subclavian Aneurysm End Result W I de C Wheeler—p 422  
\*Cerebrospinal Fever Review of 500 Cases Treated by Chemotherapy Without Intrathecal Serum G E Harries—p 423  
Mangled Forearm Treatment in Skeleton Splint with Fixed Skeletal Traction D Brown—p 425

**Wartime Dermatology**—Carslaw discusses his experience with diseases of the skin which began just before the present war. The first part of his experience consisted of six months afloat in a cold or extremely cold climate with a personnel of approximately 500 men, the second part of eighteen months was that of a skin department of a large naval hospital at home and the third consisted of six months afloat in the tropics with a personnel of approximately 1600 men. Little contact was made with centers of population during either time afloat, and fresh food was intermittently available. During the first period the few cases that were encountered consisted of impetigo and scabies and several cases of dermatitis of the hands apparently



due to change from civil to service occupation. During the second part 1,149 cases were seen—652 as inpatients and 497 in consultation. There were (in order of frequency) cases of dermatitis from all causes, scabies, impetigo and mycosis. During the last period 349 cases of mycosis, scabies, miliaria rubra or impetigo were encountered. The following points, according to the author, are of practical value in service wartime dermatology: (1) economy of loss of men hours and of drugs is of national importance, (2) the bulk of medical stores must be kept small, (3) simplicity and, when possible, standardization ease the burden of an overtaxed nursing staff and (4) early diagnosis and treatment save loss of man hours. Ointments could, he feels, be largely discarded, particularly in summer and in hot climates, mercury replaced by aniline dyes and the production of starch poultices curtailed. The best results were obtained by the use of a comparatively small number of remedies, and simplicity saved the time of nursing and dispensing staffs. Early diagnosis and treatment mean a smaller area to treat and therefore a saving of supplies and time lost. In many ways life has been made more simple by rationing in domestic life, and a plea is made that the treatment of cutaneous conditions could and should be simplified to conform with the national war effort. For the treatment of mycosis chrysarobin was used, as the cases were unusually severe and numerous.

**Cerebrospinal Fever**—From January 1940 through February 1942, 500 patients with cerebrospinal fever were admitted to the Cardiff City Isolation Hospital. They were treated by chemotherapy, Harries says, without antimeningococcus serum intrathecally. The ages of the patients ranged from an infant of 6 weeks who recovered completely to a person of 70 who died. All patients, even those who were moribund and died within a few minutes of admission, were included in the group of 500. The total number of deaths was forty-three. Sulfapyridine was employed in the treatment of 471 and sulfathiazole for the others. Sulfathiazole was as effective in promoting recovery and was less prone to cause nausea and vomiting. The drug was given by mouth in 2 Gm doses on admission and repeated in four hours' time then 1 Gm every four hours for the next seventy-two hours, then 0.5 Gm was given for a further three days. After the first 250 patients were treated the dose was increased to 2 Gm every four hours for four doses and then 1 Gm every four hours for ninety-six hours, followed by 0.5 Gm every six hours for a further three days. The increased dosage had a slight effect in diminishing recurrences and complications, such as arthritis. Children less than 12 were given half the adult dosage, and infants less than 1 received one fourth of the adult dose. In all, 1,935 lumbar punctures were performed without any untoward effect. No general anesthetic was administered. Apart from relieving headache, the reduced intracranial pressure was considered less damaging to the nervous tissue. The cerebrospinal fluid furnished a satisfactory guide to the progress of the disease. No patient was regarded as out of danger if the sugar had not returned to normal. Only six ventricular and five cisternal punctures were necessary. If the patient was comatose the tablets were crushed and given intranasally. If vomiting occurred after ingestion of the drug or the patient was delirious and nasal feeding was difficult, the sodium salt of sulfapyridine was given by intramuscular injection, but as sloughing often ensued in spite of care, it was discontinued and the sodium salt in equivalent doses was injected intravenously with three times its volume of isotonic solution of sodium chloride. Severely ill or greatly dehydrated patients were given the sodium salt of sulfapyridine intravenously in about 500 to 1,000 cc or more of isotonic solution of sodium chloride in 5 per cent dextrose solution by the vacoliter drip method. The ingestion of fluid was encouraged. The patients who had such complications as arthritis or iridocyclitis during convalescence were given a second course of chemotherapy. If bromides were given as sedatives the sodium salt rather than the potassium salt was administered. No person in attendance contracted the disease. Morphologic meningococci were found in 465 cases, or 93 per cent. Material for cultures was obtained from 214, 93 per cent belonged to group 1, 17 per cent to group 2 and 33 per cent were inagglutinable. Clinically, the various strains seemed to be of equal virulence.

## Lancet, London

2 355-384 (Sept. 26) 1942

- The Thomas Splint in Treatment of Fractured Femur W S Diggle—p 355  
Bronchography in Children C Elvine Field—p 357  
Sulfapyridine Anuria Fatal Case J Carson and G S Smith—p 359  
Id. Treated by Cystoscopy and Ureteric Catheterization R C S Benson and R C Percival—p 360  
\*Water Borne Outbreak of Paratyphoid B Fever D J Jones P G H Gell and R Knox—p 362  
Portable Apparatus for Continuous Intravenous Therapy B G B Lucas and A I Sims—p 364  
Preparation of Antiscorpion Serum Use of Atropine and Ergotamine A H Mohammed—p 364  
Plasmodium Falciparum Malaria Case J F Murray and P G Shute—p 365

**Water Borne Outbreak of Paratyphoid B**—Jones and his colleagues report the occurrence of paratyphoid fever in a village in which 21 out of 34 of the residents, living in a group of seven cottages built round a court containing a pump from a shallow well, were infected. They excreted *Salmonella paratyphi B* in their feces. That the outbreak was water borne was confirmed by the isolation of this organism from five different samples of the well water in three different laboratories. How the well became infected was not discovered but there was ample opportunity for infection by pollution of the ground in the vicinity.

2 385-412 (Oct. 3) 1942

- \*Lid Retraction in Toxic Diffuse Goiter K C Eden and W R Trotter—p 385  
Inguinal Hernia at Royal Air Force Hospital H R Arthur—p 387  
Calcinosi Cutis and Scleroderma Thibierge-Weissenbach Syndrome E W P Thomas—p 389  
Absorption of Sulfanilamide Applied Locally Blood Levels in Forty One Cases A R Hodgson and J R Robinson—p 392  
Juxtaepimerular Complex J F A McManus—p 394  
Potentialities of Municipal Medicine H Joules—p 396  
Advantages of a Socialized Medical Service S Hastings—p 397

**Lid Retraction in Toxic Diffuse Goiter**—Eden and Trotter state that lid retraction is, like exophthalmos, a characteristic feature of toxic diffuse goiter. The two conditions are easily separable clinically though both give the impression of prominence of the eye. Lid retraction was present in 72 of 134 patients with toxic diffuse goiter, in 39 of whom it was associated with true or concealed exophthalmos. Unlike exophthalmos which is apparently extrathyroid in origin lid retraction usually disappears when the thyrotoxicosis becomes inactive, although occasionally it appears or persists in the absence of active thyrotoxicosis. Therefore lid retraction appears to be governed by two factors, one of which is derived from the thyroid and the other must come from another source (possibly the anterior pituitary gland).

**Local Absorption of Sulfanilamide**—Hodgson and Robinson followed the sulfanilamide blood levels of 41 patients whose wounds, operative or others, were treated locally with the drug. Samples of blood for determination were taken every six or eight hours for the first twenty-four hours, then every twelve hours and finally daily. The value obtained twenty-four hours after operation was within 10 per cent of the peak value, except in 1 case, that of an arthroplasty of the hip. With this same exception the peak value was reached between sixteen and thirty hours after operation. In the case of the arthroplasty the blood sample taken eight hours after operation gave the highest concentration of sulfanilamide. The concentrations have usually been of the order of 1 mg per hundred cubic centimeters of blood for each gram deposited in the wound. In many cases local application alone will maintain an adequate therapeutic level in the blood, so that simultaneous oral administration is by no means always necessary. When the tissue from which absorption occurs is muscle which has a good circulation, the blood concentration attained at the end of twenty-four hours per gram of drug deposited in the wound is in the neighborhood of unity. Indeed, with some wounds care is rather needed lest too much sulfanilamide be applied locally and toxic effects result from free absorption.



**Medical Journal of Australia, Sydney**

2 193-222 (Sept 5) 1942

- Shock and Anesthesia in Relation Thereto A D Morgan—p 193  
Calculation of Heat and Moisture Dissipated from Body by Respiration with Table Designed to Make Calculation Easy at Any Temperature Any Humidity and Any Pressure of Air C E Corlette—p 198  
Organization of Casualty Clearing Hospital for Air Raids T F Rose—p 203  
Early Treatment of Battle Wounds of Head D Miller—p 207

2 223-252 (Sept 12) 1942

- Dengue Fever A S Walker E Meyers A R Woodhill and R N McCulloch—p 223  
Active Immunization by Intranasal Route in Experimental Pertussis E A North and G Anderson—p 228  
Thymine (Vitamin B<sub>1</sub>) Content of Some Australian Biscuits and Breakfast Foods E C Slater and Joan Rial—p 231  
Medical Conditions on Bathurst and Melville Islands E Ford—p 235  
Besnier Boeck Schaumann Syndrome Discussion with Report of Two Cases L E Hurley and J F Hughes—p 238  
Colloid Substitutes H L Kesteven—p 240

**Schweizerische medizinische Wochenschrift, Basel**

72 481-504 (May 2) 1942 Partial Index

- Most Frequent and Important Abdominal Disorders in Children E Hagenbach—p 481  
\*Lingual Application of Estradiol K Miescher and P Gasche—p 490  
Possibility of Occurrence of Acute Gout Attacks in Disorders of Oxalic Acid Metabolism J Wacław Grott—p 492  
Central Neurofibromatosis Case G Piotrowski—p 495

**Lingual Application of Estradiol**—Having demonstrated that testosterone has a much more intensive action when administered by the lingual route Miescher and Gasche investigated the effect of lingual administration of estradiol. The effect of the sublingual administration was compared with that of stomachal administration in a ten day test on 154 castrated female albino rats. In stomachal administration the drug was introduced by a stomach tube. In sublingual application drops were applied to the under surface of the tongue. It was found that alcoholic solutions of estradiol when administered by the lingual route exert an effect which is from ten to twenty times greater than that of stomachal administration. With the lingual administration effects can be obtained on the uterus which are not obtainable by stomachal administration. The estrus test likewise demonstrates a more intense action of the lingual administration. The uterus test, however, is much more sensitive than the estrus test. The efficacy of the lingual administration of estradiol is close to that of percutaneous or subcutaneous administration in the uterus test as well as in the estrus test.

**Archivos de Pediatria del Uruguay, Montevideo**

13 257-320 (May) 1942 Partial Index

- \*Shock Therapy in Typhoid Fever in Children E Peluffo and J M Portillo—p 257

**Shock Therapy in Typhoid Fever**—Peluffo and Portillo treated 65 children with typhoid fever with shock therapy induced by intravenous injection of antityphoid vaccine in hypertonic dextrose solution. The injections were made at intervals of two or three days. The first dose was 0.25 cc of the vaccine, subsequent doses varied with the age of the patient from 1 to 1.5 cc of the vaccine. Shock therapy by means of antityphoid vaccine had a favorable effect on the course of the disease in 50 per cent of the cases. The earlier the administration the better the results. Severe types of the disease were not influenced by this therapy.

**Arch Urug de Med, Cir y Especialid, Montevideo**

19 561-652 (Dec) 1941 Partial Index

- Erythremia and Duodenal Ulcer Efficacy of Teleroentgen Therapy B Varela Fuentes R Canzani and A Frangella—p 561  
\*Pulmonary Complications of Diphtheria in Adults E M Claveaux and F J Salveraglio—p 582  
Sedimentation Speed of Erythrocytes in Typhoid R Piaggio Blanco and C M Sanguinetti—p 587  
\*Pigmented Spots on Face Cured by Injection and Local Application of Folliculin F Rocca—p 592

**Pulmonary Complications of Diphtheria in Adults**—According to Claveaux and Salveraglio, pulmonary complications of diphtheria in adults have received little attention although they prove fatal in the majority of the cases. The

mode of origin and its significance vary according to the time of appearance of the pneumonic process. There is a type of a lesion seen in the course of an extensive laryngotracheobronchial diphtheria. Formation of intrabronchial pseudomembranes produces obstruction of the bronchi, which in turn leads to formation of foci of atelectasis which become rapidly infected and give rise to secondary bronchopneumonia. The authors had the opportunity of studying several of these extensive cases of diphtheria in adults. Signs of diffuse bronchitis with dyspnea and cyanosis are the usual clinical symptoms. Roentgenologic examination reveals multiple pulmonary shadows. Anatomicopathologic study discloses involvement of the entire bronchial tree by pseudomembranes, multiple foci of bronchopneumonia and atelectasis. Another type of lesion is represented by the bronchopneumonia of croup. This is seen more often in children. The authors observed it in a patient aged 21 who on the day after having undergone tracheotomy for croup developed a severe bronchopneumonia which terminated in cure. The pulmonary congestion produced by the diphtheritic toxin, the impairment of the pulmonary ventilation due to laryngeal stenosis and bronchial obstruction by pieces of pseudomembrane and aspiration of blood after tracheotomy are the factors which cause this bronchopneumonia. Acute pulmonary processes in the course of the secondary syndrome and of diphtheritic paralysis represent a special type. Paralysis of the muscles of respiration is the factor chiefly responsible for this form. Paralysis and anesthesia of the larynx make possible the passage of food into the respiratory passages and thus contribute to the production of septic pulmonary processes. These lesions are nearly always fatal. Paralysis of the respiratory muscles is an obstacle to successful treatment in these cases. However, prophylactic treatment can be effective in preventing these complications. The authors recommend careful disinfection of the upper air passages and frequent inhalations of oxygen alternating with carbon dioxide-oxygen mixture. To avoid the passage of food into the air passages in the presence of the paralysis of the muscles of the throat it is advisable to feed the patients by rectum, by the subcutaneous route or by the nasal tube.

**Estrone in Treatment of Pigmented Spots**—Rocca tells of a woman of menopausal age who developed coffee colored spots on the face particularly about the eyes, in the ciliary and supraciliary region, on the cheek bones and on the arms and knees. Microscopic examination of an excised spot from the arm indicated that they were not pigmented nevi. Disturbances in pigmentation frequently result from endocrine disturbances of the menopause, although they are rarely as severe as in the case cited here. Twice a week, for a period of several months 5,000 international units of estrone was administered by injection. The menstrual disturbances became regulated, the subjective symptoms improved and the facial spots began to clear up. An estrone ointment was now applied to the facial spots for twenty days. It was observed that some spots disappeared and others became much lighter. Local and injection treatments were continued for several months, when the pigmentation had decreased greatly on the face and in many parts of the body. When the endocrine treatment had been interrupted for a year, small spots began to appear in the ciliary region.

**Revista de Cirugía de Buenos Aires**

21 121-178 (April) 1942 Partial Index

- \*Perforating Posterior Fornical Endometriosis Cases J C Ahumada J A Salaber and A E Nogues—p 121  
Idiopathic Diverticula of Duodenum M S Gutarte—p 135  
Subarachnoid Meningocele of Sacral Region A Gutierrez—p 156

**Endometriosis**—According to Ahumada and collaborators perforating posterior endometriosis is rare. It is more frequent in young women. Symptoms, as a rule, are the same as in pelvic endometriosis. Small, acyclic, intermenstrual metrorrhagia, pressure on the rectum or stenosis of same, are the most frequent symptoms. A characteristic finding during gynecologic examination is a hard nodule located behind the cervix, extending laterally and infiltrating the parametrial tissue and the uterosacral ligaments. The tumor may invade the rectal wall. In the early stages the vaginal mucosa is hard inelastic and congested. In the advanced phase a more or less large

tumor or a polypoid formation on a hard neoplastic base is present. Diagnosis in the early and late stages is difficult. The clinical history of the patient, changes in the tumor during menstruation and aggravation of the symptoms during menstruation are suggestive. The diagnosis is verified by biopsy. Surgical therapy varies with the stage of the disease. In the early stage the operation consists of a total removal of the endometriosic plate through a median laparotomy with a subtotal hysterectomy and bilateral salpingectomy. Surgical castration is indicated in advanced cases and roentgenologic castration in the far advanced cases.

### Revista Clínica Española, Madrid

4 161-232 (Feb 15) 1942 Partial Index

- Tuberculous Superinfection and Reinfection in Adult Present Status of Problem A Urgoiti and J. L. Alvarez Sala—p 161  
 \*Panmyelophthisis Following Arspenamine Therapy of Syphilis Case J. Rof Carballo and J. Parras Benito—p 167  
 Experimental Investigations in a Case of Solar Urticaria J. G. Prieto, J. M. Lopez de Azcona, L. Azua, F. Bondeu and M. Cardenas—p 173  
 Metabolic Cramopathy C. Jimenez Diaz, J. Rof, A. Romero and L. Lara—p 178  
 Collaoidelastic Reaction of Mester in Differential Diagnosis of Rheumatic Disease T. Cervia and J. Garcia Lopez—p 183  
 Arthrodesis with Flexible Graft for Treatment of Tuberculosis of Elbow J. Gasco Pascual—p 186  
 \*Plasma Transfusions in Therapy of Hepatic Cirrhosis C. Jimenez Diaz, E. Roda, F. Lopez Ruiz and P. Brea—p 191  
 Jaundice Due to Atophan (Cinchophen) Two New Cases A. Romero Calatayud—p 196

**Panmyelophthisis Following Arspenamine Therapy**—Rof Carballo and Parras Benito report a case of aplastic anemia with leukopenia and granulocytopenia as well as with hemorrhagic diathesis following combined arspenamine and bismuth therapy. The extremely grave condition improved following repeated small blood transfusions. During the period of severest anemia, puncture of the bone marrow yielded only fat, but during recuperation it was slowly transformed again into normal bone marrow. The clinical improvement was indicated in advance by an increase in monocytes in the peripheral blood. The good result of the treatment in the extremely severe case indicates that small blood transfusions should be given repeatedly, particularly in cases of aplastic anemia or panmyelophthisis, in which the presence of monocytes indicates that the prognosis is not entirely hopeless. Even if puncture of the bone marrow repeatedly shows its total aplasia, this does not justify the neglect of an energetic stimulation of the hemopoietic organs.

**Plasma Transfusion in Hepatic Cirrhosis**—Jimenez-Diaz and his associates demonstrated in 1929 that in experimental hepatic disorders produced by chloroform the alteration of the hepatic parenchyma was accompanied by a diminished protein content of the plasma and by albumin globulin inversion. Wallich demonstrated an identical disturbance. The authors investigated the effect of the administration of different types of albumin on hepatic cirrhosis. Intravenous injection of plasma proteins rapidly restored the total protein content of patients with hepatic cirrhosis. The efficacy of mercurial preparations is enhanced, and even without these the diuresis is improved. The development of ascites is arrested, and in 1 patient reabsorption was obtained.

4 393-468 (March 30) 1942 Partial Index

- Lipoid Metabolism Relation of Hyperlipemia Due to Obstruction of Choleliths to Absence of Bile in Intestine C. Jimenez Diaz and H. Castro Mendoza—p 398  
 Immediate Postoperative Results in Biliary Surgery J. P. Figueras, V. Artigas, A. Gallart Esquerdo and E. Sierra—p 403  
 \*Casal's Disease Roentgen Behavior of Stomach in Pellagra M. Diaz Rubio and L. Lara Roldan—p 408  
 Attempted Sulfanilamide Therapy in Malaria R. Diaz Mora—p 413  
 Supernumerary Bones Superior Cotyloid Bone Os Trigonum, Peroneum and Anterior Tibial Bone V. Sanchez Olmos—p 419  
 \*Sulfapyridine Therapy of Persistent Bacterial Asthma C. Jimenez Diaz, C. Lahoz and L. Recator—p 423  
 First Case of Cooley's Anemia in Spain E. Jaso, J. M. Ales Reinlein and J. Pardo Urdapilleta—p 425

**Stomach in Pellagra**—Diaz-Rubio and Lara Roldan made roentgenologic studies of the stomach in 255 patients with pellagra. Most noteworthy feature was diminution of gastric peristalsis which often gave rise to great dilatation and retarded

evacuation of stomach contents. The mucosa was atrophic in over 67 per cent of the cases. The atrophy was diffuse in the majority of the cases and limited to certain zones in 16 per cent. A number of patients presented intense aerogastria and a few had large amounts of mucus. In 22.35 per cent of the cases roentgenologic appearances of the stomach were normal as regards the tonus, peristalsis, evacuation and relief of the mucosa, in spite of the fact that pellagra was fully developed. There were some cases in which no relationship existed between the severity of the changes and the gravity of the clinical picture, but in 59 patients, on whom at least 3 studies were made, there was a close parallelism between the clinical picture and the intensity of the radiologic signs. Roentgenologic examination of the intestine disclosed severe aerocoly, inflammation of the large intestine and retention of the contrast meal in the terminal loops of the ileum. Comparison of the roentgenologic appearance of the gastric mucosa of these patients with those of achylia, suggests that the organic changes in the mucosa are sequelae to the functional disturbances.

**Sulfapyridine in Asthma**—From observation and experimental studies Jimenez-Diaz and his collaborators gained the impression that bacterial infection plays a part in some cases of bronchial asthma. Ten patients with true "status asthmaticus" who for months had proved refractory to various methods of treatment were given sulfapyridine. In 8 of these this therapy effected the disappearance of all symptoms, in 2 the drug was without effect.

### Revista de Neuro-Psiquiatria, Lima

5 137-314 (June) 1942 Partial Index

- Evolution of Neurologic Thought in Neurobiology J. O. Trelles—p 137  
 Cerebral Tuberculosis J. Voto Bernales—p 165

**Cerebral Tuberculosis**—Voto Bernales found in a study of 22 cases of brain tuberculosis that the process is always secondary to tuberculosis elsewhere. The method of dissemination is most likely the hematogenous. Tuberculoma, tuberculous encephalitis and especially tuberculous meningitis are the main terminal clinical types of the disease. Tuberculosis with symptoms of epilepsy and of mixed forms of the disease are terminal clinical types less frequently seen than the foregoing. In many cases the disease develops without symptoms. The diagnosis of asymptomatic types is difficult. It is based mainly on the existence of tuberculosis elsewhere. Cerebral tuberculosis pursues a slow progressive course and leads to grave symptoms. Spontaneous recovery is extremely rare. There is neither a proper medical nor surgical therapy for the disease. The treatment consists in general care of a tuberculous patient and in decompression by trephining when indicated.

### Archiv fur Gewerbepathologie, Berlin

10 445-568 (April 16) 1942 Partial Index

- \*Lesions Produced by Light Metals E. Sedlacek—p 445  
 Fatal Poisoning with Chlorosulfonic Acid F. Roulet and O. Straub—p 451  
 \*Electron Microscopy on Asbestos Dust and on Lungs in Asbestososis J. Kuhn—p 473  
 Occupational Injuries Caused by Radiant Heat in Rolling Mills Development of Skin Cancer H. Wamick—p 486  
 \*Silicosis of Intrathoracic Lymph Nodes as Compensable Occupational Disease J. Hagen—p 502  
 Siderosis of Lungs in Electric Welders F. Koelsch—p 519  
 Lesions Caused by Light Metals W. Hofbauer—p 529  
 \*Spinal Cord and Peripheral Nervous System in Chronic Manganese Poisoning Pathologic Anatomy of Manganism H. Voss—p 550

**Lesions Produced by Light Metals**—As a physician in an airplane factory Sedlacek frequently encountered inflammations following cut injuries with duraluminum. These inflammations are mostly seen in wounds too small for surgical care. Large wounds caused by duraluminum are excised and sutured. Subsequent inflammations are rare. The appearance of a blister filled with serous fluid is characteristic of an unexcised duraluminum lesion. The blister is usually in evidence from one to two days after the injury. The contents of the blister suppurate, and in some cases necrosis develops at the base. The inflammation spreads to the surrounding tissues, and a lymph-

angitis or a lymphadenitis may develop. In addition to dermatitis, conjunctivitis and gastritis may develop. These lesions can be explained by the mechanical action of duraluminum dust, which develops in the course of drilling, can be inhaled or swallowed and, although extremely fine, may cause epithelial defects in the mucosa. Allergy does not play a part, because cutaneous tests were always negative and the blood tests made by Utz failed as a rule to disclose eosinophils.

**Electron Microscopy in Asbestosis**—Kuhn says that because the asbestos used in factories is mostly serpentine (chrysotile) asbestos and not so much hornblende asbestos, it was generally believed that the asbestos substance found in lungs with asbestosis is chiefly serpentine asbestos. Studies by Sundius and Bygden disclosed, however, that only hornblende asbestos is demonstrable in the lungs, which seems to suggest that serpentine dust is decomposed in the tissues. Kuhn used the electron microscope to study form, size and structure of asbestos dust and the asbestos found in the lungs. It was possible to detect a considerable number of asbestos dust particles that were below the threshold of the ordinary microscope. The needles of chrysotile asbestos appear under the electron microscope curved, clear and transparent. The needles of hornblende asbestos are rigid and curved pieces are rare, their diameter is usually greater than that of serpentine (chrysotile) asbestos. Needles were isolated from 3 lungs with asbestosis. Their examination under the electron microscope disclosed size and form but did not aid in deciding whether the asbestos was chiefly of the serpentine or of the hornblende type. For this reason it was decided to employ the photomicroscopic determination of the refraction exponent as suggested by Sundius and Bygden. This method revealed that the large asbestos needles isolated from the lungs were of the hornblende type. It is concluded that serpentine asbestos is decomposed in the lungs and is the essential cause of fibrosis. If asbestosis lungs are macerated with nitric acid and hydrogen peroxide not only are free asbestos needles obtained but also asbestosis bodies. Hornblende asbestos shows no signs of decomposition by the organism either in the free needles or on the asbestosis bodies.

**Silicosis of Intrathoracic Lymph Nodes**—According to Hagen, reports on silicosis as well as the legal regulation concerning compensation for occupational disease are concerned chiefly with silicotic changes in the pulmonary tissue. He describes several cases of complicating severe silicosis of the intrathoracic lymph nodes with a fatal outcome. The first patient, a man aged 63, had comparatively slight silicotic changes in the lungs, but there existed a severe silicosis of the lymph nodes at the bifurcation, which by severe cicatricial shrinkage led to the formation of 3 traction diverticula in the esophagus. Perforation of a diverticulum led to pulmonary abscess formation, bronchiectasis and generalized suppurative bronchitis. The fatal outcome of the pulmonary abscesses must be regarded as the result of silicosis. Several additional cases are described and evaluated and the conclusion is reached that silicosis of the lymph nodes, if it becomes the point of origin of a severe disorder, must be regarded as a compensable disorder, just as severe silicosis of the pulmonary tissue.

**Nervous System in Manganese Poisoning**—Voss maintains that the anatomic basis of manganese poisoning has not been clarified. Neither the few histopathologic studies on human subjects nor animal experiments have given reliable results. Changes regarded as specific for manganese poisoning could be explained also as the result of complicating disease or as caused by the age of the patient. The assumption that the clinical manifestations of manganism are due chiefly to extrapyramidal motor lesions, particularly an impairment of the pallidum, has not been definitely corroborated by anatomic findings. In view of the fact that the clinical symptoms of manganism resemble those of paralysis agitans and postencephalitic parkinsonism, changes could be expected in the substantia nigra. However, this region was found completely intact, not only by earlier investigators, but also by the author, who studied this region in 2 cases. Examination of the spinal cord and peripheral nerves of patients with manganese poisoning has been largely neglected hitherto. Whereas in the 2 cases reviewed by the author the

brain was found to be practically normal, important changes were seen in the spinal cord and in the peripheral nervous system. In one of the patients the manganese poisoning had taken an atypical course. Amyotrophic lateral sclerosis with bulbar symptoms dominated the clinical picture, and anatomic studies disclosed corresponding changes. The second case presented classic symptoms of manganism. As is frequently observed in manganese poisoning, certain pyramidal symptoms were present, but changes in the peripheral nerves were not to be suspected. Anatomic studies disclosed extensive degeneration in the right lateral pyramidal tract and in both sciatic nerves with pronounced vascular disturbances in the diseased regions. Other nerves had not been examined. The author is convinced that manganese poisoning was the cause or at least a contributing factor of the described changes. Studies should be made not only of the brain but of the spinal cord and the peripheral nerves as well.

## Archiv fur Kreislaufforschung, Dresden

9 123-302 (Oct) 1941 Partial Index

- Cardiac Pains and Electrocardiographic Aspects. Relations to Anoxia. H. Oettel—p 123  
\*Seasonal Changes in Some Circulatory Factors. H. Paul—p 164  
Muscular Tonus and Its Relations to Peripheral Circulation. G. Budelmann—p 188  
\*Influence of Increased Thyroid Activity on Altitude Tolerance in Animal Experiments. W. Rotter—p 226  
Syphilis of Aorta. Changes in Frequency and Symptomatology During Last 20 Years. H. Deitert—p 258

**Seasonal Changes in Circulatory Factors**—Paul studied seasonal changes in the pulse frequency, in the blood pressure at rest and after exertion, in the values derived therefrom and in the vital capacity on 900 healthy men between the ages of 17 and 30. The pulse rate during rest, as well as after exertion, showed noticeable seasonal changes. The maximum was observed during the winter months, January to March, the minimum during the summer months July to September. Seasonal fluctuations in the blood pressure could not be clearly established. The product of amplitude and frequency, in spite of considerable scattering of individual values, clearly showed an annual curve, the maximum is in March, the minimum in September. However, no seasonal fluctuations could be detected in the exertion values. The vital capacity shows an extremely low minimum in June.

**Increased Thyroid Activity and Altitude Tolerance**—Rotter made animal experiments to determine whether increased thyroid function would modify altitude tolerance. He treated guinea pigs with thyrotropic hormone so as to increase the thyroid function and to intensify tissue combustion. These animals, together with normal controls, were subjected to short term experiments in the low pressure chamber. It was observed that the animals which had been treated with thyroid had respiratory arrest at a time when the untreated animals still felt comparatively well. Comparative electrocardiographic tests, made at intervals, disclosed that the hearts of the guinea pigs which had been pretreated with thyroid were much more vulnerable to oxygen deficiency than those of the untreated controls. The pretreated animals showed during the experiment a greatly increased sympathetic tonus. Microscopic examination of the organs, however, permitted no conclusions regarding the greater sensitivity to oxygen deficiency of the pretreated in comparison with the untreated animals.

## Medizinische Klinik, Berlin

37 1097-1120 (Oct 31) 1941 Partial Index

- Diagnosis of Cutaneous Diseases in Various Regions of the Body. W. Krantz—p 1097  
\*Spontaneous Desensitization in Occupational Eczema and Its Significance for Estimation. F. Koch—p 1100  
Aspects of Pneumococcal Peritonitis. M. Krabbel—p 1105  
Treatment of Fracture of Neck of Femur in the Aged. H. Tammann—p 1106  
Question of Thermostability of Botulinus Toxin. P. Dahr—p 1107

**Spontaneous Desensitization in Occupational Eczema**—Koch states that follow-up examinations on patients with occupational eczema who had been advised to change their occupation revealed that many had not followed the advice. The majority of the patients remained subject to eczema, but

some had lost it in spite of further contact. Of 131 patients, 20 showed this contradictory behavior. Among the 60 bakers who were reexamined there were 10 in whom the eczema had disappeared and among the 71 persons of other occupations there were likewise 10. The explanation of such spontaneous cures and the underlying processes are of considerable interest. Regular weekly observations on 8 patients disclosed two different forms of development. One group of 5 patients experienced at every resumption of work first a considerable exacerbation of the disorder, usually with the aspects of an acute eczema, with considerable inflammation and itching. However, in spite of continuing the work there now followed, in contradistinction to earlier attacks, a gradual regression of the manifestations, which finally resulted in a complete or an almost complete disappearance of the eczema. Small foci recurred occasionally but these could be controlled with simple measures. They did not necessitate the interruption of the occupation. However when work was resumed after it had been interrupted for a while on account of holidays, vacations or layoff there was a renewed exacerbation, which, however was followed by almost complete freedom from complaints. The course in the 3 other cases was somewhat different. In these too the eczema recurred on the hands when work was resumed, that is, at the sites where it had been originally and which were chiefly exposed to the offensive substances. Later the lesion on the hands healed and recurred at other sites of the body, in 1 case at the border of the original eczema, which now had disappeared. The recurrence was so mild that the working capacity was not impaired. The author thinks that the only possible explanation is a desensitization, which presupposes specific allergic processes. He explains the difficulties encountered if an explanation is attempted and believes that eczema is not a pathogenic unit. Various other factors besides the allergic may play a part. Results of artificial desensitization carried out for therapeutic purposes have been slight. This therapeutic method cannot be generally recommended but it should not be completely abandoned. Further observations may disclose regularities which may become the basis for more favorable results.

### Zeitschrift für allgemeine experimentelle Medizin, Berlin

108 531 666 (March 3) 1941 Partial Index

- Changes in Pulse Frequency During Controlled Ergometric Work. D. Albers—p. 531  
 Passage of Prontosil and Other Dyes from Blood Stream into Pleural Exudates and in Reversed Direction. H. Bauer—p. 537  
 Combined Antitrypsin Method for Differential Diagnosis of Tumors and Infections. H. Kammerer and W. Bruckmeier—p. 551  
 Weakening and Abolishment of Vasoconstricting Effect of Epinephrine in Skin. J. Frey and H. Horn—p. 567  
 Ascorbic Acid and Schultz-Dale Phenomenon. C. Bembi—p. 581  
 \*Physiologic and Chemical Studies on Patients with Latent Allergy as Contribution to Problem of Allergic Constitution. G. Albus—p. 592

**Physiologic and Chemical Studies in Latent Allergy.**—According to Albus the basis of allergy is not purely serologic but the still largely unknown process in the body cells which is probably more of a physiologic or pharmacologic nature. The author describes physiologic and chemical studies on non-allergic persons and patients with latent allergy. The latter were clinically healthy persons with a history of allergy. The studies concerned serum protein, serum globulins, serum calcium, blood sugar, serum cholesterol, histaminase and acetylcholine esterase. It was found that as regards serum protein, serum calcium and blood sugar there was no difference between nonallergic and allergic persons. The globulins seem to be increased in allergic persons. It is suspected that the cholesterol ester is reduced in the serum of allergic patients. The activity of histaminase and choline esterase of the blood is noticeably decreased in allergic patients. The author discusses sensitization, antigen antibody reaction, histamine and histaminase, development of allergic reactions, secondary effects of allergic reactions and the allergic constitution and its modification. He sets forth the hypothesis that the allergen resorption as well as the antigen antibody reaction are for every individual continuously evolving normal physiologic processes. The person with an allergic constitution, because of the reduced activity of his histaminase and choline esterase has an increased suscep-

tibility to histamine and acetylcholine. It is suggested that the more comprehensive term "histamine susceptible constitution" be substituted for "allergic constitution." There are still problems that require investigation, such as the role of epinephrine oxydase in allergy. Experimental studies demonstrated that the increase in serum globulins in allergic persons is due to their increased concentration gradient for histamine, because in animal experiments sensitization and frequent small doses of histamine effect a noticeable increase in serum globulins, in tests on human subjects glutathione, ascorbic acid and thiosulfate produce reduction in the serum globulins. The author denies that a colloidoclastic crisis is a prerequisite for the development of an allergic reaction. He suggests that insufficient negativity of the redox potential is the deeper cause of the histamine susceptible constitution. Administration of large quantities of vitamin C does not seem to solve the problem of treatment in allergy. The cardinal problem is how the organism can be influenced to return and properly utilize the redox substances. A blood transfusion has been known to improve the storage capacity for vitamin C in a case in which vitamin therapy had been a failure previously. Although there is as yet insufficient evidence for the administration of redox substances, it is essential to keep away from the allergic patient all substances that impair the redox potential.

### Zeitschrift für Immunitätsforschung, Jena

99 257-332 (Feb. 20) 1941 Partial Index

- Question of Relationship Between Sensitivity to Odor of Horses and Horse Serum Hypersensitivity. W. Hartmann—p. 257  
 Mode of Action of Antibacteriophage Serum and of Tannic Acid on Bacteriophage Protein. H. Moriyama and S. Ohishi—p. 282  
 Experiences with Dry Blood Reaction. Meincke's Classification Reaction II for Syphilis According to Meincke and Fischer. D. Gigante—p. 299  
 Consideration of Problems Connected with Pathogenesis of Diphtheria. A. Zironi—p. 309  
 Leptospirosis in Tame Laboratory Rats and Immunization of Personnel Exposed to Infection. W. Schuffner—p. 323

**Sensitivity to Odor of Horses and Horse Serum Hypersensitivity.**—Hartmann investigated the question of a relationship between sensitivity to the odor of horses and hypersensitivity to horse serum. He inquired of 1668 persons (1) whether they were sensitive to the odor of horses (2) whether they ever received an injection of horse serum and (3) whether, in doing so, they developed signs of serum disease. The group included men in military hospitals and men, women and children in a city hospital varying in ages between 5 and 65 years. The inquiry disclosed that 26 or 1.55 per cent were sensitive to the odor of horses. Of the 26 7 had previously been treated with horse serum and none had had signs of serum disease. Only 1 of 17 persons sensitive to horse odor given an intracutaneous injection of 0.1 cc of horse serum developed a mild local reaction and this person had received tetanus serum one month previously. Of the 1647 persons who were not sensitive to the odor of horses 171 had been treated once with horse serum, and of these 16 had had signs of serum disease. The intracutaneous injection of 0.1 cc of horse serum into 10 persons not sensitive to the odor of horses, but previously treated with horse serum without showing signs of serum disease, resulted in a local reaction in only 1. Ten children not sensitive to the odor of horses, but who had been treated from three to five weeks previously with diphtheria or scarlet fever horse serum were also given an intracutaneous injection of 0.1 cc of horse serum. Among these there were 4 who showed a mild reaction around the site of injection. It was thus impossible to establish a relationship between sensitivity to the odor of horses and hypersensitivity to horse serum. Testing fluids were extracted from the urine, sweat and cutaneous scales of horses, and these were used for intracutaneous tests on persons sensitive and not sensitive to the odor of horses. These tests again failed to reveal a relationship between the sensitivity to the odor of horses and to the aforementioned extracts. Eating of horse meat caused no reactions in 2 persons who were sensitive to the odor of horses. The author concluded that there is no connection between sensitivity to horse odor and hypersensitivity to horse serum.

## Book Notices

**The Pathology of Trauma** By Alan Richards Moritz, M.D. Professor of Legal Medicine, Harvard Medical School, Boston. Cloth. Price \$6. Pp. 386 with 117 illustrations. Philadelphia: Lea & Febiger, 1942.

The purpose of the author is to compile a volume which is primarily devoted to the pathogenesis, pathologic anatomy and histology of traumatic lesions which have not hitherto been adequately treated in the literature. Topics which have been satisfactorily considered are discussed briefly in the interest of completeness. The general plan of the book is satisfactory, the chapter arrangement beginning with a general consideration of mechanical injuries including various types of trauma—gunshot wounds, stab wounds and injuries due to blunt force. Other sections are devoted to trauma and infection, trauma and tumor and then follows a discussion of the lesions of the various body systems, special organs and tissues, their complications and sequelae. Attention has been given to controversial questions, notably in the chapter on trauma and tumors and in the discussion of the productive mechanism of cerebral concussion, and Moritz's reasoning is in agreement with generally accepted opinions. To those who are unfamiliar with recent advances in forensic investigations the information on the various laboratory procedures for testing discharged powder residues on the skin and clothing in gunshot wounds, the use of infra-red photography in the examination of the clothes in these cases and the utilization of ultraviolet rays in other investigations may be of interest. The section on injuries resulting from detonation of high explosives is also particularly pertinent at this time. Many other parts of the book are informative, especially the discussion of the exacerbation of diseases by trauma and the section on asphyxia of traumatic origin. Adequate references are given for those who wish to pursue further the topics which are under discussion. The illustrations are excellent and clearly depict the points which the author wishes to emphasize and are conveniently located in relation to the text. While there are a few minor omissions and the index could be improved on generally considered the book will be a valuable addition to the library of the student of forensic medicine as well as of clinicians and pathologists, for whom the book is intended. Incidentally it collects in one handy and convenient volume much information which would otherwise necessitate an exhaustive search of the literature.

**Food Charts. Foods as Sources of the Dietary Essentials.** Prepared by a Joint Committee of the Council on Foods and Nutrition of the American Medical Association and of the Food and Nutrition Board of the National Research Council. Paper. Price 10 cents. Quantity prices on request. Pp. 20. Chicago: American Medical Association, 1942.

This well illustrated essay is an interesting and forceful presentation of some of the recently acquired quantitative information about foods as sources of the dietary essentials. It has been prepared by a joint committee of the Council on Foods and Nutrition of the American Medical Association and of the Food and Nutrition Board of the National Research Council. There are eight charts which show the contribution of individual foods to the needs for protein, calcium, iron, vitamin A, thiamine, riboflavin, nicotinic acid and ascorbic acid. A feature of these graphic presentations is that the values are presented in terms of the percentage of the daily requirements which are supplied by typical servings of each food. The requirements selected are the Recommended Daily Allowances of the Food and Nutrition Board of the National Research Council. The charts show, for example, that a serving of about 3½ ounces of cooked greens (beet, kale, chard, mustard, spinach, turnip) will supply more than 10,000 international units of provitamin A, the daily allowance of which is 5,000 international units. An orange of average size, half a grapefruit or a serving of fresh strawberries will supply the 75 mg. of ascorbic acid which is considered to be a desirable intake of vitamin C. It is interesting to note the unique value of milk as a source of calcium, protein and riboflavin. There is a descriptive paragraph or two about each of the charts. In addition the booklet reproduces the table of Recommended Dietary Allowances and also provides the values of Minimum Dietary Requirements developed by the Food and Drug Administration for purposes of labeling special dietary foods. This little booklet thus provides a considerable amount of information about foods.

**History of the School of Nursing of the Presbyterian Hospital, New York, 1892-1942.** By Eleanor Lee, A.B., R.N., Assistant Professor of Nursing, Department of Nursing, College of Physicians and Surgeons, Columbia University, New York. Cloth. Price \$3.50. Pp. 286 with 57 illustrations. New York: G.P. Putnam's Sons, 1942.

Rarely does one find a volume so free from flaw as this one by Miss Eleanor Lee. Her knowledge of the Presbyterian Hospital, coupled with her being well versed in the history of nursing, makes her especially qualified for just such a work as this. That she has done it with real skill is revealed through the contents, with ten chapters, over fifty illustrations, a chronological list of events from 1892 to June 1942, an appendix, pages of which are original copies in facsimile, junior and senior lectures, 1893-1894, graduating exercises of the class of 1894 in the Training School for Nurses, with notes from diaries of members, the history and significance of the Presbyterian nurse's pin, speakers at graduation, 1894-1942, presidents of the alumnae association, a prayer offered at the funeral of Miss Maxwell, Presbyterian Hospital School of Nursing, 1894, hospital officers administrative staff, nursing service, Faculty of Medicine of the College of Physicians and Surgeons, officers of instruction, Department of Nursing, plan of instruction, 1942, explanation of table of trends in nursing, bibliography, and a helpful index.

To select one feature as most prominent is difficult but through the table of contents one sees what ground is covered, and one needs only to go through these chapters to see how great a piece of work this has been, with method most meticulous, attention to minute details and thoroughness by the author, all of which make the volume increasingly valuable with all its information and also as a tool of reference. Each chapter has its own part in forming the whole, many having worthily contributed toward making the volume all that it is, and, where mention can not be made in the contents, mention is made in the index, as in the case of the Florence Nightingale Memorabilia, easily beyond compare and as delightful in its way as is the chapter on the Alumnae Association.

Chapter I is chiefly devoted to the Presbyterian Hospital in its early days at the time of its opening on Oct. 10, 1872 and, as its title implies, the Presbyterian Hospital before the establishment of the Training School for Nurses. Mention is made of its benefactors and various organizations, how middle aged women were employed as nurses, with their training gained through experience and with the help of doctors, up to 1891, when, because of increased demands on the hospital, and in awareness of the great possibilities the work of nursing might extend, decision was made to establish its own training school.

With chapter II, on the founding and early development of the Training School for Nurses, the Training School for Nurses was opened in May 1892, Miss Anna Caroline Maxwell having taken over her duties as superintendent of nurses on January 1 of that year. From the time of her appointment until her retirement in June 1921, constant progress was made through the untiring and devoted service of this gifted woman, all of which has been ably continued by Miss Helen Young, acting director at the time of Miss Maxwell's retirement, who was made director of the Nursing Service and the School of Nursing of the Presbyterian Hospital in 1923.

To both of these praiseworthy women the author has given high merit, as well as to others where merit was due, thus reflecting merit on herself, equally deserved. From the time the Training School for Nurses was born, all worked loyally, perhaps little dreaming on "how firm a foundation"—toward what has now become the Department of Nursing of the College of Physicians and Surgeons, Presbyterian Hospital School of Nursing,—a monument of service to serve all "without regard to race, creed or color." Credit should also go to the publishers, who have done fine work with their neat binding, paper, print and entire format, adding their part to a work already easily readable. It is a volume that should find an early place not only in all medical and hospital libraries, but in public libraries as well, as also in the hands of doctors and countless lay readers, for all of whom it will arouse interest in history not yet awakened and stimulate that already alive in the many who long since have learned the joy of all that is historical.

**Massage Manipulation and Local Anaesthesia** By James Cyriax M.D. B Ch Assistant Medical Officer Physiotherapeutic Department St Thomas's Hospital London Cloth Price 12s 6d Pp 302 with 26 illustrations London Hamish Hamilton Medical Books 1941

This monograph opens with the statement that "this work is intended primarily for graduate masseuses and for the medical practitioners from whom they receive instructions" In the United States most medical men instructing physical therapy technicians would not recommend the book to their students because many of the procedures described have never before been published and many of the techniques presented would have to be verified by a physician before he could recommend them

Among the many subjects dealt with for the first time, attention may be drawn to the author's technique for the treatment of spastic conditions of the alimentary tract by manipulation of the intestine The author believes that great improvement, even cure of long standing abdominal disorders, can be achieved by manual treatment of the gastrointestinal tract Considerable experience and the use of controls will be required to substantiate the author's statements "Paradoxically enough constipation is harmless as long as no effort is made to treat it by taking laxative medicines" and "If the perineum is lax, the tone of the levator ani muscle can be restored by active exercises even years after childbirth" Cyriax outlines the material on a regional basis and gives the conditions in each region that are amenable to the application of physical therapy His theories have been evolved over a period of years in the course of a systematic reevaluation of long established methods Their advantages have been amply demonstrated to the author and his colleagues in the physical therapy department of St Thomas's Hospital His approach to the subject matter is practical Although the book is thought provoking the theories presented will need further investigation especially by physical therapy physicians

**Los Angeles County Hospital House Staff Manual** Edited by Morris F. Collier M.D. Third edition Paper Price \$3 Pp 342 with 1 illustration Los Angeles 1942

This manual prepared for the guidance of the house staff of the Los Angeles County Hospital, has been completely revised since the publication of the second edition in 1941 It is a treatise of modern practice and is sufficiently comprehensive to cover the essential needs in relation to general rules and regulations, minor technical procedures, the hospital formulary, diet outlines, laboratory procedures and other departmental routines These standardized procedures should prove exceedingly helpful to new house officers, who must necessarily consolidate and systematize their knowledge in order to function efficiently in a complex hospital organization Directive outlines are included with reference to physical therapy, radiation therapy, general medicine, contagious diseases, pediatrics, neuromedicine, neurosurgery, general surgery, anesthesia, urology, orthopedics, fractures, gynecology, obstetrics, dermatology-syphilology, ophthalmology and otolaryngology There are special sections on sulfonamide therapy, war gases, burns, immunization procedures, public health regulations and psychiatric studies Full directions of diagnostic and therapeutic methods are included in all outlines The present volume can be highly recommended as a model for other hospitals seeking to develop a suitable "procedure book" for their own needs

**Emergency Care** By Marie A. Wooders B.S. R.N. Principal School of Nursing Hackensack Hospital Hackensack N.J. and Donald A. Curtis M.D. Lieutenant Colonel Medical Reserve Commanding 342d Medical Regiment United States Army Hackensack Cloth Price \$3.50 1p 560 with 201 illustrations Philadelphia F.A. Davis Company 1942

The title of this book implies correctly that it is more than just another manual on first aid Col. Walter P. Davenport states in a foreword that in addition to fulfilling its purpose as a nurses' manual for service in national and civilian emergencies it will prove of assistance to nurses in their professional duties and will orient them in the realities of nursing as modified by the necessities of military service The book is divided into sections devoted to general emergencies, hospital accidents, accidents due to individual activities—home and farm accidents—occupational emergencies—camp school and industry—public

emergencies (major disasters) and national and civil emergencies This results in some problems in arrangement, such as the separation of the newer methods of treating burns, which appear under General Emergencies, from another discussion of burns which appears under Home and Farm Accidents, the latter dealing principally with prevention—use of matches, hot liquids and the like This is, however, a minor drawback for any one who reads through the whole book The section on the control of hemorrhage by pressure over blood vessels is illustrated by an osseous skeleton rather than the conventional figure showing the blood vessels Many sections are delightfully illustrated with little sketches which resemble cartoons and which carry their message well The final section includes chapters on administration in army hospitals, organization of the army medical department and similar discussions, which should prove invaluable for any nurse about to enter one of the services The book can be recommended to nurses whether in civil or military life

**Public Health Statistics** By Marguerite F. Hall M.A. Ph.D. Assistant Professor of Public Health Statistics School of Public Health University of Michigan Ann Arbor Cloth Price \$3.50 1p 408 with 41 illustrations New York & London Paul B. Hoeber Inc. 1942

In the field of public health even more than in that of clinical and laboratory research a thorough knowledge of the handling of statistics is imperative This book has combined a common sense view on the interpretation of public health statistics with a clear and concise presentation of the algebra involved Miss Hall who is assistant professor of public health statistics in the School of Public Health at the University of Michigan gives prominence to the limitations of the statistical method by citing Quetelet's four rules 1 Have no preconceived ideas Be unbiased Attack your problem with an open mind 2 Don't reject contrary values Eliminate possible errors then seek verification of the contrary values 3 Face the facts you find 4 Compare data that are comparable Accurate comparison can be made only between similar things and over short periods of time Data drawn from unlike sources may lead to false interpretations These rules are sound for any scientific method and the fact that they are applied to statistics is merely evidence of the scientific acceptability of statistical methodology

Of special interest to prospective contributors to THE JOURNAL is the following exercise given at the end of one of the chapters Select a table published in THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION Give its fundamental weaknesses and make a skeleton table which would more nearly conform to the theoretical ideals of statistical tabulation Though not all tables in THE JOURNAL can be used as horrible examples, most writers on clinical subjects have been inclined to neglect the principles of proper statistical treatment of their data Herein lies a useful reminder

**Bernard creador de la medicina científica Estudio crítico de su labor científica seguido de una versión castellana de su Introducción al estudio de la medicina experimental** Por el Coronel M. C. José Joaquín Izquierdo profesor de fisiología experimental en la Escuela médico militar y en la Facultad de medicina de la Universidad nacional de México México D.F. Paper Price 20 pesos Pp 329 Mexico D.F. Imprenta Universitaria de México 1912

The interest in Claude Bernard on the part of Mexican investigators is praiseworthy The first translation of *Introduction à l'étude de la médecine expérimentale* (Paris 1865) appeared in Mexico in 1880 The second and more concise translation itself a classic, by don Carlos García (1900) was published in the somewhat obscure village of San Luis Potosí The García translation has been missed by most of the collectors of Bernard and indeed the author of the book under review belatedly admits neglecting the mention of it in his outline of studies in physiology in Mexico, *Balance cuatricentenario de la fisiología en México* (1934) The present work is an excellent treatise on Claude Bernard, as it includes not only biographic material but a careful analysis and descriptions of Claude Bernard's most significant experiments The bibliography, although incomplete, is sufficient to support the text and, on the whole the book is to be recommended not only to medical historians but to physiologists as well



## Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS BUT THESE WILL BE OMITTED ON REQUEST.

### EFFECT ON SKIN OF HEAT AND COLD

**To the Editor**—Please inform me if the tissue changes such as those due to thermal changes can be called burns? Specifically, can the changes produced by the action of solidified carbon dioxide on tissue be called a burn? Also what are the essential physiologic and pathologic differences in heat or cold on tissues? I have heard that ice application or hot water bag application makes little difference as used on tissue, as for example in acute appendicitis. In other words, either ice or heat may be used to get the same result.

M D California

**ANSWER**—Changes in the skin from the use of solidified carbon dioxide are often spoken of as burns. Burns as ordinarily understood, however, mean injuries from heat. Perno is a term often used in connection with the results from exposure to cold. The tissue changes that follow the use of cold differ from those from heat.

According to Sonnenburg and Tschmarke (quoted by Gans, Oskar, *Histologie der Hautkrankheiten*, Berlin, Julius Springer, 1925, vol 1, p 175) it is customary to divide the frostbites into various grades analogous to those for burns but it is necessary to bear in mind that this classification is based on a purely superficial resemblance of the symptoms devoid of any pathologic justification. Thus one may distinguish between erythematous, bullous and gangrenous dermatitis. The first is marked by a vascular dilatation following a fleeting constriction. A short period of paleness is followed by a bluish red discoloration, swelling and definite itching of the skin, the result of a passive hyperemia. In this condition complete restitution is still possible. If, however, the action of cold and hence the venous accumulation is continued, the increased swelling will be associated with anesthesia of the whole area. Later the formation of serous vesicles is noted, developing into hemorrhagic ones if the damage is deeper. Their disintegration is followed by long lasting ulcers—the second stage of the freezing. At this stage a certain forecast of consequences is no longer possible, since these sequels are largely correlated with impairment of the vessels, which can be gaged only in the course of time. The highest degree of freezing is marked by a deep blue-red discoloration of the whole skin, which is completely anesthetized. A necrosis involving cutis, subcutis and often also the muscles, even all the soft parts together with the bony structure, may lead to the destruction of whole parts. This necrosis usually appears as a dry or moist gangrene, depending on whether the elimination proceeds aseptically or with a secondary infection with all its consequences.

### SULFUR PREPARATIONS USED FOR MITES AND HUMAN HEALTH

**To the Editor**—Kindly let me know whether or not there are any health hazards to workers on citrus groves, connected with the spraying or dusting of sulfur preparations for the control of rust mites. The preparations used are a fine sulfur dust, a so called 'wetable sulfur' and a lime sulfur.

Edward J. Kempf, M.D., Wading River L. I., N. Y.

**ANSWER**—"Wetable sulfur" is sulfur which has been ground with some wetting agent so that on addition of water the mixture is wet easily and the sulfur does not float on top, as would be the case if plain powdered sulfur was used. The preparation known as "lime sulfur" is a polysulfide of calcium, approximately of the formula  $\text{CaS}_2$ , made by boiling sulfur with lime and filtering.

The use of wettable sulfur preparations under ordinary field conditions should involve no special health hazard except, possibly, for an occasional instance of sulfur dermatitis in hypersensitive persons.

It is possible that in the practical use of lime sulfur small amounts of sulfur dioxide or hydrogen sulfide might be formed. However, as far as can be ascertained the only health hazard from lime sulfur as normally used may be a dermatitis in susceptible individuals. It might be stressed that in concentrated solution, lime sulfur may act as a powerful depilatory, and at least one instance has been seen in which such a solution caused burns of the skin. In actual use as an insecticide the preparation is used in such dilute form that its caustic effect is probably not noticeable.

### DIFFERENTIATION OF SPLENOMEGALY—ASCOLI TREATMENT OF MALARIA

**To the Editor**—A white man aged 53 who has had an enlarged spleen for the past ten years has been examined by several competent internists and has had appropriate laboratory work up. The patient's medical history reveals the fact that in 1912 he lived in Tripoli at which time he was said to have had fever but diagnosis of the condition was not known. He had been in relatively good health until 1932 when he began to suffer from gastric distress and the spleen was found to be enlarged. Since then the spleen has been becoming larger. At the present time it is enlarged down to the iliac crest and is well beyond the umbilicus to the right. In the last two years the patient has had several attacks of severe pain in the left side of the abdomen. The pain was noticed first at movement, and these attacks have been presumably splenic infarction. The patient has been examined thoroughly several x-ray examinations of the chest and a gastrointestinal series proved negative. Urinalysis has been essentially negative. Complete blood counts revealed moderate anemia. Leukocytes have been normal in type and number and on no occasions have any basophils or parasites been found in blood smears. A splenic puncture done five years ago did not reveal any abnormality. The physical findings revealed the enlarged spleen mentioned and basal congestion in the left lower lobe. The patient has chronic rhinitis and a postnasal drip. The liver edge can just barely be felt. The blood Wassermann reaction was negative. Gastric washings have not revealed any tubercle bacilli. Gastric analyses have been within normal limits. Blood examinations including coagulation time, bleeding time, calcium and cholesterol determinations have been within normal limits. The diagnosis is presumed to be either splenic enlargement due to chronic malaria or possibly, kala-azar or leishmaniasis. The patient has been treated symptomatically by use of tonics and diet. He refuses an operation. The question arises of further treatment, the advisability of roentgen therapy or of the Ascoli treatment. If the Ascoli treatment is to be given what are the chances of epinephrine injections to be used causing embolic phenomena due to thrombi of spleen, which must have occurred?

O. J. Pellitteri, M.D., New York

**ANSWER**—This letter implies a query as to diagnosis when it says that the diagnosis is presumed to be either splenic enlargement due to chronic malaria or possibly kala-azar or leishmaniasis. Kala-azar is the visceral form of leishmaniasis associated with enlargement of the spleen and liver. As in the case of chronic malaria, examination of material obtained by splenic puncture should serve to exclude malaria and kala-azar if the characteristic evidences of these diseases are absent. Even though there is a slight risk of hemorrhage after splenic puncture, it might be worth while to repeat this examination, since it has not been made for five years. The possibility that the symptoms have been caused by schistosomiasis seems improbable unless the patient lived for a long time in northern Africa in a region where he might have been exposed to repeated reinfection. Perhaps it would be worth while to consider again the possibility of this disease. If the three diseases mentioned are definitely excluded, a diagnosis of Banti's disease would seem to be probable, but histoplasmosis or some other form of fungous disease might be considered among the possibilities.

As to the direct question regarding the Ascoli treatment and its possible relationship to infarction of the spleen, in the first place infarction of the spleen is a common symptom of malaria, regardless of the use of epinephrine injections. The Ascoli treatment has been used by a considerable number of authorities. Froilano de Mello (*Experimental Studies on the Treatment of Malarial Splenomegalies by the Method of Ascoli*, *South African M. J.* 12:835 [Nov 26] 1938) published an excellent critical study of the subject and a general review. Many writers have reported groups of cases numbering from about 20 to 400. For the most part the reports fall into two groups: (1) those which are enthusiastic about the results of the treatment and (2) those which noted little or no benefit from its use. A number of authors stress the fact that transitory circulatory disturbances not infrequently result. These most commonly occur after a number of injections have been given. Giuseppe Pizzillo (*Malarial Splenomegaly and Venous Thrombosis Treated with Intravenous Epinephrine*, abstr. *Trop. Dis. Bull.* 38:32 [Jan.] 1941) reported failure to obtain reduction in the size of the spleen in a case which subsequently proved fatal. Toward the end of the course of treatment, after the twentieth injection, there was a copious hematemesis followed by abundant melena. Six months later splenectomy was performed and was followed by death. The author attributed the absence of contraction of the spleen after administration of epinephrine to phlebotic thrombosis, which he assumed to have existed prior to the treatment. Only a single published case found seems to have a direct bearing on the question (Jorge, A. Lourenço da Silva, Jose Ferreira, and Leal, A. *Estillac Congestive Splenomegaly with Hemorrhage*, abstr. *Trop. Dis. Bull.* 33:266 [April] 1936). These authors report a case diagnosed as Banti's disease in which administration of epinephrine brought about considerable reduction in the size of the spleen. Subsequent hematemesis was followed



by still further reduction. In this case it was thought that splenic thrombophlebitis had occurred and had been followed by rupture of veins of the gastrosplenic anastomoses. It does not seem necessary to suppose that use of epinephrine caused the thrombophlebitis or the hemorrhage. The fact that only 2 cases of thrombophlebitis which might conceivably be attributed to the use of epinephrine have been found would make it appear that the risk of such an eventuality is small.

### WAR ACTIVITIES OF GIRL SCOUTS AND GIRL GUIDES

*To the Editor*—Please send me information as to the duties of the Girl Scouts in civilian emergency also information as to the English Girl Scouts activities  
W. J. Tucker, M.D. Ashland, Wis.

**ANSWER**—Girl Scouts have taken part in civilian emergency activities in their various localities, meeting the local needs and fitting into the local picture. The composite picture of service given by Girl Scouts throughout the country is as follows: Girl Scouts collected tons of paper and scrap metal in conservation drives, bottles and special materials for clinics, thousands of books for soldiers in camp, old clothes, first aid and invalids' equipment for the Red Cross. They made clothes and quilts for the Red Cross, Needlework Guild and other agencies, cookies and camp kits for soldiers, baby trays and toys for nurseries, bandages and card files for hospitals, surveys of available hospital space and possible emergency bed space, gardens to grow food and herbs needed by welfare groups for medicines and cakes and candy to raise money for relief agencies. They gave welcome to the children of defense workers and refugees, help at home and in day nurseries to relieve mothers for other jobs, clerical help to social agencies, and gifts and friendship to old folks' homes, orphanages, veterans and other needy families and institutions. No one troop could do all these, but each did some. The older girls from 15 to 18 are organized in groups known as Senior Service Scouts and receive specialized training and give special service in first aid, child care, messenger service, emergency outdoor cooking and through the Wing Scouts, a newly organized group, make model airplanes and learn how to identify planes.

The Girl Guides of Great Britain have taken an active part in the war effort. These girls have participated in the usual salvage projects in various localities and also were asked by the air ministry to collect empty cotton spools, and collected over two hundred thousand of these. They have helped in harvesting and farming and have also assisted in camouflage projects in small communities and have made use of camouflage in concealing their own tents in their own small camps. They have helped in teaching "blitz cooking" for family, neighborhood and large canteen groups using improvised fireplaces made from bricks from bombed houses. At the request of the Ministry of Food demonstrations of this emergency outdoor cooking were given throughout the British Isles.

### FLOATING OPACITIES OF EYES

*To the Editor*—A white man aged 46 whose previous history is irrelevant has complained for the past twenty years of seeing small objects floating in front of his eyes particularly in front of the left eye. He claims that they are small capillaries in which he can distinctly make out red blood corpuscles. Sometimes they are near to his vision and sometimes they seem distant. Together with this he has headaches mostly over the left fronto-parietal region which are more intense when he is trying to concentrate on his work. His vision is 20/20 in both eyes without glasses. His urine and blood study (Wassermann blood count and study of blood smear) are negative. Many ophthalmologists have seen him some called it avitaminosis while others said it was vitreous bodies floating about the eye chambers. None have however been able to give him any relief. He is a sign maker making both neon and painted signs.

Peter J. Milazzo, M.D. Corona, L. I. N. Y.

**ANSWER**—The query does not state whether the floating opacities are actually visible in the vitreous of the patient. If none are visible, the condition is a type of subjective scotoma for which no organic basis has been found. It may be compared to certain tactile sensations without organic cause. It indicates no pathologic condition of the eye and does not really interfere with vision except as an annoyance. Correction of refractive errors, if present, and attention to other possible causes of nervous exhaustion are sometimes of value. The symptom usually becomes much less noticeable and eventually may disappear or be noticed only under exceptional conditions. No relation with avitaminosis is known to exist.

If visible vitreous opacities are present, uveitis must be excluded, but vitreous opacities also occur as part of a presenile degeneration of the vitreous which is common and seldom has any serious consequences.

### EGG WHITE IN TREATMENT OF CANCER

*To the Editor*—There appeared in the New York Times of Dec. 2, 1942 an article entitled "Egg Whites Tested as Cancer Relief." I have a patient with carcinoma of the bladder who has been operated on and irradiated at a large clinic. His prognosis as we all know is hopeless with a gradual decline day by day. Yesterday his wife came to my office with the article mentioned and asked if there was anything in it that would give her husband any relief or comfort. I advised her that as far as I knew there was nothing to this treatment, but, to ease her mind, will you kindly tell me the merits of the article or of the treatment?

M. D., New York

**ANSWER**—The theoretical basis for the use of egg white in the treatment of cancer depends on five observations:

1. The biotin content of some tumor tissue was found to be greater than that of normal tissue of the same origin.

2. Temporary regressions of new growth have been reported rarely to follow intercurrent infections.

3. Certain infectious agents, particularly bacteria, are known to use biotin in their metabolism.

4. Biotin has been found to have a weak effect in inhibiting the protective effect by certain dietary constituents against liver cancer caused in the rat by the administration of dimethylaminoazobenzene.

5. A protein known as avidin, contained in egg white may combine with and inactivate biotin.

The feeding of egg white to small animals induces a biotin deficiency. Woglom fed mice with cancer sufficient avidin to eliminate biotin effect in their bodies completely. Even during this period new metastases appeared. There is no reason to suppose from the evidence available that the feeding of egg white or its protein constituent, avidin, to man or animals will cause any change in the course of a neoplastic growth. The single exception to this statement is the report by Kaplan recently discussed before the Radiological Society of North America. No confirmations of Kaplan's observations have been published.

### SHOCK VERSUS INFECTION IN TREATMENT OF COMPOUND FRACTURE

*To the Editor*—There is some question in my mind regarding the early treatment of compound fractures. I know the Orr-Trueta technic and feel that I can apply this method when given the proper instruments and hospital. However, it is the early treatment that offers somewhat of a puzzle. Let us assume that our patient is a soldier on the battlefield. His wound is a compound fracture with a protruding bone. The area around the fracture is quite dirty, and perhaps there is a piece of shell and cloth within the wound. An aid man or litter group equipped with splints encountered him. Now should the wound be simply covered with a sterile dressing and the patient gently placed on a litter with some support like a pillow or coat or should traction and splints be applied regardless of whether the protruding bone might be drawn into the wound? This phase of treatment has troubled me no end. I have felt that it might be wise to place about 10 Gm. of sulfanilamide in the wound, apply traction and splints and send the patient on to a hospital if possible where proper treatment can be given. Shall we sacrifice shock prevention by no immobilization and thus tend to prevent infection or shall we avoid shock and gamble on infection by immobilization? It must be one or the other. I myself should rather place sulfanilamide in the wound, apply splints and avoid shock.

M. D. Massachusetts

**ANSWER**—The conclusion that it is better to avoid shock and gamble on infection by immobilization in fixed traction in a Thomas leg splint, even if bone fragments are drawn back into the wound, is correct and orthodox. Thus treated not only is shock lessened but pain, possible hemorrhage and avoidable motion at the fracture site leading to churning of the tissues by bone fragments may be eliminated. The sulfanilamide if obtainable, is highly desirable to spread into the wound, which is covered with a sterile dressing.

### BASAL METABOLISM IN NERVOUS PATIENT

*To the Editor*—Will the administration of a small amount of sodium bromide or of phenobarbital to an apprehensive patient for sedative purposes shortly before a basal metabolic determination affect the results undesirably? The patient I have in mind has no conclusive signs or symptoms of hyperthyroidism.

M. D. Colorado

**ANSWER**—The administration of a small dose of sodium bromide or of phenobarbital probably will not have much effect on the basal metabolism readings of the patient described. The best way to get a good reading of an apprehensive patient is by frequent determinations of the basal metabolism on different days. In fact, little attention should be paid to a single test of any patient. The important observation is the level of metabolism.

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## DIETARY CONDITIONS IN INDUSTRY

ROBERT GOODHART, M D

FOREST HILLS, N Y

The proper feeding of large groups of people is a complicated task involving the consideration of many factors and the cooperation of both private and governmental agencies. There are the problems of provision of nutritious foodstuffs, of the distribution, preparation and service of foods, of food habits and of adequate housing, transportation and feeding facilities, and there is the question of cost and purchasing power.

The job we have set for ourselves, that is, improving the quality of the meals consumed by the industrial worker (and thereby improving his health and morale), not only demands the consideration of these problems but poses a few others more or less peculiar in themselves. These include

1 The dinner pail or lunch box. The great majority of industrial workers have their lunches prepared for them at home, while others patronize local merchants who prepare lunch boxes for this purpose. This will probably continue to be so, although the time required to inspect all packages coming in and going out of industrial plants engaged in war work has, in some instances, discouraged this practice.

2 The restaurants, lunch wagons, refreshment stands and food hawkers located in the vicinity of industrial plants.

3 The rolling kitchens or food carts, refreshment stands and automatic vending machines employed within plants.

I do not mean to imply that these devices are to be condemned, quite the contrary. A problem does arise however, in relation to the types of foods obtained from them by the workers. Too often they function largely as vendors of foods of very limited nutritional value, e g candy, pastry and soft drinks.

Assuredly, a situation which appears to encourage some of our industrial executives to make statements for publication and general dissemination like the quotations which follow calls for, at the very least, an active educational campaign.

"It is our firm belief that the candy bars sold throughout the plant are a definite aid to the health and efficiency of our employees."

"Candy is important in lessening fatigue and increasing morale of employees."

"Employees' nourishment afforded by candy dispensed through canteen."

4 The preparation, service and cost of midshift meals provided by restaurants and canteens located on plant premises.

5 The disruption of the eating habits of great numbers of workers which resulted from the institution of the twenty-four hour working day.

6 The optimal length of the lunch period and of the interval between feedings.

7 The decision as to what proportion of the worker's daily nutritive requirements must be provided for at the plant if he is to be kept well nourished and in good health. Many workers come to work without breakfast, particularly when distances are great and transportation facilities poor. In other instances, the community facilities are grossly inadequate to provide for the proper feeding of the new workers brought into the community by war industries. The Committee on Nutrition in Industry of the Food and Nutrition Board of the National Research Council has recommended that the midshift meal should supply at least one third of the worker's daily food requirements and has suggested that it would be desirable for at least two thirds of the daily requirements to be supplied at the plant.<sup>1</sup> The British government has stipulated that factory canteens in Great Britain should supply the workers with two thirds of their daily nutritional needs.

8 The particular dietary requirements of workers who must come into contact with toxic chemicals and other noxious agents, or who labor under unusual conditions of physiologic stress.

There are other questions, which I am sure have already occurred to many, that must be answered for individual plants and industries.

It is not possible for me to discuss adequately the whole problem of industrial feeding in the short time allotted to me. I shall therefore restrict myself largely to demonstrating that a problem of nutrition exists among industrial workers by citing the conditions found in a few representative industrial cafeterias by several independent investigators.

In March 1942 Miss G Dorothy Williams of the New York State Nutrition Committee inspected the cafeteria of a large plant located near Albany, N Y. She found that the men's trays contained mostly meat, potato, bread, pie and milk, while the girls consumed sandwiches, coffee and pie. There were few trays with a vegetable or salad. This may have been due partly to the fact that the vegetables looked rather unpalatable, because of too long periods of soaking and overcooking. The salads were also quite unattractive, because of either poor refrigeration or poor management. Practically no whole wheat breads or rolls were sold.

Read before the Section on Preventive and Industrial Medicine and Public Health at the Ninety Third Annual Session of the American Medical Association, Atlantic City, N J June 12 1942

1 The Food and Nutrition of Industrial Workers in Wartime National Research Council Reprint and Circular Series no 110 April 1942

Miss M. M. Queneau and Dr. S. A. Hyman of the New York State Health Department are at present conducting surveys of foods served and consumed in several New York State factories. They have furnished me with their observations on the three plants at which their studies have been completed. In the first plant they found that only 24 per cent of the workers ate a good lunch and 26 per cent ate a poor lunch, in spite of the fact that a liberal choice of protective foods was offered. In the second plant only 12 per cent of the workers had good lunches, and those of 41 per cent were poor. The third factory

of foods offered to the employees. I found that it was possible to choose a satisfactory lunch. However, on both occasions my lunch was priced by the cafeteria manager at 57 cents. The average sum spent for lunch in that cafeteria by the employees is 37 cents. Between 200 and 250 of the 500 employees eating in the cafeteria regularly choose the day's "special," which is priced at 30 cents. Coffee is included but milk is 5 cents extra. It is not surprising, therefore, that on the two occasions that I witnessed the lunches coming off the cafeteria line not more than 100 employees chose milk with their meals. In another plant which I visited the manage-

TABLE 1—Thirty Cent Daily Special April 29, 1942

Food Items	Weight of Portions Ounces	Estimated Vitamin Content Based on Literature				Niacin
		Vitamin A International Units	Thiamine Hydrochloride International Units*	Ascorbic Acid International Units	Riboflavin Sherman Bourquin Units*	
Braised breast of lamb (edible portion)	7½	0	913	0	2½	No data available
Mashed potatoes	3½	0	37	0	18	
String beans	9½	703	0	275	15	
White bread (2 slice)	2½	0	21	0	18	
Butter (1 pat)	1½	0	14	0	0	
Cream (light)	1	0	6	0	37	No data
Coffee (1 cup)	1	0	0	0	0	
Estimated vitamin content of entire meal based on literature		1 1½	911 (0.9 mg.)	475 (4 mg.)	74 (1 mg.)	
Percentage of daily requirements		0.8	50.0	0	37.0	
Results of analyses of vitamin content of entire meal			0.073 mg.	4.1 mg.	1.1 mg.	8.0 mg.
Percentage of daily requirements		No data	4.1	5.7	4.6	50.0
Percentage lost in preparation		No data	91.0	8.0	0	No data

Protein (N x 6.25) 26.9 Gm (13 per cent of total solids of meal) Total calories 176

TABLE 2—Fifty-Seven Cent Diet Selected with Attention Paid to Nutritive Value of Foods April 29, 1942

Food Items	Weight of Portions	Estimated Vitamin Content Based on Literature				Niacin
		Vitamin A International Units	Thiamine Hydrochloride International Units*	Ascorbic Acid International Units	Riboflavin Sherman Bourquin Units*	
Tomato juice	4½ oz	1 000	30	600	0	No data available
Roast beef (well done)	1 oz	18	60	21	70	
French fried potatoes	1½ oz	0	40	0	0	
Carrots	2 oz	3 000	13	43	17	
Whole wheat bread (2 slices)	3¼ oz	0	91	0	32	
Butter (1 pat)	1½ oz	0	14	0	0	No data
Milk	1½ pt	414	0	0	175	
Cocoanut custard pudding with whipped cream	3 oz	No data	No data	No data	No data	
Estimated total vitamin content (minus pudding)		4 785	0.4 (0.4 mg.)	608 (6 mg.)	334 (10 mg.)	
Percentage of daily requirements		0.8	46.7	61.3	37.0	
Results of analyses of vitamin content of entire meal			0.4 mg.	3.30 mg.	2.16 mg.	8.6 mg.
Percentage of daily requirements			0.9	1.340.0	80.0	47.9
Percentage lost in preparation		No data	0.4	34.4-7	0	No data

Protein (N x 6.25) 19.9 Gm (7.4 per cent of total solids) Total calories 1 094

\* Tomato juice assayed separately 4½ international units (0.45 mg.)

offered a very limited choice of foods, and none of the factory workers obtained a good lunch, while the lunches of 77 per cent were classified as poor.

As criteria for evaluating the lunches, Miss Queneau and Dr. Hyman used the following:

Good if lunch included all three of the following items: milk, fruit or vegetable and a main dish—meat or fish.

Fair if lacking one of these three items.

Poor if lacking two or all of the three items.

It is obvious that a lunch could meet all three of these criteria and still be grossly inadequate.

Due consideration must be given to the economic factor involved in the choice of lunches by factory and office workers. Last month I had an opportunity to inspect the cafeteria of a factory in Brooklyn. On two different occasions I selected lunches from the choice

ment was keenly disappointed with the response of the employees to its innovation of providing milk and orange juice at the main refreshment stand. I dare say that a possible answer to the problem of the poor consumption of these foods existed in the fact that a pint of milk cost 10 cents (one-half pints were not available) and a container of orange juice was 8 cents. Soft drinks and coffee sold for 5 cents each and remained the most popular drinks on the menu.

The Hartford Nutrition Committee, using standards similar to those employed by Miss Queneau and Dr. Hyman, obtained like results in a survey conducted in two Connecticut plants.<sup>1</sup>

On my tour of industrial concerns during the summer of 1941 I found that in almost every instance at least one-half of the workers selected poorly balanced lunches even when a good choice was available.

As it is impossible in many large plants for the employees to go to lunch rooms for their noon meals in the short time allotted to them for this purpose (twenty to thirty minutes as a rule), food carts are often sent into the factories. Some of these carts make provision for one hot dish. However, many do not, and all of them are well stocked with foods of doubtful nutritional value e g sandwiches, pastry, candy, soft drinks and coffee, in addition to milk and ice cream.

During my survey of dietary conditions in industry last summer I found that from 10 to 25 per cent of the employees of thirty-three large plants visited consumed milk at the plant. My experiences since that time have not made me feel inclined to doubt the applicability of this estimate to industry as a whole. In 1936 the National Dairy Council reported<sup>2</sup> that "it appears that there is no uniformity in the practice (between-meal milk service), ranging from almost no such service in some localities to a 90 per cent coverage in others. In the main, our inquiries indicate that between-meal milk is now supplied in a few factories in most localities but that there is almost no such milk service in offices. Furthermore it appears that employees do not invariably buy milk when it is made available to them. The percentage of workers taking milk varies with such factors as food habits of particular races, the season of the year and the age and sex of the workers. Sometimes as few as 2 per cent buy the milk, and rarely more than 40 per cent take it regularly."

These findings indicate a need for an active and intensive educational program. Not only is there a need for the dietary education of the worker and his family, but just as imperative is the need for the dissemination of correct information among cafeteria managers and plant executives. A great deal can be accomplished in increasing the consumption of foods and meals of high nutritional value and in decreasing the consumption of relatively poor foods by the application, by food vendors, of modern merchandising methods toward this end.

Any campaign to convince the workers of the desirability of selecting proper meals at plant food dispensaries must be predicated on an assurance that the recommended foods possess the nutritive qualities attributed to them. Unfortunately altogether too frequently it is impossible to give such assurance.

Through the cooperation of the Crotty Corporation we were able to obtain a few assays on the meals served by an industrial cafeteria to employees of a war industry in the New York area. We selected the meals for assay from the cafeteria line at the time the company employees were being fed. The various constituents of the meals were weighed in the kitchen, placed in containers with dry ice and taken to the laboratories where assays were started immediately. The assays of the diets described in tables 1 and 2 were performed by the Fleischmann Laboratories, under the direction of Dr C N Frey.

The thiamine determinations were made by the fermentation method, sulfite corrected, of Schultz, Atkins and Frey. The content of riboflavin and of niacin was determined by the collaborated methods of the Research Corporation and ascorbic acid by the indophenol method.

It is the custom in this cafeteria to serve a "daily special" for 30 cents. As a rule, more than 200 of

the 500 employees patronizing the cafeteria select the "daily special." Table 1 summarizes my findings on the "special" provided on April 29, 1942. The vitamin content of the meal, as estimated from published data on the nutritive values of the raw foods,<sup>3</sup> is sufficient to supply considerably more than one third of the daily requirements<sup>4</sup> of a moderately active man of 154 pounds (69.9 Kg) except for ascorbic acid, for which the figure represents barely one third of the requirement and for vitamin A.

However, assay of the meal, after preparation and service, discloses a thiamine content of only 0.073 mg representing a loss of approximately 92 per cent of the thiamine content of the fresh raw food. Only 4.3 mg of ascorbic acid was recovered, representing a loss of 82 per cent. The meal as served therefore supplied only 4.1 per cent of the daily requirements for thiamine and only 5.7 per cent of the ascorbic acid needed by a moderately active man.

The riboflavin content of the foods proved quite stable to the method of preparation used. The niacin, protein and calory content proved to be satisfactory. The riboflavin and niacin content of the other meals tested also proved satisfactory.

TABLE 3—Recipe for Lamb Stew

Boned shoulder of lamb	3 pounds 9 ounces
Potatoes	2 pounds
Onions	10 ounces
Celery	6 ounces
Carrots	27 ounces
Flour	1.5 ounces <sup>a</sup>

TABLE 4—Recipe for Raw Vegetable Salad

Chopped cabbage	12 ounces
Chopped green peppers	5 ounces
Chopped radishes	3 ounces
Grated carrots	6 ounces
Vinegar	$\frac{1}{4}$ cup
Salt	1 teaspoon
Sugar	$2\frac{1}{2}$ teaspoons <sup>a</sup>

The estimated content of vitamin A is only 26.8 per cent of the recommended daily requirement, a definitely low figure, particularly since most of the vitamin A was present as carotene.

Table 2 represents an attempt by me to select a nutritious meal from the varieties of food offered by the cafeteria to its patrons. It would appear that I was reasonably successful, although the price of the meal proved to be 20 cents higher than the average sum spent by the plant's employees for their lunches.

Here again the preparation and service of the meal was accompanied by a loss of thiamine hydrochloride (52 per cent) and of ascorbic acid. The ascorbic acid actually found in the meal is practically all accounted for by the tomato juice present.

The relatively high "found value" of riboflavin as compared to the estimated value is explained by the fact that no estimate was made of the vitamin content of the custard pudding.

This seems an appropriate place to draw attention to the fact that 87 per cent of the thiamine content of the "daily special" described in table 1 was provided by the meat, potatoes and beans, a condition associated

<sup>3</sup> Sherman, H. C. Chemistry of Food and Nutrition, ed. 6. New York: Macmillan Company, 1941.

<sup>2</sup> Between-Meal Milk Service in Industry. Chicago: National Dairy Council, October 1936, vol. 8, digest 2.

<sup>4</sup> Recommended Allowances for Various Dietary Essentials. Committee on Food and Nutrition, National Research Council. J. Am. Dietet. A. 17: 565 (June/July) 1941.

with a 92 per cent loss of thiamine hydrochloride in the preparation of the meal. The meat, potatoes and carrots provided 40 per cent of the thiamine content of the second meal, which showed a loss of 52 per cent of the total thiamine content in preparation.

In order to check on the destruction of thiamine hydrochloride in low cost meat dishes, Miss Marie Casteen, research associate in home economics at Teachers College, Columbia University, prepared a lamb stew according to the recipe given in table 3.

This stew was eaten by a number of people and pronounced excellent as far as taste acceptability was concerned. The recipe yielded 136 ounces of stew, about seventeen 8 ounce portions. The theoretical thiamine content of each 8 ounce serving was 0.384 mg., while assay by the fermentation method, with sulfite correction, gave a value of 0.135 mg., representing a loss in preparation of approximately 65 per cent.

Miss Casteen also prepared a raw vegetable salad according to the recipe (table 4).

Three and one-half hours after preparation this salad was assayed for ascorbic acid and found to contain

The assays in this case were run by the Laboratory of Industrial Hygiene. Thiamine determinations were by the fermentation method with sulfite modifications, riboflavin determinations by the method of Snell and Strong, niacin determinations by the methods of Dann and Handler and vitamin C determinations by the Stevens method.

The results of analyses of this meal show a much better retention of vitamin content and indicate that with proper selection and proper handling good food can be delivered without excessive vitamin loss.

My associates and I realize the inadequacy of our sampling as a basis for any generalizations, and our studies are continuing. However, the cafeteria from which the diets were selected does not differ in any important respect as to management, equipment, menus and the purchase and preparation of foods from many other "better type" industrial cafeterias which we have visited. It is well known to nutritionists and research workers in the field of nutrition that of all the vitamins, thiamine hydrochloride and ascorbic acid are the most liable to destruction in the preparation and cooking of

TABLE 5—*Forty Cent Daily Special May 28 1942*  
(Corrected to Improve Vitamin Content)

Food Items	Weight of Portions	Estimated Vitamin Content Based on Literature				Niacin
		Vitamin A International Units	Thiamine Hydrochloride International Units	Ascorbic Acid International Units	Riboflavin Sherman Bourquin Units	
Braised breast of lamb (edible portion)	5 1/2 oz.	0	163	0	170	10
Added brewers' yeast extract flavored for seasoning			110		70	
Boiled potato	3 1/2 oz.	2	40	215	19	
String beans	2 1/4 oz.	700	30	25	25	
Raw vegetable salad	5 oz.	1000	0	240	0	10
Enriched bread (2 slices)	2 oz.	0	0	0	0	
Butter (1 pat)	1 1/4 oz.	0	14	0	0	
Milk	1 pt.	414	29	34	175	
Estimated vitamin content of entire meal		443	49 (1 mg.)	176 (0.5 mg.)	411 (1.3 mg.)	
Percentage of daily requirements		89.5	70.1	8.0	48.1	
Results of analyses of vitamin content of entire meal			0.81 mg.	45 mg.	1.43 mg.	9.4 mg.
Percentage of daily requirements			45.0	60.0	5.9	51.2
Percentage lost in preparation		No data	1.7	90	0	No data

5.35 mg. per ounce. Although this amount represents about 40 per cent less than the theoretical content, it is still appreciable, being in the range of values found for canned tomato juice.

In view of the satisfactory content of this salad after a lapse of time sufficient to allow for normal handling in a cafeteria, the subject was discussed with the operators of the cafeteria and plans were made to serve a slightly changed "daily special." This special was based on the one described in table 1. The braised breast of lamb was seasoned by means of a commercial brewers' yeast extract. The potato item was served as a boiled whole potato rather than as mashed potatoes. The ordinary white bread was replaced by enriched bread, and the beverage was milk instead of coffee. The raw vegetable salad was added. The meal was prepared in the kitchen of the cafeteria and selected from the service counter in the same manner as the food first tested. The cost of the meal was 40 cents, an increase of 10 cents over the former "daily special."

The makeup of the meal, together with the estimated vitamin content and the results of assays, is shown in table 5. The theoretical vitamin values used in this table were computed from the same source as those in tables 1 and 2. The value for the added brewers' yeast extract was based on previous assays of the material.

foods. Riboflavin is relatively stable to heat, although it is destroyed to an appreciable extent in alkaline solutions at temperatures above 212 F.<sup>5</sup>

Not only do the results of these assays demonstrate the ease with which the recommended daily requirements of the Food and Nutrition Board of the National Research Council can be met by the proper selection and preparation of foods, but also they illustrate the conservatism of the recommendation by the Committee on Nutrition in Industry of the council that meals served in the plant should supply at least one third of the daily requirements.

Those who question the necessity or desirability of adhering to the recommendations of the Food and Nutrition Board are advised to read the recent article by Williams and his associates on induced thiamine deficiency in man.<sup>6</sup> The data of these workers indicate that, for their subjects, the optimal daily intake of thiamine hydrochloride was not less than 0.5 mg. or more than 1 mg. for each 1,000 calories of their diet.

They also found that, when subjects were maintained on daily intakes of 0.22 mg. of thiamine hydrochloride

5 Roscoe M. H. Heat Stability of Vitamin B<sub>2</sub> Rate of Destruction at Various Reactions of Vitamin B<sub>2</sub> Contained in Different Materials. *Biochem. J.* 27: 1540 1933.

6 Williams R. D., Mason H. I., Smith, B. F. and Wilder R. M. Induced Thiamine (Vitamin B<sub>1</sub>) Deficiency and the Thiamine Requirement of Man. *Arch. Int. Med.* 69: 721 (May) 1942.

per thousand calories of the diet, gross changes of behavior occurred, including a "diminished inclination to perform accustomed tasks and progressive decrease of ability to make social adjustments within the group" The more active subjects were the first affected In the words of the authors, "They did not maintain good health On the contrary, they all suffered impairment of physical and mental efficiency, with manifest evidence of biochemical abnormalities They lived on a plane of vitality lowered by a deficiency of thiamine, a plane which could be raised again only by the administration of thiamine"

During the past year the Committee on Nutrition in Industry of the National Research Council has been sponsoring a study of the nutritional status of industrial workers This study is being conducted under the direction of Dr Henry Borsook To date, slightly more than 1,000 men have been examined, with some extremely interesting results

Forty-two per cent had plasma ascorbic acid levels of less than 0.5 mg per hundred cubic centimeters (17 per cent less than 0.25 mg) Nineteen per cent showed signs of premature degeneration of the nervous system, as evidenced by loss of vibratory sensation in the toes to a C 256 tuning fork (generally accepted as pathologic in men under 35 years of age) Forty-seven per cent presented gross vitamin A deficiency as evidenced by localized elevated conjunctival spots Twenty-eight and six-tenths per cent had a blood hemoglobin content of less than 14 Gm per hundred cubic centimeters

As pointed out previously in this paper, the proper feeding of industrial workers is a complicated problem the solution of which requires the cooperation of industry, labor, the community and the government My own observations have impressed me with the progress being made toward the integration of the efforts of these various groups so that each one's talents and opportunities for work can be most efficiently utilized However, the evidence is so convincing that the nutritional status of large numbers of our industrial workers is below a level compatible with optimal health and physical and mental efficiency that a decided acceleration in the rate at which remedial procedures are being instituted throughout the country is indicated

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#### ABSTRACT OF DISCUSSION

DR NORMAN H JOLLIFFE, New York I think this paper indicates why dietary surveys, though indicating a high degree of dietary inadequacies in all population groups surveyed are apt to underestimate the prevalence of poor diets I wish to emphasize that the vitamin losses of cooked foods are confined almost exclusively to ascorbic acid and thiamine I have recommended in calculation of diets that the vitamin C value content of cooked foods other than tomatoes should be estimated as zero and that the thiamine content of cooked foods be estimated as 50 per cent of the raw value These studies by Dr Goodhart confirm the general applicability of this rule The only dependable dietary sources of vitamin C are citrus fruits cooked or raw tomatoes, and fresh raw fruits and vegetables Three other points made by Dr Goodhart I wish to emphasize First the necessity for industry to employ a dietitian or nutritionist to supervise the cafeterias to insure at least a third and preferably a half of the nutritive essentials in the noon day meal Second, that the cafeterias and the serving of food in industrial plants should be on a nonprofit basis or even subsidized by management or government Third, that the responsibility for adequate meals be placed in the hands of the medical department

## SKI INJURIES

### A STATISTICAL AND ANALYTIC STUDY

JOHN R MORITZ, M.D.

SUN VALLEY, IDAHO

It is my purpose in this paper to review and briefly analyze all the reported injuries sustained as a result of skiing at Sun Valley for a three year period ended in May 1942 This is now a pertinent subject in view of the increased interest and participation in skiing Considering the fact that the United States Army is engaged in the training of ski troops, there is additional practical interest in the type of injury which may be anticipated

Owing to the isolation of Sun Valley, almost all casualties must, from necessity, pass through one of several medical offices All the medical facilities are under one head, and a single record system is observed

TABLE 1—Summary of Ski Injuries

	Number
Bones fractured	257
Dislocations	35
Sprains and strains	762
Contusions	147
Abrasions	57
Lacerations	114

TABLE 2—Fractures of Lower Extremities

	Number
Femur	3
Tibia and fibula	28
Tibia alone	10
Trimalleolar	2
Bimalleolar	2
Posterior tibial malleolus	3
Internal malleolus	1
Fibula proximal shaft alone	6
Fibula distal shaft	34
Fibula distal head	72
Fibula distal epiphysis	6
Fibula avulsion of distal tip	7
Astragalus posterior process (os trigonum)	4
Astragalus avulsion	3
Scaphoid avulsion	1
Metatarsal shaft	4
Metatarsal sesamoid bone	1

This situation makes for a high degree of statistical accuracy A full time, paid ski patrol is present at all times on the various slopes It is the duty of the patrol to observe the factors contributing to cause accident as well as to administer first aid and transport the casualty to the medical department The contributing factors have been previously discussed by Brothers<sup>1</sup> and will not be considered further in this paper

Table 1 is a general classification of all injuries seen It will be noted that over 20 per cent of the total is represented by either fracture or dislocation Sprains and strains account for more than 50 per cent but the fact that the average period of disability for this injury was about four days indicates that many of them were very minor

Table 2 lists one hundred and eighty-seven fractures involving the bones of the lower extremities In all but twelve of these the force applied was one of torsion It may appear dogmatic to describe a single force responsible for fracture, but it has been observed that ski injuries occur in a rather singular manner At the time of fall, the knees usually are slightly flexed The ski becomes a fixed object which fixes the foot The fall

is to the side and forward. Thus, torsion strain is exerted through external rotation. It is my opinion that there is no weight bearing at the time of injury.

The femur was fractured three times. Twice the force was a direct impact. Only one fracture of this bone occurred as a result of torsion strain. This is rather contradictory to the general impression that the

combination of forces—torsion, abduction and weight bearing. Although the posterior malleolus of the tibia was fractured as a result of direct impact three times, the os calcis was never fractured. The fracture of the posterior process of the astragalus (os trigonum) occurred once following direct impact and three times following severe torsion strain.

It will be noted that more than half of the fractures seen are those usually referred to as "ski fractures." This is a spiral fracture involving the distal shaft or the distal head of the fibula. It occurs as frequently in one leg as in the other. The mechanism is external rotation without weight bearing. The force approaches true torsion as nearly as possible. In the consideration of this particular injury there are more important factors than the fracture itself. Rupture of the tibiofibular ligament may occur with slight lateral displacements of the astragalus. In over 10 per cent of the series this

TABLE 3—*Fractures of Tibia*

	Number
Fracture of shaft of tibia alone	10
Fracture of shaft of tibia (with fibula)	28
Fracture posterior malleolus	1
Fracture of internal malleolus	1
Bimalleolar fractures	2
Trimalleolar fractures	2

incidence of femoral fracture in torsion-strain injuries is greater. One of every five fractures was a spiral fracture of the tibia. The line of fracture in every instance involved one third or more of the entire tibial shaft and occurred in the middle and distal thirds. Usually the proximal shaft of the fibula also was fractured, and on one occasion the fibula was fractured in the proximal and distal shaft leaving this bone in three separate segments. The spiral fractures of the tibia are usually comminuted.

Six injuries were seen in which the only fracture was of the proximal shaft of the fibula. This fracture first described by Maisonneuve,<sup>2</sup> is of some academic interest. Ashhurst<sup>3</sup> considered the fracture the result of external rotation of the foot so as to produce first a tibiofibular diastasis. He thought that the continued application of the torsion force finally produced fracture of the proximal shaft of the fibula. Hoengschmied,<sup>4</sup> in cadaver experiments, found evidence to support this conception. An attempt was made to demonstrate tibiofibular diastasis in the present series but it was not possible to do so. The relatively rapid recovery of the ankle sprain in these cases also leads me to believe that diastasis did not exist. It is reasonable to believe that the law of inertia is a factor in the relationship between the fracture force and the fracture itself. Certainly the objective evidence of a given force varies with the time consumed by the application of the force. In this particular type of fracture the snow conditions were usually

TABLE 4—*Injuries to Ankle*

	Number
Sprains of ankle	371
Bimalleolar fractures	2
Trimalleolar fractures	2
Fracture, distal head fibula	72
Tibiofibular diastasis	8
Dislocation of astragalus	10

uniform, being sticky and heavy. Although there were but six fractures of this type in three years, two of them occurred within the same hour. The force of torsion was quickly applied in each instance.

The trimalleolar and bimalleolar fractures reported are typical of those seen so frequently when there is a

TABLE 5—*Injuries to Foot*

	Number
Fracture of scaphoid bones	1
Avulsion of accessory scaphoid (later excluded)	1
Avulsion fracture of scaphoid	1
Avulsion fracture of navicular	3
Fracture posterior process of astragalus (os trigonum)	4
Dislocation of astragalus	6
Fracture of metatarsus	4
Sprain of foot	50

TABLE 6—*Injuries to the Ance*

	Number
Sprain of internal lateral ligaments (to occur with sprains of ankle)	21
Contusion of cartilage	7
Dislocation of patella	2
No fractures of anterior tibial spine	
Three known cases of Pott's (Stiedl's) disease reported following injury to the internal lateral ligament	

could be clearly demonstrated. Failure to recognize this, with the consequent error in proper treatment, will account for considerable disability.

Table 4 is of interest in revealing the relative frequency of the various types of injury to the ankle. Considering the fact that the sprain group represents many very minor injuries, the incidence of fracture is high. All severe sprains are submitted to x-ray examination, and we have been acutely critical in each instance of the presence of injury to the tibiofibular ligaments. Laceration of this important structure was clearly demonstrable in 8 instances associated with sprain.

Carothers<sup>5</sup> observed in a limited number of experiments on fresh cadavers that it was necessary to divide the anterior, middle and inferior bands of the external lateral ligaments in order to produce astragalal displacement. Although there was displacement in 15 cases, the injury allowing the displacement was thought to be due to tibiofibular ligament laceration, with or without fracture of the fibula, rather than to injury to the external lateral ligaments. This is logical in view of the fact that the injuring force is one of torsion primarily.

<sup>2</sup> Maisonneuve. *Arch. gen. de med.* 165, 433, 1840.  
<sup>3</sup> Ashhurst A. P. C., and Bromer R. S. Classification and Mechanism of Fractures of the Leg Bones Involving the Ankle. *Arch. Surg.* 51 (Jan.) 1922.  
<sup>4</sup> Hoengschmied. *Deutsche Ztschr. f. Chir.* 8, 239, 1877.



Two methods of determining diastasis have been employed. One, suggested by Bromer,<sup>3</sup> is predicated on a true anteroposterior roentgenogram in which the shadow of the anterior lateral tubercle of the tibia must normally overlie at least one half of the fibular shadow. The second, suggested by Murray,<sup>6</sup> requires light anesthesia so that the injured ankle may be manipulated under fluoroscopic vision. External rotation of the foot, when there is tibiofibular ligament laceration, will allow the fibula to wing out away from the tibia.

It will be noted from table 5 that injuries to the foot were relatively infrequent. The sprains resulted in very short periods of disability. Periosteal tears were demonstrated four times: once from the anterior surface of the scaphoid and three times from the anterior surface of the astragalus. Fractures of all but the first of the metatarsal bones occurred.

Second only to the ankle, the knee was most frequently injured. Table 6 shows that the internal lateral ligaments were sprained 261 times. One fourth of these occurred in conjunction with ankle sprain. In this group the major injury, subjectively, is usually the knee

TABLE 7—Injuries to Upper Extremities

	Number
Fracture of wrist Colles	8
Metacarpal fractures	14
Strain of wrist	13
Contusion of hand or fingers	36
Dislocation of fingers	3
Dislocation of shoulder	15
Fracture of humerus (greater tuberosity)	11

TABLE 8—Dislocations

	Number
Lateral dislocation of astragalus	15
Dislocation of patella	2
Dislocation of shoulder	15
Dislocation of fingers	3
Dislocation of nose	1

It has been pointed out that an ankle sprain may be so severe as to distract the examiner from a fracture of the proximal shaft of the fibula. It is also possible for the pain experienced from sprain of the internal ligaments of the knee to make the patient minimize a fracture of the distal head of the fibula.

Localization of pain in the tibial insertion of these ligaments may be demonstrated always. That avulsion of the femoral attachment occurs occasionally is certain. In 3 instances calcification could subsequently be demonstrated by x-ray examination. Appreciation of the pain and disability associated with this unpleasant complication makes the need for careful x-ray examination of the knee following injury obvious.

It is of considerable interest that contusion of the cartilage was diagnosed in only 7 instances. External rotation of the lower leg is associated with movement of the internal semilunar cartilage laterally, so as to approach more intimately the weight bearing surfaces. However, rotation or torsion strain alone is rarely sufficient to produce serious injury to the cartilage. It must be accompanied by weight bearing. In ski injuries these two forces are infrequently applied at one time.

Table 7 lists the injuries seen to the upper extremities. These are of little specific interest in reference to

skiing, since they are the result of impact. Fracture of the greater tuberosity of the humerus occurred eleven times. There was no displacement of the fragment. In 2 instances this fracture was associated with dislocation.

Tables 8, 9 and 10 are included to make the report complete. In these groups there is nothing distinc-

TABLE 9—Miscellaneous Fractures

	Number
Fracture of wrist	8
Fracture of coccyx	1
Fracture of mandible	1
Fracture of ribs	3
Fracture of greater tuberosity	11
Fracture of scapula	1
Compression vertebral body	1
Transverse process of vertebra	2
Fracture of femur	3

tive from the injuries associated with other contact sports. The incidence of these injuries will vary greatly with terrain and the type of skiing done.

In returning to table 1, it is noted that approximately 75 per cent of the ski injuries reported are the result of torsion strain. Translated into terms of disability, this represents over 90 per cent. Consequently, any modification of skiing which will tend to decrease the application of torsion strain to the leg will reduce the number of injuries which are now being sustained. A review of the evolution of ski equipment shows that there has been a progressive tendency to approach a state in which the foot and ski act as a unit. The only noteworthy motion of the foot on the ski is a hingelike action of a few degrees. When the ski point becomes fixed in heavy snow, the foot also becomes fixed. Consequently the weight of the body going forward makes it necessary for something to give, and it is usually the lower extremity. This development in the type of ski binding now used has made for greater skill in racing and greater control in making turns and has permitted the perfection of a new style of skiing. However, there can be no question that it has been responsible for an increase in the number of torsion-strain injuries. To return to a "safe" binding which would allow the foot to become disengaged from the ski when severe torsion strain is applied would reduce this group of injuries to

TABLE 10—Miscellaneous Injuries

	Number
Strain of cervical muscles	7
Strain of lumbar muscles	14
Muscular contusions with severe hematoma	15
Minor contusions	116
Abrasions	57
Lacerations	114
Concussion of the brain	11

a minimum. Such a suggestion will never be accepted by those who ski for the thrill of accomplishing the most that can be obtained from the sport and who are willing to pay the price of injury and disability when it comes.

However, when skiing is studied as a means of transportation, as is the case when the mountain troops are concerned in the United States Army, a severely sprained ankle or a fractured leg is of considerable practical importance.

## THE PHYSICALLY HANDICAPPED IN INDUSTRIAL ESTABLISHMENTS OF THE GOVERNMENT

### POSSIBILITIES FOR THEIR INCREASED PLACEMENT

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Under the necessity of compensating for wartime manpower shortages, the U. S. Civil Service Commission, central recruiting agency of the federal government, has conducted studies which show that thousands of jobs in industrial establishments of the government such as arsenals and navy yards can be filled by judicious placement of physically handicapped persons.

A valuable source of manpower is thus opened up because many of the jobs considered in the studies have thus far been open only to persons with all their faculties.

Out of the effort to determine what positions in the federal service may be filled by physically handicapped persons and to encourage federal appointing officers to appoint these persons when practicable, in their respective agencies a medical function of major proportions has developed. It is being performed by the commission's medical division as a special aspect of the regular function of devising minimum physical requirements for positions in the federal service.

The major outcome of the medical division's effort to promote the utilization of the services of the physically handicapped whenever possible will be the issuance of a manual, which will make available to all persons engaged in placement, training and recruitment activity for the federal civil service information with respect to positions which are suitable for the various types of physical handicaps and where these positions are located. It is expected that the first edition of the operating manual will include more than fifteen hundred positions, representing many thousands of individual jobs, additional positions which, in the opinion of the regional medical officers or Vocational Rehabilitation Services, offer placement potentialities for the physically handicapped will be investigated and if appropriate from the standpoint of placement will be added to those already included in the manual.

Placement of the physically handicapped can be effected with a minimum loss of efficiency and a minimum industrial risk provided there is—

- 1 Proper evaluation of physical requirements of the positions as determined by job analysis of physical fitness factors
- 2 Proper coordination of training, recruitment and placement programs
- 3 A genuine interest in "selling" the applicant's qualifications to the employer
- 4 Proper coordination between the medical service of the commission, which is the recruiting agency for the federal government and the appointing officials of the operating agencies or their medical and safety advisers

Since there are wide variations in environmental working conditions and in functional factors of the same job in different localities, the commission does not attempt to lay down definite overall rules establishing standards for placement. Instead it recommends individual consideration of each case.

The term "physically handicapped" is interpreted as meaning "any physical deficiency, peculiarity or impairment which presents a problem in placement."<sup>1</sup> This interpretation by implication projects environmental and functional factors of the position in question into the meaning of the term. For example, a one armed person with a history of tuberculosis is physically handicapped only as far as he is unable to operate certain types of machinery or to work under certain environmental conditions. The elements of function and environment (industrial physiology) become of prime importance in considering the physical defects of handicapped persons in connection with placement.

Restrictions placed on employment of the handicapped which are not justifiable on a functional, environmental or industrial risk basis are artificial in the view of the commission. Such restrictions, in view of the large number of qualified handicapped persons the majority of whom could be placed in some type of employment, are not reasonable—especially in wartime when there is a dearth of the supply of physically fit manpower in the civilian labor market. It has been conservatively estimated that there are between 2,500,000 and 3,000,000 persons in the United States with physical limitations of sufficient severity to become a factor in occupational adjustment.

Realizing that the success of its endeavor to utilize the services of the physically handicapped in the federal civil service depends on close cooperation between the recruitment, training and placement agencies, the commission has approved the establishment of a joint committee representing the commission, the Vocational Rehabilitation Division, Office of Education, and the Council of Personnel Administration, which formulates to a considerable degree personnel policies for the federal civil service. This permanent central committee acts as a clearing and advisory group to organize more direct relationships in recruiting, training and placement activities.

In order that a proper evaluation of physical requirements of positions might be arrived at, extensive surveys pertaining to more than two thousand positions are being conducted in sixty industrial establishments of the federal government, including navy yards, naval establishments, arsenals and several plants in private industry holding government contracts. The surveys were conducted by medical officers stationed in the thirteen civil service regions. In addition to direct observation of employees performing their duties, the surveys included consultation with foremen and supervisors who were familiar with all phases of the duties performed. The resulting information is now in the process of being coded according to the system of job classification established by the U. S. Employment Service Job Classification Code<sup>2</sup> and according to the disability placement classification devised by the commission. The information will be incorporated into a manual to be used by the commission's representatives in recruitment, by the training agencies and by the employing officers.

The manual will be in loose-leaf form and subject to modifications from time to time. Through it information which will be valuable in training programs can be made available to training agencies. It will keep

1 Placement of Physically Handicapped Applicants Through Public Employment Offices. State Operations Bulletin 10, pt. VII, Washington, D. C. Bureau of Employment Security, Federal Security Agency.

2 An occupational dictionary used wherever the description of a job showed it to be identical with or closely akin to the job surveyed.

the training agencies currently informed on placement potentialities in federal governmental industry. The information, correlated with information on current employment needs, especially with respect to positions in critical categories, will no doubt go far in conserving labor supply.

# JOB ANALYSIS FOR PHYSICAL FITNESS REQUIREMENTS

1. FUNCTIONAL FACTORS IN PERFORMANCE OF DUTIES (Check all functional factors involved in performance of duty)

A. VISION	B. HEARING	C. MOTOR TENDENCY	D. ARMED
1. Near Vision Blot out	1. Hearing	1. Balance	1. Pushing
2. Far Vision Blot out	2. Hearing	2. Turning	2. Pulling
3. Near Vision Blot out	3. Hearing	3. Pushing	3. Pulling
4. Far Vision Blot out	4. Hearing	4. Turning	4. Pulling
5. Near Vision Blot out	5. Hearing	5. Pushing	5. Pulling
6. Far Vision Blot out	6. Hearing	6. Turning	6. Pulling
7. Near Vision Blot out	7. Hearing	7. Pushing	7. Pulling
8. Far Vision Blot out	8. Hearing	8. Turning	8. Pulling
9. Near Vision Blot out	9. Hearing	9. Pushing	9. Pulling
10. Far Vision Blot out	10. Hearing	10. Turning	10. Pulling
11. Near Vision Blot out	11. Hearing	11. Pushing	11. Pulling
12. Far Vision Blot out	12. Hearing	12. Turning	12. Pulling
13. Near Vision Blot out	13. Hearing	13. Pushing	13. Pulling
14. Far Vision Blot out	14. Hearing	14. Turning	14. Pulling
15. Near Vision Blot out	15. Hearing	15. Pushing	15. Pulling
16. Far Vision Blot out	16. Hearing	16. Turning	16. Pulling
17. Near Vision Blot out	17. Hearing	17. Pushing	17. Pulling
18. Far Vision Blot out	18. Hearing	18. Turning	18. Pulling
19. Near Vision Blot out	19. Hearing	19. Pushing	19. Pulling
20. Far Vision Blot out	20. Hearing	20. Turning	20. Pulling
21. Near Vision Blot out	21. Hearing	21. Pushing	21. Pulling
22. Far Vision Blot out	22. Hearing	22. Turning	22. Pulling
23. Near Vision Blot out	23. Hearing	23. Pushing	23. Pulling
24. Far Vision Blot out	24. Hearing	24. Turning	24. Pulling
25. Near Vision Blot out	25. Hearing	25. Pushing	25. Pulling
26. Far Vision Blot out	26. Hearing	26. Turning	26. Pulling
27. Near Vision Blot out	27. Hearing	27. Pushing	27. Pulling
28. Far Vision Blot out	28. Hearing	28. Turning	28. Pulling
29. Near Vision Blot out	29. Hearing	29. Pushing	29. Pulling
30. Far Vision Blot out	30. Hearing	30. Turning	30. Pulling
31. Near Vision Blot out	31. Hearing	31. Pushing	31. Pulling
32. Far Vision Blot out	32. Hearing	32. Turning	32. Pulling
33. Near Vision Blot out	33. Hearing	33. Pushing	33. Pulling
34. Far Vision Blot out	34. Hearing	34. Turning	34. Pulling
35. Near Vision Blot out	35. Hearing	35. Pushing	35. Pulling
36. Far Vision Blot out	36. Hearing	36. Turning	36. Pulling
37. Near Vision Blot out	37. Hearing	37. Pushing	37. Pulling
38. Far Vision Blot out	38. Hearing	38. Turning	38. Pulling
39. Near Vision Blot out	39. Hearing	39. Pushing	39. Pulling
40. Far Vision Blot out	40. Hearing	40. Turning	40. Pulling
41. Near Vision Blot out	41. Hearing	41. Pushing	41. Pulling
42. Far Vision Blot out	42. Hearing	42. Turning	42. Pulling
43. Near Vision Blot out	43. Hearing	43. Pushing	43. Pulling
44. Far Vision Blot out	44. Hearing	44. Turning	44. Pulling
45. Near Vision Blot out	45. Hearing	45. Pushing	45. Pulling
46. Far Vision Blot out	46. Hearing	46. Turning	46. Pulling
47. Near Vision Blot out	47. Hearing	47. Pushing	47. Pulling
48. Far Vision Blot out	48. Hearing	48. Turning	48. Pulling
49. Near Vision Blot out	49. Hearing	49. Pushing	49. Pulling
50. Far Vision Blot out	50. Hearing	50. Turning	50. Pulling
51. Near Vision Blot out	51. Hearing	51. Pushing	51. Pulling
52. Far Vision Blot out	52. Hearing	52. Turning	52. Pulling
53. Near Vision Blot out	53. Hearing	53. Pushing	53. Pulling
54. Far Vision Blot out	54. Hearing	54. Turning	54. Pulling
55. Near Vision Blot out	55. Hearing	55. Pushing	55. Pulling
56. Far Vision Blot out	56. Hearing	56. Turning	56. Pulling
57. Near Vision Blot out	57. Hearing	57. Pushing	57. Pulling
58. Far Vision Blot out	58. Hearing	58. Turning	58. Pulling
59. Near Vision Blot out	59. Hearing	59. Pushing	59. Pulling
60. Far Vision Blot out	60. Hearing	60. Turning	60. Pulling
61. Near Vision Blot out	61. Hearing	61. Pushing	61. Pulling
62. Far Vision Blot out	62. Hearing	62. Turning	62. Pulling
63. Near Vision Blot out	63. Hearing	63. Pushing	63. Pulling
64. Far Vision Blot out	64. Hearing	64. Turning	64. Pulling
65. Near Vision Blot out	65. Hearing	65. Pushing	65. Pulling
66. Far Vision Blot out	66. Hearing	66. Turning	66. Pulling
67. Near Vision Blot out	67. Hearing	67. Pushing	67. Pulling
68. Far Vision Blot out	68. Hearing	68. Turning	68. Pulling
69. Near Vision Blot out	69. Hearing	69. Pushing	69. Pulling
70. Far Vision Blot out	70. Hearing	70. Turning	70. Pulling
71. Near Vision Blot out	71. Hearing	71. Pushing	71. Pulling
72. Far Vision Blot out	72. Hearing	72. Turning	72. Pulling
73. Near Vision Blot out	73. Hearing	73. Pushing	73. Pulling
74. Far Vision Blot out	74. Hearing	74. Turning	74. Pulling
75. Near Vision Blot out	75. Hearing	75. Pushing	75. Pulling
76. Far Vision Blot out	76. Hearing	76. Turning	76. Pulling
77. Near Vision Blot out	77. Hearing	77. Pushing	77. Pulling
78. Far Vision Blot out	78. Hearing	78. Turning	78. Pulling
79. Near Vision Blot out	79. Hearing	79. Pushing	79. Pulling
80. Far Vision Blot out	80. Hearing	80. Turning	80. Pulling
81. Near Vision Blot out	81. Hearing	81. Pushing	81. Pulling
82. Far Vision Blot out	82. Hearing	82. Turning	82. Pulling
83. Near Vision Blot out	83. Hearing	83. Pushing	83. Pulling
84. Far Vision Blot out	84. Hearing	84. Turning	84. Pulling
85. Near Vision Blot out	85. Hearing	85. Pushing	85. Pulling
86. Far Vision Blot out	86. Hearing	86. Turning	86. Pulling
87. Near Vision Blot out	87. Hearing	87. Pushing	87. Pulling
88. Far Vision Blot out	88. Hearing	88. Turning	88. Pulling
89. Near Vision Blot out	89. Hearing	89. Pushing	89. Pulling
90. Far Vision Blot out	90. Hearing	90. Turning	90. Pulling
91. Near Vision Blot out	91. Hearing	91. Pushing	91. Pulling
92. Far Vision Blot out	92. Hearing	92. Turning	92. Pulling
93. Near Vision Blot out	93. Hearing	93. Pushing	93. Pulling
94. Far Vision Blot out	94. Hearing	94. Turning	94. Pulling
95. Near Vision Blot out	95. Hearing	95. Pushing	95. Pulling
96. Far Vision Blot out	96. Hearing	96. Turning	96. Pulling
97. Near Vision Blot out	97. Hearing	97. Pushing	97. Pulling
98. Far Vision Blot out	98. Hearing	98. Turning	98. Pulling
99. Near Vision Blot out	99. Hearing	99. Pushing	99. Pulling
100. Far Vision Blot out	100. Hearing	100. Turning	100. Pulling

2. ENVIRONMENTAL FACTORS (Check all environmental factors involved in performance of duty)

A. VISION	B. HEARING	C. MOTOR TENDENCY	D. ARMED
1. Eye light	1. Hearing	1. Balance	1. Pushing
2. Eye light	2. Hearing	2. Turning	2. Pulling
3. Eye light	3. Hearing	3. Pushing	3. Pulling
4. Eye light	4. Hearing	4. Turning	4. Pulling
5. Eye light	5. Hearing	5. Pushing	5. Pulling
6. Eye light	6. Hearing	6. Turning	6. Pulling
7. Eye light	7. Hearing	7. Pushing	7. Pulling
8. Eye light	8. Hearing	8. Turning	8. Pulling
9. Eye light	9. Hearing	9. Pushing	9. Pulling
10. Eye light	10. Hearing	10. Turning	10. Pulling
11. Eye light	11. Hearing	11. Pushing	11. Pulling
12. Eye light	12. Hearing	12. Turning	12. Pulling
13. Eye light	13. Hearing	13. Pushing	13. Pulling
14. Eye light	14. Hearing	14. Turning	14. Pulling
15. Eye light	15. Hearing	15. Pushing	15. Pulling
16. Eye light	16. Hearing	16. Turning	16. Pulling
17. Eye light	17. Hearing	17. Pushing	17. Pulling
18. Eye light	18. Hearing	18. Turning	18. Pulling
19. Eye light	19. Hearing	19. Pushing	19. Pulling
20. Eye light	20. Hearing	20. Turning	20. Pulling
21. Eye light	21. Hearing	21. Pushing	21. Pulling
22. Eye light	22. Hearing	22. Turning	22. Pulling
23. Eye light	23. Hearing	23. Pushing	23. Pulling
24. Eye light	24. Hearing	24. Turning	24. Pulling
25. Eye light	25. Hearing	25. Pushing	25. Pulling
26. Eye light	26. Hearing	26. Turning	26. Pulling
27. Eye light	27. Hearing	27. Pushing	27. Pulling
28. Eye light	28. Hearing	28. Turning	28. Pulling
29. Eye light	29. Hearing	29. Pushing	29. Pulling
30. Eye light	30. Hearing	30. Turning	30. Pulling
31. Eye light	31. Hearing	31. Pushing	31. Pulling
32. Eye light	32. Hearing	32. Turning	32. Pulling
33. Eye light	33. Hearing	33. Pushing	33. Pulling
34. Eye light	34. Hearing	34. Turning	34. Pulling
35. Eye light	35. Hearing	35. Pushing	35. Pulling
36. Eye light	36. Hearing	36. Turning	36. Pulling
37. Eye light	37. Hearing	37. Pushing	37. Pulling
38. Eye light	38. Hearing	38. Turning	38. Pulling
39. Eye light	39. Hearing	39. Pushing	39. Pulling
40. Eye light	40. Hearing	40. Turning	40. Pulling
41. Eye light	41. Hearing	41. Pushing	41. Pulling
42. Eye light	42. Hearing	42. Turning	42. Pulling
43. Eye light	43. Hearing	43. Pushing	43. Pulling
44. Eye light	44. Hearing	44. Turning	44. Pulling
45. Eye light	45. Hearing	45. Pushing	45. Pulling
46. Eye light	46. Hearing	46. Turning	46. Pulling
47. Eye light	47. Hearing	47. Pushing	47. Pulling
48. Eye light	48. Hearing	48. Turning	48. Pulling
49. Eye light	49. Hearing	49. Pushing	49. Pulling
50. Eye light	50. Hearing	50. Turning	50. Pulling
51. Eye light	51. Hearing	51. Pushing	51. Pulling
52. Eye light	52. Hearing	52. Turning	52. Pulling
53. Eye light	53. Hearing	53. Pushing	53. Pulling
54. Eye light	54. Hearing	54. Turning	54. Pulling
55. Eye light	55. Hearing	55. Pushing	55. Pulling
56. Eye light	56. Hearing	56. Turning	56. Pulling
57. Eye light	57. Hearing	57. Pushing	57. Pulling
58. Eye light	58. Hearing	58. Turning	58. Pulling
59. Eye light	59. Hearing	59. Pushing	59. Pulling
60. Eye light	60. Hearing	60. Turning	60. Pulling
61. Eye light	61. Hearing	61. Pushing	61. Pulling
62. Eye light	62. Hearing	62. Turning	62. Pulling
63. Eye light	63. Hearing	63. Pushing	63. Pulling
64. Eye light	64. Hearing	64. Turning	64. Pulling
65. Eye light	65. Hearing	65. Pushing	65. Pulling
66. Eye light	66. Hearing	66. Turning	66. Pulling
67. Eye light	67. Hearing	67. Pushing	67. Pulling
68. Eye light	68. Hearing	68. Turning	68. Pulling
69. Eye light	69. Hearing	69. Pushing	69. Pulling
70. Eye light	70. Hearing	70. Turning	70. Pulling
71. Eye light	71. Hearing	71. Pushing	71. Pulling
72. Eye light	72. Hearing	72. Turning	72. Pulling
73. Eye light	73. Hearing	73. Pushing	73. Pulling
74. Eye light	74. Hearing	74. Turning	74. Pulling
75. Eye light	75. Hearing	75. Pushing	75. Pulling
76. Eye light	76. Hearing	76. Turning	76. Pulling
77. Eye light	77. Hearing	77. Pushing	77. Pulling
78. Eye light	78. Hearing	78. Turning	78. Pulling
79. Eye light	79. Hearing	79. Pushing	79. Pulling
80. Eye light	80. Hearing	80. Turning	80. Pulling
81. Eye light	81. Hearing	81. Pushing	81. Pulling
82. Eye light	82. Hearing	82. Turning	82. Pulling
83. Eye light	83. Hearing	83. Pushing	83. Pulling
84. Eye light	84. Hearing	84. Turning	84. Pulling
85. Eye light	85. Hearing	85. Pushing	85. Pulling
86. Eye light	86. Hearing	86. Turning	86. Pulling
87. Eye light	87. Hearing	87. Pushing	87. Pulling
88. Eye light	88. Hearing	88. Turning	88. Pulling
89. Eye light	89. Hearing	89. Pushing	89. Pulling
90. Eye light	90. Hearing	90. Turning	90. Pulling
91. Eye light	91. Hearing	91. Pushing	91. Pulling
92. Eye light	92. Hearing	92. Turning	92. Pulling
93. Eye light	93. Hearing	93. Pushing	93. Pulling
94. Eye light	94. Hearing	94. Turning	94. Pulling
95. Eye light	95. Hearing	95. Pushing	95. Pulling
96. Eye light	96. Hearing	96. Turning	96. Pulling
97. Eye light	97. Hearing	97. Pushing	97. Pulling
98. Eye light	98. Hearing	98. Turning	98. Pulling
99. Eye light	99. Hearing	99. Pushing	99. Pulling
100. Eye light	100. Hearing	100. Turning	100. Pulling

Fig 1—Reproduction of form used in job analysis for physical fitness requirements

A preliminary review of reports received from regional medical officers has revealed a wide variation in functional and environmental factors appertaining to positions of the same title in different localities and often in the same establishment. With the need for speeding up production, there has been a shift to the assembly line technique. This inevitably has brought a tendency toward specialization, this tendency is increased by the shortage of skilled labor and the lack of time for training inexperienced labor to handle more than one job. Whereas in the past a person with a rating in a particular trade was expected to do, and was capable of doing, all the duties of that trade, now the rating is given frequently to a man whose capabilities are limited to only a few of those duties. For example, a shipfitter's rating is given to a man who works aboard ship doing very arduous work requiring considerable agility and also to the man who works in the structural shop running a drill press or some similar machine. Volume of work may necessitate shifting these men to other shops. Obviously the minimum physical requirements of a man in the structural shop are considerably less than for the ship worker. Agility, acute hearing and vision in two eyes are essential for the latter, they are not essential for the former.

Many positions are not static—that is, a job may require light duties during one period of its operation and extremely heavy duties at another time. This was characteristic of the majority of the positions observed

in a large arsenal. At the Rock Island Arsenal the position title "classified laborer" is used in referring to an employee performing almost any type of work to which a definite classification has not been given. These employees are used as apprentices, helpers and the like and are elevated by successive grades to practically any classification. Therefore it is not possible to set down dogmatically the physical requirements for the position of classified laborer.

The survey of the position of blacksmith at the Washington Navy Yard reveals placement potentialities for persons who have lost one leg and who use a good artificial appliance. The survey of the same position at the New York Navy Yard shows that there are unavoidable hazards peculiar to that establishment which make placement of a person with such a defect inadvisable.

It is apparent, therefore, that general principles of placement relating to job families or constellations cannot be followed too closely in devising the manual, instead, it is being constructed so that a particular position in a particular establishment may be considered on an individual basis. It is expected that all considerations relating to placement will be tempered by the functional and environmental factors peculiar to each governmental establishment and also by results of consultation between the commission's medical officers and

## 111. RESUME (On Ch. Opt. form)

A. VISION	B. HEARING	C. MOTOR TENDENCY	D. ARMED
1. Eye light	1. Hearing	1. Balance	1. Pushing
2. Eye light	2. Hearing	2. Turning	2. Pulling
3. Eye light	3. Hearing	3. Pushing	3. Pulling
4. Eye light	4. Hearing	4. Turning	4. Pulling
5. Eye light	5. Hearing	5. Pushing	5. Pulling
6. Eye light	6. Hearing	6. Turning	6. Pulling
7. Eye light	7. Hearing	7. Pushing	7. Pulling
8. Eye light	8. Hearing	8. Turning	8. Pulling
9. Eye light	9. Hearing	9. Pushing	9. Pulling
10. Eye light	10. Hearing	10. Turning	10. Pulling
11. Eye light	11. Hearing	11. Pushing	11. Pulling
12. Eye light	12. Hearing	12. Turning	12. Pulling
13. Eye light	13. Hearing	13. Pushing	13. Pulling
14. Eye light	14. Hearing	14. Turning	14. Pulling
15. Eye light	15. Hearing	15. Pushing	15. Pulling
16. Eye light	16. Hearing	16. Turning	16. Pulling
17. Eye light	17. Hearing	17. Pushing	17. Pulling
18. Eye light	18. Hearing	18. Turning	18. Pulling
19. Eye light	19. Hearing		

on the frequency of physical disability must be treated as estimates. According to the National Health Survey<sup>3</sup> made by the United States Public Health Service, prevalence rates are as follows:

**Orthopedic Impairments**—It is estimated that 2 out of every one hundred persons in the United States have a permanent orthopedic impairment of such serious nature that they are considered to be partly, or completely, crippled, deformed or paralyzed. On this basis there would be a total of approximately 2,500,000 persons in the United States with orthopedic handicaps, and 500,000 of them would have handicaps of such serious nature that they are incapacitated.

**Chronic Disease**—Estimates dealing with chronic disease other than tuberculosis and heart disease are not useful. It

nent or static. Acute, subacute or chronic disease processes of the bone, peripheral vessels and muscles causing orthopedic deformities are not considered in judicious initial placement, in view of the possibility of exacerbation involving one or more additional organs or members of the body. Such complications add to the physical limitations of the employee—limitations which cannot be anticipated in his vocational training. It is recognized also that the disease itself, apart from the resulting deformity, may add to the limitations on the employee's activity.

Of the orthopedic deformities met in civil service placement activity, experience has shown that atrophies

TABLE 1—*Partial List of Positions in Government Aircraft Industry Offering Placement Potentialities for Physically Handicapped*

Occupational Code	Title of Position Aircraft Industry	Region and Establishment	Disability Placement Code															
5-83 072	Aircraft instrument mechanic	† R02	00	00	00	00	00	10	15	17	18	20	21	24	27	41		
5-80 100	Aircraft mechanic general	R02	00	00	12	18	20	20	20	31	33	41						
5-80 100	Aircraft mechanic motor	R02	00	00	12	18	20	20	20	31	33	41						
1-38 01	Assistant storekeeper	R02	00	15	17	20	21	23										
4-86 010	Blacksmith	R02	00	00	18	20	21	23										
6-77 020	Buffer and polisher	R02	00	00	12	18	20	20	21	23	27							
4-78 061	Die machine operator	R02	00	00	04	10	10	17	18	20	21	31	33	37	41			
4-76 010	Die sinker	R02	00	00	04	18	20	21	23									
6-27 000	Double needle operator	R02	00	00	04	12	10	17	18	20	21	31	33	37	41			
4-74 010	Electroplater	R02	00	00	12	18	20	31	33									
6-77 040	Grinder operator	R02	00	00	04	12	15	17	18	20	21							
4-87 010	Heat treater	R02	00	00	12	13	15	17	18	20	21	31	33	41				
6-82 720	Helper sandblast machine operator	R02	00	12	15	17	21	23										
5-03 810	Inspector material supervisor	R02	00	00	12	18	20	41										
1-38 01	Junior storekeeper	R02	00	15	17	20	21	23										
4-76 130	Mechanic bomb-sight	R02	00	00	12	18	20	21	23	41								
7-10 210	Metal sprayer	R02	00	00	04	10	10	17	18	20	21	31	33	37	41			
4-80 000	Metalsmith aviation	R02	00	00	04	10	10	17	18	20	21	31	33	37	41			
7-16 210	Painter aircraft finish and insignia	R02	00	10	10	17	18	20	21	31	33							
7-49 023	Parachute repairman	R02	00	00	04	12	10	17	18	20	21	31	33	37	41			
5-17 250	Patternmaker plaster	R02	00	00	04	10	15	17	18	20	21	31	33					
1-38 01	Principal storekeeper	R02	00	10	17	18	20	41										
5-83 411	Radio repairman	R02	00	00	04	10	10	17	18	20	21	31	33	37	41			
5-03 120	Ribstitcher	R02	00	00	18	20	21	41										
6-82 720	Sandblaster	R02	00	10	15	17	21	23										
0-05 93	Senior safety inspector	R02	00	10	17													
6-27 504	Sewer	R02	00	00	04	10	10	17	18	20	21	31	33	37	41			
4-87 310	Temperer	R02	00	00	04	10	10	17	18	20	21	31	33	37	41			
4-76 210	Toolmaker	R02	00	00	04	10	17	18	20	21	31	33	37	41				
4-35 720	Upholsterer	R02	00	00	04	12	10	17	18	20	21	31	33	37	41			
5-03 210	Wireworker aviation	R02	00	00	00	10	15	17	18	20	21	31	33	37	41			
5-03 030	Aircraft fabric worker	R02	00	00	00	10	18	20	20	21	31	37						
5-83 972	Aircraft instrument mechanic	† R02	00	00	10	18	20	20	21	31	37							
7-80 120	Aircraft instrument mechanic helper	R02	00	00	00	12	18	20	20	21	31	37						
5-80 100	Aircraft mechanic motor	R02	00	00	12	18	20	20	21	31	37							
5-83 411	Electrician aircraft radio	R02	00	00	04	12	10	17	18	20	21	31	37	41				
9-05 43	Electrician aircraft radio helper	R02	00	00	04	12	10	17	18	20	21	31	37	41				
5-80 910	Junior inspector engineering mat aero	R02	00	00	00	18	20	21										
5-27 910	Painter finish and insignia aircraft	R02	00	00	00	18	20	21										
7-49 023	Parachute repairman	R02	00	31	33	37	41											
5-83 540	Aircraft armament mechanic	R02	00	00	00	41												
4-97 910	Aircraft electrician	R02	00	00	00	41												
9-05 43	Aircraft electrician helper	R02	00	00	00	41												

\* Disability placement code is interpreted in table 4.  
† Naval Aircraft Factory Philadelphia, third region.

‡ Alameda Naval Air Base Alameda Calif. twelfth region.  
§ Wright Field Dayton Ohio sixth region.

is estimated that 3,700,000 persons in the United States have a heart condition and that 680,000 have tuberculosis.

**Blindness in One or Both Eyes**—There are approximately 133,000 blind persons in the United States. Approximately 425,000 persons in the United States are blind in one eye. The latter group represents the important clue for placement potentiality in government industry at present.

**Deafness and Hard of Hearing**—This group has the largest potentialities in placement in government industry. There are approximately 65,000 persons in the general population who are totally deaf, 60,000 deaf mutes and an estimated 1,547,000 persons who are classed as being hard of hearing.

In dealing with these defects the commission is taking into consideration some fundamental principles in evaluating the results of the surveys made of positions.

In its placement activity the commission considers only orthopedic crippling conditions which are perma-

nent and deformities due to poliomyelitis and amputations (due to accidents) are the most common. These defects are considered as being static and persons with such defects are the most suitable in the orthopedic defects class for judicious placement in government industry. In the placement of the physically handicapped in the orthopedic group, the commission depends on complete preplacement medical reports of all persons being considered. When necessary, depending on the nature of the handicap, the commission's medical officers will request special reports from orthopedic specialists. The surveys indicate definitely that in no other type of defects is it more important to evaluate accurately the functional factors of the position than it is in determining individual limitations due to orthopedic defects. Although the surveys indicate that a large number of positions in governmental establishments have walking, standing or climbing as part of the duties, it is felt, on evaluating the survey reports, that placement oppor-

3 The Prevalence and Causes of Orthopedic Impairments. National Health Survey. Sickness and Medical Care Series, Bull. 4. 1935-1936.

tunities are afforded in a large number of these positions to persons with amputations of one lower extremity with a good orthopedic appliance

It is expected that in consultations between the regional medical officers and the medical and safety advisers, representing appointing officials, the question of floor hazards and dangerous machinery will be discussed. When these hazards exist, placement of a person with an amputated leg or foot is not advisable. Also certain establishments have an environment of intense heat and humidity which would not be suitable for persons with amputations of lower extremities who

ment picture for persons with arm and hand disabilities more favorable. It has been found that the range of suitability for such persons in governmental industrial employment can be determined only by a strict correlation of the extent of the impairment with a careful analysis of all functional factors of the arms or hands involved in the performance of duties of the position in question. If the functional factors indicate that only one good arm or one good hand is necessary, no particular attention is given to the efficiency of the orthopedic appliance of the defective member. The functional processes of numerous occupations in government

TABLE 2—Partial List of Positions in Government Ship Building and Ship Repair Offering Placement Potentialities for Physically Handicapped

Occupational Code	Title of Position Ship Building and Ship Repair	Region and Establishment	Disability Placement Code * -											
7 99 001	Cable splitter rigging loft	† R01	06	08	12	18	20	30	31	33	37	44		
5 75 050	Carpenter ship joiner	R01	05	15	17	30	31	33						
9 47 10	Classified laborer dock scaman	R01	05	15	17	18	20	30						
7 73 010	Crane and lift truck operator	R01	05	17										
9 48 10	Deckhand	R01	05	15	17									
4 9, 4 10	Foreman electrical installation	R01	05	13	15	17	44							
6 85 210	Gas cutter or burner	R01	05	15	17	30	31	33						
5 75 050	Joiner ship	R01	31	33	44									
4 75 010	Machinist production	R01	05	06	08	12	15	17	18	20	30	31	33	44
0 88 24	Marine engineman	R01	05	15	17									
7 70 110	Marine fireman	R01	05	15	17	30								
7 71 110	Oiler, marine	R01	05	17										
9 64 38	Packer	R01	05	17	30	31	33							
7 7 110	Painter	R01	05	17	33									
5 30 010	Pipe fitter	R01	05	17										
7 71 010	Senior crane and lift truck operator	R01	05	17										
4 80 010	Sheet metal worker	R01	05	17										
9 05 51	Shipfitter helper	R01	05	17										
4 85 010	Anglemith	† 101	30	33										
9 54 10	Ashman, power house	101	12	13	15	17	30							
4 85 010	Blacksmith	101	31	33										
4 80 070	Boat builder	101	30	31	33									
4 83 100	Boilermaker shop	101	30	31	33									
6 84 910	Calker and chipper	101	37	44										
5 25 110	Carpenter building trades	101	05	15	17	44								
5 76 100	Cement finisher building trades	101	05	13	15	17	30							
4 85 010	Chainmaker	101	31	33										
4 80 010	Coppersmith ship	101	30											
4 80 010	Coppersmith shop	101	30	31	33	37								
5 73 040	Craneman	101	13	15	17	44								
5 73 040	Craneman shop	101	05	06	08	12	13	15	17	18	20	44		
4 76 010	Die sinker	101	12	33	37									
6 78 083	Driller	101	37	44										
4 97 210	Electrician shop	101	12	13	15	17	18	20	30	31	33	37	44	
5 51 010	Engineman power house	101	12	13	15	17	24	30	33					
7 70 040	Fireman power house	101	12	13	15	17	30							
6 68 742	Flange turner	101	30	33										
6 86 110	Bending machine operator	‡ 202	05	06	08	18	20	31	33					
4 80 070	Boatbuilder	202	05	15	30									
4 86 150	Bumping machine operator	202	05	06	08	18	20	31	33					
6 84 910	Calker	202	31	33										
6 84 910	Chipper	202	31	33										
4 80 010	Coppersmith	202	30	31	33									
4 87 010	Coremaker	202	05	06	08	13	15	17	18	20				
5 73 040	Craneman	202	05											
6 85 210	Cutter or burner gas	202	06	08	18	20	30	31	33					

\* Disability placement code is interpreted in table 4  
† Boston Navy Yard, Boston first region

‡ Fort Mason San Francisco twelfth region  
§ Brooklyn Navy Yard, Brooklyn second region

wear orthopedic appliances. One large establishment has a network of railroad tracks, and it is felt that in this establishment and in any other establishment in which there are extra occupational hazards due to locomotives, moving trucks and the like, persons with amputations who are wearing artificial parts should not be placed unless the management arranges for safe exits to city thoroughfares.

The survey reports are in unanimous agreement that machine-shop work is suitable for persons with one good leg and one artificial leg. Arm and hand disabilities have been found to offer more serious placement problems than defects of the lower extremities, except when the functional factors of the job are changed to meet the impairment. It is expected, however, that improvement in orthopedic appliances devised for arm and hand disabilities will go far in making the place-

industry can be broken up to allow for the loss of an arm or a hand. In other occupations, an artificial appliance and one good arm or hand would enable the handicapped person to perform the duties satisfactorily. In the majority of governmental industrial positions the loss of the ring or little finger on one hand has not been found to hamper the efficient performance of a job. Of course, loss of a thumb on either hand necessitates a careful review of the functional factors of the position, since this defect usually renders the employee incapable of picking up, holding and manipulating small articles—very common functional processes in a large number of skilled trade positions.

In assigning disability codes to positions involving heavy lifting, bending, long standing and other functions which place a strain on the body trunk or to positions involving a humid and damp environment,

the commission has ruled out defects such as ankylosis of the spine due to arthritis, for placement consideration.

The influence of occupation on the incidence and mortality of tuberculosis among wage earners has been the concern of industrial insurance companies and public health agencies for more than a generation. The commission is cognizant of the fact that in no other kind of physical defect does the environment assume such an important role in placement considerations. Factors such as extreme changes in temperature and humidity are considered unsuitable in the placement of persons with a history of tuberculosis. Since dusts containing a high percentage of silica have an adverse effect on

sive walking or standing, were not coded to indicate that placement potentialities for ex-tuberculous persons existed. Other factors that were considered in reviewing positions for placement potentialities were (1) the speed at which the employee must work, (2) the monotony of the work, (3) the vibration of the process involved, (4) the intensity, difficulty and strain involved and (5) the posture of the employee while performing the duties of the position. Factors 1, 2, 3, 4 and 5 may be considered the extrinsic or mechanical characteristics of the job. The commission was unable to consider, on the basis of information at hand, the intrinsic or psychologic factors which have a bearing on

TABLE 3—*Partial List of Positions in Government Ammunition Explosives and Firearms Offering Placement Potentialities for Physically Handicapped*

Occupational Code	Title of Position Ammunition Explosives and Firearms	Region and Establishment	Disability Placement Code *											
			06	08	12	18	20	24	31	33	37	44		
4 75 130	Mechanic instrument maker	† RO9	06	08	12	18	20	24	31	33	37	44		
5-08 066	Optical instrument finisher	RC9	06	08	12	18	20	24	31	33	37	44		
4 75 130	Optical instrument maker	RC9	06	08	12	18	20	24	31	33	37	44		
7 08 032	Optical parts inspector	RC9	06	08	12	18	20	24	31	33	37	44		
7 83 011	Adjuster belt	• 701	06	08	08	12	18	20	24	31	33	44		
5-83 541	Armorer	701	06	08	12	18	20	24	31	33	44			
5 83 541	Armorer field service	701	06	08	12	18	20	24	31	33	44			
5-83 541	Armorer traveling S A M	701	06	08	12	18	20	24	31	33	44			
4 91 771	Assembler small arms and equipment	701	06	08	12	18	20	24	31	33	44			
7 02 311	Assembler tank and tractor	701	06	08	12	18	20	24	31	33	44			
7 02 311	Assembler vehicle shop	701	06	08	12	18	20	24	31	33	44			
1 18 06	Assistant production estimator	701	01	03	05	12	18	20	24	31	33	44		
1 18 06	Assistant production follow up man	701	01	03	05	12	18	20	24	31	33	44		
1 18 06	Assistant production route sheet writer	701	01	03	05	12	18	20	24	31	33	44		
5 51 130	Attendant switchboard	701	06	08	12	18	20	24	31	33	44			
4 75 120	Benchman machinist	701	06	08	12	18	20	24	31	33	44			
5-17 010	Benchman small arms and equipment	701	06	08	12	18	20	24	31	33	44			
4 86 010	Blacksmith	701	06	08	12	18	20	24	31	33	44			
4 86 010	Blacksmith's helper	701	06	08	12	18	20	24	31	33	44			
4-83 100	Bollermaker	701	06	08	12	18	20	24	31	33	44			
5 92 768	Boss gang mechanical trades	701	01	03	05	12	18	20	24	31	33	44		
9 03 64	Boy shop	701	06	08	12	18	20	24	31	33	44			
5-24 010	Bricklayer	701	31	33	44									
5 25 110	Carpenter	701	31	33	44									
5-26 100	Cement finisher	701	06	08	12	18	20	24	31	33	44			
1 18 06	Checker shop	701	06	08	12	18	20	24	31	33	44			
4 82 010	Coremaker	701	06	08	12	18	20	24	31	33	44			
4 01 351	Cupola tender	701	30	31	33									
4 76 120	Diesetter	701	31	33	44									
4 76 020	Diesinker	701	06	08	12	18	20	24	31	33	44			
4 07 010	Electrician	701	06	08	12	18	20	24	31	33	44			
5-41 060	Engineman locomotive	701	06	08	12	18	20	24	31	33	44			
7 23 940	Engineman power roller	701	06	08	12	18	20	24	31	33	44			
7 10 012	Fabric worker	701	06	08	12	18	20	24	31	33	44			
5-92 311	Foreman and assistant foundry	701	06	08	12	18	20	24	31	33	44			
5-92 331	Foreman and assistant forge	701	06	08	12	18	20	24	31	33	44			
5-27 010	Foreman and assistant paint	701	31	33	44									
5 91 701	Foreman and assistant printing	701	06	08	12	18	20	24	31	33	44			
5 92 592	Foreman and assistant sheetmetal	701	06	08	12	18	20	24	31	33	44			
4 85 010	Foreman and assistant welding	701	06	08	12	18	20	24	31	33	44			
5-91 501	Foreman and assistant woodworking	701	06	08	12	18	20	24	31	33	44			
4 03 771	Assembler female	§ 303	06	08	12	18	20	24	31	33	44			

\* Disability placement code is interpreted in table 4.  
† Rock Island Arsenal Rock Island Ill seventh region

‡ Benicia Arsenal Benicia Calif twelfth region  
§ Frankford Arsenal Philadelphia third region

persons with a history of tuberculosis and are known to alter susceptibility to tuberculous infection, the commission, in designating placement codes for positions which have been reported to involve this hazard has not listed such positions as offering placement potentialities for persons with a history of tuberculosis. Those positions which were reported as involving exposure to fumes or gases also were not considered for ex-tuberculous persons. Positions reported as having adverse environmental factors for ex-tuberculous patients included certain metal trades and foundry positions, some toolmaker and toolgager positions and positions involving metal polishing and battery making.

Since it is well recognized that fatigue is unfavorable to the welfare of persons with a history of tuberculosis, those positions which were reported as involving strenuous physical activities, such as heavy carrying, lifting or pushing, constant stair or ladder climbing and exces-

sive walking or standing, were not coded to indicate that placement potentialities for ex-tuberculous persons existed.

Other factors that were considered in reviewing positions for placement potentialities were (1) the speed at which the employee must work, (2) the monotony of the work, (3) the vibration of the process involved, (4) the intensity, difficulty and strain involved and (5) the posture of the employee while performing the duties of the position.

Factors 1, 2, 3, 4 and 5 may be considered the extrinsic or mechanical characteristics of the job. The commission was unable to consider, on the basis of information at hand, the intrinsic or psychologic factors which have a bearing on placement potentialities for ex-tuberculous persons.

Although this consideration, in connection with placement of ex-tuberculous persons, seemingly limits to a

large extent placement activity, a large number of skilled trades and light machine shop positions have been found on survey to be suitable for such persons and not to present the hazards discussed.

Heretofore very little has been done to effect placement of persons with heart disease in governmental industrial establishments. This defect is a common one and involves intelligent placement not only on the part of the employer but on the part of the medical advisers to management. Types of heart disease most frequently encountered on preemployment examinations for the federal civil service are rheumatic, hypertensive, syphilitic and coronary diseases.

The guiding principles in establishing disability placement codes relating to heart disease follow fairly closely the American Heart Association classifications. No attempt was made to interpolate in the disability placement code any consideration of the types of heart disease.

When surveys of positions indicated that the workers were performing duties in a damp environment or in an environment presenting sudden temperature changes, sentences will be added to the code to indicate that persons with a history of rheumatic disease should not be placed in these positions.

Persons with cardiovascular syphilis are considered the least satisfactory of all the cardiac patients from the standpoint of placement. The commission's statistics indicate that this defect has a high incidence in the laboring classes and in most instances incapacitates to the extent that vocational training and placement are difficult and, in view of the guarded prognosis of the disease, often inadvisable.

Persons with a history of coronary disease, manifested by angina pectoris, coronary thrombosis, cardiac asthma or paroxysmal dyspnea are not justifiable risks for initial placement in federal government industry.

Surveys have revealed a small number of positions in governmental industrial establishments in which persons with hypertensive heart disease may be placed, provided there is no history of decompensation.

Placement potentialities have been coded for a considerable number of machine-shop and drafting positions involving desk or bench duty. All positions in which the surveys disclosed that the performance of the duties involved climbing ladders, frequent climbing of stairs, stooping, pushing, crawling, frequent lifting or other types of arduous physical exertion have not been given disability classification codes to include cardiac disability.

Blind persons and persons with severe impairment of visual acuity receive very special consideration in placement. The commission's definition of a blind person is "A person with not more than 10 per cent visual acuity in the better eye when corrected by glasses or a visual acuity greater than 10 per cent but with a limitation in the field of vision such that the widest diameter of the visual field subtends on an angle no greater than 20 degrees."

The so-called industrially blind standard is considerably higher and may range from 20/70 to 20/100 (Snellen) with correction—that is, 63.8 per cent to 48.9 per cent visual efficiency with correction. Surveys have revealed numerous occupational and extraoccupational hazards in governmental industrial establishments which will limit placement of the blind, according

to the commission's definition, to a very small number of positions, in sheltered environments, involving repetitive work in which a sense of touch alone is required (certain inspector positions). The further utilization of blind persons in additional positions will depend on the willingness of the management to furnish safe transportation facilities for the blind within industrial establishments.

The industrially blind and those persons who are blind in one eye only, with good vision in the other, represent an important group with placement potentialities as far as government industry is concerned. The surveys reported in a large establishment indicated that approximately 90 per cent of the positions could be filled by persons who are blind in one eye and have good vision in the other. Since it is questionable whether or not one-eyed persons develop a true stereopsis or depth perception, it has not been considered wise to place these persons in dangerous positions such as those of crane operators working at a high elevation, operators of moving machinery, truck and tractor drivers and feeding machine operators and in structural and maintenance jobs in which the duties involve the use of scaffolding. In these positions surveys indicate that normal acuity, stereopsis, normal muscle balance and often normal color vision are essential. Poor distance vision, according to industrial standards, with good near vision is considered as being compatible with the efficient performance, with a minimum risk, of the duties of the following positions, in which extraoccupational hazards are not serious considerations: inspector, assorter, engineer and calibrating technician.

A large number of miscellaneous "in between jobs" in which unusual visual aptitudes are not required were discovered on survey. Such positions include laborer, certain types of mechanics, handyman, certain types of machinists and metalsmiths.

Those occupations which have been found on survey to be particularly hazardous, with the possibility of further damaging the visual apparatus, have not been coded to indicate that persons with one eye can be placed in these positions. Such positions include those in which corrosive solutions are used and those in which abrasive particles may be thrown into the eye by grinding or clamping tools.

The hard of hearing and the deaf group of the physically handicapped represent the largest group with placement potentialities. This fact has been recognized by the commission for some time, and under the provisions of an executive order of Dec. 1, 1908 deaf mutes and the hard of hearing are admitted to examinations for a large number of positions.

The recent surveys have disclosed that types of positions suitable for persons with hearing impairment are represented by a large number of jobs of the skilled, semiskilled or unskilled types that can be carried on without the need of extensive communication. The most suitable positions for the deaf have been found to be the positions of routine type in which the same operation is performed over and over again. The deaf are satisfactory employees in positions such as packer, checker, sorter, labeler, polisher, oiler and finisher and in a large number of similar positions.

The surveys reveal some positions in which it was apparent that deaf mutes might be better employees than



persons with normal hearing. Such positions include boiler maker and inspector of material equipment or inspectors of finished products where the need of communication is not important.

It is recognized that at present many hearing aids offer a benefit to the hard of hearing that is comparable to the benefit scientifically selected lenses offer to those with defective vision. Unfortunately there are still instruments on the market designed as hearing aids which lack efficiency, adaptability and durability. The efficient and serviceable hearing aid has broadened tremendously the placement potentialities of the hard of hearing group. Already a considerable number of the hard of hearing using efficient hearing aids have been employed in federal industry and in the federal civil

potentialities for machine shop jobs or structural shop jobs for the hard of hearing and the deaf, and it is not expected that many difficult placement problems will arise in utilizing the services of the hard of hearing and the deaf.

In both groups, of course, consideration must be given to psychologic or emotional maladjustment, which occasionally accompanies these defects and may make the handicapped person an unsuitable employee. It will be important for those persons responsible for placement in federal establishments to determine whether deaf or hard of hearing persons who are under consideration for employment have a healthy attitude toward their defect or environment before placement is attempted.

The employment of women in industry was given its largest impetus by the industrial revolution in Great Britain in the early nineteenth century. The appearance of many new mechanical operations in industry at that time was largely responsible for this trend. Since that time women gradually have assumed an increased importance in the labor market, especially during wartime when the male labor supply is scarce.

As far as physical ability is concerned, some women could be placed in any industrial position filled by male workers and most women, with proper training, could perform the duties of the majority of positions in industry with proper placement. Since a large number of women are limited in many respects as to physical ability to perform certain types of work in the industrial field and also have a high percentage of absenteeism due to illness for the purpose of any placement program they must be considered as presenting problems in placement or as "physically handicapped." For this reason the commission in making its surveys of industrial positions has attempted also to determine which positions in government industry could be performed by women.

One ordnance establishment was found to be employing 50 per cent women in one of its shops. These female employees were engaged in many different operations, including the grinding, polishing and plating of mirrors, prism assembling and inspecting. It was found that their work was excellent, and for some operations such as prism assembly, they were superior to men. Surveys reveal that in another ordnance establishment 85 per cent of the positions could be held by female employees, however, this establishment had very few female employees.

In coding positions which were found to be suitable for female employees and not already held by females, the commission followed the suitability classification as established by the U. S. Employment Service.

1 Positions in which women are now regularly employed.

2 Positions apparently suitable for women—those occupations in which women have been employed in some establishments in some parts of the country or occupations in which there is no apparent factor that would bar women.

3 Positions partially suitable for women—those occupations which have generally been considered to be suitable only for men but which on analysis were found to contain certain phases that did not entail excessive physical exertion and that could be taught within a reasonably short time. For example, it usually takes years of training to become efficient in all aspects of the position of precision lens grinder. Certain phases, however, such as blocking, cementing and inspecting, can be taught within a comparatively short time, and women have been found to be very adaptable to these tasks.

TABLE 4—Disability Classifications with Code Numbers \*

1 Orthopedic (a) Amputation of	Code Number		Code Number
Arm <sup>1</sup>	01	Foot <sup>1</sup>	20
Arms	02	Feet	22
Hand <sup>1</sup>	03	Back	24
Hands	04	Hips or shoulders	26
Fingers <sup>2</sup>	05		
Leg <sup>3</sup>	06	2 Vision defects	
Legs	07	Blind	23
Foot <sup>1</sup>	08	Blind in one eye with	
Feet	09	good vision in the	
		other or impaired	
		visual acuity in both	
		eyes with satisfactory	
		correction	30
(b) Disability or deformity of			
Hip or shoulder	12	3 Hearing defects	
Arm <sup>1</sup>	13	Deaf <sup>4</sup>	31
Arms	14	Hard of hearing, <sup>4</sup>	33
Hand <sup>1</sup>	15		
Hands	16	4 Chronic diseases	
Fingers <sup>4</sup>	17	Heart <sup>5</sup>	37
Leg <sup>1</sup>	18	Tuberculosis (pulmo-	
Legs	19	nary) <sup>6</sup>	44

\* A combination of disability code numbers listed for any particular position is not to be interpreted necessarily to indicate that a combination of all the defects would be acceptable for placement in that position.

1 With other member intact and fully functioning.

2 One or more fingers missing on secondary hand with good residual grasping power in that hand and normal function of primary hand. In some positions good grasping power not required in secondary hand.

3 Amputation of one lower extremity with satisfactory prosthesis and with other lower extremity intact and fully functioning.

4 One or more fingers disabled on secondary hand with good residual grasping power in that hand and normal function of primary hand. In some positions grasping power not required in secondary hand.

5 Sense of hearing nonfunctioning for ordinary purposes of life. Code number may include deaf mutes depending on amount of communication required in routine performance of duties of position in question.

6 Sense of hearing although defective functional with or without hearing aid.

7 Organic heart disease other than coronary disease fully compensated without history of decompensation.

8 Tuberculosis healed for a period of at least one year and health otherwise good. For some positions of sedentary type and with suitable working environment persons receiving collapse therapy may be considered.

service in general. Information derived from the complete survey will disclose an even larger group of positions in which persons who are hard of hearing but use efficient and serviceable hearing aids may be employed. Lip reading, motion pictures and familiarity of industrial vocabularies in training will broaden further the placement field in this class of defect.

In the placement of deaf and hard of hearing persons, extraoccupational hazards must be given due consideration. For example, a chipper in the navy yard may have hearing which is greatly diminished without affecting materially his efficiency or without his being a hazard to himself or others, however, owing to the fact that he is working in an open navy yard on ship construction around heavy moving machinery and locomotives, it is inadvisable to place him in an open navy yard, though he could work as an inside chipper. With very few exceptions, surveys have revealed placement

In utilizing the foregoing classification the commission gave consideration to the following factors in coding positions reported on the surveys

**1 Factors Which Depend on the Female Constitution—**Authorities disagree on the importance of the difference in the constitutional makeup between men and women and its relation to ability to perform heavy labor. However, it has been decided for the present that placement of women in government industry should be effected in positions involving duties of semiarduous or moderate nature. There is also disagreement on the influence of particular types of occupations on the menstrual cycle. In this connection most evidence points to the favorability of positions which alternate between standing and sitting for female employees, and such positions have been considered ideal for placement.

**2 Factors Due to the Nature of the Work Itself—**Women have been found to be particularly adaptable to industrial discipline and to have a remarkable capacity for performing repetitive and often monotonous work which calls for manual dexterity, precision and patience. A large number of women have already been employed successfully in federal arsenals, ordnance plants, quartermaster depots and navy yards doing work of this nature. Such positions include those of explosives operators, gas mask inspectors, aircraft material workers, leather and cabinet workers, parachute repairers and related positions.

Those positions disclosed on survey as involving heavy lifting or as being hazardous were not considered suitable for women in establishing the placement codes.

The foregoing discussion of the placement of the physically handicapped in government industry represents the picture as it is today. Depending on the duration of the war and resulting shortages in the labor supply, the picture will change. A greater number of additional positions may have to be found for the physically handicapped and a corresponding number of handicapped trained for these positions. Since the commission's placement manual will be in a loose-leaf form, allowing for changes in code designations either for the job classification or for disability, changing trends in the industrial field and in labor supply are provided for.

The commission's program will serve two purposes. It will promote the war effort by facilitating the training, recruitment and placement of qualified physically handicapped persons where they are needed, and it will offer the commission excellent experience which will be of great value after the war in utilizing the services of disabled veterans and those disabled as a result of accelerated industrial activity. It is expected that, depending on the duration of the war, large numbers of disabled veterans and industrial workers will be placed on the labor market.

**Two Roads Are Always Open—**A student of medicine begins his novitiate when he goes to medical school, but he should have entered upon his apprenticeship as a doctor many years before, when for the first time he was allowed free choice in his earlier education. At that point two roads are always open, one, straight and narrow, that leads through the sciences with only a few brief detours into general knowledge, the other, circuitous and serpentine, that wanders far afield dips more deeply into the wider realms of learning and returns to the highway only when necessity demands—this is the more entrancing road, for there are more flowers beside it, and from the ancient hills that it surmounts one sees the world more clearly. Although the doctor who has traveled this road must leave it for a space of years when his novitiate begins, when leisure later comes he can return to explore the inviting bypaths that branch on either side, but to him who has never trod it they are forever forbidden.—Irving, Frederick C. *Safe Deliverance*, Boston, Houghton Mifflin Company, 1942.

## THERAPEUTICS OF PNEUMONIA ON A STATEWIDE BASIS

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The application of approved methods in the diagnosis and treatment of the different kinds of pneumonia has brought about a spectacular diminution in the mortality rate from this group of diseases during the last five years. Introduction of the sulfonamide compounds has made possible a therapeutic approach to the problem which if put to maximum use should directly remove pneumonia as one of the leading causes of death.

The persistence of a relatively high mortality rate throughout the nation, even though treatment under carefully controlled conditions has produced a conspicuous decrease in the death rate, remains one of the unsolved problems of the medical profession. For the nation at large the rate is somewhere between 12 per cent and 15 per cent. In well organized clinics and hospitals, where pneumonia is regarded as one of the great medical emergencies, modern methods of treatment have been so efficient that from time to time groups of 100 patients with pneumonia have been treated without the loss of a single life.

### PROBLEMS IN STATEWIDE CONTROL

To be more widely effective, the therapeutics of pneumonia, in the light of modern scientific knowledge, should be planned on a statewide basis. Only in this way will the lag between known medical science and its application be reduced to a minimum. Facilities for diagnosis, correct therapy and the collection of statistics need be set up for the assistance of the general practitioner.

Even prior to the changes in treatment occasioned by the advent of the sulfonamide compounds, Massachusetts and New York united the resources of their respective states and used the different kinds of serum that were reasonably satisfactory in treating pneumonia. The entry of the sulfonamide compounds at a time when serum therapy was becoming more and more effective, placed in the hands of the medical profession a double barreled weapon for the treatment of pneumonia that has stricken it from the upper position in the list of mortality statistics.

### INCIDENCE

In 1936 more than 133,000 patients died from pneumonia and influenza in the United States. In the same year the mortality from pneumonia in Pennsylvania was more than 9,000 persons, ranking sixth on the list of causes of death.<sup>1</sup>

Since it is generally conceded that without the benefit of serum or sulfonamide therapy a mortality rate of approximately 25 per cent may be assumed for all cases of pneumonia, it is reasonable to suppose that about 35,000 cases of pneumonia occur in Pennsylvania each

<sup>1</sup>Read before the Section on Experimental Medicine and Therapeutics at the Ninety Third Annual Session of the American Medical Association, Atlantic City, N. J., June 10, 1942.

This article has been released for publication by the Division of Publications of the Bureau of Medicine and Surgery of the U. S. Navy. The opinions and views set forth in this article are those of the writer and are not to be considered as reflecting the policies of the Navy Department.

<sup>1</sup>MacBride, Dexter, Edith and Bortz, E. L. *Pneumonia Control Plan for Pennsylvania*. Pennsylvania M. J. 41: 279 (Jan.) 1938.

year Pennsylvania is an industrial center with slightly more than twelve thousand physicians for a population of slightly less than 11,000,000<sup>2</sup>

From July 1, 1937 to June 30, 1938 Pennsylvania had 7,117 pneumonia deaths and during the same period there were approximately 1,200 patients with pneumonia treated with agents made available through the pneumonia control program<sup>3</sup>

#### THE APPROACH TO THE TREATMENT OF PNEUMONIA ON A STATEWIDE BASIS IN PENNSYLVANIA

In addition to supplying general practitioners with weapons with which to fight this disease, there is need for a certain amount of organization. Recognition of these combined factors led the officials of organized medicine in Pennsylvania to establish the Commission for the Study of Pneumonia Control in 1936, which immediately collaborated with the department of health. Since knowledge of the disease had thrown it into a

3 To have serum placed at the disposal of the physician at any hour of the day or night. First sulfapyridine was made available to every physician throughout the commonwealth, then in November 1940 sulfathiazole and in January 1942 sulfadiazine were likewise placed at the disposal of the physicians of the state

4 To hold refresher courses

5 To educate the public

6 To carry on epidemiologic studies of pneumonia in Pennsylvania

7 To identify in every case if possible, the cause of death when pneumonia occurred just previous to death

8 To compare the values of various therapeutic agents

9 To encourage research in laboratory, clinic and field

#### PRESENTATION

With a good foundation laid, the commission, with the support of the public health officials, was ready to spread before the laity and the profession of the state ways and means for intensively attacking the pneumonia problem

To aid in this presentation representatives of organized medicine worked in close harmony. Identified with the work were the Medical Society of the State of Pennsylvania through its Commission for the Study of Pneumonia Control, the Department of Health with its Division of Pneumonia Control and Division of Health Education, and last but not least, influential lay groups

For purposes of medical organization the Medical Society of the State of Pennsylvania divided the commonwealth into twelve councilor districts, each to include from one to seven counties. The Commission for the Study of Pneumonia Control consists of representatives from all of the councilor districts and at the present time is made up of nineteen physicians

#### ROLE OF COUNTY MEDICAL SOCIETIES

To extend the benefits of modern therapy to the innermost recesses of the state pneumonia control committees were organized in fifty-eight of the county medical societies of the commonwealth

Through the committee of the county society an endeavor is made to contact every practitioner, his cooperation is sought in reporting pneumonia cases and recent literature and information are placed at his disposal. Local committees have been instrumental in encouraging general practitioners to utilize all the facilities made available through an alert department of health and its Division of Pneumonia Control

#### ATTEND CROUPS

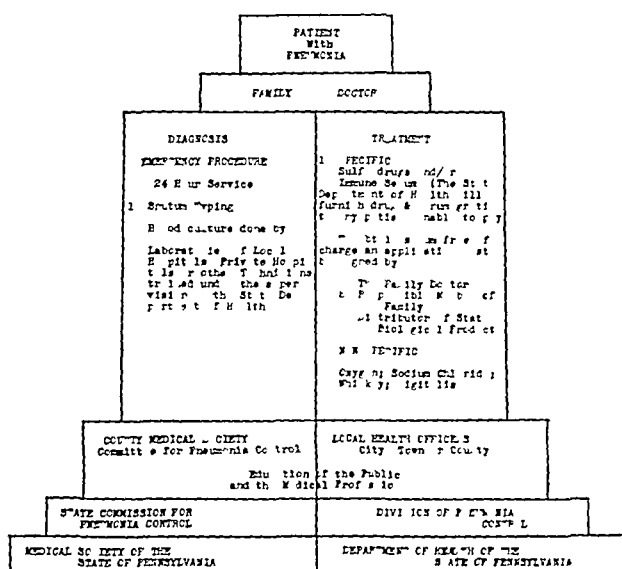
No work can be carried through successfully without the full cooperation of all parties concerned. Pennsylvania was exceedingly fortunate in obtaining this cooperation

The Pennsylvania State Nurses Association has appointed a representative in each district to help the physicians carry on the educational work. They have likewise stressed the nursing of pneumonia patients to undergraduates throughout the entire state

Also, the visiting nurse societies in the metropolitan areas have cooperated splendidly in furnishing the necessary nursing care to patients living in congested districts whose limitations are apparent

#### MEASURES OF ATTACK

1 *Pneumonia Control Centers*—There are 178 pneumonia control centers, the majority in hospitals, now established at strategic areas throughout Pennsylvania



Approach to the treatment of pneumonia on a statewide basis in Pennsylvania

class susceptible to control on a broad geographic basis, the physicians of the state enthusiastically welcomed such an idea

Pneumonia was made a reportable disease in July 1937, and a systematic campaign was started to make it, in the minds of the medical profession, the great medical emergency. Regarding pneumonia as such, physicians are impressed with the importance of prompt diagnosis and adequate treatment. The approach to the treatment of pneumonia on a statewide basis is outlined here

#### OBJECTIVES

Before proceeding further, the state department of health, which in 1939 organized the Division of Pneumonia Control, and the commission personnel realized the necessity for drawing up a definite list of objectives. These were

1 To reduce the mortality from pneumonia in Pennsylvania

2 To furnish every practicing physician in the state with the latest data and to have necessary facilities available for prompt and correct diagnosis

2 Bortz E. L. Pneumonia in Pennsylvania. *Tr. Am. Clin. & Climat. A.* (1940) 56: 103, 1941.

3 Annual Report of the Pennsylvania Pneumonia Control Division, July 1, 1940 to June 30, 1941.

Every center is capable of sputum diagnosis, blood culture studies and the furnishing of simple laboratory procedures

Fifty-three of the pneumonia control centers are classified as major stations, having available serum for types I, II, V, VIII and XIV pneumococcus infections. The remaining stations are furnished with serum for types I and II. Sulfapyridine and sulfathiazole are available at all control stations.

2 *Treatment*—The procedure in Pennsylvania is to advocate the use of sulfathiazole or sulfadiazine for

During the period of 1940-1941, 68 patients were treated with serum alone with a total of 20 deaths, or a mortality rate of 29.4 per cent.

All types of therapeutic serum are held in readiness twenty-four hours a day at the office of the Division of Pneumonia Control in Harrisburg and for patients who cannot afford to pay the serum is granted without charge.

3 *Lay Education*—Under the leadership of organized medicine an elaborate educational campaign has been carried on for the past five years. The Division

TABLE 1—Distribution of Cases and Mortality According to Pneumococcus Type by Treatment

Type	Sulfapyridine			Sulfathiazole			Sulfadiazine			Serum			Other Therapy			Nonspecific Therapy			Totals		
	Without Serum		Per Cent	With Serum		Per Cent	Without Serum		Per Cent	Without Serum		Per Cent	Without Serum		Per Cent	Without Serum		Per Cent	Without Serum		Per Cent
	Cases	Deaths		Cases	Deaths		Cases	Deaths		Cases	Deaths		Cases	Deaths		Cases	Deaths		Cases	Deaths	
Totals	2 997	341	11.5	258	59	22.9	5 101	601	9.8	440	93	21.1	196	20	10.2	68	20	29.4	34	3	8.8
1	108	8	7.4	68	11	16.3	195	6	3.1	109	14	12.8	24	2	8.3	14	2	14.3	4		
2	76	4	5.3	18	7	18.4	140	7	5.0	64	10	15.6	6			8	2	25.0	2		
3	105	7	6.7	44	17	38.6	187	20	10.7	84	33	39.3	20	7	35.0	9	3	33.3	6		
4	41	5	11.6	10	4	40.0	64	6	9.4	21	2	9.5	14	1	7.1	2	2	100.0	1		
5	23	2	8.7	11	3	27.3	54	3	5.6	19	8	42.1	8			3			1		
6	12	6	50.0	9	3	33.3	49	3	6.1	7	1	14.3	4	1	25.0	1	1	100.0	3		
7	48	5	10.4	13	7	53.8	90	3	3.3	24	4	16.7	13	3	23.1	6	1	16.7	2		
8	41	5	12.2	23	7	30.4	91	1	1.1	31	6	19.4	18			9	2	22.2	1		
9	12	2	16.7	2	1	50.0	26	4	15.4	6	1	16.7				2	1	50.0	1		
10	8						13			1			1								
11	6	1	16.7	2			8	1	12.5	3			1	1	33.3	2	2	100.0			
12	11	3	27.3	2	1	50.0	15	1	6.7	2			4						1		
13	10	2	20.0				30	4	13.3	5	1	20.0				1			1		
14	20	1	5.0	4	1	25.0	37	1	2.7	13	1	7.7	5	1	20.0	3	2	66.7			
15	6			2	1	50.0	9	1	11.1							1					
16	10	2	20.0	1			25	1	4.0	2			3			1			1		
17	11						15	3	20.0	2			1						3		
18	8	1	12.5	5	2	40.0	33	1	3.0	5	1	20.0	1						1		
19	17	1	5.9	7			38	7	18.4	5	2	40.0	4			2					
20	13			4	1	25.0	11	1	9.1	7	1	14.3	3								
21	7						12	2	16.7	1						1					
22	11	2	18.2	1			14	1	7.1	3	1	33.3				2	1	50.0	1		
23	7	1	14.3	2	2	100.0	18	1	5.6	3	3	100.0									
24	6	1	16.7	1			10			2									2	2	100.0
25	6			2			11	2	18.2	2			9	1	50.0						
26				1			13	1	7.7	2			1						1		
27				1			5	1	20.0	3	1	33.3									
28	3			1			17	2	11.8	1			2			1					
29	10	1	10.0	1			10	1	10.0	1											
30	4	1	25.0				9			1	1	100.0	1			1					
31	1						17	3	17.6	1	1	100.0									
32	3	1	33.3				17	3	17.6	1	1	100.0									
33							17	3	17.6	1	1	100.0									
Total	670	60	9.0	251	57	22.7	1 064	87	8.1	431	91	21.1	142	17	11.9	66	19	28.8	19		
00	1915	233	12.2	3			2 896	313	10.8	3			3	2	66.7	1	1	100.0	6	2	33.3
40	10	2	20.0	1	1	100.0	5	2	40.0	5	1	20.0									
88	189	25	13.2	1	1	100.0	518	57	10.2	1	1	100.0				6	1	16.7	22	3	13.6
90	208	24	11.5	2			398	46	11.6				32	1	3.1				11	2	18.2
Total	2 892	284	12.2	7	2	28.6	3 837	414	10.8	9	2	22.2	54	3	5.6	2	1	50.0	15	3	20.0

All tables presented herein are taken from the annual report of the Pennsylvania Pneumonia Control Division of the Department of Health Harrisburg, Pa. August 1941.

No. 133 signify the specific pneumococcal types 133. 00 indicates that no attempt was made at typing. 40 more than one specific typed pneumococcus present. 88 sputum typed but no pneumococci were found. 99 typed and pneumococci were found but no specific type identified.

twenty-four hours as soon as the definite diagnosis of pneumonia has been made. If the patient is desperately ill and if the blood culture is found to be positive, serum in adequate quantity is immediately recommended. Since January 1942, sulfadiazine has been made available through the Division of Pneumonia Control, and, at the present time, it is the drug of choice in the treatment of pneumococcal pneumonia.

Although, at the outset of the campaign the importance of a bacteriologic diagnosis was stressed, it is now evident that during the last two years, since the sulfonamide compounds have become so prominent, physicians generally disregard bacteriologic studies. That this practice is to be decried must be emphasized, because in selected instances the use of serum has often proved life saving, particularly for patients who had reacted unfavorably to the sulfonamide compounds.

of Health Education under the expert supervision of Mrs. Edna M. Kech during the period from Jan. 1, 1941 to Dec. 31, 1941 arranged one hundred and twenty-nine pneumonia meetings with a total attendance of 46,250. During this period seven hundred physicians addressed various lay groups at the meetings which had been arranged for by Mrs. Kech. Commendation is due the practitioners for their support in this lay education program.

In addition to the meetings, a motion picture on pneumonia has been prepared and in four months has been shown one hundred and ninety-nine times, to a total attendance of 22,822 persons.

4 *Education for the Physician*—For the medical profession seven semiannual conferences have been conducted. The attendance at each varied from seventy-five to one hundred and seventy-five physicians. Rec-

work on pneumonia was reviewed at these meetings and recommendations were made to the local county medical society. After reports from all of the societies a question and answer period was held, thereby giving all the opportunity to participate.

Diagnosis, as the key to the successful treatment of pneumonia, has been emphasized at all refresher courses that have been given in Pennsylvania. Physicians have been warned not to use serum in the absence of a specific bacteriologic diagnosis. Reports have indicated that the practice of prescribing one of the sulfonamide compounds for any infection of the respiratory tract

Now with the active participation of the Division of Pneumonia Control of the Department of Health, under the capable leadership of Dr. Dale C. Stahle, the reporting and tabulating of cases for statistics is carried on in a more efficient manner.

The most recent statistics from this department show that between the period of July 1, 1941 and Jan. 1, 1942 1,445 cases of pneumonia have been reported with 162 deaths. Allowing for final corrections, the approximate mortality is 10 per cent. From July 1, 1940 to June 30, 1941 1,500 private cases were reported to the Division of Pneumonia Control.

TABLE 2—Mortality by Race and Place of Treatment

	Sulfapyridine			Sulfathiazole			Sulfadiazine			Serum			Other Therapy			Nonspecific Therapy			Totals		
	Without Serum		Per Cent	With Serum		Per Cent	Without Serum		Per Cent	With Serum		Per Cent	Without Serum		Per Cent	With Serum		Per Cent	Without Serum		Per Cent
	Cases	Deaths		Cases	Deaths		Cases	Deaths		Cases	Deaths		Cases	Deaths		Cases	Deaths		Cases	Deaths	
Totals	2,992	344	11.5	2,058	50	22.9	5,101	501	9.8	440	91	21.1	196	0	10.1	68	30	34.4	11	3	8.8
White	2,682	315	11.7	2,10	47	21.4	4,404	451	10.0	381	85	22.2	166	14	11.1	57	16	28.0	17	2	11.8
Negro	291	23	7.9	36	11	30.6	546	44	8.1	59	6	14.5	90	6	6.7	11	4	36.4	17	1	5.9
Not specified	19	6	31.6	2	1	50.0	61	6	9.8	2									2	1	50.0
Home	715	37	5.2	67	11	16.4	1,052	50	4.7	65	6	9.1				6	1	16.7	5		
Hospital	2,273	306	13.5	191	48	25.1	4,041	451	11.2	375	87	23.1	190	10	5.3	61	29	47.6	16	43	70.6
Not specified	4	1	25.0				8												1		

TABLE 3—Distribution of Cases by Age Group

	Sulfapyridine									Sulfathiazole									Sulfadiazine			Serum			Other Therapy			Nonspecific Therapy			Totals			Percentage of Total			
	Without Serum			With Serum			Without Serum			With Serum			Without Serum			With Serum			Without Serum			With Serum			Without Serum			With Serum			Without Serum				With Serum		
	Cases	Deaths	Per Cent	Cases	Deaths	Per Cent	Cases	Deaths	Per Cent	Cases	Deaths	Per Cent	Cases	Deaths	Per Cent	Cases	Deaths	Per Cent	Cases	Deaths	Per Cent	Cases	Deaths	Per Cent	Cases	Deaths	Per Cent	Cases	Deaths	Per Cent	Cases	Deaths	Per Cent				
Totals	2 992	344	11.5	2 058	50	22.9	5 101	501	9.8	440	91	21.1	196	0	10.1	68	30	34.4	11	3	8.8	96	47	49.5	9	5	55.6	1 087	108	11.03							
Under 2	620	66	10.6	8	2	25.0	837	78	9.3	8	1	12.5																					16.3				
2-12	643	18	2.8	8	1	12.5	913	19	2.1	13	3	23.1	3			1	1	11.1	1			1										1.1					
13-40	670	39	5.8	102	11	10.8	1,772	54	4.2	168	10	5.9	11	1	9.0	20	4	13.7	14	1	7.1	56	10	17.9	4	1	25.0	163	16	9.8		6.1					
41-60	532	80	15.0	82	9	30.5	1,045	135	12.9	177	44	24.8	54	8	14.8	15	7	46.9	1			11	3	27.3	1			107	16	15.0		9.9					
Over 60	409	139	34.0	44	18	40.9	805	211	26.2	74	34	45.9	11	11	45.5	1	1	50.0				1	1	100.0	1	1	100.0	15	15	100.0	42	30.0	13.1				
Unspecified	118	2	1.7	14	2	14.3	99	4	1.7	90	1	5.0	1																			4.3					

in the absence of a specific bacteriologic diagnosis was widespread.

To keep the vital facts before the general practitioners, bulletins are flashed throughout the commonwealth at intermittent periods. The latest series of these has been compiled into a brochure entitled "New Facts on Pneumonia" and is distributed to every county medical society, through which the facts are made available to every practicing physician in the state.

**5 Case Reporting.**—No statistics are available regarding the extent of the pneumonia problem previous to 1937, at which time it was made a reportable disease. The Commission of Pneumonia Control, before the creation of the Division of Pneumonia Control in the Department of Health, attempted to collect statistics through the members of the commission and local representatives. A series of 5,977 cases in the 1938-1939 season was compiled by the Sub-Committee on Statistics of the State Commission.

#### STATISTICS

From a recent Metropolitan Life Insurance Company survey this disease caused only 41.9 deaths per hundred thousand policyholders during the first three months of the current year. This is 18 per cent below the rate in the same period of 1941, 37 per cent below the average for the last four years and 61 per cent below the average for the five years previous to the advent of the sulfonamide compounds.

A careful study of the mortality data available since the turn of the century indicates that there was a slight general trend downward of the death rate even before the efficacy of the present agents was developed. Since 1937, however, there has been a sharp and continuous declination of the mortality curve effective for men, women and children of all age groups.

As a disease pneumonia is very much on the spot at the present time. For every patient who dies some one is usually to blame—either the patient, owing to

lack of prompt resort to modern medical care, or the attending physician from lack of knowledge of what modern science has to offer. In the absence of pronounced complications and given a reasonably good constitution, the patient suffering from pneumonia today should not die.

In a closely reasoned and well documented paper presented a year ago, Stahle demonstrated a mortality rate of 9.19 per cent in a series of 15,251 patients

general practitioners, who, in the last analysis, are the key men in the control of pneumonia.

Each year, approximately three thousand physicians, or 97 per cent of the total number utilizing the facilities of the distributing centers, send in report cards on their cases. These cards, which are furnished by the Division of Pneumonia Control, permit accurate classification of the cases with reference to age, sex, color, duration of the disease, frequently whether or not there

TABLE 4—Incidence of Associated Diseases and Effect on Case Fatality Rate

Type	Sulfapyridine						Sulfathiazole						Sulfadiazine			Serum			Other Therapy			Nonspecific Therapy			Totals		
	Without Serum			With Serum			Without Serum			With Serum			Without Serum			Without Serum			Without Serum			Without Serum			Without Serum		
	Cases	Deaths	Per Cent	Cases	Deaths	Per Cent	Cases	Deaths	Per Cent	Cases	Deaths	Per Cent	Cases	Deaths	Per Cent	Cases	Deaths	Per Cent	Cases	Deaths	Per Cent	Cases	Deaths	Per Cent	Cases	Deaths	Per Cent
Totals	940	242	25.7	91	31	33.9	1,647	307	24.1	151	63	40.9	56	15	26.8	33	13	39.4	4	2	50.0	101	36	35.6	3,098	1,017	26.4
Pregnancy	28	4	14.3	4	1	25.0	45	6	13.3	1			2												80	11	13.6
Puerperium	17			3	1	33.3	25	2	8.0													1			46	3	6.5
Surgery	164	26	15.8	11	3	27.3	232	34	14.7	27	4	14.8	1			5						8	1	12.5	448	63	15.9
Heart disease	244	91	37.3	31	19	38.7	453	156	34.4	52	28	53.8	15	7	46.7	9	7	77.8	2	1	50.0	30	17	48.6	841	319	37.9
Tuberculosis	38	10	26.3	6	1	20.0	68	10	21.1	3	1	33.3	4	1	25.0	2						3			193	28	22.8
Menses	6			1			33	3	9.1													3			43	3	7.0
Pertussis	90			2	1	50.0	21	1	4.8													1			44	2	4.6
Other infections	147	20	17.0	13	5	38.5	288	50	19.1	28	10	35.7	16	1	6.2	7	3	42.9	1			22	6	27.3	522	100	20.1
Diabetes	45	11	24.4	1			81	22	27.2	8	2	25.0	4	1	25.0	1			1	1	100.0	4	1	25.0	145	38	26.2
Cancer	16	8	50.0				30	13	43.3	1	1	100.0										2	2	100.0	49	24	49.0
Alcoholism	31	13	41.9	12	2	16.7	40	10	25.0	17	11	64.7	6			4	1	25.0				4	1	25.0	114	38	33.3
Other conditions	184	54	29.3	10	5	50.0	331	80	24.2	17	6	35.3	8	5	62.5	5	2	40.0				18	8	44.4	573	160	27.9

TABLE 5—Postpneumonic Complications

	Sulfapyridine						Sulfathiazole						Sulfa diazine			Serum			Other Therapy			Nonspecific Therapy			Totals			
	Without Serum			With Serum			Without Serum			With Serum																		
	Cases	Deaths	Percentage of Total*	Cases	Deaths	Percentage of Total*	Cases	Deaths	Percentage of Total*	Cases	Deaths	Percentage of Total*	Cases	Deaths	Percentage of Total	Cases	Deaths	Percentage of Total*	Cases	Deaths	Percentage of Total*	Cases	Deaths	Percentage of Total*	Cases	Deaths	Percentage of Total*	
Totals	278	53	9.3	38	15	14.7	593	77	10.2	80	28	18.2	14	4	7.1	15	9	22.1	3	1	8.8	20	6	9.7	971	193	10.5	
Serous pleural effusions	77	11	9.6	8	3	11	146	15	2.9	29	8	6.6	8	1	4.1	2	1	2.9	1	1	2.9	9	4	4.4	230	41	3.0	
Empyema	30	10	19.0	11	2	4.3	82	16	1.6	17	4	3.9	3	1	1.0	2		2.9				1		0.5	101	33	1.6	
Otitis media	190	19	4.2	6	4	2.3	103	12	3.8	13	2	3.0				4	2	5.9	1		2.9	5		2.4	347	32	3.7	
Pericard ditis	2	2	0.1	1	1	0.4	9	5	0.2	2	2	0.0	1	1	0.0											15	11	0.2
Menin gitis	11	7	0.4	9	7	0.0	16	13	0.3	7	6	1.6				3	3	4.4				1	1	0.5	47	37	0.5	
Lung abscess	8	5	0.3				24	5	0.5	6	1	1.4				1	1	1.5	1		2.9				40	19	0.4	
Endo carditis	1		0.03				2	1	0.04	2	2	0.5				1	1	1.5							6	4	0.1	
Others	19	6	0.6	3	1	1.2	51	10	1.0	4	3	0.9	2	1	1.0	2	1	2.9				4	1	1.9	85	23	0.9	

\*Percentage of all treated cases developing these complications

treated by the physicians of Pennsylvania.<sup>4</sup> Experience with the sulfonamide compounds has been so satisfactory that the attending physicians have reduced the use of serum to a minimum (table 1).

The supervision and collection of data dealing with the pneumonia problem in highly industrial communities such as Pennsylvania, is a huge task. Organized medicine and the department of health have waged a campaign which has had the unqualified support of

is a positive blood culture, and, when given, the type of organism together with the kind of therapeutic agent and quantity administered. Red tape has been reduced to a minimum. When the cards are received in the Bureau of Pneumonia Control they are directed to the Bureau of Vital Statistics. Every case reported is classified and coded on an international code, which eliminates all questionable features of the cases and places them in the proper category.

In 1936 at a time when there was no way of collecting statistics for this purpose, the approximate number

<sup>4</sup> Stahle, D. C. A Clinical Analysis of Fifteen Thousand Cases of Pneumonia. J. A. M. A. 118:440 (Feb. 7) 1942.

of pneumonia deaths in Pennsylvania was 9,000. The most recent study by the Division of Pneumonia Control shows an incidence of 9,295 from July 1, 1940 to June 30, 1941, with a total mortality rate of 11.69 per cent. While this indicates a substantial drop over the former rate, it nevertheless is still too high.

Of 1,956 patients treated at home there were 109 deaths, or a rate of 5.57 per cent. Of 7,326 patients treated in the hospital there were 977 deaths, or a rate of 13.34 per cent. This can readily be explained by the fact that the patients with the more serious pneumonia had been sent to the hospital (tables 2 and 3).

In a critical appraisal of statistics, caution must be paid to the presence of complicating factors in order to dismiss the possibility of deaths caused by complications per se being counted primarily as pneumonia deaths. Example: Of 242 patients with pneumonia, 31 had meningitis, 5 had a pulmonary embolism, 5 had pericarditis, 15 had cancer and 39 had heart disease, while

the death rate from pneumonia without the aid and cooperation of the department of health.

Pneumonia is a specific disease. It has a definite onset and method of spread. Effective therapeutic agents are now available. The problem, then, is to have a highly trained corps of workers in the field, physicians and nurses who will regard pneumonia as the great medical emergency, strive to make an accurate and prompt diagnosis and institute treatment immediately following diagnosis.

Instructing the public to avoid contact with respiratory infections and maintain sound health habits with regard to diet, elimination and rest and visit promptly the family physician when troublesome symptoms occur serves a twofold purpose. First, it maintains the public resistance at an optimum level; second, it places the patient in the hands of the physician at the earliest time in the event that involvement of a lung occurs.

Prompt action on the part of an enlightened laity and a well trained, alert medical profession would reduce the mortality rate from pneumonia to a spectacular low.

TABLE 6—Pneumonia Cases—Death Ascribed to the Following Conditions

Meningitis	31
Pulmonary embolism	5
Pericarditis	5
Puerperal sepsis—septicemia	4
Nephritis	3
Cancer	15
Heart disease	39
Tuberculosis	6
Lung abscess	3
Cellulitis	1
Subacute bacterial endocarditis	6
Peritonitis	10
Mechanical injury	3
Cerebral thrombosis	25
Blood dyscrasia	4
Surgery	4
Diabetes	3
Uremia	6
Drug	1
Serum	1
Death within 24 hours	51
Unspecified	11
Total	242

10 had peritonitis and 25 had cerebral thrombosis (table 6). Of this series of 242 patients 54 died within twenty-four hours.

Resort to the use of effective chemotherapeutic agents early in the treatment of respiratory infection has cut down the number of pneumonia deaths. Likewise fewer patients are being sent to the hospital. It may be that during the next few years a plateau in the mortality rate will have been reached until the frontiers of pneumonia control are extended to include immunization and prophylaxis.

#### CONCLUSION

According to Haven Emerson the preservation of community health is the major responsibility of the public health officials, whereas the problem of the individual and his health needs is the domain of the general practitioner.

Pneumonia control is the joint responsibility of the public health representative and the private physician. The public health official without the utmost cooperation on the part of the medical profession cannot hope for any substantial success in wiping out the ravages of pneumonia, nor can the private physician nor the county or state society carry on a campaign to reduce

#### SUMMARY

Mortality from pneumonia is steadily decreasing. To propagate this trend further modern methods of attack have been evolved. Organization on a statewide basis in Pennsylvania has played no small part in this decline. In 1936 there were approximately 9,000 pneumonia deaths; during the 1937-1938 period 7,117 persons died from this disease; from July 1, 1940 to June 30, 1941 9,295 cases were reported, with a mortality of 10.87, and the latest statistics show that from July 1, 1941 to Jan. 1, 1942 the total number of pneumonia cases reported was 1,445 with one hundred and sixty-two deaths.

One hundred and seventy-eight pneumonia control centers located at strategic points throughout the commonwealth are prepared to furnish the physicians with necessary laboratory procedures, serum and sulfonamide compounds for treatment.

Meetings for the public are being routinely conducted for education in the rudiments of precaution and prompt action when a respiratory infection appears.

An extensive series of meetings for physicians has been conducted annually since 1937.

Statistics are collected by the report card system.

Physicians are becoming more and more alert to the gravity of this emergency and the significance of prompt diagnosis and quick action.

#### ABSTRACT OF DISCUSSION

DR. H. A. REIMANN, Philadelphia: The mortality rate from pneumonia of all kinds has declined steadily during the past forty years and so has the mortality rate from many other infectious diseases as well without the aid of specific measures. The improvement was apparently brought about by many complex factors including increased knowledge, better housing and better food. Specific serum treatment no doubt was effective in reducing the death rate in pneumococcal pneumonia more rapidly in the past ten years but sulfonamide chemotherapy, as every one knows, has caused the greatest good. Dr. Bortz is concerned with the present mortality rate of between 10 and 15 per cent in properly treated cases of pneumococcal pneumonia. It is probable however that we can never improve much on this figure, which may be near an irreducible minimum, even if better drugs are eventually synthesized. There is a certain percentage of cases with serious focal complications such as endocarditis or pericarditis with overwhelming infection, or the



causative pneumococci may become drug fast, or treatment might be delayed too long, or there may be coincident chronic disease such as diabetes, heart failure or renal failure, in which specific therapy at present seems futile. Nevertheless he is correct in urging that every effort be made to control even such cases. It has been found by long experience that the successful epidemiologic control of infectious disease is seldom accomplished by the efforts of the individual practitioner alone. For many reasons it is a matter for public health officials to contend with, as Dr Bortz has shown. The initiation of such efforts should properly be made by qualified state or other health officials but unfortunately such positions in many localities are not staffed with properly trained or interested personnel. It is highly commendable, but it should not have been necessary, for a group of busy practitioners to give their time to institute and organize a campaign such as the successful one described by Dr Bortz, however, it shows what doctors can do when the need arises and they have the will to do it. A word should be added in respect to the advice broadcast in many of the antipneumonia campaigns to give one of the sulfonamide drugs as soon as the diagnosis of pneumonia is made. It must be remembered that there are many kinds of pneumonia and for certain forms among them sulfonamide therapy is of no value. It is necessary therefore to make etiologic diagnosis in all cases as early as it is possible to do so. It is perhaps justifiable in most cases of pneumonia to administer the drugs promptly but if it is found that the disease is not caused by an infectious agent which is amenable to chemotherapy the drug should be stopped.

DR WALTER F. DONALDSON, Pittsburgh. I discuss this topic from the point of view of the various county and state medical societies. In Pennsylvania we have been particularly fortunate in the leadership typified in Dr Bortz. Our state medical society takes a part in this program, which costs more in sustained effort than in money. We carried the educational program to our entire membership in every county of the state. Dr Bortz organized his commission on our councilor district basis twelve councilor districts with one to seven counties to a district. The commission includes practitioners and teachers who know pneumonia, at least one from each district. On them falls considerable responsibility for inspiring interest by the membership throughout the various county medical societies in their respective districts. The state medical society has played a part by paying expenses of these commission members and of county society representatives to the meetings which Chairman Bortz plans and conducts twice a year at Harrisburg. It also cooperated by distributing literature to the membership throughout the various county medical societies, not reprints but preprints. Thinking of pneumonia as a seasonal disease, Dr Bortz gathers his copy early and we distribute preprints to county medical societies in December so that our members may have late information conveniently at hand. The preprint is not made up of long or dreary discussions of pneumonia by physicians in laboratories or alone by full time men in hospitals. The members of this commission meet the same problems in the early recognition and adequate treatment of pneumonia as does the general practitioner. In the 1942 preprint "New Facts on Pneumonia," no article contains more than a thousand words. They cover a dozen phases of pneumonia each written by a practitioner of current experience. We not only distribute these preprints at component society meetings in December but in January and February they appear in the *Pennsylvania Medical Journal*. Further, through the state medical society the twelve articles comprising "New Facts on Pneumonia" are multi-graphed, two or three at a time, and distributed to the publications of twenty-nine county medical societies, which print the entire series. Through such cooperation and the repetition through varied channels, our membership cannot readily avoid acquaintanceship with progress in the control of pneumonia. Programs at county medical society meetings include this subject. Essential cooperation in this yearly program between our state health department and the Medical Society of the State of Pennsylvania has been magnificent.

## THE NATURAL HISTORY OF RHEUMATIC CARDIAC DISEASE A STATISTICAL STUDY

### II MANIFESTATIONS OF RHEUMATIC ACTIVITY RECURRENCE, SEVERITY OF INFECTION AND PROGNOSIS

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AND

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NEW YORK

That rheumatic fever or rheumatic cardiac disease is a chronic infectious disease is now generally accepted. In children especially recurrent manifestations of an active inflammatory process are commonly observed. One or more such recurrences took place in 75 per cent of the 3,129 patients studied in this investigation during an average period of thirteen years after the onset of the illness.<sup>1</sup> Two recurrences were experienced by 51 per cent, three by 32 per cent, four by 20 per cent and five or more by 12 per cent.

Although recurrences<sup>2</sup> of rheumatic activity take place at all ages at which the disease is found it appears that the largest number occurs between the ages of 5 and 14 years. A curve representing the ages

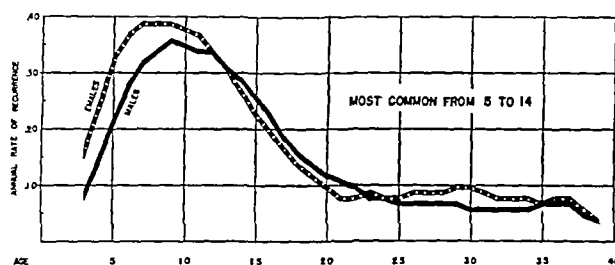


Chart 1—Recurrences of rheumatic activity taking place usually before the age of 16

at which reactivations occur shows a sharp decline beginning at the age of 11 or 12. After the age of 20 it resembles a horizontal line. Before 13, recurrences are more frequent among girls than among boys (chart 1).

#### RECURRENCES RELATED TO AGE

It has been reported that recurrences of rheumatic activity are more commonly experienced the earlier the age at which the disease is acquired.<sup>3</sup> A number of studies have shown that the tendency to infection begins to diminish about the age of puberty, suggest-

<sup>1</sup> This study was made in collaboration with WPA Official Project No. 65-197 WP 23 (N. Y. C.).

<sup>2</sup> From the Hospital of the Rockefeller Institute for Medical Research and the Heart Committee of the New York Tuberculosis and Health Association Inc.

<sup>3</sup> 1. Cohn A. E. and Lingg Claire. The Natural History of Rheumatic Cardiac Disease. I. Onset and Duration of Disease. *J. A. M. A.* 121:1 (Jan 2) 1943.

<sup>2</sup> Among recurrences of rheumatic infection are included active carditis (presence of an active rheumatic process in the heart clearly recognizable clinically), polyarthritis, Sydenham's chorea, subcutaneous nodules and manifestations of subacute activity. The term subacute activity is used to designate signs and symptoms of infection such as fever, tachycardia, joint pains, elevated erythrocyte sedimentation rate, leukocytosis or epistaxis otherwise unexplained and of insufficient degree to warrant a diagnosis of polyarthritis or carditis. Muscle or joint pains alone were not included as rheumatic reactivations because it was not possible to separate nonrheumatic pains from joint pains typical of subacute rheumatic fever. The incidence of such complaints without this discrimination has nevertheless been analyzed (chart 6 and tables 1 and 2). They were likewise considered in classifying the degree of infection to be referred to later.

<sup>3</sup> 3. Wilson M. G., Lingg Claire and Crawford G. Statistical Studies Bearing on Problems in Classification of Heart Disease. *Heart Disease in Children*. *Am. Heart J.* 4:164 1928.

ing that a condition of resistance then develops.<sup>4</sup> Some observers have presented data in support of the belief that, regardless of age, recurrences are less likely to occur five years or more after the first infection<sup>5</sup> because of the development of immune processes. But

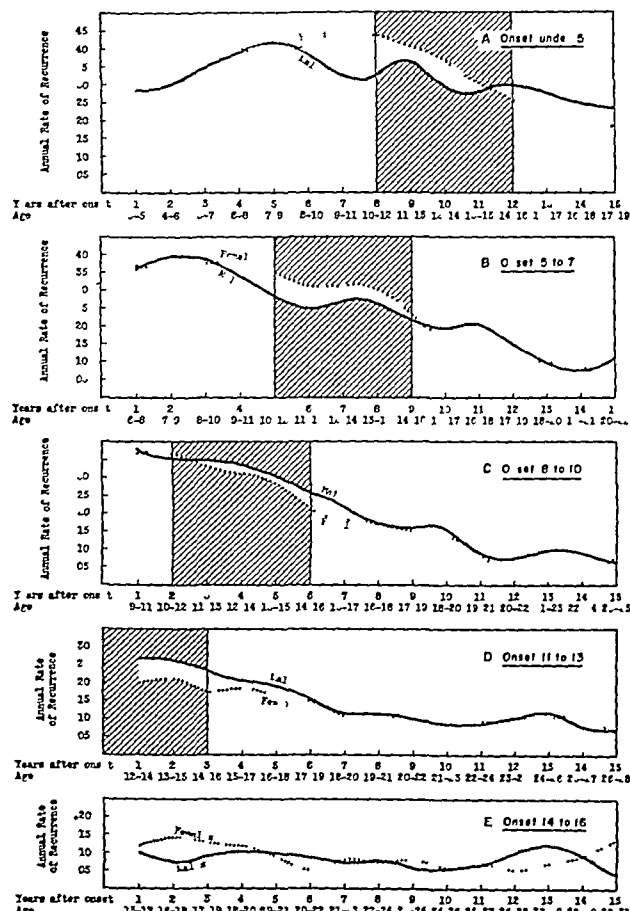


Chart 2—Recurrences of rheumatic activity in different onset groups

in most instances the onset is at 7 or 8 years. Five years after onset frequently coincides, therefore, with the beginning of puberty. It has been suggested that the decrease in recurrences noted at puberty may be due not to this physiologic change. The confusion, to repeat, occurs because five years after the onset of most cases, at 7 or 8 years, the age of puberty has arrived.

Further light is thrown on this point by curves showing the annual rate of recurrence in groups of patients in whom the disease began at different ages (chart 2). The shaded areas represent the years of puberty (ages 11 to 15), which, according to Stratz,<sup>6</sup> comprise the second phase of the preadolescent period—proceritas II.

It appears that when the onset is under age 5 the rate of recurrence does not decrease at the end of five years but remains high for eight or nine years, or

until the beginning of puberty (chart 2A), but when the onset is between 5 and 7 the curves begin to decline earlier, after four or five years (ages 11 or 12), at the beginning of puberty, and when the onset is between 8 and 10 the fall begins two or three years later, although this too is at age 11 or 12 (chart 2C). When the onset is at the beginning of puberty, between 11 and 13 however, the rate of recurrence is lower in the first five years than when the onset is earlier, and the curves show a gradual decline almost from the beginning (chart 2D), when the disease begins after puberty, at ages 14 to 16 the rate of recurrence is considerably lower at the start and the curves resemble horizontal lines (chart 2E). These curves tend to support the opinion that it is puberty and not necessarily the first five years after the initial infection, that influences the frequency of recurrent activity.

There can be little doubt that knowledge of this diminishing susceptibility to rheumatic infection at puberty is of value in judging the effect of therapeutic measures on the subsequent course of the disease and that age therefore is an important factor in estimating the effect of treatment.

#### TYPES OF INFECTION

Of the various types of infection experienced throughout life pure forms—carditis, subacute, activity, polyarthritides, muscle and joint pains or chorea—occur in

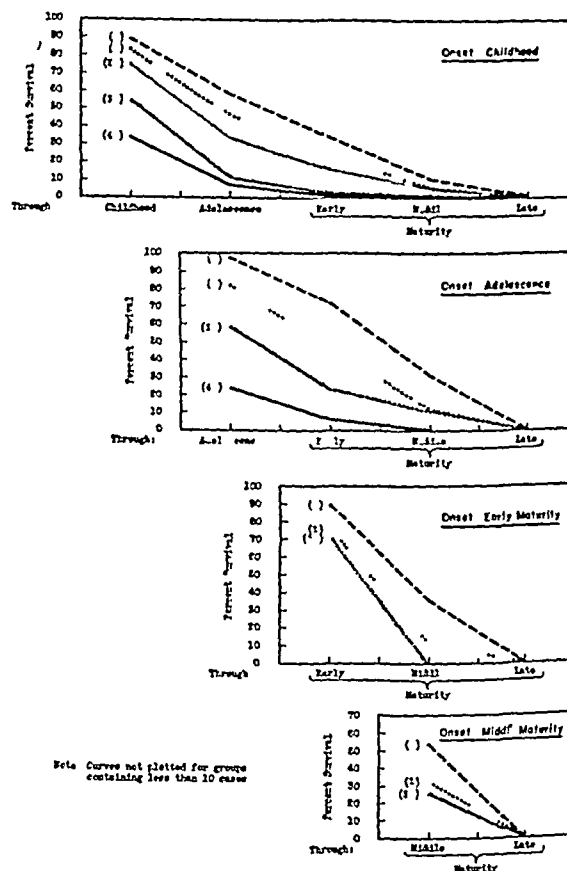


Chart 3—Survival and severity of rheumatic infection in onset period

a little less than one fourth of all the cases when the onset takes place in childhood (chart 6, table 1). Polyarthritides is the most common single manifestation, experienced recurrently in 15 per cent of the cases. Carditis is the most frequent but is rarely the only

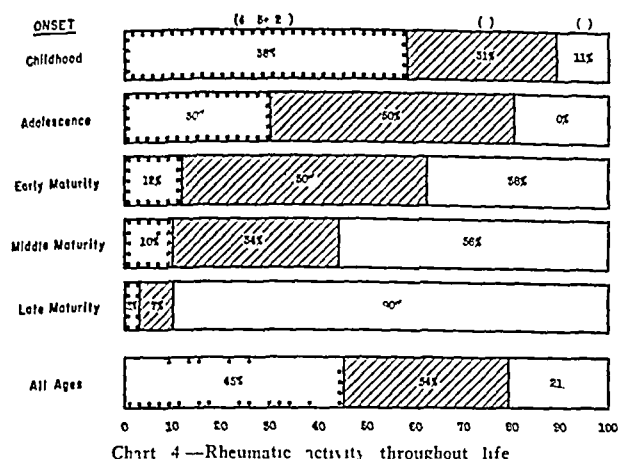
<sup>4</sup> Williams, F. A. A Study of the Course of Rheumatic Heart Disease. *Am. Heart J.* 3: 139, 1927. von Eickstedt, E. Ueber den Einfluss der Pubertät auf die Rezidivhäufigkeit der Polyarthritidis acuta. *Ztschr. f. Kinderh.* 56: 64, 1934. Stroud, W. D. Goldsmith, M. A. Polk, D. S. and Thorp, F. Q. Ten Years Observation of Children with Rheumatic Heart Disease. *J. A. M. A.* 101: 502 (Aug. 12) 1933. Wilson, J. Lingg, and Croxford.

<sup>5</sup> Kaiser, A. D. Factors That Influence Rheumatic Disease in Children. *J. A. M. A.* 103: 886 (Sept. 22) 1934. Jones, T. D. The Natural History of Rheumatic Fever and Heart Disease with Especial Reference to Etiology and Prognosis. *Bulletin Chicago Heart Association Inc.* 15: 16, 1937. Leonard, Marion. Puberty and Prognosis in Rheumatic Fever. *Am. Heart J.* 14: 192, 1937.

<sup>6</sup> Stratz, C. H. *Lebensalter und Geschlechter*. Stuttgart: Ferd. Enke, 1926.

type of infection. It was exhibited at some time by nearly three fourths of the cases.

As the age at onset advances pure forms become more common. Among patients first affected in adolescence for example polyarthritis alone occurs in 40 per cent. When the disease begins in the third



decade this increases to 43 per cent but shrinks to 22 per cent when the onset is after 30. The later the disease begins the fewer are the patients who exhibit carditis and the greater becomes the number without manifest infection—more than half, for example, when the onset is after 30.

This description of male cases suffices also for females.

#### AGE AND SUSCEPTIBILITY TO TYPES OF INFECTION

Investigation of susceptibility at different ages to different types of infection discloses the fact that at all ages polyarthritis is the most common manifestation, and active carditis comes next, that during adolescence carditis is almost as frequent as polyarthritis, that polyarthritis is at all ages the most outstanding single manifestation (table 2). During adolescence nearly a third and after the age of 20 at least 50 per cent exhibit no signs of infection.

#### CLASSIFICATION OF SEVERITY

The severity of the rheumatic infection may have a bearing on prognosis. Coombs<sup>7</sup> pointed out that prognosis is worse when patients show signs of systemic saturation with rheumatic infection. It has not been possible in this study to classify accounts of individual attacks according to severity, for this the records were too subjective to be reliable. The attempt has been made, however, to classify patients according to the degree or dose of rheumatic infection experienced in successive periods of life—childhood, adolescence, early, middle and late maturity.

To this end there were appraised (1) the manifestations presented—active carditis, polyarthritis, chorea, nodules, subacute activity, or muscle and joint pains<sup>8</sup>—and (2) their persistence—whether during a given period they were more or less continuous, whether

they recurred from time to time and the frequency of their recurrence, whether there were relatively long periods during which they were absent.

As a result, the following classification is proposed:

- 4+ when manifestations, carditis being one, are more or less continuous or recur at least four times
- 3+ when manifestations, carditis being one, recur less than four times or when with one attack of carditis, (a) muscle or joint pains persist throughout the period or (b) every type of manifestation is absent for not more than four years
- 2+ when manifestations including polyarthritis, chorea and subacute activity persist or recur at least five times, or when, after one attack of carditis, every type of manifestation is absent for a period of five or more years
- + when manifestations including polyarthritis, chorea or subacute activity recur not more than four times, even though muscle and joint pains may be continuously present
- ± when there are no manifestations or only persistent or recurrent muscle or joint pains

#### SEVERITY OF INFECTION RELATED TO AGE AT ONSET

Of those patients for whom the data were complete (2,942, or about 95 per cent), infection was classified as severe (4+, 3+) or as moderately severe (2+) in 45 per cent,<sup>9</sup> as mild (+) in 34 per cent and as questionable or absent (±) in 21 per cent (chart 4). The proportion of severe cases decreases as the age at onset increases. The proportions with severe or moderately severe as against mild or questionable activity were, for example, 58 per cent and 42 per cent respectively when the disease began in childhood, 30 per cent and 70 per cent when it began during adolescence, 12 per cent and 88 per cent when it began in early maturity, 10 per cent and 90 per cent when it began in middle maturity, and 3 and 97 per cent when it began after age 45.

In short, when the disease is acquired in childhood, of every 10 patients, 6 will exhibit severe infection and 3 mild and 1 will not experience more than muscle or joint pains in childhood. When the onset is in adolescence, out of every 10 cases infection will be severe in 3, mild in 5 and absent in 2. Of every 10 patients who acquire the disease in the twenties or between ages 30 and 45, only 1 in each group will suffer severe infection, 5 and 3, respectively will suffer mildly and 4 and 6 will not exhibit any signs of activity. When afflicted after the age of 45, 9 out of 10 will show no signs of activity.

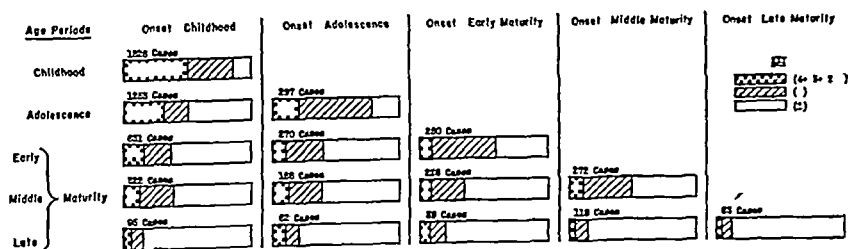


Chart 5—Severity of rheumatic activity in different age periods

#### AGE SUSCEPTIBILITY TO SEVERITY OF INFECTION

It is in the early years of life that the infectious process is most active (chart 5). Severe infection is most common in childhood, occurring in 50 per cent. With advancing age the number of severe cases become

<sup>7</sup> Coombs C. F. The Course of Rheumatic Heart Disease. M. J. & Rec. 121: 623 (May 20) 1925.

<sup>8</sup> Muscle and joint pains were not included as manifestations of rheumatic fever when they occurred after the age of 15.

<sup>9</sup> Broken down the classifications are 4+ in 21 per cent, 3+ in 17 per cent and 2+ in 7 per cent.

less frequent. During adolescence and in early maturity it is greatest among persons who have survived the disease since childhood. After the age of 30 the number of severe cases is relatively small, regardless of when the disease was acquired.

*Severity of Infection and Prognosis*—When the infection was classified as severe in childhood, only 34 per cent (4+) and 56 per cent (3+) of patients

lived through early maturity (the twenties) and only 11 per cent through middle maturity (30 to 45). This poor expectancy does not depend, it seems, on more severe infection later, for only 15 per cent of the patients who survived adolescence (chart 5) presented severe infection during the third decade, and of those who survived beyond this decade not more than about one tenth presented severe infection later.

TABLE 1—Manifestations of Infection Experienced Throughout Life

Onset Period	Manifestations Percentage									
	Carditis		Subacute Activity		Polyarthritits		Muscle and Joint Pains		Chorea	
	Total Incidence	Alone	Total Incidence	Alone	Total Incidence	Alone	Total Incidence	Alone	Total Incidence	Alone
Childhood (114) ♂ (112) ♀	69.3 67.0	4.4 3.5	4.0 3.4	0.4 0.4	71.0 63.6	14.6 14.4	16.6 27.2	2.6 7.6	20.3 27.0	2.3 4.0
Adolescence (15-20) ♂ (13-18) ♀	36.8 43.3	0.8 8.0	6.5 4.7	1.6 0.7	72.1 67.3	40.2 6.0	2.4 12.6	1.6 6.0	1.6 8.0	0.9 2.7
Early maturity (21-29) ♂ (19-29) ♀	22.8 21.4	8.7 5.2	5.6 6.3	2.2 1.7	60.9 61.5	47.5 41.0			0.0 0.6	25.7 20.6
Middle and late maturity 30 and over ♂ ♀	18.4 10.5	7.6 7.2	4.9 3.9	3.8 2.2	74.1 0.0	22.2 0.0				54.6 60.0

TABLE 2—Manifestations of Infection Experienced in Different Age Periods

Age Periods	Manifestations Percentage									
	Carditis		Subacute Activity		Polyarthritits		Muscle and Joint Pains		Chorea	
	Total Incidence	Alone	Total Incidence	Alone	Total Incidence	Alone	Total Incidence	Alone	Total Incidence	Alone
Childhood (♂ 114) (♀ 112)	45.3	3.7	3.1	0.4	60.7	21.0	20.0	7.6	24.3	7.2
Adolescence (♂ 15-20) (♀ 13-18)	37.0	10.8	3.4	1.2	26.5	22.3	16.0	6.2	5.6	2.4
Early maturity (♂ 21-29) (♀ 19-29)	18.0	8.2	2.0	1.7	37.0	25.0			1.1	0.7
Middle and late maturity 30 +	13.5	8.5	3.9	3.0	27.0	22.0			0.1	60.0

TABLE 3—Proportion of Cases with Severe and Mild Activity in Onset Period, Related to Type of Onset

Type of Onset	Period of Onset														
	Childhood			Adolescence			Early Maturity			Middle Maturity			Late Maturity		
	Number of Cases	Severe Per Cent	Mild Per Cent	Number of Cases	Severe Per Cent	Mild Per Cent	Number of Cases	Severe Per Cent	Mild Per Cent	Number of Cases	Severe Per Cent	Mild Per Cent	Number of Cases	Severe Per Cent	Mild Per Cent
Carditis	292	78	22	22	50	45	6			7*			0		
Polyarthritits	612	44	56	159	14	86	121	7	93	90	0	91	6		
Chorea	230	41	59	8	12	83	1*			0			0		
Muscle and joint pains	201	42	58	20	17	83	0			0			0		
Murmur	280	41	59	57	10	90	113	7	97	165	0	94	77		100

\* Rates are not computed for numbers under 10

survived childhood, whereas when the classification was moderately severe (2+) or mild (+), more than 70 per cent of them did survive (chart 3). Of the former patients (4+ and 3+) only 7 per cent and 12 per cent survived adolescence and only very few, 1 per cent and 2 per cent, survived the third decade. Of the latter patients (2+ or +), on the other hand, between 34 per cent and 59 per cent survived adolescence.

It is of particular interest that when the infection was mild (+) in childhood only about a third sur-

The curves of survival were furthermore consistently lower when activity was classified as ± early in the disease than when it was classified as +. Here again subsequent activity does not explain this less favorable prognosis, since few patients with onsets classified as ± exhibited manifestations later in life (charts 4 and 5). The explanation may be that among these patients continuous or recurrent carditis may, nevertheless, have been present though not recognized clinically or that with time myocardial insufficiency may have developed with or without obvious infection.

## TYPE OF ONSET RELATED TO SUBSEQUENT INFECTION

Coombs<sup>7</sup> believed that the kind of onset influenced the duration of life. When chorea came first, only 1 patient in 30 died of heart disease in the first decade, but with carditis more than 1 in 4, with polyarthrititis 1 in 5 and with subcutaneous nodules 1 in 2.

To make predictions beyond one decade on the basis of onset alone is, however, impossible, since reactivations after the age of 10 are common and since the frequency as well as the type of recurrence plays an important part. Obviously, with chorea at the age of 6 or 7 years, prognosis may not be better than with carditis if the choreic child presents active carditis later on. It seemed better, therefore, to relate the type of onset to the degree of infection experienced in subsequent years. After the first two decades as has already been shown<sup>1</sup> carditis and chorea are rare but when carditis came first in children activity was severe during child-

hood. At all ages, polyarthrititis is the most frequent single manifestation. It is the only manifestation exhibited by 40 per cent of patients between the ages of 15 and 30. After 30 years of age there is no manifest infection in about half of all patients.

The earlier the age at onset, the greater is the chance that infection will be "severe" during the next few years.

When the infection is "severe" in the early years of the disease expectancy is shorter than when the infection is "mild." Of children with "severe" infection, less than one-half survive childhood, about one-tenth survive adolescence and less than 2 per cent survive the third decade. Even when the infection is "mild" in childhood, only a third survive to the age of 30, and only one tenth to the age of 45.

Prognosis is less favorable with "mild" signs of infection in childhood than in older persons with the same degree of infection.

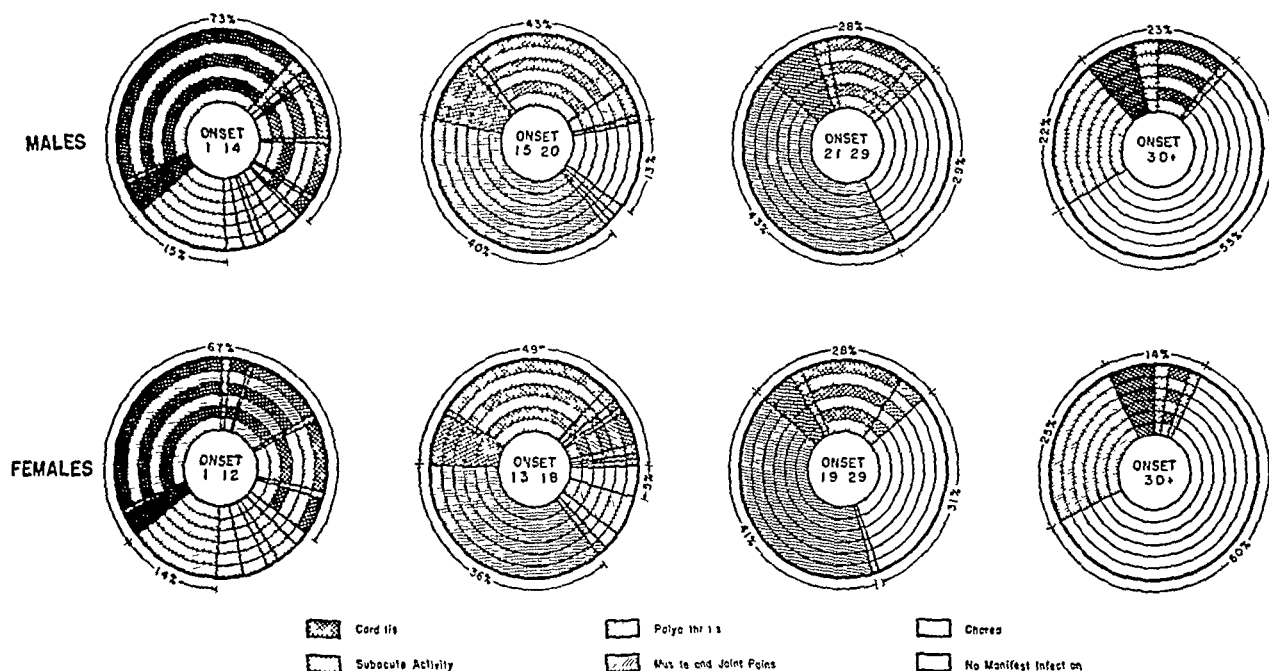


Chart 6—Types of infection experienced throughout life. Onset in childhood. Carditis the most frequent but rarely the only type of infection. Onset in adolescence and early maturity. Polyarthrititis the most common manifestation. Onset after 30. No manifest infection at any time in most cases.

hood in 78 per cent and mild in 22 per cent (table 3). With other onsets, the degree of activity fell, it was severe in about 40 per cent and mild in about 60 per cent.

In adolescence, when the first manifestation was carditis, activity during adolescence was severe in only 55 per cent and mild in 45 per cent. With other onsets it was mild or absent in at least 80 per cent. After the age of 20, activity remained mild or absent in more than 90 per cent, whatever the onset.

## SUMMARY

Recurrent manifestations of activity have been analyzed in 3,129 cases of rheumatic cardiac disease.

Recurrent manifestations are most common during childhood.

They are most prevalent before puberty rather than during the first five years after onset.

When the disease begins in childhood, carditis is the most frequent but rarely the only type of infection.

When the first manifestation of rheumatic fever is carditis, the chances are 3 to 1 that infection during childhood will be "severe." When the onset is characterized by joint symptoms or chorea or by a cardiac murmur alone, the chances are 3 to 2 that infection will be "mild." In adult life infection is "mild" or absent in 9 out of 10 cases, whatever the onset.

386 Fourth Avenue.

**Light Bombs and Small Skin Injuries**—The light bombs which are used produce thousands of small flakes of aluminum. These apparently explode horizontally and inflict innumerable very small skin injuries of the legs and lower abdomen. Serious damage, however, is produced to the inner structures of the limbs and frequently there are fractures from the great speed and spin with which the fragments enter—Mercer, Walter. *The Immediate Treatment of Air Raid Injuries, Including the Surgery of the Upper Limb from War and the Doctor*, edited by J. M. Mackintosh, M.D., Baltimore, William Wood & Co., 1942.

## RENAL BLOOD FLOW AND GLOMERULAR FILTRATION

AS INFLUENCED BY ENVIRONMENTAL  
TEMPERATURE CHANGES

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Observations on the renal circulation were carried out as early as 1883, when Cohnheim and Roy<sup>1</sup> applied the oncometer to this problem. Since then Landergren and Tigerstedt,<sup>1</sup> using the Ludwig stromuhr, and others<sup>2</sup> using modifications of the stromuhr method have extended the observations on direct measurements of renal blood flow. Van Slyke and his co-workers<sup>3</sup> contributed an indirect method based on the renal urea extraction ratio and arrived at the conclusion that the urea clearance varied directly as the blood flow. These methods are not applicable to a study of renal blood flow in man. Smith and his associates<sup>4</sup> developed the diodrast method, an indirect one, applicable to human subjects. Using this method White<sup>5</sup> and others<sup>6</sup> have contributed additional studies.

Barbour<sup>7</sup> and Lazinski<sup>8</sup> studied circulatory adjustments to hot environmental temperatures, but their work did not include the effect of such temperatures on the renal circulation. In an attempt to evaluate the effects of heat on the kidney, Goldring<sup>9</sup> and Farr and Abernethy<sup>10</sup> applied the urea clearance to febrile patients suffering from infectious processes and reported increases in clearances during the febrile stages.

Patients over 40 years of age with pneumonia did not show increases in clearances.<sup>10</sup> Farr and Moen<sup>11</sup> induced hyperpyrexia in rheumatic patients and found clearances 75 per cent of normal when fever was at its maximum. Grant and Medes<sup>12</sup> found no correlation between body temperatures and creatinine clearances in human subjects with fever due to infection. They did, however, find a general parallelism between body temperature and creatine clearances in dogs made hyperthermic by diathermy. Page<sup>13</sup> concluded that there was no significant alteration in renal function in patients with Bright's disease treated with diathermy.

Based on the principles developed by Lefevre<sup>14</sup> and Burton<sup>15</sup> a new method was developed for the measurement of peripheral blood flow. Extensive studies of changes induced in this flow by environmental temperatures have been made by Hardy and Du Bois<sup>16</sup> and Winslow, Herrington and Gagge<sup>17</sup>. One of us (R W K), working with Hick, Montgomery, Glickman and Wall,<sup>18</sup> has shown further that in hot environmental temperatures the body adjusts itself in the following manner:

1 There is no increase in cardiac output until heat is stored and the body temperature is elevated.

2 The blood volume is usually not increased but in some subjects an increase of 10 to 15 per cent was noted. When dehydration occurs there may be a reduction in volume.

3 The vital capacity is increased.

4 There is a fourfold increase in peripheral blood flow.

Since the increase in blood volume was not proportional to the increase in peripheral blood flow, it is obvious that the extra blood was shunted from the interior.

It therefore seemed important to study the effects of this shunt on the renal circulation.

## EXPERIMENTAL PROCEDURE

An air conditioned room without windows was available for these studies. The temperature and humidity could be closely regulated. Air currents were minimal (15 to 25 feet per minute) and under equilibrium the air and wall temperatures were the same.

A 10 per cent "solution of purified mulin"<sup>19</sup> prepared in 50 cc ampules for intravenous injection was used in our earlier experiments. In later ones we used mulin (Pfanzstiel C P and Eastman C P) which was prepared in a 10 per cent solution in isotonic solution of sodium chloride and passed through Seitz

11 Farr L E and Moen J K. The Effect of Induced Hyperpyrexia on the Urea Clearance of Rheumatic Patients. *Am J M Sc* **107** 53 1939.

12 Grant W H and Medes C. Creatinine Clearance During the Hyperthermia of Diathermy and Levers. *J Lab & Clin Med* **20** 345 (Jan) 1935.

13 Page I H. Effect of Diathermy Treatment of Kidneys on the Renal Function as Measured by the Urea Clearance Test. *J A M A* **102** 1131 (April 7) 1934.

14 Lefevre J. *Chaleur animale et bioenergetique*. Paris: Masson & Cie. Librairie de l'Academie de medecine 1911.

15 Burton A C. The Application of Theory of Heat Flow to the Study of Energy Metabolism. *J Nutrition* **7** 497 1934.

16 Hardy D and Du Bois E I. Regulation of Heat Loss from the Human Body. *Proc Nat Acad Sc* **23** 624 1937.

17 Winslow C I A, Herrington L P and Gagge A P. Physiological Reactions of the Human Body to Varying Environmental Temperatures. *Am J Physiol* **120** 1 1937.

18 Hick F K, Keeton R W, Glickman Nathaniel and Wall H C. Cardiac Output, Peripheral Blood Flow and Blood Volume Changes in Normal Individuals Subjected to Varying Environmental Temperatures. *J Am Soc Heating & Ventil Engineers Section on Heating Piping and Air Conditioning* January 1939, p 50. Glickman Nathaniel, Hick F K, Keeton R W and Montgomery M M. Blood Volume Changes in Men Exposed to Hot Environmental Conditions for a Few Hours. *Am J Physiol* **134** 165 (Sept) 1941. Hick Keeton and Glickman.<sup>20</sup> Keeton Hick, Glickman and Montgomery.<sup>21</sup>

19 Prepared by the U S Standard Products Company, Woodworth Wis.

Read before the Section on Experimental Medicine and Therapeutics at the Ninety Third Annual Session of the American Medical Association Atlantic City N J June 10 1942.

1 Cited by Smith H W. *Physiology of the Renal Circulation*. Harvey Lectures Series **35** 166 1940.

2 Burton Opitz R. Eine Stromuhr fur die Messung der Blut volumina der Venen. *Arch f d ges Physiol* **121** 150 1908. Burton Opitz R and Lucas D R. Ueber die Blutversorgung der Niere. *ibid* **123** 553 1908. Rein H. Die Thermo Stromuhr. *Ztschr f Biol* **87** 394 1928. Baldes E J, Herrick J F and Essex H E. A Modification in the Thermo Stromuhr Method of Measuring Flow of Blood. *Proc Soc Exper Biol & Med* **30** 1109 (May) 1933. Herrick J F, Essex H E and Baldes E J. Flow of Blood of the Kidney. *Am J Physiol* **99** 696 (Feb) 1932.

3 Van Slyke D D, Rhoads C P, Hiller Alma and Alving A S. Relationship Between Urea Excretion, Renal Blood Flow, Renal Oxygen Consumption and Diuresis. The Mechanism of Urea Excretion. *Am J Physiol* **109** 336 (Aug) 1934. The Relationship of Urea Clearance to the Renal Blood Flow. *ibid* **110** 387 (Dec) 1934.

4 Smith H W, Goldring William and Chasis Herbert. The Measurement of the Tubular Excretory Mass Effective Blood Flow and Filtration Rate in the Normal Human Kidney. *J Clin Investigation* **17** 263 (May) 1938. Chasis Herbert, Ranges H A, Goldring William and Smith H W. The Control of Renal Blood Flow and Glomerular Filtration in Normal Man. *ibid* **17** 683 (Sept) 1938.

5 White H L. Observations on Behavior of Diodrast in the Dog. *Am J Physiol* **130** 454 1940.

6 Corcoran A C, Page I H and Smith H W. Renal Excretion of Diodrast in the Dog. *Am J Physiol* **129** 339 1940. Ilox Jack, Pitesky Isadore and Alving A S. A Direct Photoelectric Colorimetric Method for the Determination of Diodrast and Iodides in Blood and Urine. *J Biol Chem* **142** 147 (Jan) 1942. White Findley and Edwards.<sup>24</sup>

7 Barbour H G. The Effects of Environmental Temperature Changes on Blood Concentration. *Proc Soc Exper Biol & Med* **21** 186 1920 1921. Barbour H G and Herrmann J B. The Relation of the Dextrose and Water Content of the Blood to Antipyretic Drug Action. *J Pharmacol & Exper Therap* **18** 165 (Oct) 1921. Barbour H G and Freedman B P. Effects of Pilocarpine on Salivary Secretion in Normal and Febrile Dogs. *Am J Physiol* **57** 387 (Oct) 1921. Barbour H G and Baretz L H. Temperature Changes Induced by Gum Acacia Injections in Normal and Febrile Animals. *Proc Soc Exper Biol & Med* **17** 209 1919 1920. Barbour H G and Howard A J. Dextrose Plethora and Its Antipyretic Effect in Calf Fever. *Proc Soc Exper Biol & Med* **17** 150 1919 1920.

8 Lazinski E. The Effects of Dry and Moist Heat on the Body Temperature and Blood Concentration of Dogs. *Am J Physiol* **67** 388 1924.

9 Goldring William. Observations with Urea Clearance Test in Acute Rheumatic Infection. *J Clin Investigation* **10** 345 1931.

10 Farr L E and Abernethy T J. Renal Physiology in Lobar Pneumonia. *J Clin Investigation* **16**: 421 1937.

filters<sup>20</sup> "EK" Seitz filter pads gave us uniformly pyrogen free solutions. The diodrast<sup>21</sup> used was a 35 per cent sterile solution obtained in 20 cc ampules.

#### ANALYTIC TECHNIC

Quantitative analysis of inulin in the blood serum and urine was carried out by our modification of the method described by Alving, Rubin and Miller<sup>22</sup> and Alving and Miller<sup>23</sup>. This modification allowed phototometric readings (Cenco-Sheard-Sanford photometer, Cenco filter No. 4) on filtrates containing 2.5 to 100 mg of inulin per hundred cubic centimeters of serum (or urine). This was made possible by using less filtrate, so that our final mixture in the tube for development of color contained 13 per cent less water and a higher percentage of hydrochloric acid and diphenylamine.

Diodrast analyses were determined after the method of White and Rolf,<sup>24</sup> using cadmium sulfate instead of trichloroacetic acid in preparing the protein free filtrate.

Inulin and diodrast clearances were then determined, the periods varying from ten to twenty minutes each. The inulin blood serum level was usually over 10 mg per hundred cubic centimeters. The level of diodrast was kept under 5 mg per hundred cubic centimeters for renal plasma flow and over 10 mg per hundred cubic centimeters for diodrast studies of the maximal rate of tubular excretion. All the patients were catheterized and the bladder emptied by successive washings with isotonic solution of sodium chloride. The residual bladder fluids were removed by insufflation through the catheter.

In our earlier tests we administered diodrast subcutaneously, a 35 per cent solution being diluted 1:3 with isotonic solution of sodium chloride after the method of White and Findley.<sup>26</sup> This gave a satisfactory level for determination of renal plasma flow. Inulin was given intravenously in a single injection of 50 cc of a 10 per cent solution after the method of Alving and Miller.<sup>23</sup>

TABLE 1—Data on Subjects Used in These Studies

Name	Age	Sex	Diagnosis	Ocular Fundi K W*	Blood Pressure Mm Hg		Rise in Blood Pressure During Cold Pressor Test Mm Hg	Drop in Blood Pressure During Sodium Amytal Mm Hg	Drop in Blood Pressure During Sodium Nitrite Mm Hg	Maxi mum Urinary Specific Gravity	Blood Non protein Nitro gen Mg per 100 Cc	Fifteen Minute Phenol sulfon phthalein Excre tion per Cent	Urea Clearance Cc	Urogram	Urine
					On Ad mission	At Rest									
S R	30	♂	Essential hypertension	1	108/98	132/84	34/20	20/10	12/0	1.029	32.7	50%†	64.8 M	Normal	Normal
D W	20	♂	Essential hypertension	1	148/70	134/70	8/8	44/0		1.037	36.3	30%	88.0 M	Normal	Normal
J W	24	♂	Essential hypertension	1	158/88	108/88	16/36	42/10	18/10	1.034	34.7	10%	37.0 S	Normal	Normal
A S	23	♀	Essential hypertension	1	166/110	130/80	20/22	26/20	16/6	1.030	30.0	30%	43.0 M	Normal	Normal
L F	17	♂	Essential hypertension	1	210/130	188/120	24/20	42/10		1.020	36.0	40%	58.0 M	Defective right pelvis	Albumin and casts
H W	27	♀	Essential hypertension	1	230/140	184/128	20/7	68/38	84/36	1.030	33.0	45%	60.6 M	Normal	Normal
R L	16	♀	Essential hypertension	3	160/120	148/114		20/12‡		1.009	20.0	15%	44.0 M	Small right kidney	Albumin and casts
R R	22	♀	Glomerulo nephritis	1	144/120	130/82	0/16	14/0	22/12		42.0	15%	22.3 M	Poor visual	Albumin
C V	30	♂	Glomerulo nephritis	4	190/124	190/124	44/16	48/8			44.0		21.0 S	Poor visual	Albumin and casts
H M	23	♀	Glomerulo nephritis	2	184/114		26/52	32/16	34/20		34.7	5%	16.0 M	No visual	Albumin
L S	35	♂	Glomerulo nephritis	1	110/70						128.6		5.0 S		Normal
L C	14	♂	Normal		122/80						29.7				Normal
L W	20	♂	Normal		110/70										Normal
R E	37	♂	Normal		108/80						30.0				Normal

\* K W indicates Keith Wagener classification based on study of photographs of the ocular fundi.

† Forty five minutes after dye was given to this particular patient.

‡ M maximal clearance S standard clearance

§ Given pentothal sodium intravenously instead of sodium amytal. Cardiac size was considered normal in all cases as estimated by

examination of the 2 meter roentgenograms of the chest.

#### PROCEDURE

The subject was placed in the air conditioned room before midnight of the day preceding the test and given water ad libitum until midnight. He was required to sleep in the nude at a temperature of 83.5 F (dry bulb) and 59 F (wet bulb), giving a relative humidity of 21 per cent, which is within the comfort zone of Houghten and Yaglou.<sup>25</sup> At 6 a. m. the patient was given 600 cc of water at body temperature. Studies of oxygen consumption and skin and rectal temperatures were begun at 7 a. m. Immediately thereafter the blood required by our studies was drawn.

Subsequently a continuous intravenous drip of a suitable mixture of inulin, diodrast and isotonic solution of sodium chloride as described in the method of Goldring, Chasis, Ranges and Smith<sup>27</sup> was used. The amount of diodrast varied with the type of study.

At the termination of the clearances under comfortable conditions, the temperature of the room was changed to hot dry (dry bulb 99.5 F, wet bulb 68.5 F, relative humidity 19 per cent) or hot wet (dry bulb 99.5 F, wet bulb 84.4 F, relative humidity 55 per cent). Under the hot condition all the heat must be lost from the surface by evaporation, since the temperature of the surrounding air is equal to or above that of the body temperature. All the heat arising within the interior of the body must be transported by the blood as it flows through the peripheral surfaces. This means that

26 White H L and Findley Thomas. Measurement of Diodrast and Inulin Clearance in Man after Subcutaneous Administration. *Proc Soc Exper Biol & Med* 45: 623 (Nov.) 1940.

27 Goldring William Chasis Herbert Ranges H A and Smith H W. Relations of Effective Renal Blood Flow and Glomerular Filtration to Tubular Excretory Mass in Normal Man. *J Clin Investigation* 19: 739 (Sept.) 1940.

20 Co Tui McCloskey K L Schiff Milton and Yates A L. A New Method of Preparing Infusion Fluids. *J A M A* 109: 250 (July 24) 1937.

21 Furnished by courtesy of the Winthrop Chemical Company Inc. 22 Alving A S Rubin Jack and Miller B F. A Direct Calorimetric Method for the Determination of Inulin in Blood and Urine. *J Biol Chem* 127: 609 (March) 1939.

23 Alving A S and Miller B F. A Practical Method for the Measurement of Glomerular Filtration Rate (Inulin Clearance). *Arch Int Med* 66: 306 (Aug.) 1940.

24 White H L and Rolf Doris. Rapid Micro Method for Determination of Diodrast and Inorganic Iodide Iodine in Blood and Urine. *Proc Soc Exper Biol & Med* 43: 1 (Jan.) 1940.

25 Houghten F C and Yaglou C P. Determining Lines of Equal Comfort. *J Am Soc Heating & Ventil Engineers* 29: 163 1923.



the peripheral blood flow must be maximal to prevent a storage of heat and a rise in rectal temperature

After a period adequate for the temperature change to occur and for equilibrium to be reached, clearances were repeated

#### TYPES OF CASES STUDIED

Cases studied included normal persons, patients with early and established essential hypertension and patients with chronic glomerulonephritis both with and without

TABLE 2—Environmental Temperature Conditions

	Dry Bulb F	Wet Bulb F	Relative Humidity
Comfortable	67.5	59.0	21%
Hot dry	89.5	68.5	19%
Hot wet	89.5	81.4	65%

Air currents—15-25 feet per minute  
Under equilibrium—Air and wall temperature the same

nitrogen retention. There was 1 patient with uræmia and normal tension and 1 patient with a well established hypertension who had suffered trauma to the right kidney.

The diagnosis of essential hypertension was made on patients with a high systolic and diastolic blood pressure who had had no known inflammatory kidney disease or urinary tract obstruction. Chronic glomerulonephritis was diagnosed on the basis of history of renal inflammatory disease and a study of urine sediment.

Among other clinical and laboratory studies carried out on our patients (table 1) were kidney function tests including urea clearances, phenolsulfonphthalein excretion tests (intravenous method) and urine concentration tests according to the method of Lashmet and Newburgh,<sup>28</sup> hourly blood pressure records for an entire day, blood pressure responses to sodium nitrite and sodium amytal, the cold pressor tests of Hines and Brown,<sup>29</sup> intravenous urograms, permanent records of the ocular fundi,<sup>30</sup> electrocardiograms and a 2 meter roentgenogram of the chest for heart size. Changes in the ocular fundi were graded according to the classification of Keith and Wagener.<sup>31</sup>

TABLE 3—Peripheral Blood Flow

Subject	Dry Bulb F	Wet Bulb F	Heat Production Cal / M / Hr	Heat Disposal Cal / M / Hr Transferred by			Conductivity Cal / M <sup>2</sup> / Hr	Blood Flow Liters / Hr
				Storage	Conduction	Convection		
L F (essential hypertension)	83.5 79.7	58.6 64.4	41.7 45.6	0 7.9	23.9 9.0	17.8 28.7	15.1 26.5	6.4 27.6
R E (normal)	83.6 79.1	59.7 65.0	24.4 24.5	0 9.2	22.7 8.6	11.7 16.7	13.1 25.3	4.4 16.7
H M (glomerulonephritis)	82.7 79.8	59.5 65.0	33.0 35.7	0 8.3	24.6 10.6	8.4 16.8	11.6 27.3	9.9 13.7

#### RESULTS

**Extent of Peripheral Blood Flow**—Studies were made of the peripheral blood flow of a normal subject and of subjects with essential hypertension and chronic

glomerulonephritis, using the method described by Keeton, Hick, Glickman and Montgomery.<sup>32</sup> The environmental conditions used in our studies are summarized in table 2.

It will be noted in table 3 that the blood flow was increased in each instance approximately four times. This indicates that patients with normal and damaged kidneys have similar quantitative reactions and that kidney damage has not affected the transfer of blood from the interior to the surface.

**Inulin Clearances**—Inulin clearances under comfortable conditions in 3 normal subjects (R E, L W in table 4 and L C in table 6) averaged 110 cc to 173 square meters of body surface. This value is lower than the mean clearance of 131 cc as reported by study of a large series of cases by Smith.<sup>4</sup> However, this falls within the variations of his mean and is also near the figure of 116.89 cc by Foa and his co-workers.<sup>33</sup> Twenty patients of all types were found to have the same inulin clearances in comfortable and in hot conditions. This would indicate that in the hot conditions there was no increase in the number of functioning glomeruli, even in the severely damaged kidneys.

**Plasma Flow**—The renal plasma flows (diodrast clearance) in normal and hypertensive subjects with

TABLE 4—Renal Plasma Flow in Patients with Normal Inulin Clearances

Subject	Diagnosis	Clearance* Cc					Hours Exposed
		Inulin		Diodrast		Variations	
		Comfortable	Hot	Comfortable	Hot		
R E	Normal	91	55	65	55	-20	3
L W	Normal	121	101	101	102	+10	2
S R	Essential hypertension (I)	107	101	119	111	-7	2
L F	Essential hypertension (I)	117	119	100	100	+31	0
R E	Essential hypertension (I)	111	69	70	73	+53	0

normal inulin clearances shown in table 4 are between the lower figures of 497 and 518 cc reported by White, Findley and Edwards,<sup>34</sup> and the Chesleys,<sup>35</sup> respectively and the higher figure of 688 cc by Smith.<sup>4</sup> When these patients were placed in hot conditions for two or three hours the changes in the renal plasma flow are not significant. The variations are in both directions and are not great.

Three patients with diminished inulin clearances (H W, A S and C V in table 5) showed a decrease in plasma flow which exceeded the ranges of experimental error when they were subjected to hot conditions. It is possible that the reduction in plasma flow may be associated with the somewhat longer exposure (four hours) to hot conditions than was practiced in the subjects with normal inulin clearances. It should be noted that in patients with sufficient kidney damage to cause definite reduction in inulin clearances there is no evidence of an increased blood flow under hot conditions.

32 Keeton R W, Hick I K, Glickman Nathaniel and Montgomery M M. The Influence of Physiological Research on Comfort Requirements. J Am Soc Heating & Ventil Engineers. Section on Heating, Piping and Air Conditioning. January 1941.

33 Foa L I, Wood W W, Lee M M and Foa Naomi L. Effective Renal Blood Flow, Glomerular Filtration Rate and Tubular Excretory Mass in Arterial Hypertension. Arch Int Med 69: 877 (May) 1942.

34 White H L, Findley Thomas Jr and Edwards J C. Interpretation of Diodrast Clearances in Man. Proc Soc Exper Biol & Med 43: 11 (Jan) 1940.

35 Chesley Leon C and Chesley Elizabeth R. The Diodrast Clearance and Renal Blood Flow in Normal Pregnant and Nonpregnant Women. Am J Physiol 127: 731 1939.

28 Lashmet F H and Newburgh L H. An Improved Concentration Test of Renal Function. J A M A 99: 1396 (Oct 22) 1932.

29 Hines E A and Brown G E. A Standard Test for Measuring the Variability of Blood Pressure. Its Significance as an Index of the Prehypertensive State. Ann Int Med 7: 209 1933.

30 Fundus photographs were taken by Dr R O Riser, Department of Ophthalmology, University of Illinois College of Medicine.

31 Keith N M, Wagener H P and Barker N W. Some Different Types of Essential Hypertension. Their Course and Prognosis. Am J Med Sc 197: 332 1939.

**Maximal Rate of Tubular Excretion of Diodrast**—Of six studies (table 6) four were unchanged by the hot environmental temperature but two showed an increase. These increases occurred in 1 normal subject and one with mild hypertension. This finding would be of considerable importance if it could be regularly reproduced. Further studies are required on this point.

**Tubular Resorption**—A study of the oral fluid intake and volume of urine passed (table 7) indicates a significant decrease in the percentage of glomerular filtrate absorbed in these subjects with decreased inulin clearances and is another method of illustrating the decreased power of conservation of fluids in patients with "damaged" kidneys.

## COMMENT

The magnitude of the transfer of blood from the interior to the surface under hot conditions as shown in table 3 subject L F amounts to 354 cc per square meter per minute or 611 cc of blood (plasma 342 cc) to 173 square meters of surface. It is realized that the interior vascular beds from which blood could be withdrawn are the lungs, viscera (liver, spleen) and muscles. Hence it is not probable that the kidneys

TABLE 5—Renal Plasma Flow in Patients with Diminished Inulin Clearances

Clearances Cc							
Subject	Diagnosis	Inulin		Diodrast		Variation	Hours Exposed
		Comfortable	Hot	Comfortable	Hot		
H W	Essential hypertension (1)	69	71	560	395	-165	4
A S	Essential hypertension (1)	69	86	517	469	-98	4
C V	Glomerulonephritis	19	19	176	107	-74	4
H M	Glomerulonephritis	16	14	120	79	-40	2
H M	Glomerulonephritis	14	11	76	97	+ 16	2
R R	Glomerulonephritis	22	24	119	124	+ 5	4

\* Hot wet

would be called on to yield this entire 342 cc of plasma. If this quantity of plasma should be shunted from the kidneys it is obvious that their function would be severely impaired. It has already been shown<sup>36</sup> that the vital capacity of the lungs is increased in hot conditions and presumably this is due to a reduction in quantity of blood in this organ. The liver and muscles are capable of yielding appreciable quantities of blood.

The methods used for the measurement of plasma flow through the kidney have a probable accuracy of 10 to 15 per cent (50 to 75 cc). Hence the kidney might yield 75 cc of the 342 cc of plasma without our detecting it. In none of the experiments on kidneys with well maintained inulin clearances was there evidence of shunting of blood. In 3 of the patients with severely damaged kidneys there was slight detectable reduction in plasma flow which could have been shunted to the periphery. The whole experiment would justify the currently held view that the blood flow through the kidney is rather jealously guarded and not influenced to any great extent by other circulatory adjustments. They speak again for the autonomy of the control of renal circulation.

<sup>36</sup> Hick F K, Keeton R W, and Glickman Nathaniel. Physiologic Response of Man to Environmental Temperatures. *Tr Am Soc Heating & Ventil Engineers* 44: 145 1938

In previously reported experiments by Smith, it was noted that there was an increase in renal blood flow when pyrogenic substances were used even though the temperature was not actually elevated. The maximum rise in temperature under hot conditions in our cases amounted to 1.8 degrees F. Our data would indicate that slight rises in rectal temperature probably do not cause an increase in renal blood flow.

TABLE 6—Effects of Heat on Maximal Rate of Tubular Excretion of Diodrast

Subject	Diagnosis	Inulin Clearance		Diodrast Maximal Rate of Tubular Excretion		Hours Exposed
		Com fortable	Hot	Com fortable	Hot	
L C	Normal	103	96	47	70	4.0
J W	Essential hypertension (1)	108	110	44	39	4.0
D W	Essential hypertension (1)	101	87	47	44	4.0
A S	Essential hypertension (1)	107	95	20	21	4.0
C V	Glomerulonephritis	22	20	6	6	4.5
L S	Glomerulonephritis	9	6	11	7	2.0

These experiments have certain therapeutic implications. The applications of warm packs and heat in various forms are of no therapeutic value in promoting an increase in blood flow through the kidneys. In the previous discussion it was shown that the theoretical considerations would lead one to expect a reduction rather than an increase in the blood flow. In the severely damaged kidneys where therapeutic help is most desirable it is noted that the blood flow decreases rather than increases. In only two experiments (diodrast maximal rate of tubular excretion L C and J W) was there an increase in tubular mass. This subject deserves further study.

## CONCLUSIONS

When patients were studied successively in comfortable and hot environmental conditions, the following changes were noted:

1 The increases in the peripheral blood flow in patients with hypertension and glomerulonephritis were the same as in normal subjects.

2 The inulin clearances in all experimental subjects remained unchanged.

TABLE 7—Tubular Resorption

Subject	Intake	Glomerular Filtrate Cc	Filtrate Absorbed per Cent
L W	1 100	122	99.3
S R	1 100	107	98.6
H W	1 600	69	98.4
R L	600	111	98.0
L F	600	117	97.7
R E	600	91	96.6
J W	1 600	108	95.0
D W	1 600	101	91.8
R R	1 600	22	83.5
H M	600	16	78.8
H M*	1 100	13	73.0
C V	1 600	22	68.0
C V	1 600	19	76.6
L S	1 100	7	74.0

\* Hot wet

3 The renal plasma flows in patients with well maintained inulin clearances show no change.

4 The renal plasma flows in patients with decreased inulin clearances show a slight but significant decrease.

5 The diodrast maximal rate of tubular excretion was found to increase in 2 of 6 cases studied.

Subjects with lowered inulin clearances are less able to conserve water than normal subjects, as indicated by a decreased percentage of the glomerular filtrate resorbed.

## REPORT OF CASES

**CASE 1—Normal control** R E, a white man aged 37, complained of aching in his legs, weakness and palpitation for more than a year. The patient appeared to be in good health. Physical examination was essentially negative. The blood pressure was 108 mm of mercury systolic and 80 mm of mercury diastolic. Blood nonprotein nitrogen, urea nitrogen and uric acid were 35 mg, 101 mg and 3.3 mg per hundred cubic centimeters respectively. Urea clearance was 86 cc (maximal clearance). The basal metabolic rate was minus 14 per cent. Urinalysis was negative.

**CASE 2—Normal control** L W, a white youth aged 20, was studied on the fourteenth day following a herniorrhaphy. The blood pressure was 110/70. Urinalysis was negative.

**CASE 3—Normal control** L C, a white boy aged 14 years, was admitted to the hospital because of a Taenia saginata infection. He had scarlet fever as a child. He appeared in good health. The blood pressure was 122/80. Blood counts were normal. The urine contained an occasional pus cell. The blood nonprotein nitrogen was 297 mg per hundred cubic centimeters. Renal function tests followed excystation of the entire worm by one week. The diagnosis was Taenia saginata infection.

**CASE 4—Essential hypertension** S R, a white man aged 21, complained of palpitation and nervousness "most of his life." A hypertension had been noted three years previously on a routine examination, and recently he had been rejected from army service because of this finding. The patient appeared in good health. His blood pressure was 158/98 on admission to the hospital. Ocular fundus examination revealed grade 1 hypertensive retinopathy. Urinalysis was negative. Blood nonprotein nitrogen and urea nitrogen were 327 mg and 135 mg per hundred cubic centimeters respectively. Urea clearance was 64.8 cc (maximal clearance). Maximum urinary specific gravity was 1.029. The phenolsulfonphthalein excretion was 50 per cent in forty-five minutes. Hourly blood pressure readings for a twelve hour period varied from a low recording of 130/90 to a high one of 152/96. Sodium amytal caused a fall in blood pressure from 134/84 to 122/82. The cold stimulus test showed an elevation of 34 mm of mercury systolic and 20 mm diastolic. Cardiac size was normal. There was a low diphasic T<sub>2</sub> noted in the electrocardiogram.

**CASE 5—Essential hypertension** D W, a white youth aged 20, complained of some shortness of breath, dizziness, weakness and nervousness for one and one-half years. He had been found to have a hypertension by his family physician to the extent of 190 mm of mercury systolic. The patient appeared in good health. His blood pressure on admission was 148/70. Ocular fundus examination revealed a grade 1 hypertensive retinopathy. Urinalysis was negative. Blood nonprotein nitrogen was 367 mg per hundred cubic centimeters. The urea clearance was 88 cc (maximal clearance). The urogram was normal. Phenolsulfonphthalein excretion was 30 per cent in fifteen minutes. The cold stimulus test produced a rise in blood pressure from 144/84 to 152/92. Hourly blood pressures on a twelve hour bed rest regimen showed a range in readings from 134/70 to 158/80. Sodium amytal caused a fall in pressure from 160/66 to 116/70. The heart was normal in size and the electrocardiogram showed some right ventricular preponderance. Maximum urinary specific gravity was 1.038.

**CASE 6—Essential hypertension** R L, a Mexican girl aged 16 years, complained of headaches, vomiting and diplopia for one week before admission. The past history included tuberculosis of the spine. Examination revealed findings consistent with a diagnosis of right internal carotid aneurysm. The blood pressure was 146/104. The urine contained occasional granular casts. The ocular fundi revealed grade 3 hypertensive retinopathy. Intravenous urogram showed a small but otherwise normal left kidney. Maximum urinary specific gravity was 1.009. An intravenous injection of pentothal sodium caused a drop in blood pressure from 138/98 to 118/88. The urea clearance was 43.9 cc per minute (maximal clearance). The blood nonprotein nitrogen was 25 mg per hundred cubic centimeters. The phenolsulfonphthalein excretion was 15 per cent in fifteen minutes. The cardiac size was normal. The electrocardiogram showed ST<sub>1</sub> and ST<sub>2</sub> elevated and T<sub>2</sub> inverted.

**CASE 7—Essential hypertension** L F, a white youth aged 17 years, was referred to the dispensary because of a blood pressure found elevated to 210/130 on some routine physical examination. A study in the genitourinary clinic using intravenous and retrograde urography revealed a deformity of the right renal pelvis. There was a history of an injury to his right side at the age of 9 following which the patient had had gross hematuria. Examination revealed a blood pressure of 192/120. On admission to the hospital his urine contained 4 plus albumin (heat-rectic acid test), occasional casts, pus and red cells. However, this test was not long after he had had a cystoscopic examination and a few weeks later, his urine contained only 1 plus albumin and an occasional cast. The blood nonprotein nitrogen was 36 mg per hundred cubic centimeters. The urea clearance was 58 cc (maximal clearance). The maximum urinary specific gravity was 1.025. The ocular fundi showed a grade 1 hypertensive retinopathy. Hourly blood pressures on a twelve hour bed rest regimen showed a range from 188/124 to 160/102. Sedative drugs caused a fall in pressure from 210/110 to 168/100. The cold stimulus test caused a rise in pressure from 188/120 to 212/140. The cardiac size was normal. Electrocardiographic findings included inverted T<sub>1</sub>, QRS<sub>1</sub> low and quadriphasic, T<sub>2</sub> and T<sub>3</sub> sharply inverted ST<sub>1</sub> elevated, T<sub>1</sub> high.

**CASE 8—Essential hypertension** H W, a white woman aged 27, complained of headaches, tiring easily, nervousness and palpitation. The patient appeared in good health but seemed quite apprehensive. Her blood pressure was 222/138. A chest roentgenogram revealed localized densities in the right apex which represented an old tuberculous lesion. The ocular fundi showed a grade 1 hypertensive retinopathy. The urine was normal. The phenolsulfonphthalein excretion test was 45 per cent in fifteen minutes. The urea clearance was 60.6 cc (maximal clearance). The maximum urinary specific gravity was 1.030. During a twelve hour period of bed rest the hourly blood pressures varied from 184/128 to 260/150. Sodium amytal caused a fall in pressure from 244/144 to 156/106. The change under sodium nitrite was very similar. The cold stimulus test caused a rise of 20 mm of mercury systolic and 7 mm diastolic. The intravenous urogram was normal. The electrocardiogram revealed an inverted T<sub>2</sub> and the heart size was normal. The blood nonprotein nitrogen was 33 mg per hundred cubic centimeters.

**CASE 9—Essential hypertension** A S, a white woman aged 33, complained of shortness of breath on exertion, headaches, dizziness and some precordial distress for one year. Late in her second pregnancy, one year previously, her blood pressure rose to 160/110. She appeared in good health on the present admission to the hospital. The ocular fundi showed a grade 1 hypertensive retinopathy. The blood nonprotein nitrogen was 30 mg per hundred cubic centimeters. Urine studies were negative. The urea clearance was 43 cc (maximal clearance). The phenolsulfonphthalein excretion was 30 per cent in fifteen minutes. The maximum urinary specific gravity was 1.030. During a twelve hour period of bed rest the hourly blood pressures varied from 130/80 to 172/108. Under sodium amytal the blood pressure fell from 148/90 to 122/70. Sodium nitrite caused a fall of 16 mm systolic and 6 mm diastolic. The cold stimulus test caused a rise of 20 mm systolic and 22 mm diastolic. The heart size was normal. The electrocardiogram revealed left ventricular preponderance.

**CASE 10—Essential hypertension** J W, a white man aged 24, complained of weakness, dyspnea on exertion, joint pains, a postnasal drip and maxillary sinusitis. The patient had had rheumatic fever at the age of 12 and again at the ages of 16 and 17. Recently his family physician had noted a hypertension of 185/120. On admission to the hospital he was ambulatory and appeared in good health. His blood pressure was 158/88. The thyroid gland was somewhat diffusely enlarged. There was a loud systolic murmur heard over the apex. The basal metabolic rate was minus 6 per cent. The erythrocyte sedimentation rate was 10 mm per hour corrected. The blood cholesterol was 210 mg per hundred cubic centimeters. The blood nonprotein nitrogen was 34.7 mg per hundred cubic centimeters. The urea clearance was 37 cc (standard clearance). The phenolsulfonphthalein excretion was

10 per cent in fifteen minutes. The ocular fundi showed a grade 1 hypertensive retinopathy. Sodium amytal caused a fall in pressure from 160/90 to 118/80. Sodium nitrite caused a drop of 18 mm systolic and 10 mm diastolic. Cold stimulus test caused an elevation of 16 mm systolic and 36 mm diastolic. The electrocardiogram showed inversion of  $T_2$ . The heart size was normal. The urogram was normal and the maximum urinary specific gravity was 1.034.

CASE 11—*Chronic glomerulonephritis*. L. S., a white man aged 35, complained of itching and pigmentation of the skin for nine months and weakness for one year. His past history was irrelevant. He appeared anemic and showed a peculiar light bronzelike appearance of the skin. He was amblyopic. His blood pressure was 110/70. The erythrocyte count was 15 million per cubic millimeter and there was 5 Gm of hemoglobin per hundred cubic centimeters (Sahli). Urinalysis was negative. The blood nonprotein nitrogen, urea nitrogen and creatinine were 128.6 mg, 85.5 mg, and 9.1 mg per hundred cubic centimeters respectively. The carbon dioxide combining power was 30 cc per hundred cubic centimeters of plasma. Serum proteins were normal and the icterus index was 7 units. The ocular fundi were normal. The urea clearance was 5 cc per minute (standard clearance). The cardiac size was normal. The intravenous urogram was unsatisfactory because of the failure of the diodrast to be excreted in a quantity sufficient to cause visualization.

CASE 12—*Chronic glomerulonephritis*. H. M., a white woman aged 23, complained of headaches, occasional vomiting and some pain in her lumbar region for one year. She had been told previously that she had hypertension. Symptoms started with her first pregnancy one year previously when she had had toxemia associated with her pregnancy. Examination revealed a blood pressure of 184/114. Urinalysis showed 4 plus albuminuria (heat-acetic acid test), an occasional granular cast and pus cell but no erythrocytes. The urea clearance was 16 cc (maximal clearance). The blood nonprotein nitrogen, urea nitrogen, uric acid and creatinine were 547 mg, 34 mg, 5.3 mg, and 4.5 mg per hundred cubic centimeters respectively. Intravenous urograms showed unusually small kidneys bilaterally. Ocular fundus examination revealed a grade 2 hypertensive retinopathy. Cold stimulus test caused a rise in blood pressure from 182/120 to 208/172. Sodium amytal caused a fall in pressure from 174/116 to 142/100.

CASE 13—*Chronic glomerulonephritis*. R. R., a white woman aged 22, complained of backaches, headaches, dizziness, some swelling of her face and ankles and slight visual disturbances for one year. Her past history indicated some kidney trouble at the age of 3 years, at which time she had been seen by a "kidney specialist." One year prior to admission she was told she had pus and albumin in her urine. Urinalysis revealed 3 plus albuminuria (heat-acetic acid test) and an occasional pus cell but no erythrocytes or casts. There was poor visualization of the urinary tract by intravenous urography. A right retrograde pyelogram showed questionable pyelectasis with blunting of the calices. There was essentially no response to the cold stimulus test except in the diastolic pressure which rose 16 mm of mercury. Hourly blood pressure readings during twelve hours of bed rest varied from 130/82 to 150/110. Sodium amytal caused a fall in pressure of approximately 14 mm of mercury systolic. Sodium nitrite caused a fall of 22 mm systolic and 12 mm diastolic. The urea clearance was 22.3 cc (maximal clearance). The phenolsulfonphthalein excretion was 15 per cent in fifteen minutes. The blood nonprotein nitrogen was 42 mg per hundred cubic centimeters. Cardiac size was normal, as was the electrocardiogram.

CASE 14—*Chronic glomerulonephritis*. C. V., a white man aged 30, complained of headaches and swelling of his feet and eyelids for several months. He had had scarlet fever at the age of 20. At the age of 24 and several times thereafter he had had gross hematuria. In 1940 he had definitely swollen ankles. Examination revealed a blood pressure of 196/124. There was a 4 plus albuminuria (heat-acetic acid test), occasional granular and hyaline casts, erythrocytes and pus cells. Ocular fundus examination revealed a grade 4 hypertensive retinopathy. Urea clearance was 21 cc (standard clearance).

Blood nonprotein nitrogen was 44 mg per hundred cubic centimeters. Serum albumin was 23 per cent and serum globulin was 17 per cent. Sodium amytal caused a fall in blood pressure from 190/124 to 142/116. The cold stimulus test caused a rise of 44 mm systolic and 16 mm diastolic. Heart size was normal.

#### ABSTRACT OF DISCUSSION

DR BENJAMIN JABLONS, New York. I have studied effects on renal blood flow by means of a different approach. This consisted in explanting the kidney subcutaneously and externally. Thus, temperature changes in the kidney could be determined under the influence of various environmental and local as well as indirect temperature modifications. In rabbits and dogs the kidney was exteriorized, so that temperature changes could be determined directly by the application of a thermocouple to the exposed surface of the kidneys. Dogs, in which exteriorization did not prove as practicable as it did in rabbits, were studied by means of a subcutaneous thermocouple. Environmental temperature changes produced little effect in the exteriorized kidney of the rabbit. In the dog, the application of cold or heat directly over the skin covering the surface of the explanted kidney failed to influence the temperature change in any great degree. Immersion of the hind legs in cold water produced little change. However, in 1 dog (that was hypertensive) with one kidney explanted and one kidney removed we found that the use of hot packs did seem to change the temperature about 1 to 2 degrees C. However, if the hind legs were immersed in water the kidney temperature changed but little. Another point observed was that in the kidneys which were exteriorized the kidney temperature remained much the same on a hot day as when the temperature was much reduced. In the main these findings are in agreement with the experience reported by the authors.

### Clinical Notes, Suggestions and New Instruments

#### A FOREIGN BODY FINDER THE LOCATOR

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There has always been difficulty in accurately locating metallic fragments embedded more or less deeply in human tissues. For decades many devices have been tried, most of them based on the principle of the magnet. Some of these were designed so that a sound effect or a light effect gave added information. Many variations of roentgen triangulation have also been used. However, few of these provided substantial help until the operative zone was uncovered, but thereafter in many cases these magnetic devices failed to act because of the interposition of the body fluids or tissues. So-called telephone probes and allied instruments were useful only within certain limits. In World War I the Bergome apparatus was probably used more satisfactorily than any other, but it was very bulky (about the size and shape of a flower pot) and often failed when the embedded fragment was small.

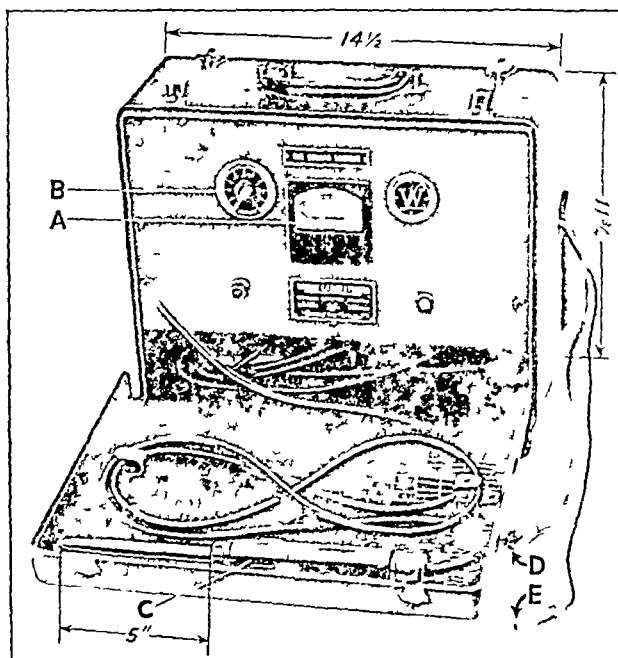
Practically all these devices functioned only for iron or steel and unfortunately many foreign bodies are of the nonmagnetic type, notably lead. X-ray aid is obviously of great value, and to the ordinary film many accessories and markers have been added more positively to delineate the hidden object. Nevertheless in many cases the search is prolonged and fruitless even though the films had been carefully prepared and skillfully interpreted. In civilian as well as in military experience there was real need for some device that would act in association with or independent of X-ray aid.

Such a device should locate the object accurately prior to the operative exposure and be equally effective in determining the depth in the wound. It should give a visible response on the dial or other indicator and become activated by fragments of iron, steel, copper, silver, aluminum, lead or their

combinations. Likewise, the electrical source should be of the ordinary plug in type or come from a storage battery or dry cells. Such elements as cost, size, sturdy construction and portability were also involved.

An apparatus fulfilling many of these requirements has been perfected and is in production.<sup>1</sup> It is called the 'Locator' and was devised for me by Samuel Berman of the electrical engineering department of the New York City Transit System. After more than a year of experimentation the first trial of the apparatus was made by me in November 1941 at the Reconstruction Hospital Unit of the Post-Graduate Hospital on a police officer who had been one of the victims in the bomb explosion at the New York World's Fair in July 1939. Several metallic fragments were removed from the region of the patient's ankle and purposely, so that an extreme test might be made, no x-ray and was employed.

I took this apparatus with me to Honolulu in December 1941 to demonstrate it before a group of physicians who had invited



Appearance and dimensions of the Locator

me to give a series of lectures on traumatic surgery. The first mass usage of the device was at Tripler General Hospital at the time of the Pearl Harbor attack, where I returned to army duty as Colonel, Surgical Consultant. At this U. S. Army hospital many of the surgical personnel used the locator with great success and indeed on two successive days removed 21 embedded fragments without a single failure.

While there, my own most satisfactory experience with the locator was in the removal of a machine gun bullet lodged within the spinal canal at the upper lumbar level, and without this "diviner" it is doubtful whether the missile would have been found despite the accurate localization afforded by many roentgenograms. The original apparatus was left at this hospital, and since returning I have used successive improved models successfully in several civilian cases.

The general appearance of the locator in size and shape suggests a portable radio. On the front panel are the dial (A) to record the proximity of the object and a single control knob (B) for regulating the sensitivity of the apparatus. The probe or finder (C) is the size and shape of a large fountain pen, it is made of stainless metal or bakelite and is furnished with a sterilizable, specially fitted rubber sleeve for search within the

wound. In an emergency a rubber glove or towel or other sterilizable material may be used instead. The plug in wire (D) is like that of any radio. A 20 foot ground wire with a spring clip terminal (E) is connected to eliminate body capacity effects and static charges.

To use the apparatus, the probe or finder is passed over the suspected area and the movements of the needle on the indicator dial are observed. As the probe comes closer to the metal particle, the needle moves higher on the dial scale until the point on the surface is found which gives the highest reading. This gives the skin or surface location and to some degree denotes also the size and composition of the metal. However, it is also necessary to know the subsurface depth, and to obtain this I select a piece of metal of the same composition and the approximate dimensions as shown on the x-ray film and approach the probe with it until the dial reading is the same as the reading previously noted on the surface location on the patient's body. The distance between the test object and the probe then equals the subsurface depth. This determination is exceedingly accurate and will usually not vary more than  $\frac{1}{10}$  inch. The fact that in the surface location there was intervening tissue while in the case of the comparison reading with the test object the measurements were in air is entirely immaterial because animal tissue and air have practically identical permeability to magnetic lines of force.

If when the incision is made the foreign body is not immediately discovered the probe (covered with its sterile sleeve) is placed in the wound and moved lengthwise with respect to the incision to a point at which the highest reading is obtained. Then the probe is pressed against each of the two walls of the incision in turn to determine by the higher of the two readings which wall contains the foreign body. The probe is then slowly raised and lowered and is stopped at the depth which gives a maximum reading on the indicator dial. In this way the correct direction in which to proceed is accurately ascertained. Obviously all metallic instruments are laid aside while the search proceeds. Wooden tongue depressors or plastics can be used for temporary retractors.

The probe handle has a control by which the operator can at will make most of the necessary adjustments without requiring an assistant at the instrument panel. There is a pilot light to show when the instrument is in use.

An apparatus working on similar principles has been used to locate buried ores or metals. The relative sensitivity of the locator to the various metals is in the order named: iron, steel, silver, copper, gold, aluminum, magnesium, platinum, lead.

So far as I know, there is no identical device although in Great Britain<sup>2</sup> and in Germany<sup>3</sup> foreign body devices of a new design are said to be in use. Some of these are x-ray adaptations, others are superheterodyne modifications.

This locator was recently used at the New York Post Graduate Hospital to extract a metallic fragment (approximately  $\frac{1}{4}$  by  $\frac{1}{8}$  by  $\frac{1}{2}$  inch) from the front of the lower third of the thigh where it presumably lay close to the bone. The surface location and depth extent were easily registered, but it required four insertions of the probe before the surgical route was determined sufficiently to extract the fragment without enlarging the original external incision. It is quite certain that I would have failed without the aid of this device. On another occasion a small foreign body was removed from the deltoid region after two previous vain attempts had been made elsewhere. Concededly in many cases it is entirely unnecessary to extract a foreign body in a silent or inaccessible region. However, the possessor of even a tiny fragment is often unwilling to permit it to remain for fear that "it may wander." Such anxiety is usually unwarranted, because an embedded fragment almost

<sup>2</sup> *Invent.* 2,517,518 (Nov. 1) 1941.

<sup>3</sup> *Zentralbl. f. Chir.* 67:2338-2344 1940. *Munchen med. Wochenschr.* 88:353-380 (March 28) 1941.

<sup>1</sup> Waugh Laboratories, 420 Lexington Avenue, New York.

usually remains in situ, imprisoned in scar tissue which usually appears very promptly. Within cavities the wandering tendency of lost instruments is of frequent occurrence, as for example in the abdomen, where artery clamps and the like are sometimes found quite distant from the operative zone, and the locator in such cases may be useful.

In the civilian as well as in the war zone this apparatus appears to have the following advantages:

- 1 Portability combined with sturdy construction and adaptability to any electrical source
- 2 Ability to be used as an accessory to fluoroscopy and to x-ray films or without them
- 3 Susceptibility of being used within the wound
- 4 Responsiveness to many kinds of metals
- 5 Ease and certainty of application

115 East Sixth Fourth Street

#### SCHISTOSOMIASIS INFECTION REPORT OF TWO CASES FOUND IN NORTHERN MICHIGAN

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We record here 2 cases of *Schistosomiasis hematobium* infection found in northern Michigan. The widespread migration resulting from conditions associated with the war will introduce into the United States and Canada diseases endemic in foreign countries. Unless possible occurrence of tropical disease is considered, wrong or missed diagnoses will be inevitable. People who have spent much time in the tropics are apt to be more familiar with some tropical diseases than many physicians in this country.

Schistosomiasis is endemic chiefly in the Mediterranean countries, the Near East and over most of Africa and nearby islands. A review of the etiology, pathogenesis, symptomatology and treatment would appear superfluous at this time since they are adequately described in all modern textbooks of tropical medicine.

The majority of reported cases in this country have been well advanced and diagnosed relatively late in the course of the disease. As far as we have been able to learn from the literature, there have been no cases reported in this country which had been diagnosed prior to the onset of symptoms. Manson<sup>1</sup> states that the incubation period ranges from three months to two and a half years. Our cases are consistent with this observation. Most cases of schistosomiasis reported in this country have been concerned with *Schistosoma hematobium*. *Schistosoma mansoni* has been found by Hoff<sup>2</sup> in New York, and *Schistosoma japonicum* has been reported from New Orleans by Hauser.<sup>3</sup>

The cases reported here are examples of a definitely known incubation period. So far as we have been able to determine case 2 is the only case in this country diagnosed prior to the development of symptoms.

#### REPORT OF CASES

CASE 1—A white boy aged 9 years seen March 25, 1942, complained of bloody urine for the past three months and enuresis for two days. He stated that for the past three months he had noted a small amount of blood at the end of urination. At first this appeared every three to four days, but in the past week it had occurred daily, the blood being seen usually at the midday urination. There was no history of recent

infection or injury. In other respects he appeared to be in good health. The boy was born in South Africa where his parents had been missionaries. The mother stated that there were many rivers in this part of Africa which were infested with snails. Approximately a year before admission the boy had swum in a river near Durban, Natal, on the East coast of Africa. He had not been swimming in natural waters in Africa at any other time. The family returned to the United States in June 1941. Since that time they had lived in northern Michigan.

The boy was moderately thin, was 55½ inches (141 cm) tall and weighed 63 pounds (28.6 Kg). The temperature was 98.8 F, the pulse rate was 92 beats a minute and the blood pressure was 96 systolic and 62 diastolic. The only demonstrable physical abnormality was a slight tenderness in the right renal area.

The laboratory studies showed a hemoglobin of 81 per cent (13.4 Gm) and an erythrocyte count of 4,100,000, giving a color index of 0.99. The hematocrit determination showed a volume index of 12. The leukocyte count was 11,400, with a differential count of neutrophils 50 per cent, lymphocytes 48 per cent, basophils 1 per cent and monocytes 1 per cent. Subsequent differential counts showed as high as 11 per cent eosinophils. Urine specimens were normal except for the terminal few drops, which showed numerous pus cells and erythrocytes and numerous colonies of *Staphylococcus aureus*. The blood urea was 10 mg per hundred cubic centimeters and the Kahn precipitation test for syphilis was negative.

On the basis of these findings he was treated with sulfathiazole. In two weeks the pyuria had disappeared and urine cultures became negative. However, the terminal bleeding persisted. Because of his having lived in a region in which schistosomiasis is endemic, a search for *Schistosoma* was made repeatedly on the terminal portion of urine specimens until a typical ovum of *Schistosoma hematobium* was discovered four weeks after the patient was first seen. The appearance of the ovum is shown in the accompanying illustration.

Because of the finding of *Schistosoma*, urine and stool examinations were done on the rest of the family—the parents, two sisters and one brother. The findings were negative in all but the brother.

CASE 2—Ova were isolated in the urine of the 12 year old brother on April 25, although he had had no symptoms and had appeared to be in good health. However, on May 8 terminal hematuria first appeared. He had been swimming with his brother in the Njongwane River in Natal, South Africa, in January 1941 and had been on several walking trips, crossing some of the smaller streams.

The boy was healthy appearing, was 64½ inches (164 cm) tall and weighed 104 pounds (47 Kg). The temperature was 97.2 F, the pulse rate was 80 beats a minute and the blood pressure was 114 systolic and 74 diastolic. The laboratory findings were a hemoglobin of 77 per cent (12.8 Gm), an erythrocyte count of 3,780,000 and a leukocyte count of 7,000, with 36 per cent lymphocytes, 44 per cent neutrophils and 20 per cent eosinophils. Several urinalyses were negative, except for the presence of both pus cells and erythrocytes varying from 1 plus to 4 plus and demonstrable ova of *Schistosoma hematobium* in most specimens. The urine culture showed 15 colonies of *Staphylococcus aureus* to 0.5 cc of urine. The blood urea was 17 mg per hundred cubic centimeters and the Kahn precipitation test for syphilis was negative. The patient was not given any treatment for the staphylococci in the urine.

#### TREATMENT

Intramuscular injections of fuadon were started on both patients. Each was given an injection in the gluteal muscles of 0.5 cc the first day, 1.5 cc the second day and thereafter

From the Burns Clinic.  
1. Manson Bahr, Philip. *Manson's Tropical Diseases*, ed. 10. London: Cassell & Co. Ltd. 1935. pp. 659-685.  
2. Hoff, Amanda. *Schistosomiasis: Report of Two Cases*. J. A. M. A. 107: 1375-1378 (Oct. 24) 1936.  
3. Hauser, G. H. *Schistosomiasis: Report of a Case*. New Orleans M. & S. J. 92: 265-270 (Nov.) 1939.

35 cc was given until a total of 30 cc (19 Gm) had been given. The ova continued to appear in the urine until two weeks after fuadin was started, then no further ova were found.

Except for mild muscular pain at the site of the injections no local or systemic reactions occurred. Supplementary treatment was not given. The family then moved to southern Michigan, from where the mother of the patients reported to us that a second course of fuadin had been given to the younger boy because of a recurrence of ova in the urine. According to reports from the mother there has been no further evidence of the disease up to September 1942.

#### COMMENT

According to a survey of the available literature the 2 cases reported by us bring to 33 the total number of cases found and reported in the United States and Canada. Of these the only case previously reported in Michigan was that of Campbell<sup>4</sup> in 1938. Apparently the only instance of the disease occurring in a person who had never been in a country in



Ovum of *Schistosoma hematobium* ( $\times 800$ )

which the disease is endemic is the case reported by Sullivan<sup>5</sup>. The infection in this instance was apparently acquired by the patient's playing with an aquarium stocked with Egyptian snails.

A possible second exception is the case reported by Peacock and Voegtlin<sup>6</sup> in which the patient died of heart disease the day after the diagnosis of schistosomiasis was made.

There appears to be little reason to fear that any cases except those brought into this country will occur. It is believed that there is no intermediate host in this country such as the special snails found in the region in which the disease is endemic.

#### SUMMARY

The two cases of *Schistosoma hematobium* infection here presented are, we believe, examples of a diagnostic and therapeutic problem requiring the alertness of civilian physicians, since one may logically anticipate many cases of chronic diseases endemic in foreign countries in the next few years.

<sup>4</sup> Campbell D. A. Vesical Bilharziasis. *J. Urol.* **10**: 598-605 (Nov.) 1938.

<sup>5</sup> Sullivan S. J. *Schistosoma Hematobium*. A Sporadic Case in Illinois. *J. A. M. A.* **98**: 1642-1643 (May 7) 1932.

<sup>6</sup> Peacock A. H. and Voegtlin M. B. Sporadic Occurrence of Bilharziasis in Washington. *Northwest Med.* **31**: 174-176 (May) 1935.

## Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING ARTICLE  
HOWARD A. CARTER, Secretary

### THE THERAPEUTIC VALUE OF ULTRAVIOLET RADIATION

(Continued from page 623, volume 120)

#### INDOLENT WOUNDS

In certain cases of indolent ulcers and wounds occasional erythema doses of ultraviolet radiation or daily treatment with graduated doses of solar radiation or artificial ultraviolet rays seem to be helpful. Some indolent ulcers and wounds appear to respond rapidly and favorably to both solar and artificial ultraviolet radiation. On the other hand ulcers occurring in Raynaud's disease or in thromboangiitis obliterans and also old chronic varicose ulcers do not respond to ultraviolet radiation.

#### CRYSPELAS

Good results have been obtained in crsipelas with both x rays and ultraviolet rays. Recently many reports have appeared in the literature which show that ultraviolet radiation is a safe and successful method for the treatment of crsipelas, especially in the very young and the old. Many times the erythema dose (eight to twenty) of ultraviolet rays from a quartz mercury arc generator is applied at one sitting to the diseased area including an inch or two of the normal surrounding skin. The treatment is repeated a second or a third time and if necessary a fourth or fifth time on successive days. Since crsipelas responds so well in all ages to the sulfonamides, ultraviolet radiation is being used less frequently. The sulfonamides are photosensitizing drugs. Therefore they should not be used in conjunction with ultraviolet rays.

#### BLOOD

While irradiation with ultraviolet may have some effect on secondary anemia, this effect is limited and not specific and far less efficient than dietetic and drug treatment.

Intense ultraviolet radiation may result in abnormal white blood cell counts. There is no unequivocal evidence that ultraviolet radiation increases resistance to specific or general infection, although a relationship between sunlight and the general course and character of disease, growth and nutrition has been demonstrated.

#### BLOOD PRESSURE

From a clinical standpoint the claim that ultraviolet rays reduce blood pressure has not been sufficiently established by the majority of those who have had long experience with natural or artificial heliotherapy to command acceptance. Most investigators feel that while exposure of the entire body to ultraviolet rays may produce some reduction in blood pressure in certain individuals, this reduction is too light and inconstant to be of clinical value. The lowered blood pressure of persons living in the tropics is the result of the action of a number of characteristics: racial, mode of life, meteorological conditions and their changes, and cannot be correlated with the quantity and quality of radiation.

#### DERMATOSIS

It appears to be the general impression in the medical profession and among lay persons that ultraviolet irradiation is of great value in dermatology. However, most of the therapeutic claims have not been corroborated and may be disregarded. There is sufficient evidence to justify the belief that ultraviolet radiation is a valuable remedy for crsipelas and for certain types of cutaneous and subcutaneous tuberculosis. It is reasonably well established that ultraviolet radiation is at times useful either alone or as an adjunct for the treatment of acne vulgaris, adenoma sebaceum, pityriasis rosea, purpura, psoriasis, telangiectasia, indolent ulcers and wounds. While there is some difference of opinion among dermatologists, the majority while admitting occasional good results that appear to be due to the radiation do not consider it an important agent in the management of other disorders.

<sup>7</sup> MacKee and Cipollaro. Ultraviolet Therapy in Dermatology. In a book of Physical Therapy, ed. 3, pp. 333-358.



Some physicians believe that ultraviolet radiation improves the color and texture of the complexion. Such statements are not in agreement with the consensus of dermatologic opinion.

*Diseases Due Partly or Wholly to Pyogenic Organisms—Acne Vulgaris.* At least 60 per cent of the patients can be cured with conventional dermatologic therapy in from a few months to a year without recourse to ultraviolet therapy. Such treatment embraces the proper choice of topical applications, adequate instruction and advice, attention to hygiene and diet and attention to various possible internal disturbances.

Erythema or flushing doses of artificial ultraviolet radiation or solar radiation once or twice a week, or daily if toleration is high, will very often cause the eruption to improve or disappear, but unfortunately recurrence is the rule. Rapid temporary improvement in selected cases is obtained often by producing an acute reaction followed by desquamation. Most dermatologists agree that the radiation is a useful adjuvant when treating recalcitrant cases. In such instances it supports topical remedies and other conventional measures. It may be combined with x-rays but if so, it is advisable to avoid erythema.

Acne vulgaris is divided into a number of clinical varieties. The intelligent management of the disease requires a clinical knowledge of the various types because the therapeutic indications differ somewhat with the type. Acne indurata is the common type. It is encountered mostly in late adolescent and early adult life and is chronic in course and appearance. In addition to comedones, pitulous follicular orifices and scars there are numerous large, deep seated pustules and perhaps occasional indolent cystlike lesions. The skin is likely to be excessively oily. This type usually tolerates and responds well to vigorous treatment.

The more acute types—acne pustulosa and acne erythematosae—are more likely to be associated with detectable and correctable systemic disturbances. It is advisable to begin treatment with soothing topical remedies before resorting to physical therapy.

Comedo and acne papulosa are seen most often at puberty. The lesions consist of blackheads and papules and there may be also some pustules and an oily skin. At times these types disappear spontaneously or yield quickly to stimulating topical remedies. Not infrequently, however, it is impossible to cure the puberty cases permanently until the patient is somewhat older. It is possible as a rule, to control the disorder through this period with suitable topical remedies or with ultraviolet radiation or both. It is important to do so otherwise acne indurata, oily seborrhea, scars and a coarse skin are apt to develop.

Although ultraviolet radiation has been blamed for superfluous hair in cases of acne vulgaris, it is generally agreed that this agent cannot make hair grow on glabrous skin. Hypertrichosis in association with acne vulgaris has been noted in the absence of local treatment of any kind. However when girls and women have a tendency to grow hair on the face it is theoretically possible that the frequent application of any remedy producing hyperemia might encourage the growth.

*Rosacea and Rhinophyma.* Rosacea can almost always be cured by giving adequate attention to the internal causes combined with suitable topical remedies. Irradiation is of little if any value. Ultraviolet radiation is usually not well borne although it may be of service in an occasional selected case. So far as concerns local treatment, the best results in cases of hypertrophic rosacea and rhinophyma are obtained with multiple scarification, surgical diathermy and scalp surgery.

*Acne Varioliformis.* Ultraviolet radiation is of doubtful value.

*Sycosis Vulgaris.* Ultraviolet radiation appears to have very little effect on the disease. Under the heading of sycosis may be included chronic pustular folliculitis of the bearded region of male adults, the eyebrows, the scalp and the pubic region. In such cases general body irradiation with solar or artificial ultraviolet radiation may be tried, but there is no real evidence that such treatment is of value.

*Furunculosis and Carbuncles.* Many physicians believe that an erythematous or a blistering dose of ultraviolet radiation preferably with a water cooled lamp with compression when applied to a boil in the very early stage of evolution, will either abort the lesion or greatly modify further development. In the hands

of most dermatologists this procedure has been uncertain and disappointing. Recurrent boils indicate some constitutional fault—organic functional or immunologic—which must be corrected if possible. In such instances it is possible that a long course of general body irradiation using either the sun or an artificial source of light might prove beneficial. While the general impression is that such treatment is helpful there is no conclusive evidence that this is so.

*Miscellaneous Pyogenic Disorders.* Ultraviolet ray treatment or heliotherapy may be of service in cases of acne conglobata (acne cacteticorum) but the result is usually disappointing. Good results have been reported with ultraviolet radiation in cases of perifolliculitis capitis abscedens et sufficiens, but the evidence is insufficient for an evaluation.

*Diseases Due to Fungi.* Many of the fungous dermatoses—blastomycosis, actinomycosis, onychomycosis—have been treated with ultraviolet radiation with poor results. Perleche a disease of the buccal commissures may be due to bacteria, fungi or to a deficiency of nicotinic acid or riboflavin. Ultraviolet radiation has not proved efficacious in this disease. Many eruptions due directly or indirectly to fungi and known as dermatophytosis and dermatophytid are discussed under the heading of eczema.

*Eczema.* It no longer suffices to say that a certain agent is of value in the treatment of eczema. Today the unqualified term eczema signifies inflammation of the skin (dermatitis) having certain characteristics that are not so frequently encountered in other eruptions. Each of the number of clinical types of eczema has a somewhat different cause and exhibits fairly definite characteristics. While the therapeutic indications are somewhat different for the various types each clinical variety has certain features common to all.

*Eczema venenatum (dermatitis venenata)* is caused by external contact with a substance to which the patient has become sensitized. Well known examples are rhus dermatitis, dye dermatitis and trade eczema. Naturally the logical procedure is to ascertain and remove the cause. Ultraviolet radiation is not indicated in this type.

*Dermatophytosis* is a convenient term coined by Highman to indicate eczema caused by fungi of which there are several types. To general practitioners and to the public these conditions are known as ringworm or 'athletes' foot.

The keratotic type occurs mostly on the palms and soles and consists as the name implies of a thickened horny layer. The interdigital and vesicular varieties are the common types of dermatophytosis. Ultraviolet radiation has been advocated but the results do not warrant its recommendation.

*Infectious eczematoid dermatitis* is a more or less generalized eczema that develops secondary to a discharging sinus, ulcer or wound. Ultraviolet radiation is also ineffective in this type.

*Neurodermatitis* occurs in two forms—circumscribed and disseminate. The circumscribed type (lichen chronicus circumscriptus) seen mostly in adults resembles patches of chronic lichen planus and shows a predilection for the flexures—the sides of the neck, the cubital and popliteal spaces and flexor surfaces of the thighs and for certain extensor surfaces—the elbows and knees—where it may exhibit a strong resemblance to psoriasis and the back of the neck in women (eczema nuchae). The Fox-Fordyce disease of the axillas and pubic region is probably a rare type of circumscribed neurodermatitis. Patches of circumscribed neurodermatitis range in size from a dime (18 mm) to an adult palm. A full erythema dose of ultraviolet radiation may be followed by improvement, but the results are uncertain.

The disseminate type of neurodermatitis when severe is one of the most recalcitrant and distressing of the dermatoses. It occurs for the most part in patients who give a personal or family history of allergic disorders—urticaria, hay fever, asthma—and the patient is often sensitized to a large number of substances—food proteins, epithelial products (hair dander, feathers), pollens and bacterial proteins. The neurogenic factor is prominent, and there may be endocrine dysfunction. The disease is common in infants, children and adolescents. It is common in young adults and uncommon in older persons. There are acute exacerbations and remissions, both of which may be of short or long duration. Itching is likely to be almost intolerable.

There is a difference of opinion regarding the efficacy of ultraviolet radiation (general body irradiation) in neurodermatitis. Certainly many patients improve when they are able to indulge in heliotherapy, but it has been impossible thus far to determine whether the improvement is due to a combination of environmental factors (rest, relaxation, contentment, salt water bathing effect of moving air on the naked skin, change of climate, escape from causative proteins) or to ultraviolet radiation.

Only occasional good results are obtained with artificial ultraviolet radiation, and in these instances improvement might have been due to other factors. Many patients have a low tolerance for radiant heat and appear to be made worse with small doses of ultraviolet radiation. Amounts sufficient for erythema are likely to precipitate an exacerbation.

*Eczema seborrheicum* (dermatitis seborrheica) presumably a bacterial, rather polymorphous type of eczema in its most simple form may consist of dandruff, a few scaly patches on the face and ears, or excessive oiliness of the face and scalp. The more severe eruptions consist of exudative and crusted patches on the head, scaly patches and patches of follicular papules on the trunk, and erythematous scaly patches under pendulous breasts and in the pubic and crural regions. It is often difficult to differentiate between seborrhea, dermatophytosis and psoriasis. Occasionally ultraviolet radiation appears to give good results, especially erythema doses for chronic dry patches, but in general it may be stated that ultraviolet radiation has not been of much service in the management of this form of eczema.

*Eczema hemostaticum* (dermatitis hemostatica) generally occurs on the legs of elderly persons and is due primarily to poor local circulation caused by varicose veins, cardiovascular disturbances, renal inefficiency, tight circular garters and so on. Additional causes are scratching and infection with pyogenic organisms. The principal treatment consists in support for the circulation (elastic stockings) and the correction of constitutional disturbances. Ultraviolet radiation appears to be of benefit for the indolent ulcers that so often complicate the disorder and it may be of service when the skin is considerably thickened. On the whole, however, ultraviolet radiation is not efficacious for this type of eczema.

*Intertrigo* is an erythema occurring in locations where the parts are in contact (axillas, crural region) and is due to friction, heat and unhygienic conditions. Dermatitis, with edema, exudation and crusting, may develop (eczema intertrigo). Differentiation must be made from dermatophytosis. Ultraviolet rays have been used for recurrent eruption with questionable results.

The term infantile eczema signifies no more than eczema occurring in an infant. Usually such eczema is one of the enumerated types or a combination of two types. So far as concerns ultraviolet there are no special indications other than those found throughout the section dealing with eczema.

Many dermatologists claim that ultraviolet rays are useful for many varieties of eczema and in selected cases this is possibly true, but in general terms American dermatologists agree that ultraviolet radiation is not of much value in this disease. It is not indicated in acute eczema. General body irradiation may be of some value in selected cases of chronic eczema. At times, any agent that will evoke hyperemia in a patch of chronic squamous eczema will hasten recovery. Ultraviolet radiation may be used for this purpose, however, judgment is required or the condition is apt to get worse instead of better. Such treatment may be successful but the physician is taking a risk.

*Psoriasis*, *Parapsoriasis*, *Dermatitis Exfoliativa*, *Lichen Planus*. In psoriasis, ultraviolet radiation in amounts sufficient to cause erythema, applied to the individual lesions about once a week, will at times promote resolution. Such treatment, however, is not particularly efficacious and if the erythema involves the normal skin, the lesion may spread over the entire area of erythema.

Daily heliotherapy to the entire body irrespective of the location of the eruption or daily general body irradiation with artificially produced ultraviolet rays, is thought by many dermatologists to be of value. It is advisable to avoid erythema because the too vigorous treatment of psoriasis, especially the more acute types, may favor the development of dermatitis

*exfoliativa*. In fact, radiation is contraindicated in the acute types. If general body irradiation is proved to be of real value, it would seem to be a particularly favorable treatment for children. Goeckerman and O'Leary's coal tar technique appears to have given better results in psoriasis than the use of ultraviolet radiation alone. This consists in applying a 3 per cent crude coal tar ointment at night. The next morning the ointment is wiped off. This is followed by irradiation of the entire body after which a bath may be taken. When possible, the treatment is given daily. The most that can be hoped for in psoriasis is control of the disease, it cannot be cured.

Remissions in parapsoriasis, an incurable disease, have been reported with erythema doses of ultraviolet radiation. There are several types of the disease, only two of which have at the present writing responded temporarily to the treatment—the papular and the plaque or patch types.

Ultraviolet radiation has not been found useful in dermatitis exfoliativa.

*Pruritus*, *Prurigo*.—Ultraviolet radiation is recommended by some for the various types of essential pruritus—pruritus ani, pruritus vulvae, so called senile pruritus—but the majority of dermatologists have not been favorably impressed with the results. Erythema doses may increase the pruritus.

Ultraviolet rays have been advocated for the relief of pain associated with diseases such as zoster. They appear to be of little service for this purpose.

*Prurigo nodularis* does not yield well to ultraviolet rays, although a few apparently satisfactory reports have been published. The same statement applies to prurigo mitis and prurigo ferox.

*Diseases of the Appendages*.—In hyperhidrosis, ultraviolet radiation is not usually effective.

Although pompholyx is thought by some to be an entity, the majority appear to believe that it is a variety of dermatophytosis or dermatophytid. Often it is but a transient eruption. In any event, ultraviolet ray treatment has proved disappointing.

*Alopecia* may be divided into alopecia areata and alopecia prematura. The first consists of circumscribed bald patches on the scalp or face. In some instances the entire scalp, the face and even the trunk and extremities may be involved—alopecia totalis. The cause is not known. It may be endocrinologic or neurogenic.

*Alopecia prematura* may be divided into cases caused by seborrhea capitis (alopecia seborrheica) caused by systemic disturbances such as acute febrile diseases, chronic systemic disorders, neurogenic factors (alopecia systemica) and those cases for which no cause can be found except a family history of early baldness (alopecia idiopathica or hereditaria).

Although ultraviolet radiation has been used extensively by a large number of dermatologists and others in the treatment of all types of alopecia, there is now fairly general agreement that ultraviolet radiation is in no sense a specific that it is not a hair grower. In amounts insufficient to produce erythema it appears to be useless. Quantities sufficient for vigorous hyperemia probably do no more than hyperemia evoked by any agent—phenol for instance. If this is conceded, ultraviolet radiation may be considered to be a useful adjunct for the treatment of alopecia areata and the several types of alopecia prematura. It is not improbable that recovery in many cases of alopecia areata is spontaneous. The prognosis in alopecia idiopathica is unfavorable. If proper attention is given to the constitutional disturbances in cases of alopecia systemica, the prognosis is excellent. Early cases of alopecia seborrheica respond favorably to topical applications. Finally, it may be stated that all types of alopecia can be handled as successfully without as with ultraviolet radiation.

*Tuberculosis of the Skin and Allied Conditions*.—*Lupus Vulgaris*. *Lupus vulgaris* is definitely benefited by treatment with ultraviolet rays. A great deal of time and patience is required but the results often reward the effort. A combination of generalized and localized ultraviolet radiation yields the best results in the treatment of this condition. Excellent results by careful exposure of the entire body to sunlight have been obtained. Concentrated carbon arc light therapy by the Finzen method gives the best results as far as concerns regional treat-

ment Beneficial results also may be obtained with the water cooled quartz arc lamp, especially when it is possible to dehematize the area by pressure with the quartz frontpiece on the lamp. Dehematization may be obtained also with local injections of epinephrine, but the results are not as good as with compression. The dose must be heavy—several or many times the erythema dose at each sitting. Of course the reaction is severe, and the treatment is not repeated until the reaction has disappeared.

Such large doses require from five to twenty minutes. Since only a small area (a square inch or two) is covered in one exposure, a great deal of time is required for the treatment of extensive eruptions.

There is enough reliable clinical evidence available to give substantial support to the belief that daily general body irradiation with an air cooled quartz mercury arc lamp is of real value. Solar radiation of the entire body probably gives better results. Such treatments may have to be continued for several or many months. Ultraviolet therapy may be combined with general systemic treatment including bed rest and with such treatment as tuberculin injections, high vitamin well balanced adequate diet and, if proper precautions are taken with roentgen treatment. It is not, of course, possible to cure all cases. A number of complications, such as tuberculous lymphangitis and visceral tuberculosis may prevent the patient from reacting favorably to any treatment.

**Lupus Miliaris Dissemminatus** As far as is known this type of true cutaneous tuberculosis has not been treated with ultraviolet rays. The eruption is likely to disappear spontaneously in a few months.

**Lupus Erythematosus** Apparently radiation is not of much value in this condition. At times, discoid patches may be benefited with erythema doses of ultraviolet rays applied directly to the lesions. However, these patches may be made worse by such treatment. General body irradiation was formerly used, but there is sufficient evidence to indicate that erythema is followed at times by the precipitation of disseminate lupus erythematosus. Radiation was used more in former years than at present. General ultraviolet radiation in cases of lupus erythematosus not only yields poor results but may cause dangerous sequelae. Therapy with gold salts and with bismuth has given such satisfactory results that other therapeutic methods are used mostly as adjuvants in selected cases.

**Tuberculosis Orificialis** Good results may be obtained with ultraviolet irradiation in cases of tuberculosis of the orificial mucous membranes. However, when the desired result is not obtained in a reasonable time, other local methods such as x-rays, grenz rays and the electric cautery or surgical diathermy, should be seriously considered. Most orificial tuberculosis is secondary to involvement of the viscera and general medical attention is required.

**Tuberculosis Verrucosa Cutis** (wartlike tuberculosis of the skin, verruca necrogenica, anatomic tubercle) Ultraviolet rays have not been found very useful in this disease.

**Scrofuloderma** Satisfactory results have been obtained in many cases of scrofuloderma with and without tuberculous adenitis. The best treatment appears to be adequate attention to the general health, a suitable diet, tuberculin injections and daily general body irradiation with either solar radiation or artificial ultraviolet radiation. Locally applied ultraviolet radiation alone fails. Stubborn cases in which there is an underlying suppurating tuberculous focus (glands, bones) may require surgical intervention.

**Erythema Induratum** (Bazin's disease) The local application of ultraviolet radiation is of questionable service. These patients should be handled from a general medical standpoint—rest, light exercise, diet and general body irradiation (solar or artificial ultraviolet radiation).

**Sarcoid** Thus far, ultraviolet radiation has not been shown to be of real service in the management of the two types of sarcoid (Boeck type and Darier-Roussy type). Statements made under the headings of Bazin's disease and sarcoid apply also to that apparent variant of these conditions, periphlebitis nodularis necroticans.

**Granuloma Annulare** Ultraviolet rays appear to be of little if any value in this disease.

**Tuberculid** Papulonecrotic tuberculids exhibit eruptions which are usually widespread and bilateral and are characterized by remissions and exacerbations. In some cases generalized ultraviolet radiations seem to shorten the course of the disease and in others radiation seems to have no effect. The treatment of lupus pernio with ultraviolet radiation is ineffectual.

**Nevus Araneus** Spider nevus can be eradicated with blistering doses of ultraviolet radiation, but electrolysis is a much better method.

**Nevus Flammeus** Port wine marks are exceedingly difficult to eradicate. Blistering doses of ultraviolet radiation administered by the water cooled quartz mercury arc lamp with compression may occasionally improve very faint nevi of this type and may reduce the color of more pronounced lesions.

Other types of vascular nevi and the pigmented nevi do not respond favorably to ultraviolet ray treatment.

**Adenoma Sebaceum** Good results with blistering doses of ultraviolet radiation have been obtained in this disorder usually with the water cooled quartz mercury arc lamp with compression.

**Telangiectasia** This condition, when occurring as a sequel to roentgen or radium treatment, can be improved with ultraviolet radiation. Either the water cooled or air cooled lamp at a distance may produce satisfactory results. As pointed out by Hazen and by C. Guy Lane, x-ray and radium skin has a low toleration for such radiation. Therefore, the initial dose should be small. As a rule, it requires from one to several erythema doses or even blistering doses to destroy the capillaries. It is best not to treat with strong doses of ultraviolet rays most cases of radiodermatitis as too vigorous treatment may in some severe cases cause the tissue to ulcerate. It is difficult to obtain the correct amount of vascular destruction. When the treatment is too vigorous, the treated area is likely to be too white and also the atrophy caused by the x-rays or radium becomes more visible.

**Miscellaneous Cutaneous Disorders**—**Dermatitis Herpetiformis and Pemphigus** There have been numerous reports of good results with general body irradiation with ultraviolet rays in cases of dermatitis herpetiformis and chronic pemphigus. However, others are not convinced that the radiation is of value for the purpose. Evaluation is difficult because these diseases are characterized by exacerbation and remission.

**Scleroderma** Ultraviolet radiation has been advocated for scleroderma both local applications and general body irradiation being used. The results have been very discouraging.

**Milia** Ultraviolet rays have been tried in a few cases and have not proved beneficial.

**Pityriasis Rosea** Ultraviolet radiation has been found useful for shortening the course of pityriasis rosea. One dose, sufficient to cause erythema and exfoliation, may suffice to clear up the eruption. Apparently it is the exfoliation that effects the cure. It is advisable to avoid too severe an erythema, especially for the first dose in severe cases. It is customary to give a suberythema dose at the first sitting to determine toleration. A few days later a full erythema dose may be given. The natural course of this self-limited disease is from one to three months. Subjective symptoms usually are mild or absent and the eruption seldom attacks the face or other exposed parts. For these reasons most patients prefer to avoid the discomfort that is likely to be associated with a widespread sunburn. In some cases of pityriasis rosea the eruption is severe, inflammatory and subjective symptoms are annoying and it is doubtful whether ultraviolet radiation is indicated.

**Leukoderma** The literature contains many reports of good results in the treatment of this disease with local applications or erythema doses of ultraviolet rays with and without general body irradiation. The modern dermatologic consensus is that the method is almost if not completely, useless. As a rule such treatment is likely to make the areas more conspicuous because the white areas do not tan while the surrounding areas become very dark. Recently, occasional satisfactory results have been obtained by painting the white areas with oil of bergamot and applying ultraviolet radiation in quantities sufficient to evoke erythema.

(To be continued)

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**Tuberculosis of the Skin and Allied Conditions.**—**Lupus Vulgaris.** **Lupus vulgaris** is definitely benefited by treatment with ultraviolet rays. A great deal of time and patience is required but the results often reward the effort. A combination of generalized and localized ultraviolet radiation yields the best results in the treatment of this condition. Excellent results by careful exposure of the entire body to sunlight have been obtained. Concentrated carbon arc light therapy by the Finsen method gives the best results, as far as concerns regional treat-

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Such large doses require from five to twenty minutes. Since only a small area (a square inch or two) is covered in one exposure, a great deal of time is required for the treatment of extensive eruptions.

There is enough reliable clinical evidence available to give substantial support to the belief that daily general body irradiation with an air cooled quartz mercury arc lamp is of real value. Solar radiation of the entire body probably gives better results. Such treatments may have to be continued for several or many months. Ultraviolet therapy may be combined with general systemic treatment including bed rest and with such treatment as tuberculin injections, high vitamin well balanced adequate diet and, if proper precautions are taken, with roentgen treatment. It is not, of course, possible to cure all cases. A number of complications, such as tuberculous lymphangitis and visceral tuberculosis, may prevent the patient from reacting favorably to any treatment.

**Lupus Miliaris Disseminatus** As far as is known, this type of true cutaneous tuberculosis has not been treated with ultraviolet rays. The eruption is likely to disappear spontaneously in a few months.

**Lupus Erythematosus** Apparently radiation is not of much value in this condition. At times, discoid patches may be benefited with erythema doses of ultraviolet rays applied directly to the lesions. However, these patches may be made worse by such treatment. General body irradiation was formerly used, but there is sufficient evidence to indicate that erythema is followed at times by the precipitation of disseminate lupus erythematosus. Radiation was used more in former years than at present. General ultraviolet radiation in cases of lupus erythematosus not only yields poor results but may cause dangerous sequelae. Therapy with gold salts and with bismuth has given such satisfactory results that other therapeutic methods are used mostly as adjuvants in selected cases.

**Tuberculosis Orificialis** Good results may be obtained with ultraviolet irradiation in cases of tuberculosis of the orificial mucous membranes. However, when the desired result is not obtained in a reasonable time, other local methods, such as x-rays, grenz rays and the electric cautery or surgical diathermy, should be seriously considered. Most orificial tuberculosis is secondary to involvement of the viscera, and general medical attention is required.

**Tuberculosis Verrucosa Cutis** (wartlike tuberculosis of the skin, verruca necrogenica, anatomic tubercle) Ultraviolet rays have not been found very useful in this disease.

**Scrofuloderma** Satisfactory results have been obtained in many cases of scrofuloderma with and without tuberculous adenitis. The best treatment appears to be adequate attention to the general health, a suitable diet, tuberculin injections and daily general body irradiation with either solar radiation or artificial ultraviolet radiation. Locally applied ultraviolet radiation alone fails. Stubborn cases in which there is an underlying suppurating tuberculous focus (glands, bones) may require surgical intervention.

**Erythema Induratum** (Bazin's disease) The local application of ultraviolet radiation is of questionable service. These patients should be handled from a general medical standpoint—rest, light exercise, diet and general body irradiation (solar or artificial ultraviolet radiation).

**Sarcoid** Thus far, ultraviolet radiation has not been shown to be of real service in the management of the two types of sarcoid (Boeck type and Darier-Roussy type). Statements made under the headings of Bazin's disease and sarcoid apply also to that apparent variant of these conditions, periphlebitis nodularis necroticans.

**Granuloma Annulare** Ultraviolet rays appear to be of little if any value in this disease.

**Tuberculid** Papulonecrotic tuberculids exhibit eruptions which are usually widespread and bilateral and are characterized by remissions and exacerbations. In some cases generalized ultraviolet radiations seem to shorten the course of the disease and in others radiation seems to have no effect. The treatment of lupus pernio with ultraviolet radiation is ineffectual.

**Veni**—**Nevus Araneus** Spider nevi can be eradicated with blistering doses of ultraviolet radiation, but electrolysis is a much better method.

**Nevus Flammeus** Port wine marks are exceedingly difficult to eradicate. Blistering doses of ultraviolet radiation, administered by the water cooled quartz mercury arc lamp with compression, may occasionally improve very faint nevi of this type and may reduce the color of more pronounced lesions.

Other types of vascular nevi and the pigmented nevi do not respond favorably to ultraviolet ray treatment.

**Adenoma Sebaceum** Good results with blistering doses of ultraviolet radiation have been obtained in this disorder usually with the water cooled quartz mercury arc lamp with compression.

**Telangiectasia** This condition when occurring as a sequel to roentgen or radium treatment, can be improved with ultraviolet radiation. Either the water cooled or air cooled lamp at a distance may produce satisfactory results. As pointed out by Hazen and by C. Guy Lane, x-ray and radium skin has a low toleration for such radiation. Therefore the initial dose should be small. As a rule, it requires from one to several erythema doses or even blistering doses to destroy the capillaries. It is best not to treat with strong doses of ultraviolet rays most cases of radiodermatitis as too vigorous treatment may in some severe cases cause the tissue to ulcerate. It is difficult to obtain the correct amount of vascular destruction. When the treatment is too vigorous the treated area is likely to be too white and also the atrophy caused by the x-rays or radium becomes more visible.

**Miscellaneous Cutaneous Disorders**—**Dermatitis Herpetiformis** and **Pemphigus** There have been numerous reports of good results with general body irradiation with ultraviolet rays in cases of dermatitis herpetiformis and chronic pemphigus. However others are not convinced that the radiation is of value for the purpose. Evaluation is difficult because these diseases are characterized by exacerbation and remission.

**Scleroderma** Ultraviolet radiation has been advocated for scleroderma, both local applications and general body irradiation being used. The results have been very discouraging.

**Milia** Ultraviolet rays have been tried in a few cases and have not proved beneficial.

**Pityriasis Rosea** Ultraviolet radiation has been found useful for shortening the course of pityriasis rosea. One dose, sufficient to cause erythema and exfoliation, may suffice to clear up the eruption. Apparently it is the exfoliation that effects the cure. It is advisable to avoid too severe an erythema, especially for the first dose in severe cases. It is customary to give a sub-erythema dose at the first sitting to determine toleration. A few days later a full erythema dose may be given. The natural course of this self-limited disease is from one to three months. Subjective symptoms usually are mild or absent and the eruption seldom attacks the face or other exposed parts. For these reasons most patients prefer to avoid the discomfort that is likely to be associated with a widespread sunburn. In some cases of pityriasis rosea the eruption is severe, inflammatory and subjective symptoms are annoying, and it is doubtful whether ultraviolet radiation is indicated.

**Leukoderma** The literature contains many reports of good results in the treatment of this disease with local applications of erythema doses of ultraviolet rays with and without general body irradiation. The modern dermatologic consensus is that the method is almost, if not completely useless. As a rule, such treatment is likely to make the areas more conspicuous because the white areas do not tan while the surrounding areas become very dark. Recently, occasional satisfactory results have been obtained by painting the white areas with oil of bergamot and applying ultraviolet radiation in quantities sufficient to evoke erythema.

# THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY JANUARY 9 1943

## ANNUAL DUES NOW PAYABLE

In this issue of THE JOURNAL a colored slip is inserted! Fellows of the A M A and subscribers may use it to remit now. Fellowship dues and subscription are payable in advance. The use of the colored slip at this time will save the Association the expense of postage and clerical effort incurred by sending personal bills to each Fellow and subscriber. The slip, when folded, forms an envelop already addressed and postpaid. Names and subscription prices of all the special journals published by the Association, as well as *Hygeia*, the Health Magazine, are included on the slip. Remittance for any of these other publications may be conveniently included with the amount sent for the annual dues. Those who have already paid will, of course, disregard the colored slip.

## PLANNING FOR POSTWAR MEDICAL CARE

Probably few other groups have more interest in the problems concerned in planning for the postwar world than has the medical profession. Many surveys already indicate a general agreement that the provision of optimum health through the widest possible application of the principles of preventive medicine and the treatment of disease and through the best possible distribution of medical services are considered by most of those consulted to be among the first problems to be given consideration. Even satisfactory nutrition for those portions of the world which have already begun starving must in itself depend on medical diagnosis as to the nature of the malnutrition and the means to be followed for nutritional improvement. Few of the suggestions thus far made for constituting suitable

agencies for the study and control of postwar problems have indicated the necessity for dependence on sound medical advice and administration. Such proposals as have come have been the fruit of considerations by economists and statesmen. In Great Britain a medical advisory commission for the minister of health has just been established, it includes the leaders of all the recognized national medical organizations together with Lord Dawson of Penn and Sir Thomas Horder, whose positions in relationship to medical care of the royal family are well known. One wonders why so many years elapsed before the minister of health was given such assistance.

The Beveridge report which has been widely discussed editorially in many newspapers and periodicals in this country, has only recently become available for consideration. Its medical aspects are elucidated in the correspondence from London in this issue of THE JOURNAL. Sir William Beveridge's recommendations are essentially an expansion of Britain's present system of social insurance involving a state paid medical service for all regardless of individual financial status. Medical planning is a function of a special committee of the British Medical Association, the *Lancet* has published a condensation of the report of an independent, anonymous planning group of some two hundred British physicians, separate proposals have also been made in England by the medical communist and other independent agencies. What will come of all these proposals is difficult to conjecture. Presumably all the plans and planning will be tossed into the parliamentary hopper, where any ultimate proposal will have to be subjected to the strainer of the financial considerations. Sir William Beveridge pointed out that his recommendations are concerned 'not with increasing the total wealth of the British people but with distributing whatever wealth is available.' Great Britain is still operating on deficit finance. As was pointed out by the *Pittsburgh Press*, there is little security in red ink. Wealth has to be created before it can be distributed.

In the United States various agencies have been considering the problems of postwar planning. At a meeting of the Committee on War Participation of the American Medical Association (reported elsewhere in this issue) President-Elect James E. Prullin called attention of the committee to the necessity for participation in planning and urged the establishment of some suitable special agencies in the American Medical Association for this purpose. These matters may well come before the House of Delegates at its next session.

A special committee including representatives of the Social Security Board, has made a preliminary report to the President, and another committee appointed by the American Council on Public Affairs, has developed a statement on security as it relates, among other things, to health. These publications have apparently aroused

but little public interest. We in this country are, of course, also concerned with the situation from a financial point of view. As the *Pittsburgh Press* pointed out, the United States government also is operating on deficit finance. "Our public debt has just passed the 100 billion mark.

The social security taxes we have paid into the social security fund have been lent to the government and have been spent."

Various reports emanating from sources in Washington indicate that neither the Senate Committee on Finance nor any of the other agencies which might be concerned with these matters are inclined to expansion of social security legislation at this time. Nevertheless such considerations must come eventually. When they do come, the extent to which the Social Security Act covers the administration of preventive medicine and medical service will be a matter of utmost importance to the medical profession.

Some fundamental concepts should be kept constantly before us. Most important is a realization that conditions in the United States are different from those in any other nation in the world. It would be the height of folly for us to approach this problem with the view that techniques established as suitable in other nations would be equally suitable for us. The American democracy differs, even in its essentials, from the other great democracies. Any technique developed for medical service in this country should be adaptable to the maintenance of the American democracy. The nature and quality of medical service in the United States have always differed from those of other nations. The scale of living of the American people has been of a quality far superior to that generally available elsewhere in the world. Obviously any new techniques that are developed for wider distribution of medical service should not contemplate a considerable depreciation of quality in order to attain wider distribution.

The platform adopted by the American Medical Association urges the principle of local control with financial aid from state and federal sources as needed to accomplish the objectives that are sought. The soundness of this principle as it relates to the functioning of the American democracy cannot be questioned.

Finally comes the principle of free choice. The very basis of the American democracy is free choice. Free choice of the school one attends, the newspaper one reads, the church in which one worships, the store in which one makes one's purchases, the car in which one rides, the bank in which one keeps one's funds, the hospital in which one receives hospital care, the physician and the lawyer whom one consults. Careful reading of the Beveridge plan indicates that such considerations have not seemed particularly to be the concern of those who approach the problems of medical care wholly from a social or economic point of view. Unless

medical care is approached primarily from the medical point of view, the result will inevitably be interference with the progress of medical science and depreciation of the quality of medical service.

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#### SELECTIVE SERVICE DEFERMENT OF PHYSICIANS, MEDICAL STUDENTS AND PREMEDICAL STUDENTS

Under the heading of Medicine and the War in this issue of *THE JOURNAL* appears a bulletin issued by the national headquarters of the Selective Service System to all Selective Service boards. Careful reading will indicate the exact status of physicians, medical students and premedical students at this time in relation to the *Selective Service*.

The Directing Board of the Procurement and Assignment Service, recognizing the necessity for maintaining a continuous supply of qualified young men for training in medicine, has just adopted the following recommendation:

In order to reserve for the study of medicine, dentistry and veterinary medicine certain students of superior ability and already partially prepared in their training who in the normal course of events, would be inducted by Selective Service for general military service before the proposed Collegiate Training Corps is established, the Directing Board of the Procurement and Assignment Service recommends that accredited medical dental and veterinary medical schools give consideration to the early acceptance of qualified premedical, pre-dental and pre-veterinary students for classes to be admitted in the calendar year in 1944, as well as in 1943.

Students so accepted should be clearly qualified and desirable for training in these professional fields. These students if not in an Army or Navy Reserve Corps should be recommended for deferment to their Selective Service boards and these recommendations carried to appeal boards if necessary. Such deferments should be only for the limited period until the proposed Collegiate Training Corps becomes operative. Vacancies in these classes after these advance selections should be filled at a later date.

Students who are accepted for medical schools in accordance with these recommendations will be in a favorable position for deferment by the Selective Service System. It will be observed that premedical students in good standing, who have completed one or more years of premedical work, are recommended by the national headquarters of the Selective Service System for deferment by local boards. Acceptance by a medical school, as suggested, should therefore make it possible to secure deferment for well qualified and particularly desirable premedical students irrespective of their year in college. Indication by the medical schools that certain students are acceptable for admission will provide helpful information to the Army and Navy boards which will be responsible for selecting students to be assigned by them for continuance of premedical training in the proposed Collegiate Training Corps.



## Current Comment

### PHYSICIANS NEEDED AS REPLACEMENTS IN CIVILIAN SERVICE

Every physician may well take pride in the manner in which the medical profession has responded to the nation's call for service. More than one month ahead of schedule the medical profession voluntarily met the procurement objectives (quotas) of the Army and Navy. The response to calls for service continues, through the Procurement and Assignment Service carefully considered scientific planning of future procurement objectives has been formulated. The willingness of physicians to enlist before quotas were established greatly reduced the number of remaining physicians in some areas. Already three hundred and five older physicians have been voluntarily relocated to new areas as a part of their contribution to the war effort. Opportunities still remain for service in critical areas, boom towns and large industrial organizations in the replacement of those physicians who have gone or who are willing to go into the armed forces. Younger physicians, those under 37 years of age who are physically disqualified for the armed services, are urgently needed. Total war means total effort of every individual for victory. Physically disqualified physicians under 37 years of age may be most effective in the war effort by offering their services to the Procurement and Assignment Service. The state committee of the Procurement and Assignment Service in each state will discuss the arrangements and opportunities for this service with those who volunteer.

### MEDICAL SOCIETY HONORS CITIZENS

A novel method for interesting the public in health matters has been developed by the Lake County (Ind.) Medical Society.<sup>1</sup> It has established an award which bears the name of the late Dr. Thomas Oberlin of Hammond, Ind., a charter member of the Lake County Medical Society and for forty-three years a leader in Lake County medical circles. Dr. and Mrs. Oberlin were killed in an automobile accident in March 1941. Four citizens of Lake County were selected by the Lake County Medical Society to receive the Oberlin award. Each of these received a handsome silver plaque in recognition of distinguished service for public health. The four citizens selected for this honor on the first occasion of its award included the editor of the *Gary Post-Tribune* and the editor of the *Hammond Times*. Each newspaper was cited for its "individual and always uncompensated" contributions to the health of the people of Lake County. These contributions, according to the committee on awards, were "impossible to list because the history of these contributions is as long as the history of these great institutions." Another award was given to the president of the Lake County council for his work in combating tuberculosis as president of the Lake County Tuberculosis Association since 1936. A posthumous award to a prominent industrialist was given in recognition of his services as "a dynamic force in the interest of

the health and welfare of the people of this (Lake) county." The establishment of this award recognizes the joint interest of medical and lay groups in public health. The choice of an industrialist, a voluntary health worker and two newspaper editors for the first award is a recognition of the value of community cooperation. Such projects as this and county accreditation, an individual award system established in Minnesota for the control of tuberculosis, typify public health progress in the American spirit with local initiative and community cooperation paving progress.

### MEDICAL JOURNALS AND MEDICAL PROGRESS

Evaluation of the periodical literature of medicine is difficult. Casey<sup>2</sup> has presented an evaluation of the medical periodical literature by means which he believes to be unique and which apparently allow satisfactorily for important variables. The study reported is based on the number of references to British and American periodicals during the first three months of 1934 in the American and British medical literature. First in this list is *THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION*, followed in the second, third and fourth positions by the *Journal of Biological Chemistry*, the *Journal of the American Chemical Society* and the *American Journal of Physiology* respectively. The *Lancet* and the *British Medical Journal* appear in the tenth and eleventh positions. As Casey points out, the hundred journals tabulated were exerting in 1934 the greatest influence on general medical progress, although this influence could have been good, bad or indifferent. Of considerable interest is the evidence that periodicals in the fields of physiology, chemistry and mathematics were then (and are now according to a recent check) playing a large part in current medical progress.

### UNSCIENTIFIC SCIENCE SERVICE

In a bulletin issued by Science Service, Washington, D. C., published Dec. 18, 1942 in *Science* magazine, appear the following two paragraphs:

A hint that the shortage of doctors is already affecting the national health picture may be found in the death rate for eighty-eight large cities. For the week ending December 5, the latest on which figures are available this took a big jump, to 135 per 1,000, although there are no signs of epidemics.

With no epidemic and no reports so far of a more virulent type of pneumonia or influenza the only suggested explanation for the increased death rate is lack of medical care resulting from the shortage of physicians.

The inference based on the evidence available discredits the use of even the word science in the service that takes the responsibility for such statements. Observe that figures for one week only are concerned and this without relationship to any evaluation of the usual increased prevalence of respiratory and infectious diseases at this season, the movement of great numbers of people, the changing virulence of disease, and innumerable other factors.

<sup>2</sup> County Accreditation—A New Deal in Human Tuberculosis Control. Current Comment J. A. M. A. 120:128 (Sept. 12) 1942.

<sup>1</sup> Casey, Albert E. Influence of Individual North American and British Journals on Medical Progress in the United States and Britain. Bull. M. Library A. 30:464 (Oct.) 1942.

<sup>1</sup> Medical Honor Four with Health Award. *Gary Post-Tribune*, Dec. 11, 1942.

# MEDICINE AND THE WAR

*In this section of The Journal each week will appear official notices by the Committee on War Participation of the American Medical Association, announcements by the Surgeon Generals of the Army, Navy and Public Health Service, and other governmental agencies dealing with medicine and the war and such other information and announcements as will be useful to the medical profession*

## SELECTIVE SERVICE BULLETIN ON PHYSICIANS, DENTISTS, VETERINARIANS, OSTEOPATHS, STUDENTS AND PREPROFESSIONAL STUDENTS

The following bulletin has been circulated under date of Dec 14, 1942 by the national headquarters of the Selective Service System to all secretaries of service boards

**1 Persons Qualified**—There are certain persons trained, qualified or skilled in the practice of medicine, dentistry, veterinary medicine and osteopathy who, if engaged in the practice of their respective professions, are in a position to perform vital service in activities essential to war production and to the support of the war effort and in activities the maintenance of which is necessary to the health, safety and welfare of the nation

**2 Critical Occupations**—The War Manpower Commission has certified that in the practice of medicine, dentistry, veterinary medicine and osteopathy, and in training and preparation therefor, there are critical occupations which, for the proper discharge of the duties involved, require a high degree of training, qualification or skill. In the accompanying tabulation is a list of 'critical occupations' in medicine, dentistry, veterinary medicine, and osteopathy

**3 Consideration of Occupational Classification**—The War Manpower Commission has certified that there are serious shortages of persons trained, qualified or skilled to engage in these critical occupations. Accordingly, careful consideration for occupational classification should be given to all persons trained, qualified or skilled in these critical occupations and engaged in activities essential to the health, safety and welfare necessary to war production and essential to the support of the war effort, and persons in training and preparation therefor

**4 Students in Preprofessional Training**—A registrant who is in training and preparation as a premedical, pre-dental, preveterinary or preosteopathic student, pursuing courses in liberal arts or sciences in a recognized university or college may be considered for occupational deferment after completion of his first academic year in such preprofessional course, and thereafter if he is a full time student in good standing, if he continues to maintain good standing in such course of study and if it is certified by the institution that he is competent and that he gives promise of successful completion of such course of study and acquiring the necessary degree of training, qualification or skill

**5 Students in Professional Schools**—A registrant who is in training and preparation as a medical, dental, veterinary or osteopathic student in a recognized medical school, dental school, school of veterinary medicine or school of osteopathy shall be considered for occupational classification during the period of such professional course, provided he is a full time student in good standing, he continues to maintain good standing in such course of study and if it is certified by the institution that he is competent and that he gives promise of the successful completion of such course of study and acquiring the necessary degree of training, qualification or skill to become a recognized medical doctor, dentist, doctor of veterinary medicine or osteopath

**6 Interns**—A registrant who has completed his preprofessional and professional training and preparation as a medical doctor, dentist or osteopath, and who is undertaking further studies in a hospital, institution or dental clinic giving a recognized internship, shall be considered for occupational classification so long as he continues the internship but for a period not to exceed one complete year

**7 Opportunity to Engage in Profession**—When a registrant has completed his training and preparation in a recognized col-

lege or university, or in a recognized hospital, institution or dental clinic, and has acquired the high degree of training, qualification or skill in one of these professional fields, such registrant should then be given the opportunity to become engaged in the practice of his profession in the armed forces or in a civilian activity necessary to the public health, safety or welfare necessary to war production, or essential to the support of the war effort. In many instances following graduation from a recognized college or university, or the completion of an internship, a certain period of time will be required in the placing of such persons in an essential activity. When a registrant has

### *Critical Occupations Medical, Dental, Veterinary and Osteopathic*

Preprofessional student after completion of his first academic year in such preprofessional course

Premedical  
Pre-dental  
Preveterinary  
Preosteopathic

Professional students during full professional course following completion of preprofessional course

Medical  
Dental  
Veterinary  
Osteopathic

Intern in hospital, institution or dental clinic giving recognized internship following completion of professional studies

Medical interns  
Dental interns  
Osteopathic interns

Persons engaged in practice of their respective professions

Medical doctors  
Dentists  
Doctors of veterinary medicine (engaged in care of animals raised and maintained for work or food or in the inspection of meat food products)  
Osteopaths

been deferred as a necessary man in order to complete his training and preparation, it is only logical that his deferment should continue until he has had an opportunity to put his professional training and skill to use in the best interest of the nation. Accordingly, following graduation in any of these professional fields or following an internship, a registrant should be considered for further occupational classification for a period of not to exceed sixty days in order that he may have an opportunity to engage in a critical occupation of his profession in the armed forces, war production, support of the war effort or in an activity essential to civilian health, safety or welfare provided that during such period the registrant is making an honest and diligent effort to become so engaged

**8 Deferment Permitted Whether or Not Commission is Pending**—The official statement of any recognized premedical, pre-dental, preveterinary or preosteopathic college or university, the official statement of any recognized medical, dental, veterinary or osteopathic college or university, or the official statement of any hospital, institution or dental clinic giving a recognized internship showing that a registrant satisfied the requirements of this bulletin shall be sufficient for the consideration of such registrant for occupational classification on occupational grounds solely. Registrants will be considered for

occupational classification as prescribed in this bulletin without regard for the fact that a commission in the armed forces may be granted to him or is pending

9 *Procurement and Assignment Service*—In order that every doctor, dentist or veterinarian may render the greatest professional service to the nation the President has created the Procurement and Assignment Service for the purpose of gathering information with respect to the supply of qualified medical doctors, dentists and doctors of veterinary medicine. To work with headquarters of the Procurement and Assignment Service there have been appointed for each state and the District of Columbia a state chairman for medical doctors, a state chairman for dentists and a state chairman for doctors of veterinary medicine. When considering the classification of any registrant who is a

medical doctor, dentist or doctor of veterinary medicine, the director of Selective Service desires that local boards, through the state director, shall consult with the respective state chairman of the Procurement and Assignment Service.

10 *List of State Chairmen*—Names and addresses of the respective state chairmen of the Procurement and Assignment Service will be provided to state directors from time to time.

11 *Effective Period of This Bulletin*—This bulletin is effective until July 1, 1943, unless sooner amended. During the effective period of this bulletin the War Manpower Commission is giving further study to the training and preparation and utilization of persons trained in these professional fields.

LEWIS B. HEPSTON, DIRECTOR

## WAR PARTICIPATION COMMITTEE

A meeting of the War Participation Committee of the American Medical Association was held on Dec. 14, 1942 at the Mayflower Hotel, Washington, D. C. Those present included the following members of the committee: Walter I. Donaldson, chairman; William R. Molony, Sr., Roger T. Lee, John H. O'Shea, Edward R. Cunniffe, Clyde L. Cummer, James E. Paulin, Olin West, Morris Fishbein and Ernest E. Irons. Others present were R. L. Sensenich, Harvey B. Stone, Harold S. Diehl, Thomas A. Hendricks, Frank H. Lahey, Thomas Parran, Warren F. Draper, J. W. Mountain, C. E. Rice, George Baehr, Maxwell E. Lapham, Mary Switzer, Gerald D. Timmons, William N. Hodgkin, George Anderson, Harold Hertford and Russell A. Sands.

Comdr. Max Lapham stated that there were forty or fifty critical areas which were now being studied by the Procurement and Assignment Service for Physicians, Dentists and Veterinarians. Information concerning such areas comes from a wide variety of sources, including governmental agencies, senators, congressmen, the Federal Housing Commission and medical organizations. A number of physicians have been relocated in some critical areas. The Procurement and Assignment Service was able to retain six physicians from going into military service from Mobile, Ala., since there had been too many withdrawn from that area. Attention was called to the importance of study and revision of licensure laws in order to minimize the difficulties of relocation.

Dr. Frank Lahey pointed out that meetings were being planned in the various corps areas of representatives of the Procurement and Assignment Service, the medical profession and the United States Public Health Service to discuss this problem.

Dr. Thomas Parran stated that there was need for additional personnel in the field of public health. At present the need includes 276 physicians, 650 nurses, 450 sanitarians and 250 laboratory technicians. An agreement had been reached between the Procurement and Assignment Service and the United States Public Health Service, and a memorandum had been sent to the district directors of the United States Public Health Service, under the title "Operating Policy on Matters Relating to Shortages of Medical and Allied Personnel, Relationships with Corps Area and State Procurement and Assignment Officials, and Functions of the Division of States Relations, United States Public Health Service, in this field," as follows:

'1 The U. S. Public Health Service and the Procurement and Assignment Service will jointly undertake studies of war industry and extracantonment areas from which shortages of medical and allied professional personnel are reported.

'(a) These studies shall be made jointly by the appropriate corps area chairman of the Procurement and Assignment Service, state medical and dental chairman of the Procurement and Assignment Service and representatives of the U. S. Public Health Service, either the district director or some one detailed by the district director or by the Surgeon General.

'(b) District directors of the U. S. Public Health Service should take the initiative in contacting state and corps area chairmen of the Procurement and Assignment Service in seeking to arrange for such studies. The Procurement and Assignment Service will take the same initiative if information concerning a critical area comes to its attention first.

'(c) When recommendations are being considered for any area it should be kept in mind that the ratio of 1 active physi-

cian to 3,000 people is considered by the Procurement and Assignment Service and the U. S. Public Health Service as the minimum compatible with war health standards of the civilian population.

'(d) The findings and proposed recommendations of the survey group should be discussed with a representative group of citizens of the area involved before the report is submitted to Washington.

'(e) Recommendations will not always concern additional physicians or dentists but may deal with the possibilities of spreading the services of physicians already in the community by making available some type of auxiliary services such as hospital facilities, nursing services and medical offices and equipment. In other instances the need may be for the expansion of public health facilities.

'(f) Reports of joint studies shall be submitted to the central office of the Procurement and Assignment Service and to the Surgeon General simultaneously and should be signed by the representatives of the Procurement and Assignment Service and the U. S. Public Health Service making the survey. If representatives making the joint report cannot reconcile differences of opinion regarding the recommendations made, these differences should be indicated in the report. Recommendations should be specific and not general as to the plan for meeting the need, including the number of physicians, dentists, auxiliary personnel and facilities.

2 Many situations where shortages exist can be met through local effort by the relocation of physicians living within the state. It is in areas to which physicians must be transplanted from other states that federal assistance most often will be needed.

3 Licensure for doctors moving interstate will be a difficult problem in some states. However, conferences with the Procurement and Assignment Service and state licensing boards may provide means by which out of state physicians may be granted temporary permits to practice medicine in shortage areas for the duration of the emergency.

4 The general counsel's office in an opinion dated July 28, 1942 states that under the authority of title VI Social Security Act the U. S. Public Health Service may detail its personnel to a state to render medical services "provided the public agency to which these officers are detailed has authority under the law of that state to engage in the activities contemplated therein. This arrangement should be used in areas where other means of giving medical care cannot be arranged."

5 The U. S. Public Health Service usually cooperates with state health departments, therefore the question will arise in considering the detail of personnel to cooperate with and assist the state by rendering medical services in war industry and extracantonment areas whether the state health department has the authority to engage in this type of activity. The general counsel's office is of the opinion that most state statutes fail to indicate either positively or negatively what the state health department's responsibility is with regard to this subject. Hence it may be necessary for the state health officer to make an administrative decision concerning this point.

'6 On recommendation of the state health officer and with the approval of the district director after consultation with the state chairman of the Procurement and Assignment Service, personnel now assigned to state health departments under emergency health and sanitation may be assigned to render medical services in areas where shortage exists. In making such assignments district directors will review the total needs in their respective districts and attempt to meet the most urgent ones.

"7 When doing reconnaissance surveys of war industry and extracantonment areas on your own, district directors will concern themselves as in the past, with shortages in such areas of medical and allied personnel

"8 The Community Medical and Dental Service Section has been established in the States Relations Division to serve

"(a) In a liaison capacity between the U S Public Health Service and the Procurement and Assignment board concerning medical care problems in war industry and extracantonment areas

"(b) In an advisory capacity to district directors concerning local plans for providing and utilizing physicians and allied personnel to render medical care

"(c) As a coordinating office with respect to the various medical care interests of the service, other than those dealing with established beneficiaries

"Senior Surg Carl E Rice is in charge of the Community Medical and Dental Service Section. Asst Surg J M Chisolm and Health Administration Specialist Irma M Ringe are also attached to this section

"9 The Community Medical and Dental Service Section should be kept currently advised concerning plans that are being devised and actions taken to alleviate medical care shortages. Such plans may represent the joint efforts of local medical societies, public health departments, hospitals, visiting nursing associations, councils of social agencies and others

"10 The Budget Bureau will consider making special allocations from the President's Emergency Fund for particular areas of need"

There was discussion as to the safe minimum ratio of physicians to population, it was agreed to give further consideration to the statement referring to a ratio of 1 physician to 3000 population. It was also proposed that a representative of the state medical society be added to the group which would recommend assignment of personnel from state health departments to medical service in areas where shortages exist

Dr Frank Lahey called attention to an action of the Procurement and Assignment Service requesting medical periodicals to publish a call for physicians who would be willing to be relocated for the period of the emergency. Dr Harold Diehl reported a compilation of the status of interns and residents at present in hospitals in relation to military service so that the names of those found physically disqualified could be sent to the state chairmen of the Procurement and Assignment Service as men possibly available for location in depleted areas. It has been estimated that about one third of the entire group of interns and residents are women and men who are physically unfit for service with the armed forces

A discussion followed which was concerned with the extent of the authority of the War Manpower Commission in assigning physicians for various agencies and purposes

Dr John O'Shea presented a statement of the situation in the state of Washington, particularly in the city of Vancouver. In this area which houses the Kaiser shipyards, there were normally 2000 people with 20,000 people in the county and from 90 to 100 doctors. It has been estimated that in July 1943 the city will have 157,000 people with 12,000 new homes. The Kaiser company has 19 physicians in its hospital. Bremerton, which is a navy yard city, had 23 physicians. There were 22,000 people and there are now 90,000 people. In Portland the problem is handled by the Portland Medical Service Bureau. In the plant, which is 16 miles from the city of Portland — men are employed. These are the three major problems in the Northwest

Dr William R Molony described the situation in California stating that the California Physicians Service had been working on the problem in Loma Linda and Wilmington. Some 6000 physicians are associated with the California Physicians Service. Special problems were developed in relation to the housing projects in Marin County and Vallejo

At the Lockheed-Vega plant, which has some — employees and which is employing some — new employees each day (mostly women), all employees are examined beforehand and 12 physicians are required who do nothing except make examinations before employment. The shipbuilding yard did not require such examinations because the unions do not agree to have men examined before employment

Special consideration was given to the problem of the total number of physicians to be supplied to the armed forces by the state of California. Dr John O'Shea pointed out that there had

been competition between the Kaiser and Boeing plants for physicians, salaries rising from \$300 a month to \$450 a month. He also gave the figures as to the number of physicians taken from the various large cities of the state of Washington

#### LICENSURE OF PHYSICIANS

Special consideration was given to the problem of licensure of physicians and the possibility of temporary licensure for the period of the emergency. A question was raised as to the effect of such temporary licensure on the basic science laws prevailing in many states

Dr Morris Fishbein pointed out that it would be impossible to control movements of physicians wholly by the effects of publicity regarding the need for men in various areas. He thought it desirable that the War Manpower Commission establish as soon as possible the extent of its authority in controlling the movements of members of the medical profession during the period of the emergency. Dr Roger I Lee suggested that there are many social factors involved related to the relocation of a physician at any time and that economic factors also play a large part

Special consideration also was given to the problem of the refugee doctor. One of the purposes of the temporary licensure procedure was to place some of the well qualified refugee physicians in areas where physicians are greatly needed. Dr Edward R Cumfrie stated that there were perhaps 1,000 such refugees available in New York State for transplantation. Dr Fishbein suggested that inquiry be made in the individual states to determine whether or not such refugees would be acceptable for service in areas in which shortages prevail

Dr Fishbein requested that inquiry be made of the War Manpower Commission to state definitely its jurisdiction over members of the medical profession in various circumstances. For instance: What jurisdiction do they have over men in the draft age which includes interns and residents who are physically disqualified? What jurisdiction over alien physicians? What jurisdiction over physicians above draft age who may wish to be relocated and what jurisdiction over physicians in full time salaried positions and industries? It was suggested that the Procurement and Assignment Service undertake to obtain such a statement

A subcommittee which had been appointed to develop a procedure for determining needs of physicians in war industry and extracantonment areas made the following report

The Public Health Service and the Procurement and Assignment Service will jointly undertake studies of war industry and extracantonment areas from which shortages of medical and allied professional personnel are reported

"(a) These studies shall be made jointly by the appropriate Corps Area Chairman of the Procurement and Assignment Service, state medical and dental chairmen of the Procurement and Assignment Service and representatives of the U S Public Health Service, either the district director or some one detailed by the district director or by the Surgeon General

Also the state medical society and the state health department each will be invited to designate a representative to participate in such studies"

#### PROVISION FOR PREMEDICAL AND MEDICAL STUDENTS

Dr Harold Diehl presented a statement concerning provisions for premedical and medical students and the manner in which classes could be maintained during the period of 1943 and 1944. It was pointed out that official memorandums on these subjects would shortly be issued by the Army and Navy and by the War Manpower Commission and the Selective Service System

#### AFTERNOON SESSION

At a meeting of the War Participation Committee Dr James Paulin and Dr Ernest E Irons presented a plan for cooperation of the American Medical Association with the American College of Physicians and the American College of Surgeons in organizing groups of physicians who could be sent to camp hospitals in various portions of the United States to aid in ward rounds, conducting clinics, round tables, lectures and other techniques for instruction and graduate education of the physicians in the armed forces. It was pointed out that the annual sessions of these organizations are not to be held during the duration of the war period and that it would be desirable to develop an agency for the extension of medical information to those men

who are largely out of touch with general medical activities. The College of Physicians had made an appropriation to finance a part of the program, and it was felt that the other organizations concerned could also participate. Dr. Olin West stated that the proposal had already come before the Council on Scientific Assembly of the American Medical Association and that a special report was to be prepared for its consideration. Dr. Irons explained the methods by which the teams and their participation in the effort would be organized.

Dr. Moloney suggested the possibility of utilizing the traveling groups also for extension to civilian physicians. It was proposed that Commander Boitz of the Navy be asked to undertake the organization of this service.

#### POSTWAR PLANNING

Dr. James Paullin called attention to the need of organization of medical services in relationship to postwar planning for medical care throughout the world and the necessity for integrating the efforts of all the various agencies engaged in such problems. Consideration was given to the Beveridge report and to other postwar plans that have been called to the attention of the public.

#### TEMPORARY LICENSURE

The Committee on War Participation also discussed at some length the necessity for temporary licensure and the proposals of the Federation of State Medical Boards and the Procurement and Assignment Service in this regard.

#### STATE PARTICIPATION IN PROVISION OF MEDICAL CARE

It was recommended by the War Participation Committee that state medical societies cooperate with the state Procurement and Assignment Service and with the state boards of registration and licensure in determining areas in districts that lack medical service and in plans for providing medical service in such areas when the need arises. The Secretary of the American Medical Association, Dr. Olin West, was requested to inform the secretaries of all the state medical associations of the action taken.

#### STATE COMMITTEES ON WAR PARTICIPATION

It was also recommended that each state medical society develop a state committee on war participation to cooperate in such activities.

## ARMY

### DR. EVARTS GRAHAM INSTRUCTS ARMY OFFICERS IN SURGERY

The Department of Surgery of Washington University School of Medicine, St. Louis, under the direction of Dr. Evarts A. Graham, has arranged for short, intensive postgraduate courses in the specialties of surgery for selected groups of U. S. Army officers. The first group of forty officers arrived November 8 for a six weeks course which will include instructions in a number of the different departments of the medical school. In the first group of student officers were two alumni of Washington University School of Medicine, Lieut. Col. Robert M. Moore '26, and Lieut. Col. Walter Matuska '31.

### PROFESSIONAL USE OF NARCOTICS BY MEDICAL OFFICERS

New regulations have recently been issued jointly by the U. S. Commissioner of Narcotics and the Commissioner of Internal Revenue outlining the conditions under which officers of the Medical Corps of the Army and Navy may prescribe narcotic drugs. (7 Federal Register 10770, Dec. 23, 1942). These regulations provide that such officers, in the course of official medical treatment of Army and Navy personnel and members of their families entitled to receive such treatment, will be required to issue prescriptions for these patients which may call for narcotic drugs or preparations. Where the drug or preparation cannot be furnished from official stock, it must be obtained, pursuant to the official prescription, from a drug store duly qualified by registration under the Harrison Narcotic Act to fill narcotic prescriptions. Such prescriptions, issued in the course of official professional practice only, and prepared on official blanks or stationery, such as printed forms of an Army or Navy hospital or dispensary, and otherwise meeting the requirements of narcotic regulations relating to prescriptions, may be filled by a duly registered druggist although they do not bear a registry number of the issuing practitioner. These prescriptions, however, must bear the signature, title, corps and serial or jacket number of the issuing medical officer and must be filed with and retained for the same period as narcotic prescriptions issued by regularly registered practitioners and filled by the druggist.

The foregoing procedure will not apply to prescriptions written by an Army or Navy medical officer in the treatment of a private patient, that is, a patient not entitled to receive medical treatment from the physician in the latter's capacity as a service medical officer. In prescribing and dispensing narcotic drugs to such private patients, the medical officer is subject to all the requirements of the Harrison Narcotic Act, including registration and payment of taxes, as are imposed on other physicians conducting private medical practice.

### SYMPOSIUM ON EPIDEMIC KERATO-CONJUNCTIVITIS

A symposium on epidemic keratoconjunctivitis was held at Columbia University College of Physicians and Surgeons, New York, December 4, under the direction of the U. S. Army Surgeon General's Office and in conjunction with the Commission of Neurotropic Virus Diseases and the Board for the Investigation and Control of Influenza and Other Epidemic Diseases in the Army. Dr. John H. Dunnington, director of the Institute of Ophthalmology of the Presbyterian Hospital, New York, spoke on 'History of the Disease from the Hawaiian Outbreak to the Present Time.' Dr. Murray Sanders of the Commission on Neurotropic Virus Diseases, 'The Clinical Picture, Epidemiological Data, Recommendations,' Dr. Alton F. Briley, assistant professor of ophthalmology at the New York Postgraduate Medical School and Hospital, Columbia University, New York, 'Differential Diagnosis,' Dr. James E. Perkins, director of the New York State Department of Health, 'Additional Epidemiological Observations (the Schenectady Epidemic),' Dr. John R. Paul, chairman of the Commission on Neurotropic Virus Diseases, 'Role of the Virus Commission in the Problem.' Opening remarks were presented by Col. James S. Simmons and the discussion was opened by Lieut. Col. A. J. Lanza, both of the Surgeon General's Office. Following luncheon clinical cases were presented and various phases of laboratory work used in the diagnosis and treatment of epidemic keratoconjunctivitis were demonstrated.

### TO DISCONTINUE OFFICER CANDIDATE SCHOOL AT CARLISLE BARRACKS

With the graduation of the eleventh class from the officer candidate course at the Medical Field Service School, Carlisle Barracks, Pa., on December 23, the work of gradually discontinuing the Officer Candidate School at that post began and will end on March 1. To offset the eventual closing of the medical administrative Officer Candidate School, the number of medical department officers to be trained for field duty beginning New Year's will be steadily increased.

Two hundred and forty-eight enlisted men became second lieutenants in the Medical Administrative Corps at the graduation exercises on December 23 and have already been assigned to administrative duties so that medical officers can be relieved of such duties. The diplomas and commissions were presented by Brig. Gen. Addison D. Davis, commandant of the school, and the oath of office was administered by Lieut. Col. Thomas G. Hester, adjutant of the Army Medical Center, Washington, D. C., himself a senior officer in the Medical Administrative Corps.

## BRAZILIAN MEDICAL OBSERVERS

Two medical observers from the Brazilian army recently arrived at the U S Army Medical Field Service School, Carlisle Barracks, Pa., for a few days visit. Lieut Col E Marques Porto and Capt Carlos Pinau Goncalves, with the approval of the War Department, were assigned to Carlisle Barracks for seven days. This observation tour follows closely the visit of Gen Joro Afonso de Souza Ferreira, the Brazilian surgeon general, and of Capt Abelardo Lobo, who last year graduated from the Medical Field Service School at Carlisle Barracks. Colonel Porto likewise had visited Carlisle Barracks previously, as he was a delegate to the International Congress of Military Surgery in 1939.

## STRENUOUS TRAINING

Without previous army experience a professional group comprising doctors of medicine and dentistry graduated on Dec 12, 1942 following an intensive six weeks course at the Officers Training School at Miami Beach, Fla. About 40 per cent of the academic part of the doctors training consisted in fitting them for work with combat units, including courses in aviation medicine, tropical medicine and field surgery. The doctors and dentists followed a twelve hour day period of training including two strenuous hours of physical training and one hour of drill. Major Sidney Davison, assistant director of training in the medical section, said that most of the new officers had come through the strenuous program in "fine style."

## CIVILIAN DEFENSE

### NEW COURSES FOR GAS SPECIALISTS

A new five day gas specialist course for persons responsible for the organization of gas defense in the target areas was presented in the six War Department civilian protection schools conducted on behalf of and in collaboration with the U S Office of Civilian Defense. This is the first course to be presented in cooperation with the Chemical Warfare Service for state gas consultants and senior gas officers who are responsible for the organization of community gas defense. Courses have been presented at regional schools for medical school representatives, who have in turn been responsible for the education of practicing physicians in the medical aspects of chemical warfare. These schools have been conducted in the East and plans are under way for the presentation of such schools elsewhere in the United States.

The first session of the gas specialists course was at Amherst College, Amherst, Mass., November 29 through December 4. The course was offered December 13-18 inclusive at the other War Department civilian protection schools at Loyola University, New Orleans, Purdue University, Lafayette Ind. University of Washington, Seattle, Stanford University, Palo Alto, Calif., and Occidental College, Los Angeles.

Presentation of the specialized course dealing with gas defense is part of a new plan of instruction in the War Department civilian protection schools. The ten day general course formerly given by the schools was discontinued with the session of November 1 to November 11. The other courses cover plant protection, basic civilian protection and instruction for staff members.

The gas specialists' course placed emphasis on the administrative organization of state and local gas defense programs and the training of civilian protection personnel and the inter-related activities of all units of the U S Citizens Defense Corps.

at the time of a gas attack. It was an advanced course open to those with college degrees in chemical, sanitary or civil engineering, chemistry or equivalent scientific training.

### BLOOD PLASMA FOR CIVILIAN DEFENSE

The Medical Division of the Office of Civilian Defense and the United States Public Health Service reported on Dec 8, 1942 the current status of the blood plasma program which was initiated early last spring.

The report indicates that 130 hospitals have now received grants in aid and are preparing reserves of plasma to total at least 63,130 units. In addition to this reserve 27,500 units of frozen plasma have been obtained through the Army and Navy from blood collected by the American Red Cross. This supply has been distributed. The Medical Division has also procured 37,500 units of dried plasma from blood collected by the American Red Cross and this supply is in process of distribution.

The total reserve, which is largely concentrated in the 300 mile coastal target areas, will be 126,630 units for treatment of casualties resulting from enemy action. In addition, 1,250 units are in Puerto Rico and 250 in Alaska.

In addition to these sources of plasma, the Red Cross is distributing to target areas 5,000 units which will be available to the Office of Civilian Defense for treatment of civilian casualties resulting from enemy action. Many hospitals which have not received grants under the program are also preparing plasma reserves which total approximately 50,000 units.

Plasma required for the treatment of war related injuries may be obtained by any community through its chief of Emergency Medical Service. To meet such emergencies, plasma may be transferred (1) within a state by the state chief of Emergency Medical Service, (2) within a region by the regional medical officer and (3) from one region to another by the Medical Division, U S Office of Civilian Defense.

## MISCELLANEOUS

### NEW SPONGE RUBBER SUBSTITUTE

A new sponge rubber substitute made of linoleic acid a derivative of vegetable oils, was developed in the Research Laboratories of Bauer and Black (Division of the Kendall Company), Chicago, by Drs H M Strong and Marguerite Naps during the course of investigations with vegetable oil derivatives in cooperation with the Northern Regional Laboratories, U S Department of Agriculture at Peoria, Ill. It is believed that the process does not require anything new in the way of equipment, and plant facilities and the materials involved are at present available. The sponge product can be made in any thickness and in varying densities, and in many respects the properties of the new substitute are so close to those of rubber that they appear identical. Both the product and the process are being made available to the government for war uses for the duration, and information can be obtained through the Rubber Reserve Section. The company reserves for after the war the commercial rights which may be obtained through patents.

### RELIEF WINGS INCORPORATED

This nonprofit organization with headquarters at Airlines Terminal Building (suite 408), 80 East 42d Street, New York City has now available an especially equipped single motored air ambulance for either disaster service or individual emergencies. The organization has enrolled ten flight surgeons and thirty flight nurses for call in New York City for air ambulance relief. Flight nurses and flight surgeons are available also in Boston, New Orleans, Chicago, Albuquerque, N M, Kansas City, Mo and Tampa, Fla. Relief Wings coordinators in eleven sections of the United States have made available to civil air patrol groups sample stretchers which will fit in any one of five large single motored airplanes and medical aid ambulance supply kits are being distributed as the organization's budget permits. Thus there is available in the East at present without specific charges for use of the plane an air ambulance for patients who may need to be removed to hospitals or to other parts of the country. Relief Wings Inc hopes however that donations will be made to the organization, when air ambu-

lance service is needed, which would be commensurate with the actual cost of the flight operation

The treasurer of Relief Wings, Inc., is Mr J Hibberd Tylor, and the chairman of the organization's Aero Medical Research Committee is Dr Harry V Spaulding. This organization was started in May 1940 and is now laying plans for a widespread program of humanitarian air service.

Among the sponsors, officers, sectional leaders and advisory committees of Relief Wings, Inc. are nationally known citizens, aviators and scientists. The well known aviatrix Miss Ruth Nichols is the executive director.

### TOTAQUINE DOSAGE

According to the *Oil, Paint and Drug Reporter* of Dec 21, 1942 the Food and Drug Administration believes that manufacturers or distributors of totaquine antimalarial remedies should inform consumers how long the contents of the package will last in the treatment of malaria—whether for the full seven day period or for some shorter period. Proper treatment of malaria with totaquine calls for doses of 30 grains daily for seven days, FDA says.

The administration admits that it is without authority to force such a step but, for reasons of economy in view of the shortages of cinchona alkaloids, considers it a matter that should be given serious consideration by the marketers of the product. For patients to take the remedy only to find that the doses were not sufficiently strong to effect the cure would only be wasting the product. Thus far manufacturers have indicated a willingness to go along on the idea, although some are a little dubious about how it might affect sales in the South where the people have been used to buying quinine in small quantities.

### DENTAL EQUIPMENT FOR COAST GUARD STATIONS

The Medical and Surgical Relief Committee of America, 420 Lexington Avenue, New York City, shipped on Dec 21 1942 four cases of portable dental equipment to be used in coast guard stations on the west coast of the United States. The shipment included four foot-operated drills to be used on ship board and in areas without electricity, and dental instruments and material sufficient to set up four complete mobile dental units. The equipment was selected by Lieut J T Reece who, the committee says, is serving with the U S Coast Guard.

### MEDICAL AND SURGICAL RELIEF COMMITTEE OF AMERICA

The Medical and Surgical Relief Committee of America, 420 Lexington Avenue, New York, received on December 17 approximately 5000 pounds of surgical instruments rescued from the scrap metal heap, which were donated by Dr Walter L Bierring, state health commissioner of Iowa when it was learned that many of the instruments contributed to the recent Iowa scrap metal campaign were in good condition and would more effectively serve the war effort if reconditioned and made available to the various organizations which call on the committee for help. After the necessary repairs have been made, the instruments will be placed in emergency medical field sets for distribution to the U S Coast Guard and to first aid posts, needy hospitals and other recognized relief agencies in the United States and Alaska. The idea of salvaging the instruments for reconditioning came from Harry A Hurd DDS, Des Moines, who acted as chairman of the Dental Salvage Committee of the Des Moines District Dental Society in the government's scrap metal campaign. Shortly after the start of the dental drive a campaign for scrap was also directed to physicians under the leadership of Dr Robert L Parker, Des Moines, chairman of the Iowa State Medical Society. Contributions were made by 854 persons representing 273 cities and towns in Iowa and 11 other states, including Arkansas, Colorado, Kansas, Montana, Minnesota, Nebraska, New Mexico, Oklahoma, South Dakota, West Virginia and Wyoming. The joint drive was immediately successful, but it was soon apparent that many of the instruments were too good for scrap. In addition to the instruments which will be reconditioned it yielded approximately 1,000 pounds of scrap.

### COMMITTEE ON SANITARY ENGINEERING CREATED BY THE NATIONAL RESEARCH COUNCIL

A sanitary engineering committee has been organized, at the request of the Surgeon General of the Army, by the National Research Council through the Division of Medical Sciences acting for the Committee on Medical Research of the Office of Scientific Research and Development. Through liaison officers, advice and assistance on sanitary engineering problems are also furnished to the Navy and the Public Health Service.

As epidemiologic and entomologic advice was deemed necessary, personnel representing these sciences was included. Close liaison with the Surgeon General's Office is maintained through the Sanitary Engineering Branch of the Division of Preventive Medicine. The committee consists of:

Abel Wolman, chairman, professor of sanitary engineering, Johns Hopkins University, Baltimore.

Kenneth D Maves, secretary, professor of epidemiology, School of Hygiene and Public Health, 615 North Wolfe Street, Baltimore.

Harold F Babbitt, professor of sanitary engineering, University of Illinois, Urbana.

F C Bishop, assistant chief, Bureau of Entomology and Plant Quarantine, U S Department of Agriculture, Washington, D C.

V M Ehlers, chief engineer, Texas State Board of Health, Austin.

Gordon M Fair, professor of sanitary engineering, Harvard University, Cambridge, Ma.

H A Whitfield, chief engineer, division of sanitation, State Department of Health, Minneapolis.

In the several meetings to date the committee has devoted major efforts to the problem of procurement and training of the large number of sanitary engineering personnel required for essential war activities. In addition to the needs for sanitary engineers as commissioned officers in the Sanitary Corps of the Army, the U S Public Health Service and the Corps of Engineers utilize sanitary engineers on a civil service status.

The committee has also considered the sanitary engineering functions performed by the Sanitary Corps of the Army with a view toward providing constructive suggestions on the many problems occasioned by the war including the safeguarding of army water supplies, the disposal of waste and malaria control.

The program covering future activities of the committee includes a continuation of its present work on the availability of and the demand for sanitary engineering personnel, the orderly procurement of and assignment to military, semimilitary and civilian agencies of trained sanitary engineers, information on military sanitary engineering problems and their solution and a consideration of postwar needs for sanitary engineers and the fields in which they may be most profitably utilized.

The committee has had strong liaison representation from the War Department by the presence in the deliberations of Colonel Simmons, Hardsburg, Prentiss and Robinson from the Navy by Admiral Stephenson and Commanders Cushing, Tipton and Burton, from the U S Public Health Service by Mr J K Hoskins and from the Selective Service in the person of Major Robert A Bier. The National Research Council representatives in the deliberations have been Drs Weed, Drayson and Forbes and Colonel Larkes.

### INFORMATION SERVICE FOR WORKING MOTHERS

A recent release from the Department of Welfare of New York City calls attention to the need for a centrally organized but decentrally operated advice and information service for mothers. The members of the Mayor's Committee on Wartime Care of Children agreed that there is a major need for such a service where mothers who are employed in industry or are about to be employed can secure information as to the facilities which are available for the care of their children. According to the release, as many as six of these local centers may be established as a beginning.

### NO MORE BIOLOGIC PRODUCTS IN SYRINGES

The syringe type package for biologic products is one of the latest war casualties. After the present stock of serums, vaccines and antitoxins packaged in single doses with syringes and needles enclosed runs out there will not be any more. According to the *Oil, Paint and Drug Reporter* the WPB is going to give priority assistance in the future for the syringes and needles.



## Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST SUCH AS RELATE TO SOCIETY ACTIVITIES NEW HOSPITALS EDUCATION AND PUBLIC HEALTH)

### ALABAMA

**Lectures on Venereal Disease**—Dr Percy S Pelouze assistant professor of urology at the University of Pennsylvania School of Medicine, Philadelphia, and consultant for the gonorrhea control program for the U S Public Health Service, opened a series of lectures in Mobile, January 4. Dr Pelouze will travel throughout the state during the month delivering talks to physicians and nurses and local medical societies.

### CONNECTICUT

**Personal**—The Stamford Medical Society recently gave a dinner in honor of Dr Donald R MacLean, Stamford, who practiced as an anesthetist in Stamford for twenty-five years prior to his retirement about seven years ago.

**Society News**—Dr Joseph I Linde, health officer of New Haven and formerly president of the state medical society, was recently elected president of the Connecticut Tuberculosis Association. Dr Leroy U Gardner, Saranac Lake N Y addressed the Yale Medical Society recently on "The Action of Silica and Its Neutralization."

**Regional Meeting on Mental Deficiency**—The annual regional conference of the Northeastern Section of the American Association on Mental Deficiency was held at the Southbury Training School, Southbury, recently. The speakers included Dr Joyce V Deutsch, Southbury on "Encephalography as a Therapeutic Procedure in Convulsive Disorders."

### DISTRICT OF COLUMBIA

**Study Medical Needs in Washington**—The committee on medical services of the Medical Society of the District of Columbia will conduct a survey of wartime medical needs of Washington. The city will be divided into areas. The volume of patients treated by each physician and the number he was unable to attend will be studied by the committee. In a statement to the press, December 20, Dr A Magruder Macdonald president of the district society, stated that a recent study revealed there is now an adequate supply of physicians in Washington, provided there are not further drastic losses to the armed services and the deficiencies in distribution, now being studied, are remedied.

### ILLINOIS

**Assistant State Alienists Appointed**—Drs Ralph C Hamill, associate professor of psychiatry (Rush) and Irene C Sherman associate in psychiatry, University of Illinois College of Medicine, Chicago, respectively have been named assistants to the state alienist, Dr Harry R Hoffman to fill a temporary vacancy caused when the former assistants Drs Melvin F O Blaurock, Oak Park, and Samuel H Kraines left for military service on indefinite leaves of absence.

### Chicago

**Health of Industrial Workers**—The Chicago Conference on the Health of Industrial Workers will be held at the Palmer House on January 13 under the auspices of the Chicago Medical Society, Illinois Manufacturers' Association and the division of industrial hygiene of the state department of public health in cooperation with the committee on industrial health of the state medical society, Chicago Board of Health, Chicago Society of Industrial Medicine and Surgery, Chicago Industrial Nurses Club and the Chicago Chapter of the American Industrial Hygiene Association. Among the speakers will be

Dr Carl M Peterson Secretary of the Council on Industrial Health American Medical Association The Urgent Need for Better Local Industrial Health Organization

Dr Clarence D Selby Detroit Why Do Employees Stay Away from Work and What Can We Do About It?

Dr Milton H Kronenberg How the Small Plant Can Conduct a Health Program

Dr Fred H Albee New York Problems of Employing the Physically Handicapped

Mr George P Wardley The Employer's Viewpoint

Mr Alfred Borah The Industrial Commission's Attitude

Mr Frank R Peregrine Medicolegal Aspects

Mr Sterling Morton, president of the Illinois Manufacturers' Association, will act as toastmaster at the dinner meeting and speakers will include Hon Dwight H Green, governor of Illinois on "We Have a Job to Do to Improve the Health of the Industrial Worker, and Dr Walter C Alvarez Rochester, Minn, "The Care and Feeding of Executives."

### MARYLAND

**Personal**—Dr Edward Davens, Baltimore pediatric consultant to the state department of health, has been appointed chief of the bureau of child hygiene to succeed Dr James H M Knox Jr, Baltimore, effective September 1.

**New County Hospital**—Lanham funds totaling \$635 000 have been made available for the construction of a hospital and nurses' home for Prince Georges County. A 30 acre tract of land has been purchased at Cheverly to accommodate a one story 100 bed hospital and an adjoining 50 bed nurses' home. The new structures are expected to be completed by the end of February. The project was developed by a committee following an action taken about two years ago by the Prince Georges County Medical Society, when it went on record as deeming a hospital necessary and advisable.

### MICHIGAN

**Bulletin Dedicated to Dr Handy**—A recent issue of the Bulletin of the Genesee County Medical Society was dedicated to Dr John W Handy Flint, emeritus member of the Michigan State Medical Society, who has passed his ninetieth birthday. Dr Handy graduated at the University of Michigan Medical School Ann Arbor, in 1884 and has been practicing in Flint since 1885, according to the state medical journal.

**Fund to Aid Library**—Dr Bert R Hoobler and his wife Icie G Macy Hoobler Ph D Detroit, have given \$500 to aid in the development of a Wayne University branch of the Hooker Scientific Library. The fund will be administered by Neil E Gordon, Ph D chairman of the department of chemistry in the College of Liberal Arts and director of the Hooker Scientific Library, housed at Central College, Fayette Mo.

**Secretaries' Conference**—The annual County Secretaries' Conference of the Michigan State Medical Society will be held at the Olds Hotel, Lansing January 24. The tentative program lists the following speakers:

Edward T Broadwell rationing director OPA Detroit The Ration Program as It Affects Physicians

Capt Harold Mulbar Michigan State Police East Lansing Any Spies in Michigan?

J W Holloway Jr Director Bureau of Legal Medicine American Medical Association Chicago Physicians Income Tax for 1942

Dr L Fernald Foster Bay City Facts for the Physician

Lieut Comdr Maxwell E Lapham Washington D C How the Medical Profession Can Meet Military Industrial Research and Civilian Needs During Wartime

Earl W Munshaw LL B state senator Grand Rapids Temporary Licenses and Dislocating of Physicians

Eric C Nissen insurance counselor Detroit Group Disability Insurance for Physicians

**Cummings Foundation and Detroit Orthopaedic Clinic Merge**—Announcement has been received of the recent merger of the Cummings Foundation with the Detroit Orthopaedic Clinic. The foundation was established in 1920 for "the establishment and maintenance of a home for the care maintenance and education of crippled children. For a time it was in such condition that no assets were available. The original group of trustees was augmented in 1934 by the formation of a foundation which functioned until June 1942. The fund is administered by a board of trustees elected annually by members of the corporation of the Detroit Orthopaedic Clinic. Estimated in 1920 at about \$1,500 000 a large percentage of which was in real estate holdings the fund has been decreased to about one third of its former value. The Detroit Orthopaedic Clinic an outgrowth of Sigma Gamma Clinic established in 1920 maintains an outpatient department in the city where approximately 1 000 patients are seen annually, a 50 bed hospital school in the country and a special program for the study of better methods for the care of physically handicapped children. Following the merger the name of Sigma Gamma Hospital School was changed to the George H Cummings Memorial Hospital School according to the terms of the will. Dr Charles W Peabody Detroit is chief of staff. Dr Winthrop M Phelps Baltimore is acting consultant for the cerebral palsy program, and sixteen surgeons and physicians serve as a consultant board for the agency. The organization offers a total program, with great emphasis on personality adjustment, through all departments. Programs which supplement orthopedic care include child guidance nursery schools recreation and vocational placement.

## NEBRASKA

**Former State Health Director Chosen Congressman-Elect**—Dr. Arthur L. Miller, Lincoln, formerly president of the Nebraska State Medical Association and until recently director of the state department of health has been chosen congressman-elect from the Fourth District to the United States Congress.

## NEW YORK

**Personal**—Dr. Simon J. Gormley, deputy commissioner of the Albany Department of Health, has been named editor of the Albany Health Bulletin to succeed Dr. Daniel V. O'Leary who has served in this capacity for many years. In the future the bulletin will be published twice monthly instead of weekly.

—Dr. James P. Kelleher, Poughkeepsie, acting medical inspector in the state department of mental hygiene, has been appointed superintendent of the Rome State School, succeeding the late Dr. Charles Bernstein, Rome.

## New York City

**William Henry Welch Lectures**—Homer W. Smith, Sc.D., professor of physiology and director of the Physiological Laboratories, New York University College of Medicine, delivered a William Henry Welch Lecture at Mount Sinai Hospital of New York, January 5, on 'The Physiology of the Kidney'. A second lecture on the subject will be given, January 12.

**Insurance Superintendent Chosen President of Hospital Service**—Louis H. Pink, LL.D., New York State Superintendent of Insurance since 1935, has been elected president of Associated Hospital Service of New York, filling the vacancy that occurred with the death of Dr. Sigismund S. Goldwater. Mr. Pink was to leave his office as superintendent of insurance on December 31.

**New Head of Tonometer Station**—The National Society for the Prevention of Blindness has announced that Dr. Mark J. Schoenberg, chairman of its glaucoma committee is now in charge of the station for checking the accuracy of original Schiotz tonometers which is maintained at the headquarters of the society, 1790 Broadway. Dr. Adolph Posner, who formerly directed the tonometer checking station, is on active duty with the United States Army Medical Corps.

**Welfare Commissioner Granted Leave of Absence**—William Hodson, LL.B., who has just completed his ninth year of service as commissioner of public welfare of New York City, has been granted a two months leave of absence by Mayor LaGuardia so that he may undertake a mission for Herbert H. Lehman, LL.D., former governor of New York and now director of Foreign Relief and Rehabilitation. Commissioner Hodson's leave will begin about January 15.

**Dr. Magelaner Appointed Superintendent of Kings County Hospital**—Dr. Israel Magelaner, formerly medical superintendent of Harlem Hospital has been appointed medical superintendent of Kings County Hospital, Brooklyn. He succeeds Dr. Emanuel Giddings who left to join the army medical corps. Dr. Emanuel W. Lipschutz, who has been acting medical superintendent at the Kings County Hospital, has been named medical superintendent of the Harlem Hospital, succeeding Dr. Magelaner.

## NORTH CAROLINA

**Duke University Withdraws Aid from Maternity Clinic**—Effective March 24 sponsorship of the maternity clinic of the Charlotte department of health will be discontinued by the Duke University School of Medicine, Durham newspapers report. Similarly, after that date, supplies for the clinic are not to be furnished by the school nor is Duke to continue to pay \$30 a month to apply on the salary of a nurse employed in the clinic. There is hope that a plan may be worked out whereby aid might be obtained from the state board of health to assure uninterrupted conduct and maintenance of the clinic.

## OREGON

**Members of State Board**—Dr. Edward H. McLean, Oregon City, was recently appointed by the governor a member pro tem of the state board of medical examiners to succeed Dr. Frank E. Fowler, Astoria, who is serving in the U. S. Army. Dr. Harold L. Blosser, Portland, is president of the board, and Dr. Linford S. Besson, Portland, is secretary-treasurer. Other members of the board are Drs. Carl G. Patterson, Baker, Charles C. Newcastle, Portland, Irvin R. Fox, Eugene, and J. L. Ingle, D.O., La Grande.

## PENNSYLVANIA

**Supervision of Typhoid Carriers Requested**—The 1943 session of the Pennsylvania legislature will be asked to place all chronic typhoid carriers under state supervision, in accordance with a resolution advanced by the Lancaster City and County Medical Society and adopted recently by the state medical society. If the action is taken, the carriers would be registered and supervised but would be given limited pay to supplement their earned incomes for losses in salaries or wages resulting from restricted employment.

**Programs on Industrial Hygiene**—County medical societies throughout the state are urged to present during February a program on industrial hygiene which has been endorsed by the state medical society. In order that there may be complete uniformity of presentation the commission on industrial health and hygiene of the society will furnish texts of papers to be presented. The subjects will cover objectives of organized medicine in industrial health and hygiene, medical and non-medical problems in the field and methods necessary to attain described objectives. The commission urges the societies to present this material, no matter what other commitments are planned.

## Philadelphia

**Roentgen Survey at Navy Yard**—The Philadelphia Tuberculosis and Health Association is conducting an x-ray survey of civilian employees at the Navy Yard in Philadelphia. Between 50,000 and 60,000 persons will be given examinations. The work is being done as a joint project of the tuberculosis association and the division of tuberculosis of the state department of health with the cooperation of officials at the Navy Yard and the U. S. Public Health Service. The Bulletin of the Pennsylvania Tuberculosis Society states that the survey is the most extensive case finding effort that has been undertaken in Philadelphia.

**Hospitals Require Patients to Be Vaccinated**—Virtually all of the hospitals in the city are requiring vaccination of all patients and personnel to keep a smallpox outbreak in the area from entering the city proper, newspapers reported. More than 3,000 persons have been vaccinated within two weeks at the Philadelphia General Hospital and the municipal hospital for contagious diseases. Thousands in other hospitals and state institutions have been ordered vaccinated, it was stated. The orders were disclosed after the Abington Memorial Hospital at nearby Abington was quarantined under police guard on December 31 following the admission of a 44-year-old patient with smallpox. Eastern Pennsylvania has reported 37 cases in the first outbreak since the last war it was reported. THE JOURNAL, January 2, page 61 reported an outbreak of smallpox in an Amish section in Kishicoquillis Valley.

## TEXAS

**Changes in Faculty at Texas**—Included among the recent changes in faculty at the University of Texas Medical Branch, Galveston are the appointments of Charles B. Allen, Ph.D., as assistant professor of anesthesiology and Dr. Edward J. Lefeber as assistant professor of internal medicine. Dr. George M. Decherd, Jr. has been named associate professor and clinical biochemist at the John Sealy Hospital.

**Hospital Memorial to Physician**—The Newton Memorial Hospital was recently opened in Cameron. Chartered as a nonprofit organization, the hospital was founded to commemorate the life and work of the late Dr. William R. Newton, Sr., who at the time of his death in 1938 was a state senator. The hospital was built from the home of the late Dr. Newton by expanding certain parts of the building according to the state medical journal.

## VIRGINIA

**University News**—The Medical College of Virginia, Richmond, has received a grant of \$8,400 from the Office of Scientific Production and Research of the U. S. government for the continuation of research on shock, which is being done by Dr. Everett I. Evans, assistant professor of surgery. Dr. Tinsley R. Harrison, professor of medicine, Bowman Gray School of Medicine of Wake Forest College, Winston-Salem, N. C. delivered the Alpha Omega Alpha Lecture at the medical college, November 24 on 'Cardiac Dyspnea'. The lecture is sponsored annually by the Alpha Omega Alpha fraternity. The Nutrition Foundation has given a grant of \$3,000 to Alfred Chanutin, Ph.D. for continuation of his investigation of 'fat metabolism in the 'nephritic' rat' at the University of Virginia, Charlottesville.

## GENERAL

**New Trustees of Pathology Board**—Dr Paul R Cannon, professor of pathology, University of Chicago School of Medicine, and Dr Robert A Moore professor of pathology Washington University School of Medicine, St Louis, were recently elected trustees at large of the American Board of Pathology.

**Internal Medicine Board Reduces Fee**—The American Board of Internal Medicine announces a reduction in its registration and examination fee from \$40 to \$30. The certificate fee will remain at \$10, making a total of \$40. The oral examination fee in the subspecialties will remain at \$10. The reduction in fees became effective on January 1 and will apply to candidates for the written examination on February 15 whose applications have not been accepted for a previous examination.

**Van Meter Prize Awarded to Rochester Physicians**—The American Association for the Study of Goiter recently announced that the Van Meter Prize has been awarded to Walter Mann BS, research fellow in radiology, and Charles P Leblond, University of Rochester School of Medicine and Dentistry, Rochester, N Y, for their essay on "Chemical Transformation of the Iodine Fixed by the Thyroid Gland." Honorable mention was given to Dr John Douglas Robertson London, for his essay on "The Nature of the Disordered Calcium and Phosphorus Metabolism in Thyrotoxicosis and Myxedema" and Major Monroe A McIver, M C, A U S and Mrs Eleanor A Winter, Cooperstown, for their work on "Liver Changes Occurring in Hyperthyroidism with Special Reference to the Deleterious Effects of Anoxia."

**Resurvey of Graduate Nurses**—On January 1 a nationwide survey of graduate registered nurses was undertaken by the U S Public Health Service at the request of the subcommittee on nursing of the Office of Defense Health and Welfare Services. A questionnaire is being sent to nurses. Return postcards have been provided by the public health service and will be distributed in the states by the state agent appointed by the service for the purpose. Local nursing councils for war service and district nursing associations will cooperate in locating graduate nurses in their communities. The completed questionnaires will be retained in the local areas, tabulations of data being sent to the state agents, who in turn will send a complete tabulation for the state as a whole to the public health service in Washington, D C. It is considered essential that every graduate nurse, married or single, active or inactive, fill out a questionnaire and return it to her state agent at once. Nurses who have not received the card may secure one from the state nursing council for war service or the state nurse's association.

**Request for Contacts with Persons Interested in Medical Aspects of Crime**—The Medical Correctional Association, an affiliate of the American Prison Association, is interested in establishing contact with all professional personnel who are especially concerned with or interested in the medical aspects of crime. Dr John D Reichard U S Public Health Service Hospital, Lexington, Ky, is president of the association, and other officers are Drs John W Cronin El Reno, Okla., and Lawrence Kolb Washington, D C, vice presidents, and Dr Robert M Lindner, Lewisburg, Pa, secretary-treasurer. Membership in the association is confined to the following groups:

Physicians employed in penal and correctional institutions or jails  
Physicians social welfare workers and special workers engaged in medical research work in penal and correctional institutions or jails

Physicians psychologists social workers and special workers engaged in medical research work in connection with institutions or hospitals for the mentally ill mentally defective individuals juvenile delinquents defective delinquents outpatient or behavior clinics dealing with any aspect of crime or its prevention criminal juvenile and domestic relations courts parole probation public and private schools colleges and universities and federal state county and municipal public health organizations

Any person who though not automatically falling in any one of the three aforementioned groups presents satisfactory evidence of being engaged in research or an occupation in which the medical aspects of crime are acknowledged as important features.

**Joint Orthopedic Meeting**—The eleventh annual meeting of the American Academy of Orthopaedic Surgeons and the thirtieth annual session of the Clinical Orthopaedic Society will be held at the Palmer House Chicago January 17-20. On Sunday there will be a panel discussion on "Chemotherapy in War Wounds" with Drs Frank L Meleney New York John S Lockwood Philadelphia, Champ Lyons Boston and Alton Ochsner New Orleans, as the speakers. Monday morning Chicago members of the Clinical Orthopaedic Society will present a clinical program and in the evening there will be a debate on the Kenny method of nursing care in poliomyelitis. Foreign guests on the academy program will be Dr Herman de las Casas, Caracas, Venezuela, and Brigadier Walter Rowley Bristow, formerly of London now chief orthopedic surgeon

of the Royal Army Medical Corps. One session will be devoted to "Complicating Trauma Associated with Orthopedic Casualties." There will be instructional courses and scientific motion pictures every morning and afternoon. Included among other speakers on the academy program are:

Dr Arthur B LeMesurier Toronto Canada Importance of Leaving a Good Amputation Stump

Dr Fred H Albee New York Treatment of Nonunions of Gunshot Fractures With and Without Loss of Substance

Dr Robert I Harris Toronto Fractures of the Os Calcis Principles of Treatment with Improved Technique and the Results Obtained by It

Dr John Alexander Ann Arbor Mich Injuries of the Chest

Dr Dallas B Phemister Chicago Local Excision and Massive Transplantation in a Selected Series of Sarcomas Involving the Long Bones

Dr J Warren White Greenville S C Total Carpectomy for Intractable Wrist Flexion

Dr Francis J Halford Honolulu Hawaii A Civilian Surgeon's Evaluation of Achievements and Mistakes

**Meetings of Ear, Nose and Throat Society**—The Eastern Section meeting of the American Laryngological Rhinological and Otolological Society will be held in Hartford Conn January 15. Speakers will include:

Drs Gordon D Hoople and Irl H Blaisdell Syracuse N Y The Problem of Acute Serous Otitis Media

Dr Raymond H Marcotte Hanover N H Local Sulfanilamide Therapy in Acute Mastoiditis

Dr Julius W McCall Cleveland Preliminary Voice Training for Laryngectomy

The Middle Section meeting will be held in Detroit January 20. Among the speakers will be:

Scott N Reger Ph D Iowa City Correlations Between Air and Bone Conduction Acuity Over Wide Frequency Ranges

Dr George J Thomas Pittsburgh Pentothal in Ear Nose and Throat Surgery

Dr Elisha S Gurdjian Detroit Treatment of Skull Fractures in Relation to Nasal Sinuses and the Temporal Bone

At the Southern Section meeting in Chattanooga, Tenn January 28 the speakers will include:

Dr J Hallock Moore Huntington W Va Meniere Syndrome

Dr Lester A Brown Atlanta Ga Osteomyelitis of the Frontal Bone

Drs Lee Cohen and Samuel L Fox Baltimore Atresia of the External Auditory Canal

The meeting of the Western Section in Portland, Ore January 31, will be addressed, among others by:

Olof Larsell Ph D Portland The Auditory Apparatus and the Inception of Hearing

Dr Ralph A Fenton Portland Local Use of the Sulfonamides

Dr Albert B Murphy Everett Wash A Neuropharyngeal Syndrome Suggesting Virus Origin

## LATIN AMERICA

**Personal**—The government of Cuba appointed Dr Juan Miguel Portuondo Domenech, Havana, minister of public health and social aid. Dr Miguel Etchebarne, Santiago was recently appointed to a similar position in Chile by the government of Chile.

**Hospital Service Praised by Chilean Federation**—The Medical Federation of Chile devoted the July-December 1942 issue of *Medicina Social* in its entirety to an extensive outline of hospital service in the United States. This issue is dedicated to the forty-fourth annual convention of the American Hospital Association held in St Louis this past October. Thirty pages comprise a narrative, statistical and graphic presentation of hospital service in the United States. The cover page is illustrated with the American flag, a picture of the New York Hospital and an inscription tendering it as a homage for the forty-fourth annual convention of the hospital association. It also contains a forethought on the future of medical science which reads "We have before us a new frontier governed by technical, economic and social forces in contrast to our present concept of medicine. Let's be prepared." The editorial material in Spanish, written by Dr Gustavo C Fricke director of the Hospital de Vina del Mar Valparaiso Chile contains an article on the history of the first hospital in the United States and the evolution of hospital service to our present times, the distribution of hospitals in the United States, their classification giving special emphasis to the hospital organization in the New York metropolitan area, the cost of medical care, medical staff organization in the hospitals of the United States, the role of physicians and nurses in the hospital field and the education of technical personnel.

## CORRECTION

**Public Health in Chile**—In the Buenos Aires letter in THE JOURNAL, Oct 17 1942 page 549, in the ninth line from the bottom of the first item entitled "Public Health in Chile" the number 3 600 should have been 3,600,000.

## Foreign Letters

### LONDON LETTER

(From Our Regular Correspondent)

Dec 4, 1942

#### Medical Committee to Advise Minister of Health

As previous letters to *THE JOURNAL* show, the war will bring about great changes in this country, and among these the practice of medicine must be included. Already several medical committees have investigated the subject. It is now stated in the House of Commons by the Ministry of Health that the government has set up a Medical Advisory Committee to advise the minister of health on the medical aspects of problems affecting the health of the people. The minister has for some time felt the need for associating with his work a representative body of medical men and women engaged mainly in the clinical practice of their profession. The members of the committee include the presidents of the Royal Colleges of Physicians, Surgeons and Obstetricians and Gynecologists, the chairman of the council of the British Medical Association, Prof. Henry Cohen, Prof. Harry Platt, Lord Dawson of Penn and Lord Horder.

#### Recruiting for Army from Medical Staffs of Hospitals

The universal recruiting of all classes for the fighting services has given rise to difficulties in the case of persons engaged in work necessary for the community. A prominent example is the medical profession and particularly the staffs of hospitals. Under present conditions it has been found impracticable to arrange for traveling army medical boards to visit hospitals for the purpose of examining the male medical staffs who are of military age, as was hoped. The only alternative was to use fixed centers, necessarily limited in number. This has entailed undue inconvenience and loss of professional time. It has therefore been decided to make the examinations at selected hospitals in the emergency hospital scheme by senior members of the staff of the hospitals. But as the decision as to medical fitness or otherwise of a physician for service must rest with the War Office, this examination by a civilian practitioner can not finally determine the matter. If he finds that the physician is not physically fit for general service the army council will arrange for his examination. But a physician found fit at the civilian examination will not be further examined unless and until he is nominated for a commission. Notwithstanding the provisional nature of the civilian examination, it will serve the purpose for which the arrangements were initiated by facilitating the task of the hospital authorities in planning ahead their staffing.

#### Social Reform to Produce Freedom from Want The State to Provide Medical Treatment for All

On June 10, 1941 a minister announced in the House of Commons that he had arranged for a comprehensive survey of the existing system of social insurance and allied services which would be considered in due course by the Ministerial Committee on Reconstruction Problems, and that well known economist Sir William Beveridge had accepted the invitation to become chairman of an interdepartmental committee which would conduct the survey. The committee was composed of government officials from the various departments involved. Later it was recognized that it would be difficult for these officials to commit themselves on issues of high policy involving their own departments. It was decided that Beveridge alone should be responsible for the report, while the officials acted as his advisers and assessors on the various technical and administrative matters with which they are severally concerned.

Beveridge's report has now been published. It commits the government, which has to examine it, to nothing, but there can be no doubt that something on the lines of the report is bound to be done. The discussions on social reform brought about by the profound dislocation of our normal activities necessitated by the war portend great changes. Our natural conservatism is due to an instinct to preserve what has been tried and to distrust of what has not been tried. Provision for most of the many varieties of need due to interruption of earnings and other causes that may arise in modern industrial communities has already been made on a scale not surpassed and hardly rivaled in any other country. In only one respect—limitation of medical service both in its range of treatment and in the classes for whom it is provided—do we fall short of what has been done elsewhere. In one thing we fall short in providing cash benefit for maternity and funerals and in the system of workmen's compensation.

Our social insurance and the allied services are conducted by a complex of disconnected administrative organs, proceeding on different principles, doing invaluable service but at an unnecessary cost. Limitation of compulsory insurance to persons under contract of service and below a certain remuneration if engaged in nonmanual work is a serious gap. Many persons working on their own account are poorer and more in need of state insurance than employees. There is no real difference between the needs of sick and the needs of unemployed persons, but they get different rates of benefit, involving different conditions. There are three different tests for non-contributory pensions, for supplementary pensions and for public assistance.

Beveridge lays down three guiding principles. 1. Any proposals while using to the full the experience of the past, should not be restricted by considerations of sectional interests established in gaining that experience. A revolutionary moment in the world's history is a time for revolutions, not for patching. 2. Organization of social insurance should be treated as only one part of a comprehensive social progress. Fully developed it may provide income security, it is an attack on want. But want is only one of five obstacles on the road of reconstruction. The others are disease, ignorance, squalor and idleness. 3. Social security must be achieved by cooperation between the state and the individual. The state should offer security for service and contribution but should not stifle initiative, opportunity or responsibility. It should encourage each individual to provide more than a minimum for himself and his family.

The scheme covers all citizens without upper income limits but has regard to their different ways of life and is classified in its application. Six main classes are recognized: (1) employees, (2) others gainfully employed, including employers and independent workers, (3) housewives that is, married women of working age, (4) others of working age not gainfully occupied, (5) those below working age and (6) those retired and above working age. The sixth class will receive retirement pensions and the fifth will be covered by children's allowances. The four other classes will be insured for security appropriate to their services. All classes will be covered for comprehensive medical treatment, rehabilitation and funeral expenses. Every one in classes 1, 2 and 4 will pay a single security contribution by a stamp or single insurance document each week or combination of weeks. In class 1 the employer will also contribute. The contributions will differ from one class to another according to the benefits provided and will be higher for men than for women. As a substitute for unemployment benefit, training benefit will be available to assist persons to find new livelihoods if their present ones fail.

Unemployment benefit, disability benefit, retirement pension and training benefit will be at the same rate irrespective of

earnings. This rate will provide by itself the income necessary for all normal classes. There will be a joint rate for a man and wife who are not gainfully occupied. When there is no wife or she is gainfully occupied there will be a lower single rate. Unemployment benefit will be subject to attendance at a work or training center after a certain period. Pensions other than industrial will be paid only on retirement from work. They may be claimed after the minimum age, 65 for men and 60 for women. If retirement is postponed, the rate will be paid above the basic.

Medical treatment covering all requirements will be provided for all citizens by a national health service organized under the health departments. Postmedical rehabilitation treatment will be provided for all persons capable of profiting by it. There will be a comprehensive national health service for the prevention and cure of disease and a rehabilitation service fitting for employment by both medical and postmedical treatment. The health service will insure that for every citizen there will be available whatever treatment he requires in whatever form he requires it. The medical part of the scheme may be described as an extension, with much improvement, of the present panel system from manual workers and persons with small incomes to every one and to every form of treatment. What will remain of private practice? The answer "Very little if any" can be safely given. The reaction of the medical profession to the scheme cannot yet be stated. It has been favorably received by all the political parties. Of the advantage of unifying all health services, with their inconsistencies and unnecessarily high costs of administration, there can be no dispute. What will probably give rise to controversy is extending social insurance to all, including millionaires. But the colossal taxation of high incomes, likely to last for years after the war, may diminish very much the number of rich. This taxation extends as high as thirty-nine fortieths of big incomes, and therefore the state provided medical service may be useful even to millionaires.

#### Compulsory Treatment of Venereal Disease

In contrast with the compulsory treatment of venereal disease in other countries, the arrangements in this country have been based exclusively on voluntary attendance. This is in accordance with that respect for the freedom of the individual which is characteristically British. But here the obvious criticism is that what is granted is freedom to spread disease. The voluntary system has had a large measure of success, and before the war the incidence of venereal disease was low and compared favorably with that of other countries. The war has now accustomed us to limitation of our freedom in many directions, and for good reason a new defense regulation introduces compulsion for the treatment of venereal disease in certain carefully defined circumstances. The new regulation leaves the voluntary basis unchanged but provides for compulsion where necessary to bring under treatment a group of persons—small in numbers but responsible for much harm—who are impervious to methods of education and persuasion and refuse to attend for treatment although known to be infected and to be spreading infection.

The regulation provides that persons named by two separate patients under treatment as the suspected source of their infection can be required, by notice served on them by the health officer of the district in which they live, to attend for examination and, if necessary, for treatment by a "special practitioner," and to continue treatment in accordance with his directions until they are certified as free from venereal disease in a communicable form. A special practitioner is defined as one employed or qualified to sit as a venereal disease officer of a treatment center, a specialist in venereal diseases in the

fighting services or any other practitioner designated for the purpose by the minister of health.

The regulation imposes on "special practitioners," on receiving information from a patient under treatment for venereal disease as to the person from whom he suspects that the disease was contracted ("the contact"), the duty of sending to the local health officer particulars of "the contact." All information is to be treated as strictly confidential. A special practitioner is to serve on the contact (if found on examination to be suffering from venereal disease) a notice requiring attendance for treatment. A special practitioner in private practice is under no obligation to treat a contact as a private patient but, if he does, he must discharge the duties laid down in the regulation. If a patient fails to comply with a notice requiring him to attend for treatment or to follow directions given him, he becomes liable to a maximum penalty of three months' imprisonment or a fine of \$500 or both. There are also penalties for giving false information in an attempt to blackmail some other person.

#### Tuberculosis Among Young People

The first Varrier-Jones lecture was delivered by Wing-Commander R. R. Trail, an expert on tuberculosis. His subject was "The Early Diagnosis of Pulmonary Tuberculosis." He said that except in a disappointingly small percentage of cases we were a long way from the early diagnosis of pulmonary tuberculosis. Tuberculosis now claimed half the total deaths from all causes at ages between 15 and 24. In the air force 40,119 members, including women of the auxiliary service, had been examined by mass roentgenography. Miniature roentgenograms, which can be made at far lower cost and at seven times the speed of full size ones, were taken. Despite the fact that 30,130 men concerned had within the previous six months a stricter medical examination than before, with a view to selection for special duties, the results of roentgenography of these unusually "fit" subjects showed that 65, 22 per thousand, exhibited signs of active disease, and 108, 36 per thousand, signs of inactive disease.

For the 9,989 women roentgenographed the figures were even worse. 38, 38 per thousand, had active disease, and 56, 56 per thousand, had inactive. The highest figures per thousand occurred in the age groups up to 29, being much greater in women than in men. While the incidence of active disease was practically 1 per thousand more for women in the age group 20-24, for women under 20 it was double that of men. For inactive disease the incidence in women under 20 was four times as great as among men, and in the age group 20-24 one and a half times as great.

The figures show that among our supposedly healthy adolescent and young adult population between 18 and 24 some 3 per thousand had unsuspected active tuberculosis and that more than 1 in 2,000 was a potential source of infection, as, unknown to himself, the patient had positive sputum. We have a population of some 5 millions in these age groups. This means that some 15,000 persons in Britain have unsuspected tuberculosis. All of them require at least expert supervision and advice, and many are in need of treatment. These figures relate to persons without admitted symptoms. The conclusion is that some 25 per cent more cases can be found in the early stage of tuberculosis by mass roentgenography than by the ordinary methods of diagnosis.

#### Royal College of Surgeons a Meeting Place for American and Canadian Medical Officers

The council of the Royal College of Surgeons has decided to offer the use of the library as a meeting place for American and Canadian medical officers.

## Deaths

**Joseph Rilus Eastman** \* Indianapolis, Central College of Physicians and Surgeons, Indianapolis, 1894, Friedrich-Wilhelms-Universität Medizinische Fakultät, Berlin, Prussia, Germany, 1897, professor emeritus of surgery at the Indiana University School of Medicine, president of the Indiana State Medical Association in 1919 and of the Indianapolis Medical Society in 1925, member of the American Surgical Association and of the Societe Internationale de Chirurgie, member and in 1913 1914 president of the Western Surgical Association, a founder, fellow and formerly governor of the American College of Surgeons, received a certificate of merit for an exhibit of fetal peritoneal folds by means of special photographs and drawings in the Scientific Exhibit of the American Medical Association in 1913 and was a member of the House of Delegates of the Association from 1912 to 1915, in 1917, from 1919 to 1922 and in 1924, during World War I was a director of the American Hospital in Vienna, Austria, and received the Austrian Imperial decoration of the Red Cross for his work there, later served as a major in the medical corps of the U S Army and as a member of the general medical board of the Council of National Defense, formerly on the staffs of St Vincent's and Deaconess hospitals, owner and director of the Joseph Eastman Hospital, visiting surgeon at the Indianapolis City Hospital, aged 71, died, November 29, of diabetes mellitus

**Howard Bennett Mettel** \* St Louis, University of Michigan Medical School, Ann Arbor, 1921, since Oct 1, 1942 director of medical and health service of the Midwestern Area of the American Red Cross, served as assistant professor of pediatrics and assistant in medical economics and postgraduate instruction at the Indiana University School of Medicine, Indianapolis, instructor of pediatrics at his alma mater from 1923 to 1925, member of the Indiana State Medical Association, specialist certified by the American Board of Pediatrics, Inc member of the American Academy of Pediatrics, for many years chief of the bureau of maternal and child health of the Indiana State Board of Health and acting director of the division of services for crippled children in the state department of public welfare at Indianapolis, in 1940 was elected secretary, in 1941 vice chairman and later chairman of the maternal and child health division of the American Public Health Association, served as secretary of the Indianapolis Medical Society, was a member of the staffs of the James Whitcomb Riley Hospital for Children, Methodist, St Vincent's and Indianapolis City hospitals, Indianapolis, aged 46, died, November 30 in the Barnes Hospital of bronchopneumonia

**George Thomas Tyler Jr** \* Greenville, S C Johns Hopkins University School of Medicine, Baltimore, 1904, past president and a member of the executive committee of the Greenville County Medical Society, one of the founders' group and specialist certified by the American Board of Surgery, served in the medical corps of the U S Army during World War I, at one time operated a private hospital, served as a chief of the general surgical service, president of the staff and on several committees of the organized staff of the Greenville General Hospital for two years or more editor of the *Bulletin* of the Greenville County Medical Society, aged 66 died November 26 in the Johns Hopkins Hospital, Baltimore, of a fungous infection of the meninges

**Lenna Leota Meanes**, New York, Drake University Medical Department, Des Moines, Iowa, 1897, formerly clinical instructor in obstetrics at her alma mater, at one time director of the baby health conference of the Iowa State Department of Agriculture, past president of the Iowa State Society of Medical Women served on the staffs of the Salvation Army Maternity Home and the Methodist and Mercy hospitals, Des Moines, for many years medical director of the Foundation for Positive Health, Inc, author of "Exercises for Health", aged 71, died, December 4, in the Braker Memorial Home of coronary occlusion and hypertension

**Harold Egbert Alexander**, Saskatoon, Sask, Canada, University of Toronto Faculty of Medicine, 1910, F R C S, Edinburgh, Scotland, 1925, fellow of the American College of Surgeons, attending surgeon, St Paul's and City hospitals, aged 58, died, October 5

**Francis Marion Barton**, Willisville, Ark, St Louis College of Physicians and Surgeons, 1910, aged 73, died, November 25, of prostatitis and cystitis

**Phebe Anderson Bottorff**, Kalispell, Mont, Hahnemann Medical College and Hospital, Chicago, 1894, aged 80, died, November 16, in Los Angeles of cerebral hemorrhage

**John D Bryant**, Fayetteville, Tenn, University of Tennessee Medical Department, Nashville, 1890, member of the Tennessee State Medical Association, aged 75, died, November 24, of coronary heart disease

**Edwin Martin Bullwinkel**, Brooklyn, Long Island College Hospital, Brooklyn, 1898, member of the Medical Society of the State of New York, aged 65, died, October 10

**Martin Francis Burns**, Port Washington N Y, College of Physicians and Surgeons, New York, 1895, aged 73, died, November 15, of acute coronary occlusion

**Matthew Campbell** \* La Crescenta, Calif, L R C P and S, Ireland, 1904, served as a captain in the medical corps of the U S Army during World War I, aged 68, died, November 10, in the Glendale (Calif) Sanitarium of coronary thrombosis

**Samuel Victor Carmichael**, Strome, Alta, Canada, Queen's University Faculty of Medicine, Kingston, Ont, 1908, aged 60, died, October 27, of a heart lesion

**Barrett Conner Catlin**, Baltimore, Southern Homeopathic Medical College Baltimore, 1895, at one time associate professor of obstetrics at his alma mater, formerly chief of the eye clinic, obstetrician and secretary of the board of directors of St Luke's Hospital, aged 74, died in November

**John Coulter Cheeseman**, Ingram, Pa, Miami Medical College, Cincinnati, 1878, member of the Medical Society of the State of Pennsylvania, aged 95 died November 24, of hypostatic pneumonia following an old cerebral hemorrhage

**Ratford Frank Childs**, Audubon Iowa, Omaha Medical College 1897, member of the Iowa State Medical Society, associate on the staff of the St Anthony Hospital, Carroll, aged 68 died, November 19, of coronary thrombosis

**Carter James Crippen**, Constable, N Y, University of Michigan Department of Medicine and Surgery, Ann Arbor, 1878, aged 90, died, November 12, of bronchopneumonia

**Alfred W Crozier**, Pittsburgh, Western Pennsylvania Medical College Pittsburgh 1904, member of the Medical Society of the State of Pennsylvania, served as a lieutenant in the medical corps of the U S Army during World War I, formerly a member of the staff of St Francis Hospital, aged 63, died, November 9, of chronic myocarditis and coronary occlusion

**James Taylor Davis**, Elizabeth N J Howard University College of Medicine, Washington D C 1920, member of the Medical Society of New Jersey, aged 52 died November 21, of heart disease

**Ephraim Elmer Ellsworth** \* Ironton Ohio, University of Louisville (Ky) Medical Department 1894, formerly secretary of the Lawrence County Medical Society, on the staff of the Charles S Gray Deaconess Hospital, aged 78 died November 12

**Charles Cowdrey Fitts**, Carrollton, Ga Emory University School of Medicine Atlanta, 1917, member of the Medical Association of Georgia served during World War I, head of the medical unit of the county civilian defense board and until recently chief examiner of the local draft board, aged 48, died, November 8

**Thomas H Flynn** \* Somerville, N J, Albany (N Y) Medical College 1890, past president of the Somerset County Medical Society, on the emeritus staff of the Somerset Hospital, for many years director of the Second National Bank of Somerville, aged 85 died, November 27, of chronic myocarditis

**William Martin Garner**, Rosston Ark, University of Arkansas School of Medicine, Little Rock 1911, member of the Arkansas Medical Society, aged 59, died, November 19, of cirrhosis of the liver

**Lester McCutcheon Githens**, Wren, Ohio, Eclectic Medical College, Cincinnati 1921, served during World War I, aged 47, died, November 16, in the Adams County Memorial Hospital, Decatur, Ind, of uremia

**William Laurence Gray**, Seattle, Vanderbilt University School of Medicine, Nashville, Tenn, 1901, aged 69, died, November 11, of coronary embolus

**Sergius Alexander Hartman**, Milwaukee, University of Moscow Faculty of Medicine, Russia, 1895, aged 73, died, November 13, of chronic cardiovascular disease

**Charles Henry**, Pleasant Plain, Iowa State University of Iowa College of Medicine, Iowa City, 1886, also a pharmacist, for many years a member of the U S Pension Board, aged 82, died, November 23, in Ottumwa of arteriosclerosis

**Robert G Herring**, Martinville, Ark University of Arkansas School of Medicine, Little Rock, 1901, aged 83, died, November 30, of pneumonia



**Nathan J Hughes**, Waverly, Ill, Cincinnati College of Medicine and Surgery, 1879, University of the City of New York Medical Department, 1890, for several years was on the Waverly township high school board of education, aged 88, died, November 18, of cerebral hemorrhage

**Herbert S Hutchinson**, Milford, N H, Bellevue Hospital Medical College, New York, 1880, member of the New Hampshire Medical Society and for fifty years' membership in the society received a gold medal in 1932, aged 93, died, November 26

**Amanda Elizabeth Ingraham** ♂ Wethersfield, Conn, Tufts College Medical School, Boston, 1900, member of the American Academy of Pediatrics and of the New England Pediatric Society, at one time founded a hospital and organized a training school for nurses for the Serbian government, director of the bureau of child hygiene of the Connecticut State Department of Health at Hartford from 1923 to 1936, aged 68, died, November 26, of heart disease

**Joseph Clinton Irvine**, Denver, Homeopathic Hospital College, Cleveland, 1884, aged 84, died, November 18, of bulbar paralysis

**Edward Joslin** ♂ Whitehall, N Y, Albany Medical College, 1891, village health officer of Whitehall from 1922 to 1939, aged 74, died, November 24, of carcinoma of the sigmoid

**John Alexander Lane** ♂ Eureka Calif, Cooper Medical College, San Francisco, 1898, aged 68 died, November 11, in St Joseph Hospital of coronary thrombosis

**George Mitchell Lochner**, St Petersburg, Fla, University of Michigan Department of Medicine and Surgery, Ann Arbor, 1909, member of the Florida Medical Association, served overseas as a captain in the medical corps of the U S Army, surgeon general of the National and Florida Veterans of Foreign Wars, aged 56, died, November 17

**Eugene Y Malone**, Trussville, Ala, Medical College of Alabama, Mobile, 1892, served during World War I, aged 73, died, November 25, of angina pectoris

**Frank F Martin**, Roosevelt, Okla, St Louis College of Physicians and Surgeons, 1907, aged 62, died, November 17, in the General Hospital, Hobart, of a kidney infection

**Orson Eugene Matter**, Maywood, Ill, Chicago Homeopathic Medical College, 1896, College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois 1904, member of the Illinois State Medical Society, aged 70, died, December 3, in the Oak Park (Ill) Hospital of arteriosclerosis

**Frederick Aaron Meisle** ♂ Philadelphia Jefferson Medical College of Philadelphia 1904, aged 62, died, November 21, in the Jefferson Hospital

**William George Moorehouse**, Lancaster, Pa, University of Pennsylvania Department of Medicine, Philadelphia, 1885, formerly a medical examiner for the Pennsylvania Railroad, aged 80, died, November 20, in the Lancaster General Hospital of a fracture of the right femur as the result of a fall, pneumonia and arteriosclerosis

**Charles Samuel Noble**, Seattle, New York University Medical College, New York, 1896, aged 67, died, November 15

**Dorothy Kathryn O'Connor**, Riverside Ill, University of Illinois College of Medicine, Chicago, 1938, member of the Illinois State Medical Society, aged 31, died, November 20, in St Luke's Hospital, Chicago

**Edward R Palmer** ♂ Ashland, Ky, University of Louisville Medical Department, 1896 past president of the Jefferson County Medical Society, the Louisville Society of Medicine and the Louisville Urological Society, at one time vice president of the Kentucky State Medical Association, formerly professor of physiology at his alma mater, aged 70, died, November 25

**Ernest Boring Porter** ♂ Altadena, Calif, Northwestern University Medical School, Chicago, 1925 fellow of the American College of Physicians, formerly health officer of Coronado, served during World War I, captain, medical reserve corps, U S Army, not on active duty, on the staff of the Mercy Hospital, San Diego from 1927 to 1938, aged 47, died November 15, of coronary thrombosis

**Moses D Rabenoyich**, Toledo, Ohio, University of St Vladimir Faculty of Medicine, Kiev, Russia 1879, aged 84, died, November 25, in the Toledo Hospital of hypostatic pneumonia following a fracture of the left femur due to a fall

**Florence Stephen Richard**, Shreveport, La Tulane University of Louisiana School of Medicine, New Orleans, 1919, aged 49, died, November 11

**Alexander Peter Robertson** ♂ Alton, Ill, National University of Arts and Sciences Medical Department, St. Louis, 1913, past president of the Madison County Medical Society, served in the medical corps of the U S Army during World War I, at one time health commissioner of Alton, for seventeen years director of the Social Hygiene Clinic aged 52, on the staff of the Alton Memorial Hospital where he died November 20, of ruptured aneurysm of the aorta

**Frank Augustus Ross** ♂ South Berwick Maine, Medical School of Maine, Portland, 1896, aged 69, died, November 16, of cerebral hemorrhage

**Benson Ruddell**, Frankfort, Ind, Medical College of Indiana, Indianapolis, 1900, member of the Indiana State Medical Association aged 66, died November 24, of carcinoma of the cervical glands of the left side of the neck

**S P Ruff**, Marshall, Ark (licensed in Arkansas in 1903), aged 82, died, November 26 of lobar pneumonia

**Edwin Stanton Saylor**, West Point Pleasant, N J University of Pennsylvania Department of Medicine, Philadelphia, 1898, member of the Medical Society of the State of Pennsylvania, at one time chief of ophthalmology at St Timothy's Hospital and on the staffs of the Wills, Pennsylvania and Polyclinic hospitals, Philadelphia, formerly lecturer on diseases of the eyes and ears at the American Stomach Hospital, Philadelphia, served during World War I, aged 76, died, November 23, in Laurelton of myocarditis

**Ernest Schemer**, Grand Rapids, Mich, Detroit College of Medicine, 1894, aged 84, died, November 18, of senility

**William H Slaterry**, Lincoln, Neb, St Louis College of Physicians and Surgeons, 1902, formerly city physician, a member of the executive board and active member on the committee of internal medicine of St Elizabeth Hospital, aged 70, died, November 17, of diabetes mellitus

**Louis E Slayton**, Spencerport, N Y, University of Vermont College of Medicine, Burlington, 1884, aged 80, died November 29, in Cazenovia of arteriosclerotic cardiorenal disease

**Henry Hutchison Taggart**, Wichita, Kan, Kansas City (Mo) Medical College, 1900, formerly secretary of the staff of the Wichita Hospital, aged 68, died, November 9

**Frederick Llewellyn Thomson**, San Antonio, Texas, McGill University Faculty of Medicine, Montreal, Que, Canada, 1896 member of the Bexar County Selective Service Board number 9, aged 68, died, November 17

**Achilles Douglas Tyree**, Clifton Forge, Va, Medical College of Virginia, Richmond, 1911, member of the Medical Society of Virginia, served as a captain with the British Expeditionary Forces in France during World War I, aged 52, died, November 12

**Herbert Dutton Weaver**, Saskatoon, Sask, Canada, Trinity Medical College, Toronto, Ont, 1897, for several years lectured at the Dalhousie University Faculty of Medicine Halifax N S, aged 75, died, September 12, in St Paul's Hospital

**James L Wells**, Chicago, Harvey Medical College, Chicago, 1902, member of the Illinois State Medical Society, formerly on the staff of the Englewood Hospital, aged 72, died December 14, of coronary thrombosis and hypertension

**Carolyn Louise Westlake Widdowson**, Le Roy, N Y University of Buffalo School of Medicine, 1897, aged 69 died, November 3

#### DIED WHILE IN MILITARY SERVICE

**Frank Clinton Andrus** ♂ Minneapolis University of Minnesota Medical School, Minneapolis 1933, specialist certified by the American Board of Pathology Inc, member of the American Association of Pathologists and Bacteriologists and of the American Society of Clinical Pathologists, assistant professor and formerly teaching fellow in the department of pathology at his alma mater, at one time instructor of pathology at the Ohio State University College of Medicine Columbus in April 1938 was appointed director of the laboratory of the Springfield City Hospital, in September 1939 was made director of the laboratory of the Minneapolis General Hospital, captain in the medical corps, Army of the United States, chief of the laboratory service of the Percy Jones General Hospital Battle Creek, Mich, aged 35, died, November 14 in Battle Creek, Mich, of coronary occlusion



## Bureau of Investigation

### SOME MISCELLANEOUS MEDICAL FRAUDS

#### A Variety of Schemes Debarred from the Mails

Fraud orders issued by the Post Office Department have frequently been the subject of extensive articles by the Bureau of Investigation in these pages of THE JOURNAL. Following are brief abstracts of some fraud orders not dealt with previously.

**Ambrew Mate Institute**—Under this trade style in Adna E. Hall of New York started in 1933 an enterprise then limited to the sale of Ambrew Mate Tea, a proprietary name for a plant leaf product from South America. That period it will be recalled was the heyday for exploiting mate (under proprietary names) as a tonic and many other things. Around 1937 Hall went into the hair growing business. In his advertising he quoted from what he described as a newspaper feature article written in 1937 by George Jean Nathan, dramatic critic in which Mr. Nathan is supposed to have claimed that fifteen years earlier when some of his hair had fallen out after an attack of influenza an English sea captain who had a head of hair at sixty-two that looked like the Wild Man of Borneo's told him that the heavy growth was due to application of the juice of the mullein plant whereupon the critic tried the stuff himself and obtained similar results as did scores of his personal friends. The story was dealt with in a current comment in THE JOURNAL April 10, 1937, page 1266. From the newspaper article Hall claimed to have got the inspiration for an alleged hair grower and proceeded to market it under the name Lotta Lox, which a government chemist found to be a mixture of 2.6 Gm. of mullein with glycerin and rosewater. Hall's representations for this as a cure for baldness did not convince the Post Office Department which after an investigation notified him to show cause on Jan. 9, 1942, why the mails should not be closed to his business on the ground that it was fraudulent. Hall did not appear at the hearing on that date but sent his attorney. An expert medical witness for the government testified that many cases of falling hair and baldness are due to systemic causes not remediable by external application of local tonics and that the commonest form of permanent baldness alopecia prematura is due to hereditary factors and not amenable to any known treatment that in alopecia areata the hair may return in course of time without artificial aid and that in senile alopecia or baldness of old age resulting from progressive loss of hair due to atrophy of hair follicles there could be no restoration of hair growth. It was further shown that Hall's mullein mixture would have no effect on systemic causes of baldness or in any way bring about a growth of new hair or stop excessive hair loss. The witness dismissed the testimony credited to Mr. Nathan for the efficacy of mullein in baldness with the opinion that the regrowth of hair if any was due not to the mullein but to time and time alone. In spite of the defense attorney's contention that Hall's advertising contained no representation or promise as to the curative power of Lotta Lox and that the government's expert medical witness was not qualified to pass on the merits and action of the product without having personally used or prescribed it the preponderant evidence at the hearing was that the business amounted to obtaining money through the mails by means of false and fraudulent pretenses, representations and promises. The Post Office accordingly issued a fraud order on May 6, 1942, against the Ambrew Mate Institute and its officers and agents.

**David Aitchison**—From Arlington, Va., this person sold a cancer cure through the mails and styled himself M.D. D.D.M. L.L.D. In December 1941 the Post Office Department notified him to show cause at a hearing to be held on Jan. 16, 1942, why a fraud order should not be issued against him. Neither Aitchison nor any one representing him put in an appearance but subsequently he sent the Post Office a statement commenting on what had taken place at the hearing. The gist of the evidence presented there and of Aitchison's communication as reported is given in the following abstract of the Post Office memorandum of this case. Aitchison solicited business by means of advertisements placed in periodicals circulating through the mails. One of these read: "Cancer treated successfully by the famed Street method (Whatever that was)." To inquirers Aitchison sent handwritten questions regarding their physical condition and from their replies he pretended to diagnose their cases after which of course he recommended his treatment at various prices ranging from \$25 to several hundred dollars. It appears that he prescribed for a variety of disorders. His cancer treatment consisted of three preparations called "No. 36," "No. 52," and "Rectum." Government chemists reported on these as follows: "No. 36" a gray uncoated tablet of 3.1 grains containing milk sugar, lactose hydrate and 1/10 grain of charcoal. "No. 52" a powdered material containing senna leaves, buckthorn bark, alfalfa leaves and stems, caraway seed and about 10 per cent of sodium sulfate. "Rectum" (rectal injection) a hydroalcoholic solution containing 17 grains of plant extractives per hundred cubic centimeters with no minerals or alkaloids. The medical witness at the hearing, an eminent authority on cancer, testified that this combination of medicines would have no value whatever in the treatment of any type of cancer nor would Aitchison's recommendation of diet, exercise and rest eliminate or even check a cancerous condition. It was brought out that although Aitchison claimed to be licensed as a doctor of naturopathy in Maryland, Virginia and Tennessee, the authorities of those states denied this. Among other evidence submitted at the hearing was a certified copy of a record of the District of Columbia Police Court showing that Aitchison had been convicted on Nov. 1, 1922, of practicing medicine in that district without a license and sentenced to pay a fine of \$1,000 or serve 90 days in jail. It was further shown that though Aitchison claimed to

be a graduate of the National College of Therapeutics, a school which he stated had specialized in naturopathy but which is no longer in existence, he had had no recognized medical training and so far as the evidence showed was not licensed to practice medicine or any other method of healing anywhere in the United States. Neither did his communications to the Post Office Department offer any evidence to support his claim that he had cured many cases of cancer. Accordingly a fraud order debarbing his business from the mails was issued on Feb. 23, 1942, against the various designations under which he had operated.

**Glamo Form Products**—This was the trade style used by a Brooklyn concern which sold through the mails an alleged bust developer known as 'Glamo Form'. This was sold for \$1 with the promise that when used as directed it would enlarge and reshape flat undeveloped breasts and provide the user with a beautiful bust line and further would develop unshapely and thin legs into legs with beautiful symmetrical proportions. The Glamo Form concern was said to be receiving about 100 pieces of mail daily at the time that the Post Office notified this company to show cause on Feb. 5, 1942, why it should not be debarred from the mails for operating a fraud. The defendant company denied the charges alleging that what it actually offered was a course of treatment consisting of advice on massage and brassieres and that the entire course was not confined to the use of its massage cream. No one representing the concern appeared at the hearing however to testify that it was engaged in selling brassieres. On the contrary the evidence presented clearly showed that the only product actually intended to be sold was the massage cream. In fact it was shown that the promoters sold the cream to women who wrote in that they desired this product if it would provide them with a beautiful bust line in place of breasts that had been flat and flabby for years. The cream according to government chemists was nothing more wonderful than a mixture of oils, fats and wax with 10 per cent of water and 15 per cent of camphor. An expert medical witness for the government testified at the hearing of this case that the cream of itself would neither build up flat flabby breasts nor reduce those which were large and pendulous nor would the accompanying recommended exercises accomplish this result. This testimony was even confirmed by the defendant's medical witness, an unnamed Brooklyn physician whose admission of those facts must have given scant support or comfort to the concern that had hired him. Altogether the evidence showed that the Glamo-Form business was a scheme to obtain money through the mails by means of false and fraudulent pretenses, representations and promises and it was accordingly debarred from the mails by a fraud order issued on March 27, 1942, against the names Glamo Form and Glamo Form Products of Brooklyn and their officers and agents.

**Hairtone Company and Marvel Company**—Of the making of many hair growers as with books there is no end. The one that was exploited under the name Quinine Hair Marvel by a Matilda Richman of Brooklyn first doing business as the Marvel Company and later as the Hairtone Company was another to come under the scrutiny of the Post Office Department. If one could believe the claims made for it this product when used as directed would overcome the most obstinate case of baldness, eliminate dandruff and grow moustaches and eyebrows like magic. A government chemist's report on it however was somewhat disillusioning showing that it was merely a mixture of substances used for years in hair growers which never grew any hair. Petroleum a trace of a vegetable oil about 1 per cent of sulfur and less than 1 per cent of quinine. In time the product seems to have been changed over to liquid form under a new designation Quinine Hairtone with Olive Oil which according to its exploiter contained salicylic acid and quinine sulfate 1 grain each, betanaphthol 1/2 grain, resorcinol 2 grains, sulfur 20 grains, olive oil 8 minims and castor oil 30 minims. Thus the name of the preparation was misleading since the mixture contained more castor oil than olive oil. Not for this reason but because of other false and misleading representations under which it was sold the Post Office Department after due investigation of the scheme ordered the promoter of the Hairtone Company and Marvel Company to appear at a hearing on Jan. 30, 1942, and answer charges of conducting a mail order fraud. Her attorney appeared for her. An expert medical witness for the Post Office described at some length the various causes of baldness (with which the defendant's medical witness, a Brooklyn physician whose identity was not disclosed in the memorandum on the case, agreed) and further showed that the treatment in question would have no value in removing or correcting these conditions. Also without weight the government charged was the contention of the defendant's counsel that Matilda Richman had not intended to represent her preparations as a treatment for baldness or to give the impression that the use of the product will grow hair unless the hair roots are actually alive. The government disproved this claim of the attorney by showing that in at least one instance Matilda Richman had sold her Quinine Hair Marvel to an inquirer who had described himself as almost completely bald and who had specifically stated that he wanted the preparation if it would grow new hair on the bald spots. In view of the preponderant evidence that the treatment did not justify the representations made for it the business was debarred from further use of the mails by a fraud order issued on May 22, 1942, against the names Hairtone Company and Marvel Company and their officers and agents.

**Nu Hair Products**—Under this trade style one Joseph Villon operated from New York and Brooklyn in selling an alleged hair grower through the mails. It was known as Complete Nu Hair Scalp Treatment and comprised the Besgro Formula, Pressing Compound and Special Shampoo. If one could believe the advertising these would cure head sores and scars, prevent loss of hair and grow long healthy hair on the head of any person who was bald. There was the additional promise that great success has been reported in most obstinate cases. In view of these claims the Post Office Department notified the concern to show cause on January 27, 1942, why a fraud order should not be issued against it. On that date the concern's attorney appeared at the hearing. A qualified chemist testified that his analyses had shown the following compositions: Nu Hair Besgro, an opaque yellow salve con-

turning petrolatum 6.55 per cent of sulfur and a small amount of wool fat, Nu Hair Pressing Compound a slightly perfumed amber colored petrolatum salve, Castile Shampoo a granular soap powder with no medication. The chemist added that he did not find the quinine and balsam peru claimed to be present in the Nu Hair Besgro. An expert medical witness testified for the government that though the sulfur in this product would destroy parasites in the hair and scalp and that the ointments would tend to soften the epidermis of the scalp with the shampoo acting as a cleanser the treatment as a whole would be of no value for any systemic cause of baldness or falling hair and this fact also was admitted by the defendant's witness. This was a Dr Edward Podolsky of Brooklyn who confessed that he was not a dermatologist. Podolsky is, however, known to have promoted the sale of various fad foods. Eventually the Nu Hair Products and their officers and agents were debarred from the mails by a Post Office fraud order issued on March 9 1942.

## Correspondence

### RESUSCITATION OF THE NEWBORN

*To the Editor*—With regard to resuscitation of the newborn, almost all students of the subject advocate tracheal intubation. This is a simple operation if the proper directions are followed.

First, one needs a semirigid catheter of latex or some similar substance of approximate size F 12. The tracheal end preferably should be beveled and all surfaces emery papered smooth. Its length of about 8 inches has been found satisfactory. For the past several years, students of the University of Georgia School of Medicine have been taught tracheal intubation by practice on a recently delivered stillborn infant. The technic is so simple that each of a class of forty is able to intubate the trachea during a one hour period. This includes exposure of the trachea by direct laryngoscopy with an electric lighted infant laryngoscope, of which several inexpensive models are on the market. With the epiglottis held anteriorly by the laryngoscope blade, while the infant lies supine on a flat surface, the catheter is gently inserted into the round tracheal opening which lies immediately anterior to the larger esophageal cavity. The catheter is inserted about 2 inches and then the insufflator is attached to the other end.

We have found satisfactory a simplified De Lee type of mouthpiece insufflator with an added weighted valve which automatically prevents too much pressure to the lungs (Volpitto, P. P., and Torpin, Richard. Apnea Neonatorum. Its Treatment by a Simplified Insufflation Technic, *South M J* 35:559 [June] 1942).

There is little doubt that many infants could be made to breathe that never do, and that many who die in the first week or so of life from pneumonia probably obtain the infection from inspiration of infected secretions at the time of birth.

RICHARD TORPIN, M.D., Augusta, Ga.

### "JEJUNAL ULCERS AND RECURRENT HEMORRAGES AFTER PARTIAL OR SUBTOTAL GASTRECTOMY"

*To the Editor*—The article by E. D. Kiefer on this subject (*THE JOURNAL*, Nov. 14, 1942) may change the whole aspect of surgical treatment of duodenal ulcer. If radical operation is followed by jejunal ulcer in as many as 7 per cent of the cases then our conception that gastrectomy is superior to gastroenterostomy has to be revised.

However, an analysis of the 12 cases reported in Dr. Kiefer's paper does not permit the assumption that the results of radical operation in duodenal ulcers are "tragically disappointing" as far as postoperative jejunal ulcers are concerned.

As a matter of fact, in 7 of the 12 cases no radical operation but Finsterer's method was used, and according to a personal communication of Dr. Kiefer in 2 cases of the remaining 5 gastric resection was done not for duodenal ulcer alone but for duodenal ulcer plus gastroenterostomy plus jejunal ulcer.

In the 30 cases of Dr. Kiefer's series in which the Finsterer operation was done, it must be appreciated that in this method the ulcer, the pylorus and part of the antrum are not included in the resection. In 7 of these 30 cases jejunal ulcers subsequently developed. The first disappointing results of the Finsterer procedure were published as far back as 1932 (a bibliography is presented in an article on technical procedures in the *Journal of the International College of Surgeons* 5:1 [Jan-Feb] 1942). Dr. Kiefer is quite correct in stating that "any procedure that does not remove the pylorus and the duodenal ulcer is inadequate," as it is not a radical operation.

As to the 2 patients who had duodenal ulcer plus gastroenterostomy plus jejunal ulcer, in them the question of primary radical operation for duodenal ulcers is not involved. Those marginal ulcers which recur even following partial gastrectomy are frequently looked on as "surgically incurable." That designation is not entirely justified. However, it is most probable that these "incurable" ulcers are not primarily incurable but that insufficient surgical intervention such as gastroenterostomy or the Finsterer operation results in an irritative condition which later makes the ulcer refractory to any medical or surgical therapy.

In view of the fact that jejunal ulcer (only one verified by operation) developed in only 3 cases out of at least 115 in which primary resection was done, I would call these results fairly satisfactory rather than disappointing.

RUDOLF NISSEN, M.D., New York

### ANDROGENS AND TESTICULAR IRRADIATION IN CANCER OF THE PROSTATE

*To the Editor*—In discussion of a recent group of papers on prostatic cancer, Munger (*THE JOURNAL*, Dec. 5, 1942, p. 1120) said "The theorem of possible relationship of some factor in the testicle, probably androgenic, to carcinoma of the prostate was promulgated by me eight years ago." The quotation refers apparently to an oral promulgation rather than a publication, since no reference to it could be found in the papers of Dr. Munger cited before 1941 in the *Quarterly Cumulative Index Medicus*, a source which most workers accept as indicating publication in the clinical fields of medicine. The first paper proving any relationship between hormones and cancer of the prostate gland was published by Huggins and Hodges (*Cancer Research* 1:293 [April] 1941), who showed that cancer of the prostate is activated by androgen injections and is inhibited by eliminating androgens through castration or neutralization of their activity by estrogen injection. These conclusions have since been confirmed in many published reports.

Some months ago the effect of irradiation of the gonads was described by Munger (*J. Urol.* 46:1007 [Nov.] 1941), who concluded that "a study of several cases treated by testicular irradiation with [prostatic] resection seems to indicate that slightly better results were obtained than in those cases treated by resection and x-ray exclusive of the testicular application." This appears to me to be a fair statement of the results. Many observers have reported that extensive irradiation of the testes of animals does not eliminate androgen production by these glands, although the germinal epithelium is destroyed. Moreover, consonant with the experimental findings, the observations of Gutman (*THE JOURNAL*, Dec. 5, 1942, p. 1112) and of Huggins (*Ann. Surg.* 115:1192 [June] 1942) indicate that orchiectomy has produced clinical benefit in cases of prostatic cancer in which testicular irradiation had been administered previously in sterilizing amounts with unsatisfactory clinical results. Roentgen irradiation of the testes appears to be inadequate as a therapeutic agent in human prostatic cancer.

CHARLES HUGGINS, M.D., Chicago

## Medical Examinations and Licensure

### COMING EXAMINATIONS AND MEETINGS

#### ANNUAL CONGRESS ON MEDICAL EDUCATION AND LICENSURE

CHICAGO Feb 15 16 Sec Council on Medical Education and Hospitals Dr H G Weiskotten 535 North Dearborn Street Chicago

#### NATIONAL BOARD OF MEDICAL EXAMINERS EXAMINING BOARDS IN SPECIALTIES

Examinations of the National Board of Medical Examiners and Examining Boards in Specialties were published in THE JOURNAL Jan 2, page 71

#### BOARDS OF MEDICAL EXAMINERS

ALABAMA Montgomery, June 15 16 Sec, Dr B F Austin 519 Dexter Ave., Montgomery

ARKANSAS \* Eclectic Little Rock June 3 4 Sec Dr C H Young 1415 Main St. Little Rock

CONNECTICUT \* Hartford March 9 10 Endorsement Hartford March 23 Sec to the Board Dr Creighton Barker 258 Church St New Haven

DELAWARE Dover July 13 15 Sec Medical Council of Delaware Dr Joseph S McDaniel 229 S State St Dover

DISTRICT OF COLUMBIA \* Washington May 10 11 Sec Commission on Licensure, Dr George C Ruhland 6150 E Municipal Bldg Washington

FLORIDA \* Jacksonville June 21 22 Sec Dr William M Rowlett Box 786 Tampa

GEORGIA March Sec State Examining Boards Mr R C Coleman 111 State Capitol Atlanta

HAWAII Honolulu Jan 11 14 Sec Dr James A Morgan, 48 Young Bldg Honolulu

IDAHO Boise Jan 12 13 Dir Bureau of Occupational Licenses Mr Walter Curtis 355 State Capitol Bldg Boise

ILLINOIS Chicago Jan 19 21 Superintendent of Registration Department of Registration and Education Mr Philip M Hurman Springfield

INDIANA Indianapolis Jan 13 15 Sec Board of Medical Registration and Examination Dr W C Moore 301 State House Indianapolis

IOWA \* Iowa City Feb 22 24 Dir Division of Licensure and Registration Mr H W Grete Capitol Bldg Des Moines

KENTUCKY Louisville March 2 4 Sec State Board of Health Dr A T McCormack 620 S Third St Louisville

MAINE Portland March 9 10 Sec Board of Registration of Medicine Dr Adam P Leighton 192 State St Portland

MASSACHUSETTS Boston March 9 12 Sec Board of Registration in Medicine Dr H Q Gallup 413 F State House Boston

MICHIGAN \* Ann Arbor and Detroit June 11 13 Sec Board of Registration in Medicine Dr J Earl McIntyre 100 W Allegan St Lansing

MINNESOTA \* Minneapolis Jan 19 21 Sec, Dr Julian I Du Bois 230 Lowry Medical Arts Bldg St Paul

MISSOURI St Louis Feb 16 18 and March 23 25 Sec State Board of Health Dr James Stewart State Capitol Bldg Jefferson City

MONTANA Helena April 6 7 Sec Dr Otto G Klein First National Bank Bldg Helena

NEVADA Reciprocity Carson City Feb 1 Sec Dr R A. Petty 215 N Carson St Carson City

NEW HAMPSHIRE Concord March 11 12 Sec Board of Registration in Medicine Dr Deering G Smith State House Concord

NEW MEXICO \* Santa Fe April 12 13 Sec Dr Le Grand Ward 135 Sena Plaza Santa Fe

NEW YORK Albany Buffalo New York and Syracuse, Jan 25 28 Chief Bureau of Professional Examinations Mr H L Field 315 Education Bldg, Albany

OREGON \* Written Portland Jan 20 22 Exec Sec, Miss Lorraine M Conlee 608 Failing Bldg Portland

SOUTH DAKOTA Pierre Jan 19 20 Dir Medical Licensure State Board of Health Dr J F D Cook Pierre

UTAH Salt Lake City June Dir, Department of Registration Mr G V Billings 324 State Capitol Bldg Salt Lake City

VERMONT Burlington March 25 27 Sec Dr F J Lawless Richford

WASHINGTON \* Seattle Jan 11 13 Dir Department of Licenses Mr Thomas A Swazey Olympia

WEST VIRGINIA Charleston March 1 3 Commissioner, Public Health Council Dr C F McClintic State Capitol Charleston

WISCONSIN \* Madison, Jan 12 14 Sec, Dr H W Shutter 425 E Wisconsin Ave., Milwaukee

WYOMING Cheyenne, Feb 1 2 Sec Dr M C Keith Capitol Bldg Cheyenne

\* Basic Science Certificate required

#### BOARDS OF EXAMINERS IN THE BASIC SCIENCES

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RHODE ISLAND Providence Feb 17 Chief Division of Examiners, Mr Thomas B Casey 366 State Office Bldg Providence

### New York Endorsement Report

The New York Board of Medical Examiners reports 73 physicians licensed to practice medicine by endorsement from January 1 through May 23, 1942. The following schools were represented

School	LICENSED BY ENDORSEMENT	Year Grad	Endorsement of
Stanford University School of Medicine		(1928)	California
Yale University School of Medicine (1936)	(1939)	(1940)	N B M Ex
Georgetown University School of Medicine (1939)	(1939)	(1940)	N B M Ex
Howard University College of Medicine		(1940)	N B M Ex
Northwestern University Medical School		(1907)	Oregon
Tulane University of Louisiana School of Medicine		(1939)	Louisiana
Johns Hopkins University School of Medicine (1934)			N B M Ex
University of Maryland School of Medicine and College of Physicians and Surgeons (1938)	(1939)	(1936)	Maryland
Harvard Medical School (1932)	(1939)	(1940)	N B M Ex
Tufts College Medical School (1937)	(1938)	(1938)	N B M Ex
University of Michigan Medical School		(1938)	Michigan
Wayne University College of Medicine		(1937)	Michigan
University of Minnesota Medical School		(1938)	Minnesota
Washington University School of Medicine		(1922)	N B M Ex
University of Nebraska College of Medicine		(1933)	N B M Ex
Albany Medical College (1939)	(1940)	(1940)	N B M Ex
Long Island College of Medicine (1939)	N B M Ex		California
New York Medical College Flower and Fifth Avenue Hospitals (1938)	(1939)	(1940)	N B M Ex
New York University College of Medicine (1935)	(1939), (1940)	(1940)	N B M Ex
University of Buffalo School of Medicine (1939), (1940)	(1940)	(1940)	N B M Ex
University of Rochester School of Medicine and Dentistry (1940)	(1940)	(1940)	N B M Ex
Duke University School of Medicine (1936)	(1937)	(1940)	N B M Ex
Eclectic Medical College Cincinnati (1939)		(1939)	Penna
Hahnemann Medical College and Hospital of Philadelphia (1929)	(1939)	(1939)	Penna
Jefferson Medical College (1929)	(1939)	(1939)	Penna
University of Pennsylvania School of Medicine (1922)	(1939)	(1939)	Penna
University of Pittsburgh School of Medicine (1931)	(1939)	(1939)	Penna
Woman's Medical College of Pennsylvania (1935)	(1939)	(1939)	Penna
Baylor University College of Medicine (1937)	(1939)	(1939)	Texas
University of Vermont College of Medicine (1929)	(1937)	(1937)	Vermont
Marquette University School of Medicine (1940)	(1941)	(1941)	N B M Ex
University of Toronto Faculty of Medicine (1921)	(1941)	(1941)	N B M Ex
McGill University Faculty of Medicine (1940)	(1941)	(1941)	N B M Ex
Medizinische Fakultät der Universität Wien (1937)	(1938)	(1938)	N B M Ex
University of Cambridge Faculty of Medicine (1938)	(1938)	(1938)	N B M Ex
Rheinische Friedrich Wilhelms Universität Medizinische Fakultät Bonn (1937)	(1937)	(1937)	N B M Ex
American University of Beirut School of Medicine (1942)	(1942)	(1942)	N B M Ex
Licentiate of the Royal College of Physicians and Surgeons of Edinburgh and of the Royal Faculty of Physicians and Surgeons Glasgow (1939)	(1939)	(1939)	N B M Ex
University of Basel (1939)	(1939)	(1939)	N B M Ex

### Tennessee June Report

The Tennessee State Board of Medical Examiners reports the written examination for medical licensure held at Knoxville, Memphis and Nashville June 17-20, 1942. The examination covered 10 subjects and included 100 questions. An average of 75 per cent was required to pass. One hundred and eighteen candidates were examined, all of whom passed. The following schools were represented

School	PASSED	Year Grad	Number Passed
College of Medical Evangelists		(1942)	1
Howard University College of Medicine		(1941)	1
University of Minnesota Medical School		(1942)	1
Long Island College of Medicine		(1942)	1
University of Buffalo School of Medicine		(1924)	1
Jefferson Medical College of Philadelphia		(1941)	1
University of Pennsylvania School of Medicine		(1942)	2
Meharry Medical College		(1942)	47
University of Tennessee College of Medicine (1941)		(1942)	19
Vanderbilt University School of Medicine		(1942)	42
McGill University Faculty of Medicine		(1940)	1
American University of Beirut School of Medicine		(1940)	1

Ten physicians were licensed to practice medicine by reciprocity from June 13 through Aug 5, 1942. The following schools were represented

School	LICENSED BY RECIPROCITY	Year Grad	Reciprocity with
Emory University School of Medicine		(1941)	Georgia
University of Kansas School of Medicine		(1939)	Kansas
University of Louisville School of Medicine		(1939)	Kentucky
University of Minnesota Medical School		(1927)	Minnesota
Washington University School of Medicine (1919)			
Colorado		(1940)	Missouri
University of Nebraska College of Medicine		(1936)	Nebraska
University of Oklahoma School of Medicine		(1938)	Louisiana
Meharry Medical College		(1911)	Illinois
University of Tennessee College of Medicine		(1941)	Mississippi

## Michigan June Report

The Michigan State Board of Registration in Medicine reports the written examination for medical licensure held at Detroit, June 3-5, 1942. The examination covered 14 subjects and included 100 questions. An average of 75 per cent was required to pass. Eighty-nine candidates were examined, all of whom passed. The following schools were represented:

School	PASSED	Year Grad	Number Passed
Loyola University School of Medicine		(1942 2)*	2
Northwestern University Medical School		(1942 4)*	4
Rush Medical College		(1941 2)*	2
The School of Medicine of the Division of the Biological Sciences		(1941)*	1
University of Kansas School of Medicine		(1941)*	1
Johns Hopkins University School of Medicine		(1942)*	1
Tufts College Medical School		(1941)*	1
Wayne University College of Medicine		(1942 66)†	66
University of Minnesota Medical School		(1941)*	1
St. Louis University School of Medicine		(1942)*	1
University of Oregon Medical School		(1941)*	1
Hahnemann Medical College and Hospital of Philadelphia		(1941)*	1
Jefferson Medical College of Philadelphia		(1941 3)*	3
University of Pennsylvania School of Medicine		(1941)*	1
Vanderbilt University School of Medicine		(1941)*	1
Marquette University School of Medicine		(1942)*	1
Queen's University Faculty of Medicine		(1940)*	1

\* Licenses have not been issued

† These applicants received the M B degree and will receive the M D degree on completion of internship. Licenses have not been issued

## Bureau of Legal Medicine and Legislation

### MEDICOLEGAL ABSTRACTS

**Workmen's Compensation Acts Death from Rocky Mountain Spotted Fever Caused by Bite of Wood Tick Allegedly Received in Course of Employment**—Prowse worked in the waste dump of a mine, parts of which were overgrown with foliage. On July 22 he told his foreman that while at work something had bitten him on the finger and that he had brushed it off. Apparently for the next few days he did not feel well and was "irritable and grouchy." On the 26th he became "ill" and was hospitalized on the 29th. On the 31st Rocky Mountain spotted fever was diagnosed, from which he died August 2. Alleging that Prowse's death was due to the bite of a wood tick suffered in the course of his employment, the widow instituted proceedings for compensation before the industrial commission of Utah. From an award in the widow's favor the employer appealed to the Supreme Court of Utah.

The sole question to be determined by this court, said the Supreme Court, is whether the evidence before the industrial commission was sufficient to sustain its findings that the workman received the fatal tick bite during the course of his employment. Rocky Mountain spotted fever is a disease of man directly traceable to a deadly virus carried by infected wood ticks. These infected transmitting agents attach themselves to man by biting. The virus becomes reactivated within several hours after ingestion of blood in the tick has begun, and it is then passed into the body of man. There are two types of infection in man—ambulatory and fulminating. The workman was diagnosed as having the latter and more fatal infection. The period of incubation within man covers a period of from two to fifteen days, depending on the severity of the infection, the resistance of the man and the locality of the bite. In cases of fulminating infections, the period of incubation is determined as from two to five days, the prodromal period is from two to three days in duration during which time the characteristic chilly sensations, backache and the like appear. These sensations first experienced by Prowse on July 26. Death occurs between the ninth and fifteenth day following infection. It is not infrequent that the site of the tick attachment cannot be found. Medical science has some basis for the belief that the virus of an activated tick may enter through the pores of the skin.

A physician called as a witness by the employer testified that in his experience no tick has ever bitten a man on the hand but that their tendency is to seek a locality on the body where they are not so apt to be brushed off. Because of this testimony the employer contended that the industrial commission could not properly find that the tick bite was suffered by the workman during the course of his employment, since such a finding is a mere surmise, conjecture, guess or speculation. The Supreme Court however, adverted to the direct testimony of the employer's foreman that the deceased had complained to him of a bite on his finger during working hours. This, said the court, created a conflict in the testimony sufficient to justify the finding of the commission, regardless as to whether or not this court would have arrived at the same conclusion or inference from the testimony as was arrived at by the industrial commission. The duty of this court in the presence of conflicting evidence is to examine the record, and, unless we can say that as a matter of law the conclusion of the commission was wrong because only the opposite conclusion could be drawn from these facts, this court must affirm the finding of the commission.

The employer contended that there are instances in which, even though an opposite conclusion cannot be drawn, the commission cannot conclude that the accident arose in the course of the employment. This, it was argued, is the situation where the commission cannot from all the facts infer the ultimate fact that the accident occurred in the course of the employment with any more probability than that it occurred outside of the course of employment. "To infer," answered the court, means "to bring into, to bring forward" (Webster's International Dictionary, second edition). The very process of inference involves the process of one fact or a set of facts pushing forward in the mind the probability of the inferred fact. Sometimes the basic fact or facts from which the inference arises strongly urge to any reasonable mind the inferred fact. At other times, the process of inference is more tenuous. And true it is that, where the fact attempted to be inferred is pushed or carried out of the basic facts with no more urgency than some other fact, the inferences are said to be equal and cancel each other. Perhaps the more accurate way to state the proposition is that the mind in its natural functioning does not bring forward any fact from the underlying facts because, being in a condition of equipoise, no inferable fact is brought forward or pushed out of the underlying facts as a natural conclusion. The question arises, Have we such a situation in this case? The employer urged that testimony to the effect that wood ticks are found in the entire intermountain region in which the workman lived and worked, together with testimony to the fact that he went on a picnic in the mountains and swimming within the intermountain region, puts the mind in a condition of equipoise as to the event of the accident at which it must remain. But, said the court, from the fact that ticks are found in the entire intermountain region it does not follow that they are found in equal abundance all over the region nor that the facilities for the workman to contract them were equal in all the places he chanced to be in the intermountain region during any possible period of incubation. The facts were that Prowse's work took him into brush to an extent not ordinarily to be expected while at home, swimming or even on a picnic. Moreover, four witnesses testified to the actual presence of ticks at a point 3 miles from where Prowse worked. The conditions that existed in the locality where the witnesses saw the ticks were practically the same as the conditions at the place where the deceased worked. In view of these facts, we can assume that there were ticks where Prowse worked, thus tending to show the actual presence of ticks in the locality of Prowse's work in contradistinction to the entomologic fact which we all know that ticks exist throughout the intermountain region. But one further potent piece of evidence is sufficient in view of the evidence just recited to throw the mind off equipoise. It has been established that in cases of fulminating infection the period of incubation is from two to five days. Here Prowse became ill on July 26, the period of incubation extending back to the fifth day from that date, or to July 22, the date on which Prowse complained of a bite. During this period he was off work on July 24, a holiday. From the record it appears that he remained at home on this

day The remaining days during this period of incubation he spent at his work, traveling between his home and work, and at home There is nothing appearing of record which is intrinsically discrediting to the uncontradicted testimony of the witnesses nor is such testimony wholly from interested witnesses Furthermore, the evidence as appears in the record not only carries "a measure of conviction" to the reasonable mind but is sufficient to throw the mind off equipoise, raising the inference that the deceased picked up the tick in the course of his employment

For the reasons stated, the award of the commission in favor of the widow was affirmed—*Salt Lake County v Industrial Commission*, 120 P (2d) 321 (Utah, 1941)

**Harrison Narcotic Act Unlawful Sale by Physician, Bona Fide Medical Practice**—The defendant, a practicing physician, was charged with a violation of the Harrison Narcotic Act in that he had unlawfully sold morphine sulfate, a derivative of opium The evidence showed that the defendant had from time to time delivered morphine to certain persons without use of the order form prescribed by law and that the defendant gave no directions, either verbally or in writing as to how the drug should be taken The two morphine deliveries specifically set forth in the indictment were made at night in secluded places on the streets of Atlanta, Ga As to one of these, witnesses for the government testified that it was made after dark in a secluded place on the street near a school building Government officers watched while the sale and delivery was being made, the officers having furnished the \$5 which was used by another person to purchase the morphine from the defendant When the sale and the delivery had been consummated, the officers took possession of the morphine and arrested the defendant The \$5 was identified by serial numbers and dates as being the same money furnished by the officers, and a quantity of morphine was found in the defendant's possession From a judgment of conviction, the defendant appealed to the U S circuit court of appeals, fifth circuit

The defendant contended that the sales were made in connection with the bona fide practice of medicine What constituted bona fide medical practice, the court said must be determined on consideration of the evidence and attending circumstances In the present case, the evidence was such that the jury could properly conclude that curbside sales of morphine as charged in the indictment were not made in connection with a bona fide medical practice but that they were in fact unlawfully made The evidence, the court concluded, made a case for the jury, and the trial court properly refused to direct a verdict in favor of the defendant physician The court also found that there had been no error committed in the admission or exclusion of evidence during the trial, that the evidence was sufficient to support the verdict and that no reversible error existed Accordingly the judgment of conviction was affirmed—*Moore v United States*, 128 F (2d) 887 (1942)

**Taxes Exemption from Occupational Tax Law, When a Physician "Practices" His Profession**—The defendant was licensed to practice medicine in Louisiana in 1929 and immediately entered the United States Public Health Service and was assigned to the United States Marine Hospital, Mobile County, Ala, where he remained until his resignation from the service in June 1940 During that time he was for one year head of the department of venereal diseases, for five years he engaged in general surgery at the hospital and for the remaining period he engaged solely in the treatment of diseases of the eyes, ears, nose and throat During this entire period his only remuneration from the practice of his profession was his salary from the government In June 1940 he obtained a license to practice medicine in Alabama and opened an office in Mobile specializing in diseases of the eyes, ears, nose and throat The state brought suit against the defendant to recover certain license taxes alleged to be due it for the last half of 1940 and all of 1941, the time during which the defendant had been in private practice From a judgment for the defendant, the state appealed to the court of appeals of Alabama

The defendant contended that he was exempt from the payment of the taxes because of the following language of the

statute "Provided that the license imposed by this section shall not apply until such person shall have practiced his or her profession as long as two years" The court of appeals first pointed out that an exemption from license taxation under a constitutional or statutory provision is in derogation of common right and must receive a strict interpretation and no claim to exemption can be sustained unless it is clearly within the scope of the exempting clause The existence of an exemption will not be presumed but must be clearly proved, and if there is any doubt the uncertainty will be resolved against the exemption The plain purpose of the exemption quoted, said the court, was to aid the young practitioner in establishing himself in his profession The court could not assent to the proposition that the defendant was not subject to the tax until he had engaged in private practice for as long as two years The practice of a profession and private practice are not synonymous In the opinion of the court, the defendant was practicing medicine when he was doing general surgery in the United States Marine Hospital Medicine was his profession Therefore he was practicing his profession within the language of the statute Accordingly the court concluded that the circuit court had erred in denying the right of the state to recover the tax Judgment in favor of the defendant was reversed and judgment was entered in favor of the state Certiorari was denied by the Supreme Court of Alabama—*State v Sellers*, 9 So (2d) 19, 9 So (2d) 20 (Ala, 1942)

**Chiropractors Advertising as Evidence of Unlicensed Practice**—The defendant was charged with a violation of the Ohio medical practice act in that he advertised or announced himself to be a practitioner of medicine and surgery in one of its branches, to wit, chiropractic, before obtaining a certificate from the state medical board as required by law The evidence showed that the defendant exhibited on the porch of his residence a gold lettered sign reading "J D Method D C" and that inside the vestibule was a "regular clock sign reading "Doctor is in Please be seated" The defendant admitted that these two signs were all the advertising he was doing "right now From a verdict of guilty in the trial court the defendant appealed to the court of appeals of Ohio Lucas County

The defendant contended that such evidence was not sufficient to prove him guilty beyond a reasonable doubt and furthermore that it most tended to prove merely an intent to practice his profession and that intent alone was not evidence of criminal conduct The court disagreed with this contention Considering this evidence as a whole and the court it sufficiently appears that not only was Method intending to practice his profession but also he was actually so engaged and surely was advertising himself as practicing medicine The finding of guilty of the offense charged was therefore sustained by the evidence and the judgment of conviction was accordingly affirmed—*State v Method*, 42 N E (2d) 1013 (Ohio, 1942)

## Society Proceedings

### COMING MEETINGS

Annual Congress on Industrial Health Chicago Jan 11-13 Dr Carl M Peterson 535 North Dearborn St Chicago Secretary

Annual Congress on Medical Education and Licensure Chicago Feb 15-16 Dr H G Weiskotten 535 North Dearborn St Secretary

American Academy of Orthopaedic Surgeons Chicago Jan 17-21 Dr Myron O Henry 825 Nicollet Ave Minneapolis Acting Secretary

Clinical Orthopaedic Society Chicago Jan 18-21 Dr Myron O Henry 825 Nicollet Ave Minneapolis Secretary

Eastern Section American Laryngological Rhinological and Otolological Society Hartford Conn Jan 15 Dr Edward J Whalen 750 Main St Hartford Conn Chairman

Middle Section American Laryngological Rhinological and Otolological Society Detroit Jan 20 Dr Voss Harrell 2539 Woodward Ave Detroit Chairman

Southern Section American Laryngological Rhinological and Otolological Society Chattanooga Tenn Jan 28 Dr Francis B Blackmar, 1301 Broadway Columbus Ohio Chairman

Western Section American Laryngological Rhinological and Otolological Society Portland Ore Jan 31 Dr Irving M Lupton 1020 S W Taylor St Portland Ore Chairman

## Current Medical Literature

### AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1932 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (\*) are abstracted below.

#### American Journal of Clinical Pathology, Baltimore 12 449-508 (Sept.) 1942

- Recent Advances in Photometric Clinical Chemistry W S Hoffman Chicago—p 449  
Underlying Principles and Minimal Standards of Laboratory Examination for Tubercle Bacilli H C Sweeney Chicago—p 458  
Hemorrhagic Problems in Child Surgery I N Kugelmann New York—p 467  
Comparison of Tissue and Spirochetal Antigens in Complement Fixation Tests for Syphilis Based on Results Observed in the Washington Serologic Survey J A Kolmer Philadelphia—p 480  
Comparison of Methods of Analysis for Lead in Urine W R V Marriott Pasadena Calif—p 488  
\*Subacute Monilia Endocarditis New Clinical and Pathologic Entity J G Pasternack Staten Island N Y—p 496

**Subacute Monilia Endocarditis**—The recovery of yeast-like cells from the first blood cultures of a patient with subacute bacterial endocarditis caused Pasternack to carry out further studies and identification of the micro organism. Monilia was subsequently proved to be the etiologic agent of the patient's illness. Within the last two years two strains of Monilia have been recovered from 6 cases of subacute endocarditis. In 5 of them the micro organism was identified as *Candida* (Monilia) *parakrusei* and in 1 as *Candida guilliermondii*. All the patients except the author's were diacetylmorphine addicts. Subacute endocarditis due to Monilia is a new clinical and pathologic entity. An analysis of the pathologic data of the observed cases discloses the following: The vegetations were engrafted on old sclerotic valves. In 2 cases the aortic valve was involved and in 1 the mitral. The spleen was greatly enlarged and showed massive infarcts. The kidneys showed multiple small infarcts. The brain showed meningeal and focal parenchymatous lesions. Blood cultures readily yielded a prolific growth of Monilia. The author's case presented an isolated focus of hemorrhagic infarction of the ileum, edema and petechiae of the rectal and urinary bladder mucosa.

#### 12 509-544 (Oct.) 1942

- \**Enterobius Vermicularis* in Appendix Report of Study on 1,000 Surgically Removed Appendices J R Schenken and Emma S Moss New Orleans—p 509  
Efficiency of Various Types of Equipment Used in Collection of Blood for Transfusions I Needles and Adapters L W Diggs Memphis Tenn—p 518  
Mitotic Activity in Uterine Leiomyomas P H Hartz and M J Hugenholz Curacao Dutch West Indies—p 523  
Urinary Phenols I Method of Determination M Volterra New York—p 525  
Cor Biloculare with Transposition of Great Cardiac Vessels and Atresia of Pulmonary Artery Phylogenetic and Ontogenetic Interpretation J I Rossmann Chicago—p 534

**Enterobius Vermicularis in Appendix**—Schenken and Moss determined the incidence of *Enterobius vermicularis* in 1,000 consecutively removed appendices. The patients were operated on at the Charity Hospital at New Orleans between July 5 and Oct 14, 1937. The complete appendiceal content of the first 600 appendices was delivered into a test tube and thoroughly emulsified in water. The specimen was centrifugated for one minute at about 500 revolutions per minute (group 1) and for the other 400 appendices (group 2) the same procedure was employed except that centrifugation was repeated until the supernatant fluid was clear. Of all the appendices 23.3 per cent were infected with *E. vermicularis*. In group 2 42.1 per cent of the appendices from white females and 38.3 per cent of the appendices from white males were infected. The respective figures for Negroes were 10.1 and 12.8 per cent. The observations in group 2 are regarded by the authors as more accurate than those in group 1 because of the use of the improved technic.

## Archives of Dermatology and Syphilology, Chicago

46 619-782 (Nov.) 1942

- Dermatologists for the Army and the Navy W H Giv Pittsburgh—p 619  
\*Vitamin Therapy in Dermatology and Syphilology P A O'Leary Rochester Minn—p 628  
Phytopharmacologic Reactions of Blood Following Treatment with Sulfanilamide and Derivatives D I Macht Baltimore—p 635  
Generalized Moniliasis with Proved Pathogenicity Report of Case L Tulipan and E Muskatblat New York—p 643  
Trichophyton Purpureum (Bang) and Trichophyton Gypseum (Bodin) Differentiation in Culture A E Edgecombe Evanston Ill—p 651  
Unusual Sites of Lesions in Pellagra Gangrene of Toe in One Case T J Riordan S Gellis and A M Rubinowitz New York—p 661  
Cutaneous Fistulas of Dental Origin R C Wende and H A Solomon Buffalo—p 665  
Parapsoriasis Its Relation to Mycosis Fungoides and Tuberculosis Review of Fifty Two Cases H Montgomery and R J Burkhardt Rochester Minn—p 673  
Pathogenesis of Synovial Lesions of Skin A Eliassow and S B Frank New York—p 691  
Collod Degeneration (Collagen Degeneration) of Skin M J Reuter Milwaukee and S W Becker Chicago—p 695  
Oriental Sore in United States Report of Case Mabel G Silverberg and E J Henschel New York—p 705  
Transparency Test for Differential Diagnosis of Plantar Warts L Goldman Cincinnati—p 711  
Biologic False Positive Reactions for Syphilis Associated with Hyperproteinemia Preliminary Report L Cardon and D H Atlas with assistance of E Aron M J Brunner S L Teitelman and J Bunatv Chicago—p 713  
Ragweed Dermatitis Among Workers in Flour and Grain Industries J W Jordan P C Campbell and E D Osborne Buffalo—p 721  
Cisternal Puncture Favorable Report Based on Over Six Thousand Punctures L J Alexander E C Fox and A G Schoch Dallas Texas—p 725  
Use of Vitamin A in Keratosis Blennorrhagica Successful Treatment with Massive Doses Report of Case F C Combes and H T Behrman New York—p 728  
\*Failure with Cryotherapy in Treatment of Acne Scars H M Friedlander Washington Pa—p 734  
Varioliform Eruption from Sulfathiazole A G Frank Atlanta Ga and E F Traub New York—p 737

**Vitamin Therapy**—O'Leary points out that certain cutaneous diseases are due to avitaminosis and that after the supplemental use of the necessary vitamin or vitamins, either by proper diet or by the administration of a synthetic form, the cutaneous signs of the disease disappear. The diseases include pellagra, ariboflavinosis or cheilosis, phrynoderma, pityriasis rubra pilaris, keratosis follicularis and the so-called seborrheids (nonpellagrous eruptions) recently described by Gross. Another group of diseases in which the results of vitamin therapy are less pronounced, do not appear in all cases and are less conclusive includes lichen spinulosus, keratosis pilaris, senile vaginitis, monilia infections, rosacea keratitis, psoriasis, acne cachecticorum and "dry skin." The evidence now indicates that under certain conditions vitamins do be effective must be in harmony or in combination, as, for example, in pellagra, in which nicotinic acid, thiamine and riboflavin is necessary to control the disease. The author believes that other diseases, such as psoriasis, may be completely controlled when the proper combination and ratio of vitamins is found. This would probably explain some of the discrepancies in the literature and differences of opinion as to the value of vitamin therapy in dermatology. No significant benefit has been obtained with vitamins in the various cutaneous manifestations of syphilis. The most pronounced benefits occur when a dermatosis is associated with constitutional signs of avitaminosis.

**Cryotherapy in Treatment of Acne Scars**—Friedlander states that he noticed no improvement in the scars of acne treated with carbon dioxide slush. In 13 of the 20 patients treated the average number of treatments was thirty-seven. Cryocautery offers nothing that cannot be obtained with conventional less time consuming and less painful methods.

## Indiana State Medical Assn Journal, Indianapolis

35 603-676 (Nov.) 1942

- Role of General Practitioner in Present Industrial Hygiene Program J G Townsend Bethesda Md—p 603  
Treatment of Pneumonia Plummer New York—p 608  
What Is Good Anesthesia? Comment Based on Twenty Five Thousand Personally Administered Anesthetics F T Romberger Lafayette—p 613  
Injuries to Peripheral Nerves J F Maurer Brazil—p 620



## Journal of Clin. Endocrinology, Springfield, Ill

2 615-670 (Nov) 1942

- \*Syndrome Characterized by Gynecomastia Aspermatogenesis Without Aleydigism and Increased Excretion of Follicle Stimulating Hormone H F Klinefelter Jr E C Riefenstein Jr and F Albright Boston —p 615
- Clinical Evaluation of Estrone Estradiol Benzoate and Diethylstilbestrol H W Eisfelder New York —p 628
- Oral Hormone Therapy in Anovulatory Bleeding Grete Stohr New York —p 633
- \*Treatment of Acne with Orally Administered Estrogens C H Lawrence and N T Werthessen Boston —p 636
- Dosage of Female Sex Hormones Estradiol and Anhydrohydroxyprogesterone by Sublingual Application C A Joel Basle, Switzerland —p 639
- Delayed Induction of Menstruation in Primary Amenorrhea Case J M Looney Worcester Mass —p 643
- Observations on Mechanism of Uterine Bleeding R B Greenblatt Augusta Ga —p 645
- Schizophrenia in Hypogonad Man Case G F Sutherland and R G Hoskins Worcester Mass —p 647
- Influence of Methyl Testosterone on Muscular Work and Creatine Metabolism in Normal Young Men L T Sarmuels A F Henschel and A Keys Minneapolis —p 649
- Clinical Reviews in Andrologic Endocrinology II Treatment of Androgenic Failure R L Pullen J A Wilson E C Hamblen and W K Cuyler, Durham N C —p 655

**Syndrome Characterized by Gynecomastia**—Gynecomastia, small testes, aspermatogenesis, evidence of normal to moderately reduced function of the Leydig cells, increased excretion of estrogenic substance and usually a reduced excretion of 17-ketosteroids were observed during the last four years at the Massachusetts General Hospital. Two similarly affected private patients were seen by Klinefelter and his co-workers. Estrogenic substance was increased to a degree comparable to that found in castrates. Testicular biopsies of 7 patients showed hyalinization of the seminiferous tubules and normal appearing interstitial cells. The examined mammary tissue of 4 patients showed some ductal hyperplasia with definite proliferation of the periductal connective tissue. It is probable that the gynecomastia is reversible. Testosterone propionate and progesterone have been tried without success, estradiol dipropionate caused further enlargement. Surgical removal of the breast is recommended for cosmetic reasons and, if carefully done, is an exceedingly satisfactory procedure. It seems unlikely that anything can be done to correct the aspermatogenesis. The studies support the view that the testis produces two hormones androgen from the Leydig cells and  $\alpha$ -hormone (inhibin) from the tubules. The gynecomastia is not due to hyperestrogenism or androgen alone, it may be due to the combination of androgen and lack of inhibin.

**Estrogen Treatment of Acne**—Lawrence and Werthessen used estrogen in the treatment of acne of 14 women and 11 men. Only 3 of the women and 4 of the men were less than 20 years of age. The average age of the women was 25.8 years and that of the men 20. It seems unlikely, therefore, that spontaneous remission can be an important source of error in evaluating the results of estrogen therapy. The duration of the acne varied from one to thirty years. Seven of the women complained of severe dysmenorrhea, 8 of hypomenorrhea and 2 of menorrhagia. Thirteen had definite exacerbations of the acne at the time of menstruation. Diethylstilbestrol or ethinyl estradiol was taken orally. The initial dose of the former was 0.5 mg daily until tolerance was determined. Medication of women was omitted four days before the predicted menstrual period and resumed forty-eight hours after menstruation had ceased. Ethinyl estradiol was given in daily doses of 0.15 mg and increased to 0.3 mg if the response was unsatisfactory. Fifteen of the 25 patients became entirely free from acne after two to six months of treatment, 2 whose treatment was intermittent became free in eight and nine months and the remaining 8 are still under treatment, all show improvement. All the female patients (but 1 with hirsutism) have shown a synchronous improvement, comparable to the response of the acne, in menstrual difficulties. The biologic and recent experimental evidence and the results of adequate estrogen therapy suggest that acne is caused by a disturbance of the normal functional balance between androgens and estrogens when the preponderance of the androgenic factor becomes sufficient to exert its specific acneogenic effect in a given individual.

## Journal of Experimental Medicine, New York

76 401-496 (Nov) 1942

- Quantitative Alterations in Hyperemia Responses to Local Ischemia of Smallest Blood Vessels of Human Skin Following Systemic Anoxemia Hypercapnia Acidosis and Alkalosis J R DiPalma Brooklyn —p 401
- Unsaturated Fatty Acids in Dietary Destruction of *N,N*-Dimethylaminobenzene (Butter Yellow) and in Production of Anemia in Rats P Gyorgy R Tomarelli R P Ostergard and J B Brown Cleveland —p 413
- Liver Injury Liver Protection and Sulfur Metabolism Methionine Protects Against Chloroform Liver Injury Even When Given After Anesthesia I L Miller and G H Whipple Rochester N Y —p 421
- Serologic Reactions of Protein Films and Denatured Proteins A Rothen and K Lansteiner New York —p 437
- Quantitative Studies of Photochemical Despeciation of Horse Serum Approach to Problem of Intravenous Foreign Protein Therapy J P Henry, Montreal Canada —p 451
- Immunization of Fowls Against Mosquito Borne Plasmodium Gallinaceum by Injections of Serum and of Inactivated Homologous Sporozoites P F Russell and B N Mohan Coonoor India —p 477

## Journal of Immunology, Baltimore

45 79-156 (Oct) 1942 Partial Index

- Correlation Between Anatomic Changes and Allergic State in Tuberculous Guinea Pigs C E Woodruff and Ruby G Kelly Northville Mich —p 79
- Influence of Nonspecific Protein on Heat Inactivation of Antibody to Pneumococcal Polysaccharide I Effect of Various Proteins on Heat Stability of Antibody R K Jennings and L D Smith Newark Del —p 105
- Id II Electrophoretic Investigation of Heat Inactivation of Antibody in Presence of Casein Laura F Krejci, R K Jennings and L D Smith Newark Del —p 111
- Specific Molecular Valence of Antigen and Antibody S B Hooker and W C Boyd Boston —p 127

## Journal of Nervous and Mental Disease, New York

96 369-492 (Oct) 1942

- Primary Melanoma of Central Nervous System F H Mackay and E F Hurteau Montreal Canada —p 369
- Review of Symptomatology of Alzheimer's Disease A P Bay and J Weinberg Alton Ill —p 378
- Effect of Vitamin E on Muscular Dystrophies B J Alpers H S Gaskill and A Cantarow Philadelphia —p 384
- Electrofit in Treatment of Mental Disease D J Impastato and R Almans New York —p 395
- Wilson's Disease in Light of Cerebral Changes Following Ordinary Acquired Liver Disorders R W Waggoner and N Malamud Ann Arbor Mich —p 410
- Action of Pyridine and Some of Its Derivatives in Preventing Experimental Convulsions in Animals I J Pollock and I Finkelman Chicago —p 424

## Laryngoscope, St Louis

52 757-834 (Oct) 1942

- Electroencephalography in Relation to Otology R S Schwab and R Carter Boston —p 757
- Encephalography in Ototoxic and Rhinogenic Complications H Brunner Chicago —p 768
- Mycosis of Middle Ear and Mastoid J J Shea Memphis Tenn —p 784
- Impaired Hearing in School Children S J Crowe S R Guild Ella Langer W E Loch and Mary H Robbins Baltimore —p 790
- Vitamin Therapy Today I H Jones Los Angeles —p 805
- Review of Literature for 1941-1942 I H Jones and W P Covell Los Angeles —p 815

## Minnesota Medicine, St Paul

25 841-952 (Nov) 1942

- Use and Abuse of Sulfonamides A E Brown Rochester —p 859
- \*Hypersensitivity to Thiamine Hydrochloride W S Eisenstadt Minneapolis —p 861
- Diagnosis and Treatment of Lichen Planus C W Lyman Minneapolis —p 863
- Infectious Mononucleosis J M Ryan St Paul —p 871
- \*Myasthenia Gravis G M Constans and R B Radl Bismarck N D —p 873
- Portal Cirrhosis C Vandersluis Bemidji —p 880
- Tetany in the Severely Traumatized Newborn W R Shannon St Paul —p 884

**Hypersensitivity to Thiamine Hydrochloride**—During the past year Eisenstadt encountered 2 cases of hypersensitivity to thiamine hydrochloride given parenterally. Even after the allergic reaction (local anaphylaxis in 1 and angioneurotic edema of the tongue, lips and eyelids and violent sneezing in 1) appeared, both patients subsequently tolerated thiamine hydrochloride orally without any untoward effects. Why this was so is hard to explain, possibly a rather high threshold of sensitivity to vitamin B<sub>1</sub> existed in these individuals and when it was taken



orally there may not have been a sufficiently high level at any one time to evoke an allergic reaction. The immunologic response of the patients was identical with that of well known sensitizing proteins. Constitutional reactions resulted only when the interval between injections exceeded one week. The possibility of an allergic reaction following parenteral administration increases as the interval between injections is lengthened. Intradermal tests were positive and passive transfer tests were negative. Five other similar cases have been reported.

**Myasthenia Gravis**—Constans and Radl present 11 cases of myasthenia gravis in which the prostigmine test was a valuable diagnostic aid. In 2 a relationship to pregnancy is brought out and in 2 cold or grip. The response of a particular patient to one form of therapy or even to a combination of different therapeutic agents varies. Before prostigmine is used orally or otherwise, myasthenia gravis must be known to be present. Patients must realize the type of affliction they have and must live within their limits of physical endurance. A few simple aids for the improvement and comfort of the patient while undergoing treatment are an eye patch for the relief of distressing diplopia, spectacles with a darkened or frosted lens or the painting of the lens on the affected side with clear nail polish. Prisms may be successful. Aminoacetic acid and ephedrine have been of definite value. However, less expensive medication, such as ephedrine sulfate and prostigmine bromide, has also been of value. Atropine may be needed to overcome some of the drying effects of the prostigmine. Prostigmine methylsulfate may be needed subcutaneously or intramuscularly if serious symptoms occur. Aminoacetic acid and ephedrine have been of definite value and should be tried. The dose of aminoacetic acid must be large. The dose of ephedrine sulfate will vary from  $\frac{1}{8}$  to  $\frac{3}{8}$  grain (0.008 to 0.024 Gm) two to three times a day. Like prostigmine, it is probably best to use small doses frequently.

### Nebraska State Medical Journal, Lincoln

27 369-400 (Nov.) 1942

- Recent Developments in Treatment of Severe Third Degree Burns W A Wolff J E Rhoads and W E Lee Philadelphia—p 369  
Neurocirculatory Asthenia Part II F W Niehrus Omaha—p 375  
Surgical Infections of Kidney A D Munger Lincoln—p 377  
Value of Salicylates as Compared with Sulfa Drugs S A Swenson Rushville—p 381  
Chemotherapy in General Surgery F C Hill Omaha—p 384  
Differential Diagnosis of Coma and Its Management Neurologic Aspects W A Muehlig Omaha—p 386  
Medical and Hospital Obstetric and Pediatric Care for Wives and Infants of Men in Military Service—p 388  
Control of Dental Caries J R Thompson—p 392

### New York State Journal of Medicine, New York

42 1983-2078 (Nov. 1) 1942

- Chemotherapy in Ulcerative Intestinal Disease J A Bargin, Rochester Minn—p 2011  
Farm Accidents K Creevey Cambridge—p 2016  
Prevention of Cinchophen Toxicity by Use of Vitamin K W B Rawls New York—p 2021  
\*Finger Sucking Serial Dental Study from Birth to Five Years J H Sillman New York—p 2024  
Allergy in Childhood V Choice of Drugs in Treatment of Asthmatic Attack B Ratner New York—p 2029  
Deficiencies in Otolgic Surgery F L Lederer Chicago—p 2033

**Finger Sucking**—On the basis of eight years of studying the dental aspects of 1,000 newborn infants, of more than two hundred models of their gum pads and a serial study of 50 children from birth to 5 years, which included from two to twenty sets of consecutive casts for each child, Sillman found that in all newborn infants the mandible is posterior to the maxilla, giving the chin the appearance of receding. From birth to 2 years the mandible grows forward faster than the maxilla. This contributes toward changing the features from those of a baby's face to those of a child's face. After 2 years this relationship of the jaws is generally maintained. Irregularities of the teeth are common in the first dentition, regardless of habit. Rotations of the incisors and molars are often present even before the teeth erupt. This point is extremely important to remember before finger sucking is said to be the cause of crooked teeth. Before and during eruption of the deciduous teeth, particularly the first incisors and first molars, the child's urge to bite is a physiologic process and usually passes unevent-

fully before the age of 3 years. During this time, heckling adults are apt to make suckers of nonsuckers or to accentuate the force of sucking and create a habit. Under such conditions displacement of the teeth will occur. A force of a certain intensity and duration will change the position of the teeth and the surrounding structures whether the force is applied with an orthodontic appliance or a finger, but one must be sure that such a force is operating. In any event the only area involved is the site of application, i. e. the anterior region. The force that maintains the mandible in its proper position is far greater than the force of the sucking. If by the age of 4 years the child persists in finger sucking, he should be helped to stop it. In instances in which sucking had caused crooked teeth, the displaced teeth corrected themselves spontaneously after the sucking was stopped.

### Public Health Reports, Washington, D C

57 1559-1598 (Oct. 16) 1942

- \*Prevention and Treatment of Agranulocytosis and Leukopenia in Rats Given Sulfamylguanidine or Succinyl Sulfathiazole in Purified Diets S S Spicer F S Daft W H Sebrell and L L Asburn—p 1559  
\*Incidence of Cancer in San Francisco and Alameda Counties Calif 1938 H J Sommers—p 1566

**Agranulocytosis and Leukopenia in Rats**—The nutritional experiments on rats of Spicer and his co-workers with sulfaguanidine and sulfasuxidine (succinyl sulfathiazole) have demonstrated that agranulocytosis, leukopenia and hypocellularity of the bone marrow will develop in animals given either drug in a purified diet. However, most of this blood dyscrasia can be prevented or successfully treated with whole dried liver or with certain liver extracts.

**Incidence of Cancer**—The data obtained by Sommers from all physicians, hospitals and clinics in San Francisco and Alameda Counties, Calif., of all patients treated or observed for any malignant growth during 1938 show that of 7,859 patients 5,773 were residents and 2,086 nonresidents. There were 1,974 cancer deaths recorded, 173 of which were in resident cases not reported by doctors or hospitals. If these are added to the reported cases the total of resident cases is 5,946. The prevalence rate was 525.7 per hundred thousand residents. To a certain extent this high prevalence rate in the area is attributable to the unusually old population. The most frequent primary sites of cancer in males were the digestive tract, skin and buccal cavity, in women the breast, uterus and digestive tract. The cancer incidence per hundred thousand men was 416 and for women 611. The incidence rates for those first seen in the study year were 255 per hundred thousand men and 314 per hundred thousand women.

### Radiology, Syracuse, N Y

39 383-512 (Oct.) 1942

- \*Irradiation Treatment of Cavernous Hemangioma with Special Reference to So Called Contact Roentgen Irradiation H D Kerr Iowa City—p 383  
Use of Over Penetrated Film Technic in Diagnosis of Cavities S N Tager Champaign Ill—p 389  
Attempt at Roentgenographic Visualization of Thoracic Duct and Cisterna Chyli Theoretical Considerations and Preliminary Observations D Kornblum New York—p 395  
Roentgen Therapy of Hypertrophic Scars and Keloids A F Hunter New York—p 400  
Renal Rickets Report of Case L J Menville L Williamson and D Mattingly New Orleans—p 410  
Cystic Fibrosis of Pancreas with Observations on Roentgen Appearance of Associated Pulmonary Lesions C J Attwood and W H Sargent Oakland Calif—p 417  
Relation Between Radiation Effects and Cell Viability as Indicated by Induced Resistance to Transplanted Tumors Anna Goldfeder New York—p 426  
Simple Technic for Cerebral Arteriography J E Hemphill Durham, N C—p 432  
Roentgen Manifestations of Acute Infectious Mononucleosis in Abdomen M H Poppel and S Starr New York—p 437  
Cyclotron as Medical Instrument F J Hodges Ann Arbor Mich—p 440  
Concentration of  $P^{32}$  in Some Superficial Tissues of Living Patients L D Marinelli and B Goldschmidt New York—p 454  
Simple Foreign Body Localization Device Applicable to Standard Fluoroscopes E R Miller San Francisco—p 464

**Irradiation of Cavernous Hemangioma**—Kerr treated 96 cases of hemangioma with radium plaques at a distance of 2 mm and 49 with short distance contact roentgen therapy. Of the first series the results were good in 61, fair in 14 and poor

in 11, 10 were inadequately treated or followed. The respective figures for the other series are 34, 7, 3 and 5. The author thinks that not enough attention has been given roentgen therapy in the care of this condition. The slightly better results obtained with roentgen therapy are probably of no great significance, but when the apparatus is available its use is recommended.

### Rhode Island Medical Journal, Providence

25 205 224 (Oct.) 1942

Medical Examiner System in Rhode Island A. R. Moritz, Boston —p. 205  
\*Fluid Administration R. O. Bowman Providence —p. 207

**Fluid Administration**—Fluid or water therapy, Bowman points out, must like all medical treatment be on a sound physiologic basis or definite harm will result. In general the patient whose illness is not complicated needs at least 2,500 cc. of fluid daily for water balance. If it must be given parenterally, 1,000 cc. of this amount should consist of isotonic solution of sodium chloride and 1,500 cc. of isotonic dextrose in water. If fever or profuse sweating is present the amount should be increased at least by another thousand cubic centimeters, preferably of the dextrose solution. After vomiting or gastric drainage the volume lost should be replaced by an equivalent amount of isotonic solution of sodium chloride. After diarrhea the volume excreted should be compensated by 1,000 or more cc. of isotonic solution of sodium chloride or 500 cc. of an alkaline solution and 500 cc. of saline solution. Hypertonic solutions should be used to relieve cerebral or pulmonary edema. They have no place in the treatment of dehydration. Whole blood should be given only when extra erythrocytes and hemoglobin antibodies, platelets or fibrinogen are needed. For the prevention of shock sufficient concentrated plasma or plasma should be given to keep the hemoglobin or erythrocyte count from rising. If plasma is not available, hypertonic solutions of dextrose or sodium chloride are of some help, dextrose is better. Crystalloid solutions are of little value once shock has developed. Fluids may be given by mouth, rectum and clysis. More important than the decision to give fluids is the decision of what kind of fluid and how much to give.

### Southwestern Medicine, Phoenix, Ariz

26 325 354 (Oct.) 1942

Malignant Lesions of Stomach V. C. Hunt Los Angeles —p. 326  
Allergy and Acute Intestinal Disturbances T. D. Cunningham Denver —p. 329  
Paranasal Sinusitis M. P. Spearman El Paso Texas —p. 332  
Conditions of General Interest A. W. Egenhofer Santa Fe N. M. —p. 337

### Tennessee State Medical Assn Journal, Nashville

35 375 416 (Oct.) 1942

Abortions and Progesterone J. M. Brockman Memphis —p. 402

35 417-454 (Nov.) 1942

\*Use of Sulfonamides in Treatment of Gonococcal Conjunctivitis G. J. Levy and P. M. Lewis Memphis —p. 417  
Results of Serologic Tests for Syphilis Among Selective Service Registrants in Tennessee —p. 421  
\*Carcinoma of Lung H. E. Johnson and R. A. Daniel Jr. Nashville —p. 426  
Anorectal Fistula J. M. Stockman Knoxville —p. 433

**Sulfonamides for Gonorrheal Conjunctivitis**—Levy and Lewis treated 137 cases of gonococcal conjunctivitis with sulfonamides. Toxic reactions, with the exception of 1 early case, were practically negligible. Nausea was frequent, especially when sulfapyridine was administered. Slight cyanosis was common. Sulfapyridine and sulfathiazole are definitely superior to sulfanilamide in the treatment of gonococcal infections of the eye. Usually a cure may be expected within three days. Local treatment does not compare favorably with the internal use of the drugs. Every patient with gonococcal conjunctivitis should have immediate and adequate systemic treatment with sulfathiazole, and as an adjunct a 5 per cent sodium sulfathiazole solution should be instilled locally.

**Carcinoma of Lung**—Johnson and Daniel state that pneumonectomy is the patient's only chance for cure from lung cancer. Radiation therapy is only a palliative measure. The duration of the life of patients not operated on or treated with

radiation varies from a few weeks to about three years, during most of which time many are in distress. The operative mortality rate of pneumonectomy is about 30 per cent, this is not high when it is remembered that the disease is always fatal if pneumonectomy is not performed. Several cases in which carcinoma of the lung was cured for five or more years are cited. Success depends on the alertness of the medical profession in detecting the disease in its early stages.

### Texas State Journal of Medicine, Fort Worth

38 417-474 (Nov.) 1942

Not by Cans Alone W. B. Russ San Antonio —p. 423  
Diagnosis and Principles of Treatment of Dietary Deficiency Diseases T. D. Spies Birmingham Ala. —p. 427  
Important Facts Concerning Diagnosis and Management of Lesions of Terminal Portion of Colon I. A. Bunc Rochester Minn. —p. 431  
Analysis of One Hundred and Three Consecutive Hysterectomies J. R. Phillips and F. S. Sears Houston —p. 435  
Renal Tuberculosis J. M. Price Dallas —p. 439  
Radiation Therapy of Uterine Cancer R. H. Crockett, San Antonio —p. 444  
X-Ray Therapy in Treatment of Chronic Pyelonephritis J. H. Smith San Angelo —p. 448  
Sulfonamide Drugs in Ophthalmology and Otolaryngology R. E. Windham San Angelo —p. 451

### Virginia Medical Monthly, Richmond

69 589 650 (Nov.) 1942

Virginia Laws of Interest to Doctors R. T. Catterall Richmond —p. 589  
The Year's Activities in Medical Society of Virginia R. W. Miller Richmond —p. 609  
Management of Recent Faciomaxillary and Mandibular Fractures F. D. Woodward and G. S. Fitz Hugh Charlottesville —p. 612  
Chronic Prostatitis: Clinical Review of 100 Cases in Which Fresh and Peroxidase Stained Secretions Were Studied W. M. Brunet and D. Shaw C. H. Reinhardt and Irene J. Andry Chicago —p. 619  
Traumatic Rupture of Internal Iliac Artery: Case Report with Discussion of Some Useful Procedure in Management of Vascular Injuries L. M. Bell and J. A. Miller Winchester —p. 623  
Leiomyoma of Stomach: Case Report N. Bloom and C. Williams Richmond —p. 627  
Less Discussed Uses of Sulfonamides H. C. Davis Bluefield —p. 629  
Importance of Physical Examination in Diagnosis of Primary Bronchial Carcinoma P. P. Vinson Richmond —p. 631

### War Medicine, Chicago

2 901-1076 (Nov.) 1942

Effort Intolerance in Soldiers: Review of 500 Cases M. Jones and R. Scarsbrick London England —p. 901  
Mortality in Penetrating Wounds of Abdomen in Civil Practice with Particular Reference to Influence of Hemorrhage R. M. Moore and J. C. Kennedy Galveston Texas —p. 912  
Chronic Exhaustion State in Test Pilots J. H. Tillysch and M. N. Walsh Rochester Minn. —p. 917  
Electroencephalographic Study of 275 Candidates for Military Service J. E. Hart, E. A. Gibbs and F. A. Gibbs Boston —p. 923  
Psychiatric Induction Examination with Review of Results of Examining 17,000 Selectees D. J. Flicker Camp Blanding Fla. —p. 931  
Neuropsychiatric Examination of Recruits at United States Naval Training Station Newport R. I. C. L. Wittson H. I. Harris W. A. Hunt and P. Solomon Newport R. I. —p. 944  
\*Specificity of Lecithovitellin Reaction in Diagnosis of Gas Gangrene Due to *Clostridium welchii* L. A. Weed S. Minton Jr. and Eunice Carter Indianapolis —p. 952  
Mechanism of Reaction Between Lecithovitellin and Toxin of *Clostridium welchii* L. A. Weed R. Forney and Eunice Carter Indianapolis —p. 960  
Gastrointestinal Disorders: Important Wartime Medical Problem W. H. Dunn New York —p. 967  
Epidemic Keratoconjunctivitis M. J. Hogan and J. W. Crawford San Francisco —p. 984  
Sulfadiazine Therapy of Purulent Meningitis: Including Its Use in Twenty Four Consecutive Patients with Meningococcal Meningitis H. A. Feldman Atlanta Ga. L. K. Sweet and H. F. Dowling Washington D. C. —p. 995

**Lecithovitellin Reaction and Gas Gangrene**—Weed and his associates show that the reaction (opacity or a precipitate) of *Clostridium welchii* to normal human serum or lecithovitellin is not specific either for *C. welchii* or for its toxin. In their experiments the reaction was produced (undiminished) by the supernatant fluid from cultures of *C. welchii* after boiling for one hour—long after the lethal and the hemolytic factors were destroyed. The reaction may be prevented by monovalent anti-toxin for *Clostridium tetani* and *Clostridium septicum*, normal human serum and tenth molar phosphate buffer (pH 7) and by

adjusting the  $pH$  to 7.4 with normal sodium hydroxide. Cultures of *Cl. welchii* grown in Taylor and Stewart's casein medium, which does not permit production of type A toxin, give more rapid and definite lecithovitin reactions than those grown in chopped meat broth. Uninoculated casein broth will give a positive lecithovitin reaction when the  $pH$  is lowered sufficiently. The degree of acidity necessary varies somewhat with the particular batch of medium used. The reaction is obtained with a wide variety of aerobes which cannot possibly be confused culturally or serologically with *Cl. welchii*. The reaction produced by the common aerobes may be prevented by monovalent antitoxin for *Cl. welchii*, *Cl. tetani* or *Cl. septicum*. The reaction can also be inhibited by normal human serum and by tenth molar phosphate buffer ( $pH$  7). Therefore the reaction cannot be relied on as a rapid diagnostic method for detecting the presence of *Cl. welchii* toxin or antitoxin.

**Purulent Meningitis**—The subjects of investigation by Feldman and his co-workers were 24 patients with meningococcic meningitis and 18 with purulent meningitis admitted during the past nine months to the isolation pavilion of the Gallinger Municipal Hospital and treated with sulfadiazine. Those with purulent meningitis were also given specific serum. The initial dose of the drug for adults consisted of 4 to 6 Gm., followed by 1 Gm. every four hours. Children were given half of an initial twenty-four hour dose and then daily approximately 1 grain per pound (0.14 Gm. per kilogram) of body weight. The drug was taken orally except by unconscious patients or patients who were vomiting severely. These were given the drug in the form of the sodium salt intravenously or subcutaneously. Treatment was terminated abruptly after the patient had been asymptomatic for about a week. The temperature of 18 of the 24 patients returned to and remained within normal limits within forty-eight hours after the first dose of sulfadiazine. Simultaneously with the fall of temperature the number of leukocytes decreased, the condition of the spinal fluid improved, the rash regressed rapidly and the patient generally improved. The temperature of 4 other patients who recovered came down more slowly, and improvement in general was more gradual. Twelve of the 24 patients were less than 2 or more than 30 years of age, the 2 who died were in the latter group, 1 a man of 44 and 1 a man of 53. Both were admitted in a severe state of acute alcoholic intoxication. The average level of sulfadiazine in the blood the day the temperature reached the base line and remained there was 82 mg. per hundred cubic centimeters, with a range between 37 and 176 mg. This refutes the idea that in patients with meningitis the blood level of a sulfonamide compound should be around 15 mg. Of 6 patients with influenzal meningitis 5 were infected with type B organisms. All were treated with sulfadiazine and homologous rabbit antiserum. Four who were more than 3 years of age made uneventful recoveries. The fifth patient, an infant of 7 months admitted with acute otitis media due to type B influenza bacillus, had been started on sulfapyridine prior to culture reports. The drug was continued, but in spite of adequate levels of the compound in the blood his condition became steadily worse and on the seventh day of therapy signs of meningitis developed. Treatment was begun with specific antiserum and sulfadiazine, but the patient did not rally. At necropsy there was evidence of petrositis on the same side as the otitis media observed on admission. The sixth of these patients was admitted with the diagnosis of a cerebrovascular accident on the basis of a history of a frontal headache for four days followed by hemiplegia. Lumbar puncture revealed purulent fluid containing numerous pleomorphic gram-negative bacilli. The diagnosis of meningitis and sinusitis was confirmed at necropsy. The experience with the 6 patients who had pneumococcic meningitis was as discouraging as it was encouraging in the two preceding groups. The pneumococcic meningitis of only 1 of the patients in this group was primary, but even she did not recover despite a slight improvement at the start of treatment. At necropsy a thick, adherent, basilar exudate was encountered, with no evidence of abscess or other foci of infection. On initial lumbar puncture 6 other patients with purulent meningitis had cell counts ranging from 600 to 3,200 per cubic millimeter, normal

reduction of Benedict's solution and no organisms on smear or culture. Five of these patients had presumably organic cardiac murmurs, and necropsy revealed bacterial endocarditis without gross evidence of meningitis. The sixth patient was admitted in a deep stupor and died fourteen hours later. Necropsy revealed a massive abscess involving almost the entire left temporal lobe, for which neither the cause nor the mechanism could be explained.

### Wisconsin Medical Journal, Madison

41 967-1066 (Nov.) 1942

- Incidence of Atmospheric Mold Spores in Relation to Climatic Conditions in Milwaukee 1935-1941 T. G. Randolph and T. L. Squier Milwaukee—p. 987  
Bronchitis C. F. Burke Madison—p. 991  
Contact Infections in Childhood Particularly Tuberculosis K. E. Kassowitz Milwaukee—p. 995  
Epilepsy in Childhood M. G. Peterman Milwaukee—p. 1001  
Treatment of Vaginitis in Children T. K. Brown St. Louis—p. 1003

### Yale Journal of Biology and Medicine, New Haven

15 1-138 (Oct.) 1942

- \*Clinical Fetal Electrocardiography A. V. N. Goodyear, A. J. Geiger and W. M. Monroe New Haven Conn.—p. 1  
Enzymatic and Mechanical Properties of Muscle Proteins W. A. Engelhardt Moscow Soviet Union—p. 21  
Obtaining Plasma from Birds W. J. McFarland, R. Tennant and A. A. Liebow New Haven Conn.—p. 39  
Intranasal and Intraperitoneal Infection of Mouse with *Coccidioides immitis* M. Tager and A. A. Liebow New Haven Conn.—p. 41  
Educational Opportunities in School Health Examinations Claire Burton Reinhardt and I. V. Hiseck New Haven Conn.—p. 61  
Silk Catgut and Wound Infections J. Burke Buffalo—p. 73  
Critical Evaluation of Pseudoisochromatic Plates and Suggestions for Testing Color Vision J. R. Gallagher, Constance D. Gallagher, Andover Mass. and A. E. Sloane Boston—p. 79  
The Early New England Doctor: Adaptation to Provincial Environment M. S. Beinfeld New Haven, Conn.—p. 99

**Clinical Fetal Electrocardiography**—Goodyear and his co-workers used a standard portable amplifier type electrocardiograph in conjunction with a single stage resistance coupled preamplifier with abdominal leads to take 181 fetal electrocardiograms. The results were positive in 87 per cent. The electrocardiographic examinations were made on 154 gravid women pregnant for four or more months. The technique proved helpful in the clinical solution of a variety of obstetric problems and in detecting multiple pregnancy. The fetal heart rate and such factors as the duration of pregnancy, maternal heart rate or the sex of the fetus were not correlated. The amplitude of the fetal electrocardiogram bore no relation to maternal size or to the age and size of the embryo except practically at term, when the fetal deflections usually became larger. The electrocardiographic diagnosis of fetal position was fairly successful with the abdominal lead combinations employed but showed no advantage over usual clinical methods. The practical application of fetal electrocardiography is not primarily for the diagnosis of pregnancy, as the biologic tests answer this question earlier and with fewer false negative results, but rather in the ability of a positive electrocardiogram to reveal immediately that the fetus is alive when fetal movements and heart sounds are imperceptible. In this respect a positive electrocardiogram is more significant than a positive biologic test, as the latter depends on the presence of chorionic tissue and may remain positive for a week or two after the death of the fetus. The graphic method will detect multiple pregnancy earlier than roentgenography. Fetal electrocardiography has proved valuable in differentiating between cephalic, breech and perhaps transverse presentations. Unusual variations in the fetal heart rate or rhythm may suggest fetal abnormalities of distress and a fetal wave lasting longer than 0.04 second may indicate congenital intraventricular block. The effects of drugs, anoxia, toxemia, anesthesia and labor on the fetal heart action can probably be conveniently studied by this method. The detection of the action current of the fetal heart in utero during the second and third months of gestation would be important, as it is at this time that the problem of ectopic gestation is most troublesome. Such further development is largely a technical matter and offers a challenge to ingenuity.

## FOREIGN

An asterisk (\*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

## British Journal of Radiology, London

15 273-306 (Oct.) 1942

- Radiographic Stereoscopy D. B. McGrigor—p. 273  
Problems of Postwar Reconstruction in Radiology: Future of the Specialties G. Jefferson—p. 283  
What May We Expect from Physics? W. V. Mayneord—p. 286  
Regional Radiodiagnostic Service C. G. Teall—p. 289  
Radiologic Education of the Future H. K. G. Hodgson—p. 292  
Radiotherapeutic Education of the Future G. F. Stebbing—p. 294  
Radiotherapy and the Cancer Act R. Paterson—p. 297  
Comparison of Action of X and Gamma Radiation on Fibroblasts F. D. H. Paterson—p. 302

## British Medical Journal, London

2 445-472 (Oct. 17) 1942

- Blood Transfusion in Soviet Union A. Bagdasarov—p. 445  
\*Comments on Epidemic of Hepatitis P. Evans—p. 446  
\*Inpatient Treatment of Civilian Neurotic Casualties: Report on 100 Cases Treated in Emergency Medical Service Neurosis Center W. S. MacLay and J. Whithy—p. 449  
\*Cure of Scabies and a New Remedy G. H. Percival—p. 451  
Benzyl Benzoate in Treatment of Scabies: Comparison of Effects of Aqueous and Spirit Emulsions K. C. Mallen—p. 452  
Treatment of Varicose Veins in Soldiers E. L. Farquharson—p. 453

**Epidemic of Hepatitis**—Evans reports the occurrence between October 1939 and June 1942 of 65 cases of epidemic hepatitis in a hospital among children and nurses. The hospital cared at one time for as many as 120 children and a variable number of adults. The infectious hepatitis became endemic in the hospital early in 1940 and the epidemic started the following winter. It gradually subsided in the next year and a half, but the frequent introduction of young nurses and children into the community is likely to maintain the infection and form a reservoir from which the disease can be distributed to other places. Infection is usually transmitted from case to case, but abortive cases are probably important links in the chain of infection. Young children and senior nurses were less susceptible than older children and junior nurses. The incubation period was usually about a month but shorter and considerably longer periods are possible. The duration of infectivity is uncertain. Several weeks of invalidism may often follow the infection. The blood sedimentation rate may remain elevated many weeks after a mild attack. Relapse and second attacks are uncommon but have been recorded. The mode of transmission in the epidemic, as in most, appeared to be aërial and perhaps also by contagion. The frequency with which nurses became infected by nursing patients is striking when compared with the rarity with which patients in bed infected other patients and suggests the possibility of the acquisition of the virus from feces or urine. Usually a direct communication could be traced from case to case, at times an abortive case seemed to be the cause. Health carriers have been suggested as playing an active part.

**Inpatient Treatment of Neurotic Casualties**—MacLay and Whithy report the results of the first hundred patients (whose long continued neurosis made them unfit for work) who were treated in an emergency medical service neurosis center between July 1941 and January 1942. Their average age was 45, revealing that the stresses of war fall more heavily on older persons. All had been closely exposed to bombing, which resulted in some physical injury to 50. Severe mental stress, such as loss of husband, wife or children, loss of home or business or being buried for hours had been endured by 86. The average duration of incapacity for the 100 patients before admission was seven months. The factors responsible for the persistence of symptoms appeared to be fear of exposure to another severe experience in 39 instances, domestic and financial factors in 42, pension considerations in 13, the illness helping to solve a preexisting problem in a few, physical factors in 24 and physical illness in 11. The foregoing factors were rarely single. The most important symptoms were anxiety states in 37 instances, hysteria in 25, depression in 22, physical in 11 and schizophrenia in 2. 3 patients left before they were fully investigated. One third of the patients left the hospital by the end of a month, one half by two months and two thirds by three months. The best results were obtained by those who recovered

quickly. The results suggested that the patients had been awaiting specialized treatment such as can be rendered in a hospital and could not have recovered without it. Of the patients who showed no change, 2 suffered from schizophrenia and 5 from a physical illness which could not be expected to improve, thus only 12 were not benefited by the psychiatric treatment. In 57 the onset of the illness was wholly due to the precipitating incident and in another 18 it was due to the incident but there were previous predisposing personality characteristics which did not amount to a neurotic illness. The others were regarded as instances of neurotic relapse or aggravation of preexisting physical illness. The treatment adopted was that ordinarily used in psychiatric practice: persuasion, explanation, reeducation, removal of symptoms by suggestion and occupational and physical therapy. The important feature was an assessment of the factors responsible for the persistence of the illness and their removal whenever practicable. Practical difficulties allowed only 36 patients to be followed up. This revealed that after an interval of six months the estimated prognosis of 26 corresponded to that at discharge, of 5 it was better and of 5 not as good. Specialized inpatient treatment of neurotic casualties appears to be well justified by the results.

**New Remedy for Scabies**—Percival used tetraethylthiuram monosulfide for treating 50 patients with scabies. It was non-irritant when applied as a pure powder and cutaneous idiosyncrasy was not encountered. It was curative in a 5 per cent liquid preparation, 25 per cent tetraethylthiuram monosulfide, 10 per cent of polyglycerol ricinoleate and 65 per cent of industrial methylated spirit. One part of this oil was added to four parts of water immediately before use. The 25 per cent concentration remained stable at room temperature but crystallized at a lower temperature. Gentle heating redissolved the crystals. The diluted oil separates and thus the required 5 per cent dilution should be prepared just before use. For cure the preparation was rubbed over the whole body, with the exception of the head, face and neck, twice a day for three days.

## Journal of Laryngology and Otology, London

57 337-352 (July) 1942

- Atrophic Rhinitis: Treatment of Atrophic Rhinitis with Estrogenic Compounds I. S. Hall and I. A. M. Macleod—p. 337  
Nature of Vascular Action (Passive Opening) of Eustachian Tube in Relation to Changes of Atmospheric Pressure and to Aviation Pressure Deafness J. I. G. McGibbon—p. 344

## Lancet, London

2 413-444 (Oct. 10) 1942

- Early Diagnosis of Pulmonary Tuberculosis R. R. Trail—p. 413  
\*Proflavine Powder in Wound Therapy G. A. G. Mitchell and G. A. H. Buttle—p. 416  
\*Nicotinic Acid in Treatment of Angina Pectoris F. J. Neuwahl—p. 419  
Diagnosis of Coma in Cerebrospinal Fever with Diabetes L. Cole—p. 421  
Immunity with T. A. B. in Outbreak of Paratyphoid Fever E. C. Dax and Doris M. Stone—p. 422  
Bilateral Congenital Subluxation of Acromioclavicular Joint J. Grieve—p. 424  
Corrosive Pyloric Stenosis Without Esophageal Involvement D. P. Degenhardt and R. C. Henderson—p. 425  
Sperm Survival in Rubber Sheaths J. Tynen and R. M. Ranson—p. 425  
Peripheral Nerve Palsies Following Intramuscular Injections of Sulfonamides J. St. C. Elkington—p. 425

**Proflavine Powder in Wound Therapy**—Proflavine powder was tried by Mitchell and Buttle in the treatment of eighty wounds that proved intractable to chemotherapy. Experimental work has shown that the substance was relatively non-toxic and had a strong bactericidal effect on many organisms. Various forms of treatment, apart from routine sulfonamide therapy and closed plaster, were tried in the 80 resistant cases. Failure of the methods led to the dusting of proflavine sulfate powder into the wounds. The amount of proflavine used never exceeded 2 Gm, and usually only about 0.5 Gm or less was employed. This depended on the size of the lesion. It was introduced into cavities by a small Volkmann's scoop or the end of a blunt dissector, or in extensive wounds it was dusted over the entire surface and evenly distributed with a spatula or scalpel handle. It was never employed more than two or three times, four to twenty-eight days elapsed after each appli-

cation When used prophylactically the amount varied according to the size of the lesion but was usually about 0.25 Gm mixed with 2 to 5 Gm of powdered sulfanilamide The use of the proflavine has resulted in beneficial results in almost every instance When staphylococci were the infecting organisms, proflavine has proved more efficient in controlling or eliminating the infection than any other drug so far tried, and the response of many wounds with mixed infections has also been good With one exception there has been no interference with healing The dressings were usually painless, and no general toxic manifestations have been observed

**Nicotinic Acid and Angina Pectoris**—Neuwahl treated 6 patients suffering from angina pectoris with niacin and the results appear to be remarkably uniform and lasting Oral administration of the drug caused a noticeable decrease in the number and the severity of attacks in several patients, in others the effect was transient, possibly because absorption or interaction of chemical substances in the gastric secretion was interfered with Intravenous administration heightened the efficacy of the drug Therefore to obtain equal conditions oral administration was discontinued and a drip infusion of a 0.05 per cent solution of niacin was chosen to overcome differences in susceptibility One infusion of 100 to 300 mg of niacin produced as a rule a remarkably beneficial result, which was maximal after twelve to twenty-four hours Further infusion seemed to cause a definite stabilization in the condition of the patients, who became free from anginal attacks after several weeks The worst affected patients reacted best Usually six infusions were sufficient The symptoms of the 6 patients have completely or almost completely regressed for three to seven months after the course of treatment was completed, 3 have actually resumed heavy manual work

### Schweizerische medizinische Wochenschrift, Basel

72 505-532 (May 9) 1942 Partial Index

- Psychiatry in Consulting Hours of Medical Practitioner J E Staehelin—p 505
- \*Drug Fever and Chills Due to Sulfathiazole Chemospecificity, Clinical Diagnosis and Prevention S Moeschlin—p 510
- Vertebral Fractures Due to Muscular Traction W Jaeger—p 515
- \*Clinical Significance of Arcus Lipoides (Arcus Senilis) Corneae F Rintelen—p 515
- Proteases in "Acidoglobulin" Fraction of Various Plasmas and Their Possible Role in Thrombin Formation R Feissly—p 516

**Drug Fever and Chills Due to Sulfathiazole**—Moeschlin reports 6 patients who developed drug fever in connection with sulfathiazole medication Tolerance tests demonstrated that the fever was the result of specific sensitization This sensitization, however, did not apply to other sulfonamide derivatives Patients who have become sensitized to sulfathiazole may react with decided chills to the renewed administration of even small doses of the drug These chills, together with high temperatures, increased leukocyte count and accelerated blood sedimentation may simulate septic conditions Absence of granulations in the neutrophils indicates drug fever in cases in which the diagnosis is doubtful In cases in which drug fever is suspected, the sulfanilamide preparation should be discontinued or should be replaced by another of the sulfa drugs, because a patient sensitized to one of these compounds may tolerate others By ascertaining the sulfa content of the blood, it could be demonstrated that rise in temperature appears a short time after the offensive compound enters the blood stream Drug fever produced by sulfathiazole is sometimes accompanied by corneal infiltration, marginal phlyctenae and glossitis, but these are of short duration Existence of a drug fever should be investigated, when, in the course of treatment with sulfa drugs, no reduction in temperature is effected in the course of a few days

**Clinical Significance of Arcus Lipoides (Arcus Senilis) Corneae**—Question has been raised whether the presence of a lipid ring in the cornea suggests the existence of similar pathologic processes in other parts of the body It has been suggested that arcus senilis of the cornea makes arteriosclerosis probable Rintelen investigated the problem on a large necropsy material The eyes of 600 comparatively fresh cadavers were inspected without optic aids for the presence of the senile arcus A noticeable lipid ring was detected in 214 cases Examination

of the entire vascular system of the 214 cadavers disclosed that 66 (31 per cent) had no signs of arteriosclerosis, 97 (45 per cent) had a moderate sclerosis of the entire or of a part of the arterial vascular system, only 51 (24 per cent) had a severe sclerosis, particularly in the large vessels No lipid ring was seen in 39 of those who had reached an age of more than 60 years, but 13 (33 per cent) had a severe arteriosclerosis, which in 7 had been the actual cause of death The lipid ring was found 4 times in persons under 50 and none of these had arteriosclerosis There is apparently no evidence of a close relationship between lipid infiltration of the cornea and arteriosclerosis This is not surprising, when it is considered that the lipid ring of the cornea is an aging phenomenon with usually dominant hereditary transmission, whereas arteriosclerosis is an extraordinarily complex pathologic process

### Revista Clínica Española, Madrid

5 299-394 (June 15) 1942 Partial Index

- Role of Liver in Intermediate Metabolism F Grande Covan—p 299
- Studies on Lathyrism C Jimenez Diaz and F Vivanco—p 310
- Early Diagnosis of Acute Perforations of Gastroduodenal Ulcers A G Baron—p 326
- \*Evaluation of Oncotic Pressure in Pathogenesis of Edemas E Juncadella Ferrer—p 342
- Gastric Acidity in Patients with Gastroduodenal Ulcer P de la Viesca and J Fernandez Pleyan—p 355
- \*Four Cases of Asthma from Sensitization to Cimex Lectularius C Lahoz and L Recatero—p 361

**Oncotic Pressure in Pathogenesis of Edema**—Juncadella Ferrer studied the relation between oncotic pressure and edema the levels of oncotic pressure which by themselves can be regarded as causing edema and the involvement of the alteration of the oncotic pressure in edemas observed in different syndromes and diseases The protein formula and the oncotic pressure were determined in 401 cases in 136 of which edema existed at the time of determination Numerous examinations were made on the edema fluid and on the blood volume Clinical studies demonstrated that a definite connection exists between oncotic pressure and edema The edema increases proportionately to the decrease in pressure At a pressure below 15 cm of water edema is a necessary result, and it is frequent when the pressure is below 25 cm In such cases the decrease in pressure alone suffices to explain the edema At pressures above this level edema becomes consistently rarer and other eliciting and contributing factors must be searched for Oncotic pressure values above 40 cm of water are normal, so that if edema develops with such pressures other factors are responsible In secondary anemia edema is encountered in the presence of normal or only slightly reduced oncotic pressure values In the edemas of leukemia the oncotic pressure factor likewise plays an unimportant part In the edemas of cardiac patients the oncotic pressure plays a variable role, it is apparently not the primary causal factor but an important additional factor Acute glomerular nephritis is accompanied by high oncotic pressure, and the edemas developing cannot be ascribed to it In pernicious anemia the oncotic pressure seems to play an auxiliary rather than a primary role in the development of edema The edemas of chronic glomerular nephritis exist in the presence of widely varying oncotic pressures In serum disease edema develops in the presence of extremely low oncotic pressure values, that is, in these cases edema is obligatory During nephrosis and amyloidosis the edemas are characterized by a low oncotic pressure

**Asthma from Sensitization by Bedbugs**—Lahoz and Recatero describe 4 cases of asthma which they could trace to sensitization by bedbugs Three of the 4 patients had seasonal asthma, and the possibility of sensitization by pollen was considered All 3 improved when they changed their residence The improvement when living in homes not infested with bedbugs and still more the experience in the open air make the authors reject sensitization to pollen This was further confirmed by negative skin reactions to pollens Sensitization to spores of *Tilletia* could also be ruled out by negative skin reactions Routine intradermal tests gave slightly positive reactions to bacterial substances and completely negative reactions to fungi, pollens, house dust, wool, feathers, hair and the like Tests made with extracts of bedbugs gave strongly posi-

tive reactions whereas the same extracts were negative in persons with other forms of allergy and in healthy persons. The patients were advised to remove the bugs from their homes by thorough cleaning, repainting and, if possible, change of furnishings. Treatment consisted in progressively increasing injections of extract of *cimex lectularius*. Two of the 3 patients passed the summer of 1941 without attacks, and in the third an equally favorable result is hoped for, although the injection of the maximal dose elicited a severe local reaction and an attack of asthma. A secondary sensitization of the fourth patient to bedbugs could be demonstrated. The authors consider that the odor, the bite or the contact with the insect or its excretions may be responsible.

### Beitrage zur klinischen Chirurgie, Berlin

172 161-304 (Aug. 23) 1941 Partial Index

- \* Traumatic Cholecystitis—Development, Clinical Significance and Recognition as Traumatic Sequel. M. Biehl—p. 161
- Pancreatic Calculi in Course of Dyskinesia of Extrahepatic Bile Passages. H. Griessmann—p. 230
- Mustard Gas Poisoning in Four Children. Clinical Contribution to Problem of Mustard Gas Poisoning. W. Osterchrist—p. 240
- Injection Treatment of Hemorrhoids According to Blond and Hoff. H. Wille Baumkauff—p. 255
- Malignant Testicular Tumors. J. von Szelezky—p. 265

**Traumatic Cholecystitis**—Biehl observed 3 cases of biliary disorders which had occurred in connection with trauma. A railroad worker aged 22 was thrown against a crank the impact striking the epigastric region. He experienced immediately a severe pain in the gastric region which was intensified on movement and on deep breathing. The pain radiated toward the right scapula. The patient later collapsed and was brought to the hospital. Laparotomy disclosed that the gallbladder was torn away from the liver bed. The bladder was removed. The second patient was a man aged 54 who had fallen from a bicycle. At operation two days later there was found peritonitis caused by tears in the small intestine. An intestinal resection was performed. Three weeks later the patient was subjected to a cholecystectomy because of symptoms of acute cholecystitis. The removed gallbladder presented a circumscribed mucosal tear in the fundus of the gallbladder. The wall in the region of the tear was necrotic but perforation did not take place. Colon bacilli apparently had entered the gallbladder and had caused a cholecystitis. The third patient was a man aged 52 who had been in an automobile accident and had sustained a patellar fracture. Suture of the patella was followed by suppuration of the knee. The patient was not aware of having sustained an abdominal trauma, but five weeks after the accident there suddenly developed an acute cholecystitis which necessitated a cholecystectomy. The gallbladder contained 2 calculi. The thickened wall in the region of the corpus was found to contain numerous intramural abscesses. In the region of the fundus there was an inflamed mucosal flap, and a portion of the wall was denuded of mucosa. It is suggested that streptococci which produced the mural abscesses had found a breeding place under the torn off mucosal flap and that the postoperative suppuration of the knee was probably a hematogenous result of the cholecystitis. The mucosal lesions in cases 2 and 3 were probably caused by trauma. The resulting cholecystitis therefore may be designated as "traumatic cholecystitis."

### Zeitschrift für ges. experimentelle Medizin, Berlin

108 667-796 (April 24) 1941 Partial Index

- Behavior of Reticuloendothelial System in B<sub>1</sub> Hypovitaminosis. I. Csáfi and M. Szabó—p. 667
- Effect of High Temperatures on Central Regulation of Respiration. A. Hamori—p. 676
- Effect of Liver Extract Preparations on Blood Catalase. G. Kibelitz—p. 700
- Blood Diastase and Spleen. G. Papayanopoulos and S. Thaddea—p. 708
- Paradoxal Digitalis Effect. Contribution to Relationship Between Chemical Constitution and Biologic Action of Cardiac Glucosides. H. Oettel—p. 713
- \* Fragility of Blood Vessels in Internal Diseases. W. Schaefer—p. 725
- \* Counting of Thrombocytes. Elisabeth Meister—p. 742
- \* Animal Experiments on Problem of Embolism. Special Consideration of Total Number of Emboli. W. Hachmeister—p. 780

**Fragility of Blood Vessels in Internal Diseases**—Schaefer investigated the incidence of the impairment of the vascular wall in internal diseases, using the vascular fragility test of Sack. A certain negative pressure is exerted by means

of a suction cup on the small cutaneous vessels until vascular tears appear. The author reports observations on 97 persons, of whom 14 were healthy. The vitamin C content was determined in order to rule out its influence on vascular fragility. It was found that in the majority of the cases there was a vitamin C deficiency. Only in 10 out of 97 there was no vitamin C deficiency. The patients were given daily a certain quantity of vitamin C until 50 per cent of it was eliminated in the urine. This is regarded as an indication of saturation. The vascular fragility test of Sack was employed before and after saturation with vitamin C. The test is suitable for the quantitative determination of vascular fragility. An increase in vascular fragility is observed in infections and inflammatory diseases, in diseases of the vascular system and in case of toxic impairment of the vascular wall by arsenic. There is no impairment of the vascular wall in leukemia, anemia and polyglobulism.

**Counting of Thrombocytes**—The fact that no less than sixty-one methods have been described suggests the inadequacy of the individual methods. Meister investigated methods which are fundamentally new, have been evaluated favorably and meet clinical requirements. The various methods employ cutaneous blood, venous blood, the plasma counting chamber, the whole blood counting chamber, with or without hemolysis and a streak or a smear preparation. She found that the same figures are obtained regardless of whether cutaneous or venous blood is used. Methods which utilize plasma are unsuitable because the thrombocytes are unevenly increased in the plasma, whereas fewer are carried along in the sedimentation of the erythrocytes. If the whole blood counting chamber is used with hemolysis, the visual field is filled with numerous point and threadlike fragments of the hemolyzed erythrocytes, which makes differentiation of platelets impossible. If the whole blood counting chamber is used without hemolysis, a part of the platelets are destroyed by the fixation fluid. The count is dependent to a considerable extent on the degree of hemolysis. She concludes that the streak preparation of Pomo or the ordinary blood smear (according to Sack's suggestion) yields results correct within the margin of error.

**Pulmonary Embolism**—Hachmeister raises the question as to the cause of death in pulmonary embolism. Clinical observations on pulmonary embolism being difficult, because the fatal cases terminate rapidly and the mild cases are rarely recognized, animal experiments were resorted to. Of the methods used heretofore only the intravenous injection of air can be regarded as physiologically unobjectionable. The author developed a method which closely imitates the physiologic conditions of human embolism. He injected emboli prepared from the animal's own blood. He was interested in investigating the quantity of emboli that can be injected at once without changes taking place in the arterial and venous blood pressure, the quantity of emboli that causes only temporary circulatory disturbances and the quantity of emboli which, injected at once, causes death. In the course of experiments on dogs the arterial blood pressure was measured in the left femoral artery and venous blood pressure in the left jugular vein. The emboli were injected into the right femoral vein. It was found that the injection of from two to five emboli produces no changes. The length of the individual embolus was 2.3 cm and the diameter 4.5 mm. Dogs of from 11 to 15 Kg in weight exhibited a fall in arterial blood pressure in response to the injection of from fifteen to twenty emboli. This change in arterial pressure appeared from ten to fifteen seconds after the injection of the emboli. The venous blood pressure increased after twelve seconds but attained its normal value in the course of approximately 27 minutes. The injection of from thirty to thirty-five emboli caused death in dogs weighing from 10 to 15 Kg. The severity of the symptoms of pulmonary embolism is to a great extent dependent on the number of individual emboli which invade the circulation, as well as on the time intervals at which the emboli follow one another. Embolism may result fatally even in the presence of adequate possibilities for the pulmonary circulation. The question whether other, perhaps reflex, factors play a part and cause a further shutting off of pulmonary arteries and thereby death was not explained by these experiments.



## Book Notices

**Aftereffects of Brain Injuries in War Their Evaluation and Treatment The Application of Psychologic Methods in the Clinic** By Kurt Goldstein M D Clinical Professor of Neurology Tufts Medical School Boston Foreword by D Denny Brown M D Professor of Neurology Harvard Medical School Boston Cloth Price \$4 Pp 244 with 49 illustrations New York Crane & Stratton 1942

During the war of 1914-1918 Kurt Goldstein, the author of the present volume, probably had more experience in studying head injury cases from a neurologic point of view than any other person on either side. Goldstein, a competent observer, prolific writer and excellent neurologist, has produced this small volume comprehensively covering the neurologic symptoms and sequelae of head injuries and their origin from a neurologic-mechanical point of view. In addition he discusses some extensive psychologic laboratory studies of these cases, the tests being primarily psychophysical in type. This chapter is interesting because it shows the practical nature of the tachistoscope, the ergograph and other little used but easily applicable quantitative instrument tests of coordination. The book closes with two chapters which will be widely read by physicians who have to do with the rehabilitation of head injury cases. These chapters deal with the treatment by physical and neurologic means and the social adjustment of these head injured. There is an extensive and useful bibliography appended to this volume. The work is modern, practical and useful and is the first book of its kind to be made available for the wounded of the present conflict. While the material will be amplified by future studies, the soundness of the contents will make this book a must for therapists with post-traumatic neurologic patients.

**Introduction to Parasitology** By A S Pearse Professor of Zoology Duke University Durham N C Cloth Price \$3.75 Pp 357 with 448 illustrations Springfield Illinois & Baltimore Charles C Thomas 1942

In the brief confines of this book the author has surveyed the field of parasitology from protozoa to bats. The book is intended as a reference work for college students to be used in conjunction with lectures and laboratory work. Emphasis is placed on parasites that infest man, however, and whole chapters are devoted to malaria and hookworm. The medical technologist will find detailed instructions for many procedures of laboratory diagnosis. At the end of some of the chapters is a brief paragraph outlining medical treatment. On the whole these are satisfactory for the purpose intended, although there are a few instances in which a proprietary preparation has been mentioned, such as stovarsol for ciliate infestations instead of the chemical name acetarsone. The final chapter is devoted to instructions for the collection and care of parasites for laboratory collections. The book is recommended for persons desiring a synopsis of parasitology.

**Internal Secretion of the Germinal Tissue of the Testes and Prostatic Hypertrophy** By Nils Tornblom Published in Uppsala Lakareforenings forhandlingar Ny foljd Bd XLVIII 1 2 Paper Pp 106 with 68 illustrations Uppsala Almqvist & Wiksells Boktryckeri AB 1942

The author discusses the etiology of prostatic hypertrophy as related to the question of (1) more than one hormone formation in the testis, (2) an independent endocrine function of the germinal tissue of the testis, (3) an increased formation of testosterone after cessation of internal secretion in the germinal tissue, (4) isolation and characterization of hormone formed in germinal tissue of the testis and (5) induced changes in the prostate by increased action of testosterone, similar to spontaneous prostatic hypertrophy. Tornblom shows by experimental studies on rats and dogs that two hormones are formed in the testicles, one in the germinal tissue and one in the interstitial cells. The latter hormone (testosterone) stimulates the growth of the prostate and seminal vesicles. The germinal tissue hormone is characterized in relation to testosterone by a greater weight increase of the hypophysis in castrated rats than in the growth of the prostate and seminal vesicles. Cessation

of the internal secretion of the germinal tissue in rats produces increased weight of the hypophysis as well as an increased production of testosterone in the interstitial cells which stimulates the growth of the prostate and the seminal vesicles. The author points out that the hormone of the germinal tissue has been isolated, and when administered in small doses to castrated rats it inhibits the weight increase of the hypophysis. The increased action of testosterone (testosterone propionate) produces enlargement of the prostate in dogs which is similar histologically to the hypertrophy of the prostate usually encountered.

**Castor Oil and Quinine Once a Doctor Always a Doctor** By George Winton Vandegrift M D Cloth Price \$3 Pp 232 New York E P Dutton & Co Inc 1942

The son of an eccentric, masterful and lovable physician has written this very human book about the "Corner Doctor" in New York's old seventh ward in the colorful eighties and nineties, which closed the nineteenth century. Dr Vandegrift Sr had an intuitive diagnostic ability and a hypnotic influence over his patients, especially the females, and an unusual amount of common sense, curiosity and energy. With an extraordinary gift for making friends, he hobnobbed with every one from burglars to some of the most famous litterateurs of his day. His medical practice overflowed the office in his home at all hours, and many of his patients had such confidence that they either followed him on his vacations to his farm in Maryland or would often cause him to terminate these short periods by constantly wiring or writing for his quick return to New York. He wore a high hat, opal studs, a long coat and yellow linen duster. He dined late and got about late. His patients waited by the hour in the office until he was ready to see them and always seemed well rewarded even though they were subjected to nauseating shotgun prescriptions or his favorite shorter prescription of castor oil and quinine. The son, and the author became a physician and took over his father's practice, however slow at first, as many of the patients refused to see any one but his father. His story, warm with humanity, humor and vitality, contains vivid pictures of his father and old New York. Indeed, if the late Charles Dickens, the great Englishman, had known father Vandegrift, we would probably have had another work as famous as "Dombey and Son".

**The First Negro Medical Society A History of the Medico Chirurgical Society of the District of Columbia 1884 1939** By W Montague Cobb A B M D Ph D Associate Professor of Anatomy Howard University Washington D C Cloth Pp 159 Washington D C Associated Publishers 1939

The Medico Chirurgical Society of the District of Columbia is the oldest American Negro medical society. This small volume is a review of the difficulties in earlier days that Negro physicians encountered in becoming members of the Medical Society of the District of Columbia, which appears to be, the author says, the first scientific society chartered by act of Congress. This problem of Negro physicians back about 1870 finally reached the House of Delegates of the American Medical Association, and here are republished some of the reports of the committees to which certain phases of the problem were referred. The archives of the Medico-Chirurgical Society previous to 1920 could not be found by the author. For the last eighteen years there is a definite record of the programs of the meetings of the society, of which 58.6 per cent have been devoted to scientific discussions and the remaining 41.4 per cent to business the nature of which the author says was not always of sufficient significance to warrant the time spent on it. To this fact may be charged much of the lack of interest among the members of which the society has regularly complained. Of the eighty-five scientific meetings held in this period of years, in 43.5 per cent the programs were presented by visiting speakers. There are now 170 Negro physicians practicing or teaching medicine in the District of Columbia, of whom 84.7 per cent are members of the Medico Chirurgical Society. The Negro population of



the District is said to be 170,000, making a ratio of 1 Negro physician to 1,000 Negro inhabitants.

The author lists some two hundred and nineteen publications by members of the society and briefly reviews the work it has done on community problems. The author points out some deficiencies of the society, yet he believes it has contributed to Negro medical progress in Washington.

**The Problem of Cooperative Medicine** By V. J. Tereshchenko. Studies of the Cooperative Project. Series B. Studies in the Field of Cooperative Medicine. Part I. Federal Works Agency Work Projects Administration for the City of New York. Published with the Assistance of the Edward A. Filene Good Will Fund, Inc. New York. Paper. Pp. 80. New York, 1942.

This work, which is "sponsored by the U. S. Bureau of Labor Statistics" and "published with the assistance of the Edward A. Filene Good Will Fund, Inc.," is made up largely of quotations from the carefully selected speakers of the National Health Conference, radio speeches and hostile critics of organized medicine on the one side, to which are contrasted quotations from articles and addresses of physicians who oppose the position of the first list of speakers. This is the old method of setting up straw men in which the verdict is decided in advance. It is admitted that "the concept of cooperative medicine has not become crystallized as yet and, therefore, causes confusion in the terminology now applied." The "well defined principles" of cooperation are stated, but there is no attempt to show that these principles are offered in the so-called cooperative health associations described. The opponents of cooperative medicine are said to maintain that "the whole problem of medical care can be solved simply by increasing the efficiency of the already existing system of medical care." Of course, no attention is paid to the fact that organized medicine has been conducting more plans to determine the best method for paying for medical care than all the "cooperative associations" combined.

**Gregg Medical Shorthand Manual** By F. M. B. Smither. Second edition. Cloth. Price \$2. Pp. 191. New York: Gregg Publishing Company, 1942.

The medical stenographer who uses Gregg shorthand will find this manual of great aid in the simplification of outlines for medical terms. Shortened forms for commonly occurring medical words, prefixes, suffixes and common phrases and word combinations with ample practice material are included. The introduction includes a list of Greek and Latin prefixes and suffixes with definitions, and various other practical hints for the beginner whose chief difficulty is lack of medical vocabulary. Emphasis is placed on the value of a knowledge of etymology, which, as any experienced reporter will confirm, is half the battle in devising outlines for unfamiliar terms in any branch of science and in any system of shorthand.

**Medical Parasitology** By James T. Culbertson. Assistant Professor of Bacteriology, College of Physicians and Surgeons, Columbia University. New York. Cloth. Price \$4.25. Pp. 285 with 37 illustrations. New York: Columbia University Press. London: Oxford University Press, 1942.

This book consists of two parts, general considerations and infections caused by animal parasites. The first contains chapters on infection, epidemiology, natural resistance and acquired immunity, diagnosis, specific therapy and prophylaxis. Part II deals with the thirteen zoological groups of animal parasites. It is an uncritical compilation of data without citation of sources. Thus it is stated that "most adults are probably relatively resistant to *Endameba histolytica*. Among those who contract the infection, few manifest severe symptoms." This may be true at the time of detection in carriers or chronic cases but did not apply in the Chicago outbreak. The statement that the iron alum hematoxylin technic for detection of amebic cysts in stools is not often resorted to because of its difficulty is to be deplored, since it alone suffices to protect the patient from inadequate and all too often false diagnosis. The plates are based on photographs and contain some new material. The text figures are often quite inferior.

**First Aid to the Injured and Sick. An Advanced Ambulance Handbook** [By Francis James Warwick and A. C. Tunstall.] Edited by Norman Hammer, M.R.C.S., County Surgeon, St. John Ambulance Brigade, London. Eighteenth edition. Boards. Price \$2. Pp. 336 with 313 illustrations. Baltimore: William Wood & Company, 1941.

This handbook on first aid was brought out in England and has been well known there since its first publication in 1901. It is divided into two parts, the first dealing with the form and functions of the body—admirably brief and suitably illustrated—and the second with first aid. The latter, according to the preface, has been practically rewritten in the light of the reviser's special interest in air raid first aid. The sections on wounds from war weapons, war gases from the first aid point of view, and the collection and immediate care of air raid casualties, including those affected or contaminated by gas, are especially noteworthy. The book is of handy pocket size and is suitably indexed. It is one of the best and most reliable books in the field.

**Housekeeping Service for Chronic Patients. An Analysis of a Service for the Chronically Sick and the Infirm Aged Operated by the Work Projects Administration** By Marta Fraenkel, M.D. Research Bureau, Welfare Council of New York City. Paper. 1p. 143. New York: Welfare Council of New York City, 1942.

The Welfare Council of New York City supervised a WPA project to provide housekeeping aides in the home care of chronic patients without expense to the patients. From Oct. 1, 1939 to June 30, 1940 such assistance was given for various periods to 2,508 patients, a majority of whom were over 65 years old and suffering from some form of disability which rendered them unable to do their daily household work, two thirds being confined to their homes. About one third required care throughout the year but the remainder for shorter periods. All were under medical supervision, but many did not demand active medical care. There was an extensive system of supervision, mostly by medical social workers which must have added greatly to the overhead expense. Unfortunately there are no figures given as to the total cost. Economic changes and the dissolution of the Work Projects Administration has now ended many features of this experiment.

**Eat What You Want! A Sensible Guide to Good Health Through Good Eating** By W. W. Bauer, M.D., Director, Bureau of Health Education, American Medical Association, Chicago, and Florence Maryne Bauer. With an introduction by Morris Fishbein, M.D. Cloth. Price \$2. Pp. 263. New York: Greenberg Publisher, Inc., 1942.

This is an unusually readable book on diet containing thoroughly sound information picked without appearing crowded, into a comparatively small number of pages. There are a number of tables including one on food values and another on the number of calories used per hour under various types of activity. There is a satisfying chapter on vitamins. The book explodes many dietary superstitions and advertising balldoo. A number of actual menus either for home or for restaurant choice are included. All these features and others make this book especially useful for the reader who is not particularly trained in nutrition. The final chapter, "If you carry your lunch," seems especially timely.

**First Aid and Bandaging. A Handbook of First Aid and Bandaging** By Arthur D. Bellillo, M.B., B.S., D.P.H. and others. Cloth. Price \$1.75. Pp. 628 with 239 illustrations. Baltimore: William Wood & Company, 1942.

This is the fourth reprinting of this manual on first aid since May 1941, a record which speaks for the timeliness of the subject as well as for the quality of the contents. The arrangement is conventional, beginning with chapters on the general principles of first aid, case taking, diagnosis and the structure of the human body. The latter, although supplemented in later chapters by further description and illustrations, seems rather too abbreviated. There is more emphasis on bandaging in this book than in some of its contemporaries. The final chapter is devoted to training in first aid—a sort of outline of a first aid course. There is an adequate index.

## Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT HOWEVER REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS BUT THESE WILL BE OMITTED ON REQUEST.

### CAN HAIR TURN WHITE OVER NIGHT?

To the Editor—Can hair actually turn white over night or is this pure myth? What chemical imparts color to hair, I mean natural color not artificial? Can particle of pigment in a hair shaft be seen with the high power of the microscope in cross section or does it require a higher power than even oil immersion of the ordinary laboratory microscope?

M D California

To the Editor—One of our local high school boys had an argument with his teacher. The teacher claimed that it is quite possible for a person's hair to turn gray in a single night. I told the young man that in my opinion a person's hair could not possibly turn gray in one night but that I would go to the fountain head of all wisdom.

M D, California

ANSWER—The color of hair is due to pigment in two forms, a soluble one which pervades all the cells and also as fine granules which are most numerous in the outer part of the cortex but are present also in the central cortex and the medulla. The pigment is melanin, thought to be formed by the action of tyrosinase on tyrosin (Rothman, Stephen. In Vitro Studies on Pigmentation, *J Invest Dermat* 5 61 [April] 1942) and may vary widely in its color. Rothman, by exposing it in vitro to the action of ultraviolet radiation, caused it to become paler, a portion even losing all its color and becoming soluble. The melanin of blond hair is of a much different shade than that of red or dark hair. The amount of granular melanin varies a great deal, much more being present in dark hair. It may be seen by use of any of the objective lenses of the microscope. For the detection of gas in the hair the low power objective is best, for it allows more chance for light to strike the hair from above and be reflected. Too strong a reflected light is confusing for it lights up the many small reflecting surfaces mentioned by Strong (R M. The Cause of Whiteness of Hair and Feathers, *Science* 54 356, 1921) too brightly. A mild light will show the reflection from the gas without this confusion.

Occasionally in examining hairs by transmitted light, larger homogeneous dark masses are seen, which by reflected light appear white. These are globules of gas, to which further reference will be made. Besides reflecting globules of gas there are many minute breaks and angular surfaces in and on the hair, all of which reflect light and modify the effect of the melanin on the color of the hair. Jarnecke (H. Changes of Color of Hair by External Influences, *Dermat Wchnschr* 106 212, 1938) says that the content of silicic acid in hair also influences its color.

There are three theories of the way in which hair becomes gray.

1 The dark hair falls out and the new hair appears without pigment. This is a common occurrence in cases of alopecia areata. In younger patients the new hair acquires pigment after a time. In old patients it is apt to remain white. Most authorities agree that this is the way in which ordinary grayness occurs.

2 The cells of the medulla become phagocytic and carry off the pigment through the hair root (the theory to explain sudden blanching advanced by Metchnikoff, Elie. On the Process of Hair Turning White, *Proc Roy Soc London B* 69 156, 1901-1902).

3 The sudden blanching occurs by the formation of gas which appears in the hair, and the light reflex from these bubbles conceals the pigment, which remains in the hair.

The Metchnikoff theory was evidently an extension of his general theory of phagocytosis and has found no support.

The third theory found its greatest exponent in Landois (L. Die plötzliche Ergrauen der Haupthaare, *Virchows Arch f path Anat* 35 575, 1866) and is generally accredited to him, although he states that Griffith was the first to demonstrate the reflecting bubbles of gas in the hair. Landois supported his claim by microscopic study of the sudden blanching of the hair of a man aged 34 with delirium tremens, who originally had blond hair and blue eyes. Landois's theory is that hair suddenly blanching does not lose its pigment but the pigment is concealed by the reflexes from the gas bubbles. He agrees that ordinary gray hair, on the contrary, is usually gray because of loss of pigment.

The founders of modern dermatology in Vienna von Hebra and Kaposi, denied the possibility of the occurrence of sudden

blanching. Stieda (L. Ist plötzliches Ergrauen des Haupthaars möglich? *Deutsche med Wchnschr* 36 1484, 1910) wrote a paper denying it. Bloch (Bruno. Ueber die Entwicklung des Haut und Haarpigmenter beim Menschliches Embryo und über das Erloschen der pigmentbildung im ergrauenden Haar [Ursache der Canities] *Arch f Dermat u Syph* 135 77, 1921) the discoverer of the dopa theory of melanin formation, disbelieved it. Galewsky, one of the greatest authorities on hair and hair diseases, was skeptical, and more recently this same attitude has been voiced by Strong. The Suttons (*Diseases of the Skin*, ed 10, St Louis C V Mosby Company, 1939, p 1397) consider this possible. Most English speaking dermatologists accept the possibility of occasional cases of sudden blanching of the hair.

Strong's adverse opinion is founded on microscopic study of the hair. He found no more gas in gray hair than in pigmented hair, but the gray hair was deficient in pigment. For ordinary gray hair all authorities agree that this is true. Landois's claim was that suddenly blanched hair differed from ordinary gray hair in retaining its pigment, which is concealed by abundant globules of gas.

In the rare condition known as pili annulati, ringed hair, the white segments are white not because of loss of pigment but because of bubbles of gas that conceal the pigment. It is mentioned by H R Crocker in the second edition of his textbook (*Diseases of the Skin*, Philadelphia F Blakiston Son & Co 1893, p 790). Heepke (H. Ueber Veränderungen des Pigmentes und Luftgehaltes im Haar *Verhandl d Anat Ger* 30 127, 1931) studied a case of this kind. He found the gas difficult to remove, in contrast to Landois's experience. Cady and Trotter (A Study of Ringed Hair *Arch Dermat & Syph* 6 301 [Sept.] 1922) found that in most cases the gas was more or less resistant to removal, but 1 of their cases gave up the gas quite readily. They warn that such hairs should be examined soon after they are mounted lest they lose the gas. This is in accordance with Landois's experience. Further, their chemical experiments led them to suggest that the gas imprisoned in the hairs may be carbon dioxide.

Thus we have plenty of proof that gas bubbles can hide the pigment and cause still pigmented hair to appear gray. The statement that such gas can form and occupy a whole long hair in a few hours depends for proof on Landois's study, supported by a few others.

One of them, Heinicke (Zur Casuistik des Verhaltens der Haare bei Geisteskranken *Neurol Centralbl* 22 146 1903) relates the history of a woman aged 21 with dementia precox who during her stay in the hospital had several recurrences of her mental disturbance. It was noticed during one of these attacks that a strand 3 cm wide of her originally blond hair had become almost silvery white. It extended from the center frontal region to the left parietal region. After four days it rapidly resumed its normal blond color. The mental attack subsided soon after this. Three days later the same strand of hair became white and in an hour or two another mental disturbance set in. The hair strand at the height of this attack was again almost silvery but, as the patient improved had by the following evening resumed almost the normal blond color. Examination of these white hairs showed more air than in normal hair. This escaped by immersion in water and the hair regained its normal color. The change in color was accompanied by hyperalgesia of the part of the scalp from which this strand of hair grew.

It is difficult to doubt the accuracy of the observations of an eminent clinician such as Gowers (Metallic Poisoning, *Lancet* 2 1173, 1901), who in a lecture digressed from a discussion on arsenical pigmentation to relate a case of traumatic meningeal hemorrhage over the left cerebral hemisphere. During the three days that the man lived after the accident the right half of his brown moustache and beard became almost white, and in the median line, separating this gray hair from the brown hair on the left side, was a line of almost black hair. Gowers compared this to the tendency so often seen in depigmentation such as occurs in leukoplakia for the border of the light area to be hyperpigmented. This change was carefully watched during life and checked after death.

Brown-Sequard (Expérience démontrant que les poils peuvent passer rapidement du noir au blanc chez l'homme, *Arch de physiol* 1869, p 442), after remarking that many of the reports of sudden blanching of the hair are unreliable relates his own experience. In August 1862 he noticed a few white hairs in the beard on the anterior part of both of his cheeks where he had none before, though they had been present farther back on his cheeks. These new white hairs he pulled out, five on one side and seven on the other. Two days later he found three white hairs, white throughout their whole length on the right side and two on the left. These he also

epilated and repeated the process many times in the next five or six weeks. He was certain that pigmented hair became white throughout its length over night.

Sustantiating Brown-Sequard's observations are the conclusions of Naegeli (Beobachtungen beim Ergrauen der Haare im Hinblick auf die zurzeit herrschenden theoretischen Anschauungen, *Schweiz Med Wchnschr* 63 1328 [Dec 23] 1933). He examined many hairs in people who were turning gray gradually and found that the single hair changes its color rapidly—in a few days. Usually the change involved the whole length of the hair, but sometimes the proximal part next the root turned white while the rest retained its color, or even less frequently the tip became bleached while the lower part was still pigmented. He therefore rejects the theory of Bloch that the pigmented hair is shed and a white one grows in its place. He is convinced that loss of pigment occurs from some change within the hair. He acknowledges the possibility of sudden blanching.

These two clinical observations propose a fourth theory of the way in which hair turns gray. It presupposes a chemical change within the hair, bleaching the melanin as it is bleached by the outward application of hydrogen peroxide or by the action of ultraviolet radiation in Rothman's experiment.

Galewsky, one of the greatest authorities on diseases of the hair, comments (Canities, *Handbuch der Haut u Geschlechtskr*, 1932, p 160) that in his extensive experience he has never seen a genuine case of sudden canities and thinks it strange that no such cases were reported during the first World War, when there was so much mental and physical distress. He overlooked the report of Vignolo Lutati (Premature Gray Hair and War Psychopathies, *Polichinco* 25 680, [July 21] 1918), who cites several cases occurring among the Italian troops. The rarity of these cases suggests that this phenomenon occurs only in those with a certain predisposition rarely brought to light by extraordinary stress. The same conditions were supposed in the cases of restoration of hair color in the answer to a query in *THE JOURNAL* Sept 27, 1941 p 1140.

The fact that in rare instances hair can quickly become gray must be acknowledged. We need further proof of Landois's gas bubble explanation which is difficult to get, for so rare an event seldom occurs under the eyes of a trained observer. The old idea that hair is practically a dead tissue, cut off from the metabolic influences in the body, must be forsaken.

#### ERYTHEMA FROM WELDING

To the Editor—A patient who is a welder has severe erythema of the chest and abdomen. As there are no blisters I think the condition is actinic resulting from ultraviolet rays from the welding arc. I advised him to wear a black shirt. Can you advise any other protective measures?

E P S Miller, M.D., Chicago

ANSWER—Erythema and even vesicles resembling sunburn have been reported as occurring among welders on the uncovered portions of the skin. This is said to be due to the actinic rays of the electric welding arc which are generated, especially in flashes.

The treatment consists in wearing clothing through which the rays will not penetrate or to apply protective ointments containing light screens. A suggested ointment would consist of zinc oxide ointment to which is added 10 per cent tannic acid or 5 per cent methyl salicylate. Such a protective ointment can be obtained from the West Disinfecting Company under the name of West Protective No 88. This ointment contains titanium oxide and methyl salicylate.

#### VITAMIN D FOR CHILDREN IN SUNSHINE AREAS

To the Editor—One of my medical friends in Central America has written to ask about the use of vitamin D in light skinned children in the sunshine area of Guatemala. It seems to be fully recognized that vitamin D should be given at least during the first year and a half of life. After that period has elapsed and the child is playing a great deal and living exposed to subtropical sun is it necessary to continue vitamin D or is it advisable to do so?

Daniel Crosby M.D. Oakland Calif

ANSWER—Vitamin D other than that synthesized in the skin by the ultraviolet of sunshine should not be necessary for any infant or child living in a sunshine area of a tropical or subtropical region. It would be necessary only for those kept closely housed. It is probable that for many infants living in such a region a need for ingested vitamin D does not exist. The general tendency in the temperate zone is to give much more than is needed. If comparable amounts are given to babies exposed frequently to sunshine, the effect may be definitely detrimental in that after several months the appetite may decrease with consequent ill effect on nutrition.

#### PROBABLE LABYRINTHINE VERTIGO

To the Editor—A woman aged 36 has been having spells of vertigo for the past four months and I am curious about their relationship to her menses. The younger of her two children is 7 years of age. She has had no serious illness. There was an appendectomy eight years ago. Her periods have been quite normal and regular. Four months ago she had a sudden attack of dizziness, which grew worse as she turned her head or bent over. She was placed in bed for a few days and stimulants for a blood pressure of 104 systolic 76 diastolic were given. In five days she had recovered completely at which time the blood pressure was back to normal 120/78. The attack had come on one day after she finished her period. The next month was normal with no vertigo. During the last of June, one day before the end of her period she had a severe attack of vertigo with intense nausea vomiting and inability to stand when she attempted to arise in the morning. Turning of the head in any direction caused worsening of the condition. Blood pressure was 118/84 pulse 87 and respiratory rate 21. There was nystagmus only to the right, urine tests were normal, the Wassermann reaction was negative. There was no pain in the ears or around the mastoid or temporal regions. There was no tinnitus or other aural symptom. Two days before the July menses she was given corpus luteum by hypodermic injection each day and for two days after the menses began. On the fourth day of the period she had a minor attack of vertigo accompanied by some nausea and considerable weakness. The blood pressure was 114/76 pulse rate 82 and respiratory rate 20. At no time has there been any fever. Since there has been no aural pain and the attacks have been more or less coincidental with the last of the menses each month I should like to know whether there is anything which we might do to help with the diagnosis and treatment. Her blood count is normal. There seems to be no congestion of the liver, no dental infection and no other point of poisoning. M.D., Arizona

ANSWER—The description of the vertigo would seem to put this phenomenon in the class of the true labyrinthine vertigo. This requires that all the usual causes of this disease be ruled out. Disease or degeneration of the auditory nerve must be considered. Cerebellar tumor is a possibility. If these and similar causes can be eliminated, the case falls into the speculative group. The relationship to the menstrual periods is suggestive. It is well known that there is often retention of fluids in the body during the menstrual period. This comes about through some obscure disturbance of the water balance. Disturbance of the water balance might easily produce a corresponding disturbance of pressure in the semicircular canals. This would be associated with a true labyrinthine vertigo.

A therapeutic test might be applied by attempting to control fluid retention during the menstrual period. The patient should be placed on a salt free diet. The sodium ion is particularly to be avoided. A week or two before the onset of the menstrual period, fluids should be sharply restricted. The fluid intake should be kept under 1,000 cc daily. Ammonium chloride in the amount of 6 to 8 Gm daily should be administered. The administration of antitrim S has been found helpful. If this regimen, kept up for three or four months prevents the occurrence of the vertigo at the menstrual period, it would offer presumptive evidence that in this case the vertigo was caused by an increased pressure in the semicircular canals due to fluid retention of a disturbed water balance.

#### PREGNANDIOL EXCRETION IN PREGNANCY AND PROGESTERONE ADMINISTRATION

To the Editor—It is admitted that in case of amenorrhea few injections of progesterone will be followed by a false menstruation. The theory seems to be that when the action of progesterone on the uterine mucosa is ended there will be a so called withdrawal bleeding. But supposing that really the woman was in incipient pregnancy what will be the effect of the injections? If the pregnant woman will bleed like the others then there is danger of abortion. The physician therefore should not give an injection if he cannot absolutely exclude the pregnancy. Or the injections of progesterone will be without effect on the pregnant woman, because she has a good and continuous supply of progesterone from her corpus luteum and later from her placenta and therefore there is no withdrawal. I should like very much to know your opinion and the state of the literature on the subject.

M.D. New York

ANSWER—There is no harm in giving progesterone to a woman who is pregnant. In order to establish uterine bleeding through progesterone administration it is necessary that the progesterone level drop to a very low point, in other words, below the threshold for bleeding. The administration of the usual amount of progesterone would have no effect on a patient with amenorrhea who is unknowingly pregnant, since the withdrawal would not result in a drop below the bleeding threshold for progesterone because of the large amounts of endogenous progesterone in such a patient. There is no harm in the treatment of patients with amenorrhea by progesterone administration on the chance that there may be an occasional instance of amenorrhea due to pregnancy.

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## CLINICAL USE OF AMINO ACIDS FOR THE MAINTENANCE OF NITROGEN EQUILIBRIUM

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DETROIT

It has previously been shown that a mixture containing all the essential amino acids can be administered parenterally without untoward effect that amino acid mixtures so administered may be substituted for protein in the diet and that by this means a patient may be maintained in nitrogen equilibrium.<sup>1</sup> It has also been shown that the solution may be administered at the rate of 1 to 2 Gm. of amino acid nitrogen an hour and that, so administered, over 95 per cent of the amino acids was utilized in patients with malignant growths, hyperthyroidism, hypothyroidism, chronic infections, chronic nephritis or cirrhosis of the liver.

The present study was undertaken to extend the types of conditions in which solution of amino acids may be profitably used and also to observe the effect of this amino acid solution on the blood protein and blood amino acid level. The solution was administered orally, intravenously and intrasternally. The material used was an acid hydrolysate of casein with 1 per cent tryptophane added for parenteral use and an enzymatic hydrolysate for oral use. It is a 15 per cent solution containing 21 per cent nitrogen and was prepared by Sahyun.

For intravenous administration the amino acid solution may be diluted in two or three parts of isotonic solution of sodium chloride or in 5 or 10 per cent dextrose. The rate may be as rapid as 200 cc. of the amino acid solution an hour although this is influenced by the rate at which the diluent—for example, 10 per cent dextrose—can be given. In general, the rate is determined by the response of the patient. Should such symptoms as headache, flushing, dizziness or nausea arise, they may be abated by reduction of the rate of administration.

Amino acid solutions used in this study were furnished by Frederick Stearns & Co., Detroit.

From William J. Seymour Hospital, Eloise, Mich., and Wayne University College of Medicine, Detroit.

Read before the Section on Experimental Medicine and Therapeutics at the Ninety-Third Annual Session of the American Medical Association, Atlantic City, N. J., June 10, 1942.

<sup>1</sup> Altshuler, S. S., Hensel, H. M., and Sahyun, Melville. *Am. J. M. Sc.* **200**: 239 (Aug.) 1940. Elman, Robert, and Weiner, D. C. *Intravenous Alimentation with Special Reference to Protein (Amino Acid) Metabolism*. J. A. M. A. **112**: 796 (March 4) 1939.

<sup>2</sup> Altshuler, S. S., Hensel, Hilda H., Hecht, Paul, and Purley, Richard. *Arch. Int. Med.* to be published.

Injection of amino acid solution into the bone marrow was done intrasternally with Turkel needles. The method was used on 3 patients and it was found that amino acids may be given by this route as rapidly as intravenously. The results were no different than those with the other methods, but intrasternal administration was advantageous in patients in whom access to the veins was difficult. The Turkel needles may be left in place for twenty-four hours or longer and repeated injections may be given through them.

For oral administration the amino acid solution was diluted in fruit juice or tomato juice. This method was just as effective as intravenous injection and clinically the ingestion of protein nitrogen in the form of amino acids gave a better result than did a high protein diet.

## USE OF AMINO ACIDS IN SURGICAL CASES

In operative conditions such as gastric surgery in which the patient can take nothing by mouth for considerable periods before or after operation, it is possible to maintain adequate nutrition by the parenteral administration of amino acid solution and 10 per cent dextrose. Three such cases are included in the present series.

**CASE 1**—A man aged 70 after a posterior gastrojejunostomy was given intravenously 400 cc. (60 Gm.) of amino acid solution in 3,000 cc. of 10 per cent dextrose daily for five days. On the sixth day and daily thereafter he was given 200 cc. (30 Gm.) of amino acid solution in tomato juice plus a varying amount of protein in a soft diet. This continued until a gastric resection was performed one month after the first operation. Then postoperatively daily for the first three days the patient was given 200 cc. (30 Gm.) of amino acids in 3,000 cc. of 10 per cent dextrose. The patient made an uneventful recovery. Blood protein levels were maintained throughout.

**CASE 2**—A man aged 58 at operation was found to have a large carcinoma of the stomach with extensive metastases to the liver and omentum. Preoperatively daily for five days he received 400 cc. (60 Gm.) of amino acid solution in 5 per cent dextrose. Postoperatively he was given 400 cc. intravenously daily for seven days and then 400 cc. intravenously and 200 cc. orally for twelve days. The patient died three weeks after operation. The blood protein levels were 66 Gm. per hundred cubic centimeters before operation, 47 Gm. per hundred cubic centimeters on the eighth day after operation and 61 Gm. per hundred cubic centimeters four days before death. The addition of the oral amino acids after the seventh day helped raise the blood protein level, but it did not reach normal.

**CASE 3**—A man aged 26 was admitted with a diagnosis of acute appendicitis and was operated on the same day. He was found to have an acute ruptured appendix with diffuse peritonitis. He received 400 cc. of amino acid solution in 3,000 cc. of 10 per cent dextrose daily for the first six days. During this time he took nothing by mouth. For the next six days amino acid solution was given orally in fruit juice with a soft diet. The blood protein levels were 6 Gm. per hundred cubic centimeters on the first postoperative day, 61 Gm. per

hundred cubic centimeters on the seventh day and 67 Gm per hundred cubic centimeters on the fifteenth day. The patient made an excellent recovery.

During periods when these patients were taking nothing by mouth it was found to be most important that sufficient dextrose be given to supply the necessary



Fig. 1—Varicose ulcer of five months' duration

calories. Otherwise the amino acids would be utilized for energy instead of for tissue repair.

The second group consists of 7 cases of nonhealing postoperative wounds.

CASE 4—A man aged 55 was operated on at another hospital for a ruptured gangrenous appendix and the incision became infected. On admission a secondary closure was performed. Four days later the wound was not healing and the peritoneum was visible. Intravenous administration of amino acid solution was begun and continued daily for eight days. Decided improvement was observed after four days of this treatment. Beginning with the ninth day amino acids were given orally for six days. The wound continued to heal and the patient made a good recovery.

CASE 5—A man aged 49 was operated on for umbilical and bilateral inguinal hernias. A separation of the umbilical and right inguinal incisions ensued which were then reoperated on. Eight days later the wounds disrupted. Intravenous administration of amino acid solution was begun and continued for five days after which the solution was given orally for eight days. A month later oral administration was resumed in preparation for a secondary closure, which was performed. Amino acid therapy was continued for five days. The following month the patient was discharged with wounds well healed.

CASES 6 AND 7—Two men with carcinoma of the penis had amputations performed and the wounds were healing very slowly for five weeks. One patient had a urethral transplant made beneath the scrotum. After the operation the margin of the transplant did not heal. Each patient was given daily 200 cc of amino acid solution orally for nineteen days. In

the case in which the transplant was made the wound healed, the patient gained 2½ pounds (1,134 Gm) and he was discharged feeling well. In the other case the wound healed satisfactorily.

CASE 8—A man aged 79 had a perineal prostatectomy which was healing very slowly, and a fecal fistula developed. A month after operation daily oral administration of 200 cc of amino acid solution was begun. An improvement was noted in the patient's general condition, and the wound healed more rapidly. The fistula was allowed to heal until a sinus tract developed. Two months later the sinus tract was resected and the wound healed well. In the two months preceding the second operation the patient gained 31 pounds (14 Kg).

CASES 9 AND 10—Two patients had sinuses following drainage of perinephritic abscesses. One patient had been operated on a month before amino acid therapy was begun. The other patient had been operated on five months before, the wound had healed and then ruptured to the surface over the flank about a month before. Daily oral administration of 200 cc of amino acid solution was started and in four weeks the sinuses of both patients were completely closed.

#### NONHEALING ULCERS

Ten nonhealing ulcers were studied. 2 of them in diabetic patients.

CASES 11, 12, 13 AND 14—Four patients had varicose ulcers of the legs of from seven months to two years' duration, one ulcer having recurred periodically for thirteen years. These patients were given daily 300 cc of amino acid solution orally for four weeks, by which time all the ulcers showed definite improvement (figs 1 and 2). One patient left the hospital and did not report to the clinic for his amino acid solution. Three weeks later a definite increase in the size of his ulcer was observed.



Fig. 2—Same ulcer shown in figure 1 after two months' treatment with amino acid solution.

CASE 15—A woman aged 64 had a decubitus ulcer of the leg due to pressure of a cast. Eleven months after removal of the cast the ulcer had not yet healed. She was given 300 cc of amino acid solution daily for three weeks, by which time there was definite evidence of healing.

CASE 16—A man aged 62 had a decubitus ulcer on the leg after removal of a cast. The condition had endured for six

months and the ulcer was spreading. Daily oral administration of 300 cc of amino acid solution was begun and after five weeks the ulcer showed definite improvement.

**CASE 17**—A woman aged 46 has a decubitus ulcer of the back of three years' duration. She has the tremor and facies of Parkinson's disease and has not walked for three years. Lying on her back has subjected the sacrum, knees and heels to constant pressure, which resulted in a large infected ulcer over the sacrum. Her daily temperature rises are to as high as 102 F. Oral administration of 300 cc of amino acid solution was begun and has been continued daily. The patient showed improvement for five weeks, but during the past week the ulcer has become larger and her general condition is poor.

**CASE 18**—A man aged 36, following gunshot wounds fourteen years ago, developed chronic osteomyelitis of the left ankle with ulcer. X-ray examination revealed rarefaction of the external malleolus. Two skin grafts were tried unsuccessfully. Amino acid therapy was given for three months, during which time the ulcer improved. When administration of amino acids was discontinued, however, the ulcer increased in size (figs 3, 4 and 5).

**CASES 19 and 20**—Two diabetic patients, a man and a woman aged 60 and 62 respectively, had ulcers of the feet, both had previously undergone amputation of the other extremity above

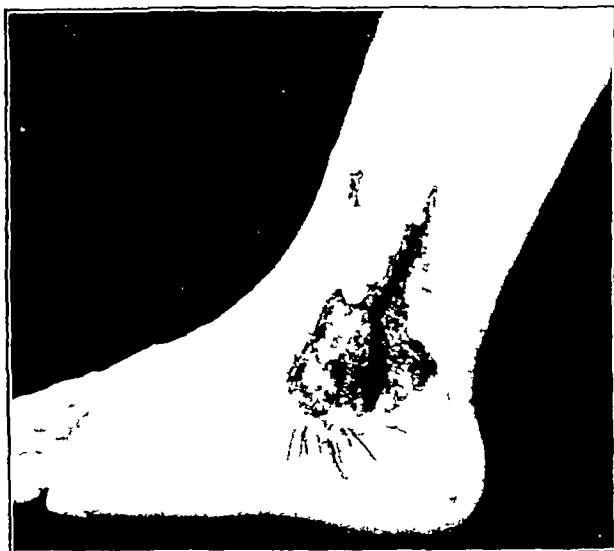


Fig 3 (case 18)—Draining ulcer recurring intermittently for thirteen years following gunshot wound.

the knee. The man had an ulcer on the lateral side of the foot of nine weeks' duration. The infection had been well cleaned but no healing was taking place. He was given 200 cc of amino acid solution daily by mouth and in three weeks was able to return to his work as a timekeeper. The woman had an ulcer of the big toe in which healing was imperceptible, although it had been clear of infection for about five months. After four weeks of daily oral administration of 200 cc of amino acid solution the ulcer was practically all filled in.

#### BURNS

Three cases of burns—2 of them extensive—were treated.

**CASE 21**—A man aged 52 had an infected third degree burn on the dorsum of the right foot with lymphangitis and lymphadenitis, and also first and second degree burns on the left leg. For six weeks healing had been very slow. Oral administration of 400 cc of amino acid solution was begun and continued daily for twenty-three days. The patient was discharged three weeks later with the burns nearly all healed.

**CASE 22**—A man aged 37 for seven months had been treated for first, second and third degree burns involving the left upper arm, shoulder, upper half of the trunk and left thigh. He had a daily rise of temperature ranging from 102 to 104 F. The wounds were healing very slowly; they were tender and the

patient seemed quite toxic. Administration of 100 cc of amino acid solution intravenously was started and continued daily for seventeen days. After this amino acid solution was given orally for three months, starting with 100 cc daily and gradually increasing to 400 cc daily. The patient improved rapidly, tenderness of the wounds disappeared and the burns healed very well (figs 6 and 7). The blood protein remained at normal values throughout.

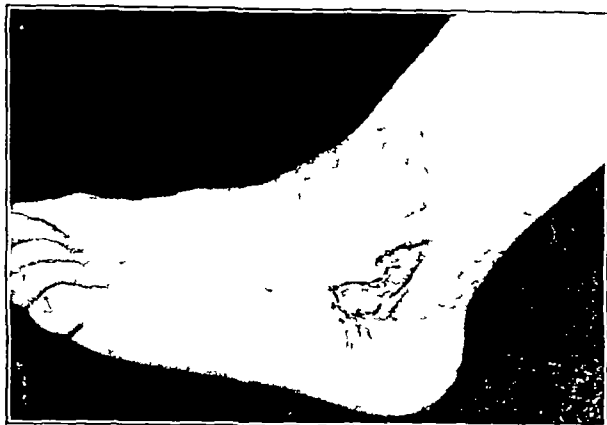


Fig 4 (case 18)—Same ulcer after three months' treatment with amino acids.

**CASE 23**—A woman aged 27 had extensive burns on both upper and lower extremities, neck and part of the chest. She had been treated at another hospital and skin grafts had been tried unsuccessfully. She was given 300 cc of amino acid solution daily by mouth. The burns were healing fairly well but renal insufficiency developed and the patient died of uremia.

#### GASTROINTESTINAL CONDITIONS

Two patients had gastrointestinal conditions.

**CASE 24**—A man aged 75 had diverticulosis of the colon and duodenum with bleeding, macrocytic hyperchromic anemia and



Fig 5 (case 18)—Appearance of ulcer after amino acid had been continued for one month.

possible cirrhosis of the liver. He received a high protein diet and 200 cc of amino acid solution by mouth daily for three weeks. On admission liver function tests revealed impairment but later they were normal. On admission, laboratory findings were hemoglobin 11.5 Gm and red blood cells 2,940,000; after treatment they were hemoglobin 13 Gm and red blood cells

4,010,000. The blood protein level before treatment was 5.3 Gm per hundred cubic centimeters and after treatment 7.6 Gm per hundred cubic centimeters. The patient was discharged much improved.

CASE 25—A man aged 28 complained on admission of diarrhea with ten to twelve stools a day. The condition had



Fig. 6 (case 22). Burn of seven months duration.

persisted for about a year. He was given 200 cc of amino acid solution by mouth daily for thirteen days and was discharged much improved.

#### MUSCULAR DYSTROPHIES

Four patients were seen with muscular dystrophies.

CASE 26—A woman aged 48 with amyotrophic lateral sclerosis was not able to sit up at the time of admission. She was daily given 200 cc of amino acid solution orally for 1 month, then 100 cc orally for twelve days and since that time 200 cc daily. She is now able to be out of bed to walk and to help herself. The fibrillations are less pronounced.

CASE 27—A man aged 34 has had amyotrophic lateral sclerosis since 1938 with progressive disability. On admission he was completely bedridden and unable to care for himself, since he could not lift his arms. He had definite dysarthria and dysphagia and very coarse, ubiquitous fibrillations. He could scarcely be understood when he spoke. He was treated with prostigmine, potassium chloride and vitamin C none of which had any noticeable effect. He was given 200 cc of amino acid solution intravenously daily for a month after which administration was changed to oral. His condition improved to the point at which he was able to make himself understood, feed himself, smoke and tend to his personal needs. He is not able to walk but he can sit up without support. Fibrillations still persist but atrophy has not progressed. When administration of amino acid solution was discontinued his condition rapidly reverted to the former state. He was again given intravenous amino acid solution daily with decided improvement.

CASE 28—A man aged 52 had his condition diagnosed as amyotrophic lateral sclerosis three years ago, and since that time his course was downhill. He was given 200 cc of amino acid solution intravenously daily for three weeks, after which the administration was changed to oral. The patient shows definite improvement and has maintained his weight.

CASE 29—A man aged 52 had myotonia atrophica and diabetes. He was unable to take care of his own needs or even to turn over in bed without assistance. He was given 200 cc of oral amino acid solution daily for two weeks and the amount was then increased to 300 cc a day. The patient now can eat alone, take care of his personal needs and sit in a wheel chair.

#### BLOOD STUDIES

Plasma protein levels were determined on every patient receiving amino acid solution. It was found that the plasma protein level can be elevated or maintained at normal with the administration of amino acid solution providing there are enough calories furnished by the diet or in the form of dextrose. Otherwise the amino acids will be utilized for energy rather than for plasma or tissue regeneration. There is clinical and experimental evidence that amino acids as the sole source of nitrogen can regenerate plasma protein and can promote growth.<sup>3</sup>

The plasma protein levels did not always agree with the clinical results. Several patients who showed very

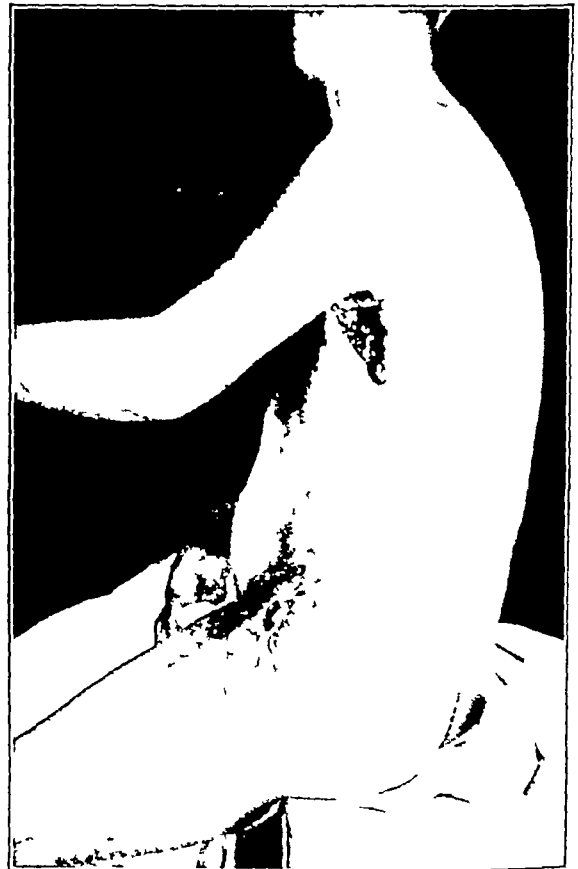


Fig. 7 (case 22).—Same burns after five months treatment with amino acids.

fine clinical improvement did not have a corresponding rise in the plasma protein levels. This may be due to the influence on plasma protein levels of other factors.

<sup>3</sup> Clark, D. E., Brunswick, Alexander and Corbin, Nancy. *Proc. Soc. Exper. Biol. & Med.* **49**: 282 (Feb.) 1942.  
<sup>4</sup> Horvitz, Abraham, Sachar, L. A. and Elman, Robert. *Proc. Soc. Exper. Biol. & Med.* **49**: 118 (Feb.) 1942.



such as infection, the state of hydration or the amount of protein reserve in the tissues<sup>5</sup>

The effect of the parenteral administration of the solution on the blood amino acid levels was also studied. Two male patients were given a diet containing 90 Gm of protein, and the blood amino acids levels were determined by Sahyun's method<sup>6</sup> before breakfast and at intervals after meals. The levels were found to be con-

Blood Amino Acid Levels

	N/g /100 Cc
Fasting	10.2
½ hour	10.5
1 hour	10.6
1½ hours	10.9
2½ hours	10.4
3½ hours	10.0
4½ hours	9.9
5½ hours	9.9
6½ hours	9.8

stant. During the experimental period a fasting level was determined before breakfast, and immediately after breakfast administration of 200 cc of amino acid solution in 600 cc of saline solution was begun. This took an hour and a half. Blood amino acid levels were determined half an hour after administration had been completed and at intervals thereafter for six and a half hours and are given in the accompanying table.

The small accumulation of amino acids in the blood following parenteral administration of the solution indicates rapid utilization. These results were similar to Sahyun's findings on rabbits.<sup>7</sup>

#### COMMENT

The significance of protein to the body has been universally recognized by chemists, physiologists and physicians. However, until recently nothing could be done to supply this essential to persons who were unable to take an adequate amount of protein by mouth. The ability to furnish protein to the body parenterally by the use of amino acids is a real advance in the field of nutrition.

In operative cases the assurance of an adequate supply of protein is most important, first, to protect the liver from possible toxic effects of anesthesia, second, to prevent tissue edema, which interferes with healing of the wound, and third, to supply the essential nutrients required for tissue repair and regeneration.<sup>8</sup>

In the nonhealing ulcers and burns there was improvement in most cases after amino acid solution was given. The amino acids were not supplemented with vitamins because of the difficulty which would then arise in interpreting the results. For practical therapeutics, however, vitamins C and D should be used in conjunction with the amino acids to treat poorly healing wounds, ulcers and burns.

The clinical improvement of the patients with muscular dystrophies was quite striking. Problems still to be solved are how the amino acids produce this effect and why a relapse occurs when the amino acid therapy is discontinued.

#### CONCLUSIONS

1 Solutions of amino acids were used as the only source of nitrogen during preoperative and postoperative periods.

2 Poorly healing postoperative wounds, ulcers and burns were stimulated to more rapid healing by the use of amino acids.

3 The disabling symptoms of muscular dystrophies were abated during the time that the patients were receiving amino acid solution.

4 Solutions of amino acids were found to be equally effective when administered orally, intravenously or into the bone marrow. The latter method done intrasternally offers an excellent way of achieving parenteral injection when the veins are inaccessible.

#### ABSTRACT OF DISCUSSION

MEVILLE SAHYUN, PH.D., Detroit. We have been studying amino acids since 1937. Nutritionally amino acids are divided into two groups: (1) nonessential and (2) essential or indispensable. The latter consists of aliphatic amino acids (leucine, isoleucine, valine, methionine, threonine), basic amino acids (histidine, lysine, arginine) and aromatic amino acids (phenylalanine, tryptophan). While our knowledge of the indispensability of these amino acids is based on studies on animals, nevertheless we believe they are important and indispensable since the human system probably cannot synthesize them. One or more of these amino acids enters into the composition of different types of proteins. As an example, in insulin protein, the amino acid constituents of which are known, we find that it contains of the essential group leucine, histidine, arginine, lysine and phenylalanine. Casein of milk contains all the indispensable ones. The good clinical results reported in this article may be attributable in part to the presence of essential amino acids in the preparation administered to the patients. It is possible that under certain conditions we may not be able to make available from the proteins of the diet, some essential amino acids required by the various organs of the body. As an illustration, a molecule of protein may be likened to a table or a chair and the parts of each to amino acids. A carpenter equipped with proper tools (enzymes of the body) can convert a table to a chair, provided he has all the essential parts, or in a simpler way can build a chair or a table from prefabricated parts—amino acids.

DR. HARRY KOSTER, Brooklyn. I thought it might be interesting to add experiences with 25 cases in which nitrogen excretion was studied preoperatively and postoperatively. The patients were starved for three days before operation. The urine was collected and the total nitrogen was estimated. Then operation was performed. They received nothing for five or six days subsequent to the operation except dextrose and 120 Gm of amino acids administered intravenously daily. The total urine was estimated subsequently for total nitrogen and we found that it was possible to keep these patients in nitrogenous equilibrium. It seems to me that that is the important contribution that can be made at the present time. From a clinical standpoint one should be cautious about this sort of treatment. While, on an a priori basis, it might be considered that the supply of amino acids intravenously would be a beneficial thing, I don't think there is enough evidence to warrant any great enthusiasm. The important thing is that it is possible to keep a patient in nitrogenous equilibrium without providing transportation of the amino acids through the mucous membrane.

DR. SAMUEL S. ALTSHULER, Detroit. The cases which were presented are merely examples of early observations and I feel that we should study more cases over longer periods of time. There are many other possible uses of amino acids yet to be investigated. By giving proteins intravenously, deamination in the liver and absorption in the intestinal tract are eliminated. This may be the explanation of why administration of amino acids gives better clinical evidence of protein utilization than does ingestion of a high protein diet. However, this is among the problems yet to be worked out.

<sup>5</sup> Whipple, G. H. *Am. J. M. Sc.* **203**: 477 (April) 1942.

<sup>6</sup> Sahyun, Melville. *J. Lab. Clin. Med.* **24**: 548 (Feb.) 1939.

<sup>7</sup> Sahyun, Melville. *Proc. Soc. Exper. Biol. & Med.* **48**: 14 (Oct.) 1941.

<sup>8</sup> Ravdin, I. S. *Surgery* **8**: 204 (Aug.) 1940. *Ann. Surg.* **112**: 576 (Oct.) 1940. Whipple, A. O. *Ann. Surg.* **112**: 481 (Oct.) 1940.

## CUTANEOUS CHANGES IN THE SPRUE SYNDROME

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The sprue syndrome has become familiar to physicians everywhere through the large literature<sup>1</sup> which has accumulated since its original descriptions by Hilary in 1759 and independently by Manson and by Van der Burg in 1880. While sprue is common in certain tropical countries which accounts for the designation 'tropical sprue,' recent publications by American and European authors have emphasized the importance of sprue as a widespread and frequently unrecognized disease of the temperate zone. From the many conflicting opinions of the past two fundamental concepts regarding the nature of sprue have emerged: (1) that celiac disease in children, tropical sprue and nontropical sprue are variations of a single disease complex, the sprue syndrome<sup>2</sup> and (2) that sprue is a disease often due to nutritional deficiency.<sup>3</sup>

Lesions of the tongue and oral mucous membranes in sprue have been well described and are regarded as of great diagnostic and prognostic importance by clinicians who have had wide experience with this disease. On the other hand, the often striking cutaneous changes have aroused relatively little attention, possibly because the widespread systemic disturbance overshadows the alterations in the skin. While resemblance is often superficial and confusion is usually eliminated by careful consideration of accessory data, the cutaneous changes in the sprue syndrome are to be differentiated from such pigmentary disorders of the skin as hemochromatosis, acanthosis nigricans, Addison's disease, asenical pigmentation, xeroderma pigmentosa, chlorasma and lentigo.

### GENERAL CONSIDERATIONS<sup>4</sup>

Sprue is a chronic disease the clinical picture of which varies with its duration and with its characteristic remissions. The insidious onset of sprue symptoms is usually preceded by a long period of dietary imbalance consisting in a deficiency of proteins and an excess of carbohydrates and fats. Gradually there is progressive weakness, asthenia, irritability, mental depression, weight loss with muscular wasting and loss of the subcutaneous fat, abdominal discomfort, diarrhea with the passage of numerous grayish, bulky, frothy, fatty, foul smelling soft or liquid stools, anemia, glossitis and stomatitis and in many cases hyperpigmentation of the skin.

Early in the course of sprue the anemia may be of the hypochromic microcytic type gradually becoming a hyperchromic microcytic anemia indistinguishable from pernicious anemia. In contrast to pernicious anemia the stomach contains free hydrochloric acid in the majority of cases, a finding which is often of great

differential value. Paresthesias occur in some patients, although posterolateral sclerosis such as is seen in pernicious anemia is rare. Children with celiac disease show a hypochromic microcytic anemia.

The serum calcium and phosphorus are frequently low. Tetany and osteoporosis are seen in adult sprue while in celiac disease there are rachitic changes, dwarfism and tetany.

Thaysen<sup>5</sup> has described a low blood sugar curve in sprue patients following ingestion of 1.5 Gm. of dextrose per kilogram of body weight. This test is useful in differentiating sprue from other conditions with which it may be most easily confused.

The pathologic changes in sprue are not impressive.<sup>6</sup> The fatty tissue of the body is depleted and there is atrophy and sometimes ulceration of the mucosa of the digestive tract.

Sprue responds dramatically to oral and intramuscular liver extract if treatment is not so long delayed that irreversible changes occur. The appetite returns, diarrhea ceases, the lingual papillae regenerate, and the patient gains weight and strength. There is a rise in reticulocytes in the circulating blood and with the assistance of iron a normal blood picture is established.

### LESIONS OF THE MOUTH AND TONGUE

Lesions of the oral mucous membranes are found in the majority of sprue patients. It has been suggested by Manson<sup>7</sup> that these mucosal changes reflect similar alterations in the entire digestive tract. Of the 34 cases of sprue collected by Thaysen<sup>5</sup> there was stomatitis in 26. From a study of 92 patients 77 of whom had symptoms related to the tongue, Castle and his co-workers<sup>8</sup> concluded that a diagnosis of sprue is almost impossible in the absence of glossitis and digestive disturbances.

According to Thaysen<sup>5</sup> stomatitis occasionally is a presenting symptom but usually appears after the onset of diarrhea. He found stomatitis localized principally on the tongue manifested by swelling and redness of the individual papillae in a limited area at the tip of the tongue or on the lateral margins. Often there was burning and smarting of the tongue and troublesome salivation. The intensity of symptoms varied greatly and was apparently unrelated to remissions and exacerbations of the disease.

In Thaysen's cases the formation of aphthae was rare. When it occurred it was most often on the lateral edges of the tongue, less frequently on the inferior surface of the tongue and buccal surface of the lips. Manson, Bahr and Willoughby,<sup>9</sup> however, found small aphthae on the buccal mucosa and tongue in 45 or 22.5 per cent of 200 cases and Low<sup>10</sup> described aphthae in 101 or 67 per cent of 150 cases.

Bahr<sup>10</sup> has described the sequence of events taking place in the tongue. The sides and tip of the tongue were first involved with inflammation and swelling of the fungiform papillae. Minute ulcers appeared which after healing left areas in which papillae were absent.

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Read before the Section on Dermatology and Syphilology at the Ninety-Third Annual Session of the American Medical Association, Atlantic City, N. J., June 10, 1942.

<sup>1</sup> Hayes, F. M., *Ashford's Bibliography of Sprue*, Puerto Rico J. Pub. Health & Trop. Med. 13: 427 (June) 1938.

<sup>2</sup> Thaysen<sup>5</sup>, Hayes and McBride.<sup>3</sup>

<sup>3</sup> Castle, W. B., Rhoads, C. P., Lawson, H. A. and Payne, J. C., *Etiology and Treatment of Sprue*, Arch. Int. Med. 56: 627 (Oct.) 1935.

<sup>4</sup> Hayes, F. M., *Monograph on Sprue*, in Christian, H. A., *Oxford Medicine*, New York, Oxford University Press, 1939, vol. 5, p. 631.

<sup>5</sup> Thaysen, T. I. H., *Nontropical Sprue: A Study in Idiopathic Steatorrhea*, Copenhagen, Levin & Munksgaard, 1932.

<sup>6</sup> Mackie, I. P. and Farley, N. H., *Pathology and Morbid Anatomy of Sprue*, Indian J. Med. Research 16: 799 (Jan.) 1929.

<sup>7</sup> Manson, Patrick, *Sprue in Allbutt, Clifford and Rolleston*, H. D., *A System of Medicine*, New York, Macmillan Company, 1907, vol. 2, p. 515.

<sup>8</sup> Manson, Bahr, Patrick and Willoughby, Hugh, *Studies on Sprue with Special Reference to Treatment Based on Analysis of Two Hundred Cases*, Quart. J. Med. 27: 411 (July) 1930.

<sup>9</sup> Low, G. C., *Sprue: An Analytical Study of 150 Cases*, Quart. J. Med. 21: 523 (July) 1928.

<sup>10</sup> Bahr, P. H., *A Report on Researches on Sprue in Ceylon*, 1912, 1914, London, Cambridge University Press, 1915.

The filiform papillae disappeared, and fungiform papillae became visible as prominent red spots. In 2 cases observed by these authors, hemorrhages occurred in the corium of the fungiform papillae, forming hemorrhagic vesicles. Finally the fungiform papillae were destroyed. Longitudinal and transverse fissures appeared, and fissuring occurred at the corners of the mouth. Post-

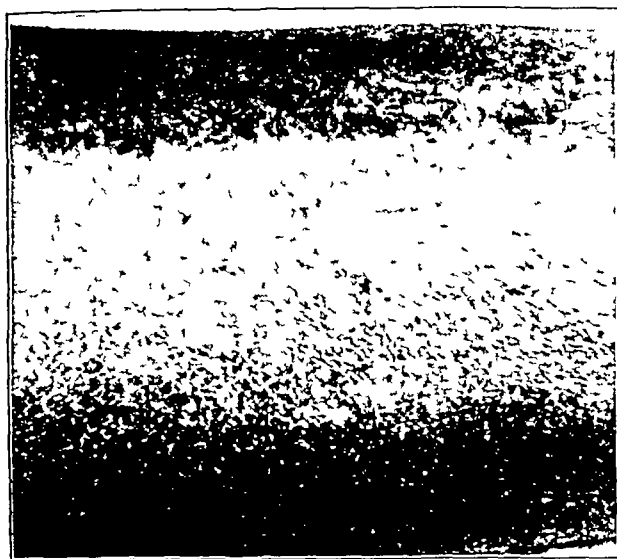


Fig 1—Right anterior tibial region showing rough dry hyperpigmented skin with more deeply pigmented macular lesions

mortem microscopic examinations of two sprue tongues showed atrophy of the lingual papillae with only the bases of the fungiform papillae remaining. There was denudation of the surface epithelium and invasion of yeast cells. Mackie and Fairley,<sup>6</sup> however, found no penetration of the mucosa of the tongue with the hyphae of monilia.

#### CUTANEOUS CHANGES

It would appear from the literature that alteration of the skin in sprue occurs in a high percentage of cases. This aspect of the disease has received but scant attention.

Bahr<sup>10</sup> described a dark brown, irregular, patchy pigmentation resembling exaggerated freckles, distributed to the forehead, cheeks, abdomen, anterior thighs, legs and scapulas.

According to Thaysen<sup>12</sup> the skin in sprue is pale, grayish yellow or yellow brown but not icteric, dry, without turgor and slightly scaly. Cutaneous pigmentation was noted in 12 of his 34 cases. In 5 cases there were diffuse, scattered brown patches. Two cases resembling chloasma, with pigmentation localized to the face. In 2 cases pigmentation was localized on the abdomen. In 1 case pigmentation was so deep that the case resembled Addison's disease. One patient had dark brown spots, 2 cm in diameter, scattered over the entire body. Three severely anemic patients had petechiae. Brittle, frayed nails in 2 cases, and edema of the skin were also mentioned by this author.

Skin lesions were noted in 7 of 15 cases reported by Bennett, Hunter and Vaughan.<sup>11</sup> The eruption in several cases was confused with psoriasis, pustular dermatitis and eczematoid dermatitis. In 1 case there were

large moist, red abraded areas 2 to 8 cm in diameter with scaly, brown pigmented borders which resembled pellagra and cleared up after three weeks' treatment with brewers' yeast. In this case the skin lesions were so severe as to be the presenting symptom.

Snell<sup>12</sup> has commented on the resemblance of the hyperpigmentation of sprue to pellagra and acanthosis nigricans. Only 10 of 32 cases studied showed no pigmentation. In the remaining 22 cases there were pigmentary eruptions of varying degree. Petechiae were noted in 2 cases. In 2 cases there was eruption resembling pellagra. Diffuse melanosis was present in 1 case. Urticaria occurred in 1 case. Lackluster hair, brittle nails and clubbed fingers were common.

Thaysen,<sup>12</sup> in a series of 10 cases of sprue, described 7 in which symmetrical hyperpigmented patches occurred on the forehead and the nose and below the eyes. In several of these cases pigmented patches were present on the cheeks, and pigmented streaks from the angle of the jaw to the cheeks. Distribution of the eruption in 2 cases was so characteristic as to suggest the diagnosis.

A diagnosis of sprue was made in 6 cases studied in the medical service of the University of Virginia Hospital between 1927 and 1940. The records of these cases were reviewed.

Glossitis was noted in 5. In 2 no pigmentary changes in the skin were described. Four cases showed decided cutaneous changes characterized by melasticity, dryness and scaling of the skin. In 1 a patchy brownish, pigmentary eruption was present on the extensor surfaces of the arms, legs and dorsum of the hands. One case showed universal yellowish pigmentation with hyper-

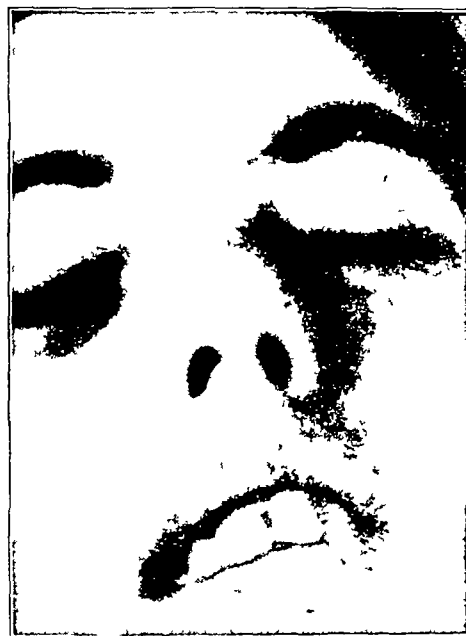


Fig 2—Face showing chloasma like eruption

pigmented patches on the dorsum of the hands. One case showed generalized yellowish pigmentation. The case reported displayed universal pigmentation with superimposed localized hyperpigmentation.

11 Bennett T I, Hunter Donald and Vaughan Janet M. Idiopathic Steatorrhea (Gee's Disease). A Nutritional Disturbance Associated with Tetany, Osteomalacia and Anemia. *Quart J Med* 1: 603 (Oct) 1932.

12 Snell A M. Clinical Observations on Nontropical Sprue. *South M J* 28: 516 (June) 1935. Tropical and Nontropical Sprue (Chronic Idiopathic Steatorrhea). Their Probable Interrelationship. *Ann Int Med* 12: 1632 (April) 1939.  
13 Thaysen T E H. Ten Cases of Idiopathic Steatorrhea. *Quart J Med* 4: 359 (Oct) 1931.

Autopsies were performed on 2 of the 3 patients who died. No significant changes were noted in the adrenals of these patients. 1 of whom had pigmentary changes, in the other no cutaneous changes were described.

While 6 cases do not represent a large experience consideration of the clinical and histopathologic studies in 1 case has afforded an opportunity to form certain conclusions regarding the nature of the cutaneous changes in sprue.

#### REPORT OF CASE

A white married woman aged 26 was admitted to the medical service of the University of Virginia Hospital on Oct. 26, 1940 complaining of weakness and of numbness and tingling in the arms and legs of two and one half years duration. Weakness and fatigability increased accompanied by pallor of the skin and severe transitory pains in the lower legs. These symptoms progressed with occasional remissions and exacerbations until April 1939, at which time she began to experience severe precordial pain, with exertional dyspnea and palpitation requiring bed rest. In April 1940 the patient had a rapid onset of persistent diarrhea accompanied by abdominal dis-

The cervical lymph nodes were palpable. The lungs were normal. There was a soft murmur following the first heart sound, heard best in the third left interspace. Rhythm, size, shape and position of the heart were normal. The tip of the spleen was palpable. The deep reflexes of the knees and ankles were hyperactive. Neurologic examination was otherwise normal.

The hemoglobin was 5 Gm per hundred cubic centimeters (Haden), red blood cells 1,620,000, white blood cells 6,400 with 61 per cent polymorphonuclears, 2 per cent eosinophils, 28 per cent small lymphocytes, 3 per cent large lymphocytes and 6 per cent monocytes. Reticulocytes were 9.4 per cent. The color index was 1.08. The volume index was 12, hematocrit 16. The average cell size was 8 microns. There were numerous macrocytes in the stained blood smear. The blood Wassermann and Kahn reactions were normal. The urine was normal. Gastric analysis showed 45 degrees of free hydrochloric acid after subcutaneous injection of histamine. The icterus index was 10. Serum calcium was 10.3 mg. and phosphorus 6.4 mg. per hundred cubic centimeters. Plasma chlorides were 620 mg. per hundred cubic centimeters. The blood proteins totaled 5.8 Gm per hundred cubic centimeters. Fasting blood sugar was 100 mg. per hundred cubic centimeters. A test for dextrose tolerance (oral) showed a flat curve with a maximum rise of 92 mg. per hundred cubic centimeters after one hour. A test for adrenal insufficiency as standardized by Cutler, Power and Wilder<sup>14</sup> was well within the limits of normal with 10 mg. of chloride ion per hundred cubic centimeters of urine obtained on the specified routine. Sudan III stains on the stool showed definite increase in fat. Roentgenograms of the gallbladder and gastrointestinal tract disclosed no abnormalities.

The patient's temperature and pulse rate became normal within twenty-four hours after admission. On intramuscular and oral liver extract the reticulocytes rose to 12 per cent and the patient gained weight (5¼ pounds or 2.4 Kg.) and strength. During her stay she passed from one to four stools daily except during the period of preparation for a gastrointestinal series when she passed eight stools.

At the time of discharge, Nov. 22, 1940, the hemoglobin was 10 Gm (Haden), red blood cells 3,120,000, white blood cell 7,800, color index 1.1, volume index 13, hematocrit 35, average cell size 7.5 microns, reticulocytes 0.9 per cent. The diffuse patchy pigmentation of the face, shoulders and extremities had diminished considerably at the time of discharge. Examination one month after she left the hospital revealed a 50 per cent diminution in the intensity of the generalized pigmentation with the disappearance of many of the larger hyperpigmented patches. No further clinical observation have been possible.

#### HISTOPATHOLOGIC OBSERVATIONS

A biopsy was made on the lateral middle third of the right tibial region. The excised tissue included several deep brown macular patches with a generous portion of the less deeply pigmented surrounding skin. The lower legs were free of such varicosities and stasis dermatitis.

The following histopathologic data were based on microscopic studies of sections fixed in 10 per cent solution of formaldehyde and embedded in paraffin. The following stains and combination of stains were used: hematoxylin and eosin, Van Gieson's picric acid and fuchsin stain<sup>15</sup> for connective tissue, the prussian blue reaction (after Kyes)<sup>16</sup> for hemosiderin<sup>16</sup>, counterstained with Mallory's basic fuchsin for hemofusins<sup>17</sup> and Foot's silver technique<sup>1</sup> for melanin.

The cutaneous surface was thrown into numerous folds. There was slight loosely lamellated hyperkeratosis. The stratum granulosum was normal. Sections of the tissue stained with

14. Cutler H. H., Power M. H. and Wilder R. M. Concentration of Chloride, Sodium and Potassium in Urine and Blood. Their Diagnostic Significance in Adrenal Insufficiency. *J. A. M. A.* 111: 117 (July 9) 1938.

15. Mallory F. B. *Histological Technique*. Philadelphia: W. B. Saunders Company, 1938.

16. Bensley R. R. and Bensley S. H. *Handbook of Histological and Cytological Technique*. Chicago: University of Chicago Press, 1938.

17. Foot N. C. Useful Methods for the Routine Examination of Brain Tumors. *Am. J. Path.* 11: 245 (March) 1938.

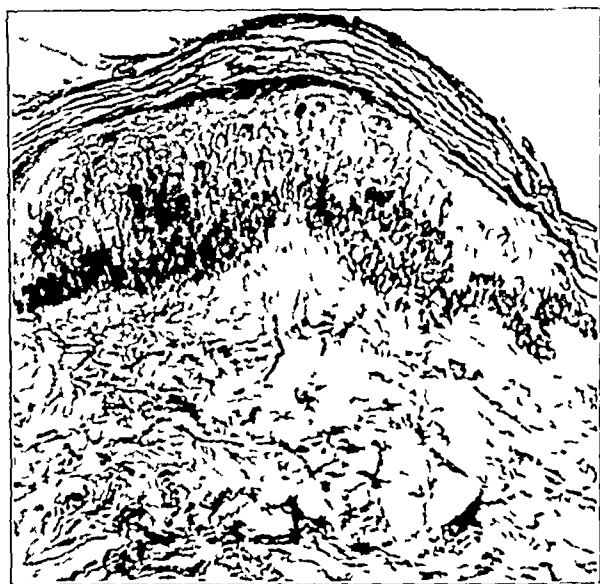


Fig. 3.—Section of skin of right lower leg, showing heavy deposit of pigment in the rete and basal cell layer. Foot's silver technique.

tention with the passage of four to eight bulky, foul smelling, soft or liquid stools daily. In June 1940 she began to experience soreness of the mouth and tongue, bleeding of the gums and painful ulcers of the mouth and tongue. At this time she noticed her skin becoming darker, with a brownish patchy eruption on the face, shoulders, arms and legs.

In spite of a good appetite and a diet containing adequate amounts of milk, eggs, fresh meat and vegetables (according to her story) she experienced a weight loss of 20 pounds (9 Kg.) during her illness.

The family marital and past histories were irrelevant.

On admission the temperature was 100.1 F., the pulse rate 100, the respiratory rate 22 and the blood pressure 90 systolic and 60 diastolic. The patient was extremely emaciated. The skin was loose, rough and dry with universal yellow brown pigmentation. There were numerous irregular discolorations and confluent patches of deep brown pigmentation varying from 0.5 cm to 5 cm in diameter symmetrically distributed to the cheeks, nose, scapular regions, extensor surfaces of the forearms and lower legs and dorsum of the hands and feet. There were confluent hyperpigmented patches on the forehead and malar regions resembling chloasma. The mucous membranes were pale. The tongue was red and slick and the fungiform and filiform papillae were absent. There was decided gingivitis.

hematoxylin and eosin showed heavy deposits of light brown, finely granular pigment in the cells of the basal layer. At intervals in the basal cell layer the pigment concentration was more intense. In these areas, collections of pigment laden rete cells extended far upward in the malpighian layer, forming a lenticle. The presence of hemosiderin (iron) was not demonstrable by the special stain. The silver stain without counterstain showed many fine pigment granules stratified longitudinally throughout the stratum corneum. The rete cells contained small numbers of fine, round or ovoid pigment granules. The lenticular collections, already described, showed heavy pigmentation. There were many fine round or ovoid pigment granules in the columnar basal cells, with concentration of pigment in the upper portion of the cell, "capping" the nucleus. A few dendritic cells, laden with pigment, were arranged between the palisade basal cells. No abnormalities were seen in the corium.

#### COMMENT

In sprue the glossitis stomatitis and fissuring at the corners of the mouth (ariboflavinosis) respond favorably to liver extract and appear to be related to a deficiency of the vitamin B complex.

The role of avitaminosis in the production of pigmentary changes requires further investigation. Anorexia, the damaged intestinal mucosa and the rapid passage of intestinal contents through the digestive tract operate to produce an extreme degree of vitamin deficiency. There is no doubt that a deficiency of the fat soluble vitamins occurs in patients with steatorrhea.<sup>18</sup> Certain components of the skin changes in sprue, such as roughness and dryness of the skin with follicular keratosis, may be due to avitaminosis A. Some observers<sup>19</sup> have suggested that the low values for serum calcium and phosphorus may be due to failure of absorption of vitamin D and to interference with vitamin D manufacture in the skin.

There has been much speculation regarding the nature of the cutaneous pigment. Since the icterus index is rarely elevated,<sup>20</sup> excessive hemolysis appears to have little if any part in the production of pigment. In the case reported the icterus index of 10 was not regarded as significant. The skin pigment does not give the reaction for iron.

Thaysen<sup>5</sup> has reviewed the literature dealing with the relationship of sprue to inadequate functioning of the adrenal cortex. Pigmentation, hypotension and adynamia, which occur so constantly in Addison's disease, are also found in a high percentage of sprue cases. In sprue these symptoms subside during remissions, and, as Thaysen has pointed out, no anatomic changes have been demonstrated that would suggest that sprue gives rise to Addison's disease. The case reported shows no abnormality of that part of the adrenal cortex involved in electrolyte metabolism.

The histopathologic features of this case, showing an increase in the melanin content of the basal cell and rete layers, support Thaysen's theory<sup>5</sup> expressed in the following quotation: "The chemical nature of the pigment is as yet quite unknown, but I find it not unreasonable to regard this pigmentation as an increase of the normal skin pigment."

Differential diagnosis of cutaneous pigmentation in sprue should offer no great difficulties.

Glossitis pigmentation and favorable response to liver extract are characteristics common to pellagra, sprue and pernicious anemia. In pellagra the body weight is usually maintained, anemia is seldom severe and the cutaneous erythema, scaling, fissuring and crusting are limited to surfaces exposed to irritation or to the sun's rays. Follicular keratoses and cheilitis due to riboflavin deficiency are frequently seen. Diarrhea and neurologic changes are usually present. The histopathologic picture in pellagra varies according to the stage of the disease. There is perivascular cellular infiltration in the corium, hyperkeratosis, parakeratosis and increased pigmentation in the basal layer and sometimes atrophy of the corium and epidermis.

The skin of pernicious anemia is diffusely icteric. Microscopic examination shows the presence of iron pigment. Achlorhydria occurs in all cases, while gastrointestinal symptoms are relatively uncommon. Combined degeneration of the spinal cord seen in 5 per cent of the patients with pernicious anemia frequently indicates the diagnosis.

The clinical and histologic features of acanthosis nigricans, Addison's disease, hemochromatosis and arsenical pigmentation have been described in detail by Montgomery and O'Leary.<sup>21</sup>

Acanthosis nigricans may be easily differentiated from sprue pigmentation by the symmetrically distributed verrucous pigmented patches which show a characteristic histopathologic picture and by the frequently associated neoplasm.

The pigmentation of Addison's disease may be indistinguishable clinically and histopathologically from sprue. Pigmentation of the mucous membranes of the mouth in patients with Addison's disease may be of differential value. The tendency of patients with Addison's disease to excrete urine containing chloride in high concentration has been found of diagnostic significance.<sup>14</sup>

In addition to the systemic changes of hemochromatosis, microscopic examination of the skin discloses deposits of hemosiderin. Arsenical pigmentation may be differentiated from sprue by the history of arsenical medication and by chemical determination of the arsenic content of the skin and urine. Microscopically, arsenical pigmentation shows hyperkeratosis and atrophy with inflammatory reaction in the papillary portion of the corium, whereas sprue, Addison's disease, chloasma and lentigo show only an increase in melanin content. Xeroderma pigmentosum, which shows pigmentation, atrophy, hyperkeratosis and formation of cutaneous carcinoma, can be easily differentiated from sprue pigmentation.

#### SUMMARY AND CONCLUSIONS

Stomatitis and glossitis with papillary atrophy are a constant feature of the sprue syndrome.

In a high percentage of cases of sprue the skin is rough, loose, dry and universally hyperpigmented, with a superimposed hyperpigmented macular eruption resembling chloasma. While variations in the intensity of the eruption are to be expected, in its fully developed form the cutaneous changes may often suggest the diagnosis.

Histopathologic alterations, consisting of excessive deposits of normal skin pigment (melanin) in the rete and basal cell layers, are not specific.

18 Albright, Fuller and Stewart, J. D. Hypovitaminosis of All Fat Soluble Vitamins Due to Steatorrhea. *New England J. Med.* **223**: 239 (Aug. 15) 1940.

19 Hanes, F. M. and McBryde, Angus. Identity of Sprue, Non-tropical Sprue and Celiac Disease. *Arch. Int. Med.* **58**: 1 (July) 1936.

20 Weiss, Charles. Recent Literature on Tropical Sprue. *Arch. Path.* **6**: 885 (Nov.) 1928. Suarez, R. M. Clinical and Hematological Review of Sprue Based on the Study of 150 Cases. *Puerto Rico J. Pub. Health & Trop. Med.* **14**: 157 (Dec.) 1948.

21 Montgomery, Hamilton and O'Leary, P. A. Pigmentation of the Skin in Addison's Disease, Acanthosis Nigricans and Hemochromatosis. *Arch. Dermat. & Syph.* **21**: 970 (June) 1930.

## ABSTRACT OF DISCUSSION

DR J LAMAR CALLAWAY, Durham, N C Drs Kaufman and Smith have thoroughly studied their series of sprue patients from an angle hitherto only casually observed. During the past five years I have observed some 10 patients with sprue, and although certain of these patients had rough, loose, dry, somewhat hyperpigmented skin I have not been impressed with anything approaching a specific cutaneous picture such as is presented for example, by pellagra. In the majority of sprue patients there is a multiple vitamin deficiency and the cutaneous lesions were many times merely a manifestation of a generalized avitaminosis and not specific for the sprue syndrome itself. A review of records of 65 patients who were studied at Duke Hospital by Dr Fred M Hanes revealed that only occasional mention of pigmentation and cutaneous changes was made other than that the skin was loose, dry and somewhat scaling; however, these records were made by the regular house staff which was not particularly cognizant of the cutaneous changes or interested in them. In several instances pigmentation suggestive of chloasma localized over the face was noted and in 1 case the skin was distinctly yellowish brown with a follicular hyperkeratosis over the body giving to the skin a rough coarse feel which was described as like that of a shark's skin. There was no actual erythema but the shins and wrists presented a pigmented appearance. Several of the cases reported by Drs Kaufman and Smith showed a yellowish pigmentation and the exact significance of this in their cases or ours is not clear. The stomatitis, glossitis and papillary atrophy appear at all times to be a constant feature of the sprue syndrome. I agree with their description of the signs and symptoms of the sprue syndrome, their interpretation of the etiologic factors responsible and their therapeutic regimen. It has been suggested that the atrophic condition of the subcutaneous tissue as a result of fat loss may be responsible in some way for the generalized cutaneous appearance of the patients. In the microscopic sections that I have reviewed the general appearance is much the same as those described by the authors. There is some hyperpigmentation, atrophy of the entire skin and appendages with a moderate round cell infiltration. I did not grasp the significance of the histologic picture but in the future I will be more observing of the clinical and histopathologic features of sprue patients.

DR HERMAN SHARLIT, New York. I will offer an explanation for hyperpigmentation under all circumstances in which it may occur, based on observations in cell metabolism in such cells as can normally produce pigment. A living cell naturally must have oxygen to survive. The oxygen that reaches the cell is chiefly acquired by the primary respiratory system, which gives us our ordinary system of cellular respiration and which we can readily measure by the manometric method. Any other system of reaction in the cell requiring oxygen takes second place to this primary system in the integral organism. However, as soon as a piece of tissue is removed from the body that tissue is moribund. It is dying and the first system which begins to show the evidence of this morbidity is the primary respiratory system. As this system loses in power loses in ability to operate at optimum other systems requiring oxygen can then operate more effectively. In other words as soon as the oxygen potential in the cell becomes reduced some other systems requiring oxygen can be more effective. One of these systems involves the production of pigment so that in metabolic experiments on skin, where an effort is made to minimize the amount of oxygen available to the cell in other words to render the oxygen potential in the cell lower, the effect is one of provoking pigment production in epidermal cells. It is possible—and we have demonstrated it in our laboratory—to provoke pigment production in biopsy skin tissue in an atmosphere of nitrogen just as effectively as in an atmosphere of oxygen, the meaning of this is that, in the laboratory procedure of accelerating pigment formation in epidermal cells, atmospheric oxygen is not necessary. In other words, while it is not an anaerobic process, the amount of oxygen that is actually required within the cell can best be utilized when the oxygen potential therein is at a minimum. I would ask those who observe pigmentation

to see whether they cannot be clinically impressed with the fact that in these cases, whatever the disease in which hyperpigmentations occur, we are dealing with partial anoxemia in the tissues. In the cases just reported in which desperation for air causes rapid respiration, the cells are operating under a state of partial anoxemia, and this status can readily explain the pigmentation in these cases, if correct, it will tend to explain most hyperpigmentation.

DR PAUL GROSS, New York. Considering the skin changes in sprue from the dermatologic point of view, one can readily see from the clinical description by the authors and the histopathologic aspects outlined by Dr Callaway that the pigmentary changes are associated with an inflammatory reaction of the skin. It was this combination which prompted Erich Hoffman (Richl) when describing the peculiar pigmentary changes observed in certain persons during the first world war. This disease was considered a nutritional disturbance, and I have in the last two years observed a patient who presented a typical picture of melanodermitis toxica. The hyperpigmentation was confined to the exposed parts, namely the dorsum of the hands, the extensor surface of forearms and the face, especially the perioral region. The patient had a macrocytic anemia but no clinical signs of intestinal sprue. She responded well to intra-muscular liver therapy but had two mild relapses a few months after liver therapy had been discontinued. It is not possible to say what deficiency is responsible for the melanosis but the disturbance of intestinal absorption in sprue apparently represents one of the mechanisms which produce these peculiar skin manifestations.

DR L. MILES STANDISH, Hartford, Conn. Apparently sprue is not uncommon in some other parts of the country. At a clinic in New York an interesting case of sprue was shown. The cause was definitely multiple avitaminosis. The woman, a Greek restaurant owner, had been eating irregularly. The case, undiagnosed for several weeks was first recognized by the extreme loss of weight and weakness. She had not only the red atrophic tongue but also the shirk skin and some pigmentation. She failed to improve on a diet and with heroic doses of vitamin B complex. Thorough blood work was done including frequent tests for fat and cholesterol. Daily fat estimations in the stool were made. Then they began to give vitamin A in large doses. They gave the amazing amounts of 5000 000 units of vitamin A obtained by a new process. They found that this was the only factor along with a much reduced fat diet that controlled the patient. She is still being followed carefully by the Rockefeller Institute and the New York Hospital group.

DR MERRIN T. R. MANNING, San Jose, Calif. In considering all these cases of intestinal and absorptive deficiencies, in which we can include celiac disease, sprue, chronic diarrheas, colitis and pernicious anemia we should consider why the patient has these symptoms. We should go into the patient's history and find out whether or not he had symptoms primarily which suggested an achlorhydria or whether his diet at that time was deficient. Sprue, one might say, is the end result of multiple vitamin deficiency and the picture as described today is one of the B complex deficiencies. One may see a dominant A deficiency factor or one may see a dominant nicotinic acid deficiency factor or a riboflavin deficiency factor but the thing that one has to treat is the patient's absorptive ability, which many times is so damaged by atrophy that he cannot absorb these things by mouth and one has to use injections. Incidentally, this patient apparently also shows a C deficiency. I think that Dr Gross will agree that the action of vitamin C and the oxidation process of cells is important in the production of pigment but riboflavin is slow in its effect, nicotinic acid is rapid. If vitamins are given by mouth and there is considerable atrophy of the mucous membrane one has to give the patient time to absorb them and then to regenerate the papillae. Finally more rapid absorption will begin until, if one is giving larger doses they absorb so fast that the effect is of overdosage. The crude liver extract is more effective by injection than is the refined liver extract and is probably a better method of

handling these cases in the early treatment rather than pushing so much medication by mouth. Later when one begins to get papillae brick on the tongue one may give the medication by mouth and discontinue the injections. The whole thing is an internal medical problem primarily. It is necessary to correct the achlorhydria that is primary, correct the dietary deficiency and finally treat effectively and not with too small doses and with full consideration of the pathologic changes found.

DR DUDLEY C SMITH, Charlottesville, Va. There are many interesting cutaneous and medical problems associated with this condition. The relationship to pernicious anemia, of course, is very close. Whether or not the hemopoietic principle in liver is the curative factor for sprue is not known. There are many other important problems and relationships to be worked out.

## INSULIN RESISTANCE DUE TO INFECTION IN DIABETES MELLITUS IN MAN

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Infection is probably the most common of the several causes for insulin resistance in diabetes mellitus in man, but the mechanism of this phenomenon is not understood. There are several theories which have been advocated to explain this resistance: (1) decrease of endogenous insulin secretion by the pancreas,<sup>1</sup> (2) decrease of effectiveness of endogenous and exogenous insulin,<sup>2</sup> (3) increase of metabolic rate,<sup>3</sup> (4) greater glycogenolysis by the liver,<sup>4</sup> (5) increase of epinephrine secretion by the adrenal,<sup>5</sup> (6) decrease of insulin kinase secreted by the liver,<sup>6</sup> (7) increase of adrenal cortex secretion,<sup>7</sup> (8) increase of secretion by the anterior lobe of the pituitary gland,<sup>8</sup> (9) increase of secretion by the thyroid gland,<sup>9</sup> (10) decrease in ability of the skeletal muscles to form glycogen<sup>8</sup> and (11) increase of inhibitory action on insulin of the blood plasma.<sup>9</sup>

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Released for publication by the War Department Manuscript Board which assumes no responsibility other than censorship for the contents of this article.

1 Williams J. L. and Dick G. F. Decreased Dextrose Tolerance in Acute Infectious Diseases. *Arch. Int. Med.* 50: 801-818 (Dec.) 1932.

2 Sweeney J. S., Barshop Nathan and LoBello L. C. Effect of Toxemia on Tolerance for Dextrose and on Action of Insulin. *Arch. Int. Med.* 53: 689-698 (May) 1934. Sweeney J. S., Barshop Nathan, LoBello L. C. and Rosenthal R. S. Effect of Toxemia on Tolerance for Dextrose and on Action of Insulin. *ibid.* 54: 381-388 (Sept.) 1934.

3 Hayward G. W. and Duncan G. G. Effect of Alteration in Metabolic Rate on Action of Insulin. *Am. J. M. Sc.* 198: 396-402 (Sept.) 1939.

4 Taubenhaus Matthew and Soskin Samuel. On the Mechanism of Insulin Resistance in Toxemic States. *J. Clin. Endocrinol.* 2: 171-175 (March) 1942.

5 Lawrence R. D. and Buckley O. B. The Inhibition of Insulin Action by Toxemia and Its Explanation. I. The Effect of Diphtheria Toxin on Blood Sugar and Insulin Action in Rabbits. *Brit. J. Exper. Path.* 8: 58-75 (Feb.) 1927. Evans, C. L. and Zeckwer I. T. Nature of Hyperglycemic Response to Injections of Certain Killed Bacteria. *ibid.* 8: 280-288 (Aug.) 1927.

6 Himsforth H. P. The Activation of Insulin. *Lancet* 2: 935-936 (Oct. 29) 1932.

7 Young F. G. Experimental Investigation on Relationship of Anterior Hypophysis to Diabetes Mellitus. *Proc. Roy. Soc. Med.* 31: 1305-1316 (Sept.) 1938. Best C. H., Campbell James and Haist R. E. Effect of Anterior Pituitary Extracts on Insulin Content of Pancreas. *J. Physiol.* 97: 200-206 (Dec.) 1939.

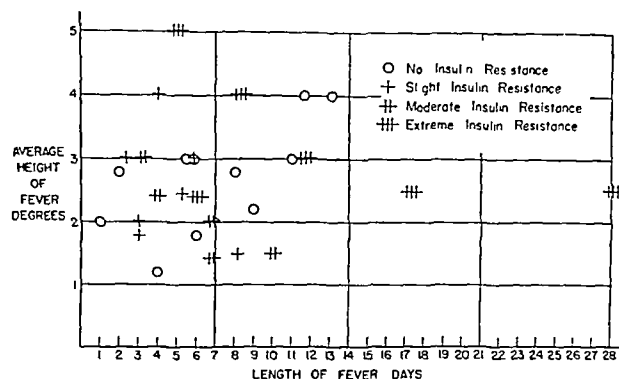
8 Wien R. The Influence of Fever on the Peripheral Action of Insulin. *Quart. J. Pharm. & Pharmacol.* 11: 177-185 (April-June) 1938.

9 Karelitz Samuel, Cohen Philip and Leader S. D. Insulin Inactivation by Human Blood Cells and Plasma in Vitro. *Arch. Int. Med.* 45: 546-554 (April) 1930.

The present investigation was undertaken in hopes that the data might be of some value in understanding this mechanism. Therefore we studied the reaction of the diabetes in controlled cases to the following conditions: (1) different types of infection or idiopathic fever, (2) injections of foreign proteins, (3) fever induced by the cabinet method, (4) repeated administration of histamine and (5) repeated administration of epinephrine. The urine of all the patients used in this study was rendered free of sugar in the hospital before the infection or fever developed or the aforementioned methods of study were instituted.

There were 24 patients who contracted an infection or an idiopathic fever while in the hospital after the diabetes had been adequately controlled. Typhoid vaccine was administered intravenously in doses of from 1 to 60 million bacteria to 14 patients. Fever was produced by the cabinet method six times in 4 patients. Histamine was administered in doses of  $\frac{1}{40}$  grain (0.0016 Gm.) subcutaneously every four hours for two days to 2 patients, and epinephrine in doses of 0.5 cc. was administered intramuscularly every four hours for two days to 2 patients.

The degree of resistance was classified as slight, moderate and severe. If the insulin had to be increased 15 units or less to control glycosuria the resistance



Absence of apparent relationship between the presence or degree of insulin resistance and the average height and duration of the fever.

was called slight, an increase of 15 to 30 units was called moderate, and an increase of 30 or more units was called severe. In some instances the insulin was not increased or it was not increased sufficiently to prevent glycosuria. In such cases a glycosuria up to 20 Gm. was considered to be a slight resistance, 20 to 50 Gm. as moderate and above 50 Gm. as severe.

### RESPONSE OF PATIENTS TO INFECTION

Of the twenty-eight observations on 24 patients who contracted infection or idiopathic fever, insulin resistance was not demonstrable in 10, whereas it was slight in 8, moderate in 4 and severe in 6. There was no apparent relation of sex, age or the duration of the diabetes to the development of insulin resistance. Mild or moderate diabetes, on the other hand, is more likely than severe diabetes to require more insulin during a toxemia, as shown in table 1. It is to be noted from table 2 that there was no relationship between the degree of fever and the degree of insulin resistance.

The greatest rise in body temperature may not be a good index of the severity of toxemia, because it may not persist for a sufficient time to alter the carbohydrate metabolism. It was for this reason that the average height of the fever and the degree of insulin resistance



were plotted with the duration of the fever. No definite relationship was observed. Two of the cases having the longest duration of fever also showed extreme increases of insulin requirement, but in one of these the insulin resistance had almost disappeared before the fever subsided. It is very common to observe insulin resistance appearing one to four days before any other evidence of infection, on the other hand, some cases do not require more insulin until several days after the infection is manifest, while in others the two appear simultaneously. In our cases the resistance developed before the fever in 2 instances, simultaneously with it in 5 and after in 9. There appears to be no relationship between the onset of insulin resistance and the onset of toxemia to the degree of alteration of insulin requirement.

The toxemia in 21 of our cases was due to infection, in 4 it was not due to infection and in 3 it was doubtful. A case of gastric hemorrhage due to a peptic ulcer presented a slight resistance and 1 with coronary occlusion a moderate resistance. All of the extremes occurred in cases of infection. Of the organisms known, streptococci were present in 5, tubercle bacilli in 1, *Escherichia coli* in 3 and pneumococci in 2. Not one of the infecting organisms showed any constant alteration of the insulin requirement. There was also no relation of the insulin sensitivity to the pathologic condition present, as shown in table 3. It is possible that the degree of toxemia is not measured accurately by the foregoing factors. It was for this reason that the mortality rate was compared with the presence and degree of insulin resistance. It is to be noted from table 4 that all of the patients showing slight insulin resistance

TABLE 1—Data Indicating That the Less Severe the Diabetes the More Likely That Extreme Insulin Resistance May Occur During Toxemia

Severity of Diabetes	Insulin Resistance			
	None	Slight	Moderate	Extreme
Mild	1	2		3
Moderate	2	2	2	2
Severe	7	4	2	1

TABLE 2—Absence of Relationship Between Height of Fever and Degree of Insulin Resistance

Degrees of Fever	Insulin Resistance			
	None	Slight	Moderate	Severe
0				
1		2		
2	4	2	1	
3	3	3	1	
4			2	1
5		1	1	1
6				1
7				1
Total	10	8	4	6

survived, death ensued in 1 case showing moderate and in 2 with no insulin resistance, whereas 4 of the 6 cases with severe resistance ended fatally. It is difficult to evaluate these 4 cases. In 1 of the 4 requiring great increases of insulin the resistance had almost disappeared before death, and in another the insulin requirement was not altered for the first twenty-three days but increased gradually during the last five days before death.

#### RESPONSE TO INTRAVENOUS ADMINISTRATION OF TYPHOID VACCINE

Of the 14 patients who received typhoid vaccine, 1 received two courses. The number of injections varied from one to ten in the different cases. In depancrea-

TABLE 3—Evidence That Insulin Resistance Is Not Related to Pathologic Condition Present

Cause of Fever	Insulin Resistance			
	None	Slight	Moderate	Severe
Arsenical dermatitis	1			
Coronary occlusion			1	
Idiopathic	1	2	1	
Gastric hemorrhage		1		
Liver abscess				1
Infected thyroidectomy wound	1			1
Leishmaniasis	1	1		
Infected amputation stump	2	1		
Miliary tuberculosis	1			
Urinary tract infection			1	1
Lung abscess				1
Erysipelas		1		
Pneumonia				1
Acute appendicitis			1	
Pharyngitis		1		
Streptococcal infection finger		1		
Cankre of toe				1
Total	10	8	4	6

TABLE 4—Data Indicating That Insulin Resistance Occurs More Frequently in Fatal Cases

Outcome of Case	Insulin Resistance			
	None	Slight	Moderate	Severe
Recovered	8	8	2	2
Death	2	0	1	4

tized dogs Greene, David and Johnston<sup>10</sup> found that it was frequently necessary to administer typhoid vaccine repeatedly in some instances to produce insulin resistance, but the development of resistance was not related to the number of injections. Insulin requirement was not altered in 3 of the patients and was increased slightly in 6, moderately in 4 and extremely in 1. There was no relationship between the presence and degree of insulin resistance and the number of injections of typhoid vaccine, as shown in table 5. The presence and degree of insulin resistance were also not related to the height of the fever as shown in table 6. An analysis of the response of each patient to each injection of typhoid vaccine revealed that slight insulin resistance developed even without the presence of fever. These data are shown in table 7. Of the 18 instances in which fever was not produced a slight increase of insulin requirement was noted in 8. In those in which fever was produced there was no alteration of insulin requirement in 13, whereas varying degrees of resistance were present in 23 instances.

#### RESPONSE TO FEVER INDUCED BY CABINET METHOD

There were six observations on 4 patients whose diabetes had been controlled adequately before fever therapy. The effect of such therapy on the development of insulin resistance is shown in table 8. Insulin resistance developed to a slight degree during two of the

10. Greene, J. A., David, Ann and Johnston, George. Production of Insulin Resistance in Depancreatized Dogs. *Am. J. Physiol.* 136: 595-599 (June) 1942.

six observations. One patient exhibited none during the first treatment but required a slight increase in insulin during the second. As in the previous groups there was no relationship between the height of the fever and the presence or degree of insulin resistance. Two of the patients had previously received typhoid vaccine, and their temperature curves were duplicated in the cabinet. It is of interest that 1 showed slight resistance following typhoid vaccine injection, but none with the fever therapy. The other patient required a severe resistance with typhoid vaccine, whereas it was only slight with fever therapy.

The insulin requirement of the 2 patients who received histamine or of the 2 who received epinephrine was not altered.

## COMMENT

A decrease of endogenous insulin secretion by the pancreas is the theory which has been most widely accepted. The work of Greene, David and Johnston<sup>10</sup> which showed that insulin resistance can be produced in depancreatized dogs makes this theory untenable.

Another theory which has been fairly widely accepted is that the increase in metabolic rate accounts for the insulin resistance during an infection. Our observations cast a good deal of doubt on this theory. The presence and the degree of insulin resistance were not

that produced by the cabinet method casts further doubt on this theory. These observations convince us that the fever is of minor significance in the production of insulin resistance. That the toxemia was more important has been suggested by Rabinowitch<sup>11</sup> and others and is supported by our observations. The term tox-

TABLE 7—Response of the Diabetics to Single Injections of Typhoid Vaccine

	Insulin Resistance			
	None	Slight	Moderate	Severe
No fever, no glycosuria	10			
No fever with glycosuria		8		
Fever without glycosuria	13			
Fever with glycosuria		1	1	1

TABLE 8—Alteration of Insulin Requirement Produced by Fever Therapy by the Cabinet Method

Degree of Fever	Insulin Resistance	
	None	Slight
4	1	
5		1
6	1	
7	2	1
Total	4	2

TABLE 5—Demonstration That Insulin Resistance Is Not Related to the Number of Typhoid Vaccine Administrations

Number of Typhoid Injections	Insulin Resistance			
	None	Slight	Moderate	Severe
1	1	1	1	
2		2	1	
3		1	1	1
4	1	1	1	
5				
6				
7	1			
8				
9				
10		1		
Total	3	6	4	1

TABLE 6—Demonstration That Insulin Requirement Is Not Related to the Height of Fever Produced by Administration of Typhoid Vaccine

Degree of Fever	Insulin Resistance			
	None	Slight	Moderate	Severe
0	1			
1			1	
2		1		
3	2	2		
4		2	3	1
5				
6		1		
Total	3	6	4	1

related to the height or duration of the fever in our cases with infection following typhoid vaccine administration or during and following fever induced by the cabinet method. In addition, some of our cases manifested slight resistance following typhoid vaccine injections without the appearance of fever, whereas, others showed none even though the body temperature rose 4 and 6 degrees. The difference in response of 2 cases to fever produced by typhoid vaccine administration and

emia, however, is vague and does not explain the mechanism of this phenomenon. Depletion of the sugar stores of the body undoubtedly plays some role in certain cases of insulin resistance, as emphasized by Greene and Swanson,<sup>12</sup> but it is not the principal factor. An increase in the secretion by the thyroid has been thought to account for a greater insulin requirement, but Greene and Swanson<sup>13</sup> have previously shown that the hyperglycemia and glycosuria in cases of hyperthyroidism without diabetes mellitus can be eradicated by a diet high in carbohydrate and can be reproduced by a diet low in carbohydrate and high in fat.

Insulin resistance has been attributed to an increase of epinephrine secretion by the adrenal gland. It is generally recognized that hyperglycemia and glycosuria frequently follow the administration of epinephrine and in cases of pheochromocytoma, hyperglycemia and glycosuria are found during an attack of paroxysmal hypertension. The administration of epinephrine every four hours for two days in 2 of our cases, however, failed to produce any evidence of insulin resistance. It is readily admitted that the dosage may have been inadequate, but subjective and objective manifestations of epinephrine effect were produced in both cases. Such evidence is against insulin resistance being due to an increased epinephrine secretion by the adrenal gland.

The fact that the dogs described by Greene, David and Johnston<sup>10</sup> developed insulin resistance coincidentally with the greatest tissue reaction in a cellulitis produced by subcutaneous administration of turpentine suggests that a histamine-like substance may be liberated by the inflamed tissue and may be a factor in the

11 Rabinowitch I. M. Influence of Infection on Reaction of Diabetics to Insulin Treatment. Report of Unusual Case. *Canad. M. A. J.* **26**: 551-554 (May) 1932.

12 Greene J. A. and Swanson L. W. The Utilization and Effect of Added Dextrose in Cases of Controlled and Uncontrolled Diabetes. *J. A. M. A.* **118**: 364-367 (Jan. 31) 1942.

13 Greene J. A. and Swanson L. W. Alteration of Glucose Tolerance in Patients with Disease of the Pituitary, Thyroid and Adrenal Glands by Changes of Diet. *Tr. A. Clin. Med.* **26**: 360-365 (Nov) 1940.

production of insulin resistance. It was for this reason that histamine in mildly toxic doses was administered frequently for two days to 2 of our patients whose diabetes was controlled. There was no increase of insulin requirement in the 2 cases. These observations are against, but do not eliminate, the possibility that some such substance is a factor in the development of insulin resistance.

The importance of glycogenolysis by the liver in insulin resistance is still a debatable question. Newburgh and Conn<sup>14</sup> have postulated that an excess of fat in the liver is a factor in the glycosuria and hyperglycemia in cases of "fat diabetes." Soskin<sup>4</sup> has suggested that there is a greater glycogenolysis by the liver in insulin resistance. That a fatty liver was not a factor in insulin resistance in depancreatized dogs was shown by Greene, David and Johnston.<sup>10</sup> Soskin has attributed the glycogenolysis to an abnormal mechanism produced by an increase of amylase. Work recently completed in Gibson's<sup>15</sup> laboratory, however, failed to show any relationship between the blood amylase and the insulin requirement. In addition, one case of mumps pancreatitis in which the blood amylase was greatly increased failed to show hyperglycemia, glycosuria or decreased sensitivity to insulin.

It is difficult to evaluate the role played by the anterior lobe of the pituitary gland in alterations of insulin sensitivity. From the work of Young<sup>7</sup> and of Best and his co-workers<sup>8</sup> the action of the pituitary is on the pancreas. The production of insulin resistance in depancreatized dogs<sup>10</sup> casts some doubt on the role played by the anterior pituitary in insulin resistance of toxemias. The roles that are played by the liver, the pituitary, the adrenals and the muscles in the production of decreased sensitivity to insulin are yet to be established.

There is much to be learned regarding the mechanism of insulin resistance which occurs during infection in diabetes mellitus. Regardless of the mechanism there are a few pertinent observations worthy of note. Insulin resistance does not develop in all cases of diabetes mellitus during an infection. It may occur during one infection and not appear during another comparable toxemia. Insulin resistance is more likely to be developed by patients with less severe diabetes than by those with more severe diabetes. As a rule, however, those patients who develop extreme insulin resistance with one infection will also develop it with subsequent infections or fevers.

#### SUMMARY

The occurrence of insulin resistance has been ascertained in patients with diabetes mellitus during infections, idiopathic fever, administration of foreign proteins, fever produced by the cabinet method and administration of histamine and epinephrine.

Insulin resistance did not develop in all cases of infection or fevers or to administration of histamine or epinephrine. Its occurrence was not related to the sex, age, height and duration of the fever or to the apparent toxemia. Insulin resistance appeared to develop more frequently in mild than in severe cases. Different theories have been advocated to explain this phenomenon.

#### ABSTRACT OF DISCUSSION

DR. HOWARD F. ROOT, Boston. As the authors say, many different conditions may explain insulin resistance. The occurrence of insulin resistance calls attention to the need of further diagnostic study. Insulin resistance does not develop in all cases during infection. Actually, severe pyogenic infection some times lasts a long time, resulting even in death, and yet insulin resistance not only is absent but the patient, who previously required a large amount of insulin, may become during the last stages of his severe infection sugar free, with normal blood sugar, requiring no insulin. Dr. Vály Menkin of the Harvard Medical School has shown experimentally in diabetic animals that with pleural exudates for example, there is a great excess in proteinolysis, so that the fluids in the affected area contain an excessive amount of amino acid nitrogen. Therefore the rise in blood sugar and the excessive glycosuria may be due to diffusion of dextrose from this area of increased protein breakdown. In a group with infection seen at the Deaconess Hospital resistance to insulin has been associated with allergy to insulin. A patient who, in a previous admission, had a mild diabetes with only temporary use of insulin returned with pyelitis. She required 80 to 90 units and had generalized urticaria whenever insulin was given. She was skin sensitive to the insulin molecule, but also in her blood serum specific precipitins to insulin were demonstrable. Her sensitization decreased and disappeared in the course of some months' time. Another young man, whose blood formerly showed no precipitin to insulin, developed precipitins to insulin and urticaria during the course of sarcoid of the lung. A third patient had had diabetes and asthma for many years. With the development of a slight attack of pneumonia, she became comatose and required 140 units. These cases justify the hypothesis that, in the presence of diabetes, an infection not merely may stimulate the antigenic mechanism in such a way as to produce antibodies to the specific invading organism but may stir up antibodies to insulin itself. This possibility is worthy of future study. Disturbances of glycogen storage and increased glycogenolysis occur in skin disorders and in liver disease with increase in insulin requirement. A woman with jaundice due to a stone in the common bile duct at the time of the operation for the removal of the stone required a thousand units a day, a few days later required none and now, two years later, still requires no insulin.

DR. JAMES A. GREEN, Iowa City. None of our cases showed any evidence of skin sensitivity to insulin. It seems difficult to believe that allergy is the important factor in cases with an infection lasting for four or five days, in which a severe insulin resistance develops. In such cases an insulin requirement of 15 units on a given potential sugar intake may increase to as much as 70 to 180 units for four or five days. Immediately after the fever subsides the insulin requirement decreases rapidly and within a week or ten days returns to the previous level. I can hardly see how allergy would explain that mechanism, but neither can I explain it by any other mechanism, so perhaps allergy is as good as any.

**The Greatest Joy**—There are a few doctors who are disappointed in their profession. Their lives are busy, full of interest, and now and then exciting. New discoveries concerning the causes of disease, new methods, new drugs are constantly appearing, what was final six months ago has already been discarded. The doctor comes to know much of humanity—much more than does the priest, for in times of dire stress nothing is hidden from him—he sees men stripped of their bravado and women shorn of their blandishments, he may admire the courageous, but it is his greater privilege to comfort the frightened and discouraged. Some take pleasure in unraveling an obscure diagnosis, others in the exciting pursuit of an elusive scientific fact, most in the treatment and recovery of their patients. But the greatest joy of every true physician is to do each task well, "his eyes look still upon the pattern of the thing that he maketh, he setteth his mind to finish his work, and watcheth to polish it perfectly"—Irving, Frederick C. Safe Deliverance, Boston, Houghton Mifflin Company, 1942.

<sup>14</sup> Newburgh L. H. and Conn J. W. New Interpretation of Hyperglycemia in Obese Middle Aged Persons. J. A. M. A. 112: 711 (Jan. 7) 1939.

<sup>15</sup> Gibson R. B. Personal communication to the authors.

## MANAGEMENT OF MALE PUBESCENCE

FIRST LIEUT WILLIAM A SCHONFELD

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The period of pubescence and adolescence in a boy is frequently associated with physical and psychologic problems. Their solution frequently determines the effectiveness and happiness of the adult. It is the obligation of the general practitioner and pediatrician in cooperation with the school authorities, training centers for boys and the family to help solve these problems.<sup>1</sup> This requires an understanding of the mechanisms of pubescence and the ability to recognize and manage adequately their normal and abnormal variations.

## MECHANISM OF PUBESCENCE

The development of a person includes a prolonged period of latency in genital growth called prepubesence (fig 1 A to B) - During this time the testes do not grow but are maintained in this state of latency through the action of subthreshold amounts of hypophyseal gonadotropic hormones.<sup>3</sup> During the second decade of life the anterior hypophysis through increased secretion in the quantity of gonadotropic hormones stimulates the interstitial cells of the testes to produce androgenic hormones. These in association with other factors of maturation induce rapid growth and development of the penis, prostate, seminal vesicles, larynx, hair follicles and epiphysis. This period of rapid genital growth is called pubescence<sup>2</sup> (fig 1 B to C). The point in development when the testes have matured adequately to produce spermatozoa and the individual is capable of procreating is called puberty (C). Postpubescence or adolescence (C-D) follows this, with continued development of the primary and secondary sex characteristics to full maturity (D).

## RANGE OF VARIATION

In view of the complexity of the process of growth and maturation it is not surprising to find great variations in normal boys<sup>4</sup> as to the age of onset of pubes-

cence, the rate of development and the ultimate size of the genitalia. To determine the range of this variation I correlated the measurements of the penis and testes<sup>5</sup> with the degree of maturation of the secondary sex characteristics in about 1,500 males selected at random.

These subjects were then arbitrarily subdivided into six stages of development and maturation (fig 2). The first stage included all the prepubescents and the sixth the adolescents and physically matured individuals, while the intervening stages included all the boys during pubescence. The qualifying criterion for the second stage was the beginning of active growth of the testes and penis but no pubic hair, while the third, fourth and fifth stages included respectively the three stages of pubic hair development described by Cramp-ton.<sup>6</sup> In each stage I noted the range of size of the penis and testes as well as the associated secondary sex characteristics.

On the basis of this classification, the age frequency distributions were plotted for the 1,500 normal boys and men ranging in age from 1 day to 25 years (fig 3). This chart indicates the decided variation as to physiologic development at each age. It illustrates that pubescence (stage 2) may normally begin at any age from 10 to 16, with isolated cases beginning even

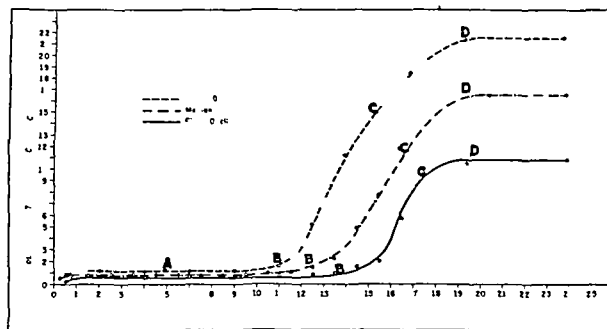


Fig 1—Phases of individual development A to B prepubesence, B to C pubescence, C to D postpubescence (adolescence). Point C puberty, point D maturity.

later, and the knowledge of the median or average age of onset is of no significance.<sup>6</sup>

Cognizance of these variations of the normal is one of the most important factors in the management of the male pubescent. By far the greatest number of prepubescents who are commonly regarded as endocrine problems will develop into normal adults,<sup>8</sup> whether the problem relates to the size of the genitalia, obesity or growth. This development is best achieved by wholesome surroundings among well adjusted adults, an adequately controlled diet and a well balanced ratio of rest and exercise, depending on the boy's needs.

## PREPUBERAL OBESITY OR PSEUDO-FROHLICH SYNDROME

The most common problem that confronts the pediatrician and general practitioner interested in endocri-

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Read before the Section on Pediatrics at the Ninety Third Annual Session of the American Medical Association, Atlantic City, N. J., June 10, 1942.

Released for publication by the War Department Manuscript Board, which accepts no responsibility, other than censorship for the contents of this article.

Dr. Irving H. Pardee cooperated and actively participated in this study of male pubescence at Neurological Institute and Columbia Presbyterian Hospital Medical Center during the past nine years. Dr. Max Gilbert of Schering Corporation supplied us with oretone, pranturon and anturon for this study.

1. Burns D. and Secker J. Physical Fitness of Preadolescent Boys of Three Socio-Economic Levels. *J. Physiol.* 98, 2P (March 14) 1940.  
Busing H. Ueber die körperliche Entwicklung Jugendlicher während der Lehrzeit (Ein Beitrag zur ärztlichen Berufsberatung). *Gesundh. u. Erziehg.* 49, 34 (Feb.) 1936.  
Chambers M. M. Guidance for Rural Youth. *Educ. Rec.* 22, 187, 1941.  
Frank L. K. Adolescence and Public Health. *Am. J. Pub. Health* 31, 1143 (Nov.) 1941.  
Meyers J. Physical Findings in New York City Continuation School Boys. *An. Element. in Vital Statistics of Adolescents* ibid 21, 615 (June) 1931.  
Fullias E. V. Maturation Factor in Vocational Guidance. *School & Soc.* 48, 628 (Nov. 12) 1938.  
Schlesinger E. Jugendliche im Beruf ihre körperliche Entwicklung während der Pubertät. *Arch. f. Hyg. u. Bakt.* 113, 335, 1935.

2. Harris J. A. Jackson C. M. Paterson D. G. and Seamon R. E. The Measurement of Man. Minneapolis: University of Minnesota Press, 1930. p. 215.  
Cramp-ton W. C. Physiological Age. A Fundamental Principle. *Am. Phys. Educat. Rev.* 13, 141, 214, 268 and 345, 1908.

3. Engle E. T. Action of Extracts of Anterior Pituitary and of Pregnancy Urine on Testes of Immature Rats and Monkeys. *Endocrinology* 16, 506 (Sept.) 1932.  
Smith P. E. in Allen E. Danford C. H. and Doisy E. A. Sex and Internal Secretion ed 2. Baltimore: Williams & Wilkins Company, 1939. p. 931.

4. Moffett C. W. Shoe Sizing and Fitting. An Analysis of Practices and Trends. Miscellaneous Publication 469. United States Department of Agriculture, 1941.  
O'Brien R. Girshick M. A. and Hunt E. P. Body Measurements of American Boys and Girls for Garment and Pattern Construction. Miscellaneous Publication 489. United States Department of Agriculture, 1941.  
Peter Karl. Männliche kindliche Geschlechtsorgane. in Peter Karl, Wetzel Georg and Heiderich Friedrich. *Handbuch der Anatomie des Kindes*. Munich: J. F. Bergmann, 1928. vol. 2, pt. 1.

5. Schonfeld W. A. and Beebe G. Variations in the Size of the Genitalia of Normal Boys from Birth to Maturity to be published.

6. Greulich W. W., Day H. G., Lachman S. E., Wolfe J. B. and Shuttlesworth F. K. *Handbook of Methods for the Study of Adolescent Children*. Monographs of the Society for Research in Child Development, Washington, D. C. National Research Council, 1938. vol. 3, no. 2.  
Shuttlesworth F. K. Adolescent Period (Graphic and Pictorial Atlas) ibid no. 3.  
The Physical and Mental Growth of Girls and Boys Age Six to Nineteen in Relation to Age at Maximum Growth. ibid 1939. vol. 4, no. 3.

7. Kubitschek P. E. Sexual Development of Boys with Special Reference to Appearance of Secondary Sexual Characters and Their Relationship to Structural and Personality Types. *J. Nerv. & Ment. Dis.* 76, 425 (Nov.) 1932.  
Reich H. Klinische Testikelmessungen bei Kindern. *Jahrb. f. Kinderh.* 105, 290, 1924.

8. Shorr E. Endocrine Problems in Adolescence. *J. Pediat.* 19, 327 (Sept.) 1941.

nology is the management of the obese boy.<sup>9</sup> Since the distribution of fat in these boys resembles that found in women and adult eunuchs, the physician is inclined to make a diagnosis of obesity due to hypogonadism particularly since the genitalia appear small. They fail to realize that this type of obesity is not at all abnormal in boys having a pyknic or predominantly endomorphic somatotype.<sup>10</sup>

The apparent hypogonadism is due to the fact that the penis is usually embedded in suprapubic fat. When the fat pad is pushed back (figs. 4 and 5) and the penis and testes are measured, it is evident that the genitalia are within the range of normal when compared to previously established standards<sup>11</sup> and that there is no delay in onset of pubescence.<sup>12</sup> Since there is no genital dystrophy, the diagnosis which is so frequently made of adiposogenital dystrophy of Frohlich's type is entirely unwarranted. With the advent of puberty,

ments with a relatively high proportion of protein and supplementary vitamins and reduction of salts and fluids to a minimum. Although myxedema is uncommon, thyroid may be given along with the proteins to accelerate the basal metabolism. To be effective, desiccated thyroid must be given in the highest dose tolerated,<sup>14</sup> which is just below the toxic level for the individual. In addition amphetamine sulfate may be used in 5 to 10 mg doses morning and afternoon to dull insatiable appetites.<sup>15</sup>

#### RATIONAL OF ENDOCRINE THERAPY

The literature has created a great deal of confusion as to the indications, limitations and contraindications of the many commercially available potent endocrine products.<sup>16</sup> I shall attempt to clarify this situation by presenting a rational approach to the treatment of the problems associated with pubescence based on our controlled experiences in the endocrine clinics of Columbia-Presbyterian Medical Center and Morrisania City Hospital in a series of more than 750 cases.

There are two main groups of endocrine substances used for the male, the gonad stimulating or gonadotropic substances and the gonad substituting or androgenic substances. The gonadotropic substances are commercially available from three sources: the anterior hypophyseal gonadotropins, extracts of the anterior pituitary gland of animals, chorionic gonadotropins of pregnant mare serum, and chorionic gonadotropins of human pregnancy urine. The relative effectiveness of these products depends on the total concentration of gonadotropic hormones present and the relative amounts of gametogenic and interstitial cell stimulating hormones which they contain.

Extracts of human pregnancy urine have been used extensively because of their high concentration of interstitial cell stimulating chorionic gonadotropins to stimulate the testes to produce androgens. The androgens, in turn, are now commercially available as testosterone propionate, in 10 mg and 25 mg ampules for intramuscular injection, methyl testosterone for oral administration in 10 mg tablets and testosterone pellets to be used as implants. All three are also available as injections. Their action is identical to the androgens produced by the testes, namely to stimulate the accessory reproductive organs and secondary sex characteristics. As yet there is no known endocrine product capable of initiating spermatogenesis.

The physiologic action of both of these types of hormones is the induction of pubescence. The chorionic gonadotropins of human pregnancy urine act by stimulating the interstitial cells of the testes while the androgens act through substitution for the mature testis. This I believe is the basis for all endocrine therapy in the prepubescent whether it is directed

	1	2	3	4	5	6
HAIRLINE						
FACIAL HAIR						
CHIN						
VOICE (larynx)						
BREASTS						
AXILLARY HAIR						
BODY CONFIGURATION						
BODY HAIR						
PUBIC HAIR						
PENIS						
LENGTH (cm)	3.8	4.5-9	4.5-12	8-15	9-15	10.5-18
CIRCUMFERENCE (cm)	5	4-6	4-8	4.5-10	5-10	5-10.5
TESTES (cc)	3-15	1.75-6	1.75-11	2-20	6-20	8-25
PROSTATE	OR			S		S
	PRE PUBESCENCE	PUBESCENCE			POST PUBESCENCE	

Fig. 2—Stages of development and maturation

most of these boys grow taller and slimmer<sup>17</sup> although I believe they usually maintain their characteristic somatotype throughout life.

Thus, the treatment limits itself to a slimming regimen and the formation of new habits of activity and interests. Accordingly, to induce loss of weight<sup>18</sup> the diet should be reduced to the basal caloric require-

9. Bauer, J. Common Diagnostic and Therapeutic Errors in Management of Fat Boys. *M. Rec.* 151:89 (Feb. 7) 1940. Hunsen, I. Obesity During Growth. *Clinical Studies Acta med. Scandinavica* 91:43 1937.

10. Kretschmer, E. *Physique and Character* translated by W. J. H. Spratt. London, K. Paul, 1925. Sheldon, W. H., Stevens, S. S., and Tucker, W. B. *The Varieties of Human Physique*. New York, Harper & Brothers, 1940.

11. Bruch, Hilde. Obesity in Relation to Puberty. *J. Pediat.* 19:362 (Sept.) 1941. Werner, S. C. Study of Untreated Frohlich's Syndrome Without Brain Tumor. *J. Clin. Endocrinol.* 1:134 (Feb.) 1941. Bauer, J.

12. Rosenstern, J. VIII. Ueber die körperliche Entwicklung in der Pubertät. *Ergebn. d. inn. Med. u. Kinderh.* 41:789 1931. Kornfeld, Werner. Ueber die Habitusentwicklung in der Pubertätszeit. *Wien. klin. Wchschr.* 50:1610 (Nov. 26) 1937.

13. Kelsey, C. G., and Lorenz, E. J. Nutritional Obesity in Children in Private Practice. *J. Pediat.* 19:241 (Aug.) 1941. Ricket, C. Nutritional Requirements of Puberty. *Quart. Bull. Health Organ. League of Nations* 5:549 (Sept.) 1936. The average diet is 900 to 1200 calories calculated by taking two tenths of the sitting height squared [0.2 (S. H.)<sup>2</sup>] or on the basis of the basal metabolism.

14. Start with 1 gram (0.065 Gm.) of desiccated thyroid U. S. P. daily and increase every two or three weeks by 1 gram daily until clinical improvement or toxic symptoms are evidenced. In the presence of toxic symptoms stop for one week and start again at a slightly lower dose. It must be remembered that thyroid preparations have a delayed and accumulative effect and that the various commercially available preparations differ in their calorigenic effects.

15. Kunststadter, R. H. Experience with Benzadrine Sulfate in Management of Obesity in Children. *J. Pediat.* 17:490 (Oct.) 1940.

16. Schonfeld, W. A. Commercially Available Newer Endocrine Products. *New York State J. Med.* 42:1538 (Aug. 15) 1942.

against sexual immaturity, eunuchoidism, inadequate or excessive growth lack of testicular descent or merely anxiety as to genital adequacy. The treatment varies only as to the product used, dosage, duration of treatment and stage of pubescence induced (fig 2)

#### PROGNOSTICATION OF SEXUAL DEVELOPMENT

In the management of the prepubescent his present genital status is of interest only as it reflects the individual's future sexual development, since the actual size of the genitalia is of physiologic significance only after pubescence. In the prepubescent one is concerned with the ability to respond to future stimulation and the probability of the anterior hypophysis to initiate this stimulation in due time.

I use various indirect methods to evaluate this prognosis, since hormone assays<sup>17</sup> were found to be of no aid in the prepubescent. Measurements of the penis and testes are of value to differentiate normal boys with apparently small genitalia from those with actual genital hypoplasia. It is to be remembered that the testes are normally maintained during prepubescence in a latent state by the action of minimal amounts of gonadotropic substances from the anterior hypophysis. Any disturbance of this function may cause an aplasia of the testes<sup>3</sup> similar to that found in primary testicular

response is expressed as an increase in the circulating androgens<sup>18</sup> and is clinically manifested by congestion and enlargement of the penis and subsequently the prostate. This response has often been misinterpreted in the literature as a therapeutic achievement.

Usually 500 to 750 international units three times each week of a proved potent batch of chorionic gonadotropin of human pregnancy urine is adequate to stimulate the testis but if no response is noted in two or three weeks the dose is increased to 1,500 international units three to five times each week for two or three weeks more. Evidence of response warrants the assertion that the boy has at least one normal testis and probably adequate anterior hypophysial function, so that he will have spontaneous pubescence in due time if there is no abnormal change in his status.

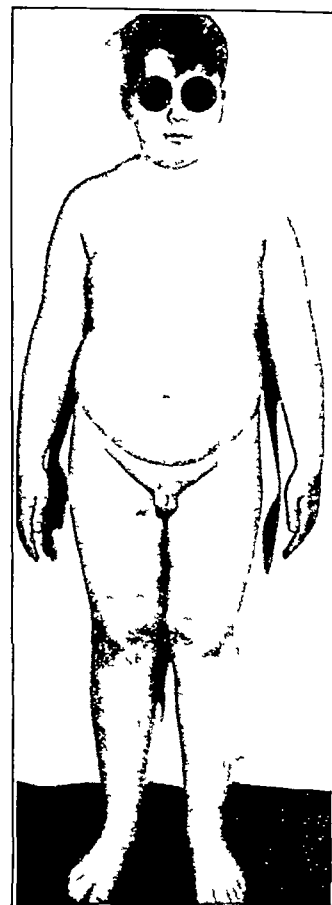


Fig 4—Appearance of a prepubertal obese boy with apparent hypoplasia of the genitalia.

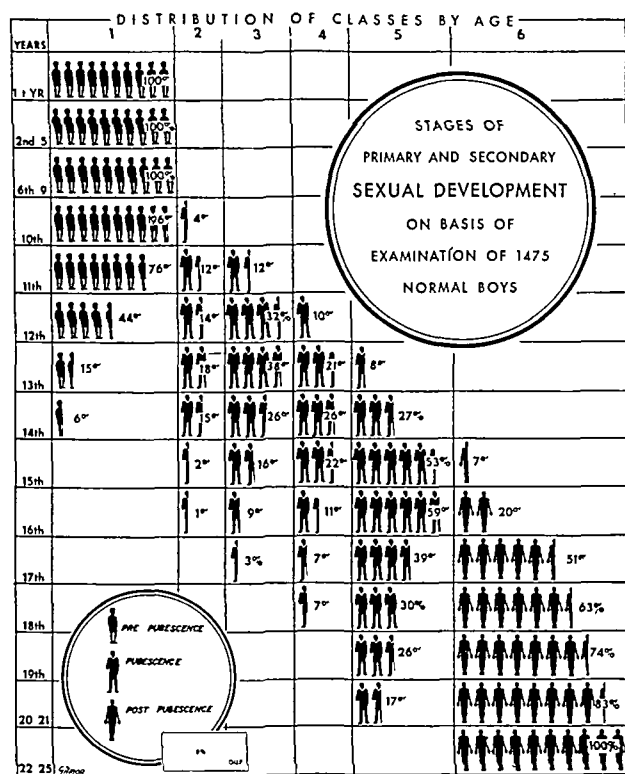


Fig 3—Age frequency distribution of the six stages of development and maturation. Each figure represents 10 per cent of total in each age group.

hypoplasia. Thus testing the responsiveness of the testes to large doses of chorionic gonadotropins of human pregnancy urine would help evaluate both gonadal and hypophysial factors in pubescence. This

#### CRYPTORCHISM, DELAYED PUBERTY AND EUNUCHOIDISM

In the prepubescent it is frequently difficult to differentiate bilateral cryptorchism or delayed puberty from eunuchoidism. Thus I find it necessary at times to utilize the prognosticating therapeutic test as a criterion for differential diagnosis.

Cryptorchism has been discussed so frequently in the literature<sup>19</sup> that I shall not review my experience except to stress the fact that a diagnosis should not be made until after thorough and repeated examinations, as illustrated in figures 6 and 7. I have often noted that in the presence of a hyperactive cremasteric reflex the testis may ascend through the open inguinal canal or under the fascia. It is important to differentiate

17 Dorfman R I, Greulich W W and Solomon C T. Excretion of Androgenic and Estrogenic Substance in the Urine of Children. *Endocrinology* 21: 741 (Nov.) 1937. Oesting R B and Webster B. Sex Hormone Excretion of Children. *ibid* 22: 307 (March) 1938. Nathanson I T, Towne L E and Aub S C. Normal Excretion of Sex Hormones in Children. *ibid* 28: 851 (Dec.) 1941.

18 Moore C R. Gonadotropic Substances and Male Hormone Effects in the Organism. *J Urol* 42: 1251 1939. Sand K and Plum P. Elimination of Testicular Hormone in Urine During Treatment of Adiposogenital Dystrophy with Gonadotropic Hormone. *Ugeskr. f. Leger* 100: 719 (June 30) 1938.

19 Counseller V S. Ten Years' Experience in the Management of Cryptorchism. *J Urol* 46: 722 (Oct.) 1941. Hamilton J B and Hubert G. Effect of Synthetic Male Hormone Substances on Descent of Testicles in Human Cryptorchism. *Proc Soc Exper Biol & Med* 39: 4 (Oct.) 1938. Johnson W W. Cryptorchism. *J A M A* 113: 25 (July 1) 1939. Kunstadter R H. Hormone Treatment of Cryptorchism. Eight Years Experience. *Urol & Cutan Rev* 45: 81 (Feb.) 1941. Thompson W O and Heckel N T. Undescended Testes. Present State of Glandular Treatment. *J A M A* 112: 397 (Feb. 4) 1939. Endocrine Treatment of Cryptorchism. *ibid* 117: 1953 (Dec. 6) 1941. Werner A A, Kelling Dough, Ellersieck Dorothy and Johns G A. Effect of Gonadotropic Extract of the Pituitary in Cryptorchism. *ibid* 106: 1341 (May 2) 1936. Zelsson C and Steinitz E. Treatment of Cryptorchism with Chorionic Gonadotropic Hormone and Male Sex Hormone. *J Pediat* 17: 315 (Sept.) 1940.

these patients with migratory cryptorchism who require no treatment except in the presence of torsion, from those boys with an actually undescended or ectopic testis<sup>20</sup>. Even if both testes are undescended, the abnormal positions do not interfere with the functioning of the interstitial tissue,<sup>21</sup> so that pubescence develops normally. However, the seminiferous tubules usually fail to mature and degenerate with the advent of pubescence.

In eunuchoidism there is a complete aplasia of the testes so that pubescence never develops spontaneously. Once a diagnosis of eunuchoidism<sup>22</sup> is established an attempt should be made to differentiate patients with intracranial lesions and primary hypophysial disturbances from those with primary testicular hypoplasia as a result of a congenital defect or disturbance of testicular circulation caused by torsion or surgery.

Pubescence fails to develop in many patients with hypophysial disturbances<sup>23</sup> as a result of intrasellar



Fig 5—Appearance of genitalia of boy shown in figure 4. To evaluate the genitalia suprapubic fat pad is pushed back.

and of extrasellar pathologic conditions. The anterior lobe of the hypophysis is directly involved in eosinophilic tumors with gigantism, in chromophobe or basophilic adenomas or as a result of congenital aplasia of the gland as in hypophysial dwarfism (atrophic or Lorain-Levi). However, inflammatory or degenerative processes of the base of the brain or skull or a suprasellar neoplasm, such as a craniopharyngioma,<sup>24</sup> may through pressure directly on the hypophysis or through a disturbance of its circulation or neurotropic fibers also create secondary eunuchoidism.

20 Hamilton J B and Hubert G. Differential Diagnosis of Pseudo-cryptorchism and True Cryptorchism. *Endocrinology* 21:644 (Sept.) 1937.

21 Rea C E. Functional Capacity of the Undescended Testis. *Arch Surg* 38:1054 (June) 1909.

22 The term eunuchoidism is used rather than hypogonadism to imply the inability of the individual to develop pubescence spontaneously rather than referring to the size and function of his genitalia at the time of examination.

23 Bailey Percival. Intracranial Tumors of Infancy and Childhood. Chicago: University of Chicago Press 1939. Rasmussen A T. Innervation of the Hypophysis. *Endocrinology* 23:263 (Sept.) 1938.

24 Rathke pouch tumor or hypophysial stalk tumor.

In primary eunuchoidism, the goal of treatment in children as in adults is the development of primary and secondary sex characteristics with androgens,<sup>25</sup> the best guide to dosage being the child's response. Start with 10 mg of testosterone propionate by intramuscular injection three times each week or give 30 mg of methyl testosterone daily by mouth or insert 150 mg pellets of testosterone subcutaneously, increasing as indicated to 25 mg of testosterone propionate hypodermically three times each week to induce pubescence. When development reaches the maximum for the individual a maintenance dose must be established and continued through life, otherwise regression will take place.

In secondary eunuchoidism however the treatment should first be directed to eliminate if possible, the primary pathologic process by means of neurologic surgery or radiation therapy. If this fails to allow pubescence to develop or if the etiologic process cannot be eliminated then only should androgens be used to induce pubescence.

#### ADIPOGENITAL DYSTROPHY, OR FROHLICH'S SYNDROME

The term Frohlich's syndrome has been used so frequently as a diagnosis of obesity in childhood when associated with only apparent hypogonadism that its true significance has been lost.<sup>26</sup> The use of this term should be limited to cases of secondary eunuchoidism associated with obesity as a result of a craniopharyngioma or an inflammation or degenerative lesion involving both the hypothalamus and the hypophysis. Before labeling a boy as having Frohlich's syndrome one should consider carefully whether he actually has adiposogenital dystrophy with a bad prognosis or merely prepubertal obesity with normal genitalia and an excellent prognosis. The treatment of Frohlich's syndrome involves the removal of the primary pathologic process if possible and induction of pubescence with androgens. A slimming regimen is also instituted for the obesity.

#### PROBLEMS OF GROWTH IN HEIGHT

Although a great deal has been written about the diagnosis, pathology and treatment of the abnormalities of growth a conclusive understanding of the problem is not available. The one approach that I consider of primary importance in the determination of the prognosis of a boy with idiopathic or hypophysial dwarfism is to evaluate his genital status.

Since the anterior lobe of the pituitary gland controls both growth and gonadal development it is readily understood that aplasia of this gland would at times

2 Bickard G K, L. Crumilly R and Lissner H. Implantation of Testosterone Compounds in Cases of Male Eunuchoidism. *J Clin Endocrinol* 1:38 (Jan) 1941. Fudelsberg, Joseph and Madoff I. The Effectiveness of Methyl Testosterone Administered Orally. *Am J M Sc* 202:83 (July) 1941. Edelberg, Joseph and Ornstein F A. Observations on the Implantation of Testosterone Pellets. *J A M A* 117:1068 (Sept 27) 1941. Hamilton J B. Therapeutics of Testicular Dysfunction. *ibid* 116:1903 (April 20) 1941. Mori card R and Bize P R. Premieres observations de developpement du penis provoqué chez l'enfant par injection d'acetate et de propionate de testosterone. *Bull Soc de pediat de Paris* 35:26 (Jan) 1937. Tager B N and Shelton E K. Therapy in Male Hypogonadism. Testosterone Propionate, Inunction and Methyl Testosterone Orally. Case Report. *J Clin Endocrinol* 1:131 (Feb) 1941. Turner H H. Clinical Use of Synthetic Male Sex Hormone. *Endocrinology* 24:763 (June) 1939. Vest S A and Barclay Bruno Jr. Introral Use of Methyl Testosterone. *J A M A* 117:1421 (Oct 25) 1941. Vest S A and Howard J E. Clinical Experiments with the Use of Male Sex Hormones. I. Use of Testosterone Propionate in Hypogonadism. *J Urol* 40:154 (July) 1938. Webster B. The Treatment of Hypogonadism in the Adolescent Male. *J Pediatr* 13:847 (Dec) 1938.

26 Bruch Hilde. The Frohlich Syndrome. *Am J Dis Child* 58:1282 (Dec) 1939. Warkany Josef, Farber Sidney and Logan M I. Round Table Discussion on Adiposogenital Dystrophy. *J Pediatr* 19:854 (Dec) 1941.



result in eunuchoidal hypophysial dwarfism. The other forms of intracranial disorder previously discussed which might give rise to hypophysial eunuchoidism are also associated with short stature except in cases of eosinophilic tumors which through their excessive secretion of growth factors result in gigantism.

In the normal boy the continued secretion of hypophysial growth factors stimulates progressive growth until the onset of pubescence. At this time probably as a result of an increase in androgens the epiphyses receive an extra stimulus resulting in a prepubertal spurt of growth followed by fusion of the epiphyses and cessation of growth. This is associated with the further maturation of the gonads and epiphyses.

However in primary eunuchoidism the absence of testicular development prevents fusion of the epiphyses and allows continued action of the growth factors to stimulate long bone growth resulting in a tall eunuchoid. In cases of precocious puberty however the premature maturation of the gonads creates an early pubescent spurt of growth and excessive height for the child's age which is then followed by early closure of the epiphyses and ultimate deficiency in height.

I have presented this theoretical explanation of the various problems related to idiopathic and hypophysial-gonadal dwarfism in order to create a better understanding of the rationale of treatment as I see it. When deficiency of growth is associated with eunuchoidism as

growth<sup>2</sup>. However usually deficiency in growth during prepubescence is not associated with eunuchoidism, although frequently there is a delay in the age of onset of pubescence to the upper limits of normal. In cases of short normal boys I have tried the various commercially available growth factors and found them to be of no value. I have thus reverted to the use of large doses of thyroid adequate diet with supplementary vitamins fresh air and exercise to stimulate the patient's maximum growth.<sup>25</sup>

However in isolated instances of prepubescent boys ranging in age from 12 to 18 years I have used large doses of androgens over a period of four to eight weeks, inducing the earliest evidence of pubescence (class 1, fig 2) and the frequently associated spurt of growth.<sup>26</sup> Treatment would then be stopped for three to six months to allow regression of the genital response. This course would be repeated in the hope that a series of two or three such growth spurts would be greater than the one growth spurt which the boy would have had spontaneously. I do not generally recommend this form of treatment as it is still experimental. The danger is that the genital maturation will be carried too far, which would induce the same situation as in precocious puberty, namely a premature closure of the epiphyses and cessation of growth.<sup>27</sup>

#### ACNE

Acne occurs as a result of the increased activity of the sebaceous glands associated with hair follicle development<sup>28</sup> during normal pubescence. Nevertheless it causes many pubescents a great deal of anxiety. Every endocrine substance has been used for acne but I have found none of them to be effective. Local treatment seems to be the only therapy of value. If boys are taught to use a face brush and tincture of green soap early in pubescence severe acne can be avoided. Once it is present and secondary infection has ensued the most effective treatment seems to be 10 per cent salicylic thiazole ointment.

- 27 McCullagh F P and Rossmiller H R. Methyl testosterone III. Effects on Body Weight and Growth. *J. Clin. Endocrinol.* 1: 507 (June) 1941. Webster B and Hoskins W H. Influence of Androgen Therapy on Growth Rate of Hypogonadal Adolescent Boys. *Proc. Soc. Exper. Biol. & Med.* 45: 72 (Oct.) 1940.
- 28 Merkins I C. Sir Charles Clubbe Memorial Oration. Unveiling the Mystery of Growth. *M. J. Australia* 1: 935 (June 19) 1937.
- 29 Dorff G B. Chorionic Gonadotropin Effects on Height and Osseous Development in Sexually Underdeveloped Young Boys. *Endocrinology* 27: 403 (Sept.) 1940. Goldzieher M A. Growth and Sex Hormones. *J. Clin. Endocrinol.* 1: 924 (Nov.) 1941. Rubinstein H S and Solomon M L. Growth Stimulating Effect of Testosterone Propionate. *Proc. Soc. Exper. Biol. & Med.* 44: 442 (June) 1940.
- 30 McCullagh F P and McGurl F J. The Effects of Testosterone Propionate on Epiphyseal Closure, Sodium and Chloride Balance and on Sperm Counts. *Endocrinology* 26: 377 (March) 1940.

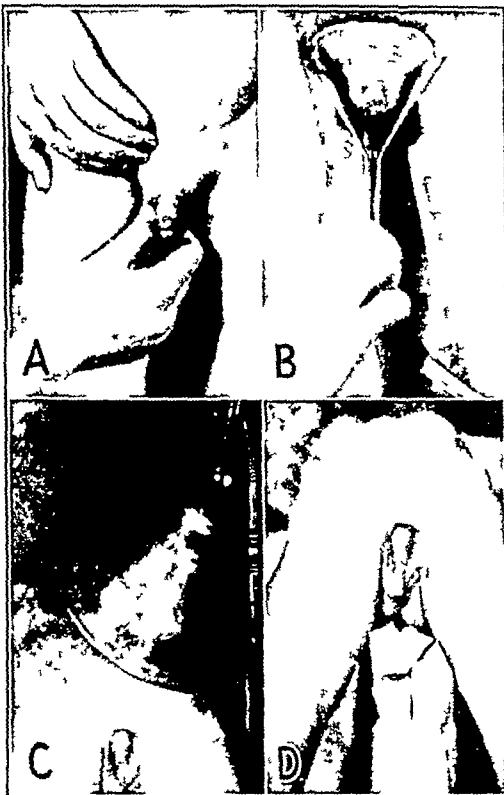


Fig 6—Methods of examination for position of testes. A apply pressure over external inguinal ring before palpating the scrotum to prevent retraction of the testes. B apply suction to stretch the scrotum and gubernaculum. C apply local heat for relaxation. D institute hyperextension.

proved by the fact that the boy has no genital response to large doses of chorionic gonadotropins or human pregnancy urine as previously described, the treatment is directed toward the induction of pubescence with androgens. This is usually associated with a spurt of



Fig 7—Method of examination for position of testes in cryptorchidism. The diagnosis of undescended testis should never be made until repeated examinations fail to bring it into the scrotum.

## GYNecomastia

Normal boys frequently have some mammary tissue response during pubescence, varying from a small nodule to diffuse hypertrophy of one or both breasts, which subsides at puberty.<sup>31</sup> In those cases in which the enlarged breasts persist beyond puberty we have tried every form of endocrine therapy without avail. The treatment of choice for this condition is plastic surgery, except in eunuchoids, in whom androgenic therapy seems to help when the degree of gynecomastia is mild. Dr. Jerome P. Webster has perfected a mastectomy through a circumareolar incision which leaves no perceptible postoperative scar. This operation has been ideal to obviate the psychic trauma so often caused by enlarged breasts.

## PSYCHOGENIC PROBLEMS

The psychologic makeup of a boy must always be taken into consideration in the management of all problems related to pubescence. In using gonadotropins or androgens care should be taken not to allow the genital development to advance beyond the normal range for the boy's age and his ability to handle the ensuing emotional problems.<sup>3</sup> This is particularly true in the treatment of psychoneurotic and mentally retarded boys. However, the induction of pubescence in young eunuchoids obviates the many psychogenic problems associated with this condition.

If anxieties exist as to genital development, it is not enough to state that the boy's penis is normal for his age but he must accept it as being normal. I have thus at times induced early pubescence (stage 2) in perfectly normal young boys with apparent genital hypoplasia to inflate the boy's own ego if psychotherapy alone has failed.

## CONCLUSION

Chorionic gonadotropins and androgens are potent drugs capable of modifying both the physical and the emotional development of the male pubescent. The judicious use of these substances requires an understanding of the physiologic mechanisms of pubescence and the action of the various substances.

A great deal of therapeutic confusion has been created in the literature by the failure to appreciate the range of normal variation of genital size, age of onset of pubescence and the characteristics of growth of the various types of body configurations (somatotypes). Many of these normal boys have been subjected to prolonged endocrine treatment with induction of pubescence, and their normal development is fallaciously attributed to endocrine therapy. An accurate evaluation of the existing status and future prognosis is essential for the proper management of the prepubescent and pubescent boy.

## COMMENT

In this presentation, the developmental aspects of pubescence were stressed. Criteria were presented for the arbitrary division of development and maturation

into six stages on the basis of genital measurements and associated secondary sex characteristics, and the age frequency distribution was plotted for about 1,500 boys under observation. Attention was drawn to the prolonged phase of genital latency during prepubescence and the appreciable variation in age of the onset of pubescence. These often create a problem of differentiating the normal prepubescent from the eunuchoid.

A test to prognosticate in prepubescence whether a boy will have spontaneous pubescence is based on the ability of the testes to respond to stimulation by chorionic gonadotropins of human pregnancy urine.

Induction of pubescence is the basis of nearly all endocrine therapy in this age group. The treatment varies only as to whether such endocrine products are used which stimulate the interstitial tissue of the testes to function (gonadotropins) or those which substitute for the hormones ordinarily secreted by the mature testes (androgens). The stage of pubescence to be induced also varies.

Obesity and growth should be considered in their correlation with genital development and pubescence. The criteria used differentiated in the first group the prepuberal boy with obesity from the boy with true Frohlich syndrome and in the latter group the short normal from the hypophyseal dwarf.

171 Lehigh Place

THE HOSPITAL AND THE SYPHILIS  
PROBLEM IN PROSPECTIVE  
BLOOD DONORS

WILLIAM W. FRYE, PH.D., M.D.

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In the United States each year a large number of persons volunteer as blood donors at the request of friends and relatives. During the present emergency the American Red Cross is collecting large quantities of blood from voluntary donors. Most of them young adults, these volunteers consider themselves in good health and free of disease. Many of them however are found on serologic examination by one of the standard methods to have a positive reaction for syphilis. Of 19,141 tests performed on prospective blood donors over a period of about five and one-half years at the Vanderbilt University Hospital 33 per cent of the donors were found to give a positive or a doubtful serologic reaction for syphilis on one examination.<sup>1</sup> While a single positive or doubtful blood test is not sufficient evidence to make a diagnosis of syphilis, nevertheless the possibility that these persons may have syphilis must be considered. Many of them may go on for years without having the disease recognized unless some one notifies them of the serologic results.

This paper presents the findings of a study designed to find out what is being done about the donors who have a positive or doubtful serologic reaction for syphilis. Hospitals accepting persons as blood donors should take the responsibility of informing them if the

31 Jung, F. T. and Shifton, A. L. Mammary Gland in the Normal Adolescent Male. *Proc. Soc. Exper. Biol. & Med.* 33: 455 (Dec.) 1935. Mastitis, Mazoplasia, Myxalgia and Gynecomastia in Normal Adolescent Males. *Illinois M. J.* 73: 115 (Feb.) 1938.

32 Gordon, Alfred. Neurologic Manifestations of Puberty. *J. M. Soc. New Jersey* 18: 111 (April) 1921. Wile, I. S. Body Mind Unity. *Am. J. Orthopsychiat.* 10: 532 (July) 1940. Zachry, C. B. Emotional Problems of Adolescence. *Bull. Menninger Clin.* 4: 63 (May) 1940. Zachry, Caroline B. and Light, Margaret. Emotion and Conduct in Adolescence for the Commission on Secondary School Curriculum. New York: D. Appleton-Century Company, Inc. 1940. Bize, P. R. New York: D. Appleton-Century Company, Inc. 1940.

33 Bize, P. R. and Moricard, R. Modifications psychiques provoquées par l'injection de testostérone chez les jeunes garçons. *Bull. Soc. de pédiat. de Paris* 35: 38 (Jan.) 1937. Thompson, W. O. and Heschl, J. Precocious Sexual Development from an Anterior Pituitary like Principle. *J. A. M. A.* 110: 1813 (May 28) 1938.

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1 Keller, A. E., Kampmeier, K. H. and Frye, W. W. Investigations of Transfusion Donors with Positive Serologic Tests for Syphilis. *South. M. J.* 35: 573-576 (June) 1942.

preliminary examination indicates the presence of any disease. To determine how many hospitals did assume this responsibility and in what manner questionnaires were sent to the superintendent of a geographically representative group of hospitals in the United States. The questionnaire prepared sought to obtain information on the following points:

- 1. Do you operate your own serologic laboratory for the diagnosis of syphilis?
- 2. If you do not operate your own serologic laboratory, where are tests performed for patients in your hospital?
- 3. Do you perform routine serologic tests for syphilis on all blood donors for transfusions in your hospital?
- 4. Do you have a procedure by which donors are notified if they have a positive reaction?
- 5. Who is responsible for notification of the donor?
- 6. Is the donor notified by interview or letter?
- 7. To what agency do you report positive reactions of donors?

The questionnaire was signed by the superintendent of Vanderbilt University Hospital and sent to 800 hospitals chosen from "The Transactions of the American Hospital Association for 1940." In all 603 questionnaires were returned, representing hospitals from forty-seven of the forty-eight states.

**INFORMATION OBTAINED BY QUESTIONNAIRE**  
*Serologic Laboratory Facilities According to Geographic Region*—The number and percentage of hospitals operating a serologic laboratory and testing donors for syphilis is shown in table 1. The United States was divided into eight geographic regions according to the classification of the U. S. Bureau of Census. Of the 603 hospitals, 478 operated their own serologic laboratory and 125 used public health or private laboratories. In the hospitals operating their own laboratories, 4 per cent stated that they did not test donors for syphilis. In the group of hospitals not operating a serologic

laboratory is presented in table 2. The percentage of hospitals not operating their own serologic laboratory and those not testing donors for syphilis is much higher in hospitals of less than 200 beds. The total not testing donors was 16.3 per cent in hospitals of 100 beds or less and 9.2 per cent in those with 100 to 199 beds.

TABLE 2—Number and Percentage of Hospitals Operating a Serologic Laboratory and Testing Donors for Syphilis According to Size

Size of Hospital (Number Beds)	Operating Serologic Laboratory		Not Operating Serologic Laboratory		Percentage Testing Donors for Syphilis		Percentage Not Testing Donors for Syphilis	
	Total	Not Testing Donors for Syphilis	Total	Not Testing Donors for Syphilis	Operating Serologic Laboratory	Not Operating Serologic Laboratory	Total	Not Testing Donors for Syphilis
Less than 100	43	28	4	13	14.3	20.0	16.3	10.0
100-199	240	171	10	12	5.8	17.4	9.2	9.0
200-299	157	131	3	23	2.6	36.0	4.5	4.5
300-499	88	79	2	10	0.0	0.0	2.2	2.2
500+	71	69	0	6	1.0	16.6	1.4	1.4
Total	603	478	19	125	4.0	16.1	6.5	6.5

laboratory, 16.1 per cent did not have a blood test for syphilis performed. Altogether 6.5 per cent stated that they were not testing blood donors for syphilis. This percentage is highest in the West North Central, West South Central and Mountain areas.

*Serologic Laboratory Facilities According to Type of Hospital Control*—The same kind of analysis with respect to the type of administrative control shows (table 3) that the denominational hospitals had the highest percentage (10.1 per cent) not testing donors for syphilis. Only 1 of the municipal hospitals did not examine donors, and this was a hospital which operated its own serologic laboratory. The percentage not testing donors for syphilis is highest in those hospitals not operating their own serologic laboratory.

*Responsibility for Notification of Positive Donors*—As pointed out previously, the hospital may require examination of prospective blood donors for syphilis, but it is also essential that they notify these donors when positive or doubtful serologic results are obtained.

The rest of this discussion deals with the methods by which the hospitals performing tests on donors fulfill their responsibility of notification.

Information regarding the responsibility for the notification of donors in hospitals examining them for syphilis is shown in tables 4 and 5. Considering the group as a whole, 9.4 per cent stated that they did not notify donors when the test gave a positive result. The private or attending physician was stated to be responsible for notifying the donor in 38.3 per cent. In about one fourth the house officer was responsible, while the pathologist or laboratory director handled the notification in approximately 14 per cent. Less than 5 per cent of the hospitals delegated the responsibility to the social service staff or to the health department. There was a fairly large proportion of hospitals which named some other agency or person responsible for notification. These included the admitting officer, the private laboratories, the superintendent's office and other hospital personnel.

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Geographic Region	Total Hospitals	Operating Serologic Laboratory		Not Operating Serologic Laboratory		Percentage Testing Donors for Syphilis		Percentage Not Testing Donors for Syphilis	
		Total	Not Testing Donors for Syphilis	Total	Not Testing Donors for Syphilis	Operating Serologic Laboratory	Not Operating Serologic Laboratory	Total	Not Testing Donors for Syphilis
New England and Middle Atlantic	212	158	2	54	6	1.3	11.1	3.8	3.8
East North Central	10	90	3	1	2	3.3	10.4	4.9	4.9
West North Central	67	46	4	21	7	8.7	30.4	10.9	10.9
South Atlantic	81	69	2	12	1	2.9	8.3	3.7	3.7
East South Central	35	30	1	5	0	10.0	0.0	8.6	8.6
West South Central	38	30	3	1	8	7.3	10.5	10.5	10.5
Mountain	32	27	12	10	2	9.1	20.0	12.5	12.5
Pacific	33	28	0	5	1	0.0	25.0	1.1	1.1
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*Serologic Laboratory Facilities According to Size of the Hospital*—The variation according to the size of the hospital in the proportion testing and those not testing

## GYNECOMASTIA

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PROBLEM IN PROSPECTIVE  
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**Serologic Laboratory Facilities According to Type of Hospital Control.**—The same kind of analysis with respect to the type of administrative control shows (table 3) that the denominational hospitals had the highest percentage (101 per cent) not testing donors for syphilis. Only 1 of the municipal hospitals did not examine donors, and this was a hospital which operated its own serologic laboratory. The percentage not testing donors for syphilis is highest in those hospitals not operating their own serologic laboratory.

**Responsibility for Notification of Positive Donors.**—As pointed out previously, the hospital may require examination of prospective blood donors for syphilis, but it is also essential that they notify these donors when positive or doubtful serologic results are obtained. The rest of this discussion deals with the methods by which the hospitals performing tests on donors fulfill their responsibility of notification.

Information regarding the responsibility for the notification of donors in hospitals examining them for syphilis is shown in tables 4 and 5. Considering the group as a whole 94 per cent stated that they did not notify donors when the test gave a positive result. The private or attending physician was stated to be responsible for notifying the donor in 383 per cent. In about one fourth the house officer was responsible while the pathologist or laboratory director handled the notification in approximately 14 per cent. Less than 5 per cent of the hospitals delegated the responsibility to the social service staff or to the health department. There was a fairly large proportion of hospitals which named some other agency or person responsible for notification. These included the admitting officer, the private laboratories, the superintendent's office and other hospital personnel.

When broken down according to size of hospital, table 4 shows that in hospitals of 100 beds or less and in the group of 500 beds or more the percentage which did not notify the donors having positive or doubtful serologic reactions was about 6. This percentage increased to approximately 10 in hospitals of

TABLE 3—Number and Percentage of Hospitals Operating a Serologic Laboratory and Testing Donors for Syphilis According to Type of Control

Type of Control	Total Hospitals	Operating Serologic Laboratory		Not Operating Serologic Laboratory		Percentage Not Testing Donors for Syphilis	
		Total	Not Testing Donors for Syphilis	Total	Not Testing Donors for Syphilis	Operating Serologic Laboratory	Not Operating Serologic Laboratory
Municipal	34	44	1	10	0	0	19
Private	289	26	6	61	8	17	11
Denominational	180	147	10	8	0	0	10
Governmental	80	61	2	19	5	15	1
Total	683	478	19	120	20	40	16

Other than municipal

from 200 to 500 beds. The percentage of hospitals relying on the private or attending physician for notification decreased with the size of the hospital, being lowest in hospitals with 500 beds or more. The hospitals depending on social service personnel for notification were almost all in the group with 200 beds or more and were probably all teaching hospitals or connected with a medical school.

Table 5 shows the influence of the type of administrative control on the responsibility for notification. Almost 12 per cent of the denominational hospitals failed in any way to notify donors with a positive serologic reaction. The corresponding percentage for private hospitals was almost as high, while for governmental hospitals it dropped to 7.9 per cent. Almost

hospitals using the house officers to notify donors. The same is true of hospitals utilizing the pathologist or laboratory director or the health department. In the municipal hospitals 13.2 per cent stated that the social service personnel notified donors.

**Methods Used to Notify Positive Donors**—Tables 6 and 7 show the methods used to notify donors with positive reactions. There was no definite plan or system for notifying them in 12.5 per cent of the hospitals. Approximately half of the hospitals stated that these donors were informed of the serologic findings by personal interview. The private or attending physician was listed as the means of notification in 23.5 per cent of the hospitals, which was interpreted as meaning that the physician was left with the entire responsibility. Only 7.8 per cent notified by letter and 7.6 per cent by letter and interview. The group using other methods included those stating that the donor was notified by telephone or by other members of the family.

The effect of the size of the hospital on the method of notification is shown in table 6. The percentage of hospitals having no method of notifying donors decreased with increasing size of the hospital, with the

TABLE 5—Responsibility for Notification of Donors According to Type of Hospital Control\*

Type of Control	Number of Hospitals	Percentage Not Notifying Donors	Percentage Notifying by Private or Attending Physician	Percentage Notifying by House Officer	Percentage Notifying by Laboratory Director	Percentage Notifying by Others	Percentage Notifying by Social Service	Percentage Notifying by Health Department
Municipal	34	5	13.1	1	1	0.3	1	5
Private	289	11	14	11	11	11.7	8	3.3
Denominational	180	11.5	10	11	11	5.1	0.0	1.7
Governmental	80	7.9	17.1	5	14	10.5	5	2.9
Total	683	11	13	11	11	11.8	4.8	7

\* Some hospital named more than one plan for notification of donors; therefore the percentage may add to more than 100.  
† Other than municipal.

TABLE 4—Responsibility for Notification of Donors, According to Size of Hospital\*

Size of Hospital (Number Bed)	Number of Hospitals	Percentage Not Notifying Donors	Percentage Notifying by Private or Attending Physician	Percentage Notifying by House Officer	Percentage Notifying by Laboratory Director	Percentage Notifying by Others	Percentage Notifying by Social Service	Percentage Notifying by Health Department
Less than 100	6	5.6	3.0	8	0.0	11.1	0.0	2.8
100-199	118	10.6	4.1	2.9	17.0	10.6	8	1
200-299	111	14	8.2	28.8	17.1	12.1	5.4	1.7
300-499	81	10.6	4.1	0.6	9.4	16	7.0	1.7
500+	75	1.7	1.0	8.7	16.0	17	1	1
Total	681	11	8	16.8	14.5	15.8	4.8	7

\* Some hospital named more than one plan for notification of donors; therefore the percentages may add to more than 100.

all the municipal hospitals examining donors notified them in some way, only 3.8 per cent failing to do so. It is seen that 54 per cent of the denominational and 39.4 per cent of the private hospitals placed the responsibility for notification in the hands of the private or attending physician. There was not a great deal of variation with type of control in the percentage of

exception of hospitals with 300 to 499 beds. Smaller hospitals or those with less than 200 beds leave the problem of notification in the hands of the private physician, while larger hospitals seem to rely more on the interview or letter or both as a means of notification of donors.

Table 7 shows the methods used to notify donors according to the type of administrative control. The private and denominational hospitals show the highest percentage having no system for notification of donors. When they do have a system they favor the interview as the method of notification, although denominational hospitals depend somewhat more on the private or attending physician.

The municipal and governmental hospitals use the same methods for notifying donors. Only about 7 per cent had no method for notification and approximately one half of this group of hospitals notify by personal interview. Since the number of private patients are fewer in this group of hospitals, the private or attending physician was listed as the means of notification in only 5.8 per cent of the municipal and 13.8 per cent of the governmental hospitals. In 25 per cent of the municipal hospitals letters were used and in 11.5 per cent both letter and interview.

## COMMENT

This study shows that 65 per cent of the 603 hospitals from which replies to the questionnaire were received did not test blood donors for syphilis before their blood was used. Of the hospitals testing donors for syphilis 12.5 per cent had no method for notifying these donors when they were found to have a positive or doubtful serologic reaction. Of the 603 hospitals, then 16.2 per cent either did not examine donors for syphilis or did not notify them when the serologic test was found to be positive.

It is impossible to determine how many persons are examined each year as prospective blood donors. There is no doubt that several thousand of these donors will have a positive reaction suggesting the presence of syphilis. In a large proportion of cases a blood donor found to have syphilis is not aware of the infection. If these positive donors are not informed of the results of the laboratory tests and if the significance is not explained to them, they may transmit the disease to others or late manifestations of the disease may develop which could have been prevented by treatment. Hospitals, therefore, should develop some system for notification and follow-up of each donor found to have a positive serologic reaction for syphilis.

That most hospitals would attempt to correct this situation if it were called to their attention would seem to be borne out by some of the letters which were returned with the questionnaires. The following letter was received from a hospital connected with a large medical school:

Your questionnaire called to our attention a very definite deficiency in our practice, namely, that we have not been informing blood donors of the findings in connection with Wassermann tests that were made. This deficiency has now been corrected and the member of the house staff who withdraws the blood sample has been made responsible for informing the donor of the result of the Wassermann examination, particularly in cases where findings are positive, and of advising them concerning treatment.

## Another letter states

At the time we received your inquiry we did not do serological tests on donors, but since then we have made it a standard practice.

TABLE 6—Methods Used to Notify Positive Donors According to Size of Hospital

Size of Hospital (Number Beds)	Number of Hospitals	Percentage Having No Method of Notifying Donors	Percentage Notifying by Interview	Percentage Notifying by Private or Attending Physician	Percentage Notifying by Letter	Percentage Notifying by Interview and Letter	Percentage Notifying by Other Methods	Total Percentage
Less than 100	36	20.0	25.7	45.7	5.7	2.9	0.0	100.0
100-199	218	13.2	46.8	39.2	3.4	4.7	0.4	100.0
200-299	149	10.3	55.2	17.9	7.6	6.2	2.3	100.0
300-499	85	16.7	40.5	19.0	9.9	11.9	2.4	100.0
500+	75	6.6	60.0	4.1	23.0	14.9	1.4	100.0
Total	564	12.5	47.1	23.5	7.8	7.6	1.0	100.0

Such letters indicate steps in the right direction. In order, however, for hospitals to have a successful system for notification of donors, the problem must be handled by one person. This person should be a permanent member of the hospital staff and all serologic tests for syphilis on blood donors should be reported to the person responsible for notification.

It has been our experience that a plan which depends on the house staff or the private physician is not satisfactory. A more definite system for notification of donors with positive serologic reactions is necessary as emphasized in a study of serologic reactions for syphilis in blood donors made at Vanderbilt University.

TABLE 7—Methods Used to Notify Positive Donors According to Type of Hospital Control

Type of Hospital Control	Number of Hospitals	Percentage Having No Method of Notifying Donors	Percentage Notifying by Interview	Percentage Notifying by Private or Attending Physician	Percentage Notifying by Letter	Percentage Notifying by Interview and Letter	Percentage Notifying by Other Methods	Total Percentage
Municipal	53	7.7	30.0	3.8	2.0	11.5	0.0	100.0
Private	274	15.7	49.6	20.2	6.4	7.8	0.7	100.0
Denominational	161	17.1	32.9	40.4	1.6	4.8	3.2	100.0
Governmental*	76	6.8	34.0	17.2	14.8	10.8	1.4	100.0
Total	564	12.5	47.1	23.5	7.6	7.6	1.0	100.0

\* Other than municipal.

Hospital in 1937.<sup>3</sup> In July of that year a plan for notification was developed whereby persons who volunteered as blood donors were asked to specify whether or not they wished to be informed of the results of the serologic test in the event of a positive reaction. At the time the specimen of blood was obtained the donor was asked to sign a printed form indicating whether or not he wished to be notified by personal interview or by letter. Duplicate forms were to be made out by the house officer who drew the blood from each donor. This plan failed, since the house officer, owing to lack of time and interest, soon neglected to fill out the forms. During the two and one-half years that this plan was used the house officers were given the entire responsibility for notification, but only very few donors were informed of the result of the test unless a special effort was made on their part to get in touch with the same house officer who drew the blood. Since July 1940 one of us has taken the responsibility for notification of all donors who are found to have a positive or a doubtful serologic reaction for syphilis. All donors are notified by letter or by personal interview. If there is no response to the letter, a visit is made and the need for another blood test is explained to the donor. If the second test gives a positive reaction, the person is referred to his family physician or to a clinic for final diagnosis and treatment. With this plan much better results were obtained.

If hospitals do not have a system for notification of donors, they should be encouraged to report all donors found to have a positive or doubtful reaction as syphilis suspects to the health department. The health department should assist in getting donors with a positive serologic reaction under treatment in the same way in which they are now assisting local draft boards to get a second blood test on registrants found on first examination to have a positive or doubtful reaction for syphilis.

It is felt that if the hospitals of the country will develop a satisfactory system of notification, they will not only contribute to the syphilis control program but

3 Keller, A. E. and Leathers, W. S. Serologic Reactions for Syphilis in Blood Transfusion Donors. *Ven. Dis. Inform.* 20: 59 (Jan) 1939.



they will render a definite service to a large number of persons who are unaware of the fact that they have syphilis

#### SUMMARY

1 A questionnaire was sent to 800 hospitals to determine whether or not blood donors found to have a positive or doubtful serologic reaction for syphilis were notified of the results of the test and how they were notified. Replies were received from 603 hospitals.

2 Of the 603 hospitals 65 per cent did not test blood donors for syphilis before their blood was used.

3 Of the hospitals testing donors for syphilis, 12.5 per cent had no method for notification of the donors found to have a positive or doubtful serologic test.

4 In all 16.2 per cent of the hospitals either did not examine donors for syphilis or did not notify them when the serologic test was found to be positive.

5 The person or agency responsible for notifying donors with a positive serologic reaction and the method of notification varies according to the size of the hospital and the type of administrative control.

6 The findings indicate the need in many hospitals for a more definite system whereby prospective blood donors found to have a positive or a doubtful serologic reaction for syphilis may be notified of the result of the test.

#### ABSTRACT OF DISCUSSION

DR HAVEN EMERSON, New York: When we are looking around for ways of bringing this problem syphilis to people's attention the blood donor system must be recognized as a matter of considerable importance and here we have an instance of the way it can be used and well used with good results. I hope we can get attention for this by the American Hospital Association and other professional bodies concerned with blood banks and well controlled blood donor systems.

DR JOSEPH W. MOUNTAIN, Washington, D. C.: It is astounding that any hospital should accept donors without a blood test. I am surprised to find that a fair proportion are doing so. That prompts me to ask several questions in respect to this group. You have some six hundred hospitals in the group. I am wondering how representative they are of the hospitals of the United States. Do you think that you got the hospitals which showed the best performance? Would the hospitals whose performance was not so good be the ones who would be likely to fail to send back your questionnaire? Have you any information as to what was done with respect to persons who showed positive reactions? Did the hospitals continue to use them as donors or were they rejected? I noticed that they were not notified of having the infection or 10 per cent of them were not. I noticed too that you classified hospitals as follows and I quote: 'municipal, other governmental, private denominational'—and that does not exactly conform to the classification used in the Hospital Register for example of the American Medical Association, which uses the description 'governmental, nonprofit and proprietary.' Is the term 'private' as herein used intended to be synonymous with 'nonprofit,' and is 'denominational' synonymous with 'religious'? If so what becomes of the other group of voluntary hospitals which do not fall within the categories 'private' or 'denominational'? Is there any legal responsibility involved in the failure of the hospital to take what would seem to be reasonable precautions against the transfer of infections?

DR EMERSON: Under the blood betterment it would be impossible to have any blood donor that did not have the blood test before blood was taken.

DR WILLIAM C. WOODWARD, Washington, D. C.: The law, I believe, very generally requires any one who finds that a person who he examines or treats is suffering from syphilis to report that fact to the proper authorities. If such a report states the name of the syphilitic person, surely those authorities get in touch with him, at least unless they are assured that

he is under treatment by some licensed practitioner who has assumed responsibility for the case. If the report describes the syphilitic person only by number—as I believe is sometimes permissible—then he may remain officially anonymous, but only so long as he is known to be under treatment. How is it possible, then, for a blood donor who has been found to have syphilis to remain in ignorance of that fact or to avoid the inconveniences usually associated with it?

DR H. R. O'BRIEN, Hartford, Conn.: Is there not another provision in many states requiring approved laboratories to report to the health department positive Wassermann reactions?

DR EMERSON: If the state system has an approved laboratory.

DR O'BRIEN: In how many states does that arrangement obtain?

DR WILLIAM W. FRYE, Nashville, Tenn.: These problems were brought to our attention several years ago and the present study was undertaken to determine how other hospitals were handling prospective blood donors found to have a positive blood test for syphilis. We too were surprised to find from the survey that there are some hospitals in the United States using blood donors without running a serologic test for syphilis. This question was answered in many instances: 'We do not do blood tests on donors used in this hospital.' This report is based on a geographically representative sample of hospitals taken from the Transactions of the American Hospital Association for 1940. The type of hospital control such as 'denominational,' is the classification used by the American Hospital Association. As to the rejection of donors the donor is often told that his blood is 'no good' or his blood is bad or 'it won't match.' When donors are asked about what they were told they think that all these statements mean that the blood will not match, and they have no idea that the single test indicated that they have syphilis. With regard to legal responsibility certainly a hospital should be responsible for notifying the person. There are a few states which have laws. New York State for example, requiring that all laboratories report positive blood tests to the health department. With regard to Dr Woodward's question the reporting of positive bloods to the government agencies does not solve the donor problem. In most cases the prospective donor is seen only once. If his blood test is doubtful or positive on one examination this is not sufficient evidence to make a diagnosis of syphilis and unless the donor is brought back and checked this is not reported as a case of syphilis. We have found that in many cases in our own hospital the donor had a positive blood and the intern on the case was the only one who knew the result of the test. The donor was never called back and the intern did not report the case as he had only a single blood test, which is not sufficient evidence to make a diagnosis of syphilis. Unless some one in the hospital assumes the responsibility for recheck and notification the donor with the positive test never knows that he may have syphilis. In reporting positive donors to the health department the case is reported from a hospital and it is assumed that the patient is under treatment. With such a method the prospective donor may be reported as a case of syphilis and yet he has never been informed of the fact that he has syphilis. No one has taken the responsibility for getting another blood test or for explaining to the donor the importance of a complete examination and treatment if a definite diagnosis of syphilis is made.

**London Fogs**—OWENS has studied the nature of London fogs and found that the amount of suspended solid particles is proportional to the fog density. He found 1 mg of solid material per cubic meter of air on a clear day as contrasted with 5 mg per cubic meter in a dense fog. The latter figure represents 195 tons of suspended solid material over the area of London. He found the diameter of the solid particles to vary between 0.00013 and 0.00026 mm in diameter. Water to a depth of 0.0014 mm was condensed on the surface of these solid particles. The number of particles present in such polluted air may rise to more than 50,000 per cubic centimeter. Under these conditions about 500 billion particles per day would be inhaled by an adult person.—West, Edward S. *Physical Chemistry for Students of Biochemistry and Medicine*, New York, Macmillan Company, 1942.

THE HAZARD OF PARALDEHYDE  
ADMINISTRATION

CLINICAL AND LABORATORY STUDIES

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A number of fatalities following paraldehyde administration have been reported which invariably have been attributed to an idiosyncrasy. However, analysis of reported autopsy findings, observations in the clinic and laboratory investigations on experimental animals lead to the conclusion that pathologic changes following the intravenous administration of paraldehyde are so definite that its use in this manner is not warranted.

Paraldehyde has gained in popularity because of its convenient applicability to produce unconsciousness. It has been administered orally, rectally and intravenously. The doses recommended have been variable. Indeed there are reports of human tolerance of massive doses. As much as 100 cc has been ingested with recovery.<sup>1</sup> For rectal instillation 30 cc has been recommended in the average adult.<sup>2</sup> Intravenously the injection of fractional doses of 2 to 3 cc until the desired effect is obtained<sup>3</sup> has been advocated. Undoubtedly, rapidity of absorption is a great factor, since deaths have occurred following the ingestion of 25 cc<sup>4</sup> and the rectal injection of 12 cc.<sup>5</sup>

Paraldehyde was first used in Italy by Cervello<sup>6</sup> in 1884 and in England by Strahan.<sup>7</sup> The first report of a death attributable to this drug appeared in 1890.<sup>8</sup> Six teaspoons had been given by mouth to an adult delirious typhoid patient. Five minutes later the patient "fell into an unconscious state" and died four hours later from "failure of the heart's action." Since this early publication there have been numerous reports of instances of so-called paraldehyde poisoning or idiosyncrasy to paraldehyde. Only a few of the reports which included autopsy findings will be reviewed briefly.

MacFall<sup>8</sup> reported the death of a man aged 41 who had ingested about 75 cc of paraldehyde. Autopsy revealed severe congestion of both lungs.

McDougall and Wyllie<sup>9</sup> reported the death of a psychotic woman aged 44 who drank 4 ounces (120 cc) of paraldehyde. In a few minutes she was in profound coma and showed signs of cardiac failure as evidenced by pallor and rapid, thready pulse. Despite restorative treatment with oxygen she died fifty hours later. At autopsy both lungs were deeply congested and there was considerable mucus in the trachea.

Kotz, Roth and Ryon<sup>10</sup> reported the death of a woman aged 31 who was given 31 cc of paraldehyde rectally for obstetric analgesia. She was a healthy woman and had received no other sedative medication. Ten minutes after administration of the paraldehyde the patient was in deep sleep, the respiratory rate having increased from 20 to 40 a minute and the heart rate from 90 to 120. A half hour later she was in coma with cyanosis, labored and rapid respirations and a rapid, irregular pulse. Three hours later auscultation disclosed a loud blowing murmur over the tricuspid area indicative of failure of the right side of the heart. The blood pressure diminished from 148 systolic and 98 diastolic to 118/58 millimeters of mercury. Despite treatment for heart failure (oxygen withdrawal of 250 cc of blood, digifoline intravenously and 100 cc of 25 per cent dextrose intravenously) pulmonary edema developed and the patient died eight hours after the administration of paraldehyde. Findings at autopsy revealed hypostatic congestion with edema of both lungs and severe dilatation of the right side of the heart.

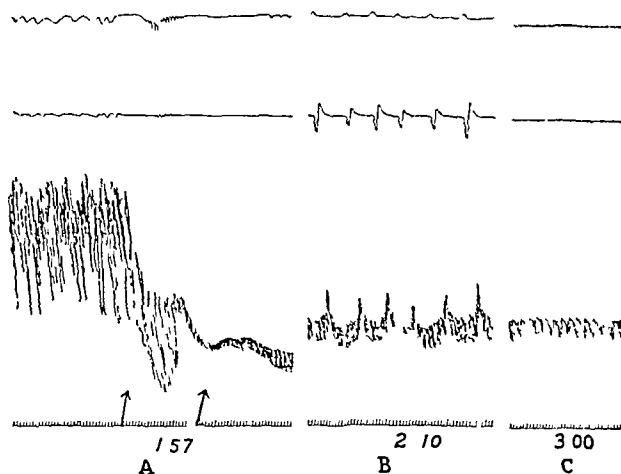


Fig. 1—Records of dog weighing 10 kg from above downward represent thoracic respiratory movements, abdominal respiratory movements, arterial blood pressure and time at intervals of one second. At 4.5 cc of paraldehyde was injected intravenously in twenty-five seconds. Prior to the injection the control respiratory rate was 14 a minute and the arterial blood pressure (under local anesthesia) was 180 systolic and 100 diastolic. During the course of the injection a period of apnea was observed while the blood pressure fell to 110/40 and soon reached a level at 60/48. In strip B thirteen minutes after the injection the animal was in second plane surgical anesthesia. The respiratory rate had increased to 120 a minute with very shallow excursions. The abdominal respiratory record showed definite reciprocal abdominal contractions which occurred every eight or nine seconds. The arterial blood pressure was 80/60. In strip C fifty minutes later the animal had regained consciousness and reacted to all forms of stimuli but respirations remained rapid (over 200 a minute) and shallow. Arterial blood pressure still remained at 80/60 (a fall of 55 per cent from the control reading). This animal died eighteen hours later of acute pulmonary edema with dilatation of the right side of the heart.

A case analogous to the one just cited was reported by Shoor.<sup>11</sup> Twelve cc of paraldehyde in 6 cc of benzyl alcohol and 30 cc of isotonic solution of sodium chloride was administered rectally to a healthy obstetric patient aged 21. Three and one-half hours later the patient was cyanotic and comatose. Respirations were 48 a minute and labored, the pulse rate was 148 a minute and irregular and the arterial blood pressure had fallen from 130/90 to 96/56. Despite oxygen therapy and cardiac supportive measures pulmonary edema ensued and the patient died twenty-one and one-half hours after the administration of paraldehyde. Autopsy revealed acute pulmonary congestion and edema.

10 Kotz, Jacob, Roth, G. B. and Ryon, W. A. Idiosyncrasy to Paraldehyde. *J. A. M. A.* **110**: 2145 (June 25) 1938.

From the Division of Surgery, Department of Anesthesia, New York University College of Medicine.

Read before the Section on Anesthesiology at the Ninety Third Annual Session of the American Medical Association, Atlantic City, N. J., June 12, 1942.

1 Underhill, F. P. Toxicology, revised by Theodore Koppanyi, ed. 3 Philadelphia: P. Blakiston's Son & Co. 1936, p. 233.

2 Kotz, Jacob and Katzman, Solie. Management of Obstetrical Patient with Paraldehyde. *Anesth. & Analg.* **16**: 301 (Nov-Dec) 1937.

3 Beruchemin, J. A., Springer, R. G. and Elliott, G. A. Intravenous Anesthesia with Paraldehyde. *M. Times & Long Island M. J.* **63**: 179 (June) 1935.

4 *Lancet* **2**: 243, 1890.

5 Shoor, Mervyn. Paraldehyde Poisoning. *J. A. M. A.* **117**: 1534 (Nov. 1) 1941.

6 Cervello, V. Recherches cliniques et physiologiques sur la paraldehyde. *Arch. ital. de biol.* **6**: 113, 1884.

7 Strahan, S. A. K. Paraldehyde Administration. *Lancet* **1**: 201, 1885.

8 MacFall, J. E. W. Paraldehyde Poisoning. *Brit. M. J.* **2**: 255 (Aug. 8) 1925.

9 McDougall, J. and Wyllie, A. M. Fatal Case of Paraldehyde Poisoning with Postmortem Findings. *J. Ment. Sc.* **78**: 374 (April) 1932.

## REPORTS OF CASES

## Two fatalities are here reported

**CASE 1**—A man aged 58 was to undergo an endothermic resection of a carcinoma of the cheek and excision of the cervical glands. Several months previously a similar resection had been performed during chloroform anesthesia. The use of intravenous paraldehyde was proposed for the second operation because of the supposedly greater safety of the latter drug. Morphine sulfate  $\frac{1}{4}$  grain (0.01 Gm) and scopolamine hydrobromide  $\frac{1}{10}$  grain (0.0004 Gm) was administered subcutaneously at 1:30 p.m. At 2:45, just prior to anesthetization, the patient's arterial blood pressure was 140/90, pulse rate 82 a minute and respiratory rate 18 a minute. At 2:57 intravenous injection of paraldehyde was started. Twenty-three cc was injected in nine minutes when the patient appeared to be in second plane anesthesia but operation could not be started because of coughing. Five cc more was injected in thirty seconds. The arterial blood pressure had fallen to 100/80 with a pulse rate of 100 a minute. The patient however was not sufficiently anesthetized and another 5 cc was injected in thirty seconds. This was further complicated by attacks of coughing so that additional injections of 4 cc of paraldehyde in thirty seconds, followed by 3 cc in twenty seconds were administered. This made a total of 35 cc of paraldehyde before the patient appeared ready for operation. At this time the patient's blood pressure was still 100/80, the pulse rate 96 a minute and the respiratory rate 56 a minute. An endotracheal tube was passed by the nasal route to assure a patent airway and operation was begun and completed in thirty-five minutes. At this point the patient seemed to be recovering from his anesthesia, as evidenced by roving eyeballs, swallowing, coughing and responding to supraorbital pressure. The patient was nevertheless returned to the ward with the endotracheal tube in place. The tube was removed at 5:40 when the patient had regained his reflexes and maintained a patent airway. The pulse rate was then 114 a minute and respirations were 36 a minute. At 7:10 the patient became cyanotic. Oxygen by nasal catheter and an intravenous infusion of 1,000 cc of 5 per cent dextrose in isotonic solution of sodium chloride were started. The patient died at 8:45 despite artificial respiration with oxygen for the last twenty minutes. Permission for a postmortem examination was not obtained.

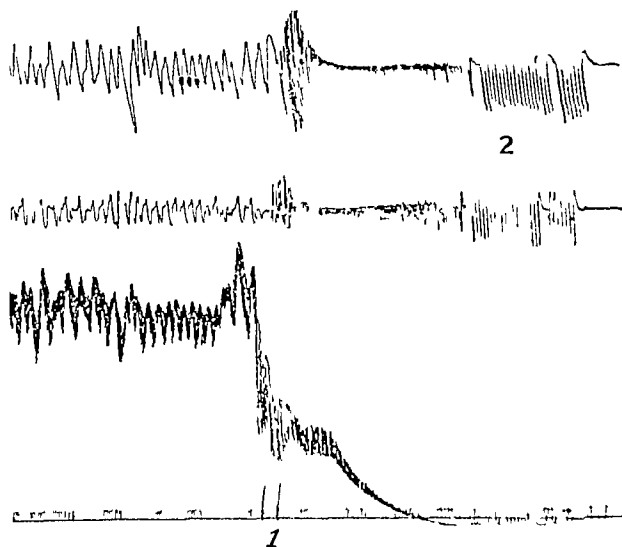


Fig 2—Records of dog weighing 14 Kg from above downward represent thoracic respiratory movements, abdominal respiratory movement, arterial blood pressure and time at intervals of one second. At 1:7 cc of paraldehyde was injected intravenously. The respiratory rate increased from 16 to 72 a minute while the arterial blood pressure previously recorded under local anesthesia fell abruptly to the zero level. Artificial respiration immediately instituted at 2 was valueless.

**CASE 2**—An obese white man aged 38 presented signs of acute peritonitis. His condition was complicated by delirium tremens. Celiotomy under ether anesthesia disclosed pan-

creatitis. Eighteen hours after the operation signs of alcoholic encephalopathy developed characterized by irrationality and delirium tremens. Morphine was ineffective as a sedative. Paraldehyde was then ordered, 15 cc to be administered by mouth every six hours. The first two doses had little or no effect in quieting the patient. A third dose was given in the



Fig. 3—Showing pulmonary hemorrhages in the right side of the heart

evening, but restraint was still necessary. Three hours after the third dose of paraldehyde the patient was found dead in bed. At autopsy severe pulmonary congestion was observed.

In the reported fatalities following administration of paraldehyde death occurred by the development of acute failure of the right side of the heart and autopsy showed pulmonary congestion with edema and dilatation of the right side of the heart. That these pathologic complications were not a coincidence was borne out by studies on experimental animals.

## EXPERIMENTATION

To evaluate the effects of intravenous paraldehyde on the cardiovascular and respiratory systems, 28 dogs, 36 cats and 24 rabbits were used.

In the dogs, control arterial blood pressure readings were recorded by cannulating a femoral artery under local anesthesia with 2 per cent procaine hydrochloride. Control respiratory movements were obtained by applying pneumographs to register thoracic and abdominal movements. No sedative or other medication was used. Paraldehyde 0.5 cc per kilogram, was then administered intravenously at the rate of 1 cc in five seconds. Under these conditions, 16 of the 24 dogs displayed general anesthesia lasting seventeen to sixty-four minutes (group 1), while the other 8 died within five minutes (group 2).

In group 1 the same sequence of events affecting the cardiovascular and respiratory systems was repeatedly reproduced and is illustrated in figure 1. The arterial blood pressure fell abruptly during the injection of paraldehyde to attain a level averaging a reduction of more than 50 per cent of the control level. This low level was maintained during the anesthetic phase and returned after the animal regained consciousness. The heart rate showed a compensating tachycardia from 80 to more than 200 a minute. Respiratory changes were likewise consistent. Immediately after injection of paraldehyde there was apnea for several seconds. This was followed by rapid, shallow respira-

11 The paraldehyde used was obtained from the Bellevue Hospital Pharmacy from the supply used routinely for clinical patients.

tions, the rate increasing from 14 to 20 to as much as 200 a minute while the minute volume decreased sharply. Accessory muscles of respiration were used often, especially the abdominal muscles. Coughing occurred frequently. Cyanosis, which became progressively more intense, was noted, determinations of the oxygen of the arterial blood showed a reduction from 17.3 to 8.8 volumes per cent. The majority of the animals in this group (11 out of 16) died six to twenty-four hours after anesthesia. Autopsy revealed acute pulmonary edema with multiple areas of gross hemorrhage in both lungs, dilatation of the right side of the heart and congestion with edema of all the viscera.

The remaining 5 animals in this group survived but looked weak and had anorexia. Three of them died within two weeks and autopsy revealed multiple pulmonary hemorrhage.

In the second group of 8 dogs which died within five minutes after paraldehyde injection the respirations rapidly increased in rate while the arterial blood pressure fell precipitously (fig 2). Respiratory and circulatory collapse appeared simultaneously. An attempt at immediate artificial respiration by rhythmic pulmonary inflation of oxygen through a tube passed into the trachea was of no avail. Autopsy revealed massive diffuse pulmonary hemorrhages and dilatation of the right side of the heart distending the pericardial sac. To obtain a better knowledge of what occurred, paraldehyde was injected intravenously in a group of 6 dogs and 6 cats whose chests were opened in the midline so as to expose the heart and lungs. This was done under light anesthesia with soluble pentobarbital and artificial respiration maintained by rhythmic inflation of air through a tracheal tube.

Kodachrome motion pictures were made in two of the experiments. It was observed that immediately following the injection of paraldehyde the lungs suddenly blanched while the right side of the heart, both the ventricle and the auricle dilated. The left ventricle contracted forcefully for a short time while the lungs

To obviate a species susceptibility, similar experiments were repeated on 36 cats and 24 rabbits with identical results. It was further determined that the minimum anesthetic dose (smallest dose that produced anesthesia) when paraldehyde was administered intravenously was 0.3 cc per kilogram of body weight in

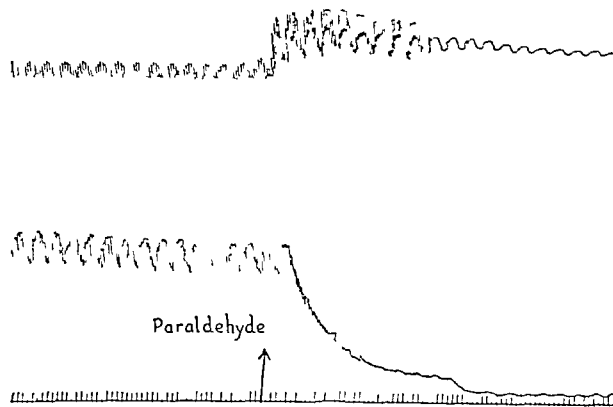


Fig 5—Upper record of myocardiogram of dog weighing 12 kg. Middle record arterial blood pressure. Bottom record the time at intervals of one second. Following the injection of 6 cc of paraldehyde intravenously the myocardiogram showed definite cardiac dilatation.

all 3 animal species. The minimum lethal dose (dose at which 50 per cent of the animals died) was found to be 0.45 cc per kilogram in cats and rabbits and 0.50 cc per kilogram in dogs. These figures represent a low margin of safety.

#### SUMMARY

Paraldehyde administered intravenously is not as safe as is generally believed.

Autopsy findings in reported clinical fatalities are similar to those reproduced in experimental animals: namely dilatation of the right side of the heart with pulmonary hemorrhages and edema.

Clinically, these fatal complications are preceded by signs of acute failure of the right side of the heart.

Experimentally the rapid development of cardiac dilatation and pulmonary hemorrhages can be observed in the open chest following administration of intravenous paraldehyde.

477 First Avenue

#### ABSTRACT OF DISCUSSION

DR RALPH T. KNIGHT, Minneapolis: Dr Burstein has done a service in collecting these case reports of others, presenting the informative details of the 2 cases which were available to him and following them through with corroborating animal experimental evidence of the mechanism of death by paraldehyde. His finding of the extremely low margin of safety between the minimum anesthetic dose and the minimum lethal dose is especially noteworthy and should be well considered by any one who contemplates using this drug. Probably few members of this section have had occasion to use paraldehyde. It was used by a good many in the latter part of the last century and in very recent years we have been reminded of its availability and serviceability. The uses for which it has been especially advocated are, first the control of alcoholic and psychotic confusion and delirium states and second, the control of anxiety and distress during the first stage of labor. These uses call for an amnesic or hypnotic rather than an anesthetic. Possibly, if the clinical employment of paraldehyde is confined to this mild effect and larger doses with their more potent effects are meticulously avoided, the margin of safety may be much wider. Still one must heed the warning voice by Dr Burstein. Obstetric analgesia and anesthesia are relatively much less satisfactory than our present methods.



Fig 4—Dilatation of the right side of the heart

began to be mottled by areas of hemorrhage which increased steadily in size. After three to five minutes cardiac arrest supervened. Figure 3 shows the pulmonary hemorrhages and figure 4 the cardiac dilatation observed in one experiment. Figure 5 is a graphic representation of the cardiac dilatation obtained by means of a myocardiograph.

results in surgical anesthesia. In their desire to improve their obstetric service many may still be tempted to explore the clinical possibilities of paraldehyde. In public hospitals, especially with limited budgets for more expensive drugs, this may be true. My only use of paraldehyde has been in the Minneapolis General Hospital, where it has been employed only for control of unmanageable alcoholic and psychotic patients on their admission. It has then been administered intravenously in doses of 2 to 8 cc., just sufficient in each case to obtain relative quietness. I believe that no more than 10 cc. has ever been injected at this hospital. We have had no fatalities, but in the last two years other resources have displaced this method. The impressive warning is that the pathologic condition which causes death, as shown by Dr. Burstein, develops not necessarily at once but during a period of time following anesthesia, and there is no criterion while we are administering the drug to tell us whether or not we still have given too little to cause the fatal changes. If one employs it one must do so after weighing the possibilities and deciding that, under the individual circumstances, it is still the most serviceable choice. It is a little difficult to think up illustrative instances in which this would be true. I should like to ask Dr. Burstein whether he believes that the initial toxic effect is on the capillaries and tissues in both the lungs and the heart or whether the pathologic condition in either one is secondary to the failure of free circulation of blood through the other.

DR. C. L. BURSTEIN, New York. In answer to the question of Dr. Knight on the toxic effect, whether it is on the capillaries or on the tissue itself, I have done several experiments, as yet unpublished, which lead me to believe that paraldehyde is a capillary poison. I have also done other experiments, such as injecting paraldehyde, not intravenously, but into the left ventricle, and in those experiments no pulmonary hemorrhages were observed but the animals died promptly, probably from some cerebral accident.

## THE USE OF PROGESTERONE IN THE TREATMENT OF POST- PARTUM PSYCHOSIS

HARRY J. SCHMIDT, M.D.  
CONVENT, LA.

A review of the literature shows that this condition occurs in every 400 to 1,000 deliveries. The variation of the figures is due to the fact that there is no line of demarcation between extreme nervousness with minor changes and a definite psychosis. Statistics show that postpartum psychosis constitutes about 10 per cent of the female admissions to the psychopathic hospitals.

The duration of the condition is from several weeks to eight months, the prognosis for ultimate recovery in the true postpartum psychosis being good.

The cause of this psychosis is as yet a matter of speculation and theory. No common findings are noted among the case reports. Psychogenic factors are not always present. Infection, shock and difficult labors are not constantly found. As a rule there is no evidence of toxemia. The literature is confusing and contradictory, indicating that the real cause is as yet unknown. The definite predisposing factor is delivery.

The nature of the psychosis indicates that the condition is definitely a clinical entity. No record was found of a postpartum psychotic patient ever developing a psychosis subsequently from any of the numerous stresses and strains of a lifetime. The favorable prognosis for ultimate recovery and the common recurrence of the psychosis following subsequent pregnancies indicate that the condition is probably due to some distur-

bance of a physiologic nature resulting from the sudden termination of pregnancy. Complete recovery without specific therapy in a period of weeks or months tends to prove definitely that some readjustment is accomplished with time.

The symptom complex of the psychosis varies with each person, the whole gamut of psychiatric illnesses being observed in these patients. The detailed classification of the psychiatrist is based solely on the behavior of the individual and is purely symptomatic. It has no important bearing on either the cause or the treatment.

### REPORT OF CASE

A white woman aged 21 was seen throughout the pregnancy. It was noted that she was unusually quiet and calm, especially for a first pregnancy. The patient was healthy, well adjusted for married life and very desirous of a child. She was advised to go to a hospital for delivery because the pelvic measurements were slightly under normal, although no grave difficulties were expected. She was delivered in a state hospital by low forceps with episiotomy. The labor was normal and of ten hours' duration. There were no complications of the puerperium, and the patient was discharged on the fifth day.

Two days after her return home she developed noticeable nervousness, suffered from insomnia and eventually became hysterical. The condition became progressively worse, and the patient developed a definite psychosis. She was readmitted to the same hospital to a gynecologic service. A pelvic examination showed no abnormal findings, and she was discharged within twelve hours.

The following day she became irrational, had convulsive seizures and was admitted to the neuropsychiatric ward. The case was completely worked up with a diagnosis of postpartum psychosis-schizophrenia.

The physical and neurologic examinations disclosed no abnormalities. The essential laboratory findings showed nothing of importance. The family history revealed that a married sister became somewhat nervous after pregnancy. The mental status of the patient was recorded as follows: "Behavior: general excitement, constant stream of talk. Flight of ideas, mostly about religion. Mood: sadness. Conduct: feeling of guilt, thinks she is going to Heaven. Sensorium: disoriented as to time and place." It was necessary to restrain the patient, she refused to eat, and nourishment was given through a tube. Infusions were also used. In a febrile period the temperature went as high as 103 F., the cause of which could not be determined. During this time the patient had a profuse uterine hemorrhage which was almost fatal. Several transfusions were given. The patient eventually recovered without specific treatment and was discharged as apparently normal after a stay of five weeks in the hospital.

Two weeks after her return home she again developed the psychosis. On the fifth day she began menstruating, and the psychosis cleared up one week after the period. For two weeks she was apparently normal, attending her household duties and going about as usual. At the end of the two weeks the psychosis returned. She again menstruated on the fifth day, and the psychosis terminated one week after the menstrual period. On the third month the psychosis advanced five days and suddenly disappeared with the advent of menstruation. The onset of the psychosis could be noted several days in advance by slight irritability, otherwise the patient was apparently normal during the sane phases.

The cyclic recurrence of the psychosis in the latter half of the menstrual cycle suggested that the condition had some relationship with the hormone balance. This explanation appeared to be most logical and the institution of endocrine therapy was begun at ovulation. Progesterone<sup>1</sup> 1 mg. was given daily for the first three days. At this time the patient showed signs of increasing nervousness and irritability, fore-

<sup>1</sup> The majority of the progesterone used in this case was furnished in the form of progesterone by the C. W. Carrick Company.

casting the probable onset of the psychosis. The dose of progesterone was then increased to 10 mg daily, with immediate effect on the symptoms. The nervousness and irritability disappeared, the patient became more quiet and calm and continued so with the daily injections. In spite of the dread of the hypodermics, the patient readily admitted that the injections had a most "soothing effect." The cumulative action of the hormone was very apparent. There was practically a minor change of personality. The patient became more congenial and developed an intense interest in both household duties and other diversions. Her mental acumen was far superior to that noted in any of the normal phases since the onset of the psychosis. There was no indication of the recurrence of the psychosis. The 10 mg doses of the drug were continued until two days before the expected menstrual period. The period was delayed three days and was normal in all respects. During the injection of progesterone no sedatives or other medications were given.

## COMMENT

As this entity was assumed to be of endocrine origin and satisfactory results were obtained with the use of progesterone, the rationale of treatment should be discussed. During pregnancy, progesterone is furnished by the corpus luteum for the first two or three months. At this time the function is taken over by the placenta.<sup>2</sup> The specific action of the hormone is to protect the pregnancy. This is accomplished by suppressing<sup>3</sup> or modifying<sup>4</sup> uterine contractions due to its nullifying effect on the pituitary oxytocic hormone.<sup>5</sup> There is definite clinical evidence that the hormone has other less important roles. Improvement has been observed in psychosis of pregnancy by the administration of this hormone. Other clinical disorders were effectively relieved by its use. I have noted that the patients who have uterine contractions during the latter months of pregnancy, indicating a deficiency of the hormone, are always of nervous temperament. There is definite indication from clinical observations and from the actual administration that the hormone has some sedative action either directly or indirectly on the central nervous system. During pregnancy large amounts of the hormone are furnished by the placenta. Duyvene de Wit and Oppers<sup>6</sup> found that a placenta weighing 480 Gm contained 640 micrograms of progesterone, whereas a mature menstrual corpus luteum contained about 16 micrograms.

Since the predisposing cause of postpartum psychosis is the termination of pregnancy, one may well consider the events that take place at that time. The patient is deprived of the baby and the placenta. The loss of the former definitely relieves the patient of an added burden. It should be quite significant that the sudden removal of the placenta, which has been furnishing the patient with a superabundance of progesterone, would not be unlikely to cause a disturbance of the hormone equilibrium. During pregnancy the patient becomes adjusted to the gradual change of ratio between the hormones, the progesterone becoming physiologically

increased to serve its purpose. At the termination of pregnancy the patient is suddenly and abruptly deprived of a large store of progesterone, thus disrupting the hormone balance.

Frank<sup>7</sup> in 1931 originally pointed out the imbalance between the estrogenic and corpus luteum hormones. He suggests that "it would thus appear that the continued circulation of an excessive amount of female sex hormone in the blood may in labile persons produce serious symptoms, some cardiovascular, but the most striking, definitely psychic and nervous." Since the corpus luteum hormone is concerned in the metabolism of estrogens, accelerating the excretion of estrogenic hormone,<sup>8</sup> the sudden loss of the placenta would result in an excess of estrogenic hormone in the circulation.

It must be admitted that a psychosis may result from a hormone imbalance, as minor mental changes have frequently been noted in premenstrual tension. Israel<sup>9</sup> suggests that "premenstrual tension is caused by the presence of unantagonized estrogen. This implies that the primary cause is deficient ovarian luteinization with decreased production of progesterin." An analogous condition exists following pregnancy, the cause being more apparent than can be explained during the menstrual cycle. This greater disturbance of the hormone balance post partum probably accounts for the more serious mental changes, namely the definite psychosis. A periodic postpartum psychosis may be considered in the same category as an extreme premenstrual tension.

A suitable explanation of why a given patient should develop the psychosis may be found with further study along these lines. It might be interesting to note the significance of the weight of the placenta. The key to the solution may possibly be concerned with the excretory rate of the hormones. Frank<sup>7</sup> also noted in 1931 that "a comparatively small amount of female sex hormone may produce striking effects in a given person if the renal excretory level is high."

Furthermore, the relationship of the corpus luteum to the adrenal cortex may be of some importance. Progesterone has been isolated from the adrenal cortex in considerable quantities.<sup>10</sup> In reporting a series of psychiatric cases, Hoff and Shaby<sup>11</sup> stated that in 4 cases of mental confusion following the puerperium there was good response to the administration of adrenal cortex extract.

The case reported appears to be typical of the condition presenting the usual causes considered by the psychiatrist. Yet the periodic return of the psychosis associated with the menstrual cycle would definitely rule out the commonly supposed causes. The profuse hemorrhage has been noted in a number of the cases reported and occurred in 2 other cases to my personal knowledge. The rather frequent occurrence of the hemorrhage suggests somewhat that the causation is of endocrine origin. The case reports are meager and offer no information of value from the point of view of endocrinology. One report mentioned a cyclic recur-

2 Jones H W and Weil P G. The Corpus Luteum Hormone in Early Pregnancy. *J A M A* **111** 519 (Aug 6) 1938.

3 Krohn L, Lackner J E and Soskin S. Effect of Ovarian Hormones on Human (Nonpuerperal) Uterus. *Am J Obst & Gynec* **34** 379 (Sept.) 1937.

4 Wilson Leo and Kurzrok Raphael. Action of Estradiol Progesterone and Testosterone on Contractions of Human Uterus. *Endocrinology* **26** 587 (April) 1940.

5 Falls T H, Lackner J E and Krohn Leon. Effect of Progesterin and Estrogenic Substance on Human Uterine Contractions. *J A M A* **106** 271 (Jan 25) 1936.

6 Duyvene de Wit J J and Oppers V M. Considerations on Removal of Corpus Luteum Verum During Early Pregnancy and Progesterone Content of This Organ and of Mature Placenta. *Nederl tijdschr geneesk* **83** 4001 (Aug 12) 1939. *abstr J A M A* **113** 1846 (Nov 11) 1939.

7 Frank R T. Hormonal Causes of Premenstrual Tension. *Arch Neurol & Psychiat* **26** 1053 (Nov.) 1931.

8 Pincus G. Biogenesis of Primary Sex Hormones. Fate of Estrins Injected into Rabbit. *J Gen Physiol* **20** 879 (July) 1937.

9 Israel S L. Premenstrual Tension. *J A M A* **110** 1721 (May 21) 1938.

10 Wolf William. *Endocrinology in Modern Practice* ed 2 Philadelphia W B Saunders Company 1939.

11 Hoff H and Shaby J A. Suprarenal Cortical Extract in Acute Confusional States. *Lancet* **I** 27 (Jan 6) 1940.

ience of the psychosis but did not furnish any menstrual data. Kraines,<sup>12</sup> in discussing this condition, states that, "in those patients wherein the menstrual period is associated with emotional disturbances, testosterone propionate has been found useful." The action of this hormone would be the same as that of progesterone as regards their relationship to the estrogenic hormone. Physiologically progesterone would be the indicated hormone for treatment.

In the 2 other cases familiar to me the psychosis persisted for eight months, during which time menstruation did not occur. It is quite likely that the reestablishment of the menstrual cycle in the case reported was responsible for the psychosis becoming periodic. It may be suggested that in the treatment of the continuous psychosis an attempt be made to reestablish the menstrual cycle by the use of the suitable endocrine therapy, large doses of progesterone being given during that particular phase. The rationale for this is quite apparent.

Time may prove the importance of the corpus luteum hormone in this as well as in other conditions. It no doubt plays the principal role in keeping the patient stable and probably accounts for the feeling of well-being experienced by some during pregnancy as compared to a nervous tension in the nonpregnant state. It is the probable cause for the absence of migraine during pregnancy. The use of the hormone is certainly indicated for the control of minor emotional disturbances frequently noted following delivery. The early use of it may prevent the development of a psychosis. Progesterone may be of definite value in the treatment of certain psychopathic conditions not associated with pregnancy.

In a review of the literature I was unable to find any case report in which the corpus luteum hormone was used as specific therapy for postpartum psychosis. Realizing that 1 case does not constitute definite proof, I submit this report with my impressions so that more complete work may be done by the men who care for these unfortunates, so badly treated by nature.

#### SUMMARY

The constant precipitating factor and the favorable prognosis for recovery indicate that postpartum psychosis is a clinical entity and is due to some disturbance of a physiologic nature resulting from the sudden termination of pregnancy.

The recurrence of the psychosis associated with the menstrual cycle in the case reported suggested that the condition had some relationship with the hormone balance. The most probable disturbance of the balance would likely be due to the sudden loss of a superabundance of progesterone furnished by the placenta. Excellent results were obtained by the administration of this hormone.

The loss of a large amount of progesterone at delivery and its accepted relationship to premenstrual tension indicate that the psychosis probably results from an excess of this estrogenic hormone in the circulation.

It is suggested that adequate dosage of progesterone be used in the treatment and that the menstrual cycle be reestablished if necessary.

## Clinical Notes, Suggestions and New Instruments

### 'CABLE RASH'—A NOTE ON A NEW CLEANSING MIXTURE

GEORGE E. MORRIS, M.D. AND IRVING R. TABERSHAW, M.D. BOSTON

"Cable rash" or "Halowax dermatitis" has been known to the medical profession for more than twenty-five years. Yet in this period of war as in 1918, cases are being seen of intractable 'chloracne' occurring in navy yard workers along both seacoasts despite the use of the most modern protective creams and ointments. This type of dermatitis is seen also in those engaged in the manufacture of the chlorinated naphthalenes and diphenyls, as well as in men in other occupations



Fig. 1—Halowax spots before cleansing

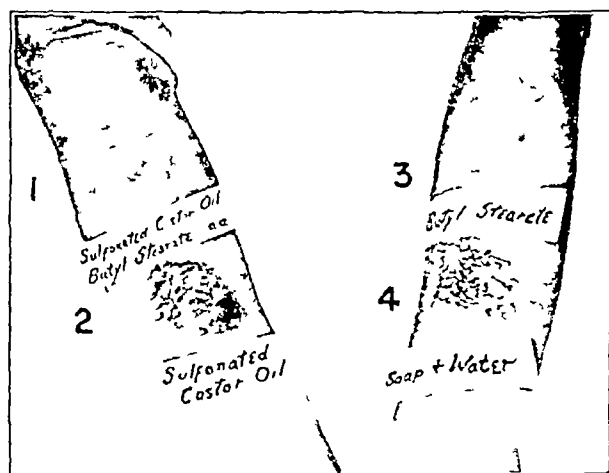


Fig. 2—1 comparative results of cleansing with mixture described; 2 sulfonated castor oil—note Halowax still present on skin; butyl stearate followed by soap and water; and 4 soap and water—note Halowax still on the skin.

in which these substances are employed. Such cable rashes are thought to be due at least in part to the blocking of the pores by the synthetic waxlike substances whose tumesolidity when they reach the skin. Acute yellow atrophy of the liver has been described as occurring from these chlorinated substances, but the present brief note is not concerned with this phase of their toxicity.

We feel that the removal of all the solid waxlike particles from the skin at the end of each work period would probably prevent the occurrence of this type of dermatitis. With this in mind we have experimented with the removal of these substances from the skin.



A black chlorinated naphthalene (Hilowax) was dissolved in chloroform and rubbed into the skin. Various mixtures of soaps, wetting agents and organic solvents were tried, and from the beginning it was obvious that soap and water would not completely remove the wax from the skin. It was finally found that butyl stearate would remove the wax from the pores, this could then be washed off with soap and water, leaving the skin clean. Since this involved two maneuvers, namely, first rubbing the oil well into the skin and then washing with soap and water, it was deemed more practical to evolve a one maneuver cleansing agent.

Such an agent consists of

	Gm or Cc
White corn meal	50.0
Butyl stearate	22.5
Sulfonated castor oil (75 per cent oil)	22.5
Oleic acid	5.0

Mix the oils together and then add the corn meal

This mixture is to be rubbed onto the skin and then removed with water. The procedure should be repeated. Butyl stearate has been found to be a bland, nonirritating substance, and no cases of dermatitis from its use have been reported. At room temperature it is a clear, colorless odorless, stable oil with a chemical formula  $C_{18}H_{35}O_2$ . At a temperature below 68 F it is a solid waxlike substance. It is important to use castor oil which contains 75 per cent of sulfonated oil and 25 per cent of inert material, for oils with greater percentages of inert materials have been found less effective. The accompanying illustrations show the efficacy of this method as compared with the use of soap and water alone or of sulfonated castor oil alone. We suggest that this mixture be tried as a cleansing agent both by workers before the acne develops and by those suffering from the disease.

23 Joy Street

## Council on Pharmacy and Chemistry

### PRELIMINARY REPORT OF THE COUNCIL

THE COUNCIL HAS AUTHORIZED PUBLICATION OF THE FOLLOWING PRELIMINARY REPORT  
AUSTIN E SMITH M.D. Secretary

#### STAPHYLOCOCCUS TOXOID (DIGEST-MODIFIED)-LEDERLE

Staphylococcus Toxoid (Digest-Modified) Lederle was presented by Lederle Laboratories, Pearl River N.Y. as staphylococcus toxin treated with pepsin until it will no longer hemolyze rabbit erythrocytes or produce necrosis in the skin of a susceptible rabbit, for the prophylaxis or treatment of infections caused by the staphylococcus. The firm submitted labels, package insert and advertising circular and a galley proof of an article entitled "Staphylococcal Toxoid Prepared by Peptic Digestion" by I. A. Parfentjev, Frances L. Clapp and A. Waldschmidt, which, when presented by the firm, was to appear in the *Journal of Immunology*.

The firm claims that the use of peptic digestion of staphylococcus toxin decreases the possibility of allergic reactions and allows increased dosage of staphylococcus toxoid with less local or general reaction. However, the amount of evidence submitted at the time of presentation does not appear to warrant these claims, and further investigation seems advisable.

In view of this, the Council voted to issue a preliminary statement asserting that at the present time there is insufficient evidence to warrant acceptance of Staphylococcus Toxoid (Digest-Modified)-Lederle for inclusion in New and Nonofficial Remedies as it appears to be an unessential modification of a toxoid for which the firm is already licensed, but that further consideration will be given to this particular preparation when additional evidence is available.

### NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

AUSTIN E SMITH M.D. Secretary

**DEXTROSE** (See New and Nonofficial Remedies, 1942, p. 418)

The following products have been accepted  
**PACIFIC COAST STERILE SOLUTIONS CO., LOS ANGELES**

**Dextrose 5% W/V in Distilled Water** 1,000 cc bottles  
Each hundred cubic centimeters contains 5 Gm. of dextrose

**Dextrose 10% W/V in Distilled Water** 1,000 cc bottles  
Each hundred cubic centimeters contains 10 Gm. of dextrose

**Dextrose 5% W/V in Isotonic Sodium Chloride Solution** 1,000 cc bottles  
Each hundred cubic centimeters contains 5 Gm. of dextrose and 0.9 Gm. of sodium chloride U.S.P.

**Dextrose 10% W/V in Isotonic Sodium Chloride Solution** 1,000 cc bottles  
Each hundred cubic centimeters contains 10 Gm. of dextrose and 0.9 Gm. of sodium chloride-U.S.P.

**THEOPHYLLINE WITH ETHYLENEDIAMINE**  
(See New and Nonofficial Remedies, 1942, p. 332)

The following additional dosage forms have been accepted  
**H. E. DUBIN LABORATORIES, INC., NEW YORK**

**Ampules Solution Aminophyllin** 0.48 Gm. in 20 cc

**Tablets Aminophyllin** 0.2 Gm. (3 grains)

**Tablets Aminophyllin** 0.2 Gm. (3 grains) (Enteric Coated)

**VITAMIN A** (See New and Nonofficial Remedies, 1942, p. 539)

The following product has been accepted

**WHITE LABORATORIES, INC., NEWARK, N. J.**

**White's Oleo-Blend Vitamin A Capsules** Each capsule contains 25,000 U.S.P. units of vitamin A derived from fish liver oils

**ASCORBIC ACID-U.S.P.** (See New and Nonofficial Remedies 1942, p. 564)

The following dosage forms have been accepted

**WALKER VITAMIN PRODUCTS, INC., MOUNT VERNON, N. Y.**

**Tablets Ascorbic Acid** 25 mg., 50 mg. and 100 mg.

**ISOTONIC SOLUTION OF SODIUM CHLORIDE**  
(See New and Nonofficial Remedies, 1942, p. 425)

The following product has been accepted

**PACIFIC COAST STERILE SOLUTIONS CO., LOS ANGELES**

**Isotonic Solution of Sodium Chloride** 1,000 cc bottles  
Each hundred cubic centimeters contains 0.9 Gm. of sodium chloride-U.S.P.

**NICOTINIC ACID-U.S.P.** (See New and Nonofficial Remedies 1942, p. 561)

The following dosage forms have been accepted

**WALKER VITAMIN PRODUCTS, INC., MOUNT VERNON, N. Y.**

**Tablets Nicotinic Acid** 20 mg., 50 mg. and 100 mg.

**SODIUM ASCORBATE** (See THE JOURNAL, July 10, 1942 p. 883)

The following dosage form has been accepted

**GEORGE A. BREON & CO., INC., KANSAS CITY, MO.**

**Ampul Solution Sodium Ascorbate** 500 mg. in 10 cc

**SULFANILAMIDE** (See New and Nonofficial Remedies, 1942, p. 142)

The following dosage form has been accepted

**HORTON & CONVERSE, LOS ANGELES**

**Sulfanilamide Tablets** 0.324 Gm. (5 grains)

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SATURDAY, JANUARY 16, 1943

## POLIOMYELITIS INHIBITION

The possibility of aborting experimental poliomyelitis in monkeys by the prophylactic or therapeutic injection of a second neurotropic virus has been suggested by Jungeblut and Sanders<sup>1</sup> of the Department of Bacteriology, Columbia University. Two years ago they adapted the New Haven strain of poliomyelitis virus to white mice by intermediary passage through cotton rats<sup>2</sup>. Thus adapted the virus lost most of its original pathogenicity for monkeys. When it was injected intravenously into monkeys the murine virus was electively localized in the central nervous system, where it persisted for relatively long periods of time without producing symptoms. On recovery from this subclinical infection the monkeys had hardly any acquired immunity against subsequent inoculation with virulent strains of poliomyelitis. This nonpathogenic mutant of virus from monkeys has been propagated for two hundred passage generations in mice, during which time it has increased a thousand fold in pathogenicity for mice with further loss of its immunizing potential for monkeys<sup>3</sup>. The murine virus is readily cultivated in embryonic mouse brain-serum ultrafiltrate<sup>4</sup>. Among their early observations there was suggestive evidence of a strong biologic antagonism between this murine mutant and the virulent parent strain of the virus.

The occurrence of antagonisms between microorganisms is interesting. As far as bacteria are concerned the antagonistic action is usually attributed to specialized enzymes, such as pyocyanase or gramicidin. Virus antagonisms, however, are apparently determined mainly by biologic reactions of tissue cells of the host. Thus the yellow mosaic virus, a mutant of the common

light green mosaic disease of tobacco, will not propagate within (or is not propagated by) tobacco tissue cells already infected with the common mosaic disease<sup>5</sup>.

Magrassi,<sup>6</sup> Doerr<sup>7</sup> and others showed that an intracerebral injection of herpes virus following shortly after a corneal or intradermal herpes infection causes a mutual extinction of the effects of both injections. Puntoni<sup>8</sup> noted that a rabbit which receives a series of intravenous injections with fixed rabies virus after a subdural infection with ordinary street virus fails to develop rabies. Hoskins<sup>9</sup> demonstrated that an intramuscular injection of a neurotropic strain of yellow fever virus protects animals against simultaneous infection with a highly pathogenic viscerotropic strain. Findlay and MacCallum<sup>10</sup> found that monkeys inoculated subcutaneously or intraperitoneally with a mixture of neurotropic and pantropic strains of yellow fever usually survive, while control monkeys inoculated with either virus alone usually succumb. Of even greater interest is the antagonism between either canine distemper or lymphocytic choriomeningitis virus and experimental poliomyelitis<sup>11</sup>. Interest here arises largely from the fact that there are no known fractional antigens common to these two interfering agents and the virus of poliomyelitis.

In Jungeblut's studies<sup>2</sup> a similar antagonistic action was noted between his nonpathogenic murine strain and virulent poliomyelitis monkey strains. He found, for example, that an in vitro mixture of murine virus and simian poliomyelitis is often noninfectious on intracerebral injection into monkeys, while the same dose of the simian virus given alone almost invariably caused lethal paralytic symptoms. This antagonism was readily titrated. On testing various virus mixtures, he found that 0.5 cc of a 1:10 dilution of murine virus would counteract at least a hundred minimum paralytic doses of simian poliomyelitis, irrespective of the simian strain used. Biopsy shows that injection of such a balanced mixture is not followed by propagation of either virus. Symptomless survival from such a balanced inoculation is rarely followed by an appreciable acquired immunity to poliomyelitis.

In a later series of experiments, Jungeblut tested the prophylactic effects of this viable murine vaccine. He found that three to five doses of the murine virus given at daily intervals by the intravenous route from one

5 McKinney H H J Agric Res 39 557 1929 Am J Bot 28 770 1941

6 Magrassi T Boll Ist sieroter milan 14 773 1935 Ztschr f Hyg u Infektionskr 117 501 573 1935

7 Doerr R and others Ztschr f Hyg u Infektionskr 119 135 679 1937

8 Puntoni V Ann ig sper 31 27 1921

9 Hoskins Meredith Am J Trop Med 15 675 (Nov) 1935

10 Findlay G M and MacCallum F O J Path & Bact 44 405 1937

11 Dalldorf Gilbert Douglass Margaret and Robinson H E J Exper Med 67 333 (Feb) 1938

1 Jungeblut C W and Sanders Murray J Exper Med 76 127 (Aug) 1942

2 Jungeblut C W, and Sanders Murray J Exper Med 72 407 (Oct) 1940

3 Jungeblut C W Sanders Murray and Feiner Rose R J Exper Med 75 611 (June) 76 31 (July) 1942

4 Sanders Murray, and Jungeblut C W J Exper Med 75 631 (June) 1942

day to two weeks before the intracerebral inoculation with simian poliomyelitis would greatly reduce the paralytic symptoms. Out of 26 monkeys thus treated only 13 developed recognizable paralysis. All of the 19 control monkeys developed partial or complete paralysis. Even more definite antagonistic effects were demonstrated in animals in which the murine vaccine was given therapeutically. Daily intravenous injections of the murine virus were begun three to five days after intracerebral inoculation with the simian virus and continued for five to seven days. Of the 45 monkeys thus treated, 24 (53 per cent) did not show demonstrable symptoms of poliomyelitis. All the 30 untreated controls developed well defined or complete paralysis.

The essential task before the New York investigators at present is the development of a basic theory to explain the observed murine-simian antagonism. The antagonism cannot be explained on the known facts or accepted theories of specific anaphylaxis or immunity. Most theories thus far proposed have been oriented about the known facts of cytologic "blockade" or of cytologic enzyme exhaustion. In his latest study, however, Jungeblut has demonstrated that murine virus partially inactivated by exposure to ultraviolet radiation retains in large measure its prophylactic and therapeutic effects. This strongly suggests that the antagonistic factor is a noninfectious chemical inhibitor formed or secreted by the murine virus. If this can be definitely established, the new "poliomyelitis inhibitor" may well prove to be a basic discovery of major practical interest. The work is being continued by the New York investigators.

Meanwhile two additional instances of viral interference of major research interest have been reported by other investigators. Delbrueck and Luria<sup>12</sup> found that a mixed infection of a bacterium with two different strains of bacteriophage, both of them feeding on (or being multiplied by) the same bacterial host, resulted in a complete suppression of the growth of one bacteriophage. Andrews<sup>13</sup> reports that cultivation of influenza A virus in a simple tissue culture renders the culture unable to support the growth of a neurotropic variant of the same strain of influenza A virus. The altered tissue culture, however, is still able to support the multiplication of an unrelated virus, such as lymphogranuloma venereum. Andrews believes the most likely explanation of this "interference" is the using up of enzymes or of specific food materials essential for the growth of the influenza virus. This is essentially a renaissance of the initial Pasteur theory of acquired immunity, which was discarded with the discovery of diphtheria antitoxin.

## DEATHS OF PHYSICIANS IN 1942

During 1942 a total of 3,328 obituaries of physicians were published in *THE JOURNAL*. Of these, 3,211 were classified as of the United States and 117 as of Canada, 85 were of women. The American Medical Directory Report Service, including the United States, possessions and Canada, recorded 3,580 deaths, including 3,353 for the United States alone, or 142 more than the 3,211 published in *THE JOURNAL*.

A net increase to the profession of 1,952 resulted from the 5,163 graduates of medical schools in the United States for 1942. The increase does not include graduates of foreign schools who were first licensed in this country in 1942. These statistics are not yet available, but 626 were recorded during the calendar year 1941.

*Age*—The average age at death was 65, as compared with 65.9 in 1941 for 3,354 deaths published in *THE JOURNAL*. Twenty-two physicians died between the ages of 25 and 29, 66 between 30 and 34, 63 between 35 and 39, 83 between 40 and 44, 104 between 45 and 49, 175 between 50 and 54, 278 between 55 and 59, 415 between 60 and 64, 551 between 65 and 69, 548 between 70 and 74, 369 between 75 and 79, 312 between 80 and 84, 178 between 85 and 89, 36 between 90 and 94 and 9 between 95 and 100. The age could not be ascertained on 2 deaths.

*Causes*—Heart disease again accounted for the greatest number of deaths among physicians. Coronary thrombosis and occlusion caused 627 deaths, and other coronary diseases and angina pectoris 143. Other diseases of the heart and myocardium were responsible for 838 deaths. In this group cerebral hemorrhage also appears with 393 deaths, arteriosclerosis 250, and cardiovascular renal disease and chronic nephritis 217. Cancer and tumors in various forms accounted for 181 deaths, those of the gastrointestinal tract totaling the largest group of 141. In the general classification, 239 deaths were grouped under diseases of the respiratory system, except tuberculosis. Of these lobar pneumonia was recorded for 23 deaths. There were 139 deaths classified under diseases of the gastrointestinal tract, 40 under diseases of the genitourinary tract, 46 under diseases of the nervous system and 29 under diseases of the blood, including pernicious anemia, leukemia and Hodgkin's disease. Diabetes accounted for 72 deaths, tuberculosis, all forms, for 36, bacteremia, septicemia, pyemia and abscess for 30. Senility and ill defined causes were responsible for 40 deaths, and 38 physicians died following an operation. Rheumatism and arthritis caused 8 deaths, influenza and other infectious diseases 5, disease of the bones and osteomyelitis 4, anaphylaxis and allergy 3, diseases of the thyroid 2 and Addison's disease 2. One death each was recorded from alcoholism, posterior mediastinitis, beriberi, virus pneumonia, tetanus, typhus fever, acute

<sup>12</sup> Delbrueck, M. and Luria, S. F. *Arch. Biochem.* 1: 111, 1942.  
<sup>13</sup> Andrews, C. H. *Brit. J. Exper. Path.* 23: 214, 1942.

epidemic hepatitis, psychosis with drug addiction, pellagra, carcinoma following x-ray burns, the result of exposure to x-rays for a number of years, and malaria.

*Accidental Deaths*—One hundred and twenty-three accidental deaths were recorded. Automobile accidents accounted for 50 deaths. Falls were responsible for 25 and then airplane accidents 10, trains 7, burns 6, drowning 4, bullet wounds 3, and overdose of medicine, poison and asphyxiation 2 each. A street car accident caused 1 death and illuminating gas 1. The type of accident was not specified for 2 deaths. Fractures, which have been classified under falls, were of the skull, hip and femur. There were 6 unexplained fractures. One death occurred when the physician slipped down an icy mountain slope, and 1 was caused by a ruptured intestine when the physician was squeezed between two operating tables.

*Suicides and Homicides*—Forty-seven suicides were recorded, 18 being attributed to bullet wounds. Next in order of classification of method were poison 8, hanging or strangulation 5, cut artery 3, overdose of drugs 2, falls (jumping) 3 and gas 2. One death occurred from injuries received when the physician threw himself under a train. The method was not reported in 5 suicides. Only 1 homicide was reported, a bullet causing death.

*Miscellaneous Positions*—Among the decedents were 253 who had been teachers in medical schools, 149 of whom had reached the professorial rank. There were 13 deans. One hundred and twenty had been members of boards of education, 128 health officers, 105 members of boards of health, 59 mayors, 55 coroners, 42 authors, 29 bank presidents, 25 legislators, 18 missionaries, 17 editors, 15 members of city councils, 15 pharmacists, 7 police physicians or surgeons, 6 clergymen, 5 fire surgeons, and 3 each had been judges, lawyers, postmasters and sheriffs. Two were justices of the peace. Three were interns. One was chairman of the revision committee of the Homeopathic Pharmacopoeia, 1 was a member of the U. S. Pharmacopoeia and 1 had been Secretary of the Interior, Postmaster General of the United States and chairman of the Republican National Committee.

Of the total of 3,211 physicians, 533 had served in World War I, 58 in the Spanish American War and 3 in the Civil War. Thirty-five were members of the U. S. Public Health Service, 20 of the U. S. Army, 15 of the Veterans Administration, 14 of the U. S. Navy and 9 of the Indian Service. One served in the Philippines during the insurrection. Three were members of the National Guard. Six had been members of the medical reserve corps of the U. S. Army and 1 of the reserve of the U. S. Public Health Service, 33 had been medical examiners of draft boards for World War I and 22 for World War II. The classification "Selective Service System" was reported in 17 deaths.

*Association Officers*—Among those who died, 2 had been President of the American Medical Association, 3 Vice President, 1 Trustee, 1 member of a Council, 1 secretary of a Council, 1 Vice Speaker, 2 members of the Committee on Medical Preparedness, 17 section officers and 32 members of the House of Delegates. There were 39 presidents of state medical societies, including 1 president of the Alaska Territorial Medical Association. One was president of the Medical Association of the Isthmian Canal Zone. There were 6 secretaries of state societies and 213 presidents of county medical societies.

*Military Service*—Eleven physicians died in action during World War II and 37 while in military service. Of those killed in action, 4 died in the Philippine Islands, 1 at Corregidor, 1 when a ship in the Caribbean was torpedoed, 1 somewhere in the Pacific, 1 at Java, 1 at sea (unknown) and 2 at Guadalcanal. Of those who died while in military service, 9 were killed in airplane accidents and 3 were reported suicides. Coronary diseases were responsible for 7 deaths, acute epidemic hepatitis 1, septicemia 1, carcinoma of the sigmoid 1 and uremia 1. Two died when the barracks were destroyed by fire and 1 was killed by the accidental discharge of a sentry's gun. 1 in a shipwreck off the coast of Newfoundland, 2 in automobile accidents and 1 in a train accident. The rest were classified under various physical conditions.

The general total of 3,211 includes deaths that occurred in Turkey, Iran, Scotland, Ecuador, China, Mexico, France, Sweden, Spain, Alaska, Hawaii and Puerto Rico.

## Current Comment

### SYRUP SUBSTITUTES

Restrictions on the use of sugar have resulted in renewed interest in syrup substitutes. One recent communication<sup>1</sup> presents a brief review of previous discoveries and recommendations in this field. Agents which have been used in the past as sugar substitutes include honey, glycerol, accharin and molasses. After listing a series of agents used to prepare experimentally artificial syrups containing a water-soluble gum and soluble saccharin, the author concluded that syrups of satisfactory stability could be prepared with sodium alginate, Irish moss, tragacanth and locust bean gum as thickening agents and saccharin as a sweetening agent. However, because of the uncertainty of the supply of tragacanth and locust bean gum, domestic sodium alginate and Irish moss may receive more attention. The thickening agents experimented with by the author include citrus pectin, methyl cellulose, Irish moss, acacia, locust bean gum, alginate, apple pectin, karaya gum, glycerol and sorbitol. It is evident that much more work is needed in this field and that the ideal and universal sugar substitute remains to be perfected.

1. Huveck C. Lee. Syrup Substitutes. J. Am. Pharm. A. 3, July 1942.

## VIRUS (?) PNEUMONIA

An atypical form of pneumonia has recently appeared widely in various areas of the United States. Baker has reported a series of observations which may throw new light on some of the problems engendered by this disease. In a communication to *Science* he<sup>1</sup> reports the isolation of a virus involved in a respiratory tract infection in cats, observed in the past year in the north-eastern part of the United States. The main characteristics of the disease in cats are its highly infectious nature, debilitating effects and long course. Its respiratory nature is recognized by sneezing and coughing, which is accompanied by a mucopurulent discharge from the eyes and the nose. The existence of pneumonia is not ordinarily determined by the usual clinical examination, but necropsy reveals grayish densely consolidated areas in the anterior lobe of the lungs. The virus was obtained by inoculating intranasally into mice suspensions of lungs from cats with typical clinical symptoms. The agent was easily transferred to eggs, which had been incubated for five days, by inoculation into the yolk sac. Attempts to pass the agent through Berkefeld filters gave irregular results. The nature of the agent, however, became apparent when sections of the yolk sac membrane stained by a suitable means revealed numerous elementary bodies similar to those of psittacosis. Centrifugation of the infected mouse lungs and yolk sac suspensions removed much of the infective agent from the supernatants and concentrated it in the sediments. This is added evidence that the observed elementary bodies are the etiologic agents. A number of instances of contact between sick cats and people who subsequently developed atypical pneumonia have appeared. Complement fixation tests have been made, but the results in both cats and man have so far been somewhat inconclusive. The conclusion is, however, that this respiratory disease in cats is due to a virus that forms elementary bodies and that this virus is the same as or crossrelated to the one causing at least some of the cases of so-called atypical or virus pneumonia in man. In another preliminary communication from Eaton and his colleagues<sup>2</sup> an infectious agent from cases of virus pneumonia was transmitted to cotton rats. Of 131 cotton rats receiving material from cases of virus pneumonia, 35 developed lung lesions. By serial intranasal passage of lung suspensions from animals which developed lesions on the first passage, strains of an infectious agent from 6 cases of virus pneumonia were adapted to cotton rats. After four to six passages the adapted strain produced gross evidence of lung involvement in over 90 per cent of the animals inoculated but seldom caused death. The lung lesions were patchy red-gray in appearance. Microscopic examination of sections of lungs showed an infiltration of the septums with polymorphonuclear leukocytes and mononuclear cells and hyperplasia of the alveolar epithelium. By cross inoculation and neutralization tests, antigenic relationships between six

established strains were demonstrated. Cotton rats immunized by two successive intranasal inoculations with adapted strains were solidly immune to reinoculation with a specimen of infectious human lung which produced definite lesions in control animals. The appearance of nonbacterial lung lesions in cotton rats after inoculation of material from cases of virus pneumonia suggests that a virus-like agent was transmitted and established by serial passage. Strains adapted to cotton rats were related to the agent in human material by cross immunity tests. This agent, which is presumably a filtrable virus, differs from the psittacosis-like virus and from other known viruses which can infect cotton rats by the intranasal route. Eaton and his co-workers conclude that it presents the evidence for the causal relation of this agent to the most common form of "atypical pneumonia" must be considered incomplete because of irregularities in the neutralization tests, particularly those with human serum.

## MEDICOLEGAL CASES 1936-1940

The House of Delegates in 1932 adopted a resolution suggesting the publication in book form of the medicolegal abstracts that are weekly printed in *THE JOURNAL*. An initial volume was published that year containing the abstracts that had previously appeared in *THE JOURNAL* during the calendar years 1926-1930. In 1936 a second volume, also covering a five year period, was published. Now a third volume is available which includes abstracts published from 1936 to 1940 inclusive. These books are bound in durable library buckram, are adequately indexed to enable the user readily to find a discussion by the courts of the particular medicolegal problem that prompts his search and contain complete tables of cases giving complete titles to all the cases abstracted. The current volume includes over eight hundred abstracts. The cases abstracted deal with a wide variety of subjects of interest to physicians and others concerned with matters of medicolegal import. A seventy-four page index begins with reference to cases involving abandonment of patients in relation to malpractice and concludes with a reference to a court discussion on zoning regulations as they apply to mental and nervous disease hospitals. Between these two index subjects are to be found references to practically all the important reported decisions of courts during the five year period in which joint issues of medicine and law have been involved. As reference sources these volumes are unique in their field and they should be in every library, legal as well as medical. The preface to the second volume called attention to an oft repeated truism that a man who acts as his own attorney has a fool for a client and to the fact that the idea prompting the publication of these abstracts in *THE JOURNAL* and in book form has not been to qualify physicians to assume the role of counsel for themselves or for others. Rather the idea has been to exemplify the medicolegal problems that have been before the courts so that physicians may more intelligently meet such problems when they arise in their own personal experiences and perhaps to aid physicians in avoiding some of the pitfalls into which their fellow physicians have fallen.

1 Baker, James A. A Virus Obtained from a Pneumonia of Cats and Its Possible Relation to the Cause of Atypical Pneumonia in Man. *Science* 96: 475 (Nov. 20) 1942.

2 Eaton, V. D., Merkel, John, Gordon, Van Herick, William and Talbot, J. C. An Infectious Agent from Cases of Atypical Pneumonia Apparently Transmissible to Cotton Rats. *Science* 96: 518 (Dec. 4) 1942.

# MEDICINE AND THE WAR

*In this section of The Journal each week will appear official notices by the Committee on War Participation of the American Medical Association, announcements by the Surgeon Generals of the Army, Navy and Public Health Service, and other governmental agencies dealing with medicine and the war and such other information and announcements as will be useful to the medical profession*

## DIABETES AND MILITARY SERVICE

ELLIOTT P JOSLIN, M D

Boston

Liberal estimated there are about 800,000 living persons with diabetes in the United States, and one might suppose that among them would be many who could serve their country as members of the armed forces. However, when one looks at the problem more closely and studies it from a statistical point of view, the number of those who could serve usefully dwindles to so few that it would not make their selection worth while. Furthermore, after induction, the impossibility of always assuring a proper diet, the possibility of increase in severity even among those not taking insulin when inducted, the recurring necessity for creation of medical boards to decide on their physical status when transferred from station to station or when hospitalized for any trivial ailment, combined with the responsibility of the government for their care during the rest of their lives, uphold the present rule to forego their

Department, Metropolitan Life Insurance Company. Assuming 5 per cent available there would be only 2,500 to 1,800 men.

A third method is open for appraising the number of those who are diabetic who could be considered army material. This is to make a study of a series of diabetic persons. For this purpose the first 10,000 cases coming for diabetes to our clinic were examined. Of this number approximately 15 per cent had benign glycosuria and not true diabetes as diagnosed when first seen, only those cases diagnosed as diabetic were included in this study. Among this group of 8,500 there were 780 males between the ages of 18 and 39. Of this 780 there were only 139 who could be considered eligible for the draft, 641 would have been ineligible because of either physical defects or severity of diabetes.

The average age of the 139 available at their first visit was 31.1 years. Already they had had diabetes 2.2 years when first seen. By 1942, ten years after the last of the 139 had come to the office, the surviving patients of the original 139 numbered 126, 13 having died (9.4 per cent). The causes of death were coronary disease 7, pneumonia 3, tuberculosis 1, coma with infection 1, and 1 death with the diagnosis of diabetes with hypertension and nephrosis.

Insulin was not taken when the patients were first seen, with the exception of 1, who had a dose of 5 units of insulin on one day during a five day stay at the hospital. Data for subsequent use of insulin and data regarding dietary habits are shown in the accompanying table. According to the table, which included both living and those who had died, 105 patients are still taking no insulin as reported by various follow-up letters, later check-ups or return visits. Four were taking insulin irregularly and 25 regularly, varying over a period from one to ten years from the time of first observation, thus evidently having contracted diabetes at least of moderate severity.

Ninety-four of the original 139 patients were on unrestricted diets, eating everything, but "light on pastries and sweets." Eleven were on moderately restricted diets.

As reported in the 1942 follow-up letters, 102 patients were well and considered themselves in good health. Most of them were working at the time, although many had had a complication of some sort since their first visit. These complications, arising from the time since they were first seen, as reported by the patients or their doctors, included carbuncles 2, abscesses and infections of the skin 7, duodenal ulcer 5, disease of the gallbladder 4, arteriosclerotic impurities including cardiac changes 9, arthritis 3, bursitis 2, thyroid disease 2, colitis 2, fractures 1, varicose veins 1, sinus infection 1, genitourinary 1. These complications were

*Diet and Insulin at Least Ten Years After Their First Visit of 139 Diabetics Selected as Possible Candidates for the Armed Forces*

Use of Insulin	Unrestricted Diets	Restricted Diets	Total
No insulin	94	11	105
Insulin irregularly	1	3	4
Insulin regularly (5 unknown)	3	22	25
Total	98	36	134

services. Especially does this seem wise when considered in connection with the need for workers in civilian life.

Statistically one can assume that two thirds of the 800,000 persons in the country who have diabetes are above the age of 40 years and of the remaining one third only two fifths are males. From the 107,000 males with diabetes under 40 years of age one must again deduct about 17,000 under 18 years of age, thus leaving by such an estimate around 90,000 total diabetic males between the ages of 18 and 40 years. In all probability not more than 10 per cent and far more likely 5 per cent would meet army requirements, and when one allows for disbarment because of dependents and other nonphysical reasons the final number available for induction would surely not exceed 4,500 and more likely 2,250 individuals.

If one bases statistical reasoning on the number of diabetic persons, assumed as 800,000 for the whole country and allocated according to the age distribution of the National Health Survey as applied to the population of 1940, the total for ages 18 to 44 is only a little over 50,000 and between 18 and 39 years about 36,000. These allocations were made for me by the Statistical

the only ones reported or that came under observation. There would be, obviously, many more not reported in a period from forty years ago, when the first patient was seen.

Among those later taking insulin, 4 were subject to reactions, including 1 with severe reactions. One patient had coma twice, and another's diabetes became very difficult to control.

If the 139 cases culled from the entire 10,000 glycosuric or 8,500 diabetic are utilized for computing the total number of the 800,000 in the country diabetically available, we have 13,062 individuals. Since these are 31.1 years old when first observed by us, the number with dependents and in essential occupations would be unusually large quite apart from physical considera-

tions, and it should be safe to reduce these figures by two thirds to approximately 4,000 men.

It thus appears both by arbitrary statistical estimates as well as by computations, based on an actual study and selection from a series of 8,500 persons diagnosed as having diabetes, that in the United States today the number of diabetic persons available for the Army or Navy lies between 4,500 and 1,800 men. With these figures in mind, the diabetic quota useful for military service is relatively so insignificant, the hazards which both the diabetic and the government would undergo if they were inducted are so great and the need for their services in civilian occupations, where they would be less exposed to complications, so apparent, that the present rule to omit them from the draft appears proper.

## ARMY

### NEW BRIGADIER GENERALS

Col Albert W Kenner of the U S Army Medical Corps has been promoted to brigadier general for his highly efficient work in North Africa. This is the officer to whom Brig Gen Larry McAfee, the assistant surgeon general, referred in his opening remarks in the first broadcast, December 26, sponsored by the American Medical Association in the present radio program entitled "Doctors at War." Among other things, General McAfee said "I cite with keen pleasure the fact that one of the senior surgeons of the North African task force was promoted to brigadier general in recognition of his highly efficient operation of the medical field service in the face of greatest difficulties." General Kenner was born in Massachusetts in 1889, was awarded a Ph.D. in 1910 and an M.D. in 1915 at George Washington University, and graduated from the Army Medical School in 1917, in which year he was commissioned in the medical corps. He has been awarded the Distinguished Service Cross, the Silver Star and the Purple Heart.

Col Fred W Rankin, M.C. President of the American Medical Association, senior consultant in surgery, and Col Hugh Jackson Morgan, M.C., senior consultant in internal medicine in the office of the Surgeon General, Washington, D. C., have been created temporary brigadier generals.

### AUTHORIZE CORPS OF PHYSICAL THERAPY AIDES AND OF DIETITIANS

The President has signed the bill (H. R. 7633) which authorizes the creation of a corps of physical therapy aides and a corps of dietitians in the Army of the United States. According to the *Army and Navy Journal* the members of these corps will come largely from physical therapists and dietitians now on duty with the medical department on a civil service status. The desire to send these women overseas and to protect their rights as belligerents is responsible, it is said, for the plan to give them military status. In general, military pay, including allowances, will be the same or slightly more than civil service pay. The act authorizes a director of each of these corps with relative rank of major, with other members holding relative rank of captain, first lieutenant and second lieutenant. Pay of members of the corps would be the same as pay of regular army officers without dependents of the fourth, third, second and first pay periods.

### PAY OF ARMY AND NAVY NURSES INCREASED

The President has signed a bill (H. R. 7633) which increases the pay of army and navy nurses. As far as the act relates to nurses, it accomplishes two objectives: (1) it gives nurses pay of their relative rank and (2) it provides increased relative rank for some nurses. In explanation the *Army and Navy Journal* says that nurses and head nurses have relative rank of second

lieutenant and will receive the pay of the first pay period (\$1,800), together with allowances. Chief nurses have relative rank of first lieutenant and will receive the pay of the second pay period (\$2,000) together with allowances. The new bill gives relative rank of colonel and pay for the sixth pay period (\$4,000) to the superintendent of the army nurse corps. All ranks, in addition to base pay, will receive longevity at 5 per cent for each three years of service up to thirty years. A clause in the act protects some nurses who would have lost pay under the new act.

### LARGE CLASS OF MEDICAL ADMINIS- TRATIVE OFFICERS

A large class graduated on December 19 from the Medical Administrative Officer Candidate School operated at Camp Berkeley, Texas, by the Medical Replacement Training Center. This class was four times the size of the class graduated in September. The ceremonies were attended by distinguished guests including Major Gen. Henry Terrell Jr., commanding general of the 90th Motorized Division stationed there, Col Henry A. Finch, Camp Berkeley commander, Hon. Will W. Hair, mayor of Abilene, Malcolm Meek, president of the Citizens National Bank of Abilene, Dean Walter H. Adams of Abilene Christian College, Dean W. B. McDaniel of McMurry College and Dr. William T. Walton, vice president of Hardin-Simmons University.

The address by the Surgeon General of the Army, Major Gen. James C. Magee, was read by Col. Frank Wakeman, and the diplomas and commissions were presented by Brig. Gen. Roy C. Hefebower, commandant of the Medical Replacement Training Center. In this largest officer candidate school class were thirteen Negroes receiving commissions as second lieutenants, the largest colored contingent to date. After the ceremonies the new officers were given ten day graduation leaves prior to reporting to their first stations for assignment to duty.

### THREE HOTELS AT MIAMI BEACH TAKEN OVER BY ARMY

Three of the largest hotels at Miami Beach, the Pancoast, the Tower and the Gulf Stream apartments were taken over by the War Department on December 17 for conversion into hospitals for the Army Air Forces. The hotels were obtained by leases. Of the three the Pancoast is the oldest, built in 1923, the Tower was built in 1935 and the Gulf Stream apartments in 1925.

### ARMY PERSONAL

Dr. William C. Menninger, Topeka, Kansas, has been commissioned lieutenant colonel in the U. S. Army Medical Corps and assigned to duty as consultant in psychiatry.



## NAVY

## THE NAVY NEEDS YOUR BINOCULARS

The U S Navy sometime ago made an urgent appeal to all persons in the United States who own binoculars to offer them to the Navy, and only six thousand persons in the entire country have done so.

In the first world war more than fifty thousand binoculars were offered, and of those which were accepted all but one were returned to their owners at the end of the war. Optical firms in this country are doing their best to meet the demands of our military forces, but the making of binoculars requires special materials, time and skill. The problem is further complicated by the great demands of the air forces, which require special optical instruments such as the stereoscopic height finder and the elbow telescope."

## NAVY PERSONALS

The name of Capt Edward C White, U S Navy Medical Corps, was sent to the Senate with recommendation for promotion to rear admiral. Captain White was head of the Inspection Division of the Bureau of Medicine and Surgery in Washington. Lieut (j g) Beulah Ann Buchanan, U S Navy Nurses Corps, chief nurse of the U S Naval Hospital at Great Lakes, Ill., is being relieved from duty there to report for service outside the continental United States. Her position will be taken over by Lieut Mary Martha Heck, U S N N C, who has been transferred from Quantico, Va.

Dr George M Caldwell, formerly resident physician at the Greenbrier Hotel, White Sulphur Springs, W Va., has been commissioned a lieutenant in the U S Navy and is stationed at Norfolk, Va.

## CIVILIAN DEFENSE

NURSING EXECUTIVES FOR EMERGENCY  
BASE HOSPITALS

The Office of Civilian Defense, Washington, D C., has issued Circular Medical Series No 24 which states that the Surgeon General of the United States Public Health Service has authorized the appointment of a limited number of qualified nurses with supervisory and administrative experience who could be sent to emergency base hospitals when activated to serve as nursing executives. They will be offered appointments in the Public Health Service on an inactive status and will be called to active duty by the Surgeon General on the recommendation of the state chiefs of Emergency Medical Service and regional medical officers only if their services are required at emergency base hospitals because of a military necessity. When on duty they will be entitled to payment by the Public Health Service according to their experience and qualifications at per diem rates based on annual salaries of \$2,600 or \$2,300 and necessary travel and maintenance when away from their usual places of residence.

The number of such nurses to be recruited in each state should be equivalent to twice the number of affiliated units actually being formed in that state. Qualified nurses should be nominated by coastal state chiefs of Emergency Medical Service in

consultation with the state nurse deputy and the directors of affiliated units in his state.

For appointment in the United States Public Health Service, candidates must have not less than two years' experience in hospital ward or operating room supervision in a hospital approved by the American College of Surgeons and the American Medical Association. They must be under 55 years of age and in good physical condition. Although their appointments obligate them to serve in an emergency base hospital in their regions if called to duty by the Surgeon General in a wartime emergency, they may resign their appointments in the Public Health Service at any time to accept assignments in the Army or Navy.

State chiefs of Emergency Medical Service may obtain the necessary application forms for these appointments from the regional medical officers. These forms should be filled out and sent to the appropriate state chief of Emergency Medical Service who will transmit them with his approval, to the regional medical officer, who will forward the applications with his endorsement to the Emergency Medical Section, United States Public Health Service, 2000 Massachusetts Avenue, Washington, D C.

## MISCELLANEOUS

AMERICAN OPTICAL COMPANY  
AWARDED ARMY-NAVY E

Ceremonies were conducted at the headquarters of the American Optical Company, Southbridge, Mass., Nov 30, 1942 for the award of the Army-Navy E. This award comes from combined Army and Navy boards of recognition for the quantity and quality of output, the avoidance of work stoppages, the overcoming of production obstacles, the training of additional labor forces, capable management, utilization of subcontracting facilities and satisfactory records on health accidents, working conditions and plant protection. The award consists of a flag to be flown above the establishment and of a lapel pin to be worn by each employee of the company symbolic of their contribution to victory in this war. The award was presented to the American Optical Company by Brig Gen Burton O Lewis and was accepted by George B Wells, president of the company. This company has been producing optical goods for one hundred and nine years and many of its products today are aiding in the war effort. The company, in cooperation with the Surgeon General's Office, has designed a mobile optical unit to handle spectacle repairs in the field and several of these units have already been built. The company supplies goggles for aviators, ski troops, navy lookouts and gunners and for mechanized troops, as well as for industrial workers on the home front. The company has made a wide variety of diagnostic and examining instruments for examining recruits and aiding in guarding the vision of service men.

## BOOKS FOR RUSSIAN MEDICAL STUDENTS

Students in the First Kharkov Medical Institute formerly at Kharkov, Russia, have written letters of appreciation to the Russian War Relief, Inc., for American medical textbooks, which have been sent by the hundreds to the Soviet Union to help prepare more doctors for work with the Russian army. When the Germans occupied Kharkov, the Kharkov Institute, one of the largest medical schools in the world, was moved to Chiklov, where classes were in full swing within a week after the student body and faculty left Kharkov. Russian War Relief, Inc., is sending still more of all kinds of up to date medical textbooks for Soviet medical students. Contributions for this purpose may be sent to Russian War Relief, Inc., 11 East 35th Street, New York City.

## INFECTIOUS DISEASES IN GERMANY

The *Reichsgesundheitsblatt* (Berlin) of July 29 contains the figures for the infectious diseases in Germany during the first half of 1942.

	1942	1941
Diphtheria	121,602	82,238
Scarlet fever	220,076	125,524
Tuberculosis (lung and throat)	68,500	63,998
Tuberculosis (other organs)	9,693	8,390
Infantile paralysis	609	420
Typhus	2,918	2,552

There were 1,205 cases of bacterial food poisoning as against 947 cases in the first half of 1941.

# ORGANIZATION SECTION

## MEDICAL LEGISLATION

### DISTRICT OF COLUMBIA

*Bill Introduced*—H R 33, introduced by Representative Burdick of North Dakota proposes to prohibit experiments on living dogs in the District of Columbia

### MEDICAL BILLS IN CONGRESS

*Bills Introduced*—H R 98, introduced by Representative Smith, Maine, a bill to create a Division of Water Pollution Control in the United States Public Health Service H R 317 introduced by Representative Fitzpatrick, New York proposes to amend the Social Security Act so as to provide for the payment of benefits to permanently and totally disabled individuals H R 348 introduced by Delegate Dimond Alaska proposes to extend the benefits of the United States Public Health Service to fishermen H R 361, introduced by Representative Magnuson Washington proposes to authorize the construction of a Veterans Administration general medical and surgical hospital and domiciliary facility in western Washington H R 369 introduced by Representative Myers, Pennsylvania, proposes to prevent discrimination against blind persons and persons with impaired visual acuity in the administration of the civil service laws and rules H R 370 introduced by Representative Myers, Pennsylvania, proposes to extend the federal old age benefit provisions of the Social Security Act to certain nurses in respect of their employment outside of religious, charitable and other non profit institutions H R 492, introduced by Representative Angell, Oregon, proposes to extend the benefits of the Social Security Act to include individuals who are physically disabled H R 493, introduced by Representative Angell Oregon, proposes to authorize the Secretary of the Interior to locate establish, construct equip and operate a hospital for the insane at Alaska H R 496, introduced by Representative Angell Oregon proposes to provide for the education of all types of physically handicapped children H R 649 introduced by Representative Bulwinkle, North Carolina, proposes to provide for the reorganization of the United States Public Health Service H R 655, introduced by Representative Ludlow Indiana proposes to provide for suitable recognition of the voluntary services of civilian nurses with the Army during the influenza epidemic H R 658 introduced by Representative Rogers Massachusetts proposes to provide prosthetic appliances to certain veterans suffering from non-service connected disabilities H R 665 introduced by Representative Rogers, Massachusetts proposes to provide medical and hospital treatment and domiciliary care for members of the Women's Army Auxiliary Corps on a parity with members of the Women's Reserve of the Navy H R 667 introduced by Representative Rogers Massachusetts proposes to authorize an appropriation to provide additional hospital and outpatient dispensary facilities for persons entitled to hospitalization in Veterans' Administration facilities H R 669 introduced by Representative Rolph California proposes to provide compensation for personnel sustaining disease or injury while performing civilian defense duties H R 691 introduced by Representative Dickstein New York, proposes to establish federal medical academies H R 699, introduced by Representative Barden North Carolina proposes to provide vocational rehabilitation education training and other services to persons disabled while members of the armed forces or disabled in war industries or through other causes or those congenitally disabled and to render such persons fit for service in war industry agriculture or other useful civilian industry

### STATE MEDICAL LEGISLATION

#### Massachusetts

*Bills Introduced*—H 44 proposes to authorize transfer to a hospital of prisoners being held for sentence or trial where it appears from a physician's certificate that such prisoner requires

medical treatment which cannot safely or properly be given in the prison H 79 proposes to amend the medical practice act by adding a new paragraph authorizing the periodic inspection of colleges, universities and medical schools approved for the purpose of medical education When the approving authority determines that such school does not meet the requirements necessary for approval it shall send written notification thereof to the proper school authority specifying what steps the school must take in order to prevent the withdrawal of approval Provisions are then made for a hearing on behalf of the medical school in the event it objects to the finding of the approving authority H 80 proposes to amend the medical practice act by providing that an applicant who has failed to pass a second examination given by the board will not be entitled to be examined on a new application until after the expiration of one year following the second examination nor unless he shall furnish the board with satisfactory proof that he has completed a postgraduate course of one year in a legally chartered medical school approved by the board H 81 proposes to amend the medical practice act by changing the list of subjects which an applicant for license to practice must have studied The new list proposed includes the subjects of anatomy, physiology pathology biochemistry bacteriology, immunology public health pharmacology materia medica pediatrics medicine surgery, obstetrics and gynecology This proposal would omit the subjects of chemistry biology physics psychiatry and hygiene required under the prior law H 84 proposes to amend the premarital examination law by authorizing the requisite certificate to be signed by a physician registered or licensed to practice in any state or a commissioned medical officer on active service in the armed forces of the United States or in the United States Public Health Service Previously only physicians registered in Massachusetts were authorized to sign the required certificate The proposal then provides that the examination shall consist of a general medical examination and shall include a standard serologic test for syphilis and such other laboratory tests as are indicated by the general medical examination and the serologic test for syphilis shall be made in a laboratory meeting standards approved by said department and sets forth the form of the certificate which the examining physician must execute

#### New Jersey

*Bills Enacted*—A 412 has become chapter 342 of the Laws of 1942 It amends section 45 9 8 of the medical practice act by requiring an applicant for licensure to prove that his medical education extended over a period of not less than four full school years including "four satisfactory courses of lectures of at least eight months each either "consecutively or in four different calendar years The consecutively is new and is for the purpose of permitting graduates of such accelerated medical courses to obtain licensure in New Jersey but the school of graduation must still of course, be in good standing in the opinion of the board S 358 has become chapter 346 of the laws of 1942 It amends certain sections of the present law regulating the practice of nursing in the following particulars (1) Present registration requirements may be waived where the applicant meets the requirements that were in existence at the time of his or her graduation from an approved school of nursing or the requirements existing on April 1 1914 if the graduation was prior to that date (2) reciprocal registration of qualified Canadian licentiates is authorized (3) the age limit of students who may be admitted to an approved school of nursing is lowered from 18 to 17½ years during the period of the war and for six months thereafter, (4) the fee for the issuance of a certificate of registration is no longer necessary A fee of one dollar will still be charged however, each time the certificate is annually renewed

## Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH)

### ALABAMA

**Changes in Health Officers**—Dr. Caroline H. Callison, Chatham, will serve as health officer of Washington and Clarke counties.—Dr. Elisha Moore, Livingston, health officer of Sumter County, has also been placed in charge of the Greene County department of health.—Dr. Julius E. Dunn, Florence, is the new health officer of Etowah and Calhoun counties, with headquarters in Anniston.

### DELAWARE

**State Medical Election**—Dr. Lawrence J. Jones, Wilmington, was elected president of the Medical Society of Delaware at its recent annual meeting to serve for one year beginning January 1, and Dr. William O. LaMotte, Wilmington, was named secretary. The next annual meeting is planned for Wilmington on October 12 and 13.

### ILLINOIS

**Special Advisory Committee on Industrial Hygiene**—Governor Green has appointed the first special advisory committee to the division of industrial hygiene of the Illinois Department of Public Health. Members of the committee are Drs. Roland R. Cross, Springfield, state director of public health, and Milton H. Kronenberg, Chicago, chief of the division of industrial hygiene ex-officio members, Philip H. Kreuscher and Joseph H. Chivers, Chicago, chairman and vice chairman, respectively, Dr. Raymond B. Allen, executive dean, Chicago Colleges of the University of Illinois, William H. Donovan, Harry Guilbert, A. G. Hewitt and Oliver E. Mount, Chicago, Dr. Nordahl O. Gunderson, Rockford, Charles G. Lanphier, Springfield, Edward F. Schweich, East St. Louis, and Dr. Harold A. Vonachen, Peoria. The new committee will aid in the development of state programs of adult hygiene including the control of hazardous working conditions and the care of pregnant women in war industries.

### Chicago

**Personal**—Evelyn B. Tilden, Ph.D. of the Rockefeller Institute for Medical Research, New York, has been appointed associate professor of bacteriology at Northwestern University Medical School.—Dr. William H. Lipman, medical director of Swift & Company, retired, January 2, having reached his sixty-fifth birthday. Dr. Lipman graduated at the University of Illinois College of Medicine in 1904 and joined Swift & Company in the same year.

**Joint Meeting on Cancer**—A joint meeting of the North Side Branch of the Chicago Medical Society and the Institute of Medicine of Chicago will be addressed on January 20 at the Chicago Woman's Club by Drs. Paul E. Steiner on "Significance of Recent Research on the Causation and Nature of Cancer and the Role of the Clinician in Further Advance," Charles B. Huggins, "Function of the Prostate and Its Relation to Tumors," and Vernon C. David, "Carcinoma of the Large Bowel."

**Alien Physicians Eligible for City Positions**—Corporation Counsel Barnet Hodes, in an opinion December 17 said that alien interns and resident physicians may be hired on a temporary basis for work in the Municipal Contagious Disease Hospital, newspapers reported. Dr. Herman N. Bundesen, president of the board of health, requested Hodes' opinion after he said his advisory board reported that it would be necessary to close the hospital January 1 if a supply of alien physicians could not be obtained. It was stated.

### INDIANA

**Personal**—Dr. Robert W. Reid, Union City, has been appointed health officer of Randolph County to succeed Dr. Andrew M. Brenner, Winchester, who has entered the Navy.—Dr. Joseph L. Allen, Greenfield, has been named coroner of Hancock County.

**Society Publishes Service Bulletin**—The St. Joseph County Medical Society, South Bend, brought out its new Service Bulletin in November. The first issue contains twelve mimeographed pages designed primarily to let the men in service know what is going on at home.

**Society News**—Dr. Byrl R. Kirklin, Rochester, Minn., addressed the Indianapolis Medical Society, November 24, on "Bleeding Lesions of the Gastrointestinal Tract," and the Indiana Roentgen Society on "The Military Situation as It Pertains to Radiologists."—The Spencer County Medical Society, at a meeting in Rockport, December 15, decided to forego all regular meetings for the duration of the war because of the small number of members remaining. Meetings will be called to transact special business only.—Dr. Maximilian Kern, Chicago, discussed "Endocrinological Types of Obesity" before the La Porte County Medical Society in La Porte, December 17.

### KANSAS

**Society News**—The Sedgwick County Medical Society was addressed in Wichita, November 3, by Drs. Hugh G. Jeter and Harry Wilkins, both of Oklahoma City, on "Paracentetic Fluid as an Aid in Diagnosis" and "Injuries to the Covering of the Brain" respectively.

**Coroners Appointed**—Governor Payne H. Ratner recently made the following appointments to the position of coroner: Drs. Wardie W. Weltmer, Beloit, of Mitchell County to succeed Dr. Richmond E. Bennett, and Dr. Claud F. Young, Fort Scott, of Bourbon County to succeed Dr. Laurence L. Cooper. Dr. Bennett and Dr. Cooper are in military service.

### KENTUCKY

**Jane Todd Crawford Day**—On Dec. 13, 1942, the first Jane Todd Crawford Day was observed. The day was set apart by an official proclamation of the governor as a part of the sesquicentennial year program commemorating Kentucky's one hundred and fiftieth year of statehood. To mark the event the women's auxiliary section of the state medical journal was recently dedicated to a review of the first ovariectomy performed by Dr. Ephraim McDowell. The cover of the special edition carries a picture "Dawn of Abdominal Surgery," executed by Dean Cornwell for John Wyeth and Brother, Inc., Philadelphia. The inside cover contains a reproduction of "Beromont and St. Martin," another of the series sponsored by Wyeth and Brother. An article on Jane Todd Crawford by George Madden Martin, Louisville, narrates the complete story of the first ovariectomy performed by Dr. McDowell in a pioneer cabin in Danville on Dec. 25, 1809.

### MASSACHUSETTS

**Public Lectures**—A course of free public lectures on medical subjects opened in the Peter Bent Brigham Hospital Auditorium, Boston, January 3, under the auspices of the Harvard Medical School. Dr. George W. Thorn, Boston, gave the first lecture on "The Role of the Endocrine Glands in Adaptation," and Dr. Joseph W. Ferrabee, Boston, the second, January 10, on "Newer Knowledge of Vitamins." Other speakers in the series are:

Dr. Frank H. Bailey, Boston, January 17, "The Supply of Doctors";  
Dr. Fredrick J. Stare, St. Louis, January 24, "How Best to Eat Under War Conditions";  
Dr. Maxwell Finland, Boston, January 31, "Common Colds and Their Complications";  
Lieut. Col. Alexander Marble, M.C. U.S. Army, February 7, "The Care of Soldiers in an Army Hospital";  
Constantin P. Yaglou, M.M.I., Boston, February 14, "Problems of Ventilation in the Home";  
Dr. Arlie V. Bock, Cambridge, February 21, "Civilian Physical Fitness as a War Measure";  
Dr. Allan M. Butler, Boston, February 28, "Healthy Children";  
Rene J. Dubos, Ph.D., New York, March 7, "Anti-septic and Chemotherapeutic Agents."

**Library Fund Named for Dr. Wilinsky**—On Dec. 20, 1942, special ceremonies were held at the Beth Israel Hospital, Boston, to celebrate the sixtieth birthday of Dr. Charles F. Wilinsky, executive director and superintendent of the hospital and formerly deputy commissioner of health of Boston. Dr. Wilinsky was presented by Judge Abraham E. Pirnanski, Boston, with a bound volume of congratulatory letters from all parts of the country. Judge A. K. Cohen turned over a sum of money to be known as the Charles F. Wilinsky Library Fund, and Mrs. Pirnanski spoke for the hospital auxiliary in presenting a fund for the hospital in his name. A portrait of Dr. Wilinsky, painted by Jacob Binder, was unveiled by Dr. Samuel A. Robins, Boston. Mr. James A. Hamilton, New Haven, Conn., president of the American Hospital Association, also spoke. The *New England Journal of Medicine* commented editorially on Dr. Wilinsky's birthday in special tribute. Dr. Wilinsky graduated at the Baltimore University School of Medicine in 1904. He was associated for many years with the Boston Health Department. In 1927, as deputy commissioner of health, he was granted a leave of absence to assist in a survey on the health of Palestine. For many years he

was in charge of the health units that were established in the city through the George Robert White Fund. In 1935 Dr Wilmsky was also in charge of a relief project for resident physicians of Boston. He became superintendent of the new Beth Israel Hospital in 1928. He is president of the Massachusetts Hospital Association.

## MICHIGAN

**Special Lectures**—Dr Edward R A Merewether, London, England, gave a special informal lecture before the Wayne County Medical Society in Detroit, December 21, on "The Latest Medical Facts from Abroad." A joint meeting of the society and the Detroit Pediatric Society was addressed, December 14, by Dr John Harry Ebbs, associate in pediatrics, University of Toronto Faculty of Medicine, Canada, on "Nutrition in Everyday Practice."

**Report on Child Guidance Program**—Three child guidance clinics have been established in Michigan in recent months as part of the program of the Michigan State Hospital Commission. Dr Frank F Tallman, Lansing, who was appointed director of mental hygiene of the commission last year, is in charge of the organization, supervision and coordination of the child guidance clinic system. The clinics are in Muskegon, Saginaw and Kalamazoo and requests have been made to the legislature for three similar clinics to be established July 1. The new clinics are a joint undertaking of the state and the community. The state pays all professional salaries for psychiatrists, psychiatric social workers and psychologists. The community provides office facilities, secretarial services, supplies and equipment. Each clinic has a local advisory committee which acts as a liaison body between the local clinic and the state hospital commission. Its chief responsibility is to raise an annual budget. Complete direction and control of the units rests with the state hospital commission. A similar clinic was opened in Lansing in 1938 and was made possible by a grant to the hospital commission from the Children's Fund of Michigan and contributions from the community. Each clinic will serve a territory within a radius of 60 miles. Consultative diagnostic and therapeutic services are rendered by the clinic.

## MINNESOTA

**Special Society Election**—Dr Paul G Boman, Duluth, was named president of the Minnesota Society of Internal Medicine at its annual meeting in Duluth recently. Dr Bayard T Horton Rochester, vice president, and Dr Reuben A Johnson, Minneapolis, secretary-treasurer.

**Personal**—Dr John deJ Pemberton was reelected president of the Mayo Clinic staff at its recent annual dinner and Dr Frank J Heck was renamed secretary, both are in Rochester.—Dr Russell R Heim, Minneapolis, has been chosen coroner of Hennepin County.—Ralph W Macy, PhD, professor of zoology at the College of St Thomas, St Paul, has been named professor of biology at Reed College, Portland, Ore.

## MISSOURI

**Collection on Ophthalmology**—The St Louis Medical Society announces the gift of Dr Joseph W Charles St Louis, of a collection on ophthalmology. The group greatly augments the library's file on this specialty.

**University News**—Dr Karl F Meyer, San Francisco professor of bacteriology and director of the Hooper Foundation, University of California Medical School delivered the Alpha Omega Alpha lecture, December 9, at Washington University School of Medicine, St Louis, on "Plague."

**Dr Cook Heads Medical Department of Lambert Company**—Charles A Cook, PhD, since 1931 research chemist at the Experimental Research Laboratories of Burroughs Wellcome and Company, Tuckahoe, N Y, is now in charge of the department of medical and biologic chemistry at the Research Laboratories of the Lambert Pharmacal Company in St Louis. Dr Cook's work has been concerned with vitamins, chemistry of gastroenteric disease amino acids and pituitary hormones.

**Memorial Plaque Honors Dr Coughlin**—Friends of the late Dr William T Coughlin presented a plaque to the St Louis Medical Society, December 1, to serve as a memorial. The gift was made on the presentation of the first Robert James Terry Lecture, which was established under the will of Dr Coughlin (THE JOURNAL, Nov 28, 1942, p 1049). The plaque was presented by Dr Llewellyn Sale. Dr Frederick E Woodruff introduced the guest speaker Dr Stuart Mudd Philadelphia who gave the first Terry lecture on Morphology of Pathogenic Bacteria and Viruses as Shown by the Electron Microscope with Some Practical Implications."

## NEW JERSEY

**Medical Scholarship Established**—Princeton University Princeton has received a legacy of \$25,000 for the endowment of a scholarship to be awarded annually to "a man of outstanding scholarship, character and promise from the state of New Jersey who intends to make the practice of medicine his life profession."

## NEW YORK

**Personal**—Dr Simon A King has been named health officer of North Dansville to succeed Dr Alden J Townsend, who resigned to enter military service.—A public celebration was held in Memorial Hall Mineville, December 1, in honor of Dr Thomas J Cummins, who has completed twenty-five years of service in Moriah. An illuminated parchment scroll, a desk set and a \$1,000 war bond were presented to Dr Cummins.—Dr Herbert M Lyon, Buffalo, has been elected president of the board of trustees of Taylor University, Upland, Ind., he graduated at the university in 1925.

## New York City

**Annual Contin Lecture**—Dr Alfred Angrist, pathologist at Queens General Hospital, will deliver the annual Contin Lecture, January 22, on "The Mechanism of Brain Injury in Head Trauma." The lecture is sponsored by the Contin Society of the New York Medical College and Flower and Fifth Avenue Hospitals.

**The Harvey Lecture**—Dr Fuller Albright, assistant professor of medicine, Harvard Medical School, Boston will deliver the fourth Harvey Society Lecture of the current series at the New York Academy of Medicine, January 21. His subject will be "Studies on the Pathological Physiology of Cushing's Syndrome."

**Hospital Closed to Conserve Oil**—The Neponsit Beach Hospital for Children, Rockaway Beach, will be closed to "help the city make up its 10 per cent reduction in fuel oil allowance," newspapers reported January 4. Patients and hospital personnel were to be moved to other city institutions beginning January 5, it was stated. The hospital will be reopened when warm weather returns.

**Personal**—Dr Nathaniel Smith, former deputy medical superintendent of the Morrisania City Hospital, has been appointed medical superintendent of the Fordham Hospital.—Dr Donald D Van Slyke recently was elected an honorary member of the British Physiological Society.—Mr Newman M Biller, assistant director of the Montefiore Hospital for Chronic Diseases, has been appointed executive director of the Home for Aged and Infirm Hebrews. He will be succeeded at Montefiore Hospital on January 1 by Dr Sigmond L Friedman.

**Lectures on Child Psychotherapy**—The Association for the Advancement of Psychotherapy announces a series of lectures on various aspects of child psychotherapy. The first session opened January 13 on "Juvenile Delinquency and Psychotherapy." On January 27 the subject will be "Children's Reaction to the War and Its Psychotherapy." Subsequent topics will be February 10, "Adolescents in Need of Psychotherapy", February 24, "Mental Hygiene in School and Psychotherapy", March 10, "The Nutritional Basis of Mental Disorders in Children", March 24, "Clinical Psychotherapy of the Child", April 14, "Preschool Education and Psychotherapy", April 28, "The Role of the Family in the Psychotherapy of the Child," and May 5, "Adult Psychotherapy and Child Psychotherapy." Speakers participating in the entire series are laymen and physicians interested in psychotherapy of the child.

**Four Schools Offered for Social Hygiene**—The board of education has granted permission to the city department of health to use four schools to give preinduction training courses on Saturday mornings. The board of education had refused to include such a course in the regular curriculum (THE JOURNAL, Dec 26 1942 p 1407). In a letter to the Health Commissioner Ernest L Stebbins John E Wade, deputy superintendent of schools wrote that should the health officials decide to organize these classes, "the board of education will not identify itself in any way with your proposals and we will not be in any position to advertise the lectures to the students. We will make available premises to you as we would to any other organization but you must undertake the enterprise as a project of the department of health wholly unrelated in any way to the Board of Education." The request for high school instruction in social hygiene was made by Dr Stebbins because of a 20 per cent increase in venereal infection among boys and girls 15 to 19 years old. In granting permission to use the schools, the board stated that any legitimate organization had the right to use the schools on Saturday mornings provided the facilities were available.

## OHIO

**Changes in Health Officers**—Dr Gregory J Nordenbrock, St Marys has been appointed health commissioner for Shelby County, effective December 15, he succeeds Dr Harry Wain, Sidney, who resigned to accept a similar position in Miami County.—Dr Clifford J Baldridge, health commissioner of the city of Hamilton and Butler County for twenty years, has resigned, effective January 1

**Medicine in the War**—A series of public health lectures opened at the Cleveland Health Museum January 10 with a talk by Dr Neil T McDermott, Cleveland on "War Nerves". The series is sponsored by the Academy of Medicine of Cleveland and other speakers in the group all of Western Reserve University School of Medicine, Cleveland, are

Dr David K Spitzer January 17 Controlling Epidemics  
Dr Roscoe D Lenz January 24 The Whys of Blood Banking  
Dr Robert F Parker January 31 Combating Soldiers' Health Hazards  
Dr Harold D Green February 7 Body Behavior in Flying  
Lnos B Buchanan Ch E February 14 Dispelling Modern Food Fallacies

**Citizens' Committee Named for Medical Plan**—A citizens' committee has been organized to act as sponsors for the Cleveland Medical Service Association prepayment plan, newspapers report. The Academy of Medicine of Cleveland recently issued a statement indicating that the plan is not a part of the academy's activities. The citizens committee includes one hundred and twenty-seven "leaders in the community's public and professional life. Subscribers to the plan will be limited to single persons with an annual income of not more than \$1,800 and heads of families of not more than \$2,400. The Cleveland Hospital Service Association has agreed to handle sale of service contracts to the public, it was announced.

**Health Information Hour Suspended**—A new service to the community, which was sponsored by the Cleveland Health Museum in the form of a 'Health Information Hour' under the title "Tell Me Doctor" has been suspended during January and February. The service constituted the selection of a group of questions sent in by the public and answered by a board of experts composed of Drs James A Doull, Richard A Bolt, John J Thomas and Helen A Hunscher PhD all of Cleveland. The questions covered all questions of general interest in the field of human biology, medical science, personal health and community hygiene. The ten best questions received a dollar war stamp. If the experts could not answer the question the inquirer received a book entitled "1680 Health Questions Answered" by Dr William W Bruer, Chicago director, Bureau of Health Education, American Medical Association, and, in addition, three dollars in war stamps. The public was invited to attend the program. It is hoped to resume the feature in March.

**Dr Herrick Given Honorary Membership in Denison Foundation**—Charles Judson Herrick, ScD, emeritus professor of neurology, University of Chicago School of Medicine, Chicago, and now in retirement at Grand Rapids, Mich., was given the first honorary membership in the Denison University Research Foundation, Granville, in recognition of his years of service to Denison University as professor of zoology and for his achievements as a scientist in the field of neurology. Dr Herrick also gave the first two lectures under the foundation to the Denison student body and the Denison Scientific Association. The Denison University Research Foundation was established by an anonymous donor in June 1942 "to promote, in close cooperation with Denison University or other institutions engaged in like activity, constructive research in the arts and sciences and in any and all fields normally associated with the activities of American colleges and universities, to provide inspiration and leadership to such selected persons as indicate a high type of scholastic endeavor, and who reflect special aptitudes in integrated projects that will contribute to human betterment."

## TENNESSEE

**Course in Internal Medicine**—Dr Robert P McCombs, Philadelphia, recently opened a ten week course in internal medicine for physicians in Chattanooga and Hamilton County under the auspices of the county medical society.

**State Supreme Court Upholds Medical School Expulsions**—The power of the University of Tennessee College of Medicine, Memphis to dismiss students found guilty by school authorities of stealing examination questions has been upheld by the Tennessee Supreme Court, newspapers reported December 13. Two of five students dismissed by the college in 1940 filed a petition in Chancery Court in Memphis charging that they were dismissed without a proper hearing and seeking reinstatement to the medical school.

## TEXAS

**Radiological Society Cancels Meeting**—The annual meeting of the Texas Radiological Society, which was to be held this month has been canceled. Dr Herman Klapproth, Sherman, is the secretary.

**Physician's Portrait Presented to Medical School**—A portrait of the late Dr Meyer Bodansky, who had been associated with the University of Texas Medical Branch, Galveston from 1919 until his death in 1941, was presented to the school by the alumni association during the semicentennial graduation exercises, Dec 18, 1942. Dr Bodansky was born in Elizabetgrad, Russia in 1896. He received his doctor of philosophy degree from Cornell University, Ithaca, N Y in 1923 and his doctor of medicine degree at the University of Chicago in 1935. Dr Bodansky had been, since 1930 serving as professor of pathological chemistry. In 1932 he was visiting professor at the American University of Beirut, Syria. At the time of his death he was also director of the laboratories of the John Sealy Hospital.

## GENERAL

**Exchange Fellowship and Travel Grants Awards Suspended**—The U S Department of State announces that for the duration of the war the award of official scholarships, fellowships and travel or maintenance grants to students from the United States will be suspended. They will be resumed as soon as feasible. However, the award of fellowships and travel and maintenance grants to citizens of the other American republics for study in the United States will not be suspended or discontinued.

**New Motion Picture on the Registered Nurse**—The American College of Surgeons sponsored the premiere of a new sound motion picture "RN—Serving All Mankind." A grant from the Becton Dickinson Foundation for the Extension of Scientific Knowledge in cooperation with numerous organizations made the picture possible. The film is suitable for showing by hospitals, nursing associations and all types of civic service and educational organizations. It tells the story of two girls who choose nursing as a career.

**Delivers Presidential Address Over the Radio**—Irving Langmuir ScD delivered his address as retiring president of the American Association for the Advancement of Science over the Columbia Broadcasting System December 26 on "Science Common Sense and Decency." The association postponed its meeting for the first time since the Civil War. Arthur H Compton ScD president of the association introduced Dr Langmuir speaking from Chicago. Dr Langmuir spoke from Albany, N Y. Watson Davis director of Science Service opened the program from Washington, D C.

**Special Society Election**—Dr William T Wootton Hot Springs National Park, Ark. was named president elect of the Southern Medical Association at its recent meeting in Richmond Va. and Dr Harvey F Garrison Jackson Miss. was installed as president. Dr Wyndham B Blanton Richmond Va. was chosen vice president. The association's award for outstanding original work by one of its members went to Dr Perrin H Long professor of preventive medicine Johns Hopkins University School of Medicine Baltimore for his studies on the sulfonamides. The award was received for him by his associate Eleanor A Bliss ScD.

**Priorities for "Life and Death" Emergencies in Airplane Travel**—Announcement has been made of a class number 5 priority to be granted when necessary for a "life saving" flight under a cooperative program of all airlines. A physician en route to attend an emergency case will be granted the recently established priority as will a child en route to a hospital for an emergency operation of some unusual or critical nature. Persons en route to funerals and other instances sometimes described as "death cases" will not be granted priority. The Regional Air Priorities Offices, which will extend this priority, may be reached through any local airline office.

**Pharmaceutical Companies Merge**—The Winthrop Chemical Company has absorbed the Alba Pharmaceutical Company, both of New York, and has taken over Alba's assets, properties, trademark and good will. According to an announcement, although Alba ceases to exist its research and manufacturing facilities in Rensselaer, N Y have been consolidated with those of the Winthrop Chemical Company and its marketing policies remain undisturbed. Dr J Mark Herbert medical director of Alba, will become assistant to Dr Theodore G Klumpp president of the Winthrop group, and other Alba personnel will be absorbed. As a result of the

merger, Fairchild Brothers and Foster, a wholly owned subsidiary of Albia has become a wholly owned subsidiary of Wmthrop. The Albia Company was incorporated in New York on Aug 30 1935

**Federation of Experimental Societies Cancels Meeting**—The executive committee of the Federation of American Societies of Experimental Biology has voted to omit the meeting which was scheduled to be held in Cleveland April 6-10. This action applies only to the federation as such and does not cover any meetings which may be organized by the constituent societies including the American Physiological Society, the American Society of Biological Chemists, the American Society for Pharmacology and Experimental Therapeutics, the American Society for Experimental Pathology, the American Institute of Nutrition and the American Society of Immunologists. According to *Science* provision will be made for publication in the *Federation Proceedings* of abstracts of such papers as would have been offered for presentation if a federation meeting had been held or which may be offered for presentation at meetings of the constituent societies.

**Grants for Research in Endocrinology**—It is announced that requests to the National Research Council Committee for Research in Endocrinology for aid during the fiscal period from July 1 1943 to June 30 1944 will be received until February 28. Application blanks may be obtained by addressing the Division of Medical Sciences National Research Council, 2101 Constitution Avenue Washington D C. In addition to a statement of the problem and research plan or program the committee desires information regarding the proposed method of attack, the institutional support of the investigation and the uses to be made of the sum requested. No part of any grant may be used by the recipient institution for administrative expenses. Applications for aid of endocrine research on problems of sex in the narrower sense cannot be given favorable consideration but the committee will consider support of studies on the effects of sex hormones on nonsexual function, for example, on metabolism.

#### CANADA

**Personal**—Dr William E Gallie professor of surgery and dean of the University of Toronto Faculty of Medicine Toronto, has been elected to honorary fellowship in the Royal Society of Medicine.—Dr Ada I Wallace, medical health officer for Emerson and the rural municipalities of Franklin and Montcalm was recently appointed first woman coroner in the history of Manitoba, it is reported.

**University News**—The two separate health service departments for men and women in the University of Toronto Ontario, have been combined this year to form the University Health Service with Lieut Col Richard W I Urquhart Toronto, as director. Dr Gwendolyn E Mulock Toronto is assistant director in charge of the women's division. The health service now provides annual physical examinations for all undergraduate students.

#### PUERTO RICO

**Bureau of Health Education**—The health education office created in 1940 as an annex to the office of the commissioner of health, Department of Health of Puerto Rico, San Juan has been converted into a bureau and its name changed to Bureau of Health Education and Research in accordance with a recent act of the Puerto Rican legislature. The *Puerto Rico Health Bulletin* states that although the last word of the new title implies scientific investigations the alterations in functions have not yet been defined either by law or administratively and there has been no provision whatever made to justify the change in name. The general objectives are to disseminate health information to teach the underprivileged class in particular and the public at large how to take advantage of the services provided by the various agencies of the insular health department and to help in drafting technical instructions for the use of medical officers nurses social workers sanitarians and other employees of the health department. Its main activities include the editing and publishing of the *Health Bulletin* the general supervision of the library of the department of health and the general preparation and distribution of health material.

#### LATIN AMERICA

**New South American Journals**—The *Revista Peruana de Pediatría* the official organ of the Sociedad Peruana de Pediatría, made its first appearance with the June issue. The first issue contained original articles and reports of various general sessions of the Peruvian Society of Pediatrics and a section of medical news. Drs Carlos J Krumdieck and Julio

Muñoz Pughovich are the editor and assistant editor respectively. The headquarters of the new journal which will be published every three months are Washington 914 Lima Peru.—The *Analisis Neuro-Psiquiatricos del Fracaso de Mujeres de Bogota* Colombia has recently appeared. Drs Edmundo Tejada Rico and Luis Jaime Sanchez are the editor and assistant editor respectively.

#### Death in Other Countries

Sir Norman Walker, formerly president of the Royal College of Physicians, Edinburgh and of the General Medical Council, died Nov 7, 1942 in Midlothian aged 81. Sir Norman graduated at the University of Edinburgh in 1884. After being appointed resident physician in 1885 at the Royal Infirmary Edinburgh he was assistant physician for diseases of the skin and later full physician in the skin department at the infirmary. He was a representative of Scotland for thirty five years on the General Medical Council. He received the knighthood in 1928 following a study of medical education in the United States and India.

#### CORRECTION

**Treatment of Phosphorus Burns**—In the abstract of Godding and Nottens article on the treatment of phosphorus burns in the current medical literature department of THE JOURNAL July 25 1942 page 1059 in the last line in the first column the words sodium carbonate should have been sodium bicarbonate.

### Government Services

#### Government Manual for Professional Men

The fall-winter 1942 edition of the United States Government Manual is now available from the U S Information Center or the Superintendent of Documents Washington D C for one dollar, either in money order or check. The Division of Public Inquiries prepares and publishes the manual for the Office of War Information. The book contains seven hundred pages detailing the legislative powers functions, location names and titles of chief officials of all the government departments and agencies. It also contains organization charts a list of current federal publications and an invaluable section on abolished and transferred agencies and functions. It is fully indexed both by subject and by personnel and serves as a ready reference handbook.

#### Examination for Hospital Training in Dietetics

The Civil Service Commission has just announced a student dietitian examination to fill positions in the Army Medical Center Washington, D C. Sixteen female students will be enrolled in this position on or about September 1 and an additional sixteen six months later. The War Department offers a six month training course in hospital dietetics at the Army Medical Center to those desiring to become graduate dietitians. The students will receive subsistence and quarters and a small remuneration during the six month training period. At the end of the training students are eligible to assignment to positions as apprentice dietitian for a six month period at a salary of \$1440 a year. Those who successfully complete this apprenticeship will be eligible for retention in the service in the position of staff dietitian at \$1800 a year. To qualify for the examination for student dietitian positions applicants must have completed a full four year college course which included appropriate study in chemistry biology social sciences education nutrition and dietetics and institutional management. Applications will be accepted from senior students who expect to complete the required course by Feb 1 1944. Provisional appointment may be made prior to completion of the course but before entrance on duty proof of the completion of the course must be submitted directly to the War Department. There are no age limits for this examination. Applications must be in the office of the commission in Washington by January 9. The examination announcement giving full details may be consulted or obtained at first and second class postoffices (except in the cities where the civil service regional headquarters offices are located where the forms must be obtained from the regional office) or from the commission's Washington D C office. Applications are not desired from persons engaged in war work unless higher skills could be utilized in the new position. War Manpower Commission's restrictions on federal appointment of persons in critical occupations in specified areas are given in form 3989 posted in first and second class postoffices.



## Foreign Letters

### LONDON

(From Our Regular Correspondent)

Dec 11, 1942

#### The Names of Drugs

The war has cut off the large supply of drugs normally imported from Germany, of which many are now manufactured in England. The question of names has arisen. The General Medical Council has published, on the recommendation of the British Pharmacopoeia Commission, lists of approved names of the drugs produced by British manufacturers. The object is to recognize nonproprietary names which can be used freely by manufacturers and avoid the difficulties to physicians and pharmacists which arise from a number of names for the same drug. When any of the drugs for which names have been approved are admitted to the British Pharmacopoeia, the approved name becomes the official title, but recognition of an approved name does not imply that the drug will be admitted. The Pharmacopoeia Commission has formed an advisory committee on nomenclature to assist in the selection of approved names. Suggestions for suitable names are invited from manufacturers interested in the production of drugs for which they are required. The commission hopes that the approved names will be generally adopted and the use of other names avoided.

The commission has laid down the following guiding principles: 1. Names should preferably be free from any anatomic, physiologic, pathologic or therapeutic suggestion. This applies only to chemicals. Such suggestion cannot always be excluded in naming biologic products. 2. The accurate chemical name should be used if suitable. When it is unsuitable an attempt should be made to form a name by combining significant syllables from the chemical name and to include an indication of the potent element or constituent of a compound. Names should preferably not be of more than four syllables. 3. They should be distinctive in sound and spelling and not liable to be confused with others. 4. Names difficult to pronounce or remember should be avoided. 5. Addition of a terminal capital letter or number should be avoided. 6. Names in the current United States Pharmacopoeia should be used either as principal titles or as synonyms. 7. Names in the British Pharmaceutical Codex or in New and Unofficial Remedies should receive preferential consideration. 8. The following terminations should be used as far as possible: -ine for alkaloids and organic bases, -in for glucosides and neutral principles, -ol for alcohols and the phenol group, -al for aldehydes, -one for ketones and other substances containing the CO group, and -ane or -ene for local anesthetics.

Among the approved names already published are Amethocaine hydrochloride, Cyclobarbitone, Dichloestrol, Diodone, Diphenan, Dithranol, Ethylsterone, Hexazole, Menthylthione, Meprochol, Mesulphen and Sulphacetamide.

#### Increase in Tuberculosis Produced by the War

The health of this nation has actually improved since the outbreak of war, but there are certain exceptions. The increase in tuberculosis observed in the last great war has been repeated. In his Malcolm Morris memorial lecture Sir Arthur MacNalty, former chief medical officer of the Ministry of Health, said that tuberculosis was an inevitable result of war conditions, which brought overcrowding, limitation of protective foods, shortage of hospital beds, increased hours of work and general war strain. The great efforts made during the years 1918-1938, which had lowered the mortality from tuberculosis, would be retarded by this second great war. Civilian deaths from tuberculosis in England and Wales had risen from 26,250 in 1939 to 28,669 in 1941.

Counter measures must be applied after the war, and for this purpose more specialists in tuberculosis, more nursing and domestic staff, and more beds will be required. The machinery of organization should be made ready now. Every tuberculous man and woman leaving the fighting services or war industry should be rehabilitated, that is, put in a position to earn a livelihood. He advocated a scheme on the lines of the Papworth Village Settlement as embodying the secret of the successful treatment of tuberculosis. One of the results of the evacuation policy due to the air raids had been to transfer considerable numbers of children from London and other cities, where most of the milk was sterilized by heat to small urban or country districts, where practically all the milk was supplied raw. That was bound to cause a rise in nonpulmonary tuberculosis in children and already signs of this were apparent. He urged people to boil their milk if they could not obtain it pasteurized.

#### Danger of Nurses Contracting Tuberculosis in Sanatoriums

In the House of Commons the minister of health was asked whether in view of the suggestion that girls should be compelled to take up sanatorium nursing and of the efforts now being made to increase the number of nurses in such sanatoriums he would investigate cases in which nurses had contracted tuberculosis in the discharge of their duties and were now maintained either by public funds or on a sum which did not permit adequate and proper care. He was also asked what steps were taken in his department to ensure the rehabilitation of nurses who contracted tuberculosis when nursing tuberculous patients. He said whether he was satisfied that sufficient financial provision was made for such a nurse to ensure adequate food and clothing and a room apart from the rest of the inmates of the house where she might be more or less segregated.

The minister, Mr. Ernest Brown, said in reply that he would call attention to the statement in a recent report of the Medical Research Council that expert opinion in this and other countries was that the risk of contracting tuberculosis from nursing tuberculous patients in sanatoriums is no greater than that involved in general hospital nursing. A nurse in a tuberculosis institution who contracts the disease is given every care and attention appropriate to her condition by the institution. Arrangements for the care and after care, directed to restore working capacity, are an essential part of the tuberculosis service and apply to nurses as much as to any other person who suffers from tuberculosis.

#### Early Diagnosis of Pulmonary Tuberculosis by Mass Radiography

Sir Penderell Varrier-Jones, the pioneer of village settlements and therapeutic occupation for the tuberculous, died in 1941. Under the presidency of Sir Harold Whittingham, director general of medical services of the Air Force, the first memorial lecture to Varrier-Jones was delivered by Wing Commander Truill. He said that except in a disappointingly small percentage of cases we were a long way from the diagnosis of early pulmonary tuberculosis. The disease now claimed half the total deaths from all causes between the ages of 15 and 24 years. The best possible tuberculosis service, with every modern equipment had made no improvement toward earlier diagnosis in ten years and the extent of the disease at diagnosis was such that the majority of patients were unsuitable for modern treatment and few survived five years following discharge from a sanatorium. This state of affairs was due to the fact that it was only on the arrival of symptoms, and not always then that the patient sought advice. In x-ray examination we have a method which can reverse all this. The physician can seek out the patient and not wait until the patient seeks him.

The lecturer then gave the results of mass radiography of 40,119 personnel in the Air Force, including the Women's



**Auxiliary Service** The miniature film could weed the abnormal from the normal but for ultimate diagnosis a large film and full clinical and pathologic examination were necessary. Notwithstanding the fact that these 40,119 persons had been examined and passed by national service boards some six to twelve months previously and that all the men had a stricter examination within the previous six months with a view to selection for special duties, the X-ray examination showed that 65 of these unusually "fit" subjects (22 per thousand) of the 30,130 men exhibited signs of active tuberculosis and 108 (36 per thousand) signs of inactive disease. For the 9,989 women the figures were worse—38 (38 per thousand) had active and 56 (56 per thousand) inactive disease.

The figures showed that, among our supposedly healthy adolescent and young population between the ages of 18 and 24, 3 per thousand have unsuspected active tuberculosis and that more than 1 per thousand is a potential source of infection, because, unknown to himself, he has a positive sputum. The population at these ages is some 5 million from which it follows that we have among us some 15,000 persons suffering from unsuspected tuberculosis.

Before any extension of mass radiography can take place, much preparatory work must be done because workers associated X-ray examination with disease and economic disaster. Legislation must protect them against loss of employment and reduced standards of life for themselves and their families.

#### Dermatology in the British Expeditionary Force in France

At the annual meeting of the British Association of Dermatology and Syphilology Dr J. T. Ingram, who was consultant dermatologist to the British Expeditionary Force in France, described his experiences. He was disappointed to find that dermatology in the army is a cloak of respectability for venereology, as syphilis does not account for more than 5 or 6 per cent of venereal disease in the army, and a dermatologist should not be asked to treat gonorrhea, which belongs to the urogenital surgeon. Though there were many branches of special medical and surgical practice—ophthalmology, otology, dentistry, pathology—there was no organization for dermatology or, for that matter, for venereal diseases. He blamed dermatologists to some extent for this. It is seventy years since Hutchinson showed what a considerable part dermatology should play in the medical curriculum and yet its leaders are still content to allow it to remain a trifling decoration on the cloth of medicine instead of insisting on its being an essential fabric.

After conferences at general headquarters it was decided to deal with simple acute dermatoses (impetigo and scabies essentially), acute gonorrhea and the continuation treatment of syphilis in field ambulances. The diagnosis and preliminary treatment of syphilis and venereal sores were conducted at certain casualty clearing stations, where mobile pathologic laboratories and specialist personnel were established. The more difficult chronic and abnormal cases were sent to separate dermatologic and venereal units established at general hospitals at the base. The medical officers for the field ambulances were recruited by calling for volunteers. From these a number were chosen and given a week of intensive instruction at the base where they handled a wealth of clinical material and conducted under supervision, the investigations and technique required of them in the field ambulances. The result was that excellent work was done in them and much wastage of man power in the army was avoided. At the base it was arranged that certain general hospitals should house units for the treatment of dermatologic cases under skin specialists and that others should house venereal units under specialists in venereal disease. Patients who needed hospitalization for longer than twenty-eight days under conditions of static warfare and seven days under active warfare were evacuated to England.

#### Opposition to the New Regulations for the Compulsory Treatment of Venereal Diseases

The introduction of the compulsory treatment of venereal diseases, as a result of the war, was reported in a previous letter to *THE JOURNAL*. As was to be expected, the new regulation at once aroused opposition. Dr Edith Summerskill, a medical member of Parliament with other women members, has tabled a prayer for its annulment. They think that it will operate unfairly against women and will be ineffective. The minister of health received a deputation from the Association for Moral and Social Hygiene and representatives of women's organizations to discuss the new regulation.

A pamphlet entitled *Venereal Disease Still a Problem in the United States* has been sent to the editors of the medical journals anonymously. It begins by referring to the compulsion existing in many states that prospective mothers and applicants for marriage certificates must have serologic tests. It then says "Nevertheless, judging from an article by de Kruif published in the *Reader's Digest*, September 1942, page 10, the wiping out of venereal disease is just as much a problem as ever." Quotations on the dangers of antisyphilitic drugs from the *Lancet* follow.

#### New Photographic Method for Identifying Human Remains

The trial of a man aged 49 at the Central Criminal Court for the murder of his wife occurred recently. The skeleton of a woman was found under a paving stone of the cellar of a Baptist chapel adjoining premises where he worked as a fire watcher. The chapel was damaged in an air raid and the body was found by a demolition worker. A fire occurred in the cellar four days after the woman disappeared, on April 11, 1941. There were signs of burning on the left side of the remains. The question of identity offered difficulty. Dr Keith Simpson, pathologist, gave evidence that in his view death took place a year or eighteen months before he saw the remains on July 18, 1942. Evidence in support of identification with the dead woman was given by Miss Mary Newman who is in charge of the photographic department at Guy's Hospital. She took a number of photographs of the remains and also made a picture of a photograph of the missing woman and on this superimposed a photograph of the skull. Evidence of identity was also given by a dentist. The prisoner was convicted. This is only the second case in which this photographic method of identifying human remains has been used. The first was in the Ruxton murder case in 1936, when it was introduced by two Scottish professors.

#### Vitamins for Expectant Mothers and Young Children

Concentrated orange juice from the United States is now available for all children up to the age of 5 years instead of 3 as heretofore. Cod liver oil compound was already available for children up to 5. Both products can now be obtained under the government scheme by expectant mothers during the last six months of pregnancy. But the minister of food states that only 24 per cent of the children eligible were getting cod liver oil and only 26 per cent were getting orange juice. The Ministry of Health including its dietitian Dr J. C. Drummond has therefore made an appeal to all parents to see that their children regularly take orange juice and cod liver oil. They can be obtained at local food offices and at 7,500 centers at a very low cost. A bottle of cod liver oil compound which lasts about six weeks costs only 20 cents and a bottle of orange juice equal to a dozen oranges and sufficient for a fortnight costs 10 cents. Those who cannot afford these charges can obtain both free.

## BUENOS AIRES

(From Our Regular Correspondent)

Dec 5 1942

## Public Health in Bolivia

A decrease in the population and in the physical strength of the people who live in the eastern part of Bolivia has been observed for the last few years. A medical committee under the chairmanship of Dr. H. Kempf, head of the Lucha Antiverminosa of the Ministry of Public Health, was appointed by the government to investigate the causes of this situation. Medical examinations were made on 5,178 persons. It was learned that 99 per cent of the population of the region had helminthiasis, especially ancylostomiasis and many had tuberculosis or malaria, leprosy, gonorrhea or syphilis. The committee found that improving the sanitary conditions of the villages and educating these people are problems of great importance. In almost all villages the supply of water is either insufficient in quantity or not well cared for. The ignorance and lack of individual and collective care are obvious. A tree called higuero, or oge, which grows in large numbers near the Beni river has antihelminthic powers. Also numerous plants from which pyrethrum is obtained have antihelminthic powers.

## Antituberculosis Campaign in 1941

Dr. Alejandro A. Ramondi, director of the Municipal Center of Buenos Aires for a Campaign against Tuberculosis, has published a report of work done by the center in 1941. There were 2,708 deaths from tuberculosis in Buenos Aires in that year. Tuberculosis in the city has increased because of the number of patients from the provinces who come to the city. The routine practice of taking roentgenograms of children has resulted in finding early tuberculosis in unsuspected children and also in preventing the spread of the disease. The roentgen examination of the chest of apparently normal persons gave good results. Tuberculosis was found in 5 cases (13 per cent) of a group of 384 students (who had a roentgen examination of the chest in the Instituto Municipal de Tuberculosis) and in 25 cases (3.02 per cent) in a group of 826 applicants for municipal positions.

## Brief Items

In Argentina a law was recently passed which established an honorary committee to conduct a crusade against echinococcosis. The committee is formed of physicians and veterinarians. It depends on the Ministry of Agriculture and the National Department of Hygiene.

The Pan American members of the Instituto Internacional de Proteccion a la Infancia with headquarters in Montevideo met the last week of August in Montevideo. Dr. Gregorio Ariz Alfaro, the Argentine representative of the council of the institute, was president of the reunion. Miss Elizabeth Shurley Enoch of Washington was the representative of the Children's Bureau of the United States.

The Asociacion Congresos de Cirugia comprising representatives of medicine and surgery in Bolivia, Brazil, Chile, Paraguay, Argentina and Uruguay, resolved to meet for the first Congress of Surgery in Buenos Aires. The Asociacion Argentina de Cirugia gave the preference to the University of Santiago the fourth centennial of the foundation of which is celebrated this year. The congress is to be held in Santiago on November 14-19 to discuss acute peritonitis, fractures of the humeral diaphysis and nontuberculous purulent pleuritis. The address of the headquarters of the general secretariat office of the association is Santa Fe 1171, Buenos Aires.

The Asociacion Argentina de Dermatologia y Sifilologia recently held a meeting in Buenos Aires to celebrate the fiftieth anniversary of the foundation of the chair of dermatology in the Faculty of Medicine of Buenos Aires. Delegates from

South American countries were present. It was recalled that Dr. Baldomero Sommer was the first regular professor of the chair, which he occupied until his death in 1918. Dr. Mariano Aberastury occupied the chair from 1918 to 1925, when he retired. Dr. Pedro L. Balaña has occupied the chair since 1925. During the meeting, dermatologic sections were held with the collaboration of the delegates from South American countries. The advisability of forming a Latin American federation for the study of dermatovenereologic diseases and also a committee for studies on massive arsenotherapy was emphasized.

The association emphasized the importance of intensifying the crusade against leprosy in Argentina. The association also voted to establish scholarships for the interchange of dermatosyphilologists who work in clinics in various countries of the American Hemisphere.

## Personals

Dr. Juan P. Garrido of Buenos Aires was appointed to the chair of pediatrics and puericulture at the Faculty of Medicine of Buenos Aires to fill the vacancy left by Dr. Mamerto Acuña who retired, having reached the age limit. Dr. Garrido is the author of "Medicina Infantil" of which more than seventeen thousand copies have been published. He has written books on tuberculosis in childhood, rickets and vitamin K and is the editor of the *Archivos Argentinos de Pediatría*.—Dr. Alfredo V. Di Cio won the Mariano R. Castex prize, which is given by the Academia Nacional de Medicina of Buenos Aires and the premio al mejor trabajo which is given by the Faculty of Medical Sciences of Buenos Aires for his book "Enfermedades de las arterias perifericas".—Drs. Egidio S. Marzetti and Jorge M. Remolero won the Doctor Luis Agote prize for their book "Estudio clinico-radiologico del enfisema pulmonar". Dr. Marzetti previously was awarded prizes of the Faculties of Medicine of Paris, Brazil and Buenos Aires for clinical studies on pneumothorax and primary bronchopulmonary tumors.—Dr. Frank Norman Wilson of the University of Michigan Medical School recently delivered lectures at the Faculty of Medicine of Buenos Aires and the National Academy of Medicine.—Dr. Fred H. Albee of New York accepted the invitation which Dr. Oscar Karmassovich head of the Instituto de Clinica Quirurgical extended to him to come to Buenos Aires for the inauguration of the ward of orthopedics of the institute which is named the Dr. Albee ward.—Dr. Jose Arce, ex-dean of the Faculty of Medical Sciences of Buenos Aires, is in the United States visiting scientific centers to study the organization of centers of hemotherapy.

## Marriages

SIDNEY RICHARD KATSKY, San Antonio, Texas, to Miss Sophie Ferverman at Albuquerque, N. M., December 4.

HUBERT BENJAMIN HAYWOOD, JR., Raleigh, N. C., to Miss Virginia Louise Allison of Richmond, Va., October 17.

FREDERICK SMITH DIER, Williamsport, Pa., to Miss Ethel Warring of Allenwood in Tampa, Fla., September 15.

CLAUDE NASH HERNDON, JR., Winston-Salem, N. C., to Miss Margaret Forester Caldwell of Greensboro, October 10.

JAMES FRANCIS ZACARIA, St. Paul, to Miss Marie Filomena Sciletti at Kansas City, Mo., October 10.

HOWARD BAILEY WILLIAMS to Mrs. Betty Carlson Lide, both of Birmingham, Ala., in November.

PAUL W. VAN METRE to Mrs. Lucy Hinton, both of Rockwell City, Iowa, October 11.

VIVIAN ALLISON TENNEY to Mr. John Franklin Bover, both of New York, November 29.

BEN A. DREIBRODT, San Antonio, Texas, to Rita Leghart of Pittsburgh, November 25.

BEATY LEE BASS, Lenoir, N. C., to Miss Patsy Smith of Winston-Salem, recently.

## Deaths

**George Washington Crile** <sup>⊗</sup> world renowned surgeon, died January 7 at the Cleveland Clinic aged 78 of subacute bacterial endocarditis.

Dr Crile was born in Chili, Ohio Nov. 11, 1864. He graduated at Ohio Northern University and in 1887 at the University of Wooster Medical Department, Cleveland, now Western Reserve University School of Medicine. Early in his career Dr Crile studied in Vienna, London and Paris. He served at Wooster University first as lecturer and demonstrator in histology and later as professor of physiology and professor of the principles and practice of surgery. He was professor of clinical surgery at Western Reserve University from 1900 to 1911 and professor of surgery from 1911 to 1924. He was also director of research at the Cleveland Clinic Foundation, of which in 1921 he was a cofounder.

Research conducted by Dr Crile included the basic factors concerned in circulation, respiration, blood chemistry and the body's source of energy. He was perhaps first to make a direct blood transfusion performed in 1905.

Dr Crile was awarded the Albrecht prize by the College of Physicians of Philadelphia in 1901, the Cartwright prize by Columbia University in 1897 and 1903, the Semm prize by the American Medical Association in 1898, the *American Medicine* medal for service to humanity in 1914, the National Institute of Science medal in 1917 and the Trimble Lecture medal in 1921. In 1925 the Lannelongue International Medal of Surgery was presented to him by the Société internationale de chirurgie de Paris, in 1931 the Cleveland medal for public service and in 1940 the distinguished service gold key of the American Congress of Physical Therapy.

The memberships in scientific societies of Dr Crile included among others the American Association of Anatomists, the American Association for the Advancement of Science, American Association for the Study of Goiter, American Physiological Society, American Association of Obstetricians, Gynecologists and Abdominal Surgeons, Southern Surgical Association, Southern Medical Association, American Philosophical Society, American Association of Pathologists and Bacteriologists, Society of Clinical Surgery, Society of Experimental Biology and Medicine, National Institute of Social Sciences, National Research Council, Association for the Study of Internal Secretions, American Heart Association, American Medical Editors' Association, Ohio State Medical Association, Cleveland Academy of Medicine, Cleveland Medical Library Association and the Inter-State Postgraduate Medical Association of North America, of which he was chairman of the program committee. He was a member of the founders' group of the American Board of Surgery. In 1923 he served as president of the American Surgical Association.

A member of the board of regents of the American College of Surgeons since 1913, Dr Crile was chairman of the board from 1917 to 1939 and president of the college in 1916. In 1907 he was Third Vice President of the American Medical Association and chairman of its Section on Surgery, 1910-1911. He was also an honorary or corresponding fellow or member of many American and European societies.

In 1898 Dr Crile was brigade surgeon in the volunteers with the rank of major, serving in Cuba and Puerto Rico. He was a major in the Officers' Reserve Corps, and professional director of the U. S. Army Base Hospital number 4, Lakeside Unit (British Expeditionary Force number 9) in service in France for one year beginning May 1917, subsequently serving as senior

consultant in surgical research, lieutenant colonel and in November 1918 colonel. He was brigadier general in the Medical Officers' Reserve Corps in 1921, holding the same rank in the auxiliary reserve corps since 1929. In 1919 he was awarded the Distinguished Service Medal and in the same year became an honorary member of the Military Division third class, Companion of Bath (British). In 1922 he was made a Chevalier in the French Legion of Honor.

Dr Crile was a prolific contributor to scientific literature. Among numerous articles and textbooks are: *Surgical Shock* 1897, *Surgery of Respiratory System* 1899, *Certain Problems Relating to Surgical Operations* 1901, *On the Blood Pressure in Surgery* 1903, *Hemorrhage and Transfusion* 1909, *Anemia and Resuscitation* 1914, *Anoci-Association (with Lower)* 1914, second edition *Surgical Shock and the Shockless Operation Through Anoci-Association* 1920, *Origin and Nature of the Emotions* 1915, *A Mechanistic View of War and Peace* 1915, *Man an Adaptive Mechanism* 1916, *The Kinetic Drive* 1916, *The Fallacy of the German State Philosophy* 1918, *A Physical Interpretation of Shock, Exhaustion and Restoration* 1921, *The Thyroid Gland (with others)* 1922, *Notes on Military Surgery* 1924, *A Bipolar Theory of Living Processes* 1926, *Problems in Surgery* 1928, *Diagnosis and Treatment of Diseases of the Thyroid Gland (with others)* 1932, *Diseases Peculiar to Civilized Man* 1934, *The Phenomenon of Life* 1936, *The Surgical Treatment of Hypertension* 1938, and *Intelligence, Power and Personality* 1941.

Dr Crile's contributions to experimental work through the years resulted in many improvements in surgery and medical practice. He traveled widely, his charm and his forceful personality marked him for leadership early in his career. The contributions of his active and curious mind are a lasting monument.

**Jabez Henry Elliott**, Toronto, Ont., Canada, University of Toronto Faculty of Medicine 1897, associate in medicine and clinical medicine at his alma mater from 1909 to 1931 and since then professor of the history of medicine, president of the American Association of the History of Medicine, member and past president of the American Clinical and Climatological Association, past president of the Canadian Association of Tuberculosis, fellow of the American College of Physicians and in 1923 vice president, fellow of the Ontario Medical Association and in 1904 vice president, fellow of the Academy of Medicine of Toronto and in 1920 president, fellow of the Royal

College of Physicians of Canada, the College of Physicians and Surgeons of Ontario, the Ontario Historical Society and the British Medical Association. In 1934 was elected president of the Canadian Military Institute, which he served as librarian for many years, a founder of the National Tuberculosis Association, physician in charge of the Muskoka Cottage Sanatorium from 1898 to 1907. During World War I served in the medical corps of the Canadian Army for many years, chief of diseases of the chest at St. Michael's Hospital and associate physician at the Hospital for Sick Children. In 1900 went to Nigeria as a member of an expedition studying malaria and other diseases. Ontario representative on the editorial board of the *Canadian Medical Association Journal* aged 69, died December 18.

**Ewing Wilber Day**, Provincetown, Mass., Georgetown University School of Medicine, Washington, D. C. 1889, member of the Medical Society of the State of Pennsylvania and the American Academy of Ophthalmology and Otolaryngology, member and past president of the American Otolaryngological Society, Inc., member, president in 1908 and treasurer from 1901 to 1907 and from 1909 to 1937 of the American Laryngological, Rhinological and Otolaryngological Society, past president of the Allegheny County Medical Society, a founder and past president



GEORGE WASHINGTON CRILE M.D. 1864-1943

## BUENOS AIRES

(From Our Regular Correspondent)

Dec 5 1942

## Public Health in Bolivia

A decrease in the population and in the physical strength of the people who live in the eastern part of Bolivia has been observed for the last few years. A medical committee under the chairmanship of Dr. H. Kemps, head of the Lucha Antivermínea of the Ministry of Public Health, was appointed by the government to investigate the causes of this situation. Medical examinations were made on 5178 persons. It was learned that 99 per cent of the population of the region had helminthiasis, especially ancylostomiasis, and many had tuberculosis or malaria, leprosy, gonorrhea or syphilis. The committee found that improving the sanitary conditions of the villages and educating these people are problems of great importance. In almost all villages the supply of water is either insufficient in quantity or not well cared for. The ignorance and lack of individual and collective care are obvious. A tree called higueron, or oge which grows in large numbers near the Beni river has antihelminthic powers. Also numerous plants from which pyrethrum is obtained have antihelminthic powers.

## Antituberculosis Campaign in 1941

Dr. Alejandro A. Raimondi, director of the Municipal Center of Buenos Aires for a Campaign against Tuberculosis has published a report of work done by the center in 1941. There were 2708 deaths from tuberculosis in Buenos Aires in that year. Tuberculosis in the city has increased because of the number of patients from the provinces who come to the city. The routine practice of taking roentgenograms of children has resulted in finding early tuberculosis in unsuspected children and also in preventing the spread of the disease. The roentgen examination of the chest of apparently normal persons gave good results. Tuberculosis was found in 5 cases (13 per cent) of a group of 384 students (who had a roentgen examination of the chest in the Instituto Municipal de Tuberculosis) and in 25 cases (302 per cent) in a group of 826 applicants for municipal positions.

## Brief Items

In Argentina a law was recently passed which established an honorary committee to conduct a crusade against echinococcosis. The committee is formed of physicians and veterinarians. It depends on the Ministry of Agriculture and the National Department of Hygiene.

The Pan American members of the Instituto Internacional de Protección a la Infancia, with headquarters in Montevideo met the last week of August in Montevideo. Dr. Gregorio Arioz Alfaro, the Argentine representative of the council of the institute was president of the reunion. Miss Elizabeth Shurley Enochs of Washington was the representative of the Children's Bureau of the United States.

The Asociación Congresos de Cirugía comprising representatives of medicine and surgery in Bolivia, Brazil, Chile, Paraguay, Argentina and Uruguay resolved to meet for the first Congress of Surgery in Buenos Aires. The Asociación Argentina de Cirugía gave the preference to the University of Santiago the fourth centennial of the foundation of which is celebrated this year. The congress is to be held in Santiago on November 14-19 to discuss acute peritonitis, fractures of the humeral diaphysis and nontuberculous purulent pleuritis. The address of the headquarters of the general secretariat office of the association is Santa Fe 1171 Buenos Aires.

The Asociación Argentina de Dermatología y Sifilología recently held a meeting in Buenos Aires to celebrate the fiftieth anniversary of the foundation of the chair of dermatology in the Faculty of Medicine of Buenos Aires. Delegates from

South American countries were present. It was recalled that Dr. Baldomero Sommer was the first regular professor of the chair, which he occupied until his death in 1918. Dr. Maximiliano Aberastury occupied the chair from 1918 to 1925, when he retired. Dr. Pedro L. Balbín has occupied the chair since 1925. During the meeting, dermatologic sections were held with the collaboration of the delegates from South American countries. The advisability of forming a Latin American federation for the study of dermatovenereologic diseases and also a committee for studies on massive arsenotherapy was emphasized.

The association emphasized the importance of intensifying the crusade against leprosy in Argentina. The association also voted to establish scholarships for the interchange of dermatosyphilologists who work in clinics in various countries of the American Hemisphere.

## Personals

Dr. Juan P. Garrahin of Buenos Aires was appointed to the chair of pediatrics and puericulture at the Faculty of Medicine of Buenos Aires to fill the vacancy left by Dr. Mamerto Acuña who retired, having reached the age limit. Dr. Garrahin is the author of "Medicina Infantil," of which more than seventeen thousand copies have been published. He has written books on tuberculosis in childhood, rickets and vitamin K and is the editor of the *Archivos Argentinos de Pediatría*.—Dr. Alfredo V. Di Cio won the Mariano R. Castex prize, which is given by the Academia Nacional de Medicina of Buenos Aires and the premio al mejor trabajo which is given by the Faculty of Medical Sciences of Buenos Aires for his book "Enfermedades de las arterias periféricas."—Drs. Egidio S. Mazzei and Jorge M. Remolín won the "Doctor Luis Agote" prize for their book "Estudio clinicoradiológico del enfisema pulmonar." Dr. Mazzei previously was awarded prizes of the Faculties of Medicine of Paris, Brazil and Buenos Aires for clinical studies on pneumothorax and primary bronchopulmonary tumors.—Dr. Frank Norman Wilson of the University of Michigan Medical School recently delivered lectures at the Faculty of Medicine of Buenos Aires and the National Academy of Medicine.—Dr. Fred H. Albce of New York accepted the invitation which Dr. Oscar Ivamsevich, head of the Instituto de Clínica Quirúrgica, extended to him to come to Buenos Aires for the inauguration of the ward of orthopedics of the institute which is named the Dr. Albce ward.—Dr. Jose Arce ex dean of the Faculty of Medical Sciences of Buenos Aires is in the United States visiting scientific centers to study the organization of centers of hemotherapy.

## Marriages

SIDNEY RICHARD KATSKI, San Antonio, Texas, to Miss Sophie Favermin at Albuquerque, N. M., December 4.

HUBERT BINSBURY HASWOOD, JR., Raleigh, N. C. to Miss Virginia Louise Allison of Richmond, Va., October 17.

FREDERICK SMITH DEER, Williamsport, Pa. to Miss Ethel Warring of Allenwood in Trumpet Fl., September 15.

CLAUDE NASH HERBON, JR., Winston-Salem, N. C. to Miss Margaret Forester Caldwell of Greensboro, October 10.

JAMES FRANCIS ZACARY, St. Paul to Miss Marie Filomena Scialoja at Kansas City, Mo., October 10.

HOWARD BAILEY WILLIAMS to Mrs. Betty Carlson Lide, both of Birmingham, Ala. in November.

PAUL W. VAN METRE to Mrs. Lucy Hinton, both of Rockwell City, Iowa, October 11.

VIRGIN ALISON TENNEY to Mr. John Franklin Bover, both of New York, November 29.

BEN A. DRIFBRODT, San Antonio, Texas, to Rita Leghart of Pittsburgh, November 25.

BEATY LEE BASS, Lenoir, N. C., to Miss Patsy Smith of Winston-Salem, recently.

## Deaths

**George Washington Crile** <sup>®</sup> world renowned surgeon, died January 7 at the Cleveland Clinic, aged 78, of subacute bacterial endocarditis.

Dr Crile was born in Chubb, Ohio Nov. 11, 1864. He graduated at Ohio Northern University and in 1887 at the University of Wooster Medical Department, Cleveland now Western Reserve University School of Medicine. Early in his career Dr Crile studied in Vienna, London and Paris. He served at Wooster University first as lecturer and demonstrator in histology and later as professor of physiology and professor of the principles and practice of surgery. He was professor of clinical surgery at Western Reserve University from 1900 to 1911 and professor of surgery from 1911 to 1924. He was also director of research at the Cleveland Clinic Foundation, of which in 1921 he was a cofounder.

Research conducted by Dr Crile included the basic factors concerned in circulation, respiration, blood chemistry and the body's source of energy. He was perhaps first to make a direct blood transfusion performed in 1905.

Dr Crile was awarded the Alva Reaga prize by the College of Physicians of Philadelphia in 1901, the Cartwright prize by Columbia University in 1897 and 1903, the Senn prize by the American Medical Association in 1898, the *American Medicine* medal for service to humanity in 1914, the National Institute of Science medal in 1917 and the Trimble Lecture medal in 1921. In 1925 the Lannelongue International Medal of Surgery was presented to him by the Société internationale de chirurgie de Paris, in 1931 the Cleveland medal for public service and in 1940 the distinguished service gold key of the American Congress of Physical Therapy.

The memberships in scientific societies of Dr Crile included among others the American Association of Anatomists, the American Association for the Advancement of Science, American Association for the Study of Goiter, American Physiological Society, American Association of Obstetricians, Gynecologists and Abdominal Surgeons, Southern Surgical Association, Southern Medical Association, American Philosophical Society, American Association of Pathologists and Bacteriologists, Society of Clinical Surgery, Society of Experimental Biology and Medicine, National Institute of Social Sciences, National Research Council, Association for the Study of Internal Secretions, American Heart Association, American Medical Editors Association, Ohio State Medical Association, Cleveland Academy of Medicine, Cleveland Medical Library Association and the Inter-State Postgraduate Medical Association of North America, of which he was chairman of the program committee. He was a member of the founders' group of the American Board of Surgery. In 1923 he served as president of the American Surgical Association.

A member of the board of regents of the American College of Surgeons since 1913, Dr Crile was chairman of the board from 1917 to 1939 and president of the college in 1916. In 1907 he was Third Vice President of the American Medical Association and chairman of its Section on Surgery, 1910-1911. He was also an honorary or corresponding fellow or member of many American and European societies.

In 1898 Dr Crile was brigade surgeon in the volunteers with the rank of major, serving in Cuba and Puerto Rico. He was a major in the Officers' Reserve Corps and professional director of the U. S. Army Base Hospital number 4 Lakeside Unit (British Expeditionary Force number 9) in service in France for one year beginning May 1917, subsequently serving as senior

consultant in surgical research, lieutenant colonel and in November 1918 colonel. He was brigadier general in the Medical Officers' Reserve Corps in 1921, holding the same rank in the auxiliary reserve corps since 1929. In 1919 he was awarded the Distinguished Service Medal and in the same year became an honorary member of the Military Division third class Companion of Bath (British). In 1922 he was made a Chevalier in the French Legion of Honor.

Dr Crile was a prolific contributor to scientific literature. Among numerous articles and textbooks are: *Surgical Shock*, 1897; *Surgery of Respiratory System*, 1899; *Certain Problems Relating to Surgical Operations*, 1901; *On the Blood Pressure in Surgery*, 1903; *Hemorrhage and Transfusion*, 1909; *Anemia and Resuscitation*, 1914; *Anoci Association (with Lower)*, 1914; second edition *Surgical Shock and the Shockless Operation Through Anoci Association*, 1920; *Origin and Nature of the Emotions*, 1915; *A Mechanistic View of War and Peace*, 1915; *Man an Adaptive Mechanism*, 1916; *The Kinetic Drive*, 1916; *The Fallacy of the German State Philosophy*, 1918; *A Physical Interpretation of Shock Exhaustion and Restoration*, 1921; *The Thyroid Gland (with others)*, 1922; *Notes on Military Surgery*, 1924; *A Bipolar Theory of Living Processes*, 1926; *Problems in Surgery*, 1928; *Diagnosis and Treatment of Diseases of the Thyroid Gland (with others)*, 1932; *Diseases Peculiar to Civilized Man*, 1934; *The Phenomena of Life*, 1936; *The Surgical Treatment of Hypertension*, 1938; and *Intelligence, Power and Personality*, 1941.

Dr Crile's contributions to experimental work through the years resulted in many improvements in surgery and medical practice. He traveled widely, his charm and his forceful personality marked him for leadership early in his career. The contributions of his active and curious mind are a lasting monument.

Jabez Henry Elliott, Toronto, Ont., Canada, University of Toronto Faculty of Medicine, 1897, associate in medicine and clinical medicine at his alma mater from 1909 to 1931 and since then professor of the history of medicine, president of the American Association of the History of Medicine, member and past president of the American Clinical and Climatological Association, past president of the Canadian Association of Tuberculosis, fellow of the American College of Physicians and in 1923 vice president, fellow of the Ontario Medical Association and in 1904 vice president, fellow of the Academy of Medicine of Toronto and in 1920 president, fellow of the Royal

College of Physicians of Canada, the College of Physicians and Surgeons of Ontario, the Ontario Historical Society and the British Medical Association. In 1934 was elected president of the Canadian Military Institute, which he served as librarian for many years, a founder of the National Tuberculosis Association, physician in charge of the Muskoka Cottage Sanatorium from 1898 to 1907, during World War I served in the medical corps of the Canadian Army, for many years chief of diseases of the chest at St. Michael's Hospital and associate physician at the Hospital for Sick Children. In 1900 went to Nigeria as a member of an expedition studying malaria and other diseases. Ontario representative on the editorial board of the *Canadian Medical Association Journal*, aged 69, died December 18.

Ewing Wilber Day, Provincetown, Mass., Georgetown University School of Medicine, Washington, D. C., 1889, member of the Medical Society of the State of Pennsylvania and the American Academy of Ophthalmology and Otolaryngology, member and past president of the American Otolaryngological Society, Inc., member president in 1908 and treasurer from 1901 to 1907 and from 1909 to 1937 of the American Laryngological, Rhinological and Otolaryngological Society, past president of the Allegheny County Medical Society, a founder and past president



GEORGE WASHINGTON CRILE, M.D., 1864-1943

of the Pittsburgh Academy of Medicine fellow of the American College of Surgeons, for many years professor of otology, laryngology and rhinology at the University of Pittsburgh School of Medicine where he had been professor emeritus since 1928, a founder of the Pittsburgh Eye and Ear Hospital and its chief of staff from 1908 to 1928 consultant, St. Margaret Memorial and Children's hospitals, Pittsburgh, and the Columbia Hospital, Wilkensburg, specialist certified by the American Board of Otolaryngology, lieutenant colonel in the medical reserve corps of the U. S. Army not on active duty served as a major and lieutenant colonel in the medical corps of the U. S. Army during World War I, aged 80, died, November 24, in the Doctors Hospital, New York.

**Henry Erdmann Radasch**, Philadelphia, Jefferson Medical College of Philadelphia 1901 appointed professor of histology and embryology in the department of anatomy on Nov. 20, 1922 and on June 15, 1942 became emeritus professor of histology and embryology at his alma mater, where he had been demonstrator of histology and embryology from 1901 to 1903, associate from 1903 to 1918 and associate professor from 1918 to 1922, instructor of histology at the Pennsylvania College of Dental Surgery from 1906 to 1909 and adjunct professor of physiology, pathology and bacteriology 1909-1910, instructor in anatomy at the Pennsylvania Academy of Fine Arts from 1913 to 1918 histologist at the Philadelphia General Hospital in 1920 member of the American Association of Anatomists author of "Manual of Anatomy," "A Compend of Histology" and "A Manual of Histology" contributed fifteen articles to the Reference Handbook of the Medical Sciences, aged 68, died November 29 of coronary occlusion.

**Alfred Baker Spalding**, San Francisco Columbia University College of Physicians and Surgeons New York 1900, appointed instructor in obstetrics at the University of California Medical School in 1902 and in 1909 professor of obstetrics, became professor of obstetrics and gynecology at the Stanford University School of Medicine in 1912 and in 1934 professor emeritus, member of the House of Delegates of the American Medical Association in 1917-1919 and 1923, member of the California Medical Association the Pacific Coast Surgical Association and of the Pacific Coast Society of Obstetrics and Gynecology, honorary fellow in 1933 of the American Gynecological Society, specialist certified by the American Board of Obstetrics and Gynecology, Inc. director of San Francisco Maternity from 1904 to 1915, consultant in gynecology and obstetrics at San Francisco Hospital and Stanford University Hospitals until 1933, aged 68, died November 26.

**Albert Allemann**, Takoma Park Md. George Washington University School of Medicine Washington, D. C. 1904, retired at the end of February 1932 from active duty in the library of the Surgeon General's Office where he had been since 1900, was for fifteen years principal assistant librarian and editor of the *Index Catalogue*, at one time assistant editor of the *Index Medicus* and later on the staff of the *Quarterly Cumulative Index Medicus* will be remembered for his editing, on the *Index Catalogue* including four volumes of the second and all of the third series, aged 82, died December 10.

**Henry Willard Allen**, Ridgefield Conn. Medico-Chirurgical College of Philadelphia, 1909 author of *Diseases of the Rectum*, aged 65, died recently.

**Raymond C. Almy**, Auburn N. Y. Syracuse University College of Medicine 1908 member of the Medical Society of the State of New York, coroner of Cayuga County, aged 60, on the consulting staff and formerly president of staff of the Auburn City Hospital, where he died November 29.

**Marvin Armstrong**, Merkel, Texas Medical Department of Tulane University of Louisiana New Orleans 1892 member of the State Medical Association of Texas, for thirty-five years surgeon for the Missouri, Kansas and Texas Railroad, aged 76, died, November 27, in a hospital at Fort Worth of complications as the result of injuries received in a fall.

**Robert Anderson Bennett**, Riverdale, Md., George Washington University School of Medicine Washington, D. C. 1906 past president of the Prince Georges County Medical Society, for many years medical examiner for Prince Georges County and health officer for Riverdale, one of the founders and director of the Citizens Bank of Riverdale, aged 80, died November 11.

**Urban Clark Billingsley**, Hayward, Calif. Cooper Medical College, San Francisco, 1904, aged 67, died, November 15.

**Sigmund F. Braunfield**, New York Long Island College Hospital, Brooklyn 1919, aged 51, died, November 22, in

the Manhattan General Hospital of cerebral hemorrhage and thrombosis.

**Betha Portis Brindley**, Danville Ala., Georgia College of Eclectic Medicine and Surgery, Atlanta, 1892, aged 87, died, November 29, in the Benevolent Society Hospital, Decatur, of pneumonia.

**Sara Craig Buckley**, Le Roy, N. Y., University of Michigan Department of Medicine and Surgery, Ann Arbor, 1884, at one time a medical missionary in Japan, aged 84, died, November 24.

**Luther Grow Bunker**, Waterville, Maine Medical School of Maine, Portland, 1892 served twelve years as a member of the Board of Registration of Medicine in Maine for six years served as city physician and as mayor in 1907 and 1908, in June 1942 was presented with a gold medal by the Maine Medical Association in recognition of his fifty years in the practice of medicine, aged 74, died, November 26.

**Martin Francis Cashin**, St. John's, Newfoundland, Canada McGill University Faculty of Medicine, Montreal, Que., 1923, aged 43, died suddenly, November 5.

**Oscar G. Cranford**, Sasser Ga. Baltimore Medical College 1892 member of the Medical Association of Georgia, aged 76, died, October 25, in a hospital at Moultrie.

**Charles Clarence Davis**, Essex Conn., Yale University School of Medicine, New Haven 1907 on the staff of the Middlesex Hospital, Middletown, aged 58, died, November 26, of carcinoma of the liver.

**George Hicks Davis**, Hollidays Cove W. Va., Baltimore Medical College 1905 member of the West Virginia State Medical Association, aged 66, died, November 20, of cerebral hemorrhage.

**Hervie Alden Dobson**, Madison, Wis. Columbian University Medical Department Washington, D. C. 1876 Civil War veteran, aged 100, died, November 27.

**Charles Russell Doyme**, Albuquerque N. M., University of Arkansas School of Medicine Little Rock, 1911 member of the New Mexico Medical Society, at one time on the staff of the Southern Hospital for the Insane Madison Ind. the Longview State Hospital Cincinnati the Topeka (Kan.) State Hospital the State Sanatorium for Tuberculosis Norton Kan. New Mexico State Hospital Las Vegas and the Arizona State Hospital Phoenix, aged 54, was found dead November 1, in a local hospital of a self-inflicted bullet wound.

**William Casper Duke**, Fredonia, N. Y. Kentucky School of Medicine Louisville 1888, Jefferson Medical College of Philadelphia 1893, for many years village health officer of Fredonia, aged 84, died November 11.

**Samuel Walker Ellsworth**, Quincy Mass. Harvard Medical School Boston 1896 member of the Massachusetts Medical Society served during World War I had served on the staffs of Quincy City Hospital, the Massachusetts Memorial and the City hospitals Boston, aged 72, died November 26.

**Richard Austin Flynn**, Belleville, Ont. Canada, Queen's University Faculty of Medicine, Kingston, 1923, aged 44, died, October 8.

**Bernard Freedman**, Los Angeles, University of California Medical School San Francisco 1941, aged 26, died, October 8, of postoperative hemorrhage.

**Roscoe S. Graves**, Saco, Maine, Homeopathic Hospital College Cleveland 1883, aged 84, died November 29, in the Trull Hospital Biddford of chronic myocarditis, hypertension and uraemia.

**Oscar Blin Hall**, Warrensburg Mo. University Medical College of Kansas City, Mo. 1898, aged 74, died recently.

**Orlando S. Harmon**, De Kalb, Mo. St. Louis College of Physicians and Surgeons 1892, aged 78, died, November 6, in the Smithville (Mo.) Community Hospital.

**Homer Benton Harper**, Barberton, Ohio College of Physicians and Surgeons of Chicago School of Medicine of the University of Illinois Chicago, 1906 member of the Ohio State Medical Association on the staff of the Citizens Hospital, aged 69, was instantly killed in an automobile accident, November 14.

**Wayne Adelbert Harris**, Santa Ana Calif. College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1904, aged 61, died November 25.

**John Joseph Hayden**, Worcester Mass., Baltimore Medical College 1908, aged 62, died November 26.

**Fred Stanley Heimer**, Unadilla N. Y. Baltimore Medical College, 1910 member of the Medical Society of the State of New York formerly a pharmacist, for many years health

officer, served as a captain in the medical corps of the U S Army during World War I, aged 61, died, November 27

**Hiram A Hess**, Ross Calif Barnes Medical College St Louis, 1897, aged 75 died November 13

**Leander S Holcomb**, Riverside, Calif, University of Louisville (Ky) Medical Department, 1893, aged 77, died, October 4

**William Henry Hood**, Reno, Nev, University of Michigan Department of Medicine and Surgery Ann Arbor 1886 member of the Nevada State Medical Association formerly surgeon for the Southern Pacific Railway, past president of the Pacific Association of Railway Surgeons was a director of the Farmers and Merchants Bank, aged 80 died November 29

**James Manney Howard Jr** \* Passed Assistant Surgeon Lieutenant, U S Navy, retired, Kinston N C University of Virginia Department of Medicine Charlottesville, 1915, entered the medical corps of the U S Navy May 22, 1917 and retired Feb 15, 1922 for incapacity resulting from an incident of the service, served during World War I, aged 51, died, November 17, in the Parrott Memorial Hospital

**Edward Raymond Stone Jr**, Washington, D C Georgetown University School of Medicine, Washington, 1939 was commissioned a first lieutenant and later a captain in the Royal Army Medical Corps aged 29, was killed in action in the Middle East, November 1, while in front line duty with the attacking forces during the advance in Egypt

**Randall Hutchinson**, Los Angeles University of Pennsylvania Department of Medicine, Philadelphia, 1887, formerly professor of physical diagnosis at the University of Southern California College of Medicine, formerly served as a member of the consulting staff at the Children's Hospital, aged 82, died, November 12

**Clarence Andrew Kelly**, St Croix Falls Wis, Marquette University School of Medicine, Milwaukee, 1939, member of the State Medical Society of Wisconsin, on the staff of St Croix Falls Hospital aged 33 was accidentally killed while hunting deer on November 16

**Maud Emilie Taft Kew**, Keene N H Woman's Medical College of Pennsylvania, Philadelphia, 1900, aged 68, died, November 7, in Boston

**Robert Bruce King**, Newborough Ont, Canada, Trinity Medical College Toronto, 1893, died, October 17

**William Andrew Lee** \* Fergus Falls, Minn Northwestern University Medical School, Chicago 1911, past president of the Park Region District Medical Society, served overseas in the medical corps of the U S Army during World War I, served as health officer of Fergus Falls and coroner of Otter Tail County aged 62, on the staff of St Luke's Hospital on the staff and formerly chief of staff of the George B Wright Memorial Hospital, where he died, November 22, of uremia and pyelonephritis

**John McKiggan**, Donkin, N S Canada Dalhousie University Faculty of Medicine, Halifax, 1921, aged 51, died recently

**Robert Hopkin Paterson**, Hamilton, Ont, Canada, University of Toronto Faculty of Medicine Toronto, 1908 served as a captain in the Canadian Army Medical Corps during World War I, since 1920 had been in charge of special clinical work for the department of health with headquarters at the General Hospital, aged 59, died suddenly, November 6

**James William Prowell**, Kansas, Okla, St Louis College of Physicians and Surgeons, 1896, county health physician for Delaware County served as a first lieutenant in the medical corps of the U S Army during World War I, at one time associated with the Indian Service in White Horse S D, aged 69 died, November 27, on state highway number 33 2 miles East of Salina

**Ben L Reitman**, Chicago American College of Medicine and Surgery Chicago, 1904 at one time instructor of surgical pathology at his alma mater author of "Second Oldest Profession A Study of the Prostitutes Business Manager" and Sister of the Road The Autobiography of Boxcar Bertha,

a colorful figure in Chicago for many years aged 63, died November 16 of coronary thrombosis

**Winifred Brenda Reynolds**, Stevensville, Mont Dalhousie University Faculty of Medicine, Halifax N S, Canada, 1900 aged 64, died October 5

**George B Ribble** \* La Moure N D University of Minnesota College of Medicine and Surgery, Minneapolis 1901 past president of the Southern District Medical Society aged 64, died, October 20, of cardiac thrombosis

**John Lewis Riggles**, Washington D C Columbian University Medical Department, Washington 1900 formerly associate clinical professor of obstetrics at the Georgetown University School of Medicine at one time instructor in anatomy at his alma mater known as the George Washington University School of Medicine formerly dispensary physician at the Columbia Hospital for Women and had been in charge of the surgery dispensary at the George Washington University Hospital aged 65, died, December 8

**Walter Alfred Sangster**, Stouffville, Ont, Canada University of Toronto Faculty of Medicine 1889, aged 77, died October 8

**Albert Lytleton Savage**, Ventnor N J Jefferson Medical College of Philadelphia 1887, aged 85 died, October 15, of chronic prostatitis and acute nephritis

**James C Shanks**, Toronto, Ont, Canada McGill University Faculty of Medicine, Montreal, Que, 1881, aged 89, died, September 17

**Robert Lee Smith**, Melbourne, Ark (licensed in Arkansas in 1903), aged 66, died, November 17, of gout and uremia

**Roy James Snider**, Thessalon, Ont, Canada, University of Toronto Faculty of Medicine 1916 served during World War I with the Canadian Army Medical Corps as a lieutenant and later with the Royal Army Medical Corps as a captain, aged 50 died September 20

**Joseph H Spicer**, Cumberland, Md, Baltimore Medical College, 1910, aged 56 died, November 30, in the Memorial Hospital of chronic myocarditis

**Harry Stein** \* Sandusky Ohio Syracuse University College of Medicine, 1930, aged 43 died November 7

**Robert Mills Stephenson**, Lexington Miss Atlanta (Ga) College of Physicians and Surgeons, 1908 member of the Mississippi State Medical Association fellow of the American College of Surgeons served during World War I on the staff of the Holmes County Community Hospital, aged 59 died November 26 of coronary thrombosis

**Arthur Ellis Threlkeld**, Wheatley Ky Chicago Homeopathic Medical College, 1880, member of the Kentucky State Medical Association, for many years chairman of the board of education of Wheatley, and bank president, aged 80 died November 21 of coronary sclerosis

**William Massie Tunstall**, Lexington, Va University of the City of New York Medical Department New York 1891, for many years chairman of the board of supervisors of Nelson County, aged 73, died, November 24

**Clarence David Vrooman**, Ellenville N Y, Albany Medical College 1892, member of the Medical Society of the State of New York, aged 82 on the staff of Benedictine Hospital Kingston, and of the Veterans Memorial Hospital where he died, November 24

**William P Watson**, Dyersburg, Tenn Memphis (Tenn) Hospital Medical College 1899, member of the Tennessee State Medical Association, past president of the Dyer-Lake-Crockett Counties Medical Society on the staff of the Baird-Brewer General Hospital aged 68, died, November 18 of carcinoma of the sigmoid with metastasis

**Edward George Weadock**, Lima, Ohio, University of Michigan Department of Medicine and Surgery, Ann Arbor, 1900 member of the Ohio State Medical Association served overseas in the medical corps of the U S Army during World War I aged 66 died, November 22

**James A Wright** \* Morrison, Ill, Beaumont Hospital Medical College, St Louis, 1887 aged 83, died, November 18

# KILLED IN ACTION



CAPTAIN EDWARD R STONE JR  
ROYAL ARMY MEDICAL CORPS



## Correspondence

### "VITAMINS FOR COLDS"

To the Editor.—In the article entitled "Vitamins for the Prevention of Colds" by Cowan Diehl and Baker, on page 1268 in the Dec. 19, 1942 issue of THE JOURNAL, the following paragraph appeared: "Most of the studies for the prevention of colds have been limited to vitamin A alone or to vitamins A and D as contained in cod liver oil. The experiments with vitamin A have resulted almost uniformly in negative results, while cod liver oil has been reported by a number of authors to reduce the severity and by some the frequency of colds. Most of the latter reports, however, are based on inadequately controlled studies." Under footnote 1 appeared a reference to a paper by Drs. Alfred F. Hess, J. M. Lewis and L. H. Barenberg entitled "Does Our Dietary Require Vitamin A Supplement?" published in THE JOURNAL, Aug. 26, 1933, page 657.

The implication, therefore, is that we expressed the opinion that cod liver oil reduced the severity or the incidence of respiratory infections and also that our study was inadequately controlled. We wish to call attention to the fact that our study was grossly misinterpreted by the aforementioned authors. As first we found that cod liver oil or products containing vitamin A had no effect on the incidence or severity of respiratory infections and secondly we had observed eighty infants who received no vitamin A supplements and served as controls. These control infants were housed in a model child caring institution in the same wards as those who received vitamin A supplements.

In a previous communication (Barenberg, I. H. and Lewis, J. M. "Relationship of Vitamin A to Respiratory Infections in Infants" THE JOURNAL, Jan. 16, 1932, p. 199) as well as in a subsequent report (Lewis, J. M., and Barenberg, L. H. "The Relationship of Vitamin A to the Health of Infants" *ibid.* April 23, 1938, p. 1338) we also found that the addition of vitamin A to the average diet of infants had no beneficial effect on the incidence or severity of respiratory infections.

J. M. LEWIS, M.D.  
L. H. BARENBURG, M.D.  
New York

### "THE PSYCHIATRIC ASPECTS OF MARIHUANA INTOXICATION"

To the Editor.—In the September 1942 issue of the *American Journal of Psychiatry* there appeared a paper entitled "The Psychiatric Aspects of Marihuana Intoxication" by Drs. Allentuck and Bowman. The paper contained certain observations which appear to be based on research conducted in New York City at Welfare Hospital under the auspices of the Mayor's Committee on Marihuana. In the Dec. 5, 1942 issue of THE JOURNAL there appeared an editorial on the paper by Drs. Allentuck and Bowman.

The research of Drs. Allentuck and Bowman was made, it is true, on only 77 subjects, and those apparently were all drawn from a prison population. Nevertheless several of the conclusions reached confirmed information in our possession. Thus the indication that marihuana precipitates in certain persons psychoses and unstable and disorganized personality is in accord with findings already in our possession. The conclusions of the study, as Dr. Kolb points out in his remarks on the paper (printed at the end of Allentuck and Bowman's paper in the *American Journal of Psychiatry*) certainly make it clear that use of marihuana may be an important contributory cause to crime. Drs. Allentuck and Bowman state definitely that marihuana by relaxing inhibitions may permit antisocial tendencies to come to the fore.

Of course the primary interest of the Bureau of Narcotics is in the enforcement aspect. From that point of view we feel that it is very unfortunate that Drs. Allentuck and Bowman should have stated so unqualifiedly that use of marihuana does not lead to physical, mental or moral degeneration and that no permanent deleterious effects from its continued use were observed. I am aware of course, that the *American Journal of Psychiatry* and THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION are published for a select professional group of readers who will understand the statement for what it was, that is a scientific statement that certain phenomena were not observed in the study of a small group drawn from a prison population. More indiscriminating readers are perhaps likely to interpret the statement as the final word of the medical profession. Also there may well be some unsavory persons engaged in the illicit marihuana trade who will make use of the statement in pushing their dangerous traffic.

I am sure that you and most of your readers are familiar with the studies which have led to the conclusions that continued use of marihuana produces or is a contributing factor in mental disorders and physical deterioration. I have collected and attach quotations from a few sources which discuss the problems that arise from the use of marihuana.

The relationship between insanity and hemp drug addiction has been worked out by us in some of the large mental hospitals (Chopra R. N. and Chopra C. S. "Present Position of Hemp Drug Addiction" memoir 31 Indian Medical Research Memoirs, supplementary series to *Indian Journal of Medical Research* July 1939).

There seems no doubt that cannabis is responsible for a proportion of the admissions to mental hospitals in the Union (Watt J. M. and Brever Brandwyk Maria C. "The Drugg Problem in South Africa" *South African M. J.* 10: 573 [Aug. 22] 1936).

It is proved beyond doubt that the prolonged use of Indian hemp usually leads to insanity. There is a special form of mental disease commonly met with in India which is produced by prolonged moderate use of hemp drugs in any form. Prolonged use of large doses of hemp mixed with datura seed is responsible to some extent for unpremeditated murder, running, much grievous hurt etc. which occur daily in a vast country like India (Dhunjibhosy J. F. "A Brief Resume of the Types of Insanity Commonly Met with in India with a Full Description of Indian Hemp Insanity Peculiar to the Country" *J. Ment. Sc.* 76: 254 [April] 1930).

Indian hemp plays an important role in the greater part of mental disorders observed in the Mussulmen of the Regency. Chronic intoxication leads at length to insanity. The abuse of cannabis leads to insanity. Chronic (cannabis) intoxication is serious in that it leads at length to total loss of will power. Intellectual decadence is complete (Brotterus Pascal. *Ha ha h—Weed of Lolly and Dream* Paris Vega 1934).

We have a number of instances where the hemp drug habit has been so established in relation to insanity that admitting (as we must admit) that hemp drug is intoxicant cause more or less of cerebral stimulation it may be accepted as reasonably proved that hemp drugs do cause insanity (Report of Indian Hemp Drugs Commission 1893-1894).

The drift toward a chronic condition is very gradual. The subject becomes less and less fit for work. An inveterate addict lives in a state of permanent stupor. Eventually he has to be placed under restraint as the result of some crime or at any rate of act of violence. In serious cases of dementia due to hashish mental and organic collapse go hand in hand (League of Nations document O. C. 1542 [6] dated Geneva Feb. 17, 1937. Subcommittee on Cannabis of the Advisory Committee on Traffic in Opium and Other Dangerous Drugs. Report by Dr. J. Bouquet Hospital Pharmacist Tunis. Inspector of Pharmacies Tunis containing answers to the questionnaire submitted to the experts document O. C. 1542 [1]).

In visits paid by the writer to the Cairo Insane Asylum it was found that insanity was due to the inhalation of hashish by smoking (Church Archibald and Peterson Frederick. *Nervous and Mental Diseases* Philadelphia W. B. Saunders Company 1908).

Continued use of the drug causes insanity in many cases (Kolb Lawrence. *Marihuana Federal Probation* publication of the Bureau of Prisons Department of Justice).

When used daily in large quantities the direct action on the cerebrum often causes chronic mental deterioration (Yauger N. S. "Marihuana—Our New Addiction Problem" *Am. J. M. Sc.* 195: 351 [March] 1938).

Hashish smoking gives rise to general physical deterioration (Lewin Louis. *Phantastic Narcotic and Stimulating Drugs Their Use and Abuse* New York E. P. Dutton & Co. 1931).

O Shrugnessy, medical director of Bengal Army in 1838 reported at least twelve eventual evil consequences of indulgence in cannabis (O Shrugnessy W. B. *On the Preparations of Indian Hemp or Cannabis* London 1838).

In certain circumstances hashish delirium has been seen to persist for several days and to assume disturbing proportions (Richet Charles. *Intellectual Poisons* Paris 1877).

With respect to the possible therapeutic applications of marihuana I strongly agree with Dr. Kolb that Dr. Allentuck and Dr. Bowman are there treading on exceedingly dangerous

ground. Certainly there is need of considerably more investigation before marihuana is used in attempted cures of morphine addicts. I take it from their paper that Drs. Allentuck and Bowman are fully aware of that need for further investigation.

H. J. ANSLINGER, Washington, D. C.  
Commissioner of Narcotics

## Medical Examinations and Licensure

### COMING EXAMINATIONS AND MEETINGS

**ANNUAL CONGRESS ON MEDICAL EDUCATION AND LICENSURE**  
CHICAGO Feb. 15-16, 1943. Sec. Council on Medical Education and Hospitals. Dr. H. G. Weiskotten, 535 North Dearborn Street, Chicago.

#### BOARDS OF MEDICAL EXAMINERS BOARDS OF EXAMINERS IN THE BASIC SCIENCES

Examinations of boards of medical examiners and boards of examiners in the basic sciences were published in THE JOURNAL Jan. 9, page 148.

#### NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS, Parts I and II. Various centers. Jan. 20-22 and March 1-3. Exec. Sec., Mr. Everett S. Elwood, 225 S. Fifteenth St., Philadelphia.

#### EXAMINING BOARDS IN SPECIALTIES

AMERICAN BOARD OF NEUROLOGICAL SURGERY. Chicago Feb. 13-16. Sec. R. Glen Spurling, 404 Brown Bldg., Louisville, Ky.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY. Written Part I. Various centers Feb. 13. Candidates in military service may take Part I at their place of duty. Oral Part II. Pittsburgh May 19-25. Sec. Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh.

AMERICAN BOARD OF OPHTHALMOLOGY. Oral All Groups Parts I and II. March 1. Sec. Dr. John Green, 6830 Waterman Ave., St. Louis.

AMERICAN BOARD OF OTOLARYNGOLOGY. Oral. New York May or June. Final date for filing application is March 1. Sec. Dr. Dean M. Lierle, 1500 Medical Arts Bldg., Omaha, Neb.

AMERICAN BOARD OF PEDIATRICS. Starting July 1, 1943. Group I will be abolished. Sec. Dr. C. A. Aldrich, 707 Tullerton Ave., Chicago.

AMERICAN BOARD OF PSYCHIATRY & NEUROLOGY. Detroit prior to the meeting of the American Psychiatric Association. Final date for filing application is March 1. Sec. Dr. Walter Freeman, 1028 Connecticut Ave. N.W., Washington, D. C.

AMERICAN BOARD OF SURGERY. Part I. March 4. Final date for filing application is Jan. 25. Sec. Dr. J. Stewart Rodman, 225 S. Fifteenth St., Philadelphia.

AMERICAN BOARD OF UROLOGY. Chicago Feb. 12-14. Sec. Dr. Gilbert J. Thomas, 1409 Willow St., Minneapolis.

### Tennessee September Report

The Tennessee State Board of Medical Examiners reports the written examination for medical licensure held at Memphis Sept. 30-Oct. 3, 1942. The examination covered 10 subjects and included 100 questions. An average of 75 per cent was required to pass. Twenty-seven candidates were examined, 20 of whom passed and 7 failed. The following schools were represented:

School	PASSED	Year Grad	Number Passed
Georgetown University School of Medicine		(1938)	1
Howard University College of Medicine		(1942)	1
Northwestern University Medical School		(1941)	1
University of Tennessee College of Medicine		(1942-16)	16
Vanderbilt University School of Medicine		(1942)	1
School	FAILED	Year Grad	Number Failed
University of Tennessee College of Medicine		(1942-7)	7

Fifteen physicians were licensed to practice medicine by endorsement from August 19 through November 12. The following schools were represented:

School	LICENSED BY ENDORSEMENT	Year Grad	Endorsement of
University of Alabama School of Medicine		(1900)	Alabama
College of Medical Evangelists		(1941)	N. B. M. Ex.
Stanford University School of Medicine		(1905)	California
Emory University School of Medicine		(1940)	Georgia
University of Illinois College of Medicine		(1941)	Illinois
University of Louisville School of Medicine		(1928)	Kentucky
Tulane University of Louisiana School of Medicine		(1938)	Georgia
Duke University School of Medicine		(1935)	N. B. M. Ex.
University of Cincinnati College of Medicine		(1931)	Ohio
Western Reserve University School of Medicine		(1911)	Ohio
Hahnemann Medical College and Hospital of Philadelphia		(1921)	Penna.
University of Tennessee College of Medicine		(1942)	Mississippi
Medical College of Virginia		(1913)	Virginia

### Arkansas November Report

The Arkansas State Board of Medical Examiners reports the written examination for medical licensure held at Little Rock Nov. 5, 1942. The examination covered 12 subjects. An average of 75 per cent was required to pass. One candidate was examined and passed. The following school was represented:

School	PASSED	Year Grad
University of Arkansas School of Medicine		(1941)

Five physicians were licensed to practice medicine by reciprocity from June 6 through Nov. 27, 1942. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad	Reciprocity with
Loyola University School of Medicine		(1942)	Illinois
Tulane University of Louisiana School of Medicine		(1901)	Louisiana
Johns Hopkins University School of Medicine		(1933)	Maryland
University of Tennessee College of Medicine		(1911)	Tennessee

### Hawaii July Report

The Board of Medical Examiners of Hawaii reports the written examination for medical licensure held at Honolulu July 13-16, 1942. The examination covered 10 subjects and included 80 questions. An average of 75 per cent was required to pass. Twelve candidates were examined, 10 of whom passed and 2 failed. Four physicians were licensed to practice medicine on endorsement of credentials of the National Board of Medical Examiners. The following schools were represented:

School	PASSED	Year Grad	Number Passed
University of Southern California School of Medicine		(1942)	1
Loyola University School of Medicine		(1942)	1
Tufts College Medical School		(1941)	1
Creighton University School of Medicine		(1941)	1
New York University College of Medicine		(1937)	1
University of Rochester School of Medicine and Dentistry		(1931)	1
Hahnemann Medical College and Hospital of Philadelphia		(1909)	1
University of Pennsylvania School of Medicine		(1918)	2
University of Wisconsin Medical School		(1916)	1

School	FAILED	Year Grad
Chicago Medical School		(1940)
Pennsylvania Medical School, Shanghai		(1936)

School	LICENSED BY ENDORSEMENT	Year Grad
University of Colorado School of Medicine		(1919)
George Washington University School of Medicine		(1916)
Harvard Medical School		(1938)
Cornell University Medical College		(1903)

### South Carolina June Report

The State Board of Medical Examiners of South Carolina reports the written examination for medical licensure held at Columbia, June 22-24, 1942. The examination covered 17 subjects and included 50 questions. An average of 75 per cent was required to pass. Forty-six candidates were examined, all of whom passed. Seven physicians were licensed to practice medicine by reciprocity and 1 physician so licensed on endorsement of credentials of the National Board of Medical Examiners. The following schools were represented:

School	PASSED	Year Grad	Number Passed
Emory University School of Medicine		(1942)	1
Tulane University of Louisiana School of Medicine		(1942-4)	4
Jefferson Medical College of Philadelphia		(1942)	1
Medical College of the State of South Carolina		(1942-40)	40

School	LICENSED BY RECIPROCITY	Year Grad	Reciprocity with
Atlanta College of Physicians and Surgeons		(1905)	Georgia
University of Georgia School of Medicine		(1938)	Georgia
University of Louisville Medical Department		(1910)	Kentucky
New York Medical College and Flower Hospital		(1936)	Ohio
Duke University School of Medicine		(1937)	Penna.
University of Nashville Medical Department		(1902)	Texas

School	LICENSED BY ENDORSEMENT	Year Grad
Boston University School of Medicine		(1939)

## Rhode Island October Report

The Rhode Island Board of Examiners in medicine reports the written examination for medical licensure held at Providence, Oct 1-2, 1942. The examination covered 10 subjects and included 73 questions. An average of 80 per cent was required to pass. Ten candidates were examined all of whom passed. The following schools were represented:

School	CLASSED	Year Grad	Number Passed
Tufts College Medical School	(1941)	(1941)*	2
St. Louis University School of Medicine		(1942)*	1
Syracuse University College of Medicine		(1921)	1
Jefferson Medical College of Philadelphia	(1940)	(1941-2)	4
University of Alberta Faculty of Medicine		(1936)	1
Dalhousie University Faculty of Medicine		(1942)*	1

\* Licenses have not been issued

## Colorado October Report

The Colorado State Board of Medical Examiners reports the written examination for medical licensure held at Denver Oct 7-9, 1942. The examination covered 8 subjects and included 63 questions. An average of 75 per cent was required to pass. Four candidates were examined all of whom passed. The following schools were represented:

School	CLASSED	Year Grad	Number Passed
University of Chicago The School of Medicine		(1939)	1
Deutsche Universität Medizinische Fakultät Prag		(1921)	1
Osteopaths*			-

\* Examined in medicine and surgery

Bureau of Legal Medicine  
and Legislation

## MEDICOLEGAL ABSTRACTS

**Liability of Manufacturer or Distributor for Death Resulting from Inhalation of Carbon Tetrachloride Sold in Cans Not Labeled "Poison"**—In the course of his employment over a period of about two months McClaren used a liquid solvent carbon tetrachloride, to remove grease from the inside of a boiler he was installing. On May 4, 1938 he worked from three to six hours inside the boiler's preheater, a closed in box about 14 feet long 8 feet high and 40 inches wide where the temperature was about 110 F. During that time the solvent was kept inside the preheater in an open pail and the workman from time to time saturated a rag in the pail and 'sloshed' it around the inside of the preheater. He became ill that day just when the reported case does not state and three days later died from carbon tetrachloride poisoning. Subsequently the administratrix of his estate brought suit for his death against the defendant who had sold the carbon tetrachloride to the deceased's employer. From a judgment for the defendant, the administratrix appealed to the Supreme Court of Missouri, division No. 1.

The liability of the defendant was predicated on the negligent, so it was contended, failure of the defendant to label the containers in which the solvent was sold so as to indicate that the contents thereof were poisonous in alleged violation of an Illinois statute, the state in which the deceased was working which made it a criminal offense for a person to sell or deliver 'any arsenic strychnine, corrosive sublimate prussic acid or other substance usually denominated as poisonous, without having the word 'poison' affixed to its labels. Apparently, it was conceded that if the defendant in marketing the solvent had violated this statute he was admittedly negligent and there was a legal causation between his negligence and the death of the workman. While carbon tetrachloride was not specifically mentioned in the statute just referred to, the plaintiff contended that it was included within the phrase 'other substance usually denominated as poisonous'. In construing this statute, said the Supreme Court, so as to determine

whether or not the defendant was negligent we must resort to that familiar rule of construction known as the ejusdem generis rule. According to that rule, where a statute contains general words only, the general words must receive a general construction, but where the statute enumerates particular classes or things, followed by general words, the general words so used are to be construed as applicable only to things of the same general character as those which are specified. Thus, before the phrase 'or other substance usually denominated as poisonous' can be construed to include carbon tetrachloride, we must be able to say that it is like some one of the species and kinds of poisons expressly mentioned in the statute. It could not do this, for in the court's opinion, carbon tetrachloride contains no single element of the various poisons enumerated by the statute. Obviously, carbon tetrachloride is not a drug but a grease solvent sold commercially as a cleaning fluid, and is not the same kind or class as the substances mentioned in the Illinois statute. The poisons there mentioned are of such character and universally so dispensed as to require a warning of their poisonous nature if taken internally in order to prevent a purchaser, or other person into whose hands the drug may come, from taking the same internally by mistake and to guard against overdoses of such as may be prescribed for medicinal purposes either alone in minute quantities or as an ingredient of a medicinal preparation. It follows, therefore, that in the light of the penal nature of this statute carbon tetrachloride is not plainly or necessarily included among its provisions and it was not negligence for the defendant to sell carbon tetrachloride without having the word 'poison' affixed on the label of the container. Nor do we think continued the court, that the administratrix has adduced any substantial evidence that the defendant negligently sold and delivered carbon tetrachloride in containers bearing no warning that its use might cause sickness or death. It appeared from the evidence that the carbon tetrachloride used by the workman had been taken from cans labeled 'Volatile Solvent use with adequate ventilation. Avoid prolonged breathing of vapor'. The evidence showed that there was no danger in using this product unless it was used in a confined unventilated place. Furthermore an agreed statement of facts showed that other manufacturers of carbon tetrachloride use a similar label in fact the label as used by the defendant had been adopted by manufacturers of this product and had been approved by the Surgeon General of the United States [sic] in 1934. No one is held by the law to a higher degree of care than the average in the trade or business in which he is engaged. *Ketterer & Armour & Co. 2 Cir. 247 F. 921, loc. cit. 931 F. 1918D, 798*. A man in conducting his business in the way that everybody else in a like business does, has measured up to the standard demanded by the law and has exercised the ordinary care of prudent men engaged in the business.

The court therefore affirmed the judgment of the trial court in favor of the defendant—*McClaren v. G. S. Robins & Co., 162 S. W. (2d) 856 (Mo. 1942)*.

## Society Proceedings

## COMING MEETINGS

Annual Congress on Medical Education and Licensure Chicago Feb 15-16  
Dr H. G. Weiskotten 535 North Dearborn St. Secretary

American Academy of Orthopedic Surgeons Chicago Jan 17-21 Dr Myron O. Henry, 825 Nicollet Ave. Minneapolis Acting Secretary  
Clinical Orthopedic Society Chicago Jan 18-21 Dr Myron O. Henry, 825 Nicollet Ave., Minneapolis Secretary

Middle Section American Laryngological Rhinological and Otolological Society Detroit Jan 20 Dr Voss Harrell 2539 Woodward Ave. Detroit, Chairman

Southern Section American Laryngological Rhinological and Otolological Society Chattanooga Tenn Jan 29 Dr Francis B. Blackmar, 1301 Broadway Columbus Ohio Chairman

Western Section American Laryngological Rhinological and Otolological Society Portland Ore Jan 31 Dr Irving M. Lupton 1020 S.W. Taylor St. Portland Ore. Chairman

## Current Medical Literature

### AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1932 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (\*) are abstracted below.

### American J Digestive Diseases, Fort Wayne, Ind

9 359-398 (Nov) 1942

- Treatment of Intestinal Disorders in Military Forces I C Gatewood Chicago—p 359
- Relationship of Hypothalamus to Large Bowel D Sheehan New York—p 361
- Concerning Influence of Glucose on Response of Human Stomach to Test Meals H Shav J Gershon Cohen S S Fels and H Siple Philadelphia—p 363
- Relationship Between Gastric Acidity and Calcium T C Valdez and J Sendroy Jr Chicago—p 367
- \*Acid Factor in Duodenal Ulcer as Evaluated by Acidity and Neutralizing Ability in Duodenal Bulb J E Berk J E Thomas and M E Rehfuess Philadelphia—p 371
- Relationship Between Gastrointestinal Motility Phases and Symptoms Associated with Duodenal Ulcer in the Human T L Patterson and D J Sandweiss Detroit—p 375
- Congenital Anomalies of Primary Midgut Loop J M Miller and E G Wakefield Rochester Minn—p 383
- Effect of Hemicellulose Hydrogels on Character of Stool and Bowel Movement R Bauer New York—p 387
- Gastrointestinal Section Army General Hospital A A Hall Atlanta Ga—p 389
- Intra Red Photography of Abdominal Wall L Waburn San Francisco—p 392
- Amount of Fat in Blood After Meal as Estimated by Counting the Cholesterol Microns R R Cooper and H Lusk Ann Arbor Mich—p 395
- Complete Biliary Obstruction Complicating Duodenal Ulcer Perforation of Ulcer Followed by Immediate Release of Obstruction S Levine and G B Gordon Brooklyn—p 397

**Acid Factor in Duodenal Ulcer**—Berk, Thomas and Rehfuess studied the gastric and duodenal acidity of 7 dogs, 22 normal persons and 23 patients with duodenal ulcer. There were some nineteen thousand determinations of the gastric and duodenal contents simultaneously collected from areas just above (pars pylorica) and just below (duodenal bulb) the pylorus. They observed that the contents of the first part of the duodenum are endowed with a considerable capacity to neutralize, buffer and dilute gastric chyme which commonly exceeds the physiologic needs. Nevertheless, even in normal subjects the duodenal bulb is an acid area and free acid is not an abnormal observation. In patients with duodenal ulcer the neutralizing ability in the duodenal bulb is impaired but not wholly absent. Such patients appear to differ from normal persons in that the neutralizing capacity in the duodenal bulb and gastric hyperacidity are defective. The acidity of the contents of the duodenal bulb is largely determined by the type of food being digested and is only partially related to the degree of gastric acidity. The acidity in the stomach and duodenal bulb is not sharply parallel. None of the customary measures of gastric acidity reliably indicate the behavior of the effective acidity in the duodenal bulb at the same time. The usual oral therapeutic dose of antacids to patients with duodenal ulcer only slightly and transiently reduces the acidity of the contents of the first part of the duodenum, the reduction may be followed by a rebound increase. Neutralization of the contents of the duodenal bulb by fasting equals, and in some respects surpasses, that observed during digestion. This neutralization in normal man is exceeded by that in normal dogs. The acidity of the contents of the first part of the duodenum is generally insufficient to affect gastric motility significantly except in patients with duodenal ulcer. It may be a factor in stimulating pancreatic secretion.

### Archives of Internal Medicine, Chicago

70 689-918 (Nov) 1942

- Incomplete Rupture of Aorta Heretofore Unrecognized Stage of Dissecting Aneurysm and Cause of Cardiac Pain and Cardiac Murmur T M Peery Washington D C—p 689
- \*Control by Radium for Gastric Acidity J A Jenkins and M McGeorge Dunedin New Zealand—p 714
- \*Use of Daily Fecal Output of Urobilinogen and Hemolytic Index in Measurement of Hemolysis E B Miller K Singer and W Dameshek Boston—p 722
- Function of Separate Kidneys in Hypertensive Subject H Chaz and J Redish New York—p 738
- Maintenance of Nitrogen Equilibrium by Intravenous Administration of Amino Acids Clinical Studies S S Altshuler Detroit Hilda M Hensel Monroe Mich P Hecht and K Purley Elmer Mich—p 749
- Production and Study of Cardiac Failure in Thymine Deficient Pigeons R L Swank and O A Bessey Boston—p 763
- \*Sulfonamide Compounds in Therapy of Bacterial Endocarditis Comparison of In Vitro Inhibitory Effects and Bacteriostatic Activity E S Orgain and Mary A Poston Durham N C—p 777
- \*Anthrax Review of Sixty Cases with Report on Therapeutic Use of Sulfonamide Compounds H Gold Chester Pa—p 785
- Polymyositis Report of Fatal Case D Goldman Cincinnati—p 822
- Sodium d Lactate Tolerance as Test of Hepatic Function C Cohn New York—p 829
- Syphilis Review of Recent Literature I W Reynolds C F Mohr and J E Moore Baltimore—p 836

**Radium for Gastric Acidity**—The effects of radium irradiation on the acidity of the gastric mucosa were studied by Jenkins and McGeorge. Fourteen patients with duodenal ulcer were treated with radium. In all, thirty tests of gastric function were carried out prior to radium treatment and forty-four after treatment. Thirteen of the 14 patients have had a decided reduction in acidity of the gastric juice and in the volume of juice secreted. Clinical improvement usually accompanied the chemical improvement.

**Hemolysis**—Miller, Singer and Dameshek determined the "hemolytic index" from an average of the output of urobilinogen in the feces in four days. This determination has proved of great value in the diagnosis and follow up of various blood dyscrasias particularly those associated with increased blood destruction. Since the daily fecal output of urobilinogen depends on the total mass of circulating hemoglobin, it is important to relate the former to the latter. This is done in the "hemolytic index," which shows that 111 to 208 mg of fecal urobilinogen is normally derived from 100 Gm of circulating hemoglobin in twenty-four hours. In anemia, or of a small surface area (as in children), the hemolytic index may show a greatly increased rate of blood destruction, although the absolute content of urobilinogen may be normal. This is particularly evident in certain types of hemolytic anemia and in pernicious anemia. In the latter a normal level of bilirubin in the blood with a greatly increased hemolytic index is common. The various indexes (acholuric jaundice, "indirect bilirubinemia, an increase in urinary excretion of urobilinogen, anemia and leukocytosis) of possibly increased hemolysis are not specific, but an increase in the fecal output of urobilinogen or in the hemolytic index is unequivocal evidence of an increased breakdown of blood.

**Bacterial Endocarditis**—The in vitro inhibitory effects of seven sulfonamide compounds on twenty organisms isolated from 17 patients suffering from bacterial endocarditis were correlated by Orgain and Poston with the clinical bacteriostatic activity of these drugs in a series of thirty-three clinical (in vivo) experiments. A certain degree of correlation existed between the in vitro inhibitory effects of these drugs and their clinical bacteriostatic activity. This emphasizes the importance of preliminary in vitro experiments to determine the most effective drug against the freshly isolated organism and its possible clinical level of inhibitory action. It appears that the in vitro and the in vivo effects of the sulfonamides may be correlative.

**Anthrax**—Gold's experience with the treatment of 60 cases of external anthrax since the advent of sulfonamide compounds leads him to believe that these compounds are reliable and safe substitutes for serum and also that the drugs should be given preference. Fifty-one of his patients were employees of a local mill engaged in the manufacture of inner lining for which the basic raw material is goat hair imported from China and India. The other 9 patients lived close to the mill and had contact with the employees or the mill's products. Twenty-one patients

were treated with antianthrax serum, 1 died. To secure recovery, 200 to 2,200 cc of serum was administered intravenously. Neoparsphenamine, in addition to the serum, was of little or no benefit. Forty-two patients were treated with sulfonamides, 39 had excellent results, 1 patient became worse after intensive treatment with sulfapyridine and its sodium salt but recovered after large doses of antianthrax serum, neoparsphenamine and immunotransfusions. 1 failed to respond to adequate doses of sulfathiazole but recovered on serum therapy, and 1 was taken off the drug too soon and was given antianthrax serum instead with good results. Sulfapyridine was the most effective sulfonamide compound, next came sulfathiazole, then sulfadiazine. Since nausea and vomiting are frequent with sulfapyridine, sulfathiazole is the drug of choice at present. Large doses of sulfathiazole should be given until edema is controlled. If there is no response in three days, antianthrax serum should be used. The use of sulfonamide compounds materially shortens hospitalization and disability.

### Archives of Surgery, Chicago

45 691 862 (Nov.) 1942

- Prothrombin and Hepatic Function. J. G. Allen and O. C. Julian. Chicago—p. 691.  
Benign Tumors of Stomach. C. S. Dudley, I. M. Scall and S. J. Morse. New York—p. 702.  
Cysts of Pancreas. J. Rubinovitch and B. Pines. Brooklyn—p. 727.  
Postoperative Chylothorax. Sudden Death Following Infusion of Aspirated Chyle. B. B. Whitcomb and W. B. Scoville. Hartford, Conn.—p. 747.  
Sodium Salts of Sulfonamide Compounds. Study with Special Reference to Their Local Use in Wounds. C. I. Fox, Jr. New York—p. 754.  
Treatment of Large Gastric Ulcers. Resume of Ten Year Study. F. Steigmann. Chicago—p. 764.  
Relation of Serum Protein to Well Healed and to Disrupted Wound. H. Koster and I. P. Kasman. Brooklyn—p. 776.  
New Methods for Determining Viability of Powder. Preliminary Report with Clinical Cases. J. O. Herrlin, Jr., S. T. Chesser and K. Lange. New York—p. 785.  
Progress in Orthopedic Surgery for 1941. Review Prepared by Editorial Board of American Academy of Orthopedic Surgeons—p. 792.

**Postoperative Chylothorax.**—A case of postoperative chylothorax is reported as the result of inadvertent section of the thoracic duct during a sympathectomy for hypertension. Sudden death occurred after intravenous administration of autogenous chyle. This Whitcomb and Scoville state, is the first time in their experience, as well as in the voluminous literature on the subject, that the thoracic duct was exposed and inadvertently torn during a sympathectomy for hypertension. The patient's extreme emaciation made her vulnerable. Delayed chylothorax occurred even though the thoracic duct had been doubly closed with four silver clips. The pressure of chyle within this duct is probably far greater than experimental work shows. The patient died promptly from what appeared to be anaphylactic shock. Necropsy was not permitted, and without it it is impossible to differentiate conclusively between anaphylaxis, fat embolism and a foreign protein reaction. Of the 6 cases reported in the literature in which infusion of autogenous chyle was instituted, 3 were fatal. Necessary precautions in the future should consist of a careful test for sensitivity followed by 5 to 10 cc of chyle intravenously with a delay of thirty minutes before the infusion proper is started, rejection of specimens containing globules more than 3 microns in diameter and a twenty-four hour culture of the chyle. If chyle fails to meet the aforementioned standards, plasma and emulsified fats with daily aspiration of the chyle, should be used instead. If chylothorax persists after one week of this regimen, phrenicectomy is indicated. Fat and protein should be infused early to prevent rapidly progressive emaciation.

**Sodium Salts of Sulfonamide Compounds.**—Fox demonstrated in dogs and mice that sodium salts of sulfathiazole and sulfadiazine are suitable for local use in wounds. To obtain more complete comparative data he determined the dissociation constants of sulfonamide compounds. It is noteworthy that in the body sulfathiazole and sulfadiazine are almost completely ionized, whereas sulfanilamide is but slightly ionized. The important fact is that since sulfadiazine and sulfathiazole occur

in the body largely in the ionized form and since their sodium salts are only moderately alkaline, resembling sodium bicarbonate, their local use seems worthy of trial. The experiments show that oral, local, peritoneal and clays administration of sulfadiazine give similar blood levels. Therefore a given quantity of drug suitably administered by any of these routes is distributed similarly throughout the body. The major advantages of local therapy are an immediate high concentration of the drug in the involved area. This concentration is sustained for twenty-four to forty-eight or more hours while the implanted drug is being transferred continuously but completely from the limited local area into the general circulation. A relatively gradual attainment (and loss) of a maximal blood level occurs. Since the implanted drug is removed completely when a soluble derivative is used foreign body reaction at the local site does not occur. As sulfathiazole and sulfadiazine are extensively ionized at the  $pH$  of the blood and when ionized their solubility is vastly increased over that in water or any of the more common solvents it is suggested that fluid or semifluid preparations, including ointments, should be prepared from the sodium salts in aqueous and not oily bases if high local drug concentrations are desired. Safe renal excretion would be insured by favoring sulfonamide salt formation by keeping the urine alkaline.

### Bulletin New York Academy of Medicine, New York

18 705 772 (Nov.) 1942

- Murphy, R. Adams. Champaign, Ill.—p. 705.  
Sympathetic Participation in Cutaneous Phenomena. P. D. McMurter. New York—p. 731.

### Delaware State Medical Journal, Wilmington

14 207 222 (Oct.) 1942

- Value. W. Marshall, Jr. Milford—p. 207.  
The Transition. R. H. Lowe. New York—p. 210.

### Iowa State Medical Society Journal, Des Moines

32 483 532 (Nov.) 1942

- Certain Peculiarities of Gallstone Disease. R. Fitz. Boston—p. 483.  
Symptoms of Pulmonary Disease. J. J. Chinsky. Oakdale—p. 491.  
Unilateral Exophthalmos Caused by Arteriovenous Aneurysm. J. C. Cunningham. Dubuque—p. 495.  
Factor in Lowering Mortality of Perforative Appendicitis. A. A. Eggleston. Burlington—p. 497.  
Practical Applications of Internal and Peritoneal Care. C. W. Seibert. Waterloo—p. 501.  
Fatality from Acute Alcoholic Intoxication Complicated by Extreme Cerebral Edema. Report of Case. J. S. Brewster. Boone—p. 504.  
Laboratory and Clinical Findings of Pancreatic Diseases. M. C. Meyer. Marquette—p. 506.

### Journal of Clinical Investigation, Boston

21 651-810 (Nov.) 1942 Partial Index

- Reactivity of Intact Blood Vessel of Fingers and Toes to Sensory Stimuli in Normal Adult and in Patients with Hypertension and in Senile Subjects. G. F. Burch, A. F. Cohn and C. Neumann. New York—p. 655.  
Blood Flow in Hand and Forearm After Paravertebral Block of Sympathetic Ganglions. Evidence Against Sympathetic Vasodilator Nerve in Extremities of Man. T. A. Warren, C. W. Welter, J. Romano and I. A. Stern, Jr. Boston—p. 665.  
Effects on Renal Resistance to Blood Flow of Renin, Angiotensin, Pituitary and Atropine. Hypertension and Toxemia of Pregnancy. H. L. Hampton. New York—p. 685.  
Capillary Blood Pressure in Man. Direct Measurement in Digits During Induced Vasoconstriction. I. W. Lichner and R. W. Wilkins. Baltimore—p. 697.  
Influence of Alterations in Acid-Base Balance on Transfer of Carbon Dioxide and Bicarbonate in Man. I. D. Koehnham. New Haven, Conn.—p. 735.  
Effect of Muscular Exercise on Peripheral Circulation in Patients with Valvular Heart Disease. D. I. Abramson, S. M. Fierst and K. Flachs. Cincinnati—p. 747.  
Relation of Hippuric Acid Excretion to Volume of Urine. T. F. Machell, J. D. Halm and I. W. Chornock. Philadelphia—p. 763.  
Serum Iodine Fractions in Hyperthyroidism. L. B. Man, A. E. Smirnov, F. F. Gildea and J. P. Peter. New Haven, Conn.—p. 773.  
Serum Magnesium in Thyroid Disease. R. F. Dine and P. H. Lavietz. New Haven, Conn.—p. 781.  
Intubation Studies of Human Small Intestine. VIII. Method of Determining Digestive Activity in Any Portion of Gastrointestinal Tract with Some Measurements of Protein Digestion in Stomach and Small Intestine. K. A. Elsom, T. W. Chornock and F. G. Dickey. Philadelphia—p. 795.

**Maine Medical Association Journal, Portland****33 221-242 (Oct) 1942**

Cancer of Stomach A G Bralev Brookline Mass—p 229

**33 243 262 (Nov) 1942**

Work of the Bingham Associates Fund in Maine J H Pratt Boston—p 243

\*Simple Efficient Splint for First Aid Care of Injured Arm or Leg  
A H Parcher Ellsworth—p 250

**Simple Splint for Arm or Leg**—Parcher describes the use of a board as a splint for the arm or leg when other splints are not available. The splint is made of plywood  $\frac{3}{8}$  inch thick and  $3\frac{1}{2}$  inches wide with an expanded head end. The splint consists of three sections 12, 24 and 36 inches in length, respectively. The two shorter sections are for the arm the longest one for the leg. The splint has double slots and bolts with wing nuts as a means for adjusting it quickly and firmly to different lengths and angles. The slots of the 12 inch section put across the slots of the longer 24 inch section and bolted permit adjustment for arm length. The broad headed end serves for fixation, as a spreader for traction, to prevent rotation of the extremity and for contact with the patient. To stabilize the splint fixation bands from holes in the head end cross over the shoulder and are tied under the opposite shoulder.

**Southern Medical Journal, Birmingham, Ala****35 959-1050 (Nov) 1942**

\*Carcinoma of Cervix Clinical Evaluation of Radium Dosage and Supplementary Roentgen Irradiation Based on Study of 915 Cases—H W Jones Jr Baltimore—p 959

\*Observations on Results of Combined Fever and X-Ray Therapy in Treatment of Malignancy H S Shoulders E L Turner and L D Scott Nashville Tenn—p 966

Diagnosis Treatment and Prognosis of Carcinoma of Buccal Mucosa L H Jorstad St Louis—p 970

Virus Pneumonia H T Engelhardt and C J W Wilen New Orleans—p 973

Id S S Riven Nashville Tenn and E A Stern Rochester N Y—p 976

Tuberculosis in 1942 C H Holmes Atlanta Ga—p 981

Role of Bronchial Tree in Pathogenesis of Pulmonary Tuberculosis B L Brock Waverly Hills Ky—p 984

Spontaneous Mediastinal Emphysema Summary and Report of Case E M Meek Huntington W Va—p 990

Control of Pellagra W DeKleine Washington D C—p 992

Melanosis Coli Review of Typical Case J H Dodson Mobile Ala—p 996

Hockey Stick Incision for Removal of Coccyx G T Tyler Jr Greenville S C—p 998

Effect of Anesthesia on Chemotherapy with Derivatives of Sulfonic Acid J Adair and Cornelia St Roman New Orleans—p 999

Sulfathiazole Therapy in Venereal Disease A A Creecy Newport News Va and H L Switkes Kecoughton Va—p 1003

\*Preoperative Use of Sulfathiazole for Prevention of Postoperative Complications J A C Colston and R W Satterthwaite Baltimore—p 1006

Cutaneous Reactions Due to Sulfanilamide R W Fowles A Pepple Richmond Va and E W Vaughan Greensboro N C—p 1015

**Carcinoma of Cervix**—The data from 915 proved cases of carcinoma of the cervix treated at the Kelly Clinic between October 1927 and January 1936 are presented by Jones, who especially correlates the clinical stage of the disease irradiation dosage and curability. A detailed analysis of the results discloses, as have studies by others, that the clinical stage of the disease is of paramount importance in determining the prognosis. The study of the effect of dosage on prognosis indicates that with a technic using large amounts of radium it is exceedingly dangerous to give less than 3000 millicurie hours. The same tendency is evident from an analysis of the cases according to the clinical stage of the disease. Radium is administered by the broken dose technic usually at intervals of four weeks, a total dose of about 4,000 millicurie hours being administered. This dosage is applicable only with applicators and specific amounts of radon and cannot be compared with other methods. The broken dose technic is used because it aids in reducing preexisting cervical infections in the same way as preradium roentgen therapy, with the additional advantage that the cutaneous area available for irradiation is used for treatment directed primarily to the parametrium and iliac gland areas. Also there is a lessened incidence of troublesome proctitis with the broken dose method. The X-ray beam is directed toward the para-

metrium and iliac gland region of the side in question and not toward the midline. Pubic sacral, trochanteric and perineal ports are employed, and sometimes even two small ports for each of these areas. A dosage of 1500 to 2000 roentgens measured with scattering is given to each port. Therapy must not be withheld even in the absence of palpable disease of the parametrium. Sulfanilamide and sulfathiazole have been used locally to reduce cervical infection. Whether their use will improve salvage remains to be seen but they have been most helpful for combating infection.

**Pyrexia and Roentgen Therapy**—On the basis of gradually accumulating evidence Shoulders and his co-workers suggest that the maximal destructive effect of roentgen therapy on tumor cells should be obtained by applying it at the time of the greatest physiologic disturbance caused by induced fever which is also lethal to certain tumor cells. They subjected 50 patients with far advanced inoperable cancer to roentgen therapy while the hyperpyrexia was at its height. Once the desired elevation of temperature (104 to 106 F) is reached it is maintained for an hour. The patient fully protected by blankets is then transferred to a warm roentgen therapy room. The patient is kept well wrapped except for the portion of the body to be irradiated. The number of combined fever and roentgen treatments varied from one to four depending on the lesion and its location. Additional roentgen therapy alone has been administered to all patients. There have been no fatalities traceable to the technic used. Thirty-nine (78 per cent) of the patients have shown definite improvement such as relief of pain decrease in the size of the tumor cessation of hemorrhage improved appetite and general comfort. The list in some instances suggests complete clinical relief. Eleven patients have shown no demonstrable improvement. The combined method of treatment produced results definitely superior to those obtained with irradiation alone. It is yet too early to indicate whether combined fever and roentgen therapy will be more than a palliative procedure. The procedure might serve as a more valuable adjunct to surgery than irradiation alone in cases in which postoperative irradiation is indicated.

**Preoperative Use of Sulfathiazole**—Since July 1940 Colston and Satterthwaite have administered one of the sulfonamide drugs for varying intervals of time preoperatively to every patient with infection of the urinary tract at the first examination or at operation if opening of the urinary tract was contemplated. The incidence of postoperative complications and morbidity appeared definitely reduced. A critical comparison of the postoperative course of patients so treated preoperatively and a control nontreated series, but having similar operations was undertaken. Of 110 treated preoperatively 39 had a temperature of 100 F or more on the first postoperative day in 20 it was 100.5 F or more in 14 101 F or more and in 3 it was 102 F or more. In the control group 87 of 196 had a temperature of 100 F or more, 57, 100.5 F or more 40 101 F or more, 14 102 F or more, and 7, 102.5 or more. On the second third and fourth postoperative days the difference in the temperature of the two groups was essentially the same. Practically the same difference in respiratory infection and other postoperative morbidity existed in the treated and nontreated patients. There were no cases of pneumonia or bacteremia in the treated group as compared to 5 and 4, respectively among the control patients.

**Southern Surgeon, Atlanta, Ga****11 755 808 (Nov) 1942**

Injuries of Spinal Cord and Cauda Equina C Pilcher Nashville Tenn—p 755

Sterilization of Sulfonamides for Local Use Neglected Problem D Lindsey New Orleans—p 765

Massive Gastrointestinal Hemorrhage Concomitant with Cholecystitis E G Laird A M Gehret and L J Rigney Wilmington Del—p 769

Diagnostic Curettage R B Greenblatt Augusta Ga—p 775

Lobectomy for Suppurative Disease of Lung R A Daniel Jr Nashville Tenn—p 780

Latrodectus Mactans (Black Widow Spider) Bite as Surgical Problem K H Ayresworth Waco Texas—p 788

Safety Valve Anastomosis and Decompression in Intestinal Surgery by Use of T Tube G L Carrington Burlington N C—p 794

Lateral Migration of Appendectomy Incision Its Relationship to Mortality R E Strain Nashville Tenn—p 797

## FOREIGN

An asterisk (\*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

## Journal Obst &amp; Gynaec of Brit Empire, Manchester

49 453-580 (Oct) 1942

\*Some Factors in Prognosis in Carcinoma of Cervix A A Gemmell —p 457

Degenerative Vulvovaginitis Associated with Estrogen Imbalance F Shute —p 482

Erythroblastosis or Congenital Syphilis? Observations on Erythroblastosis and Its Differential Diagnosis from Congenital Syphilis J I Henderson —p 499

Contribution to Etiology of Toxic Syndrome of Pregnancy K Blond —p 512

Treatment of Disproportion Associated with Moderate or Slight Degree of Pelvic Contraction in Primiparas Comparison Between Results Obtained by Instrumental Induction of Premature Labor and Method of Trial Labor Vivian H Barnett —p 524

Vitamin E in Habitual Abortion and Habitual Miscarriage E Shute —p 534

Pregnancy Following Intrauterine Application of Radium Mary H Maveur —p 542

Clinical and Biochemical Findings in Delayed Chloroform Poisoning M D Crawford —p 549

**Prognosis in Carcinoma of Cervix**—Gemmell treated 151 patients with carcinoma of the cervix between 1929 and 1938. In all but 2 the diagnosis was confirmed microscopically. In only 1 patient was Wertheim's hysterectomy performed; the rest were given radium and high voltage roentgen therapy. The technic of applying radium was that advocated by Heyman. All the patients were followed up to December 1940 or to the date of their death. Only 40 patients were alive at this time. More serious appearances in the bladder were associated with the more extensive stages of the disease. The survival rates of patients with transverse indurating or edema was roughly half that of patients with no changes or only minor changes in the bladder. The growth of the cancer toward the rectum is of serious prognostic import and affords some information of life expectancy. Variation of the dose of radium did not seem to affect the prognosis. Microscopic classification of the growth from the examination of material obtained by biopsy was of no assistance in determining prognosis. Patients who had a low value for the Bendien test before treatment usually had a significantly lower survival rate than those whose value was in the normal zone. The age of the patient or the number of children that she had at the time of treatment was no guide to the prognosis. The duration of symptoms prior to treatment was of no prognostic value. The prognosis in true stump carcinoma was approximately the same as when the whole uterus was intact. The prognosis was not affected when the disease appeared within two years of a pregnancy.

**Erythroblastosis or Congenital Syphilis**—During the last five years Henderson has encountered 53 infants with erythroblastosis. Nineteen of them recovered, 24 died and 10 were stillborn. In the present series 16 of the 46 mothers had 2, and 4 had 3 affected infants. First infants are seldom affected but once the disease has appeared in a family any subsequent infants are likely to be affected. There are four types of the disease: anemia hemolytica neonatorum, icterus gravis, hydrops fetalis and hepatic cirrhosis with intrauterine death and maceration. The fourth type is the worst type of erythroblastosis, although it seems to have escaped general recognition owing to the difficulties of obtaining macerated fetuses for examination. It seems probable that such fetuses with some edema have often been classified as having hydrops fetalis. Hydranmios during the last few weeks of pregnancy is common in this form of erythroblastosis, and intrauterine death is followed within a week or two by the delivery of a severely macerated fetus and the pale pink placenta is greatly enlarged, as in hydrops fetalis. There is little or no edema. The liver is slightly, if at all, enlarged and it is usually greenish brown, it is much less diffident than is expected from the degree of maceration. In syphilis the placenta is also pale pink with increased thickness and weight, but infarction, which is not a feature in erythroblastosis, is usually found in addition. In the placenta of this type of erythroblastosis a layer of Langhans' cells persists. This is the most characteristic microscopic feature. These cells normally disappear by the twenty-fourth week of pregnancy.

and their persistence to term is not known to occur in any other disease. The spleen is greatly enlarged. It is important to recognize this type of erythroblastosis and to differentiate it from congenital syphilis, which it superficially resembles. The records of 4 such cases are given.

## Lancet, London

2 445 474 (Oct 17) 1942

Fate of Transfused Plasma J Beattie —p 445

\*Peripheral Vasoneuropathy After Chilling 'Immersion Foot and Immersion Hand' C C Ungley and W Blackwood —p 447

Infectious Mononucleosis I Kilham and A J Steigman —p 452

Sterilization of Sulfonamides J I McCartney and R Cruickshank —p 454

**Fate of Transfused Plasma**—Beattie states that when plasma or serum transfusion is given normal human beings or experimental animals the pretransfusion blood volume is restored rapidly in some subjects and less rapidly in others. Transfusion of plasma with a normal plasma protein concentration after severe hemorrhage does not necessarily restore the blood volume to the normal value, even when the quantity of the plasma transfused is equal to or exceeds the total volume of blood lost. The increase in protein reserves which plasma transfusions bring about may be almost as important as the increase in blood volume. The drain on these reserves in severe infections and after extensive burns is obviously great, to support them may be as valuable as to combat bacterial invasion by sulfonamides. In shock the rate of plasma protein replacement is slow but as the plasma volume is increased the rate of replacement also increases. Movement of fluid into the blood stream takes place at rates, in man of the order of 200 cc an hour. At the same time plasma proteins can enter at the average rates of about 15 Gm an hour. Such rates soon after hemorrhage may conceivably be much higher. On the other hand after transfusion fluid may leave the blood stream at rates of 100 cc a minute and plasma proteins at 4 to 6 Gm a minute. It is by no means clear how these massive movements are effected without ill results. The study shows that there is yet much to learn of the mechanisms involved in the control of plasma volume and mass movements of plasma protein.

**Peripheral Vasoneuropathy After Chilling**—Ungley and Blackwood give an account of 80 cases of 'immersion foot and hand' encountered in two and a half years in Scotland. The exposure or rather immersion lasted up to fourteen days. They suggest that the term immersion foot is inaccurate and inadequate as it does not include both the causative factor—cold—and the resulting neural and vascular disturbance, i.e. a peripheral vasoneuropathy after chilling. Judging from the patients' histories the following factors appear to influence the occurrence and the severity of the vasoneuropathy: time of exposure, temperature of water, immobility, body cooling, sickness, starvation, age, race (the dark-skinned races were more prone than the northern races), morale and treatment on rescue. The footwear afforded some protection during short exposure, but boots constricted the swelling feet and impaired the circulation during long exposure. There was no evidence that previous susceptibility to cold feet or chilblains was predisposing. Biopsy of interdigital nerves from two feet amputated two and a half and four months after exposure and of two lower limbs amputated four and eleven months after rescue showed almost complete wallerian degeneration of the interdigital nerves and no significant vascular change. The tissues of the amputated limbs showed a persisting edema. The main nerve trunks showed severe degeneration and early regeneration; in the larger arteries there was slight intimal and medial fibrosis, in the large veins (1 case) patchy organized recanalized thrombi. The small vessels were not significantly abnormal. The muscles showed degenerative changes more severe than those following denervation. Probably injudicious warming of the affected limbs after rescue accentuates the damage by raising the metabolic demands of the tissues while they are still ischemic. For some hours after rescue affected limbs should be kept cool while the patients' bodies are being warmed. Once cold and wet have penetrated, boots should be discarded before they become tight. Active movements and postures impeding circulation should be avoided. Once rescued a man is stripped of wet clothing in a cool room and wrapped in blankets with the hands and feet exposed, and



he is given hot drinks. Massage is contraindicated. Patients are kept in bed, sometimes for many weeks, early walking may cause excoriation, blistering or increased swelling. The feet are raised on pillows, exposed to the air and kept dry. Sulfanilamide powder may be applied to wounds and blisters. Beneficial results from 'dry cooling' the hot hyperemic limbs with fans or ice bags are reported from Canada.

2 475 502 (Oct 24) 1942

- War and the Advancement of Social Medicine W. Jameson —p 475  
Trypanosomiasis Treated with Pentamidine T. L. Lawson —p 480  
Febrile Reactions Among Smallpox Contacts W. Napier and Alice M. Insh —p 483  
Toxic Blood Level of Sulfanilamide from Local Application R. A. Gordon and V. H. Bowers —p 484  
Perforated Peptic Ulcer in Wartime I. D. Riley —p 485

**Febrile Reactions Among Smallpox Contacts**—Febrile reactions occurred in 40 of 92 contacts received at a reception house for contacts during an outbreak of variola major in Glasgow. Of the 92 persons 22 were men, 28 women and 42 children less than 14 years of age. Fifty of the contacts had had close association with a smallpox patient for three to eight days, 27 had less intimate exposure and the contact of 15 was limited to one or two occasions. All contacts were vaccinated on the day of admission to the reception house, with success in 43, 29 who showed little or no response after several days were revaccinated successfully, and 20 were resistant to the vaccinia virus. A second vaccination appeared to activate the earlier one, which until then had shown no activity. The febrile reactions during the period of quarantine of 30 were clearly due to vaccinia and 2 to variola, 8 presented some difficulty in diagnosis. The onset of pyrexia varied between the sixth and thirteenth days after vaccination. Its duration was from one to three days. From a study of the fever of the 8 patients in whom it was difficult to classify, Napier and Insh conclude that 1. Smallpox may not be easy to recognize even in known contacts under constant observation. 2. Careful discrimination is required to decide whether the febrile attacks in contacts are due to vaccinia or to variola. 3. In a person who was recently vaccinated vaccinia is the most likely cause when the eruption is sparse but a few typical spots may be sufficient to indicate variola with certainty. 4. When vaccinia can be ruled out, a short febrile illness, with or without transient spots, that occurs in the second week after exposure offers presumptive evidence of variola.

### Medical Journal of Australia, Sydney

2 253-282 (Sept 19) 1942

- Normal Heart and Conditions Simulating Cardiac Disease E. H. Stokes —p 253  
Investigation of Effect of Administration of Vitamin B<sub>1</sub> on Gastric Secretion and Motor Activities of Stomach Preliminary Report Barbara Wood, Beryl Splitt and I. Maxwell —p 263  
School Children's Teeth Marjorie Casley Smith —p 269

### Tubercle, London

23 171-194 (Aug) 1942

- Prevention of Tuberculosis Outline of New Scheme and Analysis of Economic Factor J. E. Stokes —p 171  
Simple Sputum Concentration Method for Demonstration of Tubercle Bacilli E. Nassau —p 179

### Schweizerische medizinische Wochenschrift, Basel

72 533-556 (May 16) 1942 Partial Index

- Question as to What Extent Medical Practitioner Can Contribute to Success of Operation Before and After Hospitalization H. Heusser —p 533  
Knaus Ogino Method of Birth Control and Its Value A. Labhardt —p 537  
New Method of Stimulating Gonadotropic Function of Pituitary M. Julesz —p 541  
Clinical Control of Effects of Liver Extracts E. Jequier-Doge —p 544  
Association of Acanthosis Palmaris, Acanthosis Nigricans and Epidermodysplasia Verruciformis in Case of Gastric Cancer H. Jernneret —p 547

**New Method of Stimulating Gonadotropic Function of Pituitary**—Barborka made the observation that 30 per cent of women who received a ketogenic diet acquired amenorrhea. Although Barborka remedied this condition by the administration

of vitamin B<sub>1</sub>, Julesz is convinced that a hormone rather than a vitamin is involved because Hoffmann and Anselmo were able to isolate from the anterior lobe of the hypophysis a substance which increased the ketone bodies in the blood and was designated as the ketogenic hormone or the hormone of the fat metabolism. It is probable that the anterior pituitary plays a part in the development of ketosis and that in response to a ketogenic diet it elaborates the ketogenic hormone in increased quantities. The author investigated the question of whether ketosis stimulates only this or also other pituitary functions in mice and in human subjects. On the basis of his observations he considers it highly probable that ketosis stimulates the anterior pituitary to an increased production of the follicle stimulating principle and that any stimulus that is exerted on the anterior pituitary is probably also extended to the entire lobe. The author cites examples which indicate that the functions of the anterior pituitary do not change in an isolated manner. The ketogenic diet greatly stimulates the ketogenic hormone production but it also stimulates the gonadotropic hormone production. With the exception of roentgen rays the ketogenic diet is the only means of stimulating the anterior pituitary. In view of the fact that it increases the production of the follicle stimulating principle it is theoretically indicated in cases in which the gametokinetic function is to be increased. Thus it could be used in certain cases of azoospermia and in cases of hypofunction of the anterior pituitary such as hypophyseal dwarfism and infantilism and incipient Simmonds' disease. The ketogenic diet could be used for diagnostic and prognostic purposes.

### 72 557-580 (May 23) 1942 Partial Index

- Sex Hormone Therapy in Gynecology and Obstetrics R. Wenner —p 557  
Age Incidence Principle of Investigation in Evaluating Biologic Significance of Inherited Variations in Problems of Human Constitution Types of Scapula W. W. Grave —p 561  
True and Supposed Danger of Infection in Diathermic Puncture of Corpus Ciliare for Glaucoma Question Whether Secretion of Aqueous Humor Can Be Reduced by Diathermic Puncture of Ciliary Body Anna Ernst —p 565  
\*Trombidiosis (Harvest Itch) New Focus in Switzerland R. Schuppli —p 568

**Trombidiosis New Focus in Switzerland**—Schuppli reports that in July 1941 trombidiosis was observed for the first time in the region around Basel, Switzerland. A number of soldiers exhibited a severely itching exanthem in the axillae, on the articular flexor surfaces and about the hips. All the men who acquired the exanthem had picked bush beans. Investigation revealed red mites on the clothing and body of persons returning from the bean fields, and the same mites were discovered on the bean plants. They were identified as *Trombicula autumnalis*, or *Leptus autumnalis*. It is the larval form of the mite which causes the exanthem. The eruption is found on the covered parts of the body, particularly where the clothing adheres tightly. Shortly after a larva has attached itself to the skin, a red spot appears and becomes urticarial. An intensely itching papule develops which may have a small vesicle. Scratching ruptures the vesicles and crusts form. The scratching may result in secondary infection and pyoderma. The itching is extremely severe, intensified attacks occurring during the night. The papules persist for from ten to fourteen days. Two of about 100 soldiers were apparently immune and remained free from the exanthem in spite of exposure. The sudden appearance of trombidiosis in a region formerly free from it may be due to the introduction of the soy bean into this region. The treatment of trombidiosis is of minor importance, since it subsides spontaneously in about ten days. The itching can be counteracted by a menthol or zinc preparation. As a prophylactic measure the author suggests that the mites could be destroyed chemically while they are in the soil during the winter, or that the plants could be sprayed with insecticides. For the individual prophylaxis American authors recommend the use of sulfur on clothing and body. The author suggests application of a zinc preparation to the sites predisposed to attacks by the mites. Shower baths with generous soaping and change of clothing immediately after exposure may also prove helpful.

**Anales del Hosp de Niños e Inst de Puericult, Rosario**

1-230, 1941 Partial Index

Dick's Reaction in Scarlet Fever A Invalidi —p 127  
Infarct of Spermatie Cord Case in Infant A Biejer and A Colombo —p 149

**Dick's Reaction in Scarlet Fever**—Invalidi performed Dick's test on 150 children from 1 to 13 years of age with scarlet fever. The injection of toxin was systematically repeated with intervals of seven days. The test gave negative results in 113 of 141 patients who were brought to the hospital in the course of the first week of the disease in 4 of 5 patients who entered the hospital in the second week and in the 4 patients who were brought to the hospital on the third and fourth weeks of the disease. The author concludes that, according to his observations, the rate of negative results is 80 per cent. A negative reaction early at the beginning of the disease is negative all through it. Positive results of the reaction change to negative results in the third week of the disease in 50 per cent of the cases. Age, sex and complications of scarlet fever do not have any influence on the results of the reaction.

**Revista Medica de Chile, Santiago**

70 477-568 (July) 1942 Partial Index

Dietetic Treatment in Hepatic Cirrhosis A Mardones Acosta and H Dooner —p 479  
Origin of Hyperbilirubinemia and Fecul Pleochromia in Pernicious Anemia H Alessandri Ducci and R Fitcher —p 484  
Autotransfusion in Ruptured Fetal Pregnancy and Other Considerations H Reyes —p 499  
\*Pellagra in Adults in Santiago de Chile. Review of 110 Cases H Alessandri P Garcia Palazuelos and J Ferner M —p 498  
A Year of Experience with Electropexy M Figueroa Fehriz Vidal —p 508  
\*Thrombopenic Purpura Caused by Sulfonamides M Losada I and S Fernandez W —p 524

**Pellagra in Adults**—Alessandri and his associates report observations on 110 cases of pellagra which were observed in Santiago de Chile between 1934 and 1941. Pellagra exists in Chile in the endemic as well as in the alcoholic and secondary forms. Twenty-nine of the patients presented the endemic form, 60 the alcoholic form, in the remaining 21 it was secondary to some grave organic disorder. Alcoholism and organic disease were etiologic factors. Pellagra has been increasing during the last five years. The authors calculate that in recent years Chile must have had about 3,000 cases of pellagra annually. In the city of Santiago twice as many cases were of alcoholic as of endemic origin. Endemic pellagra was more frequent in rural than in urban regions, this is so in Chile as well as in other countries. Women developed the endemic form more often than men. Alcoholic pellagra was three times more frequent in urban than in rural environment and appeared almost exclusively in men. Pellagra developed most frequently in persons between the ages of 30 and 60 years. Hospitalization for pellagra increased during the four hot months of the year. The total mortality for pellagra was 26 per cent in the reviewed material. In alcoholic pellagra the mortality was twice as high as in endemic pellagra. The authors discuss three groups of symptoms: (1) cutaneous, (2) nervous and mental disturbances and (3) digestive disorders. Until the beginning of 1939 the authors treated their patients according to Goldberg's recommendations with bed rest, a diet rich in antipellagral foods and yeast. In some cases antianemic hepatotherapy was employed with vitamin B or A. Since 1939 nicotinic acid has been added to the aforementioned treatment. Excellent results were obtained with the classic treatment of Goldberg in the majority of cases, but in some cases of extreme malnutrition this treatment has failed. The introduction of nicotinic acid signifies a definite advance in antipellagral treatment. It greatly accelerates recuperation, shortens hospitalization and thus reduces the expense of the treatment. The nicotinic acid is not, however, a substitute for the dietetic treatment but rather an important complement.

**Thrombopenic Purpura Caused by Sulfonamide Compound**—Losada I and Fernandez W report the history of a man, aged 60, who was given daily 3 Gm of a sulfonamide compound for an injury to the left hand. Purpuric spots appeared on the fifth day of the treatment. There was a

generalized purpura, most severe on the face, thrombopenia, lack of retraction of the clot, bleeding time of more than ten minutes and positive Rumpel-Leede sign. Puncture of the bone marrow disclosed hyporegeneration and immature platelets. Purpura is one of the late manifestations of intolerance to sulfonamide compounds. In this case it appeared on the fifth day of the medication. This can be explained by the fact that a sulfonamide compound exerts a toxic effect on the hemopoiesis in the bone marrow and does not affect the cells in the circulating blood, so that these return for several days their normal proportion, the symptoms appearing days after the first ingestion of the drug. The authors have observed 2 other cases of purpura after sulfonamide medication: 1 a case of pneumonia in which sulfapyridine had been given and the other a case of typhoid in which sulfaguanidine had been given. All 3 cases took a favorable course. The treatment of this complication consists in discontinuing the drug, administering large doses of vitamin C and daily transfusions of from 100 to 150 cc of blood.

**Archiv fur Gynakologie, Berlin**

172 1 160 (Oct 16) 1941 Partial Index

Reduction of Prothrombin Effect by Anesthesia and Operation W Adams —p 87  
Intensification of Action of Corpus Luteum by Vitamin F in Treatment of Habitual Abortion J Bach and H Winkler —p 97  
Cause of Icterus Neonatorum H Albers —p 110  
Experimental Investigation on Modification of Uterine Muscle by Orally Active Corpus Luteum Hormone J Ingelhart and P Schrank —p 120  
Experimental Studies on Influence of Testosterone Propionate on Uterus J Ingelhart and P Schrank —p 129  
Gonadotropic Hormone in Placenta W Bickenbach —p 152

**Intensification of Corpus Luteum Action by Vitamin E in Treatment of Habitual Abortion**—Bach and Winkler report observations on 127 cases of threatened abortion treated by them during the years between 1930 and 1941. In 32 cases abortion took place. The authors differentiate four groups according to the treatment employed. The first group of 74 cases remained untreated and in 24 of these abortion resulted. In the second group of 27 cases progesterone was given and in 5 of these the treatment failed. A third group of 10 cases was treated with vitamin E, in this group there was 1 failure. In a fourth group of 16 cases vitamin E and progesterone were given in this group there were 2 failures. Administration of progesterone has the effect of a substitutional therapy for an insufficient corpus luteum. Vitamin E intensifies the function of the corpus luteum not only by increasing the progesterone effect but also by a true activation which is evidenced by the elimination of pregnandiol in the urine. The combined administration of vitamin E and progesterone unites the advantages of the two methods: the first doses of progesterone protect the pregnancy until the vitamin E can exert the intensifying effect on the corpus luteum generally for a period of three days. The authors advise that the treatment be initiated with 10 mg of progesterone, that this dose be reduced after three days and that it be broken off entirely after five days. The optimal daily dose of alpha tocopherol (vitamin E) is 30 mg. Lower doses activate the corpus luteum inadequately and only after a longer period. Doses in excess of 30 mg do not increase the efficacy. Threatened abortions in women with definite infantilism in whom the elimination values of pregnandiol indicate not only an insufficiency in the follicular apparatus but also of the corpus luteum cannot be averted by beginning treatment during pregnancy. The initial values of pregnandiol elimination are far below normal and the increase in function effected by alpha tocopherol is inadequate to maintain the pregnancy. The treatment to be successful in these cases must begin before the occurrence of pregnancy. Vitamin E is effective in increasing the production of progesterone and also in influencing growth of the fetus.

**CORRECTION**

**Archiv fur Gewerbepathologie, Berlin**—In the Current Medical Literature department of THE JOURNAL, January 2, page 86 the date of the issue of the foregoing German journal should have been April 16, 1941, instead of 1942.

## Book Notices

**New and Nonofficial Remedies 1942** Containing Descriptions of the Articles Which Stand Accepted by the Council on Pharmacy and Chemistry of the American Medical Association on January 1, 1942. Austin E. Smith, M.D., C.M., M.Sc., editor. Issued under the direction and supervision of the Council on Pharmacy and Chemistry of the American Medical Association. Cloth. Price \$1.50. Pp. 668. Chicago: American Medical Association, 1942.

Perhaps the most important feature of this year's New and Nonofficial Remedies is the radical rearrangement. This should make the contents more accessible and therefore more valuable to the reader. Heretofore the classification of products has been basically that of chemical relationship—the new arrangement is primarily according to therapeutic use, chemical classification being introduced by means of subheadings. In addition, the typographic style has been changed to give greater prominence to the products of individual manufacturers. Valuable features have not been sacrificed. The book still fulfils its function of establishing chemical standards for new and nonofficial preparations which the Council has found to be useful or to give adequate promise of usefulness in the treatment or prevention of disease. Its function as a guide to the most recent advances in therapeutics has been greatly enhanced.

Careful examination of the general discussions under the various headings and subheadings shows that the Council has performed its annual task of keeping the text abreast of the progress of medicine. The authoritative and compendious section of the sulfonamide compounds is an example. So also is the chapter on vitamins and vitamin preparations for prophylactic and therapeutic use. Equally important though less extensive revisions have been made in such sections as those on aluminum compounds, dextrose, gonadotropic substances, liver and stomach preparations, ovaries, parathyroid, pituitary and testes.

Among the newly accepted drugs are

Acetyl-Beta-Methylcholine and the proprietary brand, Mecholyl Chloride, proposed for use by iontophoresis, orally and subcutaneously as a parasympathetic stimulant.

Adrenal Cortex Extract for parenteral use in the treatment of Addison's disease or of adrenal insufficiency of other types as well as prophylactically in surgical procedures involving the adrenal cortex.

Aluminum Hydroxide Gel with the proprietary brand, Creamalin for oral use as an adjunct in the treatment of peptic (gastric and duodenal) ulcer.

Normal Human Serum and Normal Human Plasma

Others worthy of mention are

Cyclopropane, another general anesthetic, now included in the U. S. Pharmacopeia.

Amylcaine Hydrochloride, another proprietary local anesthetic. Pernoston Sodium, the sodium salt of the previously accepted proprietary barbitol derivative, Pernoston.

This volume should be available to all medical students, physicians, pharmacists and others interested professionally or commercially in drug therapy. One cannot commend too highly the unselfish and untiring efforts of the Council on Pharmacy and Chemistry in the preparation of this invaluable contribution to rational and up to date therapeutics.

**Drug Products Labeling Packaging Regulation** By Arthur Donald Herrick. Member of the New York and Federal Bar. Fabrikoid. Price \$7.50. Pp. 462 with 7 illustrations. New York: Revere Publishing Company, 1942.

Mr. Herrick has made a worth-while contribution toward orienting for the average reader the problems relating to the interstate sale of drugs and their advertising. This book is one which will be useful not only to those who are interested in interstate drug commerce but to the members of the medical profession and allied sciences who have a natural curiosity in the control of drugs. The contents include discussions on the early and present history of federal drug legislation, the Federal Food and Drugs Act, the Federal Food, Drug and Cosmetic Act of 1938, the formation of the Food and Drug Administration products which are subject to the act, misbranded drug products, false and misleading labeling, packaged drug products,

informative labels, label display and prominence, adequate directions and warning against misuse, fraudulent and dangerous drug products, products exempt from labeling adulterated drug products, contaminated and harmful drug products, official drugs maintenance of nonofficial standards new drugs submission refusal and suspension of new drug applications and cosmetics. A valuable portion of the book is contained in the appendices, which include the Federal Food, Drug and Cosmetic Act general regulations relating to drug products U. S. Food and Drug Administration action on crude drugs and U. S. Food and Drug Administration methods of testing antiseptics and disinfectants. The material is presented in an easily read style and represents the type of information which should be made generally available in view of the ever increasing interest in the control of drugs.

**Report of the Committee on Tuberculosis in War Time** Medical Research Council, Special Report Series No. 246. Paper. Price 25 cents. 9d. Pp. 36. New York: British Information Service. London: His Majesty's Stationery Office, 1942.

Either the bovine or the human type of tubercle bacillus may give rise to disease in any part of the human body, and the type of infection can be determined only by careful bacteriologic examinations. In England and Wales, 98 to 99 per cent of all cases of pulmonary tuberculosis and 70 per cent of all cases of nonpulmonary tuberculosis are due to the human type of tubercle bacillus, and at all ages about 6 per cent of the deaths are due to the bovine type. In Scotland, however, the incidence of the bovine type of tuberculosis in man is higher than in England and Wales. Indeed, about 5 per cent of the cases of pulmonary tuberculosis are caused by the bovine type of tubercle bacillus. Because of the prevalence of both human and bovine tubercle bacilli in Great Britain, most persons come in contact with these organisms before they reach adult life and, therefore, practically all adults have at least the primary type of tuberculosis. Persons are liable to develop clinical tuberculosis either through fresh infections from the outside or from primary foci already established in their own bodies. Thus the situation in England varies definitely from that in the United States, where probably not more than 50 per cent of the entire population has been infected with tubercle bacilli and where in large areas this does not apply to more than 25 per cent. Moreover, in many parts of this country far more persons become infected in adult life than during childhood.

Tuberculosis mortality in Great Britain was gradually declining up to the beginning of the war. Indeed, between 1928 and 1938 the death rate in England and Wales was reduced from 91 to 60 per hundred thousand persons. Nevertheless in 1938, 230,000 cases of clinical tuberculosis were under supervision at the dispensaries of England, Wales and Scotland. That year 65,000 new cases and 30,000 deaths were reported. In 1941 there was an increase of about 10 per cent in respiratory tuberculosis over that of the immediate prewar years in England and Wales, and about 18 per cent in Scotland. For nonrespiratory tuberculosis the increase was 21 per cent for England and Wales and 28 per cent for Scotland. Thus, for all forms of tuberculosis the increased mortality was 13 per cent, or 3,780 actual deaths. In England and Wales the increase in respiratory tuberculosis affected mainly children, older men and younger women. However, the actual number of additional deaths among children has been much smaller than among adults in the case of respiratory tuberculosis.

The striking feature of nonrespiratory tuberculosis has been the increased incidence of tuberculous meningitis, which has affected all age groups up to 45. In children up to 10 years there has been a relative increase in mortality of 50 per cent.

While there were more actual deaths from tuberculosis during the first two years of the last war, the increase in mortality was 5 per cent for males and 7 per cent for females from 1914 to 1916, whereas in this war from 1939 to 1941 the increase has been 11 per cent for males and 13 per cent for females. During the last war children did not suffer appreciatively more from tuberculosis than in peacetime.

The authors call attention to the decline in mortality in Great Britain during the past eighty years. The lapse which occurred during 1914 to 1918 was thought to be due at that time to

unfavorable hygienic conditions, defective nutrition and increased industrialization. They believe that the greater prevalence of sources of human tuberculous infection has an important influence. Many tuberculous hospitals and sanatoriums were evacuated in September 1939 to make room for expected air raid casualties. Thus large numbers of patients returned to their homes while the disease was contagious. Blackout conditions, with diminished ventilation and increase in cross infection, overcrowding in homes due to destruction of residential property by enemy action and the added effects of billeting, evacuation of the population which may have led to billeting in homes containing infective tuberculous persons, and also the introduction of tuberculous persons into healthy homes, are thought to have played an important part in spreading tuberculosis. The evacuation of town populations to the country, with the result that many children previously supplied with pasteurized milk were then supplied with raw milk, is also considered significant. Therefore all ages of the population are being subjected to an increased risk of exposure to tuberculosis.

Apparently large numbers of persons working in factories have been exposed to fellow workers with contagious tuberculosis, since the demand for more labor has brought into activity many persons who in peacetime would not be working.

The following measures for the prevention of further increase in tuberculosis are discussed. The first consideration in this respect is to reduce the spread of bovine infection from dairy products. Tuberculosis is widespread among the cattle of Great Britain. Before the present war began about 40 per cent reacted to tuberculin, and 40 per cent of those slaughtered in the abattoirs had areas of disease sufficiently large to be seen with the naked eye. Five-tenths per cent of milch cows were eliminating tubercle bacilli through the milk. Over 6 per cent of all farms were sending out milk containing living tubercle bacilli. In 1937 the Ministry of Agriculture introduced a plan for controlling tuberculosis in cattle, but by 1939 only about 3 per cent of the dairy farms had their herds attested. Unfortunately, this plan had to be practically abandoned during the war and there seems no hope that further progress in the eradication of tuberculous infection from cattle can be expected until more normal conditions are restored. Therefore the milk will continue to contain tubercle bacilli and the only possible immediate solution is to destroy them by heat. The authors give various suggestions for pasteurization in towns and cities and educating housewives elsewhere to heat milk adequately.

The unsuspected case of tuberculosis is regarded as a significant factor in the increase of the disease during the present war. Symptoms usually appear late, and therefore most patients have moderately or far advanced disease when it is diagnosed. The authors believe that these unsuspected cases should be screened from those sections of the population where there is the greatest danger of spreading disease. For this purpose they recommend mass radiography. They feel that the miniature film is the best solution of the present problem because of the extremely low cost and the speed with which it can be processed. However, they are thoroughly cognizant of the fact that this is not the ideal method of doing x-ray work nor is it the fastest. They recommend mass radiography as a preemployment procedure and one which should be extended to all persons employed in certain industries. They also believe it should be a periodic requirement because they are cognizant of the fact that persons whose chest films may be clear on first examination may at any subsequent time present evidence of disease.

In administering the proper treatment of persons with tuberculosis the authors lament the fact that the number of beds in sanatoriums has been decreased and that nurses and physicians are difficult to obtain for the care of the tuberculous. All this adds significantly to the problem.

Some American workers will take issue with the statement that the risk of infection with tuberculosis from nursing tuberculous patients in sanatoriums is no greater than that involved in general hospital nursing.

The committee recommends a plan whereby the patient is allowed sufficient financial support for himself and his family until he is able to resume his work. It recommends a number of schemes for providing work for persons with the disease in

a quiescent noninfectious stage on a part time basis. It also calls attention to an extremely important special group, namely persons with chronic contagious tuberculosis who cannot be treated so as to render them noncontagious and yet are not seriously ill. Many of them have good working capacity either on a part time or a full time basis. It is believed that these persons could be employed in groups where they will not disseminate their tubercle bacilli to others.

The section on tuberculosis in institutions for the mentally ill is intensely interesting and throws further light on the real cause of the increase in tuberculosis during wartime. In peacetime the mortality rates from tuberculosis in these institutions was eight or nine times that of the general population. Between 1910 and 1914 it varied between 15 and 17 per thousand resident patients but during the last war it rose to 37 per thousand in 1917, and 52 per thousand in 1918. A similar trend is already apparent in the present war, and this applies also to the institutions for mental deficiency. During the last war it was thought that the increased mortality was largely due to insufficient diet, but the authors are not prepared to pass the same judgment now, because both the quantity and the quality of the food has been good in these institutions in this war. On the other hand, there has been definite overcrowding, which has apparently increased infection possibilities from contagious cases.

A concise summary of findings and recommendations by the members of the council is included. The report contains an unusually modern point of view on tuberculosis control which is applicable to any nation where nearly all of the adult population is infected with tubercle bacilli.

*Ultra Violet Light and Its Applications Including a Description of the Numerous Practical Applications Found for Ultraviolet Light and Fluorescence in the Industries, Sciences and Arts.* By H. C. Dako and Jack De Vent. Cloth. Price \$3.25. Pp. 209 with illustrations. Brooklyn & New York: Chemical Publishing Company Inc. 1942.

This volume deals largely with the utilization of ultraviolet radiation in commercial and technical applications. One chapter is devoted to medical sciences, and it stresses the employment of ultraviolet radiation in diagnostic procedures. Little or nothing is written on therapeutic applications of ultraviolet radiation. There are many clever ideas suggested for using ultraviolet radiation in the practice of surgery, bacteriology, dermatology and pharmacology. How diseased tissues will fluoresce in the presence of ultraviolet is described, and valuable hints are advanced for the technique of recognizing pathologic tissues. The significance of ultraviolet radiation in bacteriology utilizing microinjections of fluorescent dyes and the colors certain organic and inorganic chemical compounds will produce under the influence of ultraviolet radiation are described. At least half of the book is devoted to the uses of ultraviolet radiation in criminology and police science, military, advertising, theatrical, mining and oil drilling applications. A list of firms is recorded at which supplies may be obtained for use in ultraviolet and fluorescent practice.

*Clinical Thermometers. A Recorded Voluntary Standard of the Trade.* Commercial Standard CS1 42. U. S. Department of Commerce. Jesse H. Jones, Secretary, National Bureau of Standards; Lyman J. Briggs, Director. Third edition. Paper. Price 10 cents. Pp. 19. Washington: U. S. Dept. of Commerce, Government Printing Office. 1942.

This pamphlet describes approved methods for testing clinical thermometers. The National Bureau of Standards in 1927 was requested by a committee of the Associated Thermometers Manufacturers to assist in establishing a commercial standard for clinical thermometers, to encourage the production and sale of reliable thermometers and to protect purchasers from inferior and unreliable instruments. The proposed standards were drafted and adopted in 1928. The first revision was in 1931 and the second revision in 1940. In order to be accepted, thermometers must meet standards of construction, aging, pigment tests and tests for entrapped gas and accuracy. There are tests for "hard shakers" and for "retreating index." For the accuracy test, thermometers are compared at 98, 102 and 106 F and must be tested in a certain prescribed way as explained in the pamphlet. Rigid tolerances of accuracy are demanded. The bureau is to be congratulated for its efforts in assuring accurate thermometers for the profession.

## Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS BUT THESE WILL BE OMITTED ON REQUEST.

### DERMATITIS FROM CUTTING OILS

**To the Editor**—The matter of dermatoses in men in munitions factories working with water soluble oils becomes an acute one. In a certain factory there is in use a preventive Steridol number 3, made by the C B Dolge Company of Bridgeport Conn. Will you give me information concerning this product and about the matter of these dermatoses and the pertaining bibliography?  
M D, Michigan

**ANSWER**—The large majority of cutting oil dermatitis occurs from the insoluble cutting oils yet these are sterile as far as pathogenic bacteria are concerned. Only a comparatively small percentage of dermatitis from cutting oils is caused by the water soluble cutting oils which, in contradistinction to the insoluble oils, usually contain many pathogenic bacteria. Usually they also have an offensive odor and may contain metal shivers. It is possible to have the skin injured by the shivers and the cut become infected from the bacteria in the water soluble oil or on the soiled skin and clothing.

Sedimentation and filtration to remove the chips and pasteurization to kill the bacteria are used in many plants where the water soluble oils are reclaimed and circulated through a sterilization system. In plants where pasteurization systems are not installed, antiseptics can be used in order to destroy the bacteria in soluble cutting oils.

Steridol number 3, sold by the Dolge Company, is one of these antiseptics. The extract composition of Steridol is not given by the manufacturers, but it is believed to be of the formaldehyde type of disinfectants.

The advantage claimed for disinfectants in cutting oils over heat sterilization is that when disinfectants are used the oil cannot be reinfected in the pipes and at the machines. The disadvantage of disinfectants is that they are all skin irritants and increase the dermatitis hazard from the cutting oils. Especially is this so because the continued addition of disinfectants to cutting oils for the purpose either of disinfecting them or of destroying or masking the objectionable odors (caused by the formation of sulfur compounds) has been known in some instances to increase the disinfectant content of such oils to as high as 5 per cent.

The claims made for Steridol can be read in a booklet entitled "Cutting Oil Sanitation," issued by the C B Dolge Company, Westport, Conn. For further reference to this subject see "Dermatitis from Cutting Oils" by Louis Schwartz (*Pub Health Rep* 56 1947 [Oct 3] 1941, reprint 2321).

### ANATOMY OF LEFT PLEURAL CAVITY

**To the Editor**—In answer to M D, Utah (*The Journal*, May 9 1942, p 232), there appears the following statement: "The left pleural cavity largely drains via the vena azygos minor which usually empties into the left innominate vein and so is not so immediately obstructed as is the vena azygos major." According to all recent textbooks of anatomy in the English language (Piersol ninth edition 1930 p 895 Morris, ninth edition 1933 pp 735 736 Cunningham seventh edition, 1937 p 1241 Gray twenty second edition, 1930 p 668) and personal observations both vena azygos minor inferior and vena azygos minor superior empty into the vena azygos major. The left superior or highest intercostal vein which drains the blood from the upper three or four intercostal spaces, opens into the left innominate vein. The left superior intercostal vein often communicates with the left vena azygos minor superior and may drain a small amount of blood from the highest part of the parietal pleura on that side. The statement from *The Journal* quoted does not seem to agree with the anatomic findings therefore it should not go unchallenged.

K S Chouke M D, Philadelphia

**ANSWER**—The challenge to the statement in *THE JOURNAL* concerning the preponderance of right hydrothorax in congestive heart failure is well taken and indicates the need of elucidation. There should be a correction of the statement to read as follows: "Drainage from the left pleural cavity is by way of the hemiazygos (azygos minor inferior) and accessory hemiazygos (azygos minor superior) veins, the latter not only emptying into the vena azygos major but also anastomosing almost always with the left innominate vein, which connection may account for the lesser degree of venous obstruction on the left side than on the right."

### DIFFERENTIAL DIAGNOSIS OF BACKACHE

**To the Editor**—I am 32 years old well nourished weigh 164 pounds (74 Kg) am 5 feet 8 inches (173 cm) tall and have suffered from flat feet for the last fourteen years. From the beginning I have had good medical care with regard to my arches. However I have always had trouble with my arch supports which for the most part were made of aluminum covered with leather. On the average I had new ones made every one or two years at the same time I had to go back to the orthopedic mechanic constantly for adjustments for they never felt completely satisfactory. Nevertheless I managed to get by somehow through a one year internship from 1937 to 1938, despite the fact that at this time my assisting in the operating room gave me sacroiliac backaches. During this time I saw many orthopedic surgeons. Exactly one year ago I decided to move my office from New Jersey to upstate New York. During this period I was busy packing and lifting heavy packages cartons and the like. After I had my work almost completed I suffered a sudden attack of upper back pain dull not radiating in the middle at the height of the seventh to tenth dorsal vertebrae. A well trained orthopedic surgeon ordered me to have a few days of bed rest after which I received a series of treatments which consisted of diathermy and massages of my back. I also exercised at home to straighten my posture and to increase my muscle tonus which is rather flabby because of the fact that I never had much of a chance to indulge in sports. My backaches were improved for a short time only to return again and for the last ten months I have never been without backache for more than a period of four or five days then they always recur. I have consulted several orthopedic specialists without any success. My backaches always improve temporarily after my back is massaged. For this reason I had no roentgenograms taken. Please advise me of the possible diagnosis and treatment and mainly please give me the names of a few authorities in this field preferably in the East.

M D New York

**ANSWER**—A differential diagnosis of backache such as described could not be made without additional information. Chronic malposture may result, in time, in producing symptoms of strain or wear and tear arthritis in the articular facets of the spine. Degenerative changes in the intervertebral disks secondary to an old healed vertebral epiphysitis are occasionally seen and are most often present in the lower thoracic spine. Herniation of an intervertebral disk may result from a lifting strain such as that which has been described.

Roentgenograms of the spine should be made. A careful neurologic examination is important. A therapeutic test of support by means of a good back brace may be helpful. As a number of competent orthopedic surgeons have already been consulted, it would appear to be advisable that a consultation should be arranged between an able orthopedic specialist and a neurologist. Perhaps a spinal puncture would be found to be indicated.

There is no one leading authority in this particular field in the big Eastern cities who is preeminently superior to other good orthopedic surgeons in the same locations.

### POSTPARTUM CARE

**To the Editor**—Will you give me the current opinion regarding (1) the routine use of shock blocks following delivery, (2) postpartum laxatives for the mother and (3) the use of ergot or a similar preparation for the first twenty four to seventy-two hours post partum?

R F DeWitt M D, Plymouth, N H

**ANSWER**—1 There is no indication for the routine use of shock blocks following normal delivery. This is one of the procedures that should be reserved for the patient who has had excessive loss of blood.

2 Almost all mothers need a mild laxative following delivery, although there has been much abuse in the use of laxatives. For the patient who has had a natural delivery without perineal repair, liquid petrolatum can be started on the second day and if necessary a small tap water enema can be administered the third morning. The liquid petrolatum can be continued while the patient is in bed or an agar in oil preparation can be substituted. If the patient does not have a bowel movement, the small tap water enema can be repeated every other day. For the patient who has had an episiotomy, oil can be started on the second day and in the absence of a bowel movement the tap water enema can be administered on the morning of the fourth day. For the patient who has sustained an injury to the anal sphincter, the administration of liquid petrolatum can begin on the fourth morning, a small oil retention enema can be given the evening of the fifth day, and if there is no bowel movement this can be followed by a small tap water enema the following morning. This routine has provided satisfactory results in a large obstetric service.

3 It is the practice in many large institutions to administer a 0.2 mg tablet of ergonovine two or three times a day during the first seventy-two hours to all patients. Severe after-pains may warrant discontinuing the oxytocic drug. In the presence of infection or retarded uterine involution from some other cause, ergonovine can be continued for a longer period.

### EPINEPHRINE AND PROCAINE SOLUTIONS IN DENTAL SURGERY

To the Editor—Several misinterpretations appear in reply to the query concerning the addition of epinephrine to the procaine solution used in dental operations (The Journal Sept 19, 1942, p 248). Dentists seldom employ epinephrine for the purpose of securing a dry field, if they should their success would be indifferent. While it appears that procaine hydrochloride alone is an adequate obtundant for the surgical manipulation of soft tissues it is unquestionable that anesthesia of far greater depth is required to eliminate sensation in the parodontal tissues and especially the dental pulp. Experience has repeatedly shown that this is rarely secured without the addition of a vasoconstrictor which functions chiefly to intensify the action of the procaine by retarding its absorption. This becomes increasingly true in employing the nerve blocking method which is mandatory in anesthetizing the lower posterior teeth. Satisfactory operating results in these areas virtually never follow the use of procaine alone. Optimum effects require a concentration greater than 1.75,000 of epinephrine greater than 1.80 of procaine hydrochloride as well as a waiting period of over ten minutes to allow anesthesia to reach a satisfactory depth. Many thousands of patients with original syndromes have been injected with 2 to 3 cc. of such concentrations both in the hospital and in the dental office without encountering severe reactions if the principle of basal anesthesia with barbiturates is employed and the solution is injected extremely slowly with the patient supine. Moderate reactions may occur, as they do in other groups of patients but they are generally transitory and negligible. Nevertheless caution dictates that glyceryl trinitrate and other restoratives are at hand to anticipate an emergency. The answer to the problem posed would seem to be that the patient who is a poor risk for the anesthetic is likewise a poor risk for the extraction. Excepting for the relief of intractable pain the operation should be postponed until the clinical condition offers a proper margin of safety or perhaps be altogether avoided by compromise treatment. Even under favorable circumstances extraction is a procedure not devoid of hazards and should be approached with the same careful judgment as any other operative measure.

Leo Stern D.D.S., New York

To the Editor—In Queries and Minor Notes in The Journal Sept 19, 1942, page 248, there is a question about the use of procaine hydrochloride with and without epinephrine when dealing with the original syndrome. In the reply it is stated that either epinephrine is omitted in certain cases or cobefrin is used in place of it. It should be noted that clinical and experimental evidence shows that cobefrin is subject to the same disadvantages as epinephrine.

Isaac Newirth, New York

Associate professor of  
pharmacology and therapeutics  
New York University College of Dentistry

ANSWER—[These two letters were referred to the consultant who replied to the original query. His reply follows.] I still believe that the original answer is correct. It could have been amplified to include the effect of preliminary medication skill in injection, the patient's disability, his nervousness and his output of epinephrine, but brevity was indicated. I generally employ cobefrin in a dilution of 1:50,000 as compared to epinephrine in a dilution of 1:150,000. Epinephrine in this dilution causes constriction of peripheral blood vessels and thus produces a fairly dry field.

Under these conditions, obviously, absorption of the anesthetic solution is slowed and anesthetic solution is not lost by hemorrhage. Therefore anesthesia is considerably prolonged. Nevertheless, I see fewer untoward effects with cobefrin than with epinephrine and, under the conditions with which this correspondence deals, I prefer cobefrin.

### DIETHYLSTILBESTROL AND HAIR LOSS

To the Editor—Can diethylstilbestrol cause the loss of hair from the scalp? A woman aged 22 never had a period previous to December 1941. She had bilateral mumps at the age of 10. The uterus was small, the breasts were infantile in type and there was a definite masculine hirsutism. With diethylstilbestrol which she has been taking since December 1941, periods have been at regular intervals and the dose of diethylstilbestrol has been regulated so as to have the periods at intervals of four weeks. The monthly dose was 1 mg. daily for five days and 2 mg. daily for another five days. In July she felt much better and I had not seen her again for three months. She still feels well but has skipped the last two periods. Practically all evidence of masculine hirsutism has disappeared and the scalp is noticeably bald especially in the region of the temples. I have noticed changes in the distribution of hair (possibly coincidental) with other estrogens but nothing so severe. The basal metabolic rate was minus 11 per cent in February. The blood pressure was 160 mm. systolic (following the death of a relative) but has now been normal since April. An organic basis for the blood pressure could not be found from pyelogram and urine cultures. The urea clearance test was normal.

M.D., Massachusetts

ANSWER—As far as is known there is no connection whatever between the loss of the hair from the scalp and the ingestion of diethylstilbestrol. The condition in the case cited would appear to be coincidental.

### SYMPATHETIC AND PARASYMPATHETIC NERVE SUPPLY OF CEREBRAL VESSELS

To the Editor—Would you please inform me whether stimulation of the sympathetic nerves leading to brain vessels produces vasoconstriction or vasodilatation? Have any sympathetic vasodilator nerves in the cerebral vessels ever been found? Can acetylcholine act on the cerebral blood vessels producing vasodilatation and if so where does the acetylcholine develop, since there are no parasympathetic fibers present?

M.D., New York

ANSWER—Stimulation of one cervical sympathetic trunk produces feeble constriction of the pial blood vessels on the same side of the brain. Other nerve fibers reach the arteries of the brain stem from the facial nerve by way of the greater superficial petrosal branch. The last mentioned group of fibers are commonly referred to as parasympathetic. Stimulation of this group gives feeble dilatation of the blood vessels of the ipsilateral cerebral cortex. Acetylcholine produces moderate dilatation of the pial vessels. It may be assumed to develop at the so-called parasympathetic endings. In reality, the presence of parasympathetic vasodilator nerves has never been satisfactorily proved. It is probable that sympathetic nerves normally control both the constriction and the dilatation of blood vessels. It is true that stimulation of the peripheral ends of divided posterior nerve roots produces vasodilatation. This may be an abnormal antidromic effect releasing a chemical mediator at the sensory nerve ending on the blood vessel.

### BIOLOGICALLY FALSE SEROLOGIC TESTS

To the Editor—A white woman aged 30 in excellent health presented herself for a routine blood test. She is unmarried and denies any possible exposure to syphilis by sexual intercourse. Physical examination and history are negative for symptoms and signs ordinarily attributed to a syphilitic infection. The history is extremely reliable in this instance. There is no history of previous infection or treatment for syphilis. A spinal fluid test has not been done.

#### Results of the Blood Tests

Date	Laboratory	Kline	Kahn	Kolmer	Kahn Verification Test
6 25 42	1	Positive	Neg	2+	Not done
7 2 42	1	Positive	Neg	2+	Not done
7 6 42	1	3+	±	Negative	Not done
7 6 42	2	Not done	Neg	Not done	Negative
7 6 42	3	Not done	±	Negative	
Eagle Muzzini done by this laboratory were negative Hinton was doubtful					
8 11 42	1	Not done	Neg	4+	Not done
10 3 42	1	Not done	Neg	Negative	Not done
10 16 42	1	Not done	Atypical reaction	Negative	Not done

This patient is now under my supervision. No antisyphilitic treatment has been given. Suggestions on the handling and further study of this case will be appreciated.

Don V. Hutton, M.D., Fayetteville, W. Va.

ANSWER—The conflicting serologic reports obtained thus far in this case do not warrant a diagnosis of syphilis and appear to be of the so-called biologically false positive type. The things that make these reports appear to be "false positive" are the inconsistency in the positive tests by different techniques, the variation in the degree of positiveness and the variation in the tests done on the same specimen of blood by three different laboratories. In view of these findings, a diagnosis of syphilis is not justified and accordingly treatment of this young woman for the disease is not warranted. A spinal fluid examination should be made because a positive report will sometimes be found even though the tests of the blood are as conflicting as in this case. If the spinal tests are negative, the future procedure would be to recheck the tests at two to three month intervals and when so doing to reexamine the patient for evidence of syphilis. It is not uncommon that false positive tests will spontaneously revert to negative and remain so when rechecking of the tests is done over a period of a year or so. If the spinal reports are positive, treatment for syphilis would then be warranted.

Numerous factors enter into the creating of the false positive test, among which are recent influenzal infections, low grade febrile conditions, glandular tuberculosis, disseminated lupus erythematosus, past vaccination against smallpox, typhoid and drawing the specimen during the menstrual period. These are among some of the more recently found causes for unsatisfactory serologic tests such as the example given.



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## CONTINUOUS CAUDAL ANALGESIA IN OBSTETRICS

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Continuous caudal analgesia was developed to relieve the pains of labor and delivery. Since its beginning<sup>1</sup> we have sought to improve our apparatus and refine our technic in order to provide the maximum of comfort for the mother with a minimum of risk for her and the baby.

Both Drs. J. B. De Lee and J. Whitridge Williams recognized that some obstetricians would literally follow the Biblical injunction "in sorrow shalt thou bring forth" but stated that it was the duty of the obstetrician to mitigate the sufferings of natural labor and delivery. They demanded that any anesthetic, analgesic or anesthetic agent possess safety for mother and child.

Since 1847, when Sir James Y. Simpson introduced ether in obstetrics, there has been a continuous search for a perfect method. Many different agents, used either alone or in combinations, have been described for this purpose. Not one has been found that completely meets the postulated criteria without at the same time altering the normal mechanism of labor.

Sicard<sup>2</sup> and Cathelin, working independently, blocked the sacral and coccygeal nerves through the sacral hiatus. They found in 1901 that fluids when injected into the peridural space by this route rise to a height in direct proportion to the amount of preparation used and the speed with which it is forced into the canal. Cathelin further showed that when sufficient cocaine was injected into the sacral canal of the dog it resulted in complete anesthesia of the entire body.<sup>3</sup>

Laewen and Gaza in 1911 and Schlumpert<sup>4</sup> in 1913 used caudal anesthesia in Germany for obstetric cases. In America the technic has been used successfully by Meeker and Bonar in 1923, others followed. Oldham in 1925, Lundy in 1928, Henry and Jaur in 1929, Rucker in 1930, Campbell in 1935, Johnson in 1936

and Sword in 1936.<sup>5</sup> In 1939 Baptista<sup>6</sup> reported the successful use of caudal anesthesia in 200 obstetric cases. Lahmann and Mietus<sup>5</sup> in January 1942 reported 400 obstetric cases in which caudal anesthesia was used.

These investigators confirm the practical usefulness of caudal block for delivery with comparative safety for both mother and child. Most of the writers cited described a satisfactory anesthesia resulting from an introduction of from 30 to 40 cc of 1 or 2 per cent solution of procaine or metycaine into the extradural space of the sacral canal. Most found the duration of this anesthesia to be between forty minutes and an hour and a half.

We have sought to modify their methods so that the analgesia could be started in the early stages of labor to relieve the pain and discomfort for the parturient in this period with the added advantage of continuing this analgesia until the completion of labor and postpartum repair.

In a previous paper we wrote that we used this procedure in obstetrics only after it had been thoroughly studied in the management of twenty surgical operations on the perineum and lower extremities. We first used it in our surgical service, working with Southworth,<sup>7</sup> in October 1941 for a bilateral phlebectomy. Since that time we have managed the entire course of six hundred labors and deliveries with this method without resorting to any other form of anesthesia. We believe that continuous caudal analgesia has opened a new medical horizon to the profession comparable to that developed by Lemmon and Paschal<sup>8</sup> with continuous spinal anesthesia. However, we would emphasize that with our method the drug producing the analgesia is continuously bathing the nerve trunks of the sacral and lumbar plexuses within the peridural space. At no time does this medication enter the subdural space of the spinal canal. Consequently the patient is still able to move the lower extremities throughout labor, and uterine contractions continue without impediment.<sup>9</sup>

### THE NERVE SUPPLY TO THE UTERUS

Our solution of the problem of the relief of pain during labor and delivery has been the use of a continuous regional nerve block of both the somatic and autonomic pathways which transmit the pain impulses. At the same time we have endeavored not to interfere with the motor nerve fibers to the uterus and the

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<sup>1</sup> Edwards, W. B. and Hingson, R. A. Continuous Caudal Anesthesia in Obstetrics. *Am J Surg* 57: 459-464 (Sept.) 1942. Hingson and Southworth.<sup>7</sup>

<sup>2</sup> Sicard, M. A. Les injections medicamenteuses extra duralles par voie sacrococcygienne. *Compt rend Soc de biol* 53: 396 1901.

<sup>3</sup> Cathelin, M. F. Une nouvelle injection rachidienne. Methode des injections epidurales par le procede du canal sacre. Applications a l'homme. *Compt rend Soc de biol* 53: 452 1901.

<sup>4</sup> Schlumpert, Hans. Concerning Sacral Anesthesia. *Surg Gynec & Obst* 16: 488 1913.

<sup>5</sup> Lahmann, Albert H. and Mietus, A. C. Caudal Anesthesia. *Surg Gynec & Obst* 74: 63-68 (Jan.) 1942.

<sup>6</sup> Baptista, Arthur Jr. Caudal Anesthesia in Obstetrics. *Am J Obst & Gynec* 38: 642 (Oct.) 1939.

<sup>7</sup> Hingson, R. A. and Southworth, J. L. Continuous Caudal Anesthesia. *Am J Surg* 58: 93-96 (Jan.) 1943.

<sup>8</sup> Lemmon, W. T. and Paschal, G. W. Jr. Continuous Spinal Anesthesia with Observations on the First 500 Cases. *Pennsylvania M J* 44: 975-980 (May) 1941.

<sup>9</sup> Hingson, R. A. and Edwards, W. B. Continuous Caudal Anesthesia During Labor and Delivery. *Anesth & Analg* 21: 301-311 (Nov-Dec.) 1942.



nerves to the accessory skeletal muscles which have a part in the voluntary expulsion of the baby. Thus we have designated continuous caudal analgesia.

Head<sup>10</sup> in 1893 postulated that the pain impulses of labor were transmitted through the lower thoracic and upper lumbar sympathetic ganglions. Cleland<sup>11</sup> in 1933 located these pathways in the human being by clinical observations following paravertebral sympathetic nerve block as coursing through the ganglions of the eleventh and twelfth thoracic segments. In more than 600 case studies we have substantiated these contentions. We have tested the level of skin analgesia in every patient receiving the caudal block. We have found that it is necessary to extend this level of analgesia up to and including the area supplied by the eleventh thoracic nerve and the iliohypogastric nerve on both sides before the patient has complete relief from labor pains. The superior extent of this area lies midway between the umbilicus and the pubis. Whenever the analgesia of the skin falls below this area on either side there is return of the sensations of abdominal cramps on that side, with the intensity increasing as the level of analgesia descends.

Sherrington, Head, DeLee, Rucker<sup>12</sup> and Cleland have contended that the motor nerve supply to the

cervix and lower uterine segment and that they carry pain fibers from these areas and the upper portion of the vaginal vault. There is some suggestion that they also carry inhibitory fibers to the uterus by innervating the longitudinal muscle fibers of this organ. Prolonged block of these nerves through continuous caudal analgesia produces definite softening of the cervix with more rapid effacement of the lower uterine segment and cervical dilatation as determined by rectal examinations.

Thus from this clinical study it would appear that the autonomic nerve supply to the uterus may be divided into the components presented in the accompanying tabulation.

In substantiating this work on cadavers we studied the dissection made of the peridural space in sixty cadavers after 30 cc. of methylene blue solution had been injected through the sacral hiatus. We found that in no case did this injection go higher than the sixth thoracic segment but always as high as the tenth dorsal segment. In many of them we found the structures more intensely stained on one side and to a higher level than on the other.<sup>13</sup>

Thus our dosage tables were calculated both by neurologic studies on women in labor and by dissection studies on necropsy material. We sought to determine the required volume of solution necessary to reach the pain fibers without paralyzing other vital nervous functions.

#### THE MANAGEMENT OF LABOR AND DELIVERY

Continuous caudal analgesia is started when a patient is in labor and in distress. We advise that the procedure be not started until the patient is in actual distress. Best results are secured when the contractions are regular of at least thirty seconds duration and five minutes or less apart. Often with only slight suggestion and encouragement a patient will not need much aid until she has 3 to 4 cm. dilatation. If the patient is in too severe pain the procedure can be started earlier and absolute relief given.

Under this form of analgesia the patient is continued on her normal diet and fluid intake. Thus there is no interference in the normal metabolism of either mother or child.

It is imperative that the obstetrician have a complete evaluation of the case before the analgesia is started. He should know that there is no placenta previa, meretric uteri, uncontrollable hysteria or disproportion of child to pelvis. All these are extraordinary obstetric contraindications for the use of the procedure.

We prefer to keep the patient in her own hospital room until time for delivery. She is in familiar surroundings and has her reading material, radio and visitors. Since the patient is not uncomfortable she often enjoys natural sleep and is able to conserve her energy.

An enema always precedes the administration of the analgesia unless the progress of labor is too rapid. Rectal examination gives satisfactory information without producing discomfort. Rectal examination is made with facility because of the relaxation of the anal sphincter.

Because of pronounced relaxation of the soft parts of the birth canal and outlet, progress is expedited. We have found it safe to leave the mother in bed until the presenting part can be seen by spreading the vulva.

#### Components of Autonomic Nerve Supply to Uterus

1 Visceral efferent sympathetic (motor to upper uterine segment)	Upper thoracic and possibly lower cervical sympathetic ganglions and nerves coursing in the celiac, aortic, renal and hypogastric plexuses with possible reinforcement from nerve supply to the adnexa.
2 Visceral afferent sympathetic (sensory to the uterus)	Eleventh and twelfth thoracic and possibly the first lumbar sympathetic ganglions and nerves.
3 Visceral efferent and afferent parasympathetic (inhibitory to uterus sensory and motor to the cervix sensory to upper birth canal)	Second, third and fourth sacral nerves directly to the great cervical ganglion of Frankenhauser.

The sympathetic components of the sacral nerves and ganglions probably also carry pain impulses from the cervix and vaginal vault and play a part in the mechanism of the dilatation of the cervix.

upper uterine segment arises from the upper thoracic sympathetic ganglions and courses in the fibers of the celiac, aortic, renal and hypogastric plexuses along the blood vessels to the uterus. These contentions have been substantiated by observations that women who have had high midthoracic traumatic sections of their spinal cords during pregnancy have continued the pregnancy and have gone into normal painless labor with spontaneous delivery. In our study of patients under continuous caudal analgesia we have found these postulates to coincide with our clinical observations. We have noticed that when the area of skin analgesia extends higher than the sixth thoracic segment the progress of labor with regard to frequency and force of the uterine contractions is delayed. So long as the area of analgesia is kept below the level of the umbilicus, the progress of labor with regard to frequency and strength of uterine contractions continues.

The nerve supply of the cervix and lower uterine segments is generally stated to course from the sacral sympathetic ganglions to the large cervical ganglions and directly through the parasympathetic fibers from the second, third and fourth sacral nerves. We believe that these fibers innervate the circular muscles of the

10 Head, Henry. Pain in Visceral Disease, part 1. 1893. Brain xvi, 1.

11 Cleland, J. G. P. Paravertebral Anesthesia in Obstetrics. Surg. Gynec. & Obst. 57, 51-62 (July) 1933.

12 Rucker, M. Pierce. The Use of Novocaine in Obstetrics. Am. J. Obst. & Gynec. 9, 35 (Jan.) 1925.

13 Vaux, Norris and Lull, Clifford. A Study of the Peridural Space in Cadavers in the Jefferson University Medical School, unpublished data Philadelphia 1942.

The danger of precipitant birth is minimized as the distressing expulsive forces called into play due to pain are absent. The mother is taken to the delivery room with the apparatus in place. The perineum is prepared with tincture of green soap and an antiseptic. The patient is draped and delivery accomplished.

It has been our policy to use prophylactic episiotomy and outlet forceps. The application of forceps is facilitated by complete relaxation. In spontaneous delivery the presenting part gradually irons out the perineum, dilates the vulva and delivers. With either operative or spontaneous delivery, care must be used to protect the mouth and nose of the child as it crosses the perineum so that there will be no aspiration. The majority of babies breathe spontaneously, since there is no drug obtunding the vital mechanism of the baby. In our experience the delivery of a breech is greatly facilitated. The premature baby has a better than average chance since it has been spared a severe dehydration period and excessive birth trauma due to resistance in the birth canal and outlet.

The third stage of labor is not prolonged and there is a noticeable decrease in blood loss. The contractile power of the uterus is not inhibited. When the patient is ready to return to her hospital bed the analgesia is discontinued.

#### TECHNIC FOR ADMINISTRATION

1 This method is definitely contraindicated for patients with gross deformities of the spine, particularly in the region of the sacrum, in local infection around the sacral hiatus, and for patients with a history of sensitivity to the analgesic agent.

2 The patient is placed in the modified left lateral Sims position. The sacral and coccygeal area is cleansed with soap and water and prepared with one of the antiseptic tinctures.

3 The tip of the coccyx is palpated with the middle finger of the left hand, and the thumb is used to find the U or V shaped notch indicating the sacral hiatus between the sacral cornua. This is usually about  $1\frac{1}{2}$  or 2 inches from the tip of the coccyx. In cases in which there was a failure of the inferior sacral arches to fuse into the bony roof of the sacrum, this hiatus may be  $2\frac{1}{2}$  to 4 inches from the inferior caudal tip. Experience with the standard single caudal injections is a desired prerequisite for success in the use of the continuous method.

4 The middle finger of the left hand then changes place with the thumb and marks the spot for raising the initial skin wheal.

5 A special apparatus, as illustrated in figure 2, has been developed for this procedure. The analgesic agent recommended by us is 1.5 per cent metycaïne in isotonic solution of sodium chloride. Two Gm of the drug diluted in approximately 125 cc of a saline solution in the reservoir bottle will most nearly approach this concentration. With a few cubic centimeters of this solution skin anesthesia is obtained by raising a skin

wheel with a 25 gage and deeper infiltration to the sacrococcygeal ligament with a 2 inch 22 gage needle.

6 The special malleable stainless steel 19 gage needle is then inserted in the midline in the direction of the hiatus at about a 45 degree angle with the skin.

7 As soon as the bevel of the needle pierces the sacrococcygeal ligament its reinforced metal collar is depressed through an arc of 1 to 3 cm and the needle is thrust slowly and evenly in the midline for 1 to 2 inches within the sacral canal where its bevel should lie inferior to the lowest extent of the dural sac.

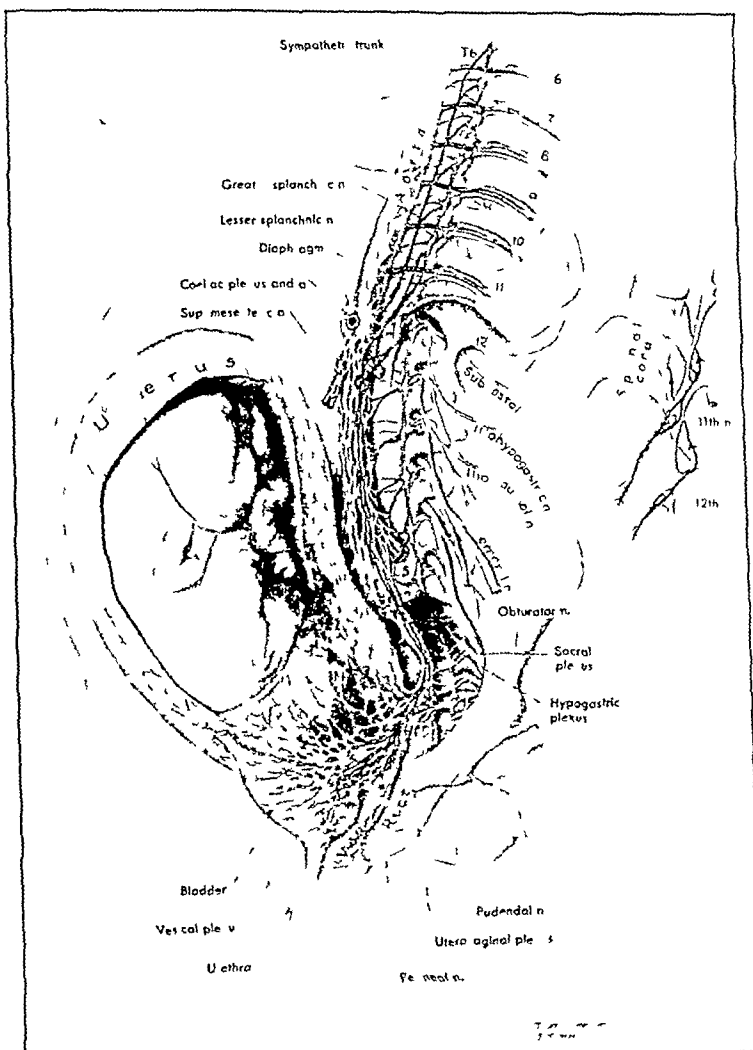


Fig. 1—The innervation of the uterus and birth canal in pregnancy. The efferent nerve fibers of the uterus constitute visceral afferent fibers and are functionally independent of the autonomic nervous system although coursing through the pelvic hypogastric and aortic plexuses before connecting with the dorsal root ganglions of the eleventh and twelfth thoracic nerves in which their nerve cells are located. The inset shows details of the connections. The sensory supply to the cervix and upper part of the vagina travels in the sacral parasympathetic nerves. It is also functionally independent of the autonomic system. The sensory and motor supply of the lower vagina, perineum and pelvic floor travels in the perineal and pudendal somatic nerves. The motor supply of the uterus is autonomic and involves both sympathetic and parasympathetic efferent components. Clinical evidence indicates that the motor fibers to the uterus leave the spinal cord at higher levels than the tenth thoracic nerve whence they pass through the aortic hypogastric and pelvic plexuses. Visceral efferent fibers believed to be motor to the circular muscle of the lower uterine segment and cervix and possibly inhibitory to the remainder of the uterus travel through the parasympathetic pelvic nerves. Clinical study verifies that (1) blocking the sacral nerve roots abolishes the pain of distention of the birth canal, paralyzes the skeletal muscle of the perineum and abolishes tone in the smooth muscle of the cervix, and (2) extending the block to include the eleventh thoracic root abolishes the pain of uterine contractions without impairing their force. It suggests that extending the block to the sixth thoracic nerve or higher may impair the strength of uterine contractions.

This may be ascertained by measuring on the skin with the stilet the approximate extent of the needle. The point of the needle should always be below the level of the second sacral spine.

8 The small section of tubing with special adapter is then slipped over the collar of the needle. The Luer-Lok syringe is securely attached to the adapter. A careful aspiration is performed.

(a) Should clear spinal fluid be obtained, the needle has pierced the dura and lies within the subarachnoid space. In such event the needle should be immediately withdrawn and the case ruled unsuited for caudal analgesia for fear of producing a massive spinal injection of the analgesic drug. Anatomic anomalies with such low lying dura are rare. (In our experience this has happened only twice in more than one thousand injections.) A FAILURE TO RECOGNIZE THIS SITUATION WOULD BE EXTREMELY HAZARDOUS IF NOT FATAL.

(b) The withdrawal of pure blood indicates that the needle has pierced a small blood vessel in the highly vascular peridural space. In this event the point of the needle should be moved until blood can no longer be obtained. Then the injection is continued cautiously.

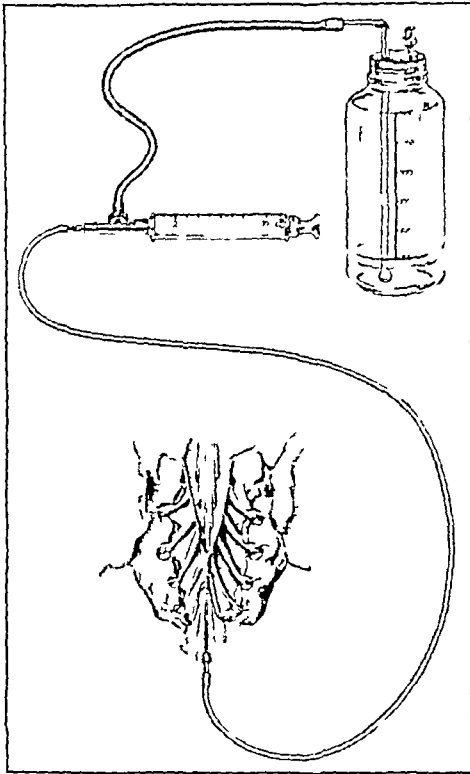


Fig. 2—Apparatus and method of injection into the sacral area

9 The danger of intraspinal injection with appearance of spinal fluid previously mentioned (see 8) can be minimized if a trial dose of 8 cc. of the solution is injected and further action delayed for ten minutes to see that a low spinal anesthetic does not ensue. Without relief of pain or loss of motor power in the lower extremities in ten minutes after injection one can safely assume that the subarachnoid space was not entered.

10 After these precautions have been carried out, the hose end of the special 4 foot rubber tubing is secured over the collar of the special caudal needle. The tubing should previously have been connected to the remainder of the apparatus as illustrated in the diagram, all air having been expelled by filling the entire system with metycaine solution.

11 With the palm of the left hand firmly pressed over the skin area against the dorsum of the sacrum, 30 cc. of 1.5 per cent solution is slowly injected. (Epinephrine should not be used in obstetric cases, since it might produce a relaxation of the uterus.)

#### *Indications That the Solution Is Being Injected into the Peridural Space of the Sacral Canal*

(a) The patients usually experience a sense of fullness progressing to an uncomfortable sensation in one or both legs as the solution circumscribes the perineural components of the sciatic nerves. This sensation can be minimized by slower injection.

(b) There will be a progressive analgesia in the areas supplied by the coccygeal, hemorrhoidal, perineal, pudendal, ilioinguinal and iliohypogastric nerve. Analgesia should be complete in twenty minutes.

(c) There is relief of abdominal uterine cramps within five to fifteen minutes.

(d) Pronounced vasodilatation, cessation of sweating and increase in temperature of skin of feet will ensue within five to fifteen minutes after injection. This phenomenon is often noticed on one side several minutes before it occurs on the other.

#### *Indications That the Solution Is Being Injected Outside the Sacral Canal*

(a) Failure of the injection to relieve pain within thirty minutes.

(b) The appearance of an "injection tumor" superficial to the dorsum of the sacrum.

#### *Supplementary Injections*

12 The supplementary injection will depend on the rate of metabolism of the drug by the individual patient. In our experience 20 cc. of additional solution injected every thirty to forty minutes is sufficient to keep the parturient comfortable for the entire course of labor. We have continued our supplementary injections for a maximum of thirty hours and for an average of seven hours.

We consider this method of analgesia to be a specialized procedure which requires special training in order to attain uniform satisfactory results.

#### STATISTICAL SUMMARY

In the series of 100 cases of delivery handled by continuous caudal analgesia the percentages were as follows in the U. S. Marine Hospital, Stapleton, N. Y.: primiparas 89 per cent, multiparas 11 per cent, cephalic 98 per cent, anterior 84 per cent, posterior 14 per cent, breech 2 per cent. In this series there were only 3 per cent unsatisfactory cases in which supplementary anesthesia was necessary.

Since Jan. 1, 1942 we have either managed or supervised the labor and delivery of 489 additional cases in the clinics of nineteen medical schools and teaching hospitals. In this group there were eleven breech deliveries, one set of twins and one cesarean section. Of this series 11 per cent obtained unsatisfactory analgesia necessitating either discontinuance of the method or the addition of supplementary anesthesia. In many of these cases the technique was being practiced by residents who were learning the procedure.

In the entire series of 589 cases there were 586 live births with no maternal complications or deaths. The average length of time the analgesia was continued was six and one-half hours. The shortest was thirty-five minutes and the longest was thirty-three hours. The average metycaine dosage was 2.6 Gm. The maximum dosage given was 11 Gm.

In cases of toxic hypertension it was noted that after the analgesia had been in effect for about forty-five minutes the pressure reached a plateau which corresponded to their normal before they became toxic. This drop persisted until after delivery and in the cases observed did not return to the toxic peak. All the patients stated that they felt much better.

## CONCLUSIONS

1 This method of analgesia in obstetrics embodies a comfortable and painless labor and delivery that is safe for mother and child

2 The analgesia is accurately developed and controlled, utilizing specially developed apparatus and technic which overcome difficulties inherent in caudal anesthetics previously to their development

3 The method can be started in any stage of labor and continued as long as necessary

4 The vital mechanisms of the child are not obtunded

5 Delivery of the child is expedited and facilitated

6 The postdelivery complications, in our experience, are reduced

7 This method involves a new analgesic technic which should be studied under those who have been trained in the method before it is employed in practice

8 Obviously, the method depends also for its success on a high degree of obstetric competence, avoiding cases in which there are contraindications, avoiding meddlesome or hasty obstetric intervention and observing well established criteria for observation of the progress of the delivery

CONTINUOUS CAUDAL ANESTHESIA  
IN OBSTETRICS

## PRELIMINARY REPORT

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AND

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Continuous caudal anesthesia has a place in obstetrics. There are some dangers and contraindications to this method. Cautious but repeated experiences with the method are desirable to evaluate it. These preliminary observations with some of the advantages and disadvantages are presented in the hope that others interested in this field may become aware of our experience. In this series of 20 patients there were 3 failures, 1 of these presented a typical shock reaction

## TECHNIC

The same technic of administration was employed as originally described by Edwards and Hingson<sup>1</sup> with the precaution of waiting ten minutes after a test injection of 8 cc (90 mg) of a 1.5 per cent solution of metycaine ( $\gamma$ -[2-methylpiperidine]-propanol hydrochloride).<sup>2</sup> This caution was exercised to make certain that the solution did not enter the subarachnoid space. If signs of spinal anesthesia did not develop, the remainder of the initial 30 cc dose (22 cc) was injected and repeated as advised by Edwards and Hingson. One of us (T G G) administered the anesthesia in this entire group.

## RESULTS

In our series of 20 cases (summarized in the table) 14, or 70 per cent, were completely successful, 3 were satisfactory but not ideal, and 3 were classified as failures. Of the 14 cases in which continuous caudal anesthesia was used during labor and delivery, 10 were completely successful and 3 others were termed satisfactory. There was 1 failure. In the 10 completely successful cases absolute relief from all labor pains was achieved. The tired, drawn, tense appearance which

was present prior to the injection disappeared. The patients became relaxed and much at ease. They were definitely pleased with the results.

In the table cases which were called satisfactory only partial relief from labor pains was obtained but the episiotomies and low forceps operations were carried out without pain. In 1 of these there was complete relief on one side with a persistence of painful sensation

Results of Continuous Caudal Anesthesia

	Total	Successful	Satisfactory	Failure
Vaginal deliveries	14	10	3	1
Postpartum abdominal sterilization	2	2	0	0
Hysterotomy 16 weeks	1	1	0	0
Cesarean section	3	1	0	2

on the opposite side, in the other 2 it was assumed that the drug did not reach a high enough level in the epidural space to block all the uterine innervation.

The two abdominal sterilizations done following labors were completed successfully without straining and without pain when the tubes were crushed or the peritoneum manipulated. Likewise the abdominal hysterotomy on an eighteen weeks pregnancy was successful, the abdominal wall incision and the evacuation of the uterus took place with complete freedom from pain or distress.

The anesthesia was started on 3 patients for cesarean section. In 1 of these there was insufficient anesthesia of the abdominal wall for incision. Further attempts to anesthetize were not attempted. In another case, that of a toxemia of the hypertensive type, good skin anesthesia was obtained to the level of the umbilicus but the patient's blood pressure fell from 190 systolic to an indeterminate level before any operative procedure was attempted. She responded in thirty minutes after the administration of ephedrine hypodermically and oxygen inhalations. No further attempt with caudal anesthesia was made on this patient. The third section was performed successfully by means of the continuous caudal method.

## COMMENT

In analyzing the 3 failures, then, we find that in 1 there was good anesthesia but the failure resulted because the patient went into vascular collapse following the injection. In the other cases the exact cause of the failure is difficult to determine, possibly a technical difficulty or possibly an anatomic variation.

It has been observed that if the solution is injected with the patient on her side (instead of in the knee chest position) the most dependent side is the first to become anesthetized and that the level of anesthesia extends higher on the dependent side. In some cases it seemed possible to get a higher level of anesthesia by injecting with the patient in the Trendelenburg position. There seems to be a direct proportion between the amount of drug given in a single injection and the level of anesthesia on the abdominal wall and also between the force of injection and the level of anesthesia.

The longest continuous period over which the drug was administered was eight hours, the procedure usually being started when the cervical dilatation was 5 cm or more. Practically all patients showed a drop in blood pressure from 10 to 30 points or more, the greater falls occurring in patients with some hypertension, 2 had a secondary rise in pressure to above the previous maximum when the anesthesia wore off.

A few minor side reactions besides blood pressure changes were encountered. Two patients complained of severe pains in the back and legs after the drug

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<sup>1</sup> Edwards W B and Hingson R A Continuous Caudal Anesthesia in Obstetrics. *Am J Surg* 58:459 (Sept.) 1942.

<sup>2</sup> Eli Lilly and Company furnished the metycaine used in this study.

wore off, 1 requiring morphine for relief. Neither had any sequela during the remainder of the puerperium. One patient with whom the anesthesia was successful complained of severe throbbing headache during the injection. This lasted for about three minutes and recurred with each subsequent injection, lasting the same length of time. Another patient complained of severe burning pain in the lower extremities beginning a few seconds after each injection and lasting about one minute. This was obviated by giving subsequent injections while anesthesia was still complete.

The method should be safe provided the anesthetic agent is injected extradurally. The epidural space is composed of loose, vascular, areolar tissue and in some places the space is much narrower than in others. It continues all the way to the foramen magnum, theoretically it would be possible to block the phrenic nerve, which receives its innervation from the second to the fifth cervical. However, this possibility is remote because of the pronounced discrepancy between motor and sensory loss. Motor loss is in most cases only partial even in the lower extremities. Therefore the danger of respiratory paralysis would seem to be less likely than in spinal anesthesia.

#### ADVANTAGES AND INDICATIONS

The continuous caudal method of anesthesia possesses advantages:

1 It is a useful form of nerve block anesthesia when a general anesthetic is contraindicated, as in pulmonary tuberculosis or upper respiratory infections.

2 The uterus appears not to relax and appears to maintain its normal motility and mechanism in contrast to its behavior under deep inhalation anesthesia.

3 Narcotics and sedatives are eliminated during the course of labor and delivery.

4 The procedure is a relatively simple one and seems safe for those skilled in this procedure.

5 At laparotomy (cesarean section) the peritoneum is not sensitive as it is when done under local anesthesia.

6 Patients in labor are calm, quiet, relaxed and rational.

7 It makes use of the principle of giving repeated amounts of a drug over a long period of time.

#### DISADVANTAGES AND CONTRAINDICATIONS

Some of the conditions which present themselves and which might be presumed to be disadvantageous and dangerous are:

1 The greatest danger would seem to be that of injecting this amount of drug into the subarachnoid space. The two safeguards are aspiration before injection and the injection of 8 cc (90 mg) for test of spinal anesthesia.

2 There is a loss of the subjective pain element as an aid to following the progress of labor.

3 When compared to the administration of a hypodermic or to oral routes of administration for analgesia during labor it can be seen that it is not a time saving procedure since a skilled person must insert the needle and inject the medication at intervals of thirty minutes or longer. This requires the attention of a physician.

4 It either prolongs the second stage or increases the incidence of operative delivery, since the patient has absolutely no urge to bear down.

5 While this type of anesthesia has the advantage of providing a contracting uterus for normal labor and third stage it is not the procedure of choice when a difficult forceps rotation or version is necessary, since here almost complete uterine relaxation is imperative.

6 Since 1 toxemic patient had a vasomotor or shock reaction, other toxemic or severe hypertensive patients have not been tested with this method.

7 It is assumed that the successful administration will increase from 70 per cent in the series of 20 patients to a distinctly more favorable rate as experience and judgment increase. It seems that an occasional failure is unavoidable because of the peculiar configuration of the sacrum.

8 The method does not give abdominal wall relaxation as compared to deep inhalation anesthetics.

9 That spinal anesthesia is contraindicated in cardiac patients with myocardial damage is a general belief, and the same may apply for continued caudal anesthesia.

10 At this time the procedure seems to be one exclusively for hospital usage because of the danger of complications.

It is our belief that in carefully supervised and selected cases continuous caudal anesthesia is a valuable addition to the field of obstetric analgesia and anesthesia and our work with it is continuing.

### MODERN TREATMENT OF PNEUMOCOCCIC PNEUMONIA

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Within the past five years numerous clinical reports have established that sulfonamide therapy, properly conducted, is an effective form of treatment for pneumococcal pneumonia. It is appropriate at this time, therefore, to evaluate the comparative merits of the sulfonamide compounds which have been used in the treatment of pneumococcal pneumonia as well as to consider some of the more important problems concerned with their rational use. This report is based on experience with 1,635 cases of pneumococcal pneumonia of adults treated with sulfapyridine, sulfathiazole or sulfadiazine in the medical wards<sup>1</sup> of the Philadelphia General Hospital between Aug. 15, 1938 and April 1, 1942.

For this study we have included all patients with a diagnosis of pneumococcal pneumonia who received sulfapyridine, sulfathiazole or sulfadiazine regardless of the amount of drug administered. In general the three therapeutic groups were comparable as to distribution of sex, race, age, pneumococcus type, antecedent disease and the day of illness on which chemotherapy was started. However, the three drugs were used for the most part during different pneumonia seasons or in different months of the same season (chart 1) and one cannot say definitely whether the disease itself was of the same severity throughout the period of this study. If the severity of the disease is based on the relative incidence of bacteremic cases it would appear (chart 1)

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Dr. William G. Turnbull, Superintendent and Miss Loretta Johnson, Directress of Nurses, showed constant interest and gave helpful suggestions in the conduct of this study.

From the Committee for the Study of Pneumonia, the Philadelphia General Hospital. Other members of this committee include Drs. J. H. Clark, J. G. Reinhold and S. B. Rose.

<sup>1</sup> Clinical facilities were given us for this study by the chiefs of the medical services.

that pneumococcal pneumonia was more severe during the last two years, also there was a definite decrease in the total number of cases within this same period (chart 1). It is possible that the relative increase in bacteremic cases and the appreciable decline in the number of pneumonia admissions were the result of an increasing trend toward home care of patients, and, for the most part, only the more severe cases were hospitalized. However, of equal importance were certain refinements in laboratory methods, particularly the employment of an antisulfonamide, para-aminobenzoic acid,<sup>2</sup> in culture mediums.

The use of para-aminobenzoic acid in blood cultures was commenced in January 1941, and it was about this time that the incidence of bacteremic cases began to rise. It is likely that a number of blood stream infections were not detected in our earlier studies, as in some of our cases samples of blood for culture were not obtained until after one, or sometimes two, doses of the drug had been given, and in addition a number of patients had received some form of sulfonamide therapy before admission to the hospital. Therefore the severity of these pneumonia cases cannot be judged on the basis of bacteremia alone, although we are of the opinion that there was a relative increase in the incidence of severe pneumonias observed in this hospital during the last two years of this study. As shown in table 1, the gross mortality for this entire series of cases was 10.6 per cent. When this fatality rate is compared to that of 40.1 per cent obtained in 1,904 cases observed in this hospital during the five years prior to the introduction of these chemotherapeutic agents, the effectiveness of this form of therapy is obvious.

#### COMPARATIVE THERAPEUTIC EFFECTIVENESS

The effectiveness of a chemotherapeutic agent for the treatment of pneumococcal pneumonia may be evaluated from the study of (1) the effect of the agent on mortality, on incidence of complications, and on the course of the disease, (2) the toxic effects on the patient and (3) the pharmacologic behavior of the drug in man.

#### MORTALITY RATES, INCIDENCE OF COMPLICATIONS AND INFLUENCE OF TREATMENT ON THE COURSE OF THE DISEASE

Sulfapyridine, sulfathiazole and sulfadiazine were comparable in effectiveness as judged by the mortality rates (table 1) of 9.7, 12.1 and 10.3 per cent for the three therapeutic groups. Positive blood cultures for pneumococci were obtained in 10.9, 15.0 and 22.2 per cent of patients receiving sulfapyridine, sulfathiazole and sulfadiazine with mortality rates of 32.5, 43.3 and 25.5 per cent respectively. However, as mentioned before, one cannot be certain as to the significance of bacteremia as an index of the relative severity of the cases in each therapeutic group. The incidence of complications was low and comparable in the three drug treated groups (table 2). The most striking clinical observation with the three drugs was the frequency with which the initiation of drug therapy was followed within twenty-four to forty-eight hours by a critical drop in temperature. The action of sulfapyridine<sup>3</sup>

and sulfadiazine<sup>4</sup> in lowering the temperature was more rapid than that of sulfathiazole although the average duration of treatment and the average stay in the hospital was practically the same for all three drug treated groups.

#### TOXIC EFFECTS

In our experience (table 3) with these drugs in pneumococcal pneumonia the incidence and severity of toxic reactions following sulfadiazine therapy were less than those observed in patients receiving sulfapyridine or sulfathiazole. This difference in toxicity was principally the relatively lower incidence of untoward gastrointestinal and renal manifestations associated with sulfadiazine treatment.

#### PHARMACOLOGIC BEHAVIOR IN MAN

In previous papers<sup>5</sup> we have presented data on the absorption, acetylation and excretion of sulfapyridine, sulfathiazole and sulfadiazine in pneumococcal pneumonia patients. Sulfadiazine given orally yields higher concentrations of the free drug in the blood and smaller proportions of acetylated drug in the blood and urine

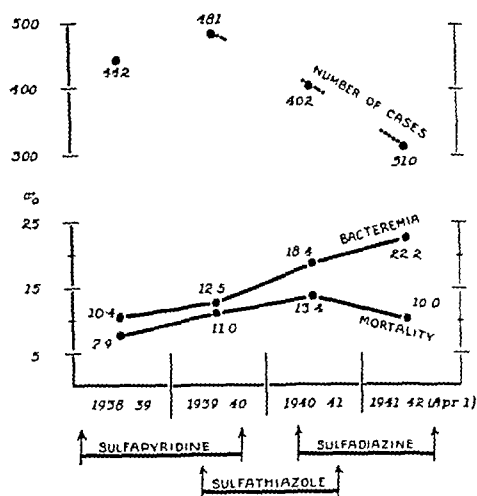


Chart 1.—Number of cases treated, incidence of bacteremia and mortality percentage in each year of this study. The three drugs were employed for the most part over the designated periods.

than do sulfapyridine or sulfathiazole. Furthermore, acetylsulfadiazine is more soluble in urine than is acetylsulfapyridine or acetylsulfathiazole. These differences in the relative degree of acetylation and solubility of the acetyl derivatives appear to have an influence on the incidence and severity of urinary tract complications following the use of these drugs (table 3). When these compounds are administered intravenously, higher concentrations of the drug are maintained for longer periods with sodium sulfadiazine than with sodium sulfapyridine or sodium sulfathiazole. This is of decided value in the control of infection in certain types of cases.<sup>6</sup>

On the basis of the foregoing data it would appear that the drug of choice for the treatment of pneumococcal pneumonia at the present time is sulfadiazine.

2 Woods D D. The Relation of *p*-Aminobenzoic Acid to the Mechanism of the Action of Sulfanilamide. *Brit J Exper Path* 21: 74 (April) 1940. Selbie F R. The Inhibition of the Action of Sulfanilamide in Mice by *p*-Aminobenzoic Acid. *ibid* 21: 90 (April) 1940. Strauss Elias Lowell F C and Finland Maxwell. Observations on the Inhibition of Sulfonamide Action by Para-Aminobenzoic Acid. *J Clin Investigation* 20: 189 (March) 1941.

3 Flippin H F Reinhold J G and Schwartz Leon. Sulfapyridine and Sulfathiazole Therapy in Pneumococcal Pneumonia. *J A M A* 116: 683 (Feb 22) 1941.

4 Flippin H F Rose S B Schwartz Leon and Domm A H. Sulfadiazine and Sulfathiazole in the Treatment of Pneumococcal Pneumonia. *Am J M Sc* 201: 589 (April) 1941.

5 Flippin H F Lockwood J S Pepper D S and Schwartz Leon. The Treatment of Pneumococcal Pneumonia with Sulfapyridine. *J A M A* 112: 529 (Feb 1) 1939. Flippin Reinhold and Schwartz Leon. Rose Schwartz and Domm A. Flippin Rose Schwartz and Domm A.

6 Domm A H Flippin H F Reinhold J G and Schwartz Leon. Intravenous Use of Sodium Sulfadiazine in the Treatment of Pneumococcal Pneumonia. *Arch Int Med* 69: 51 (Jan) 1942.

ROUTINE MANAGEMENT OF PNEUMOCOCCIC  
PNEUMONIA

**Early Treatment**—With the exception of the age of the patient (chart 2) and certain others factors<sup>7</sup> beyond the physician's control, the length of time that elapses between the onset of the infection and the beginning of specific treatment is the most important single controllable factor in the prognosis of pneumococcic pneumonia. As indicated in chart 3, there was a definite increase both in the mortality rate and in the incidence of complications in those cases in which chemotherapy was started after the first forty-eight hours of the illness. Hence the best results with these drugs are obtained when they are administered early in the infection, while the number of bacteria is still limited and the extent of tissue involvement is at a minimum. Certainly, sulfadiazine treatment should not be withheld just because

response of patients receiving sulfadiazine are still in the experimental stage and are as yet of doubtful clinical significance.<sup>9</sup> Thus it is difficult to outline a course of sulfadiazine therapy which will theoretically be effective, but it seems reasonable, for practical purposes, to administer the drug in a manner which experience indicates will probably be adequate for the treatment of pneumococcic pneumonia of adults.

In general, the oral route has proved to be the most practical method of administering sulfadiazine, although in certain instances its parenteral use is indicated. As a rule, sulfadiazine is readily absorbed from the intestinal tract into the blood stream, reaching levels of 4 to 6 mg. of free drug per hundred cubic centimeters within four to six hours after the oral administration of a single (3 to 4 Gm.) dose. After the fourth to the sixth hour the amount of drug in the blood begins to

TABLE 1—Distribution of Types, Bacteremia and Mortality Rates

Type	Sulfapyridine Treated				Sulfathiazole Treated				Sulfadiazine Treated				Totals					
	All Cases		Bacteremic Cases (10.9%)		All Cases		Bacteremic Cases (15.0%)		All Cases		Bacteremic Cases (2.1%)		All Cases			Bacteremic Cases (15.2%)		
	No	Deaths	No	Deaths	No	Deaths	No	Deaths	No	Deaths	No	Deaths	No	Deaths	% of Deaths	No	Deaths	% of Deaths
	No	Deaths	No	Deaths	No	Deaths	No	Deaths	No	Deaths	No	Deaths	No	Deaths	% of Deaths	No	Deaths	% of Deaths
1	174	8	21	1	81	4	18		101	7	2	4	22	19	5.3	81	8	9.7
2	52	5	7	1	14	1		1	19	0		0	23	1	7.0	13	2	13.3
3	124	24	11	9	76	17	11	8	25	11	11	1	23	21	19.7	21	21	63.3
4	44	5	6	5	22	0	9		21	4	7	1	110	1	11.6	14	14	63.1
5	70	2	6	1	24	0		0	0	1	9	1	14	2	2.4	21	2	9.5
6	21	1	0	0	14	4	1	0	11	1	1	1	40	0	19.5	2	1	50.0
7	48	4	8	4	41	2		1	44	4	8	2	1	10	7.5	18	7	38.8
8	50	2	4	0		3		0	41	4	9	2	14	0	7.2	13	3	20.0
9	6	1	0	0	8	3		2	0	1	2	1	5	21.7	4	3	75.0	
10	8	1	0	0	7	0	1	0		0	0	0	17	1	5.9	1	0	0.0
11	2	0	0	0	4	1	1	0	10	1	1	1	16	2	12.5	1	1	50.0
12	14	2	1	1	4	0	1	0	8	0		0	2	7.7	4	1	25.0	
13	1	0	0	0	9	0	0	0	4	0	0	0	14	0	0.0	0	0	0.0
14	27	3	1	1	20	1	0	0	11	2	4	2	69	6	10.0			60.0
15	9	3	0	0	4	0	0	0	2	0	0	0	1		0.0	0	0	0.0
16	8	2	2	2	7	0	0	0		0	1	0	20	2	10.0			3.3
17	5	1	0	0	8	3	1	0		0	0	0	13	4	6.7	1	0	0.0
18	5	0	0	0	14	1		2	12	3		2	1	6	19.3	6	4	66.7
19	16	2	0	0	10	1		1	9	1	2	1		4	11.4	4	2	50.0
20	12	1	0	0		0	0	0	6	1	1	0	21	2	9.5	1	0	0.0
21	1	0	0	0	0	0	0	0	2	0	0	0		0	0.0	0	0	0.0
22	4	0	1	0	5	0	0	0		0	0	0	1	0	0.0	1	0	0.0
23	8	1	1	1	2	1	1	1	2	0	0	0	1	2	16.7	2	2	100.0
24	4	0	0	0	4	1	1	1		0	0	0	10	1	10.0	1	1	100.0
25	5	1	1	0	11	3	2	2	6	1	2	1		2	27.7	3	3	60.0
26	7	1	0	0	5	0	0	0	2	0	0	0	14	1	7.1	0	0	0.0
27	4	2	0	0	2	0	0	0	2	0	0	0	8		25.0	0	0	0.0
28	3	0	0	0	1	0	0	0	4	1	0	0		1	12.5	0	0	0.0
29	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0.0	0	0	0.0
30	0	0	0	0	1	0	0	0		1	1	1	1	1	16.7	1	1	100.0
31	0	0	0	0	0	0	0	0		0	1	0		0	0.0	1	0	0.0
32	0	0	0	0	0	0	0	0		0	1	0		0	0.0	1	0	0.0
33	0	0	0	0	0	0	0	0		0	1	0		0	0.0	1	0	0.0
Totals	733	72	80	96	447	51	67	29	450	47	10	1	161	17	10.6%	249	81	
Mortality		9.7%		3.6%		1.1%		4.3%		10.4%		2.2%		10.6%				
Gross mortality		9.7%		3.6%		1.1%		4.3%		10.4%		2.2%		10.6%				

the case is considered mild. Likewise the use of drug should not be delayed in a suspected case of pneumonia until signs of consolidation have appeared. Obviously, this does not mean that every person suffering with a mild infection of the upper respiratory tract is to be regarded as a pneumonia suspect.

**Adequate Chemotherapy**—Theoretically, in order to obtain maximum therapeutic results with sulfadiazine in pneumococcic pneumonia it is necessary to administer the drug in such a manner as to obtain an effective concentration of free drug in the blood as soon as possible and to maintain an adequate level until the patient has developed sufficient immunity against the infection to prevent a relapse. However we have been unable to establish an optimal blood concentration for sulfadiazine in the treatment of pneumococcic pneumonia,<sup>8</sup> and, furthermore, methods for determining the immunity

diminish and if the blood concentration of the drug is to be maintained or increased it is necessary to administer additional drug in smaller amounts every four to six hours until the total dosage has been given. Since varying blood levels of the drug result in diminished therapeutic effectiveness, it is important to adhere to this schedule of dosage. As already mentioned we have been unable to determine any definite correlation between the effectiveness of sulfadiazine and the concentration of free drug in the blood although it appears that if a free blood level of 5 to 10 mg. per hundred cubic centimeters is maintained, satisfactory results may be expected. In this connection it should be remembered that such factors as drug absorption and kidney function tend to influence the amount of drug found in the blood, since the drug concentration reached in the blood is dependent both on the rate of entry into and the rate of exit from, the blood stream. On the basis of these considerations and after employing several schemes of

7 Flippin H. F. Schwartz Leon and Clark J. H. Factors Influencing the Fatality Rate of Pneumococcic Pneumonia Treated with Sulfonamide Compounds. *Ann. Int. Med.* 14: 1969 (May) 1941.  
8 Flippin, H. F. Rose S. B. Schwartz Leon and Domm A. H. Treatment of Pneumococcic Pneumonia with Sulfadiazine and Sodium Sulfadiazine. *War Med.* 2: 284 (March) 1942.

9 The Relation of Specific Immunity to Recovery from Pneumococcic Pneumonia Treated with the Sulfonamides. Editorial Comment. *Ann. Int. Med.* 16: 577 (March) 1942.



dosage, we have adopted the following dose schedule for the treatment of pneumococcal pneumonia of adults with sulfadiazine

An initial 3 Gm dose of sulfadiazine is given orally and followed by 1 Gm every six hours thereafter, until the temperature has remained normal for forty-eight

TABLE 2—Complications

Treatment	Sulfa pyridine 733 Cases	Sulfa thiazole 447 Cases	Sulfa diazine 455 Cases	Total 1 635 Cases	
Complication	Inci- dence per Cent	Inci- dence per Cent	Inci- dence per Cent	Inci- dence per Cent	Mor- tality per Cent
Massive pleural effusion	2.2	2.7	2.4	2.3	2.6
Empyema	1.9	1.8	2.2	2.0	28.1
Endocarditis	0.5	0.7	1.8	0.7	100.0
Lung abscess	0.3	0.7	0.7	0.5	75.0
Metastatic abscess		0.4	0.2	0.2	66.6
Meningitis	0.1	0.2	0.2	0.2	100.0
Otitis media	0.1	0.4		0.2	
Phlebitis	0.1		0.2	0.1	
Pericarditis		0.2	0.2	0.1	100.0

hours and the patient shows clinical evidence of improvement. It is possible in most cases to adhere to this six hour dose schedule, but occasionally when a higher blood level of drug is desired, the 1 Gm dose is given at four hour intervals until the desired drug concentration in the blood is obtained. In order to give sulfadiazine parenterally it is necessary to employ its sodium salt. Best results with sodium sulfadiazine parenterally are obtained with its intravenous use. For intravenous therapy a 5 per cent solution of sodium sulfadiazine in sterile distilled water is employed. Obviously, when the drug is administered by vein, higher blood levels of free sulfadiazine (10 to 18 mg per hundred cubic centimeters) are obtained more rapidly (within fifteen minutes) than when equal amounts (3 to 4 Gm) are given by mouth. As a rule, this form of therapy is resorted to for those patients in whom a more rapid elevation of the blood level of drug is desired or when

TABLE 3—Toxic Reactions

Treatment	Sulfapyridine 733 Cases	Sulfathiazole 447 Cases	Sulfadiazine 455 Cases
Toxic Reaction	Incidence per Cent	Incidence per Cent	Incidence per Cent
Vomiting	52.2	19.7	3.1
Hematuria	10.1	9.6	4.4
Microscopic	1.2	0.9	0.2
Gross	0.5	0.4	
Loin pain	0.4	0.4	
Renal calculi	0.1		
Anuria	1.9	3.8	1.1
Dermatitis		0.9	
Conjunctivitis			0.2
Epicleritis	0.1		
Acute hemolytic anemia	3.0	2.5	2.0
Leukopenia	0.8	0.7	
Neutropenia	5.0	5.4	2.2
Fever?	4.8	3.1	5.5
Psychosis?			

oral medication is impracticable. Patients who are unable to take sulfadiazine by mouth are given an initial 3 to 4 Gm dose of sodium sulfadiazine intravenously, followed by 2 Gm every twelve hours thereafter until the total dose has been given. Frequently it is well to give seriously ill patients a large initial dose of drug (3 to 4 Gm) by vein and at the same time start giving 1 Gm doses every four to six hours by mouth. In general, the total dosage of sulfadiazine is 20 to 30 Gm depending on such factors as the day of disease when

treatment was started, the presence of bacteremia, spread of the infection, complicating diseases, kidney function and drug toxicity. It is to be remembered that once drug treatment has been started, it is to be continued, unless signs of severe toxicity develop until convalescence is established. Not infrequently a fall in temperature proves deceptive and a spread or recurrence in the infection occurs if chemotherapy is stopped too early. Although it is not generally necessary, a safe procedure to follow, when in doubt, is to reduce the dose of drug gradually over a period of days and watch the patient carefully for evidence of recurrent infection.

**Fluid Balance**—Sulfadiazine, regardless of its route of administration, is excreted mostly in the urine, and its elimination is reduced in the presence of kidney damage. Therefore, with a decrease in kidney function, an increase in drug concentration in the blood occurs and, should the volume of urine become low, the possibility of stone formation in the urinary tract by pre-

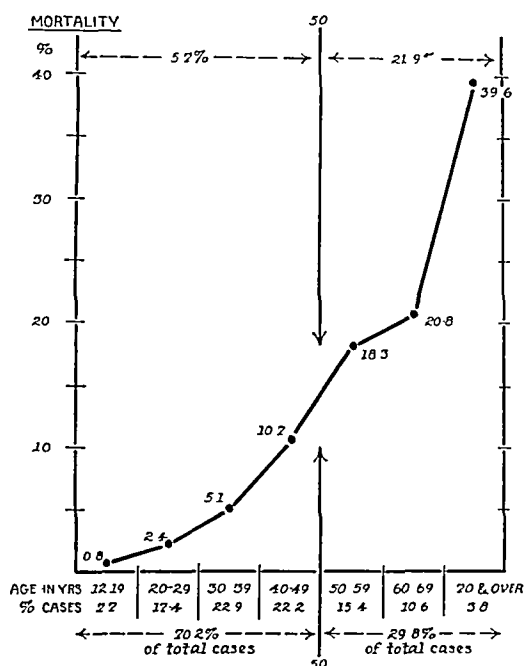


Chart 2—Influence of age on mortality in 1 635 cases

cipitation of crystals of acetylsulfadiazine is greatly increased. However, the excretion of sulfadiazine, both the free and acetylated forms, is definitely increased by an increased rate of flow of urine. Hence it is of importance, in order to facilitate the excretion of the drug by the kidneys, to maintain a urinary output of at least 1,200 cc in each twenty-four hour period. This is best obtained by forcing fluids, either by mouth or, if necessary, parenterally.

**Use of Alkalis**—The renal complications following sulfadiazine therapy are due in part, if not entirely, to the presence in the urinary tract of crystals composed of the drug, especially the acetyl portion. Since crystalluria from sulfadiazine appears to be less frequent in an alkaline urine,<sup>10</sup> it is advisable to administer alkalis to patients receiving the drug. It has been our practice to give equal amounts of sodium bicarbonate or sodium citrate to all sulfadiazine-treated pneumonia patients.

10 Schwartz, Leon, Flippin, H. F., Reinhold, J. G., and Domm, A. H. The Effect of Alkali on Crystalluria from Sulfathiazole and Sulfadiazine. *J. A. M. A.* 117: 514 (Aug. 16) 1941.

who showed evidence of renal impairment, and it seems practical to administer an alkali routinely to all patients receiving sulfadiazine therapy

**Supportive Measures**—Regardless of the therapeutic value of sulfadiazine in pneumococcic pneumonia, it is not to be used to the exclusion or neglect of established supportive measures. The pneumonia patient requires competent nursing care, complete mental and physical rest, sufficient fresh air easily digested food and adequate bowel elimination. The intelligent use of morphine still constitutes one of our principal aids in the control of certain disturbing features of this disease, such as apprehension, restlessness and pain. Fortunately the severity of abdominal distention is less pronounced in pneumonia patients receiving chemotherapy than was formerly observed, although occasional patients will require enemas, rectal tubes, local heat to the abdomen and the use of drugs like solution of posterior pituitary. In general it is best to avoid the employment of cathartics. Digitalis should be administered when indicated, but not as a routine procedure. We know of no medication or food which cannot be given to pneumonia patients treated with sulfadiazine

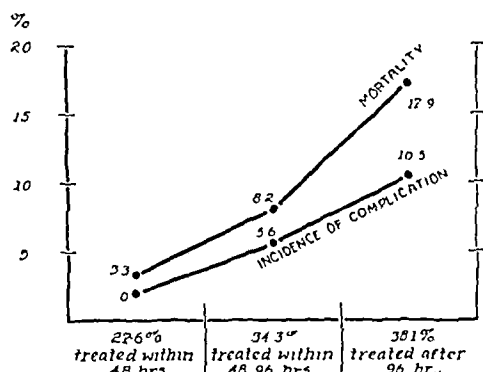


Chart 3—Mortality and incidence of complications in relation to the length of time that elapsed between the onset of the disease and the beginning of treatment in 1,635 cases

**Control of Drug Toxicity**—Although the incidence and severity of toxic reactions following the use of sulfadiazine in pneumococcic pneumonia are not as severe as those encountered with sulfapyridine or sulfathiazole therapy, it must be remembered that the drug is not entirely harmless to the host.

The vomiting that sometimes follows treatment with sulfadiazine is rarely so severe as to necessitate stopping the drug, but if it becomes so it is advisable to check the fluid and salt balance. Cutaneous and episcleral reactions may occur at any time after the drug is administered but usually after the third day of treatment. Usually it is best to stop the drug, although in certain instances, when necessary, it can be continued with caution. Acute hemolytic anemia has not been observed by us but others<sup>11</sup> have reported the development of this condition. In such cases the drug should be discontinued and blood transfusions employed. Toxic reactions involving the white blood cells are essentially negligible in the treatment of uncomplicated cases of pneumonia.<sup>12</sup> Occasionally a patient will develop leuko-

pemia, but unless the drug is given for ten days or longer this condition should not cause undue apprehension. Obviously a progressive lowering of the white blood count with a decrease in polymorphonuclear cells below 40 per cent is to be respected, although the severity of the illness not infrequently prevents the stopping of the drug unless type specific serum is available.

Fever due to sulfadiazine may occur at any time but usually after the fourth day. At times it is difficult to determine whether the temperature rise represents a drug reaction or a recrudescence of the infection. The fever of the original infection is usually normal by the third day of treatment, except when complications develop, if the patient is clinically improved, a secondary rise in temperature may usually be attributed to the drug. In such cases, if chemotherapy is stopped and fluids are forced, the temperature will drop within twenty-four to thirty-six hours. Whenever possible, it is best to discontinue chemotherapy in the presence of drug fever, as not infrequently this condition is followed by more serious toxic reactions. Psychoses due to sulfadiazine are difficult to evaluate in seriously ill pneumonia patients, but they do occur and, unless the infection is under control, there is no necessity to withdraw the drug.

Toxic reactions involving the urinary tract may occur with sulfadiazine at any time but are most commonly seen after the fifth day of treatment. As mentioned before, the renal complications from sulfadiazine are due in part, if not entirely, to the presence in the urinary tract of crystals composed of the drug. However the presence of crystalluria alone does not indicate renal involvement unless it is associated with progressing oliguria, hematuria, azotemia or loin pain. In this study, approximately one fourth of the sulfadiazine treated patients showed crystals presumably of the drug, in the urine. Microscopic hematuria was observed in 4.4 per cent of these patients, which is only slightly above the reported incidence of hematuria in cases of untreated pneumonia.<sup>13</sup> Unless a considerable number of red blood cells are detected or other evidence of renal damage is apparent cautious treatment may be continued, but it should be remembered that hematuria is often a precursor of severe renal insufficiency. Obviously the appearance of gross hematuria is an indication for stopping the drug. Although no anuria, renal calculi or loin pain was seen in this group of pneumonia cases treated with sulfadiazine, we have encountered these complications. In practically every instance in which a severe renal reaction to sulfadiazine has been observed, alkalis or adequate quantities of fluids had not been given and sulfadiazine had been administered over a period of four or more days. It is our impression that the relatively low incidence of renal complications in this series of sulfadiazine treated cases may be related to the emphasis that was constantly placed on adequate fluid intake during drug therapy and the administration of alkalis. Should any of the kidney complications mentioned be encountered during sulfadiazine therapy, the treatment consists in prompt cessation of the drug, alkalinization of the urine, forcing of fluids, administration of hypertonic dextrose solution to promote diuresis and ureteral catheterization, if necessary. The administration of mercurial compounds as diuretics or the use of magnesium sulfate as a cathartic is contraindicated in such cases.

<sup>11</sup> Dowling, H. F., Hartman, C. R., Sugar, S. J. and Feldman, H. T. The Treatment of Pneumococcic Pneumonia with Sulfadiazine. *J. A. M. A.* 117: 824 (Sept. 6) 1941.

<sup>12</sup> Dr. Walter J. Crocker, chief of the Division of Clinical Pathology of the Laboratories of the Philadelphia General Hospital cooperated with the authors in this study.

<sup>13</sup> Reimann, H. A. The Pneumonias. Philadelphia: W. B. Saunders Company, 1938, p. 70.

## CONTRAINDICATIONS TO SULFADIAZINE THERAPY

Theoretically, the only possible contraindication to the use of sulfadiazine in pneumococcal pneumonia is a history of a previous sensitivity to one of the sulfonamide compounds. However, in our experience there have been a number of patients who have developed toxic reactions to one of these drugs and not to another member of this group of compounds, although this would not necessarily indicate that the patient would not have had a toxic reaction if the original drug was used again. If a history of previous drug toxicity was obtained and the patient required immediate specific treatment it has been our practice to use chemotherapy at once and follow the patient very closely for possible drug toxicity, rather than delay specific treatment until the administration of serum was made possible. In such cases we selected the drug least likely to cause the same type of toxic reaction (table 3). It is too early to say whether the widespread use of the sulfonamides will result in an increasing number of patients developing sensitivity to these drugs, but in view of the frequency with which pneumococcal pneumonia recurs, this problem merits further consideration. In a series of 24 adults having recurrent pneumococcal pneumonia treated with sulfapyridine, sulfathiazole or sulfadiazine on two or more occasions there was no evidence to suggest that the repeated use of these compounds had influenced the incidence or severity of drug toxicity.<sup>14</sup> The presence of jaundice, acute nephritis, anemia, leukopenia or neutropenia per se in a pneumonia patient does not contraindicate drug therapy, as these conditions will usually disappear as the infection is brought under control by adequate sulfadiazine treatment. Obviously, if such conditions are present, necessary measures should be taken to detect their further development.

## MANAGEMENT OF COMPLICATIONS

The presence of pus in a lesion prevents the sulfonamides from acting on bacteria with the same maximum effect which they exhibit in diffuse, nonsuppurating infections. Sulfadiazine, therefore, is not to be employed as a substitute for surgical procedures in complications from pneumonia, such as empyema or abscesses, although the drug may be used in the hope of preventing a spread of the infection. Usually, in cases of massive pleural effusion, chemotherapy and thoracentesis will prove sufficient, but, if the effusion is thick and purulent surgical intervention is indicated. Not only is the early diagnosis of pus-containing lesions in cases of pneumonia of great importance as an aid in treatment but also the incidence of severe drug reactions is greater in patients receiving chemotherapy over long periods of time.

## TYPE SPECIFIC SERUM

For the most part the role of type specific serum in the treatment of pneumococcal pneumonia remains a controversial subject. Certainly there is no clinical basis for its routine use,<sup>15</sup> although there are certain pneumonia cases which are benefited by the administration of serum in combination with chemotherapy. For the most part we have limited the use of serum alone to cases in which severe drug reactions prevented the further use of chemotherapy, and of serum plus drug

in cases that failed to respond satisfactorily to the drug within twenty-four to forty-eight hours. On this basis type specific serum was employed in 124 (76 per cent) of our cases (table 4) with a mortality of 37.9 per cent. Whether the successfully treated patients in this subgroup would not have recovered without the additional use of serum, we cannot say. There were however a number of seriously ill patients who showed a prompt clinical response after serotherapy. Not infrequently serum was employed in cases with serious antecedent and/or complicating diseases with little or no expectation of its being effective. Unfortunately concentrated efforts were not made to determine which of the cases in the combined therapy group represented drug fast infections or failures in immunity response. Obviously these two factors constitute the basis for the rational use of serum in those cases failing to respond to chemotherapy. No doubt, with the development of more accurate methods to evaluate these factors, the employment of type specific serum will play a more definite role. At the present time it seems reasonable to use serum for patients unable to tolerate the drug and patients failing to respond to chemotherapy. When administering serum, the usual preliminary sensitivity tests, conjunctival and intradermal, must always be

TABLE 4—Combined Therapy Cases

Type	All Cases		Bacteremic Case (49 per Cent)	
	Number	Deaths	Number	Deaths
1	29	7	18	4
2	8	2	1	1
3	20	14	6	3
4	12	7	11	7
7	18	0	7	4
8	9	3	1	
Others	21	9	10	7
Total	174	47	57	28
Mortality per cent		37.9		49.1

performed. If these prove negative after twenty minutes, further intravenous testing with undiluted serum (1 cc) is carried out. If after seventy minutes no untoward reaction has occurred the patient is given an initial dose of 100,000 units of undiluted serum intravenously, followed by further injections when necessary. In general, if serum is beneficial the patient will respond to 300,000 units or less.

## LABORATORY PROCEDURES

The employment of certain laboratory procedures is of great importance in the diagnosis and treatment of pneumococcal pneumonia. In every case there should be adequate bacteriologic studies to determine the type of pneumococcus responsible for the infection. It is true that in most cases of pneumonia this information is of no therapeutic value, but in instances in which type specific serum is indicated, a knowledge of the pneumococcus type is indispensable. Blood cultures should be obtained as soon as possible. As already mentioned, if an antisulfonamide substance, para-aminobenzoic acid (5 mg per hundred cubic centimeters of medium) is added to the culture material the inhibitory action of the sulfonamide will be neutralized. This procedure should be adhered to whenever the patient has received even small doses of any sulfonamide. The sputum should be studied to determine the pneumococcus type, but in cases in which there has been some delay in

14 Schwartz Leon, Flippin H F and Clark J H. Recurrent Pneumococcal Pneumonia Treated with Sulfonamides. J Lab & Clin Med to be published.

15 Plummer Norman, Liebmann James, Solomon Saul, Kammerer W H, Kallstein Mennasch and Ensworth H K. Chemotherapy Versus Combined Chemotherapy and Serum. J A M A 116: 2366 (May 24) 1941.

typing, and the blood culture is positive, this examination is not necessary

A blood count, including hemoglobin determination, leukocyte count and a differential enumeration of the white blood cells should be done, preferably before the institution of drug therapy. It is best to check these blood constituents every two or three days, especially in cases in which the drug is required for longer than ten days. There is no absolute relationship between the number of leukocytes and the severity of the infection. In general a high initial white count which diminishes rather rapidly after forty-eight hours of treatment with the drug is of good prognostic import, while a persistent or progressively high count often indicates a spread in the infection or a complication. Patients with low initial white counts are often seriously ill, but if they respond to treatment the count will usually increase within forty-eight hours. The failure of a low white cell count to rise is generally a poor prognostic sign.

Because of the potential dangers of sulfadiazine to the urinary tract, it is important to watch every patient closely for evidence of renal damage. The total amount of urine voided in each twenty-four hour period should be recorded, as well as gross and microscopic urine studies daily to detect any evidence of kidney irritation. Blood urea nitrogen or nonprotein nitrogen determinations should also be performed in cases in which there are diminishing urinary outputs and serum chlorides should be determined in cases in which appreciable quantities of fluid and electrolyte are lost. In most instances it is not necessary to determine the blood concentration of sulfadiazine. However, in cases failing to respond satisfactorily to the drug or with diminishing urinary outputs it is practical to ascertain the amount of drug in the circulating blood.

#### SUMMARY AND CONCLUSIONS

Within the period of this study, Aug 15 1938 to April 1, 1942, 1,635 adults with pneumococcal pneumonia were treated with sulfapyridine, sulfathiazole or sulfadiazine with an averaged mortality of 10.6 per cent. This figure is to be compared to that of 40.1 per cent mortality obtained in 1,904 cases of this disease observed at the Philadelphia General Hospital during the five years prior to the introduction of these drugs. From the data presented in this report it appears that sulfadiazine is the drug of choice at the present time for the treatment of pneumococcal pneumonia. To obtain maximum therapeutic results with sulfadiazine in pneumonia, certain principles must be recognized and followed. Regardless of the effectiveness of sulfadiazine in pneumococcal pneumonia, it is not to be employed to the exclusion or neglect of other established therapeutic measures. The following plan of sulfadiazine treatment of pneumococcal pneumonia is suggested:

- 1 Early treatment
- 2 Adequate chemotherapy
  - (a) Large initial dose
  - (b) Smaller doses at regular intervals
  - (c) Continuation of drug until convalescence is established
- 3 Maintenance of adequate urinary output
- 4 Routine use of alkalis
- 5 Prompt recognition of drug toxicity
- 6 Determination of specific pneumococcus type
- 7 Employment of other therapeutic measures as necessary
  - (a) General supportive treatment
  - (b) Type specific serum
  - (c) Surgical procedures

#### ABSTRACT OF DISCUSSION

DR ADOLPH S. RUMREICH, Chicago. Dr Flippin and his associates have given a comprehensive presentation of up to date treatment of pneumococcal pneumonia. Their work demonstrates the encouraging results that can be achieved on a large scale by the proper use of present day diagnostic facilities and therapeutic armamentarium. The great reduction in mortality from pneumonia since the introduction of specific chemotherapy seems to have led to a complacent assumption in some responsible quarters that the problem has been all but liquidated and that it need no longer be a cause for concern on the part of public health authorities. However, as Dr Bortz has pointed out, there still occur thousands of preventable deaths from this cause. Dr Flippin has stated that the length of time that elapses between the onset of the infection and the beginning of specific treatment is the most important single controllable factor in the prognosis of pneumococcal pneumonia. Control of this element alone is worthy of the best joint effort of medical organizations and public health departments, in the promotion of early medical attention, prompt and accurate diagnosis and prompt and adequate modern treatment. The good results of statewide cooperative programs are susceptible of proof. Opinions differ as to the desirability of universal treatment of respiratory tract infections with sulfonamide compounds, and practices differ accordingly. None of these drugs are panaceas, nor are they innocuous. That they are specific in pneumococcal and useful in certain other pneumonias does not warrant their indiscriminate use as they are not only valueless but may be definitely harmful in some of the atypical pneumonias. We cannot yet safely dispense with accurate diagnosis and forego utilization of clinical laboratory and other adjunct facilities. The increasing trend toward home care of patients, reflected favorably in case fatality statistics, not only redounds to the welfare of the patient but tends to conserve community resources. The current trend thus seems to be all to the good, provided there is sustained endeavor for maintenance of proper safeguards in order that the maximum benefit of our remarkable new tools and weapons may be achieved.

DR WORTH B. DANFIS, Washington, D. C. The section might be interested in our experience with pneumonia at a large army cantonment hospital. The Station Hospital at Fort Bragg, North Carolina has 3,000 beds and serves a large military population. During the year 1941 there were 488 patients with pneumonia with five deaths, a mortality of approximately 1 per cent. Four of these patients died with pneumonia occurring secondary to other illness, 1 died of atypical pneumonia and none of lobar pneumonia. During the first five months of 1942 there have been 552 patients admitted with pneumonia, 384 were diagnosed as having lobar pneumonia and 164 as having atypical pneumonia. There has been one death, and this occurred in a civilian literally deposited on our door step in a moribund state on the tenth day of his illness. The mortality rate for this five months period is approximately 0.2 per cent. During 1941 and the first five months of 1942 there have been 1,040 patients admitted with pneumonia of various types and 6 have died. The mortality therefore, has been 0.6 per cent. You will notice that during the first five months the total number of patients with pneumonia has exceeded the number for the entire year 1941, though there has been little change in the post strength. This is attributable to the increase in so called atypical pneumonia, which has recently become prevalent or better recognized throughout the country. The communicability of this disease has now been clearly shown and accounts for the high incidence among troops and other closely associated groups of young persons. As you may know, two of the earlier descriptions of this disease were contributed by army physicians, Bowen in Hawaii in 1935 and Allen at Fort Sam Houston, Texas, in 1936. Our remarkably low mortality is probably due to five factors: 1 The material with which we deal, namely, a group of picked, vigorous young soldiers. 2 Admission to the hospital very early in the illness, with immediate institution of therapy. 3 The curative properties of the sulfonamides in pneumococcal pneumonia. 4 Segregation of patients with pneumonia in wards administered by medical officers, nurses and soldier attendants who have become expert in the handling of this disease. 5 The mild character

of the atypical pneumonias we have encountered Sulfathiazole was used almost exclusively until February of this year but is being gradually replaced by sulfadiazine Various toxic effects have occurred, but rarely have serious complications arisen It would appear that the modern treatment of pneumonia in a large cantonment hospital caring for troops not actually engaged in combat has maintained the mortality of this disease at 0.5 per cent

DR HARRISON F FLIPPIN Philadelphia As pointed out by Dr Daniels and Dr Rumreich, the problem of atypical, or so called virus, pneumonias is becoming more apparent There is little or no reason to believe that sulfonamide therapy is effective in this type of pneumonia However it is often difficult to determine whether a patient is suffering with this particular disease, and for this reason it has been our practice to administer sulfadiazine to all pneumonia patients for at least seventy-two hours, and if within that time no clinical improvement has been noted the drug is stopped The most important aspect of sulfadiazine therapy at present is that of urinary tract complications Again we wish to emphasize the importance of maintaining an adequate urinary output and the routine use of alkalis Although sulfadiazine is not ideal it is the best drug now available for the treatment of pneumococcal pneumonia, and if it is used with regard for its toxic possibilities, and if the patients for whom it is used are thoroughly studied and carefully followed it is a therapeutic agent with a satisfactory margin of safety

### SESAME OIL TUMORS

ADOLPH H CONRAD, M D  
ADOLPH H CONRAD JR, M D  
AND  
RICHARD S WEISS, M D  
ST LOUIS

In 1920 Mook and Wander<sup>1</sup> described the occurrence of painful, tender, slowly growing tumors in 6 patients who had been previously subjected to serious operations and had received camphor in oil injections as a stimulant Several similar cases have since come under our care and we have seen others in clinical meetings in various cities throughout the country In all of the cases seen the camphor oil injections had been made many years previous to our observation Pharmaceutical houses, since the publication of Mook and Wander's report have generally discontinued the sale of camphor

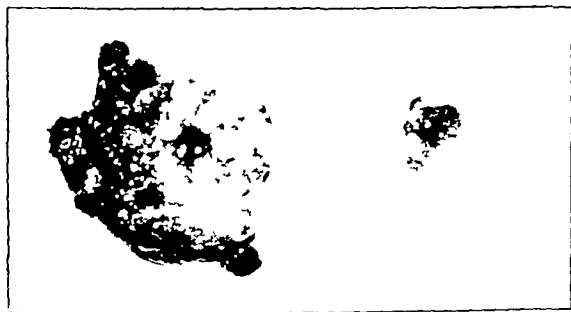


Fig 1—Gross tumors (about half natural size) removed from arm The globular dark areas are oil filled cysts

and other drugs dissolved in liquid petrolatum We have been watching for tumors due to the injection of other oils because we knew that Burrows and Johns-

ton<sup>2</sup> were able to produce oil tumors in rats by the subcutaneous injection of corn oil The tumors which they produced did not show as much cellular reaction as the camphor oil tumors, probably because of the lack of the irritant action of camphor It should also be noted that a case of multiple tumors in the buttock was reported by Irwin Sutton<sup>3</sup> following the injection

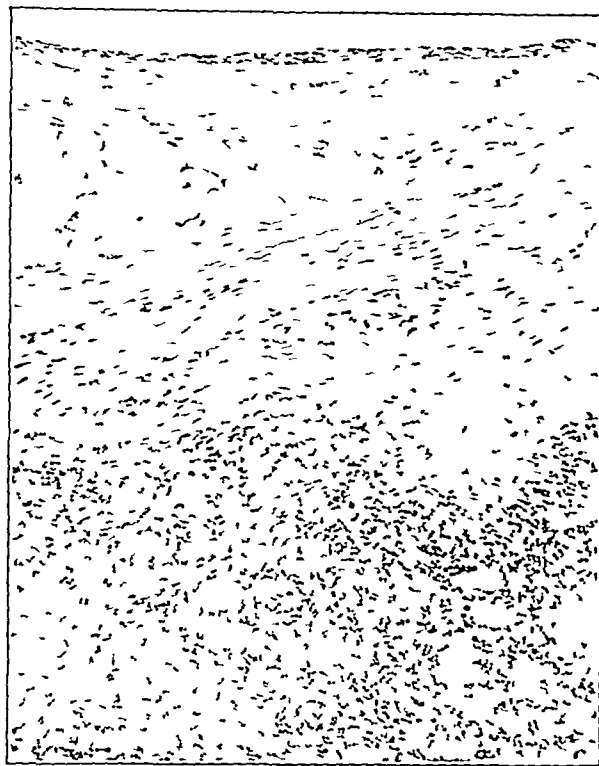


Fig 2—Cyst wall and infiltrate surrounding cyst (magnification about 95 diameters)

of mercuric salicylate in linseed oil Weidman and Jeffries<sup>4</sup> concluded that olive oil and cottonseed oil were innocuous when injected subcutaneously but admitted that their position was somewhat insecure on this point Burrows and Jorstad<sup>5</sup> found that oil tumors which had remained small and quiescent for years became active almost at once when the patient was placed on a salt poor and vitamin poor diet Jorstad and Glenn<sup>6</sup> intimated that the vitamin concerned is vitamin A It is attractive of course, to theorize that oil tumors occur in patients who habitually are on a diet low in vitamin A but no definitive proof exists as yet that such is the case

A patient came under our observation who had tumors clinically identical with those reported by Mook and Wander The oil injected was sesame oil containing estrogenic substance

#### REPORT OF CASE

Mrs M V a white woman aged 35 admitted to the skin clinic of the Barnard Free Skin and Cancer Hospital on March 12, 1940 complained of painful lumps in both arms which she stated had been present since 1935

<sup>2</sup> Burrows Montrose T and Johnston Charles C The Action of Oils in the Production of Tumors with a Definition of the Cause of Cancer Arch Int Med 36 291-332 (Sept) 1925

<sup>3</sup> Sutton Irwin Tumor Formation After Injection of Mercuric Salicylate in Linseed Oil Arch Dermat & Syph 7 223-225 (Feb) 1923

<sup>4</sup> Weidman F D and Jeffries M S Experimental Production of Paraffin Oil Tumors in Monkeys Arch Dermat & Syph 7 209-222 (Feb) 1923

<sup>5</sup> Burrows M T and Jorstad L H Cause of Growth of Sarcoids or Oil Tumors J A M A 88 1460-1462 (May 7) 1927

<sup>6</sup> Jorstad L H and Glenn F H The Action of Oils in Muscle Tissue J A M A 90 26-27 (Jan 7) 1928

Read before the Section on Dermatology and Syphilology at the Ninety Third Annual Session of the American Medical Association Atlantic City N J June 10 1942

Studies Observations and Reports from the Dermatological Departments of the Barnard Free Skin and Cancer Hospital and the Washington University School of Medicine service of Dr M F Engman ACVIII

<sup>1</sup> Mook William H and Wander William G Camphor Oil Tumors Arch Dermat & Syph 1 304-318 (March) 1920

The relevant items in her history were as follows. In 1929 she had had a unilateral salpingo oophorectomy done. In 1934 a second operation was done, at which time the uterus and the remaining fallopian tube and ovary were removed. The postoperative course was uneventful. Inquiry as to her diet since 1929 seemed to indicate that it was adequate and did not lack vitamin containing foods.

On account of menopausal symptoms she was given treatment with estrogenic substance in oil administered at intervals over a period of three years. The injections were said to have been given twice weekly into the muscles of the upper arm. After about six months of this treatment the patient noticed lumps forming at the sites of injection. She complained of this to her physician and was told that they would disappear in time. Some of them did disappear, but numerous nodules remained. The lesions had been increasing in size and number during the past two years.

When the patient was first seen in the clinic she presented numerous subcutaneous nodules in the lateral portion of both arms, chiefly in the upper third. The masses were fairly well circumscribed and could be moved to a slight extent in the subcutaneous tissue. Pressure on the masses caused a moderate amount of pain, and the patient further stated that at times the lesions would throb and ache without apparent cause. There was no inflammatory reaction on the skin. Some of the masses were as large as 4 or 5 cm in diameter and they varied from that size down to 0.5 cm. They occurred in chainlike distribution in the subcutaneous tissue.

On March 13, 1940 the tumors were removed from the left arm, and in the following May the remaining more numerous lesions were excised from the right arm. The postoperative course in both instances was uneventful.

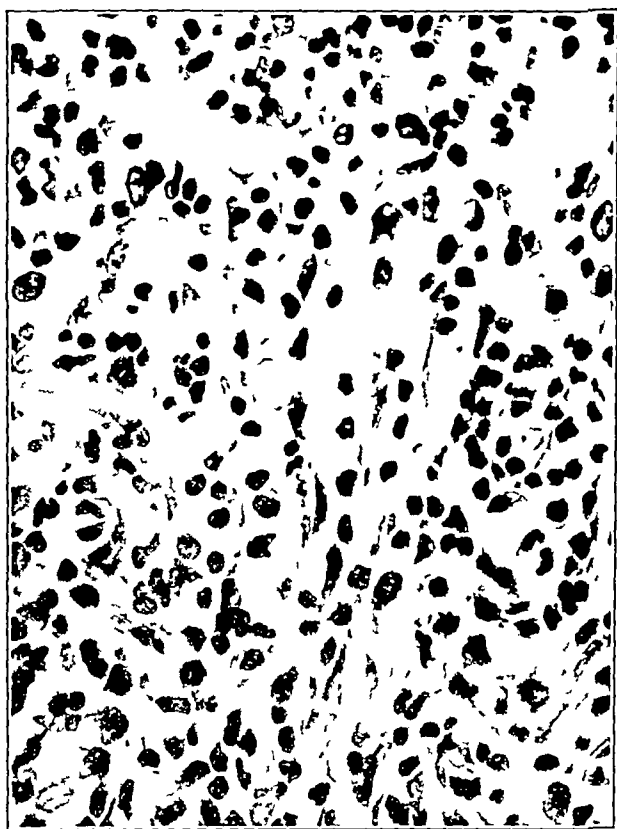


Fig. 3—Infiltrate from cyst wall slightly reduced from a photomicrograph with a magnification of 520 diameters.

Gross examination of the tumors revealed numerous cysts embedded in fat. The tumors were not found in the fascial planes or in the muscle but only in the rather thick layer of subcutaneous fat. The cysts varied in size from small globules about 1 mm in diameter to elongated lesions measuring about 1.5 cm in length, having a diameter of about 7 or 8 mm

(fig. 1). Their appearance was that of a simple cyst with a semitransparent cyst wall. When a larger cyst was cut into, oil escaped. The oil was clear, slightly yellowish and unstained. The cysts occurred singly or in groups. Most of the single cysts were the larger ones. Gross evidence of a foreign body reaction was shown by a proliferation of pericystic connective

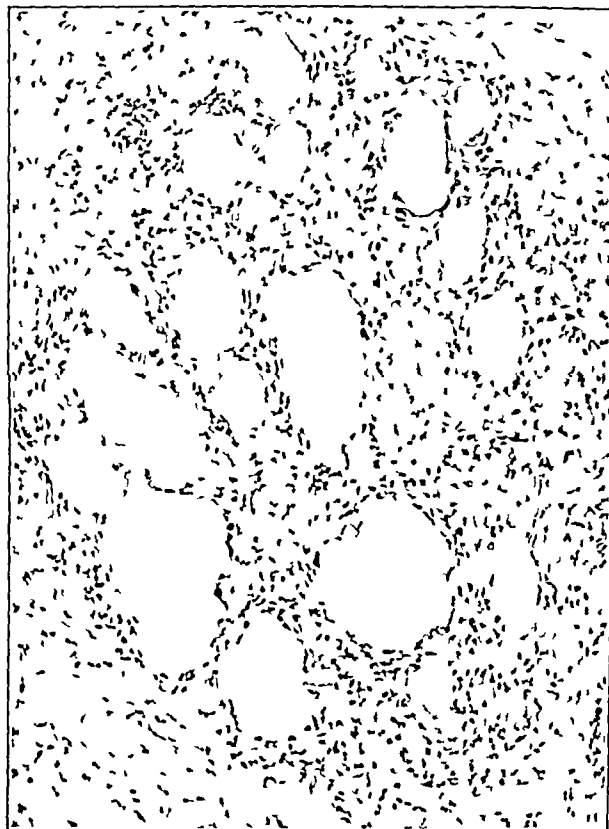


Fig. 4—Group of small cysts (slightly reduced from a photomicrograph with a magnification of 145 diameters). Flattened lining cells are easily distinguished from fat cells by the variation in size and shape.

tissue extending out into the surrounding fat. This was most definite in the areas where there were numerous small cysts. This proliferation of the connective tissue, binding the surrounding fat to the cyst, made the lesions feel much larger on palpation.

#### MICROSCOPIC STUDIES

In sections stained with hematoxylin and eosin, the cysts were found to be lined by large flattened cells most of which had retained their nuclei. The cytoplasm of some of them was finely granular and others contained deposits of yellowish droplets, apparently lipid material. A diffuse infiltration of small round cells, probably lymphocytes, was found about each cyst. This infiltration was more pronounced around the groups of tiny cysts. Occasional plasma cells and a few epithelioid cells were found. The infiltrate was not sharply defined but faded out into the surrounding normal fat (figs. 2, 3 and 4). Many large phagocytic cells were found near the walls of some of the cysts. The nuclei of these cells were eccentrically placed and they had somewhat the appearance of large plasma cells. In the cytoplasm were found numerous, small, irregular, refractile golden brown globules (figs. 5 and 6). Sections stained with sudan III showed that the globules were fatty material. These cells, which were interpreted as macrophages, were found most profusely a slight distance away from the cysts and occurred both singly and in masses. An occasional giant cell was found.

#### COMMENT

The material injected was stated by the patient's physician to have been estrogenic substance in oil. At that time the pharmaceutical house from whom the

material was obtained marketed the estrogenic substance in sesame oil. We are therefore justified in assuming that the tumors were the result of sesame oil injection. Not enough oil could be obtained from our specimens for an attempt at chemical analysis. Furthermore, it is doubtful if an oil of this character could be identified chemically.

The microscopic picture differed from that of the camphor oil tumors in that little or no fibrous encapsulation of the oil droplets was noted and the granulomatous nature of the infiltration was less pronounced. Mook and Wander stated that a diagnosis of tuberculosis had been made in their first case, but such an error was out of the question when our slides were examined. While the infiltration was granulomatous in nature, the scarcity of giant cells and plasma cells and the relatively scanty amount of infiltration excluded definitely the infectious granulomas.

There were numerous cells of a phagocytic character containing droplets of oil (figs 5 and 6) which took sudan III stain. This activity of the phagocytic cells might indicate loss of oil from the cystic areas with encapsulation by the phagocytes.

The tumors were not malignant in the usual sense, but they were invasive locally by seepage of oil from the encysted area and the formation of new tumors in more or less chainlike arrangement along the arm. In this they were quite like the tumors of Mook and Wander.

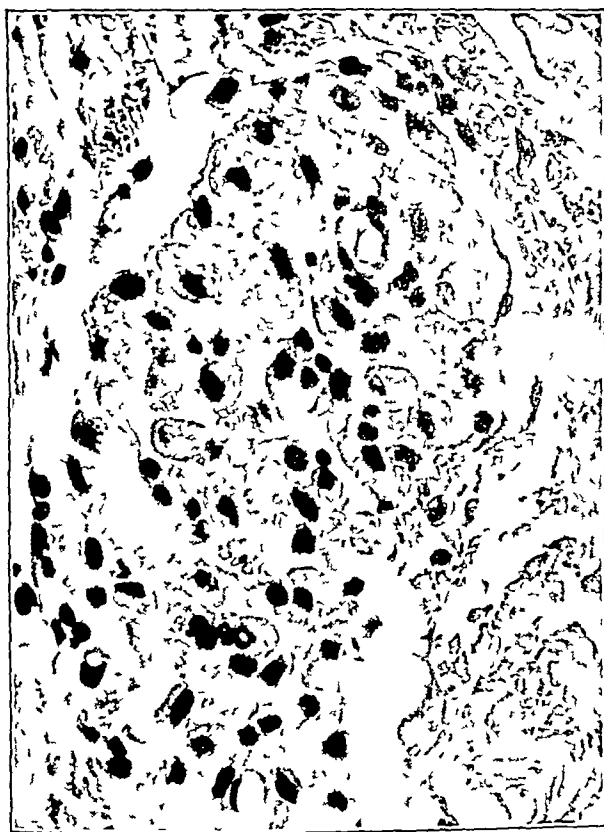


Fig 5—Group of macrophages which have taken up droplets of fatty material slightly reduced from a photomicrograph with a magnification of 520 diameters

#### SUMMARY

Tumors occurred in the subcutaneous tissue of the arms of a patient treated with estrogenic substance dissolved in sesame oil.

The tumors were found in the subcutaneous tissues, were in chainlike masses and were invasive, moderately painful and increasing in size.

Microscopically the tumors differed from the Mook and Wander camphor oil tumors in that the fibrous

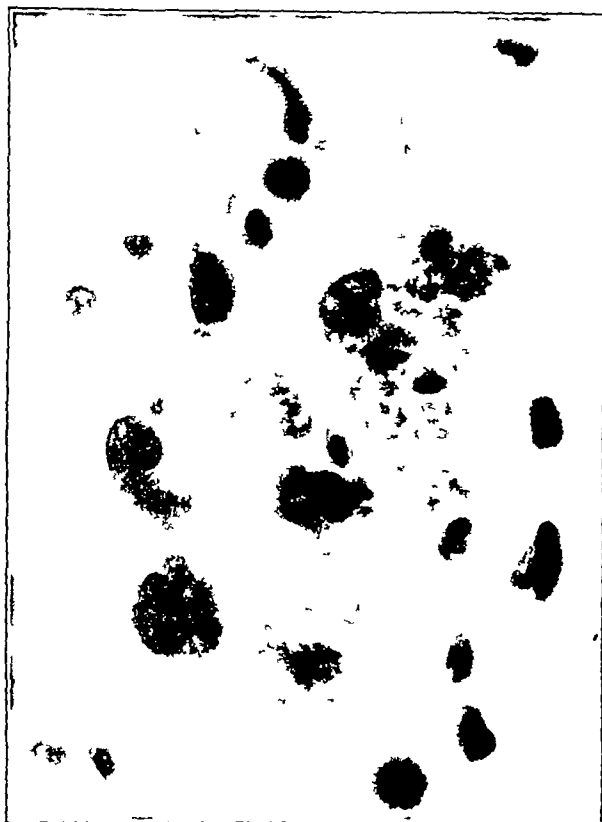


Fig 6—High power view of a group of macrophages containing fatty material slightly reduced from a photomicrograph with a magnification of 1380 diameters

encapsulation of the oil droplets was far less dense and the granulomatous infiltration was much thinner. The giant cells observed in our case were very scanty in number.

Operative measures were required to give the patient relief and to stop the spread of the tumors.

#### CONCLUSIONS

Invasive tumors may be produced by injection of estrogenic substance in sesame oil.

It is our belief that the tumors are due to the oil and not to the combination of estrogen and oil.

The injection of oils carrying active drugs and endocrine preparations into the subcutaneous tissues should be avoided.

Subcutaneous and intramuscular oil injections into the arms may produce in some persons painful and disabling tumors. Owing to the anatomicphysiologic factors involved, the tumors may increase in size and number by migration of oil droplets, so that operative measures may become necessary.

It is our belief that the muscles of the arms should be abandoned as a site for oil injections of any character and that only the gluteal muscles in the upper outer quadrant of the buttocks should be used for such injections.

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## ABSTRACT OF DISCUSSION

DR FRED D WEIDMAN, Philadelphia I agree in all respects with the conclusions in this presentation. This condition must be classified as tumor in the same sense that we speak of paraffin oil tumors. The authors have emphasized throughout the fact that there were chainlike extensions from the original focus of the disease. The puzzlement centers around the pathogenesis of the condition. Ordinarily we think of sesame oil, chemically speaking, in the same way that we do of olive oil. The composition of sesame oil except for slightly differing proportions is the same in respect to oleates, palmitates and stearates. It is possible that an adulterant was used in the sesame oil such as the much less expensive paraffin oil. That, of course, is a question. Perhaps some light might have been thrown on this possibility had frozen sections been stained with osmic acid as well as with scarlet red. If it was found that all the fat stained black, that would eliminate the possibility of there being any paraffin oil in the lesions, at least at the time that they were examined. The second possibility is that these lesions might be the result of disorganization of the fat, that is, that they were truly fatty cysts and not necessarily lesions which pathologically were what we call paraffin oil tumors. The fact that the walls of these cysts were so definite inclines one in favor of that hypothesis. There is a long spread of years, though, elapsing between the introduction of the oil and the time of the microscopic examination. It seems as though during that time the products of disorganization should have been absorbed. There is no explanation in this case as to why the sesame oil should have produced these tumors. Sesame oil, like olive oil, of course, in time should become saponified and should become absorbed. Perhaps this is the last straw on which one would have to rely in explaining the development of this lesion. Is it possible that the original focus of fat destruction did not resolve in the way that it should because there was a more or less continuous accumulation of the cholesterol and other nonsaponifiable substances, such as are included in normal subcutaneous fat? Normal subcutaneous fat does not consist purely of olein, palmitin and stearin. There is a certain definite admixture of cholesterol, and it is possible that for some reason or other the lesions did not heal up presently, but, there being a gradual disintegration of the fat, the cholesterol and such insoluble substances remained behind to serve to continue the reaction on the part of the tissue which led to these chainlike infiltrations into the surrounding tissues.

DR FRANCIS A ELLIS, Baltimore This type of tumor is rare. Sesame oil has been used for many years as a vehicle for endocrine products. Dr Emil Novak, who has written many articles on endocrine therapy, and other physicians interviewed have had no personal experience with this type of tumor, and no previous reports were found in the literature or in the *Quarterly Cumulative Index Medicus*. Iodine in sesame oil has been used by roentgenologists. The oil is usually absorbed from the bronchial tree and from body cavities or sinuses. Considering the fact that the patient had received possibly several hundred injections brings up the question of whether some of the oil was absorbed and, if it was, why wasn't more absorbed? This may have been due to accumulative trauma caused by many injections with the replacement of the normal tissue by fibrosis. There was some evidence of increased fibrous tissue about and in the wall of some of the smaller blood vessels which could have lowered the blood supply and made it inadequate for the removal of all the oil. Another reason for the decrease of absorption may be a mild allergic reaction to the oil or to the hormone contained in the oil. The three sections sent to me by the authors showed that the foreign body reaction is far less than that due to the inorganic paraffin and mineral oil tumors. The presence of the foam cell within the fibrous capsule of the cysts demonstrates that the ordinary foam cell is not neoplastic but is due to the absorption or the phagocytizing of the oil by macrophages. There were a number of yellow granules in some of the fibrous tissue that looked like hemosiderin which the authors didn't mention. They were not round, and if they were fat they should have been dissolved out by the dehydrating fat solvents used in making the sections. The word "invasion" may be a poor term to use in describing this type of tumor, as it connotes an aggressiveness or self

propulsion on the part of the tumor, whereas the oil spreads according to physical laws, by the movement of muscles, gravity, and because of the reaction to the foreign body resulting in phagocytosis and fibrosis. Weidman and Jeffries (*Arch Dermat & Syph* 7 209 [Feb] 1923) demonstrated experimentally that oil could be transported by the lymph of vessels.

DR J LOWRY MILLER, New York I have seen 2 patients this past year, one at the Columbia Medical Center and another at the New York City Hospital Clinic, both of whom had tumors which were clinically typical of paraffinoma. However, both patients had been definitely told that the injection was not paraffin before it was given.

DR ADOLPH H CONRAD, St Louis We should be on the alert and look for these tumors in the future. I understand that estrogenic substances are now being marketed in peanut oil, and the use of sesame oil has been abandoned. However, other preparations are being used for injection purposes which have as their base sesame oil, therefore it will be well to keep the possibility of tumor formation in mind.

## THE PREVENTION OF PULMONARY COMPLICATIONS FOLLOWING THIGH AMPUTATIONS

BY HIGH LIGATION OF THE FEMORAL VEIN

J ROSS VEAL M.D.  
WASHINGTON, D C

When, in the course of events, the vascular supply to a lower extremity is so severely damaged by disease that gangrene of the toes or the foot results, it is not surprising that the patient's very life is in extreme jeopardy. Frequently the disease involves the entire vascular system. There is often impairment of function of certain vital organs, notably the heart and kidneys. Procrastination of removal of the dead part invites further bodily injury from pyoinfection and toxic absorption. One cannot fail to be impressed by the hazards facing these aging individuals with vascular gangrene, nor can one ignore the sad plight in which the surgeon often finds himself in attempting to relieve the situation. Surgery is a precarious undertaking for amputation must be performed at a sufficiently high level to insure healing of the stump. Uniformly the higher the site of the amputation, the greater the mortality rate.<sup>1</sup> Persons fortunate enough to have a sufficient blood supply of the leg to allow amputation below the knee usually present a favorable prognosis. It is in those cases in which the vascular damage is so great that amputation must be performed above the knee that the problem of surgery becomes most urgent.

There are many factors which affect the outcome of thigh amputations for vascular gangrene.<sup>2</sup> Chief among these are the age of the patient, the extent and duration of his disease, the exciting cause of the gangrene, local and systemic infection, the state of health of his heart and kidneys, and particularly the postoperative pulmonary complications. These include pneumonia, pulmonary infarcts and massive pulmonary embolism. The incidence of pulmonary complications following thigh amputations is out of all proportions to similar conditions in other fields of surgery. In a

From the Department of Surgery, Gallinger Municipal Hospital. Read before the Section on Surgery, General and Abdominal at the Ninety-Third Annual Session of the American Medical Association Atlantic City, N. J. June 11, 1942.  
<sup>1</sup> Veal J R and McFetridge E M. The Surgery of Gangrene of the Extremities with a Study of 171 Cases from the Records of Charity Hospital in New Orleans. *Surg Gynec & Obst* 60 840-847 (April) 1935.  
<sup>2</sup> Veal J R. Factors in the Mortality Rate of Arteriosclerotic Gangrene. *J A M A* 110 785-789 (March 12) 1938.

series of two hundred and seventy-five amputations at various levels of the extremities which have previously been reported, 14.9 per cent of the patients died from postamputation pulmonary complications. Practically all these complications occurred in the thigh amputation group. It seems clear then that pulmonary complications following thigh amputations for vascular gangrene present a serious problem for the surgeon.

A closer study of the pulmonary lesions in the aforementioned cases revealed several important findings that seemed to have a direct bearing on this problem. The majority of the lung complications were diagnosed as pneumonia, though the characteristic distribution, the x-ray findings and the clinical course indicated that many were embolic lesions rather than the ordinary forms of pneumonitis. Dissections of the thigh stump in a group of the fatal cases demonstrated that a thrombus had formed in the femoral vein. It was also shown that the thrombus had developed at the distal or ligated end of the femoral vein. In some it extended upward for only a short distance, in others it had propagated into the iliac vein. In those incidences in which the stump had become infected, thrombophlebitis was found involving the lower segment of the vein. These findings indicated that the probable source of the emboli which were responsible for many of the pulmonary complications was from the femoral vein in the stump of the amputated limb. The controlling factor seemed to be the extent of thrombosis in the femoral stump. If the thrombus should propagate upward until a widened portion of the vein was reached there would be an excellent

variation in the extent of the thrombosis in the stump of the femoral vein? An anatomic study of the femoral vein and its tributaries has provided an answer to this question.

The femoral vein is the continuation of the external iliac and is the largest peripheral vein. It begins at the

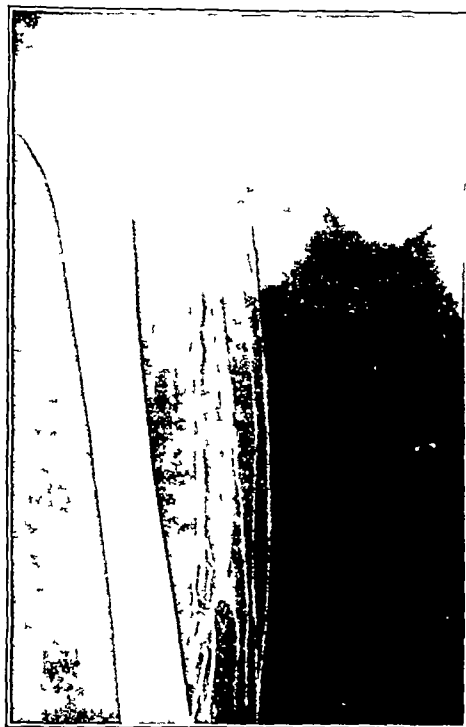


Fig 2—Venograph showing femoral vein with tributaries. Note extreme widening of femoral at point of entrance of deep profunda.



Fig 1—Venograph of normal femoral vein. Note widening of vein in upper portion.

chance for the dislodgment of a portion of the clot and the formation of an embolus. If a shower of small emboli should be thrown off and become lodged in the lungs, the pulmonary lesion would simulate pneumonia. If a larger emboli should be dislodged, infarction or massive embolism would result. There remained one important point: why should there be such a wide

ingunal ligament and extends down the inner aspect of the thigh through Hunter's canal to become the popliteal vein (fig 1). It receives the deep profunda, the saphenous and several lesser tributaries in its upper third and a variable number of smaller veins in the lower two thirds (fig 2). The saphenous is quite constant in its course, is uniform in size and enters the femoral about  $1\frac{1}{2}$  inches below the inguinal ligament. The deep profunda, the major tributary, is quite variable in size and joins the parent trunk at inconstant levels. The branches of the profunda may all unite into a single vein or they may form a double trunk, each entering the femoral at different levels. There is also great variation in the size, number and distribution of the smaller or minor tributaries. While there is a wide variation in the distribution of the tributaries, the femoral presents one of two distinct patterns. In one group there are numerous tributaries, adequate in size, which enter the parent trunk at regular intervals, so that a stepladder arrangement is presented. This type then provides an abundant flow of blood into the femoral at all levels. Ligation at any point fails to cut off an adequate inflow of blood into the femoral stump. In this type thrombus formation is retarded and limited to the distal end of the vein (fig 3A). In the second group the minor tributaries are few in number, are small in size and enter the femoral at wide intervals. This often leaves a long segment of the lower portion of the femoral vein completely devoid of tributaries. In such cases stasis thrombosis is very likely to develop and fill the entire femoral stump following ligation, incident to thigh amputations (fig 3B).

Following these studies I began, as a routine measure, the preliminary high ligation of the femoral vein in all thigh amputations. Since it is not feasible to expose a very long portion of the femoral vein to determine the number of tributaries, it becomes necessary to ligate

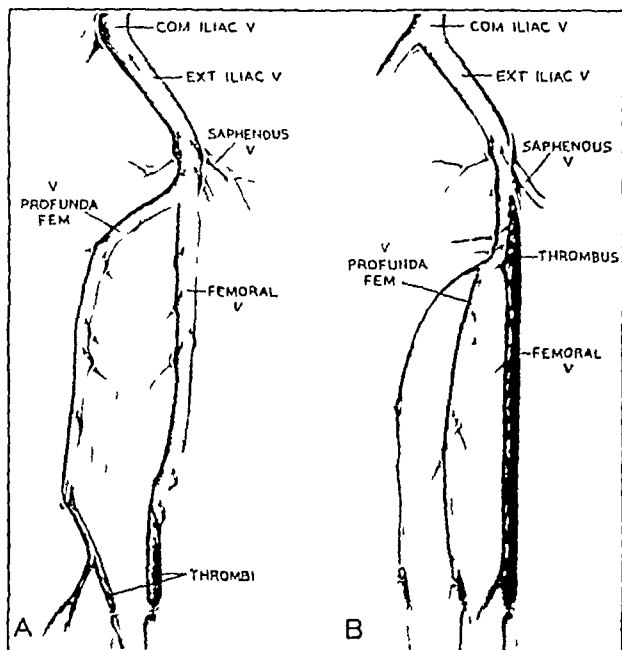


Fig 3—Schematic drawing of femoral vein and its tributaries. Thrombus formation after ligation of lower femoral vein. A note limitation of thrombus at ligated end when tributaries are abundant. B note proper position of thrombus when tributaries are small and few in number.

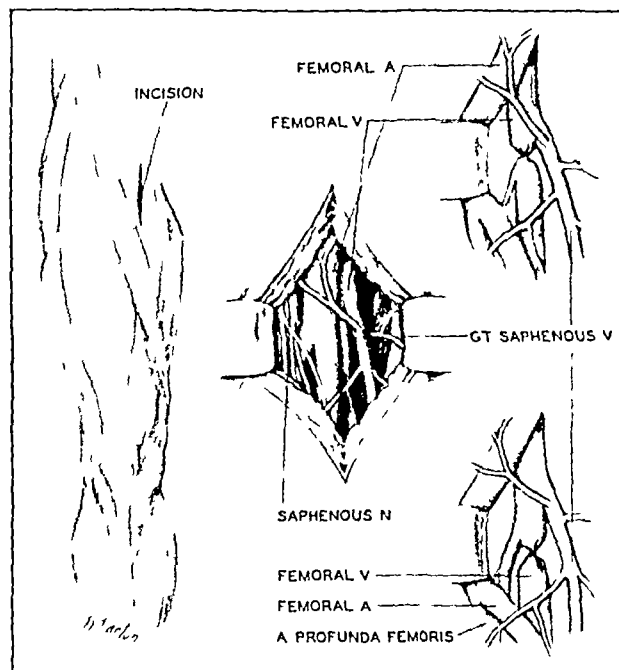


Fig 4—Technic of ligation of femoral vein in femoral triangle

the vein in all cases in order to obtain security against those that are potentially liable to thrombus formation.

In a preliminary report I outlined the result of this procedure in twenty-seven thigh amputations.<sup>3</sup> In this communication I wish to report on eighty thigh ampu-

tations in which this procedure has been used. Because such excellent results have been obtained, I feel that a review of the technic of high ligation of the femoral vein is indicated.

The femoral vein is best exposed in the femoral triangle through a vertical incision placed directly over the vessels (fig 4). The incision should be about 3 inches long and begins 1½ inches below the inguinal ligament. The saphenous vein is identified and followed down to its entrance into the femoral. At this point the femoral sheath is opened and the artery and vein exposed. The vein lies medial to and is partially overlapped by the artery. It is joined by several tributaries at this level, and these must be carefully protected. The femoral artery is retracted laterally and the vein gently exposed just below the entrance of the saphenous. The vein is freed sufficiently at this point to allow the



Fig 5—Venorraphy showing collateral venous circulation after high ligation of femoral vein. Note absence of large trunk.

passage of a ligature. It has been found that the most logical sites for ligation is just distal to the entrance of the saphenous vein. This point is easily located by following the saphenous through the cribriform fascia and ligation at this level insures adequate inflow of blood above the ligature to prevent the formation of a thrombus. There are also abundant channels available for the return blood flow (fig 5). Occasionally the deep profunda joins the femoral very near the sapheno-femoral junction. In such instances it is best to ligate the femoral distal to the profunda. The femoral vein is large and its wall is relatively thin, and care must be exercised in freeing it from its bed. I have found that the passage of the ligature can be facilitated by clamping the vein at the selected site with a hemostat. The vein can then be lifted out of its bed sufficiently to allow the ligature carrier to pass completely around it with ease and safety. Because of the wide variation

<sup>3</sup> Veal J R. High Ligation of the Femoral Vein in Amputations of the Lower Extremities. J A M A 114: 1616-1619 (April 27) 1940.

in the size of the vein and the limitation of exposure it has been found that various size ligature carriers are needed. Each tray is set up with a series of curved needles with blunt points. The size needle to fit the particular case is selected and a silk ligature is passed around the vein and securely tied. The incision is then closed in the usual manner and attention is turned to the amputation.

Following amputation a loose dressing is applied and the patient placed under a heat cradle. The stump is not elevated. In practically all cases there has been a prompt readjustment of the venous return blood flow. However, in a few cases the stump has become swollen with pitting edema. Apparently this has been caused by the occurrence of thrombosis in the profunda vein. The edema has always subsided in about ten days and has not produced any further trouble. The wounds have healed as promptly as in those cases in which edema did not occur.

The value of preliminary high ligation of the femoral vein in preventing pulmonary complications in thigh

state, sex and color. The type of amputation was essentially the same in the two series. Low spinal anesthesia was frequently used in both groups and was the anesthetic of choice when not contraindicated. The only essential difference between the two series of cases

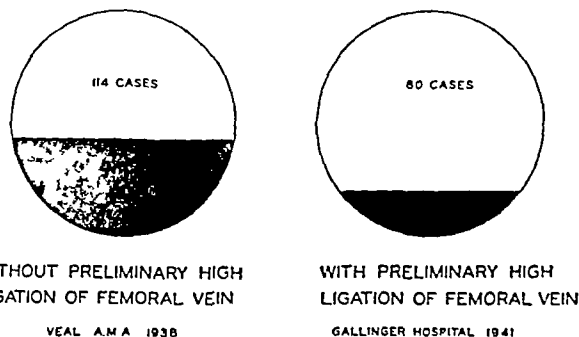


Fig. 7—Comparison of mortality rate in thigh amputations without and with high ligation of femoral vein. Black zone represents percentage of fatalities in each group. Without high ligation mortality rate is 42.1 per cent. With high ligation mortality rate is reduced to 17.5 per cent.

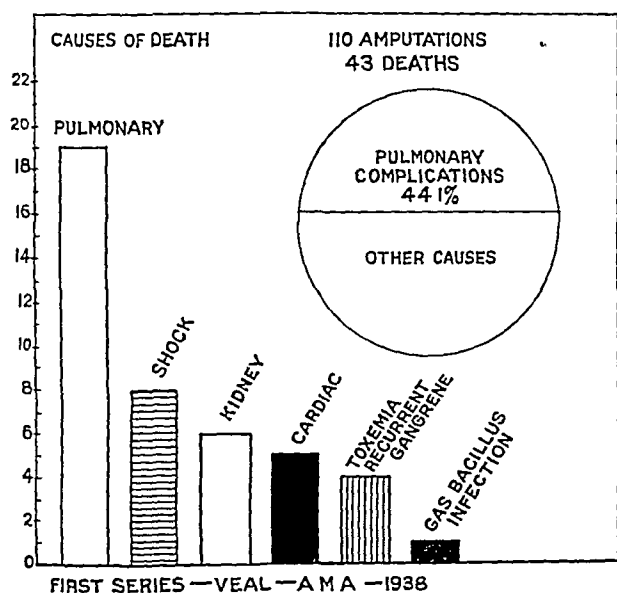


Fig. 6—Incidence of pulmonary complications in one hundred and ten amputations for vascular gangrene.

amputations can best be presented by comparing a series of amputations in which it has been used with a similar group before this measure was instituted. In 1935 I presented a study of one hundred and ten amputations for arteriosclerotic gangrene, in which there were forty-three deaths. Pulmonary complications accounted for nineteen of the fatalities (fig. 6). Another series of one hundred and four amputations for the same condition was reviewed at a later date. In this series there were thirty deaths, of which fifteen were the result of pulmonary complications. In one hundred and fourteen thigh amputations performed without high ligation there were forty-eight deaths. Approximately 42 per cent of the deaths were the result of pulmonary complications. In the present series of eighty thigh amputations there were but fourteen deaths (fig. 7). Only 1 patient contracted any type of pulmonary complication. She had diabetes, with gangrene of the foot. On the second postoperative day lobar pneumonia set in from which she later died (fig. 8). All the patients were indigent and were similar to the first groups with respect to age, duration of gangrene, general physical

was the performance of preliminary high ligation of the femoral vein in the second group of cases. The striking reduction in occurrence of pulmonary complication in this series of eighty thigh amputations by the employment of high ligation of the femoral vein seems to have solved one of the most urgent problems in the surgery of vascular gangrene.

#### SUMMARY

Pulmonary complications are more frequent following thigh amputations than in any other field of surgery. Many of the pulmonary lesions are embolic in origin. The chief source of the emboli is from the femoral vein in the amputated stump. High ligation of the femoral vein before amputation closes this source of emboli. In two hundred and seventy-five major amputations with-

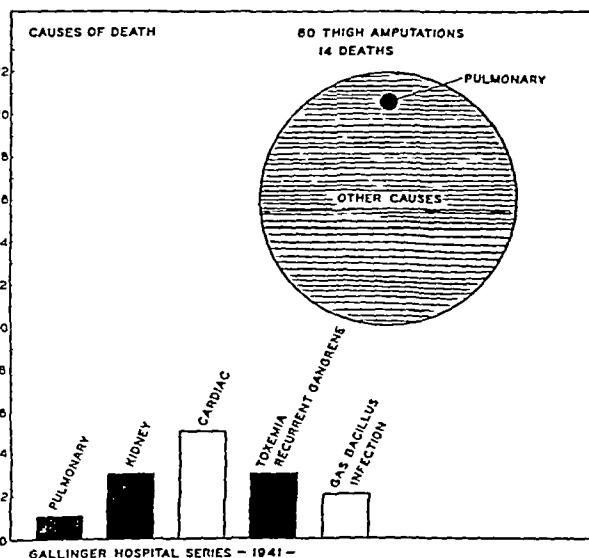


Fig. 8—Mortality in eighty thigh amputations for vascular gangrene with high ligation of femoral vein.

out high ligation of the femoral vein 14.9 per cent of the patients died from pulmonary complications. In eighty thigh amputations with high ligation of the femoral vein there has been only one pulmonary complication.

## ABSTRACT OF DISCUSSION

DR GEZA DE TAKATS, Chicago The paper of Dr Veal emphasizes the importance of venous stasis in the formation of thrombi and consecutive emboli. Retardation of venous return has been demonstrated repeatedly on patients after operation or immobilization. The interference with venous return is especially pronounced in the frequently employed Fowler position, during which stasis is produced in the pelvis, in the groin and in the deep and muscle veins of the calves. To overcome this the postoperative Trendelenburg position, maintained from twenty-four to forty-eight hours, is truly a great improvement and can be used for such patients who are unable to carry out simple exercises. Dr Lawrence Petersen has tabulated the mortality following major amputations at the Research and Educational Hospitals. There were 110 major amputations between 1927 and 1942, and 9 patients died giving a mortality of 8 per cent. There was only one death of embolism, of a patient with polycythemia vera who had been treated with leeches up to the fifth day and died on the sixth, after the use of leeches was discontinued. Only 1 patient in this group had a ligation of the femoral vein. In our experience then, pulmonary embolism does not occur frequently after amputations, the incidence being not more than 1 or 2 per cent. Recently I have attempted to study the clotting mechanism of patients by determining their response to heparin. Roughly all individuals fall into one of three groups. Their response to heparin is normal, exaggerated or diminished. In spite of the great importance of venous stasis one should not forget that coagulation of blood is favored in the postoperative state. Heparin or other anticoagulants obviously cannot be given to all postoperative patients, but the endangered group may be picked out by their response to heparin. For such patients all available measures against thrombosis must be carried out with the greatest vigor.

DR EDGAR V. ALLEN, Rochester, Minn. Theoretically there are three possible mechanisms for postoperative venous thrombosis. One of these is an increased tendency of the blood to clot. However in spite of assiduous studies no one has shown conclusively that there exists such an increased tendency after operation. There are some conditions of the blood which predispose to venous thrombosis following operation but the vast majority of patients who are operated on do not show significant changes in the coagulation of the blood after operation. A second factor is the possibility of trauma to veins. I am told that assistants do not lean on a femoral vein during a major operation and that usually no other trauma occurs. Yet it is known that after such operations as cholecystectomy thrombosis of the femoral vein may occur. For those who advocate the theory of trauma, there is some evidence in support as shown by the fact that the incidence of postoperative venous thrombosis following pelvic operations is three times as great as the incidence following operations on the upper part of the abdomen. There is no evidence that this trauma to veins is a significant, persistent cause of postoperative venous thrombosis. The third possibility is the question of slowed circulation of venous blood. How does this fit in with what is known about postoperative venous thrombosis? Similar studies on the circulation of blood in the veins of the upper extremities indicate that there is no significant slowing of the speed of circulation in the upper extremities. That might explain why postoperative venous thrombosis occurs so frequently in the lower extremities and so infrequently in the upper extremities. The fact that the maximum slowing of the venous circulation is on about the eighth to the twelfth postoperative day would fit in well with the observation that that is the period at which postoperative venous thrombosis occurs in the vast majority of instances. This slowed circulation of the blood in the veins would explain also why the administration of thyroid sharply decreases the incidence of postoperative venous thrombosis, and it would explain an observation which I have made that in approximately twelve hundred operations (sympathectomy) for hypertension performed by neurosurgeons there has not been a single instance of postoperative venous thrombosis. Sympathectomy greatly increases the speed of flow of blood through the arteries and through the veins. The evidence suggests that a slowed venous circula-

tion is responsible for postoperative venous thrombosis. A word of caution about the interpretation of statistics. Postoperative venous thrombosis is known to occur infrequently, and it is possible that a large series of patients for whom nothing was done might show no postoperative venous thrombosis merely because it does occur infrequently.

DR LYMAN W. CROSSMAN, New York. In my service at the City Hospital my associates and I have approached the matter of postoperative embolism in what might be considered a physiologic way. We try to prevent the formation of postoperative emboli. Dr de Takats discussed retarding circulation and increasing circulation. What we do is stop circulation by Frederick M. Allen's method of applying a tourniquet to the extremity 6 or 8 inches proximal to the line of cutaneous incision, refrigerating the entire extremity with ice and after two and a half hours perform an amputation with no other anesthesia. At the time of the operation we always find that the blood is fluid. We never see a blood clot. When the stump end is about ready to be closed and the tourniquet is taken off, the blood we see then is always in a liquid form. The examination of the blood drained from the specimen as it is removed has been examined and reported as being normal. Every one of the legs so treated has been examined under the microscope by Dr. James Lisa, our pathologist, and he has found no structural change as a result of the long refrigeration or the stasis and pressure brought about by the tourniquet. The tourniquet cuts off all circulation of blood and lymph and all nerve impulses. As most tourniquets are put on there is still an arterial trickle, which allows a flow of warm blood into a refrigerated extremity, and our precautions against this may explain why our patients have never had frost bite. Dr. Allen has always emphasized the inhibition of thrombosis by cold, and as we stated in the *Archives of Surgery* in January 1942 our group has encountered no instance of thrombosis or embolism with this method. As our series now comprises over a hundred amputations, this experience appears significant.

DR J. ROSS VEAL, Washington, D. C. I have been interested in the freezing of the extremities. Dr. Crossman says it is a physiologic action. Speaking of physiology of circulation after freezing, if he cuts off arterial and venous circulation he creates an ideal situation in which thrombosis should occur provided it lasted long enough. Undoubtedly one can amputate an extremity after it is frozen or partially frozen, without pain and the patient may return to the ward and be comfortable and carry on his diet but I don't think that freezing in any way prevents thrombosis. It creates a field in which thrombosis might develop if it persisted long enough. There is one remark I should like to make about high ligation. It is known that clots from other parts of the body may lodge in the lungs. There have been cases in which the embolism came from the heart or some other vein of the body than that of the femoral stump, but I feel that the majority of the pulmonary complications following thigh amputations are embolic and that the emboli arise from the stump of the femoral vein.

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**High Degrees of Personal Liberty**—As a class doctors are independent people. A doctor usually works for himself, he wears no man's collar unless he is hired to work for a medical clinic or unless he is a fashionable practitioner who toadies to the rich and so has passed under the golden yoke. Indeed, if it were not for the responsibility that every physician feels towards his patients, he would be as free as a bird in the air to go and come when he pleased and to take long vacations. If he has any doubts about the high degrees of personal liberty he enjoys in civilian life, a service with our armed forces will soon convince him. Patients may choose any physician they please and dismiss him at their pleasure, but they are not always aware that the doctor has the same privileges, there is no law or rule of medical ethics that compels him to undertake the care of any particular patient, or that prevents him from retiring—gracefully, of course—from the case if the individual proves uncooperative or unbearable. Although this privilege of dismissal is seldom invoked by doctors except as a last resort, it is frequently exercised by patients—Irving, Frederick C. Safe Deliverance, Boston, Houghton Mifflin Company, 1942.

HYPOCHROMIC ANEMIA IN PATIENTS  
WITH DEFICIENCY OF THE  
VITAMIN B COMPLEXRESPONSE TO IRON THERAPY WITH AND  
WITHOUT YEASTCARL V MOORE, MD  
VIRGINIA MINNICH, MS  
ST LOUISR W VILTER, MD  
ANDT D SPIES, MD  
CINCINNATI

Many clinicians have the impression that the response to iron therapy of patients with hypochromic anemia is enhanced if the vitamin B complex is administered concomitantly. Relatively expensive combinations of these two therapeutic agents have been prepared by pharmaceutical houses and are being extensively used. The reasoning behind this dual therapy accepts the recent impression that subclinical or subcritical deficiencies of the B complex are relatively common in the United States<sup>1</sup> and postulates that the circumstances which bring about iron deficiency may lead also to suboptimal intake of vitamins. It is assumed, furthermore, that vitamin deficiency may result either in poor absorption of iron from the intestinal tract or in its defective utilization for hemoglobin synthesis.

These ideas about the interrelationship of iron metabolism and the vitamin B complex germinate from three separate types of scientific evidence. In the first place, many investigators have frequently observed hypochromic anemias in patients with pellagra. Early studies indicated that they were more common than any other type,<sup>2</sup> but subsequent reports have shown that macrocytic and normocytic anemias also occur among pellagrins and that there is no special tendency toward coexistence with any one type.<sup>3</sup>

In the second place, Parsons<sup>4</sup> found that the iron deficiency anemia produced in rats on a milk diet can be cured with yeast as well as with iron and copper, but yeast of low iron content produced less satisfactory hemoglobin increases. Moreover, when Parsons and Hawksley<sup>5</sup> applied these observations to the treatment of nutritional (iron deficiency) anemia of infants they noticed that the yeast was not nearly as effective therapeutically as it had been in rats, and Ungley<sup>6</sup> from

observations on adult human subjects with hypochromic anemia concluded that yeast or wheat germ preparations do not raise the hemoglobin level "whether or not the diet had been grossly defective."

In the third place, Fouts and his associates<sup>7</sup> have demonstrated that in puppies fed a diet deficient in pyridoxine (vitamin B<sub>6</sub>) a hypochromic anemia develops which does not respond to iron and copper but improves dramatically when pyridoxine is given. Fouts's observations have been abundantly confirmed in experimental animals,<sup>8</sup> but instances of a similar anemia in man have not been reported.

Therefore, even though there have been suggestions that vitamin B and iron metabolism are intimately related the evidence is not conclusive except for pyridoxine in experimental animals, and there are no satisfactory data in the medical literature to support the idea that administration of the vitamin B complex increases the therapeutic effectiveness of iron in man. The present investigation was undertaken in an attempt to clarify this point. Results will be presented under the following headings: (1) occurrence of hypochromic anemias in patients with deficiency of the vitamin B complex, (2) response of these patients to iron therapy alone and (3) their response to iron when supplemental amounts of the B complex were also given.

## MATERIAL AND METHODS

Fifty adult patients with hypochromic microcytic anemia were found in the Nutrition Clinic of the Hillman Hospital in Birmingham, Ala., during the summers of 1940, 1941 and 1942. Only 5 of them were men. Almost all had been on a diet extremely low in the vitamin B complex<sup>9</sup> and, with but few exceptions, had had recurring deficiency diseases for years. Thirty-two of the 50 patients had clinical manifestations of a deficiency disease at the time of this study, 15 showed evidences of inadequacy of more than one member of the B complex. The diagnosis of each deficiency disease was made on the basis of clinical manifestations, since the levels of the various B vitamins in blood are not sufficiently altered in most cases of avitaminosis to have diagnostic significance.<sup>10</sup> Niacin (nicotinic acid) deficiency was recognized by the presence of pellagrous glossitis and dermatitis. The criteria accepted for the diagnosis of ariboflavinosis were the presence of cheilosis or cheilosis accompanied by lesions in the eye,<sup>11</sup> magenta tongue and sharklike skin about the nares. Multiple neuritis, confirmed in a few instances by biopsy of a peripheral nerve, was accepted as the principal clinical evidence of thiamine deficiency. However, patients with multiple neuritis also frequently exhibited

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From the Department of Internal Medicine, Washington University School of Medicine, St. Louis; the Department of Internal Medicine, University of Cincinnati School of Medicine; and the Nutrition Clinic, Hillman Hospital, Birmingham, Ala.

1. Jolliffe Norman, McLester J. S. and Sherman H. C. Prevalence of Malnutrition. *J. A. M. A.* 118: 944 (March 21) 1942.

2. Boggs T. R. and Padgett Paul. Analysis of 102 Cases of Pellagra. *Bull. Johns Hopkins Hosp.* 50: 21 (Jan.) 1932. Turner R. H. and Shelton E. Erythrocytes in Pellagra. *Am. J. M. Sc.* 185: 381 (March) 1933.

3. Spies T. D. and Chinn A. B. Studies on Anemia of Pellagra. *J. Clin. Investigation* 14: 941 (Nov.) 1935. Sydenstricker V. P. Studies in Pellagra in Harris, Seale and Harris Seale Jr. *Clinical Pellagra*. St. Louis, C. V. Mosby Company, 1941, chapter 16. Moore Carl V., Vilter R. W., Minnich Virginia and Spies T. D. Nutritional Macrocytic Hypochromic Anemia. *J. A. M. A.* 118: 1161 (March 28) 1942. Unpublished data.

4. Parsons L. G. Congenital Anemia. *Acta paediat.* 13: 378 1932.

5. Parsons, L. G. and Hawksley J. C. Anemia in Childhood. III. The Anemato-poietic Anemias. Nutritional Anemia and the Anemias of Prematurity, Scurvy and Celiac Disease. *Arch. Dis. Childhood* 8: 117 (April) 1933.

6. Ungley C. C. The Effect of Yeast and Wheat Embryo in Anemias. *Quart. J. Med.* 2: 381 (July) 1933.

7. Fouts P. J., Helmer O. M. and Lepkovsky Samuel. Nutritional Microcytic Hypochromic Anemia in Dogs Cured with Crystalline Factor I. *Am. J. M. Sc.* 199: 163 (Feb.) 1940.

8. Borson H. J. and Mettler S. R. Relief of Hypochromic Anemia in Dogs with Synthetic Vitamin B; *Proc. Soc. Exper. Biol. & Med.* 43: 429 (March) 1940. Wolf H. J. and Seidel E. Ueber die antianemische und antidermatitische Wirkung von Hefe-Extrakten und von Adermin. *Klin. Wchnschr.* 19: 1106 (Oct. 26) 1940. McKibbin J. M., Schaefer A. E., Frost D. V. and Elvehjem C. A. Studies of Anemia in Dogs Due to Pyridoxine Deficiency. *J. Biol. Chem.* 142: 77 (Jan.) 1942.

9. Spies T. D., Swain A. P. and Grant J. M. Clinically Associated Deficiency Diseases. *Am. J. M. Sc.* 200: 536 (Oct.) 1940.

10. Vilter S. P., Koch M. B. and Spies T. D. Coenzymes I and II in Human Blood. *J. Lab. & Clin. Med.* 26: 31 (Oct.) 1940. Axelrod A. E., Spies T. D. and Elvehjem C. A. The Effect of Nicotinic Acid Deficiency on the Coenzyme I Content of the Human Erythrocyte and Muscle. *J. Biol. Chem.* 138: 667 (April) 1941. Riboflavin Content of Blood and Muscle in Normal and in Malnourished Humans. *Proc. Soc. Exper. Biol. & Med.* 46: 146 (Jan.) 1941.

11. Sydenstricker V. P., Kelly A. R. and Weaver J. W. Ariboflavinosis with Particular Reference to the Ocular Manifestations. *South. M. J.* 34: 165 (Feb.) 1941. Johnson L. V. Clinical Ocular Conditions Associated with Vitamin B Complex Deficiencies. *Am. J. Ophthalm.* 24: 1233 (Nov.) 1941.

the emotional instability and nervousness described by Frostig and Spies<sup>12</sup> and by Williams and Mason<sup>13</sup>

Determinations of the erythrocyte count, hemoglobin value and reticulocyte percentage were made every twenty-four or forty-eight hours on those patients to whom iron was given, transportation difficulties prevented a few subjects from reporting for observation oftener than once each week. The hemocytometers and blood counting pipets used were standardized by the U S Bureau of Standards. Hemoglobin determinations were made by the Evelyn technic<sup>14</sup>. Reticulocyte preparations were made with both wet and dry methods<sup>15</sup>. Serum iron values were determined by the method of Moore, Minnich and Welch<sup>16</sup>.

#### HYPOCHROMIC ANEMIA IN PATIENTS WITH HYPOVITAMINOSIS B

Reference has already been made to the fact that hypochromic anemia has been observed by a number of investigators in patients with pellagra. However, all these surveys were made before ariboflavinosis was distinguished from the niacin deficiency aspects of pellagra and before it was recognized that multiple neuritis is also frequently a part of that syndrome. It is of interest, therefore, to record that hypochromic anemia was found with all three types of deficiency: niacin deficiency in 23 (46 per cent), ariboflavinosis in 20 (40 per cent), peripheral polyneuritis in 7 (14 per cent) and no recognizable deficiency in 18 (36 per cent). These figures total more than 100 per cent because two or all three types of deficiency were present in 15 patients. This distribution of these three deficiency diseases correlated well with their incidence in the Hillman Nutrition Clinic as a whole during these three summers of study. There was, therefore, no tendency for the hypochromic anemia to occur specifically with niacin, riboflavin or thiamine deficiency.

These results are in accord with published clinical and animal investigations. Williams and Mason,<sup>13</sup> for instance, noted in their cases of induced thiamine deficiency that any anemia that developed was of moderate degree and macrocytic. Patients with pellagra have macrocytic anemia at least as frequently as hypochromic,<sup>3</sup> and animals in which niacin deficiency is produced have not been observed to develop hypochromia of their red cells. Animals deficient in riboflavin apparently do not develop a hypochromic anemia<sup>17</sup> although administration of this vitamin does increase the rate of hemoglobin production by the anemic dog<sup>18</sup>. It is difficult to evaluate the literature regarding the association of hypochromia with ariboflavinosis because cheilosis, the most frequent manifestation of riboflavin deficiency, apparently occurs from other causes, particularly as the result of poorly fitting artificial dentures<sup>19</sup>. It is noteworthy that many of our patients were young (50 per cent under 40 years), 11 of the 20 with cheilosis had

artificial dentures. In addition, fissures at the corners of the mouth have been described as one of the clinical features of hypochromic anemia<sup>20</sup>. There are two possible explanations for this: (1) either cheilosis may occasionally be caused by iron deficiency or (2) the patients with cheilosis had an unrecognized ariboflavinosis. The latter explanation appears possible, since all the reports describing fissures at the angles of the mouth as one of the manifestations of hypochromic anemia appeared before cheilosis was related to riboflavin deficiency. Certainly there has been abundant experience in the Nutrition Clinic of the Hillman Hospital that (1) the cheilosis seen there responds to riboflavin administration and (2) most patients with cheilosis do not have an anemia. Several of the patients with cheilosis and hypochromic anemia included in this study experienced temporary improvement of their lesions at an angle of the mouth during iron therapy, but the fissuring always recurred and responded subsequently to riboflavin. It would appear, therefore, that the cheilosis among these patients resulted from riboflavin deficiency. Murphy and Damargian<sup>21</sup> came to a similar conclusion about 1 patient whom they observed.

Particular attention, however, should be given to the possibility that hypochromia in some of these 32 patients might have been caused by pyridoxine deficiency. Reference has already been made to the work of Fouts and others<sup>2</sup> which demonstrated that dogs fed a diet inadequate in pyridoxine develop a hypochromic microcytic type of anemia which does not respond to iron and copper but improves promptly when pyridoxine is given. These dogs, in addition, had a high serum iron level,<sup>2</sup> in contrast to the low serum iron values obtained when a state of iron deficiency exists<sup>21</sup>. If any of the patients included in this study had a pyridoxine deficiency, therefore, and if the manifestations of this deficiency are the same in man as in the experimental animal, then our patients should (1) have had a high serum iron value before therapy was begun, (2) have shown no hemoglobin rise when iron was given and (3) have responded specifically to pyridoxine administration. Not one of these three things was true. All patients had initial serum iron values below 0.050 mg per hundred cubic centimeters, the range usually found in subjects with an iron deficiency and distinctly below the normal average of 0.09 to 0.12 mg per hundred cubic centimeters<sup>24</sup>. All patients responded with a reticulocyte increase and hemoglobin rise when iron was given. Pyridoxine failed to produce these results. Therefore, if pyridoxine deficiency was present in any of the patients studied, it was not characterized by a hypochromic anemia.

Three factors seemed to be operative in the production of the hypochromic anemia found in this series of cases: (1) chronic blood loss, (2) lowered gastric acidity and (3) inadequate intake of iron. With three or four exceptions, all patients were shown to have either increased menstrual loss of blood or bleeding from the intestinal tract (hemorrhoids, hookworm infection, rectal stricture or peptic ulcer). Gastric analysis made on 10 of the subjects revealed either achlorhydria

12 Frostig J F and Spies T D. The Initial Nervous Syndrome of Pellagra and Associated Deficiency Diseases. *Am J M Sc* 190 268 (Feb) 1940.

13 Williams R D and Mason R L. Further Observations on Induced Thiamine Deficiency and Thiamine Requirement of Man. *Proc Staff Meet Mayo Clin* 16 433 (July 9) 1941.

14 Evelyn K A. A Stabilized Photoelectric Colorimeter with Light Filters. *J Biol Chem* 115 63 (Aug) 1936.

15 Wintrobe M M. *Clinical Hematology*. Philadelphia: Lea & Febiger 1942 p 58.

16 Moore Carl V, Minnich Virginia and Welch Jo. Studies in Iron Transportation and Metabolism. III. The Normal Fluctuations of Serum and Easily Split off Blood Iron in Normal Individuals. *J Clin Investigation* 18 543 (Sept) 1939.

17 Patek A J Jr, Post Joseph and Victor Joseph. Riboflavin Deficiency in the Pig. *Am J Physiol* 133 47 (May) 1941.

18 György, Paul, Robscheit Robbins, Frieda S and Whipple G H. Lactoflavin Increases Hemoglobin Production in the Anemic Dog. *Am J Physiol* 122 154 (April) 1938.

19 Ellenberg Max and Pollack Herbert. Pseudo Ariboflavinosis. *J A M A* 119 790 (July 4) 1942.

20 Heath C W and Patek A J Jr. The Anemia of Iron Deficiency. *Medicine* 16 267 (Sept) 1937.

21 Murphy R G and Damargian Edward. Riboflavin Deficiency with Idiopathic Hypochromic Anemia. *Rhode Island M J* 23 114 (July) 1940.

22 Fouts Helmer and Lepkovsky T, Borson and Mettler S, Wolf and Seidel A, McKibbin Schaefer Frost and Elvehjem S.

23 Fouts Helmer and Lepkovsky T, McKibbin Schaefer Frost and Elvehjem S.

24 Moore C V, Doan C A and Arrowsmith W R. Studies in Iron Transportation and Metabolism. II. The Mechanism of Iron Transportation. *J Clin Investigation* 16 627 (July) 1937.



or hypochlorhydria in all but 1 instance. This lack of gastric acidity undoubtedly diminished the ionization and subsequent absorption of food iron.<sup>25</sup> Analysis of the diets eaten by patients of the Hillman Clinic have shown them to be low in iron.<sup>9</sup> It seems justifiable, therefore, to conclude that hypochromic anemia has no special pathogenic relationship to any of the types of vitamin B deficiency recognized to date in man and that when it occurs in association with these deficiencies it has resulted from combinations of such factors as blood loss, hypochlorhydria and poor food intake.

#### RESPONSE TO IRON THERAPY OF PATIENTS WITH HYPOCHROMIC ANEMIA AND DEFICIENCY DISEASE

The second part of this study concerns the response of 10 patients with hypochromic anemia and deficiency disease to the oral administration of iron alone. No other medication was permitted, vitamins of the B complex were rigidly avoided and the subjects were instructed to make no changes in their diets. The usual therapeutic doses of ferrous salts were given (exsiccated ferrous sulfate 0.8 Gm daily) except in 2 instances (cases 3 and 6) when, for purposes of a separate investigation, the dose of ferrous sulfate was limited to 0.16 Gm daily during the first twenty-one days. Data indicating the effectiveness of therapy are summarized in table 1. A reticulocyte peak of 6 per cent or more was observed in each case on the seventh to the fourteenth day of iron administration. The 6 patients with an initial hemoglobin value of 7.8 Gm or less showed a daily rise in hemoglobin of from 0.13 Gm to 0.22 Gm per hundred cubic centimeters except in 1 young girl (case 4) with fever from a chronic pelvic infection, and it is well known that fever and infections interfere with the effectiveness of anti-anemic substances. Her daily rise in hemoglobin during a fifty-four day period was only 0.1 Gm per hundred cubic centimeters. The average daily increase in the 6 cases was 0.163 Gm, or 1.06 per cent (15.4 Gm considered as 100 per cent) for each 100 cc of blood. This figure compares favorably with the average rise of 1.175 per cent previously reported for ferrous sulfate.<sup>26</sup> For the 4 subjects with an initial hemoglobin above 7.8 Gm, the rate of hemoglobin increase was somewhat slower—0.087 Gm, or 0.565 per cent per hundred cubic centimeters a day. This average was lowered considerably by a woman (case 10) with rectal stricture who had diarrhea during most of the observation period. Even so, the rate is comparable again to the reported figure of 0.65 per cent.<sup>26</sup> It may be concluded, therefore, that the oral administration of ferrous sulfate to these 10 patients was therapeutically effective in bringing about satisfactory hemoglobin regeneration.

During the period of iron therapy, the lesions of the deficiency diseases usually remained relatively stationary. In a few instances there was slight improvement, particularly in the cutaneous lesions of patients with pellagra, but to no greater degree than is frequently seen near the end of the summer in the Nutrition Clinic of the Hillman Hospital. In several instances the lesions became worse. However, after these observations had been completed specific vitamin therapy with niacin, riboflavin or thiamine never failed to correct the clinical manifestations of the deficiency.

Case 3 in table 1 will be presented in detail.

CASE 3—A woman aged 38, a native of Alabama had experienced her first attack of pellagra at the age of 24. Since then she had had at least mild symptoms of deficiency disease nearly each year. She was observed carefully in the clinic during the summer of 1939, at which time she had (1) tenderness of the muscles of her legs with severe burning of the soles of her feet and skin over her face, neck, arms and legs, (2) nervousness and emotional instability, (3) cheilosis, (4) burning sublingually and of her tongue and (5) a fiery red edematous tongue. Her mouth felt 'scalded' and even water was difficult to drink. The consequent difficulty in eating accentuated the inadequacy of her already poor diet. Riboflavin, administered first, corrected the cheilosis but failed to influence the other signs and symptoms. When thiamine hydrochloride was also given the paresthesias disappeared, her appetite improved and her emotional instability was less evident, but the glossitis persisted. Finally niacin was given and her mouth symptoms improved. Vitamin therapy was discontinued after several weeks.

When she reported again in 1940, the glossitis, cheilosis and paresthesias had returned. She had a "glimmer in front of

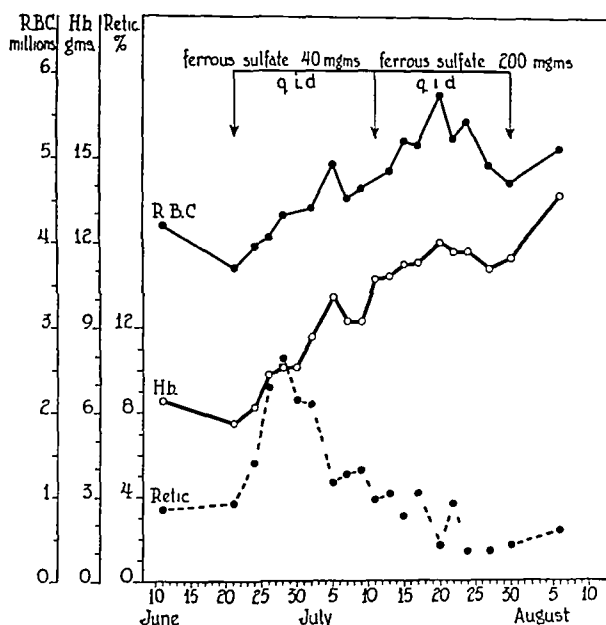


Chart 1 (case 3)—Response to iron therapy of a patient with hypochromic anemia, niacin deficiency, ariboflavinosis and multiple neuritis.

her eyes" and felt at night as if something was obstructing her vision. Fatigue was pronounced. She also complained that her finger nails were brittle and stated that, while her menses began regularly at twenty-eight to thirty day intervals, the menstrual flow was excessive and frequently lasted for two to three weeks.

Physical examination was essentially negative except for the cheilosis, glossitis and pigmentation of the skin of both arms and legs. Pelvic examination showed only an old laceration of the cervix. Reflexes were physiologically active. Laboratory studies revealed a hypochromic microcytic anemia with an erythrocyte level of 3,960,000 cells and a hemoglobin value of 5.9 Gm. Her red cells were microcytic (51 cubic microns) and hypochromic (mean corpuscular hemoglobin concentration of 28 per cent). The Kahn reaction was negative.

On June 21, 1942 she was given ferrous sulfate 40 mg four times a day. One week later a characteristic pellagrous dermatitis made its appearance on both ankles. Meanwhile, a reticulocyte response developed, a peak value of 10.6 per cent was reached on the eighth day (chart 1). After three weeks on this relatively small amount of iron the dose was increased to 200 mg of ferrous sulfate four times a day. The red blood cell count returned to normal and the hemoglobin level rose to 13.7 Gm, a daily increase of 0.2 Gm per hundred cubic centimeters of blood. Coincident with the improvement in

25 Moore C V, Arrowsmith W R, Welch Jo and Minnich Virginia. Studies in Iron Transportation and Metabolism. IV. Observations on the Absorption of Iron from the Gastrointestinal Tract. *J Clin Investigation* 18: 553 (Sept) 1939.

26 Conferences on Therapy. Treatment of Blood Disorders. I. Iron Therapy. *J A M A* 114: 2207 (June 1) 1940.

her anemia, her appetite became better, most of the fatigue disappeared and paresthesias were less troublesome. However, the glossitis, dermatitis of the ankles and cheilosis persisted throughout the whole observation period.

can absorb iron and utilize it effectively to build new hemoglobin, they do not eliminate the possibility that yeast might enhance the therapeutic response to iron. Accordingly, 4 patients were given iron alone for four-

TABLE 1—Effectiveness of Iron Therapy in Patients with Iron Deficiency Anemia and Deficiency of the Vitamin B Complex

Case	Patient	Manifestations of Vitamin Deficiency	Vitamin Apparently Deficient	Age Years	Results of Therapy							Comment
					Daily Dose of Ferrous Sulfate Gm	Day of Therapy	Erythrocytes Millions	Hemoglobin Gm per 100 Cc	Av Daily Hemoglobin Increase Gm per 100 Cc	Reticulo-cytes, per Cent	Cell Volume per Cent	
1	A B	Glossitis dermatitis	Niacin	28	0.8*	0	3.41	6.1	0.13	2.0	25	Iron taken only for 21 days
						7	4.18	7.6		8.7		
						30	4.21	10.7		1.8		
2	C B	Glossitis dermatitis	Niacin	33	0.8	0	4.49	7.8	0.16	2.2	29	Increased menstrual blood loss
						11	4.11	8.6		6.7		
						20	4.89	11.0		2.8	29	
						14	5.00	12.1		1.7		
3	B F	Glossitis, dermatitis cheilosis	Niacin riboflavin	38	0.16 for 21 days 0.8 thereafter	0	3.96	5.9	0.0	1.7	21	Profuse menstrual flow
						8	4.72	7.6		10.6		
						27	5.17	11.1		4.2	40.5	
						17	5.11	13.7		2.4		
4	E M J	Glossitis dermatitis cheilosis	Niacin riboflavin	20	0.8	0	4.18	7.8	0.10	0.9	33	Fever from chronic pelvic infection
						9	4.18	8.3		8.4		
						51	4.91	11.1		1.2	44	
5	U G	Dermatitis cheilosis	Niacin riboflavin	27	0.8	0	4.40	8.8	0.08	0	30.7	Profuse menstrual flow
						7	4.37	9.2		12.0		
						9	5.12	11.8		2.3		
6	R W H	Glossitis polyneuritis	Niacin thiamine hydrochloride	31	0.16 for 21 days 0.8 thereafter	0	3.51	7.1	0.17	0.6	23	Profuse menstrual flow
						14	3.88	8.4		9.4		
						29	4.70	12.1		1.4	40	
7	E R	Cheilosis	Riboflavin	2	0.8	0	4.30	8.9	0.10	1.9	31.5	Profuse menstrual flow myoma
						11	4.63	10.7		1.2		
						28	4.87	11.6		2.8	40	
8	L G	Cheilosis shark skin appearance of skin of nose	Riboflavin	53	0.8	0	4.41	8.7	0.10	2.1	3	
						31	5.37	1.8		2.0	4	
9	D S	Cheilosis	Riboflavin	41	0.8	0	4.92	7.6	0.22	2.1	31	Profuse menstrual flow
						10	4.07	9.6		6.0		
						21	5.02	1.2		2.5	42	
10	A W	Multiple neuritis	Thiamine hydrochloride	35	0.8	0	3.79	7.9	0.00	2.0	29	Profuse menstrual flow rectal stricture took iron irregularly
						14	3.73	8.0		7.7		
						50	3.91	10.5		1.9	31	

\*Ferrous sulfate used was exsiccated

TABLE 2—Effectiveness of Iron Supplemented with Brewers' Yeast in the Treatment of Hypochromic Anemia and Deficiency of the Vitamin B Complex

Case	Patient	Manifestations of Vitamin Deficiency	Vitamin Apparently Deficient	Age Years	Type of Iron Salt Taken	Results of Therapy							Comment
						Daily Dose Gm	Day of Therapy	Erythrocytes Millions	Hemoglobin Gm per 100 Cc	Av Daily Hemoglobin Increase Gm per 100 Cc	Reticulo-cytes, per Cent	Cell Volume per Cent	
11	V C	Dermatitis multiple neuritis	Niacin thiamine hydrochloride	29	Ferrous gluconate	1.2	0	7.9	7.0	0.17	2.0	26	Occult blood in stools. Intermittent diarrhea. no parasite ova found
					Brewers' yeast added after 14 days	7.0	15	4.08	8.3		6.2		
							24	4.70	10.6		7		
							31	4.81	11.7		1.4	44	
12	I L	Glossitis cheilosis	Riboflavin niacin	67	Ferrous gluconate	1.2	0	3.70	6.0	0.17	2.0	21	Bleeding from hemorrhoids
					Brewers' yeast added after 14 days	7.0	9	3.80	7.4		6.7		
							15	4.03	7.5		5.9		
							24	4.41	10.0		7.6		
							3	4.69	11.9		1.0	29	
13	A H	Dermatitis glossitis	Niacin	44	Ferrous gluconate	1.2	0	4.30	9.4	0.11	1.6	22	Increased menstrual blood loss
					Brewers' yeast added after 14 days	7.0	9	5.10	11.0		6.6		
							10	5.27	11.3		2.4		
							20	5.91	12.7		1.6		
							30	6.42	13.2		2.4	42	
14	I McD	Cheilosis	Riboflavin	41	Ferrous gluconate	1.2	0	4.50	9.3	0.018	2.6	33	
							9	4.69	9.6		4.6		
					Brewers' yeast added after 14 days	7.0	10	4.90	10.2		1.4		
							27	5.70	11.7		9.2		
							33	5.18	11.2		0.4	44	

#### THERAPEUTIC EFFECTIVENESS OF IRON SUPPLEMENTED WITH YEAST IN PATIENTS WITH HYPOCHROMIC ANEMIA AND DEFICIENCY OF ONE OR MORE OF THE B COMPLEX VITAMINS

While the foregoing observations establish the fact that patients with hypochromic anemia and a concomitant deficiency of one or more vitamins of the B complex

teen days and immediately thereafter iron supplemented with brewers' yeast for an additional fourteen days. This was done for two reasons. If the yeast increased the effectiveness of iron therapy then (1) a second reticulocyte response should occur during the second therapeutic period and (2) the rate of hemoglobin regeneration should be more prompt than when iron alone was given.

Data on these 4 patients are presented in table 2. Iron was given as 13 Gm of ferrous gluconate daily. Brewers' yeast<sup>27</sup> was administered in 25 Gm doses three times a day. No secondary reticulocyte rise developed following the addition of yeast, and the average daily hemoglobin increase was not greater than in those patients to whom iron alone was given (table 1). The average rate for the 2 subjects with initial hemoglobin values below 7.8 Gm was 0.17 Gm, or 1.1 per cent per hundred cubic centimeters of blood a day, and for the 2 with initial levels above 7.8 Gm, 0.099 Gm, or 0.064 per cent a day. There was, therefore, no evidence that the brewers' yeast had any additive effect in promoting a more rapid hemopoietic response.

The clinical abstract of case 11 (table 2) follows:

CASE 11—V. C., a housewife aged 29, a native of Alabama, felt well until the summer of 1940, when she "passed stomach worms" in her stool. She complained of fatigue, occasional bouts of fever and diarrhea. She delivered her third child in January 1942. During the last several months of her pregnancy she noticed shortness of breath, unusual weakness, soreness of her tongue, vertigo, burning and aching of her eyes and anorexia. These symptoms persisted after her pregnancy had been terminated and she began to lose weight. On several occasions she noted that her stools were black. There was constipation and a nocturia of two to three times. In May a pellagrous dermatitis appeared on her arms and hands. Her diet contained no green vegetables, no fresh fruit, no milk, no meat except salt pork and only an occasional egg. There had been no menstrual irregularities.

On physical examination the patient was pale and well developed. Her skin was dry and pigmented on her neck, face and arms. A scaly pellagrous dermatitis was present on the arms and legs. The tongue was pale slick and atrophic. There were no fissures at the angles of her mouth. The head and neck otherwise were normal, as were also her chest and abdomen. The heart was not enlarged, sounds were of good quality and no murmurs were present. The blood pressure was 100 systolic and 70 diastolic. The pulse was regular with a rate of 72. Reflexes were physiologically active and equal.

Laboratory studies showed 3,790,000 red blood cells, hemoglobin value 7 Gm, hematocrit 26 per cent and reticulocytes 2 per cent. Erythrocytes were microcytic (67 cubic microns) and hypochromic (27 per cent mean corpuscular hemoglobin concentration). The urine was normal except for a trace of albumin. The Kline reaction was negative. The stools contained occult blood, but no parasites or their ova were found.

From July 13 to Aug. 6, 1942, she was given 0.325 Gm of ferrous gluconate four times a day. On the ninth day a reticulocyte peak of 6.2 per cent was reached. Twenty-five Gm of brewers' yeast taken three times a day was added as a supplement to the iron on July 17. No secondary reticulocyte increase was noted. The red blood cell count and the hemoglobin level rose to 4,810,000 and 12.7 Gm respectively. With iron alone the patient's anorexia and some fatigue disappeared, but the dermatitis did not disappear until July 31, fifteen days after yeast had been added.

These results indicate that brewers' yeast does not add to the effectiveness of iron therapy for hypochromic anemia. It is felt that much of the desire to combine other substances like copper, liver and brewers' yeast with iron for the treatment of hypochromic anemia in adult patients has resulted because iron is frequently used in the treatment of anemias which are not hypochromic. Hypochromia is the one readily detectable evidence of iron deficiency, and iron has therapeutic value only when a state of iron deficiency exists.<sup>28</sup> It has never been shown to be effective in the treatment of normochromic anemias with or without supplements.

We have never seen an adult patient with hypochromic anemia who would not respond satisfactorily to iron alone unless fever, infection or a severe diarrhea was also present.

#### SUMMARY AND CONCLUSIONS

1. Thirty-two patients with hypochromic anemia were observed in whom niacin deficiency, ariboflavimosis or multiple neuritis was also present. Fifteen of these subjects had lesions of more than one type of deficiency disease. There was no tendency for hypochromic anemia to occur specifically in association with any one of these three deficiency states.

2. If pyridoxine deficiency occurred among the patients in the Nutrition Clinic of the Hillman Hospital it was not accompanied by hypochromic anemia with high serum iron levels.

3. Iron therapy alone produced a satisfactory reticulocyte response and rate of hemoglobin generation.

4. Brewers' yeast had no demonstrable effect in increasing the efficacy of iron therapy.

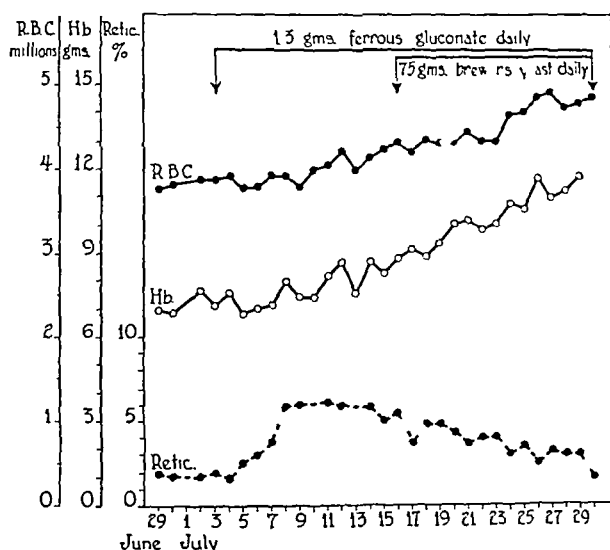


Chart 2 (case 11)—Effects of iron and brewers' yeast on a patient with hypochromic anemia, niacin deficiency and multiple neuritis.

5. The degree and type of vitamin B complex deficiency seen among these patients did not detectably interfere with iron absorption and utilization.

#### ABSTRACT OF DISCUSSION

DR WILLIAM DANESHEK, Boston: The paper is one of the first to debunk the vitamins. Vitamin therapy has become almost an obsession. Almost every case of anemia and almost any other condition which might be mentioned is now being treated with vitamins. To have Dr. Moore show that the vitamin B complex is not essential in the treatment of hypochromic anemia represents one of the first steps to make the pendulum swing the other way. Iron, liver extract and the vitamin B complex are essentially intracellular enzymatic materials which have to do with oxidation-reduction mechanisms within the body cells. Deficiencies in iron, liver extract and vitamin B complex may result in similar objective phenomena relating to the skin, the tongue, the corners of the mouth and the fingernails. Cheilosis is considered by some to be pathognomonic of riboflavin deficiency, although I believe this is an exaggeration. About twelve years ago when we reported our cases of chronic "idiopathic" hypochromic anemia, we directed attention to lesions at the corners of the mouth then called "la perleche". A deficiency in various types of intracellular enzymatic substances (fractions of the vitamin B complex) may produce changes at the mucocutaneous junctions at the corners of the mouth. I should like to know if Dr. Moore has any "yardsticks" by which

<sup>27</sup> The brewers' yeast powder contained 0.18 mg of thiamine, 0.06 mg of riboflavin and 0.4 mg of niacin per gram.

<sup>28</sup> Pound Table Discussion on the Therapeutics of Anemia. *J. Pediat.* 17: 547 (Oct.) 1940.

to tell whether patients with cheilosis actually have ariboflavinosis or some other deficiency. It is certain that some persons not only have a vitamin B complex deficiency but an iron deficiency as well. Doctors frequently ask "Since combined deficiencies are common, why not give a combination of the various drugs?" I always like to combat that. I like to reserve liver extract for pernicious anemia (liver extract deficiency), vitamin B complex for vitamin B deficiency and iron for hypochromic anemia. The vitamin B complex, as Dr. Moore and his collaborators pointed out, has apparently nothing to do with iron deficiency. If one has a case of chronic hypochromic anemia it should be treated with adequate doses of iron. The addition of vitamin B complex has been without value, in my experience.

DR. CARL V. MOORE, St. Louis. What Dr. Dameshek has said about the difficulties of diagnosing riboflavin deficiency is correct. It so happened that, during a part of the time that these studies were being made, determinations of riboflavin were made on samples of blood and muscle obtained from some of the patients. These determinations did not make the diagnosis more definitive. Therefore we are forced to stay in support of the diagnosis of riboflavin deficiency in these people who had cheilosis that (1) their cheilosis was not improved when they were given iron alone and that (2) their cheilosis did disappear when subsequently they were given adequate therapeutic doses of riboflavin. I realize how unsatisfactory it is to make a diagnosis of a disease on the basis of response to therapy, but at the present time, it seems to me, therapeutic response is the best criterion we have for substantiating the diagnosis of riboflavin deficiency.

## EPIDEMIC KERATOCONJUNCTIVITIS

### CLINICAL AND EXPERIMENTAL STUDY OF AN OUTBREAK IN NEW YORK CITY

#### FURTHER OBSERVATIONS ON THE SPECIFIC RELATIONSHIP BETWEEN A VIRUS AND THE DISEASE

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Information concerning epidemic keratoconjunctivitis has, for the most part, been limited to clinical descriptions. Because the incidence of the disease in the United States has increased rapidly since its appearance in California two years ago, further information on the status of the etiologic agent and its mode of spread is desirable.

Initial efforts in this direction were made when, early in 1942, a few cases were observed in New York City and a virus was isolated.<sup>1</sup> The present investigation deals with 80 cases examined and treated at the office of a local ophthalmologist. These cases were studied from the clinical, epidemiologic and experimental aspects.

#### CLINICAL ASPECTS

While epidemic keratoconjunctivitis is certainly a distinct clinical entity, and while it has a well defined symptomatology in fully developed cases, it should

be stressed that the beginning signs and symptoms are often indefinite and vary so greatly that in the early stages the disease may be easily confused with other acute eye diseases, especially acute conjunctivitis. Since the onset is so variable, it is suggested that the possibility of epidemic keratoconjunctivitis be considered in any case of acute conjunctivitis which does not show improvement after ten days (especially if there is little or no secretion present).

In the group of cases under discussion, the signs and symptoms which were the basis for diagnosis were as follows. Initially there was a hyperemia and swelling of the palpebral conjunctiva. Very often the conjunctiva resembled that seen in ordinary follicular conjunctivitis. At this stage the patient complained of irritation, a "sandy feeling" as if a foreign body was present, and tearing. After twelve to thirty-six hours the bulbar conjunctiva also became congested and hyperemic, and varying degrees of edema of the lids (particularly of the upper lid) were often present. Occasionally the amount of edema was so extreme that it was difficult to open the eyes for inspection. In a small number of cases pseudomembranes appeared, usually on the conjunctiva of the lower lid. When these pseudomembranes were removed with a swab, bleeding points were revealed.

The intensity and sequence of appearance of the objective signs mentioned varied greatly in the cases studied. It must be stated that the initial symptoms had no bearing on the duration or intensity of the disease. As a matter of fact eyes which showed violent symptoms in the beginning occasionally cleared up fairly rapidly and without resultant visual impairment.

In addition to the clinical picture described, two conditions were so often present that together they were considered pathognomonic for epidemic keratoconjunctivitis in this study.

1. There was practically no discharge from the conjunctiva.

2. Shortly after the onset of the inflammation of the conjunctiva a swelling of the preauricular nodes appeared. Occasionally the submaxillary and cervical nodes also were enlarged.

In 34 of the 80 cases, i. e. 42.5 per cent, the second eye became involved after a varying period of time. As a rule the course of the disease in the second eye was much shorter and the inflammation considerably less than in the first eye.

**Corneal Involvement**—This was a frequent and serious complication. It occurred in many cases without any signs of pain or photophobia or other subjective or objective warning. Corneal infiltrations developed in 42 of 80 cases, or 52.5 per cent. The time interval between the onset of the disease and the involvement of the cornea varied between five and thirty-eight days, with an average period of fourteen days. Usually the first sign of corneal involvement was the appearance of several tiny punctate infiltrates of the cornea in the subepithelial layer. In no case did abrasions, superficial ulcers or lesions of the surface epithelium occur at the points where the infiltrates later developed. The corneal epithelium was always intact and did not stain with fluorescein. In the majority of cases the corneal infiltrates were located on the exposed part of the cornea, i. e. within the confines of the palpebral fissure, and usually in the pupillary area.

It has been asserted by some observers that an eye affected with epidemic keratoconjunctivitis should be closed in order to prevent the development of erosions.

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From the Departments of Ophthalmology and Bacteriology, Columbia University College of Physicians and Surgeons and the Institute of Ophthalmology, Presbyterian Hospital.

This investigation was carried on in informal collaboration with the Commission on Neurotropic Virus Diseases, Board for the Investigation and Control of Influenza and Other Epidemic Diseases in the Army. 1. Sanders, Murray. Epidemic Keratoconjunctivitis. Arch. Ophth. 28: 581 (Oct.) 1942. Sanders, Murray, and Alexander, R. C. J. Exper. Med. 77: 71 (Jan.) 1943.

or of superficial ulcers and consequently of corneal infiltrates. Following this suggestion, the eyes of a considerable number of patients were kept covered for a long period of time, but this did not prevent the development of corneal lesions. Once the cornea became involved, the opacities failed to absorb to any considerable degree and were present after a period of six months. For this reason it seems likely that in most of the cases observed in this series, unlike those studied elsewhere,<sup>2</sup> absorption of corneal opacities may not take place.

In spite of the fact that corneal opacities were present, however, many of the patients still enjoyed 20/20 vision. However, in 14 of the 42 cases with corneal involvement impairment of vision from 5 to 15 per cent was observed. The degree of impairment of vision in these cases was distributed as shown in table 1. This evaluation of visual impairment was possible because records of patients' vision both before and after the disease were available, and routine visual examinations were carried out at the patients' first visits.

**Systemic Manifestations**—Since in previous experience with epidemic keratoconjunctivitis an occasional patient had complained of systemic symptoms, an attempt was made to determine as exactly as possible what systemic symptoms, if any, were manifested by the patients in this investigation, and whether these manifestations were related to the ocular disease. Careful questioning of each patient revealed that headache and "night pain," fever and malaise were more or less common.

By far the most common symptom was the headache which 49 patients (61.2 per cent) described. As a rule, the headache was moderately severe and was not relieved by analgesics. The most frequent description was of a dull pain extending over the fronto-occipital areas. The headache, which appeared shortly after the onset of conjunctivitis, lasted two to three days in "moderate" cases and about four days in "severe" cases. The 9 patients with severe headaches, and 4 of the patients with moderately severe headaches, could not sleep because of this symptom and consequently described it as a "night pain." The patients felt quite certain that the headaches were associated with the keratoconjunctivitis.

The extent to which other symptoms were present is seen from the following data. Five patients reported that they had been definitely feverish shortly after the onset of the conjunctivitis, but no record of rise in temperature was kept by either patient or physician. Twelve patients apparently suffered from moderate malaise and 14 from severe malaise, making a total of 26 cases, or 32.5 per cent. All these patients were quite definite in their statements and described the symptom as "not feeling well" or having an "achy feeling."

Preauricular lymph node enlargement is a diagnostic criterion of epidemic keratoconjunctivitis, but because of its relationship to systemic involvement and immune response it may be considered with the systemic manifestations. In the present series only 5 patients did not have distinctly palpable regional nodes at the time they were seen by the examining physician. The enlargement and tenderness of the nodes persisted from one week to several months after the onset of the

conjunctivitis. In 56 cases (70 per cent) there was moderate enlargement and the node diameters varied from approximately 1 to 1.5 cm. In these cases involvement was generally limited to the preauricular glands. In addition, definitely enlarged glands with diameters of approximately 2 cm were present in 17 cases. Other regional lymph channels were commonly involved when the preauricular gland was very large and in most of the latter 17 cases the submental and cervical nodes also were palpable. It was in this group that malaise was most common.

It might be well to point out at this time that 3 patients who had severe systemic symptoms had a mild ocular disease. On the other hand 19 patients had both severe systemic and severe ocular symptoms. It should be noted that no patient had a severe ocular disease without accompanying systemic symptomatology.

**Disability and Course of the Disease**—Disability varying from one to eight weeks was suffered by 57 patients (71.2 per cent). In table 2 the loss of time from work is shown; these figures do not, of course, reveal the loss of efficiency, which in many cases was present for periods longer than those indicated.

TABLE 1—Degree of Impairment of Vision

Degree of Visual Impairment	Number of Cases
5 per cent	3
10 per cent	3
15 per cent	6

TABLE 2—Loss of Time from Work

Disability in Weeks	Number of Patients
0	23
1	5
2	15
3	10
4	10
5	8
6	2
8	1
Total	89 cases

It is of interest to note that, of the 57 patients who suffered disability, 24 had no corneal involvement. More than half of this group of 24 (16 patients) were kept from work because of systemic reactions and general discomfort which could be traced to the eye. The remaining 8 patients were kept from work only because of ocular discomfort. The majority of patients who suffered one or two weeks' disability is to be found in the group who complained of systemic symptoms without corneal involvement (15 of 20 patients), whereas those patients (27 of 37) who lost three, four, five, six or eight weeks from work had, for the most part, severe corneal involvement.

In general we appeared to be dealing with a moderately severe outbreak as judged by disability, systemic involvement and ocular symptomatology. In this respect it should also be noted that 28 patients developed a bilateral keratoconjunctivitis, the second eye of 21 of the 28 patients (75 per cent) became involved within a three to seven day period after the appearance of symptoms in the first eye.

It was impossible to compute the mean duration of epidemic keratoconjunctivitis in the present study because many of the patients are still under observation, and others did not return to the physician's office when they felt better or when they returned to work.

<sup>2</sup> Hogan M J and Crawford J W. *Am J Ophthalm* 25: 1059 (Sept.) 1942. Rieke F E. *Epidemic Conjunctivitis of Presumed Virus Causation*. J. A. M. A. 119: 942 (July 18) 1942.

**Treatment**—It was found that strong antiseptic solutions did more harm than good. A mild solution of boric acid or a mild solution of zinc sulfate gave temporary subjective relief. Large doses of sulfathiazole and sulfadiazine given orally, and sulfathiazole applied locally, had no effect. Intradermal injection of tuberculin did not hasten the absorption of corneal infiltrations.

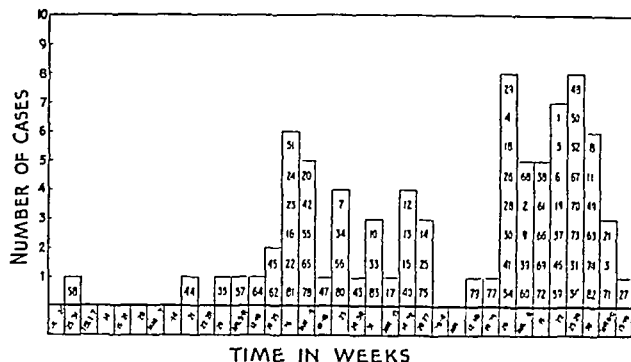


Chart 1—Incidence of epidemic keratoconjunctivitis. Each number represents a patient.

The routine procedure which appeared to give some relief consisted of cold compresses applied locally and mild solutions of boric acid or zinc sulfate instilled in the eye after each compress. Ethylmorphine hydrochloride 0.5 to 2 per cent for local use on the eye was prescribed routinely in order to bring about absorption of the corneal opacities. In addition to this local treatment, riboflavin was given by mouth, usually 15 mg a day. As stated previously, no noticeable absorption resulted in any case.

#### EPIDEMIOLOGIC ASPECTS

In analyzing the cases which constituted the present outbreak, the first observation of possible significance was that the initial case was observed in the office on Jan. 27, 1942, with a history of keratoconjunctivitis of three days' duration. This appeared to be a mild case, without corneal involvement. The acute phase lasted until February 17 when the patient was considered 'cured' and was discharged. In spite of the apparent mildness of the infection, the ocular discomfort and headaches were sufficiently pronounced so that the patient did not work for two weeks. As can be seen from chart 1, the next 4 cases occurred in a rather sporadic fashion, and it was not until fourteen weeks after the appearance of the first case that a distinct increase in the incidence of the disease was noted, with 6 new cases appearing during the week of April 26 and 5 new cases in the week of May 3. From that point on, the incidence of epidemic keratoconjunctivitis among patients in this study fluctuated. It reached a peak during the month of August, and at this point the aid of the Ophthalmological Institute of Presbyterian Hospital was enlisted. The incidence then fell rapidly to only 1 new case during the week of September 13. No new cases have developed in the office practice since that date.

Since it was noted that epidemic keratoconjunctivitis appears in shipyards and industrial centers, an effort was made to classify the patients according to occupations. It was found that there was a wide variety of occupations (table 3). Although the same industrial company is apparently represented frequently, the individual cases were scattered in subplants and branch offices throughout the city, and, as far as could be

determined, the patients had absolutely no contact with one another outside the physician's office.

Further investigation revealed that only 10 of the 80 patients (12.5 per cent) had come to the office because of epidemic keratoconjunctivitis. The other 70 patients originally complained of foreign bodies, ocular abrasions and wounds (usually of the cornea), acute or subacute conjunctivitis and corneal ulcers. Seven cases fell into a miscellaneous group of symptoms which included thrombosis of the central vein, chalazion, subacute conjunctival hemorrhage, allergic acute conjunctivitis and lime burn. As can be seen from table 3, the various original pathologic conditions were fairly well distributed throughout the different occupations.

It appears that preceding trauma or inflammation may predispose an eye to the subsequent attack of epidemic keratoconjunctivitis, but it is obvious that these conditions are not the only factors involved, since even during the epidemic period only a small proportion (average 10 per cent for any one month) of patients treated at the office for ocular trauma or inflammation developed epidemic keratoconjunctivitis.

The epidemiologic data have been presented because little or no definite information is available concerning the mode of spread of epidemic keratoconjunctivitis. It is interesting to note, however, a possible significant sequence of events in connection with certain patients in this study.

Patient 58, the first one with epidemic keratoconjunctivitis seen, appeared in January. Analysis of the visits of patient 58 revealed an overlapping with the visits of patient 64, and 64's visits overlapped with those of the patients who next developed the disease, i.e., 44, 22, 57, and 45 (chart 2). It should also be noted that cases 64 and 44 were mild and occurred early in the period before the pronounced increase in incidence, whereas this increase took place shortly after the appearance of two severe cases, 57 and 22.

Another fact which may be interjected at this point is that patient 64, who formed a connecting link

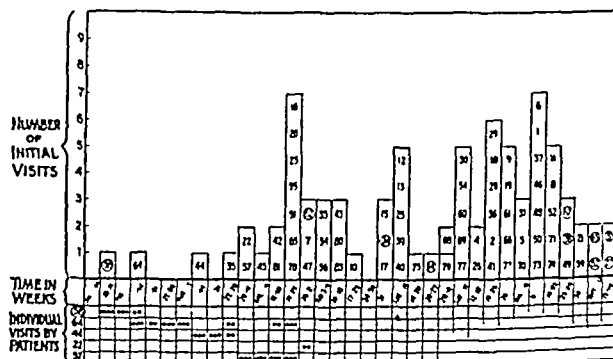


Chart 2—Visits of patients to doctor's office. Each number represents a patient. An encircled number represents a patient who had epidemic keratoconjunctivitis when first seen by the physician. In the lower part of the graph, each dot represents one visit to the office by the patients indicated in the column on the left.

between the original one 58 and the patients who next contracted the disease, did not develop epidemic keratoconjunctivitis until nine weeks after his appearance at the office. Did he then harbor the virus without evidence of infection and serve as a possible focus of infection for others or did he merely become

3. Patient 35 (chart 1) is not included in this sequence of those whose visits overlapped because this patient did not return to the office after the diagnosis of epidemic keratoconjunctivitis was made.

infected at a later date? For the present the answers to this and other questions must remain entirely in the field of speculation. As far as can be determined, hygienic procedures were followed at the office, so that, presumably, contaminated hands did not touch fresh patients. Therefore it is not possible to determine the exact mode of spread of the disease in the present instance.

In spite of this limited information, the present epidemiologic data may be of value in two respects.

1 It is obvious that physicians who see patients with ocular inflammation should continue to observe meticulous hygienic precautions since they are manifestly dealing with a large number of individuals who may be susceptible to epidemic keratoconjunctivitis, although just what the individual predisposing factors are remains to be determined.

2 From an analysis of patients' visits, it is obvious that early diagnosis of epidemic keratoconjunctivitis

described elsewhere. One series of tissue cultures were kept at 37 C for three days and one series at room temperature for nine to ten days. At the end of the periods designated, groups of 6 mice were injected with tissue culture material intracerebrally (0.03 cc) and also intraperitoneally (0.1 cc). If this first passage from tissue culture to mouse was negative or questionable, i. e. if mice did not develop definite symptoms following inoculation, no further attempts were made toward the isolation of a causative agent. In other words, the present experiment was a test of how practical the tissue culture technique is for a simple isolation of virus. It should be noted that routine bacteriologic studies of scrapings gave entirely negative results in 2 of the 9 cases and that in the remaining 7 cases there was noted *Staphylococcus albus*, diphtheroids or gram positive bacilli (1 case). Also routine bacteriologic examinations of secretions from eyes of patients were essentially negative.

TABLE 3—Occupations and Original Diagnoses of Patients in the New York Study of Epidemic Keratoconjunctivitis

Employer	Type of Work	Number of Cases	Original Diagnosis					
			Foreign Body	Wound or Abrasion	Conjunctivitis	Corneal Ulcer	Epidemic keratoconjunctivitis	Miscellaneous
Public motor transportation (9 cases)	Bus drivers	4	3		1			
	Motor repairs	4	1	2	1			
		1		1				
Railroad workers (12 cases)	Track workers	1	1					
	Car repairers	3		1	2			
	Car cleaners	2	1	1				
	Baggage car workers	2	1	1				
	Ticket collectors and trainmen	4	2		2			
Public utility workers (10 cases)	Mechanics	8	3	2			3	
	Engine inspectors	1				1		
	Meter readers	1			1			
	Office workers	5		1	2	1	1	
Dock workers (8 cases)	Crane truck operators	4	2	1				1
	Loading ships and trucks	3	1		2			
	Office worker	1	1					
Steel workers (11 cases)	Grinders	3			2			1
	Assemblers	2	1			1		
	Drill operators	1		1				
	Cleaning castings	2	1	1				
	Wire cutters	2	1		1			
	Mechanics	1			1			
Food industry (3 cases)	Truck drivers	1			1			
	Food packers	2		1			1	
Miscellaneous (22 cases)	Store workers, housewives and others	22	3	1	8	1	5	4
Totals		80	27.5%	14.5%	36%	5%	10.5%	6.5%

and isolation of such patients as soon as possible is strongly indicated. This is emphasized by the fact that in the present investigation direct definite transmission of the disease occurred in 3 instances: from a husband to his wife, from a girl to her fiancé and from a son-in-law to his father-in-law.

#### EXPERIMENTAL ASPECTS

The experimental phase of the investigation was divided into two parts. First, an attempt was made to repeat earlier work on the isolation of a virus.<sup>4</sup> Second, additional serologic data were gathered to clarify the relationship between epidemic keratoconjunctivitis and the virus isolated previously.

Virus isolation experiments were carried out with conjunctival scrapings from 9 patients. The scrapings were obtained during the acute phase of the disease and were put into tube-tissue cultures (serum ultrafiltrate and embryonic mouse brain) which have been

Virus was isolated from the 2 specimens of scrapings which had contained no bacteria. In 1 of the 2 cases the 37 C series was negative (produced no symptoms when injected into mice) whereas the tissue culture kept at room temperature evoked symptoms in 2 of 6 animals within three days. Emulsion of the brains of these mice produced symptoms when injected into other mice, and the virus was maintained without difficulty. The virus is now in its fifteenth mouse passage and in its fourteenth tissue culture generation.

In the second case, both the 37 C and room temperature cultures gave positive results: the former bringing down 4 of 6 mice in two to six days and the latter producing symptoms in 3 of 6 mice within a similar period of time. In this instance also the virus was maintained without difficulty. It is now in its thirteenth mouse passage and in its seventh tissue culture generation.

In both instances in which virus was obtained all bacteriologic tests of brain emulsions and of tissue cultures were negative. The virus showed the same filtration activity (i. e. passed through membranes in

<sup>4</sup> Simms, H. S. and Sanders, Murray. Use of Serum Ultrafiltrate in Tissue Cultures for Studying Deposition of Fat and for Propagation of Viruses. Arch. Path. 33: 619 (May) 1942.



the same range of average pore diameter) as the virus isolated previously in New York City from patients not connected with this group. The virus was also neutralized by serums from convalescent patients studied in both this and a previous investigation. These data strongly suggest the identity of the virus isolated in the present study with that observed originally.<sup>1</sup>

The remaining attempts at isolation either were negative or resulted in transient symptoms in mice which could be maintained for only one, two or three mouse passages. The results of this phase of the experimental work were entirely consistent with previous experiments.

It was, of course, necessary to investigate further the specific nature of the isolated agent by testing with

TABLE 4—*Development of Specific Antibodies in Patients with Epidemic Keratoconjunctivitis, Serum Specimen A Taken as Soon as Possible After Onset, and Specimen B Taken Seventeen to Thirty-Four Days after Specimen A*

Patient	Number of Days After Onset of Disease	Serum Virus Titer* (Mouse Test)	Number of Neutralizing Doses
Experiment 1			
Control (normal human serum)		10 <sup>0</sup>	0
No. 79	A 41 days †	10 <sup>-4</sup>	100
	B 59 days	10 <sup>-5</sup>	10 000
Experiment 2			
Control (normal human serum)		10 <sup>-0</sup>	0
No. 66	A 20 days	10 <sup>-4</sup>	10
	B 48 days	10 <sup>-5</sup>	1 000
No. 60	A 21 days	10 <sup>-4</sup>	10
	B 50 days	10 <sup>-2</sup>	1 000
No. 82	A 9 days	10 <sup>-4</sup>	10
	B 26 days	10 <sup>-5</sup>	1 000
No. 67	A 3 days	10 <sup>-4+</sup>	?
	B 34 days	10 <sup>-5</sup>	1 000
No. 68	A 43 days	10 <sup>-4</sup>	10
	B 74 days	10 <sup>-1</sup>	10 000

\* In all cases mortality rather than morbidity was used to determine the mouse titer. The highest dilution of virus which produced symptoms and death in the mice into which it was injected was considered the end point of virus activity.

† Patient 79 had bilateral involvement, the second eye becoming involved twenty days after the onset of the disease in the first eye.

Technic: Constant amounts of undiluted serum were mixed with equal amounts of serially diluted virus. The mixtures were held for one hour at 37° C. and for four hours in the ice box and then injected intraperitoneally (0.1 cc.) into unweaned mice.

convalescent serum. Serums were obtained from as many patients as possible. This could not always be done, however, and specimens were taken from only a relatively small number of patients, i. e. 19 individuals.

In 8 of the 19 cases studied we were able to obtain 2 serum specimens, 1 taken as soon as possible after the onset of the disease and the other taken seventeen to thirty-four days after the first. So far, 6 of these serums have been tested. In these 6 cases the development of specific antibodies has been clearly demonstrated. In 1 instance the first specimen when mixed with virus gave a titer approximating that of the control serum-virus mixture, but in the other cases an appreciable interval had elapsed between the onset of the disease and the time at which the first specimen was obtained, and neutralization varying from 10 to 100 neutralizing doses was therefore observed. The later specimens gave neutralization of from 1,000 to

10,000 doses, showing that a distinct increase in antibodies had occurred. These results are summarized in table 4. It will be noted that some of the patients seemed to respond much more rapidly than other patients, as measured by the number of neutralizing doses which could be demonstrated, but great care must be taken in interpreting the antibody responses, since the present group of patients is small and it is not possible to evaluate the effect of such individual variables as severity or duration of disease. The most important fact is that the first specimens contained one level of neutralizing antibodies, and later serum specimens showed an increase.

In the remaining 11 cases, in which only 1 serum specimen could be obtained the specimen was taken about one month after the onset of the disease and after the acute phase had passed. The serums showed neutralization varying from 100 to 10,000 mouse doses.

The technic in these experiments was similar to that described in a previous report, i. e., constant amounts of undiluted serum were mixed with equal amounts of serially diluted virus to give the final dilutions desired, these mixtures were kept one hour at 37° C. and were then injected intraperitoneally (0.1 cc.) into unweaned mice. In all cases mortality rather than morbidity was used to determine the mouse titer. The highest dilution which produced symptoms and death in the mice into which it was injected was considered the end point of virus activity.

The virus used was that isolated from E. L. (not included in this group of patients) in April 1942.

#### SUMMARY

1 Clinical, experimental and epidemiologic data have been obtained in 80 cases of epidemic keratoconjunctivitis.

2 The following features were found to be diagnostically significant in all cases in this study: hyperemia and swelling of the palpebral conjunctiva, congested and hyperemic bulbar conjunctiva, edema of the lids and occasional pseudomembranes on the conjunctiva of the lower lid. In addition, lymph node involvement and the absence of discharge were found to predominate.

3 Forty-two patients had corneal involvement. There has been no absorption of corneal opacities after a period of five months.

4 Of the 42 cases of corneal involvement 14 (33 1/3 per cent) showed impairment of vision varying from 5 to 15 per cent.

5 The relationship between the ocular disease and systemic symptoms was investigated. 49 patients (61.2 per cent) complained of headaches, 9 patients having severe headaches, 26 patients (32.5 per cent) complained of malaise.

6 In 3 cases severe systemic reactions occurred in the presence of a mild ocular disease. All patients with severe ocular involvement had systemic symptoms.

7 Fifty-seven patients (71.2 per cent) lost from one to eight weeks from work because of epidemic keratoconjunctivitis.

8 Epidemiologic data showed that there appeared to be individual predisposing factors present, but the nature of these factors is not fully understood. Of the 80 cases presented, 70 presented epidemic keratoconjunctivitis subsequent to ocular trauma or inflammation.

9 In two of nine attempts, direct implantation of cultures with conjunctival scrapings yielded a filtrable virus which proved to be apparently identical with that isolated previously

10 The virus which was isolated on these two occasions produced definite symptoms in mice. It was neutralized by convalescent serum from a patient who had suffered from epidemic keratoconjunctivitis and who was not associated with the present group of patients

11 Nineteen convalescent serums from patients in this group were tested. Neutralizing antibodies against the virus varied from 100 to 10,000 mouse doses. The virus used in the neutralization experiments was that isolated in an independent study of epidemic keratoconjunctivitis in New York City

12 In 6 of the 19 cases antibody development was demonstrated. Specimens of serum taken as soon as possible after the onset of the disease were compared with specimens taken seventeen to thirty-four days after the first specimen was obtained. In all cases there was a distinct increase in the titers of the second samples indicating a specific relationship between the virus and epidemic keratoconjunctivitis

#### RECOMMENDATIONS

Because epidemic keratoconjunctivitis is a disease apparently new to continental United States, and because little definite information is available concerning its mode of spread, precautions should be taken to keep it under control. On the basis of the data which have been presented, the following recommendations are made:

1 Physicians should become familiar with the clinical picture of epidemic keratoconjunctivitis, so that an early diagnosis can be made

2 Meticulous cleanliness and disinfection of the hands of physicians and nurses who have come into contact with a case of epidemic keratoconjunctivitis is indicated

3 All instruments should be thoroughly sterilized, and individual droppers and glass rods should be used for each patient

4 All solutions which can be so treated should be periodically boiled

5 Strict isolation of patients with the disease should be effected as soon as possible

6 All contacts of the patients should be observed for early signs of the disease

**Rabies in the United States**—Rabies has a somewhat characteristic distribution throughout the United States. Human cases during the past ten years have averaged 57 annually. Two states, namely Texas and Tennessee, have averaged 51 to 6 cases yearly for ten years, twelve states have averaged 21 to 5 cases annually, whereas sixteen states have been entirely free and four states have had but 1 case during the past ten years. The number of cases in animals is not so readily determined but in general follows the same distribution. Thus, Texas and California have reported an average of more than 1,000 proved cases annually during the past five years, and Tennessee, Georgia, Alabama, Ohio, Indiana, Michigan and Illinois at least 400 to 800. On the other hand, ten states have reported an average of only 1 or less annually.—Webster, Leslie T. Rabies, New York, Macmillan Company, 1942

## Clinical Notes, Suggestions and New Instruments

### TREATMENT OF SEVERE DIABETIC COMA WITH 1,820 UNITS OF INSULIN

CHARLES CABELL BAILEY, M.D., BOSTON

My purpose in this report is to emphasize the need of large doses of insulin in cases of severe diabetic coma. This patient received 1,820 units in seven hours, which is the second largest dose used in a series of 536 consecutive diabetic comas treated in the Joslin service in the New England Deaconess Hospital since May 1923. The greatest quantity, 2,272 units in the twenty-four hours before recovery, was given to a man who had a diabetic coma during a phase of insulin resistance. Joslin,

#### Recovery from Diabetic Coma with 1,820 Units of Insulin Despite a Blood Sugar of 1,232 Mg and a Carbon Dioxide Combining Power of 7 Volumes per Cent

	Time	Crystalline Insulin Units	Carbon Dioxide		
			Blood Sugar Mg	Combining Power Vol %	Blood Pressure
Sept 10 1942	Admitted				
	8 30 p m	50	1,232	7	76/40
	8 50 p m	100 intravenously 100 subcutaneously			40/?
	9 07 p m	100 intravenously 100 subcutaneously			
	9 20 p m	100 intravenously 100 subcutaneously			60/?
	9 50 p m		1,112	7	
	10 00 p m	100 intravenously 100 subcutaneously			72/50
	11 00 p m	200 intravenously 200 subcutaneously	976	6	76/50
	11 20 p m	100 intravenously 100 subcutaneously			
Sept 11 1942	12 30 a m	100	903	6.8	80/50
	2 00 a m	200			76/40
	4 00 a m		528	13	104/60
	7 30 a m		218	21	
	9 15 a m		121		
	11 00 a m		71	36	
	1 00 p m				114/60

Root, White and Marble<sup>1</sup> in treating 536 diabetic comas employed an average dose of about 200 units of insulin in the first two or three hours of treatment. The patient to be described received 1,450 units during his first three hours in the hospital

#### REPORT OF CASE

A man aged 23 with onset of diabetes in 1930 at the age of 11 years was admitted to the New England Deaconess Hospital at 8 30 p m Sept 10, 1942 completely unconscious in diabetic coma

Congenital nystagmus and slight congenital pes cavus were present. His first attack of diabetic coma occurred in 1935, five years after the onset of his diabetes, and he recovered with 270 units of insulin. His second diabetic coma occurred in 1936 and this time he was given 350 units of insulin. Also in 1936 a diabetic cataract was removed from his right eye. His third attack of diabetic coma was in 1939 when he had a gangrenous appendix. An operation was performed during the coma and he recovered with only 145 units of insulin. A right nephrectomy was done in July 1940 because of a large right functionless pyonephrotic kidney.

From the George F. Baker Clinic, New England Deaconess Hospital. Elliott P. Joslin, M.D., medical director.  
1. Joslin, E. P., Root, H. F., White, Priscilla and Marble, Alexander. Diabetic Coma. J. A. M. A. 119: 1160 (Aug 8) 1942.

The present, or fourth, attack of diabetic coma apparently was brought on by disregard of his diet. For three days before admission he was troubled with polydipsia and polyuria, but his appetite remained good. He reported for work on the night shift at 11 p. m. on September 9, at which time he first noticed anorexia and extreme polydipsia. During the night he felt 'groggy,' and nausea began at 5 a. m. on September 10, the day of admission. He vomited first at 5:30 and felt quite ill. Deep breathing or air hunger developed on his way home from work at 8 o'clock. At 8:30 he tried to take his usual injection of 40 units of crystalline and 40 units of protamine zinc insulin, but he felt so 'groggy and sick' that he bent his needle and failed in the attempt. He then lay down on his bed and was found unconscious by his mother at 6:30 p. m., ten hours later. His local physician Dr. Joseph A. Dunn, saw him at 7 o'clock, diagnosed diabetic coma, recognized the seriousness of his condition and gave him 70 units of regular insulin. He was admitted to the Deaconess Hospital at 8:30, one and a half hours later.

On admission he was completely unconscious and almost moribund with feeble gasping respirations at 28 a minute, the deep breathing and air hunger which he later recalled having noticed earlier in the day having disappeared. He appeared in a definite state of shock with a blood pressure of 76 systolic and 40 diastolic, flushed face, very dry tongue and a strong odor of acetone on his breath. The rectal temperature was 92 F and the pulse 94. The skin was dry and cold. The bladder was distended almost to the umbilicus. The liver was palpable 2 cm. below the costal margin. The lungs were clear and the heart was normal in size. The eyeballs were so soft that the tension could not be measured by an ophthalmologist even twelve hours after entrance. Lipemia retinalis was looked for but not found.

Tests for blood sugar and the carbon dioxide combining power of the blood were taken, the patient was covered with several blankets, and four warm water bottles were placed near him one blanket thickness from the body. The urine on admission had already given a red Benedict test and 4 plus diacetic acid and in consequence 50 units of crystalline insulin had been immediately injected.

A preliminary blood sugar report at 8:50 p. m., twenty minutes after entrance, showed that the blood sugar was above 1,000 mg. per hundred cubic centimeters whereupon 100 units of crystalline insulin was given intravenously and another 100 units subcutaneously. By this time the final report was ready and showed that the blood sugar was actually 1,232 mg. and that the carbon dioxide combining power was 7 volumes per cent.

Huge doses of crystalline insulin appeared indicated and therefore within the first four hours he received 1,550 units, 600 of which was given intravenously, the latter because of his poor circulation and obviously poor chance for its quick absorption. By the end of five and a half hours of hospital treatment he had received 1,750 units of insulin to which should be added the 70 units given by his local physician one and a half hours before admission, making a grand total of 1,820 units of insulin in seven hours. No more insulin was administered for the next seventeen hours. The division of the insulin dose and blood sugar response are given in the accompanying table.

Other treatment during the first six hours of hospitalization consisted of isotonic solution of sodium chloride, 3,000 cc. intravenously and 2,000 cc. subcutaneously, four doses of caffeine with sodium benzoate, each 7½ grains (0.5 Gm.) one of which was by vein, gastric lavage with warm water and the removal of 400 cc. of dark fluid, and finally a cleansing enema.

At 10 o'clock, ninety minutes after admission, the pulse, which had previously been regular, became totally irregular, and an electrocardiogram showed auricular fibrillation. By midnight the pulse was again regular and normal. A later electrocardiogram was also normal.

As the patient's condition improved the feeble gasping respiration changed to the typical deep labored Kussmaul type, after which the Kussmaul breathing gradually disappeared. The temperature rose steadily to normal over a period of sixteen

hours. He began to respond three hours after admission by mumbling and was able to answer questions seven hours after entry, and one and a half hours later commenced taking sips of water, orange juice and ginger ale. By the next morning, September 11, ten and a half hours after entrance, the blood sugar was 218 mg. and the carbon dioxide combining power 21 volumes per cent.

The admission blood pressure of 76/40 almost disappeared shortly afterward, although it was never actually registered below 40 mm. of mercury systolic. This, however, gradually rose as his general condition improved.

The blood cholesterol of 406 mg. fell in the first ten and a half hours to 284 mg. A phenolsulfonphthalein renal test showed a 56 per cent excretion in two hours despite the fact that there was only one kidney. Twelve hours after admission the red blood cell count was 3,760,000, hemoglobin 11.9 Gm. and white blood cell count 6,800. The initial nonprotein nitrogen of 55 mg. per hundred cubic centimeters dropped to 33 mg. two days later. The blood acetone (combined acetone, diacetic acid and beta-hydroxybutyric acid) was 195 mg. An examination of the urine two days after recovery showed a specific gravity of 1.014, no albuminuria, and no casts, red blood cells or white blood cells.

The remainder of his hospital stay during which he received supplementary vitamins in addition to his diet was uneventful and he was discharged September 23, thirteen days after he entered on a diet of carbohydrate 190 Gm., protein 90 Gm. and fat 90 Gm. with crystalline insulin 14 and protamine zinc insulin 52 units. His case represents the seventy-second successive recovery from diabetic coma with a carbon dioxide combining power of 20 volumes per cent or below in this clinic, although now January 1 the total successive recoveries number seventy-five, no death having taken place since August 1940.

#### COMMENT

This case teaches again that diabetic coma is a deficiency state, the deficiency being insulin and that in deep coma of prolonged duration massive doses of insulin are of prime importance. Other supplementary measures such as artificial warmth, saline infusions, gastric lavage and enemata, while very helpful, take definitely a secondary place to adequate doses of insulin.

#### ACCIDENTAL AMPHETAMINE SULFATE POISONING

A. J. HERTZOG, M.D., A. E. KARLSTROM, M.D., AND  
M. J. BECHTEL, M.D., MINNEAPOLIS

Amphetamine (benzedrine) sulfate in recent years has become a useful and widely used drug. Although the toxicity of this agent has been claimed to be slight it still may be the source of accidental poisoning. A number of cases have been reported in which nonfatal toxic symptoms resulted from large doses of the drug. Ehrlich, Lewis and Krumbhaar<sup>1</sup> refer to a man aged 67 who recovered after accidental ingestion of between 300 and 800 mg. (most likely 450 mg., i. e. 5 to 6 mg. per kilogram). He was seen on the second morning with an elevated blood pressure and he was very excited and apprehensive. His heart action was violent. Therapy consisted of soluble pentobarbital only. Apfelberg<sup>2</sup> reported that a psychoneurotic man remained in coma thirty-six hours after taking 140 mg. of amphetamine sulfate. This patient recovered. Anderson and Scott<sup>3</sup> reported a case in which collapse, vomiting and heart block with an occasional extrasystole occurred after ingestion of only 30 mg. (0.4 mg. per kilogram). It would appear that the tolerance for the drug varies greatly. Nathan-

From St. Barnabas Hospital and the Department of Pathology of the University of Minnesota Medical School.

<sup>1</sup> Ehrlich, W. E., Lewis, F. H. and Krumbhaar, E. B. Experimental Studies on the Toxicity of Benzedrine Sulfate in Various Animals. *Am. J. M. Sc.* 1938, 785-803 (Dec.) 1939.

<sup>2</sup> Apfelberg, Benjamin. A Case of Benzedrine Sulfate Poisoning. *J. A. M. A.* 110, 575-576 (Feb. 19) 1938.

<sup>3</sup> Anderson, E. W. and Scott, W. C. M. Cardiovascular Effects of Benzedrine. *Lancet* 2, 1461-1462 (Dec. 19) 1937.

son<sup>4</sup> observed that older persons seemed to tolerate more of the drug than young people.

The only fatal case that we are able to find reported in the literature is that of Smith<sup>5</sup> in 1939. This was a 25 year old college student who suddenly collapsed and died during an examination. He had been in the habit of taking 5 mg of amphetamine sulfate thirty minutes before each examination. It was considered probable that he had taken 30 mg of the drug during the few days prior to his death. At autopsy no adequate anatomic explanation was found to account for his death other than dilatation of the right auricle of the heart and gastric and splanchnic dilatation. A sample of the gastric contents was reported to contain 0.25 mg of the drug. Some have questioned whether death in this instance was actually due to the small quantity of amphetamine sulfate that the victim had taken. The fact that he had been in the habit of using the drug would exclude an idiosyncrasy.

#### REPORT OF CASE

A girl aged 12 months had always enjoyed good health. On the morning of Aug. 30, 1942 she was playing on the floor of the bedroom of her home with her 2 year old sister. The older child apparently climbed on a chair while alone and took from the medicine chest a box of amphetamine sulfate tablets and a bottle of ferrous sulfate tablets. It is believed that the sister then gave the younger child the tablets. Shortly before 8:30 a. m. the younger child was found on the floor in a state of collapse. She was very pale. There were 12 amphetamine sulfate tablets and a bottle of ferrous sulfate tablets scattered on the floor. The prescription for the amphetamine sulfate was easily identified. Thirty tablets of 10 mg each had been prescribed for an older relative as a nerve tonic. It was believed that 16 tablets had remained in the box before the accident and 12 tablets were found on the floor. Hence it was thought that the child took a minimum of 4 tablets, or 40 mg. However, the family was not very definite as to the number of tablets she had taken and it is quite possible that more than the amount stated had been taken by the child. The child was thought also to have taken an uncounted number of ferrous sulfate tablets of 3 grains (0.2 Gm.) each. The child was brought to St. Barnabas Hospital immediately. On admittance at 9:30 she was drowsy, cyanotic and semicomatose. Shortly after admittance she vomited brownish material. Gastric lavage revealed large quantities of brown colored material. The stomach was washed with plain water until the washings became clear. At one time during this procedure the pulse became feeble and undetectable. Respirations ceased temporarily but were reestablished by artificial respiration and carbon dioxide. The pulse remained rapid and weak. Erythematous blotches appeared over the skin of the extremities. Mucus collected in her throat. At 4:15 a. m. on August 31 extreme dilatation of her pupils was noted. Respirations became more shallow and she died at 5:05 in spite of artificial respiration approximately nineteen hours and thirty minutes after admission.

Autopsy was performed three hours and ten minutes after death. The body was 79 cm long and weighed 25 pounds (11.3 Kg.). The pupils were widely dilated and measured 7 mm. A number of reddish blotches of the skin on the anterior surfaces of the body was noted. The peritoneal and pleural cavities appeared normal. The heart weighed 45 Gm and showed no abnormalities. The right lung weighed 100 Gm and the left 65 Gm. They were a mottled hemorrhagic color and showed generalized edema. The spleen weighed 30 Gm. It showed no abnormalities. A state of contraction of the organ was not demonstrated. The liver weighed 310 Gm and grossly appeared normal. The mucosa of the esophagus was normal. The entire wall of the stomach including the serosa had a dark hemorrhagic color. The stomach contained approxi-

mately 300 cc of greenish gray fluid. The mucosa was intact and had a grayish black color. The gastric contents did not have a characteristic odor. The duodenum and first portion of the jejunum showed slight discoloration of the mucosa. The mucosa of the remaining small bowel, colon and rectum appeared normal. The small bowel contained fluid similar to that found in the stomach. The pancreas appeared normal. The adrenals, especially the right showed a diffuse hemorrhagic discoloration. The kidneys weighed 40 Gm and 38 Gm respectively and showed nothing of note. The thymus weighed 14 Gm. The remaining examination revealed no abnormalities. The lumbar spinal cord appeared normal. The bone marrow of the sternum was red. Normal postmortem blood clots were present. Examination of the brain was not permitted.

The only significant findings microscopically were in the lungs, stomach and adrenals. Many of the alveoli of the lungs contained coagulated serum and red blood cells. The mucosa of the stomach was intact. The remaining gastric wall showed a recent diffuse hemorrhage with many red blood cells present. A potassium ferricyanide stain showed a large amount of iron pigment deposited in the mucosa of the stomach. Both adrenals showed a recent hemorrhage located for the most part in the region of the medulla. A postmortem blood count showed 68 per cent lymphocytes, 29 per cent polymorphonuclear neutrophils, 2 per cent eosinophils and 1 per cent monocytes. An imprint of the bone marrow from the sternum showed a normal appearing marrow with active hemopoiesis. Megalokaryocytes were present. The anatomic diagnosis was recent hemorrhage in the gastric wall and adrenals and edema of the lungs. Death was attributed to amphetamine sulfate poisoning.

#### COMMENT

The sudden collapse followed by coma and death of a healthy 1 year old child following the accidental ingestion of amphetamine sulfate and ferrous sulfate together with the autopsy findings, established poisoning as the cause of death. Ferrous sulfate can be eliminated as the cause since this iron preparation is relatively nontoxic. Amphetamine sulfate is a powerful sympathetic stimulant closely related chemically and physiologically to epinephrine. Unlike epinephrine amphetamine sulfate is destroyed very slowly by the body and its effects are more lasting. Ehrlich, Lewis and Krumbhaar<sup>1</sup> found no specific anatomic changes in animals dying of lethal doses of amphetamine sulfate. In a wide variety of animals they reported dilatation of the heart, congestion of the liver and kidneys, either congestion or contraction of the spleen, the presence of air in the stomach and intestines and in some animals subpleural and pericardial hemorrhages as well as well defined and sharply demarcated areas of constriction of the small intestine. A few of the animals showed necrosis of the liver and spleen. In monkeys the findings in the central nervous system were venous stasis and perivenous hemorrhages in the meninges and white matter of the hemispheres and cerebellum. Toxic degeneration of some of the nerve cells in these regions were also noted. The authors found the minimum lethal dose of the drug to vary considerably with the age and species of the animal. Young monkeys were the most susceptible in which 5 mg per kilogram was a lethal dose while an adult monkey required from 20 to 25 mg per kilogram. It appears that our patient had received 35 mg per kilogram of body weight. The family could not be very definite as to the exact number of tablets taken however and it is possible that she received considerably more than this amount. The hemorrhage in the regions of the medulla of the adrenals found at autopsy suggests a possible relation with the sympathicotropic action of the drug. At present there is no specific antidote for amphetamine sulfate poisoning.

#### SUMMARY

Sudden collapse with coma and death occurred in a 1 year old child following the accidental taking of ferrous sulfate and amphetamine sulfate. Death is considered to have been the result of amphetamine sulfate poisoning.

<sup>4</sup> Nathanson M. H. The Central Action of Beta Aminopropyl benzene (Benzedrine). J. A. M. A. 108:528-531 (Feb. 13) 1937.  
<sup>5</sup> Smith Lowell C. Collapse with Death Following the Use of Amphetamine Sulfate. J. A. M. A. 113:1022-1023 (Sept. 9) 1939.

## Council on Foods and Nutrition

THE COUNCIL ON FOODS AND NUTRITION HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT FRANKLIN C. BING Secretary

### VEGETABLE JUICE COCKTAILS

The commercial production of canned tomato juice is a relatively new and now important industry. At one time little attention was given to the vitamin C content of the finished product. Then, largely as a result of investigations conducted under the auspices of the National Canners Association, it was learned that considerable destruction of vitamin C may occur unless precautions are taken to eliminate air in the processing. This can be done by conducting the canning operations in an atmosphere of steam. Other improvements in technological procedure were developed and today commercially canned tomato juice can be expected confidently to provide the full vitamin C

*Vitamin C in Mixed Vegetable Juices and in Ordinary Canned Tomato Juice*

Mixed Vegetable Juices		Ascorbic Acid Mg per 100 Cc	pH
Specimen No	Name of Product		
1 and 2	Rolle's Vegetable Juice Cocktail	63	4.2
3 and 4	Oelrich's Big 9 Vegetable Cocktail Juice	98	4.1
		39	4.1
5	Cellu Mixed Vegetable Juices	47	4.1
6	V 8 Cocktail 8 Vegetable Juices	76	4.4
7	Holleb's Blended Supreme Vegetable Juice Cocktail	80	4.1
		95	4.3
8	Snider's Vegetable Juice Cocktail	132	4.2
9	Scott Co. Vegetable Juice Cocktail	130	4.1
Average		83	
Tomato Juices		Ascorbic Acid Mg per 100 Cc	pH
10	Roosevelt Brand Tomato Juice	160	4.0
11	Campbell's Tomato Juice	180	4.0
12	Savoy Tomato Juice	180	4.0
13	Libby's Tomato Juice	200	4.1
14	Rind Co. Brand Tomato Juice	140	4.0
15	Holleb's Supreme Tomato Juice	140	4.0
16	Security Brand Tomato Juice	210	4.0
17	Royal Blue Stores Brand Tomato Juice	150	4.0
18	Snider's Tomato Juice	160	4.0
19	Heinz Tomato Juice	160	4.0
Average		168	

content of the freshly expressed juice. Losses in the can like wise appear to be small, although this factor needs further study. There is evidence that the vitamin C is retained better in tinned containers than in glass.

With the development of canned tomato juice as an important food item there has been witnessed also the more recent production of what have been called tomato juice or vegetable juice cocktails. One such preparation has been accepted by the Council for a number of years, it consists of ordinary canned tomato juice with a dash of tabasco sauce for flavoring purposes. Of late, however, there have been developed juices in which tomato juice may represent less than 60 per cent of the total volume. The question arises: How does this manipulation of tomato juice affect the nutritional quality of the products?

At its meeting in March 1942 the Council discussed the available evidence on this problem and decided<sup>1</sup> not to approve of mixed vegetable juices of inferior nutritive value. The evidence then on hand showed clearly that these so-called vegetable juice cocktails have less vitamin C than ordinary tomato juice.

There is an additional health aspect to the vegetable juices, or suspensions of finely minced vegetable material, especially those which are made by so-called health food stores for dis-

persing to the public. Tomato juice, like the citrus fruit juices, is quite acid in reaction and therefore requires less heat treatment to render it safe from spoilage organisms or pathogenic bacteria than is necessary in the processing of less acid juices. Carrot juice, celery juice and the like are less acid than tomato juice and their addition to tomato juice reduces the hydrogen ion concentration. The mixed juices therefore may require quite different processing times and temperatures. The recent tracing in California of 2 cases of typhoid to contaminated carrot juice, improperly pasteurized, is an example of a hazard that all too frequently is overlooked by the amateur or inexperienced food dispenser.<sup>2</sup>

Correspondence with firms has indicated that sometimes little attention has been given either to the sanitary or to the nutritive aspects of these mixed vegetable juices. For that reason samples of representative products were purchased on the open market. Also samples of tomato juice were obtained for comparative purposes. These specimens were examined for their vitamin C content and hydrogen ion concentrations in the A. M. A. Chemical Laboratory by Dr. Albert E. Sidwell and Dr. George O. Sharp. The data are provided in the accompanying table. The pH was determined by the glass electrode method. The ascorbic acid concentration was determined by titration with 2,6-dichlorophenolindophenol according to a modification of the method of Bessey and King<sup>3</sup> as described by Thornton.<sup>4</sup>

The figures show that the average ascorbic acid content is less than that of undiluted tomato juice. The pH in general is slightly less acid, so that no special problem would be presented in the proper processing of these particular products. The values for the ascorbic acid content of canned tomato juice in this series average 168 mg. to each hundred cubic centimeters. In some earlier tests performed for the Council by Dr. E. M. Bailey of the Connecticut Agricultural Experiment Station the average ascorbic acid content of seventeen brands of tomato juice was 180 mg. to each hundred cubic centimeters. Although some of the better mixed juices approach the vitamin C content of the poorer samples of tomato juice, the average of the samples examined and reported herein is about half the value of tomato juice.

No determinations were made of the carotene content of these products. It would appear, from the nature of the manufacturing processes that the vitamin A value of the mixed juices likewise is less than that of undiluted tomato juice.

The advertising of the mixed vegetable juices is apt to be misleading, because of the impression that the products contain the food values of each ingredient. The uninformed reader no doubt gains the erroneous impression that all the nourishment of celery, parsley, carrots, spinach, lettuce, endive, watercress and perhaps other vegetables is in a product. Instead of being superior products, the present report shows that the mixed vegetable juices are likely to be inferior in nutritive value to ordinary tomato juice.

It is of interest that the War Production Board in its original M 81 order early in 1942 restricted the production of canned mixed vegetable juices containing less than 70 per cent tomato juice, but apparently this order later was rescinded. More recently the War Production Board again has severely restricted the production of these products during 1943. A factor that may need consideration in evaluating the products from the point of view of essentiality in wartime is the question of what becomes of the solid part of the vegetable, the juice of which is used to dilute the tomato juice. Is this material with its unextracted food values discarded? What is the cost of the products as compared to the cost of better known relatively standard items? The answers to such questions no doubt will help in the complete evaluation of the significance of the various mixed vegetable juices that have been developed, but such considerations are not within the purview of the Council.

<sup>2</sup> Geiger, J. C. *Am. J. Pub. Health* **29**, 1244 (Nov.) 1939.

<sup>3</sup> Bessey, O. A. and King, C. G. *J. Biol. Chem.* **103**, 687 (Dec.) 1933.

<sup>4</sup> Thornton, N. C. *Contributions of Boyce Thompson Institute* **9**, 273 (1938).

<sup>5</sup> The Vitamin C Content of Commercially Canned Tomato Juice and Other Fruit Juices as Determined by Chemical Titration. *J. A. M. A.* **110**, 650 (Feb. 26) 1938.

<sup>1</sup> Annual Meeting of the Council on Foods and Nutrition. *J. A. M. A.* **119**, 344 (May 23) 1942.

In view of the foregoing facts the Council reaffirms its decision not to approve of the production of mixed vegetable juices of inferior nutritive value. The Council also voted to authorize publication of the present report with a view to providing some of the considerations which have led to the present decision.

## Council on Industrial Health

### MEDICAL SERVICE IN INDUSTRY

THE COUNCIL ON INDUSTRIAL HEALTH HAS APPROVED THIS ARTICLE AS THE SIXTH IN A SERIES ON MEDICAL SERVICE IN INDUSTRY

C. M. PETERSON, M.D., Secretary

### AN INDUSTRIAL HEALTH PROGRAM FOR A COUNTY MEDICAL SOCIETY

At the request of the War Participation Committee of the American Medical Association, the Council on Industrial Health has prepared a program for improved county medical society organization to enable physicians to contribute more directly to industrial health activity in small plants. Local circumstances should modify these recommendations as needed.

#### ORGANIZATION OF THE COMMITTEE

Every medical society in a county having sufficient industrial concentration to justify it, should organize a committee on industrial health. There should be representation on the committee from (1) private practice, (2) industrial practice and (3) the local health department. These are the essential professional groups needed to supply an adequate health service to industry in any community.

It is desirable also that an executive officer of the county medical society should be a member of the committee.

#### OBJECTIVES OF THE COMMITTEE

The committee should understand the components of an adequate industrial health service and be prepared to adjust them to existing local medical and public health facilities and to patterns of community medical practice.

The essentials of an industrial health service are:

1 A competent physician who takes genuine interest in applying the principles of preventive medicine and hygiene to employed groups and who is willing to devote regular hours to such service in the working environment.

2 Industrial nurses with proper preparation, acting under the physician's immediate supervision or under standing orders developed by him or by the committee on industrial health of the county medical society.

3 Industrial hygiene service directed at improvement of working environment and control of all unhealthful exposures, to be provided by physicians and others with guidance and assistance from the specialized personnel in state and local bureaus of industrial hygiene.

4 A health program which should include:

(a) Prompt and dependable first aid, emergency and subsequent medical and surgical care for all industrially induced disability.

(b) Health conservation of employees through physical supervision and health education.

(c) Close correlation with family physicians and other community health agencies for early and proper management of nonoccupational sickness and injury.

(d) Good records of all causes of absence from work as a guide to the establishment of preventive measures.

#### COMMITTEE ACTIVITY

The following recommendations will be supplemented from time to time by instructions made up from reports issued by the Council on Industrial Health and from other sources. The material will reach the committees through industrial health bulletins, medical journals, direct correspondence and the Council's field activities.

1 The committee in the county society should request instruction from the committee on industrial health in the state medical association and from the state division of industrial hygiene. Preferably, a preliminary conference should be held with representatives of these two agencies to establish:

(a) The lines of relationship and responsibility already existing between government, industry, labor and the medical profession.

(b) The principal industrial health problems of the community as a basis for remedial action.

(c) The proper organization and employment of local medical and health facilities.

(d) Supplementary services which can be called on from sources outside the community itself.

The needs of small industry should be particularly stressed.

2 The names of all physicians now serving or willing to serve in industry should be determined. These physicians should be invited to attend a meeting at which the results of the preliminary conference just described can be reported and general details of the program presented for discussion and adoption.

3 Conferences should be held with other essential professional groups, particularly industrial or public health nurses and industrial hygienists, in order that dependable arrangements for services provided by these groups may be made.

4 The county medical society committee should then request a conference with the executives or a representative committee of the local manufacturers' association, chamber of commerce or both to describe the program and to determine how the medical profession and the local health department can accelerate and improve production through appropriate health activity. Specifically, the following items should be discussed:

(a) The essentials of industrial health service as outlined.

(b) The health and economic benefits of such a service.

(c) Methods of supplying this service.

(d) Probable cost.

The committee of the manufacturers' association can well be asked to act permanently as adviser to the county medical society committee.

5 Active cooperation should be secured from local labor organizations both in respect to the conduct of medical services in the plant and to establish a program of health education in the community. Health education should emphasize particularly nonoccupational factors which are of importance to the health of workers—nutrition, housing, proper use of leisure time, recreation and other related activities. The committee representative of local labor organizations should be requested to assume a considerable share of responsibility for the health educational aspects of the program and should regularly act in an advisory capacity to the committee on industrial health of the medical society.

6 The next procedure should be an open meeting conducted jointly by the county medical society and the local manufacturers' organization or chamber of commerce, to which employers, physicians, other professional agencies, representatives of labor and, in fact, the community at large can be invited. This meeting will provide means for promoting the program widely throughout local industry.

7 Following preliminary organization, the activities of the county medical society's committee on industrial health will fall mainly under four major headings:

(a) Investigation of local causes of lost time in industry as a basis for necessary remedial service.

(b) Coordination of community industrial health facilities.

(c) Frequent education of the public about the benefits of an industrial health program.

(d) Continuous education of the medical profession as a means for elevating standards of industrial health service.

In all other ways the committee should exercise that degree of initiative and leadership which will properly represent medical responsibilities and opportunities in this important field.

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SATURDAY JANUARY 23 1943

## CONTINUOUS CAUDAL ANALGESIA IN OBSTETRICS—A METHOD FOR SAFE, PAINLESS CHILDBIRTH

Elsewhere in this issue appear two papers by Hingson and Edwards<sup>1</sup> and by Greedy and Hesselstine<sup>2</sup> dealing with a method called continuous caudal analgesia, used in obstetrics for the relief of pain during childbirth. The method, which is a natural outgrowth of the development of local, spinal and caudal anesthesia was first used in obstetrics in the U. S. Public Health Service Marine Hospital at Stapleton on Staten Island, New York, on Jan. 6, 1942. Since that time the method has been tried in some nineteen clinics associated with medical schools and well established hospitals. Altogether some 589 women have been delivered of babies by this method without maternal mortality and with but 3 instances in which infants died—these without reference to the method of analgesia that was employed.

As will be observed by a careful reading of the articles, the technic is one which demands the competent art of the specially trained anesthetist or surgeon and the practice of a high order of obstetric science. It is not a method for indiscriminate use in the home or by those who have not been especially trained in its technic or in a realization of conditions which might contraindicate its use. These considerations are especially emphasized in both the manuscripts which are published. Indeed, Drs. Hingson and Edwards, before undertaking their technic, dissected many cadavers to study at first hand the anatomy of the region concerned. They have continued their study toward improvement of the method by modifications of the apparatus concerned, the solutions used and the methods of use.

The relief of pain in childbirth has been one of the long sought goals of the medical profession. In developing their technic Drs. Hingson and Edwards traveled

frequently to leading institutions of medical education and to lying-in hospitals in order to train men working in these fields in the technic that they themselves had elaborated. The significance of the observation is such that the Editor of THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION considered it desirable to assemble promptly the opinions of some of those who have had opportunity to test the method under controlled conditions in hospitals. The following is a statement by Dr. Norris W. Vauk, professor of obstetrics at Jefferson Medical College and obstetrician and gynecologist-in-chief at the Philadelphia Lying-In Hospital.

Our experience at the Philadelphia Lying-In Hospital with continuous caudal analgesia since July has been highly satisfactory. It is a 100 per cent effective analgesia and is not dangerous if properly administered using the technic outlined by Drs. Hingson and Edwards. It needs constant supervision by some one trained in the technic.

There are a few contraindications to its use, chief of which is placenta previa.

The labor is definitely shortened. Cervical dilatation is more rapid. Postpartum blood loss is less. Primary respiration in the infant is established promptly. Involution of the uterus is hastened. This form of analgesia does not inhibit or delay lactation. Bladder function is not disturbed. There is no lower extremity paralysis.

In all surgical procedures the tissues heal rapidly. Our clinic is using this method cautiously under the supervision of an anesthetist trained in the administration of spinal anesthesia. Our time has been limited in the use of this method, but our results so far show that it is the best method yet devised for the relief of pain in labor.

Another obstetrician who had opportunity to test the method for a considerable period is Dr. Francis R. Irving, associate professor of clinical obstetrics at Syracuse (N. Y.) University College of Medicine. He states:

Dilatation occurs rapidly soon after administration of the analgesia. We find that the needles are troublesome regardless of flexibility and utilize a catheter instead of the needle. We have delivered 85 women since October 10 without failures. There is no question that it is perfect painless childbirth without deleterious effect on mother or child.

The use of this method shortens labor and relieves the soft parts. We have had considerable experience with scopolamine, the barbiturates and paraldehyde.

As a complication the physician should watch particularly the fetal heart. The knee elbow position of the mother may cause pressure on the cord and thus affect the fetal heart. This has no bearing on the technic but is a danger which should be observed. The procedure may be accomplished with the patient lying on her side, but that is a technical difficulty which is important as far as the baby is concerned. If the obstetrician will realize that the position of the mother may affect the fetal heart the method would seem to be the best word in obstetric analgesia.

Dr. John S. Lundy, head of the Department of Anesthesia in the Mayo Clinic, Rochester, Minn., says:

We have used continuous caudal analgesia about fifty times and I think it is fine. It has also been used successfully in Brook General Hospital, Fort Sam Houston, Texas, Walter Reed Hospital, Washington, D. C., and many other places.

The time since the introduction of this method has been exceedingly brief. Nevertheless the experience accumulated seems to be sufficient to warrant the belief

<sup>1</sup> Hingson, Robert A. and Edwards, Wildo B. Continuous Caudal Analgesia in Obstetrics this issue p. 225.

<sup>2</sup> Greedy, Thomas G. Jr. and Hesselstine, H. Close Continuous Caudal Anesthesia in Obstetrics this issue p. 229.



that it constitutes a real advance in securing relief of pain for mothers during childbirth. As with all other advances made in modern medical science, those who are especially trained in the method and who learn to avoid its use in cases in which the contraindications are clear are likely to be most successful in its employment. As is emphasized by all who have discussed the subject in this issue of *THE JOURNAL*, including Drs Hingson and Edwards, Gready and Hesseltine, Vaux, Irving and Lundy, the method should be used only in hospitals in which there are available the services of persons trained in the administration of the analgesia and obstetricians competent to conduct a delivery with the scientific considerations and finesse associated with the special practice of the obstetric art.

With continued use of this method, still further improvements will no doubt result. Drs Hingson and Edwards are physicians commissioned in the United States Public Health Service. On them largely will fall the burden of educating other physicians in the principles of the technique and in the conditions which should govern its use. Already they have given frequently of themselves of their time and of their efforts in traveling to more than nineteen medical schools and hospitals, in which they have stayed for periods sufficiently long to instruct men already well trained in anesthesia and in obstetrics. From all these areas come reports such as those here cited which are more than encouraging as to the objective that has been attained. The extension of this advance in medical and obstetric science to physicians and to prospective mothers places another burden on those agencies in the United States which are cooperating in extending graduate education to the medical profession.

#### CONTROL OF AIR BORNE INFECTION

Working at Harvard University, William F and Mildred W Wells<sup>1</sup> invented an apparatus and developed a technique which made it possible to explore the air for micro-organisms in controlled atmospheres. Liquid suspensions of micro-organisms could be atomized into a tank and their presence demonstrated quantitatively by the air centrifuge. These researches established that transmission of infection through the air may take one of two forms, depending on the size of the infected droplet. The more obvious form recognized by Flugge is droplet infection proper. It applies to droplets larger than 0.1 mm in diameter, which are rapidly removed from the air by gravity before they can dry and within a short distance from the source. The second form may be called air borne infection and deals with the dried residue of infected droplets or droplet nuclei, derived directly from droplets less than

0.1 mm, depending primarily on air for the buoyancy that keeps them suspended for longer times and carries them longer distances. The Wellses<sup>2</sup> also investigated the bactericidal effect of ultraviolet radiation on micro-organisms suspended in air and proved it to be of a higher order of magnitude than humidity, ozone or commercial germicides.

With Wilder the Wellses<sup>3</sup> carried out a four years study in the Germantown Friends' School and a one year study in the Swarthmore public schools. They were able to report that, as the result of ultraviolet irradiation there has been no epidemic spread of contagion among the highly susceptible groups of children of primary schools, although epidemic spread has occurred among less susceptible groups of older children in the departments of schools whose atmospheres were not irradiated. The experiment supports the hypothesis that epidemic contagion is spread through the medium of confined atmospheres and that it can be prevented by radiant disinfection of air. Deryl Hart and his co-workers established that air is an important source of contamination in every operative wound and that sterilization of the air in the operating room can be accomplished by bactericidal irradiation.<sup>4</sup> Del Mundo and McKhann<sup>5</sup> reported that the hospital infection rate during the winter of 1939-1940 in a control ward of the Infants' Hospital of Boston was 12.5 per cent, but in a ward in which the conditions were entirely comparable except that each cubicle was protected across the front and across the top by ultraviolet radiation the cross infection rate was 2.7 per cent. Sommer and Stokes<sup>6</sup> found that ultraviolet radiation was effective in reducing the number of air borne organisms in a hospital ward.

Recently Henle and his associates<sup>7</sup> prevented air borne infection in white mice exposed in a large hospital ward subdivided into sixteen separate cubicles by using ultraviolet radiation or sprays of propylene glycol. Groups of animals were placed in some of the locations, while cultures of the hemolytic streptococcus of Lancefield's group C or of the virus of influenza A were atomized in one of the cubicles. Both organisms spread rapidly throughout the air of the ward. Ultraviolet radiation and propylene glycol vapor were com-

1 Wells W F and Wells Mildred W. *Air Borne Infection* J A M A **107** 1805 (Nov 28) 1936

2 Wells W F, Wells Mildred W and Wilder T S. *The Environmental Control of Epidemic Contagion I. An Epidemiologic Study of Radiant Disinfection of Air in Day Schools* Am J Hyg **35** 97 (Jan) 1942

3 Wells W F, Wells Mildred W and Wilder T S. *Sterilization of Air in the Operating Room* editorial J A M A **112** 1072 (March 18) 1939

4 Del Mundo Fe and McKhann C F. *Effect of Ultraviolet Irradiation of Air on Incidence of Infections in an Infants' Hospital* Am J Dis Child **61** 213 (Feb) 1941

5 Sommer H E and Stokes Joseph Jr. *Studies on Air Borne Infection in a Hospital Ward I. The Effect of Ultraviolet Light on Cross Infection in an Infants' Ward* J Pediat **21** 569 (Nov) 1942

6 Sommer H E and Stokes Joseph Jr. *Studies on Air Borne Infection in a Hospital Ward II. Effects of Ultraviolet Irradiation and Propylene Glycol Vaporization on the Prevention of Experimental Air Borne Infection of Mice by Droplet Nuclei* J Pediat **21** 577 (Nov) 1942

7 Henle Werner, Sommer H E and Stokes Joseph Jr. *Studies on Air Borne Infection in a Hospital Ward I. The Effect of Ultraviolet Light on Cross Infection in an Infants' Ward* J Pediat **21** 569 (Nov) 1942

pared in their effectiveness as disinfectants of the air. With heavy concentrations of air borne streptococci (more than 3,000 cells per cubic foot of air) most of the control mice died from streptococcic pneumonia and septicemia, while propylene glycol vapor protected them completely and ultraviolet radiation failed to prevent death only in the cubicle containing the atomizer. With low concentrations of the streptococcus (200 to 500 organisms per cubic foot of air) all mice survived and cultures taken from the lungs on the eighth or tenth day failed to reveal the streptococcus. However, it could be shown in other experiments that a carrier state had been induced in the animals exposed under control conditions and not in those protected by ultraviolet barriers. This was demonstrated by inoculation of the virus of influenza A eight to ten days after exposure to the air borne streptococcus. All mice died from influenza, but only those belonging to the control group now showed hemolytic streptococci in cultures taken from the lungs. Ultraviolet radiation and propylene glycol vapor were similarly effective in preventing the air borne infection with the virus of influenza A. These results indicate that both ultraviolet radiation and propylene glycol vapor are effective disinfectants of the air. Their application will depend on the individual problems and the location to be disinfected.

#### SCIENTIFIC INFORMATION FOR MEDICAL OFFICERS

Two projects now well under way, recently developed, are additional assurance to physicians associated with the armed forces of opportunity to keep themselves abreast of advances in medical science. By cooperation of the editorial staff of THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION with the Committee on Information of the Division of Medical Sciences of the National Research Council and the Divisions of Publications of the United States Army and Navy Medical Departments and the United States Public Health Service, a letter is being prepared every two weeks, which is distributed to every officer in these services. Such letters are sent by air mail or by V-letter to various camps and hospitals and are there mimeographed for distribution to the individual officers. In some instances, copy is sent directly to an individual officer. The letters consist of from four to six pages of brief abstracts of articles of significance appearing in the current medical literature.

By special arrangement also E. R. Squibb and Sons has planned to distribute to officers in the armed forces a publication called *Medical Journal Abstracts*, prepared by the library staff of this company. Copies of this periodical are sent to each station, camp, hospital or post in care of the chief medical officer or the chief

surgical officer and then distributed by him to the medical officers in his group. The company offers to send *Medical Journal Abstracts* on receipt of a correct APO address also to medical officers overseas, subject, of course, to decisions of governmental authorities in charge of postal regulations.

Certainly these attempts to aid physicians in the armed forces to keep abreast of advances in medical science can result only in improvement in medical service to the men for whose health and medical care they are responsible.

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### Current Comment

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#### THE OPINION OF THE SUPREME COURT

In the text of the opinion of the Supreme Court, published elsewhere in this issue (page 267), attention is called to the following paragraphs:

*Paragraph 6*—"First Much argument has been addressed to the question whether a physician's practice of his profession constitutes trade under Section 3 of the Sherman Act. In the light of what we shall say with respect to the charge laid in the indictment, we need not consider or decide this question."

*Paragraph 7*—"Group Health is a membership corporation engaged in business or trade. Its corporate activity is the consummation of the cooperative effort of its members to obtain for themselves and their families medical service and hospitalization on a risk-sharing prepayment basis. The corporation collects its funds from members. With these funds physicians are employed and hospitalization procured on behalf of members and their dependents. The fact that it is cooperative, and procures service and facilities on behalf of its members only, does not remove its activities from the sphere of business."

*Paragraph 28*—"We need add but a word as to the sufficiency of the proof to sustain the charge. The petitioners in effect challenge the sufficiency, in law, of the indictment. They hardly suggest that if the pleading charges an offense there was no substantial evidence of the commission of the offense. But, however the argument is viewed, we agree with the courts below that the case was one for submission to a jury. No purpose would be served by detailed discussion of the proofs."

*Paragraph 29*—"Third. We hold that the dispute between petitioners and their members, and Group Health and its members, was not one concerning terms and conditions of employment within the Clayton and the Norris-La Guardia Acts."

*Paragraph 37*—"In truth, the petitioners represented physicians who desired that they and all others should practice independently on a fee for service basis where whatever arrangement for payment each had was a matter that lay between him and his patient in each individual case of service or treatment. The petitioners were not an association of employees in any proper sense of the term. They were an association of individual practitioners each exercising his calling as an independent unit. These independent physicians, and the two petitioning associations which represent them, were interested solely in preventing the operation of a business conducted in corporate form by Group Health."

## ANNUAL CONGRESS ON MEDICAL EDUCATION AND LICENSURE

Mobilization of manpower necessitates many unusual readjustments. The mobilization of the medical profession for service to the armed forces and to civilians and the maintenance of production of physicians have been fraught with many difficulties. The medical schools of the country have voluntarily reduced the period required for the curriculum of the medical school from four to three years. The required pre-medical college course has been reduced to two academic years. Now the War Manpower Commission and other federal agencies have formulated a coordinated program looking to the satisfactory training of an adequate number of physicians to meet both the military and the civilian needs. Many of the details in regard to this program have not yet been clarified. The seriousness of the many problems involved, affecting as they do the lives of thousands of young men as well as the efficient conduct of many of the colleges of arts and all of the medical schools of the country, emphasizes the importance of the Annual Congress on Medical Education and Licensure to be held at the Palmer House in Chicago on February 15 and 16. The program appears in this issue of *THE JOURNAL* on page 269. One of the greatest problems involved in the mobilization of the medical profession is the meeting of changing civilian and industrial needs. This calls for the relocation of many physicians and the consequent adjustment of state licensure regulations. The program, including as it does addresses by President Elliott, chief of the Professional and Technical Employment and Training Division of the War Manpower Commission, General Dalton of the U S Army, representatives of the Office of Procurement and Assignment and the Surgeon Generals of the U S Army, the U S Navy, and the U S Public Health Service, should go far toward clarifying the details of the various programs involving the whole field of medicine in the war.

## MALARIAL HEMAGGLUTINATION

An interesting contribution to the pathology of malaria is contained in a study of intravascular hemagglutination in birds infected with *Plasmodium cathemerium*, currently reported by Lack<sup>1</sup> of the University of Tennessee. Using the Knisely quartz rod microilluminator, the investigator studied the histopathology of the circulation in the wing web of normal and experimentally infected canaries. A drop of liquid petrolatum placed on the epithelium facilitated visualization at a magnification of 96 diameters. All experimentally infected birds developed parasites in the blood stream with counts up to 67 per cent, from which all but one bird died. As the parasite count began to rise there was an initial loss of "streamlining" in the peripheral circulations accompanied by transient sticking of leukocytes to the endothelial lining of the venules plus evidence of plasma leakage. As the count increased the white cells became adherent to the endothelium in

ever increasing numbers, accompanied by the formation of sticky clumps of red cells which retarded the rate of blood flow in many areas. In the subsequent twenty-four to forty-eight hours came progressive intravascular clumping. The clumps were now fairly firm, could withstand intravascular stress and occasionally appeared in the arterioles. Plasma viscosity was apparently increased. The clumps were originally formed only by parasitized cells but later included both infected and normal erythrocytes. The final stage was a "pastelike" blood flow followed by death of the bird within a few hours. Intravascular agglutination had previously been described in experimental malarial monkeys by Knisely and his co-workers of the University of Chicago. The phenomenon presumably occurs in man.

## FATAL ACCIDENTS TO INFANTS IN WARTIME

According to a recent issue of the Statistical Bulletin of the Metropolitan Life Insurance Company<sup>1</sup> a rising birth rate such as has been experienced during the last few years is inevitably accompanied by a proportionate increase in the accidental deaths in earliest childhood, especially in view of the present haphazard attitude toward child safety. It may therefore be anticipated that for the year 1942, and probably also for 1943, the figures on the number of children under 1 year of age who die of accidental injuries will be well above the average of the last ten years. Experience has shown that, of every thousand born, 1 will die in the first year of life as the result of an accident. If this ratio persists, 2,600 children under 1 year of age will be found to have been accidentally killed in 1942. The number, moreover, may be as high as 3,000 if, as is not unlikely, there was an actual increase in the accidental death rate during the year. Among the most important factors which influence this death rate, as pointed out in the report, are early maternal absences and the attempt to keep infants warm by heavy covers—the latter a factor of special importance to parents living in homes subject to fuel oil rationing. Indeed, the greatest hazard encountered by infants is that due to smothering. The parent who covers the child with more or heavier blankets to offset the decrease in the amount of heat in the home this winter should make sure that the bed clothing is arranged so that the child cannot be suffocated. Fatalities in infants frequently occur also from foreign bodies lodged in the air passages, particularly aspirated vomitus, inhaling of food and the swallowing of safety pins, marbles, thumb tacks and other objects. Hot water bottles left in the crib to keep it warm should be well covered and tested to see that they are not so hot as to burn the baby. Other causes of accidents are hot liquids in pots, pans and cups left within reach of babies, poisons and drugs left carelessly about, stoves or other hot objects against which the child may fall, and falls out of cribs, beds and windows and down stairs.

<sup>1</sup> Statistical Bulletin Metropolitan Life Insurance Company 23:3 (Nov.) 1942.

# MEDICINE AND THE WAR

In this section of *The Journal* each week will appear official notices by the Committee on War Participation of the American Medical Association, announcements by the Surgeon Generals of the Army Navy and Public Health Service, and other governmental agencies dealing with medicine and the war and such other information and announcements as will be useful to the medical profession

## ARMY

### THE ARMY FLIGHT SURGEON

The flight surgeon today, as described by Brig Gen David N W Grant A U S air surgeon Army Air Forces in the *Army and Navy Journal* of January 2 is an integral part of the Army Air Forces, that is, of air research and development of every combat unit of every air evacuation unit and of the paratroopers. The flight surgeon plays a major role in the development and maintenance of *esprit de corps* and morale among the personnel of the army air forces. He has developed methods for selecting from the youth of America those whose aptitude for flying is greatest. He preserves and conserves manpower of the air forces at maximum efficiency through the supervision of a carefully studied and specially constituted application of preventive medicine. He is responsible for the restoration of combat casualties to active health.

General Grant continues. The supercharged high powered motor which enables aircraft to fly at altitudes of 40,000 feet has introduced the complex problem of hypoxia. Above 10,000 feet there is insufficient oxygen for normal physiologic requirements. Above 20,000-25,000 feet life cannot be maintained without the use of accessory oxygen equipment. At 40,000 feet it is impossible for the human being even when breathing pure oxygen to live without using pressurized breathing equipment. Thanks to the development of the oxygen mask and regulators our air combat forces are now operating routinely and safely in the vicinity of 35,000 feet.

Motion sickness referred to in the air forces as 'air sickness' has been a serious problem. The aviation cadet who repeatedly

becomes airsick must be eliminated. Air borne troops are unable to fight after parachuting to earth if they are airsick. Prevention and control of airsickness are subjects of extensive research. Selection tests are now being developed so that potentially airsick individuals will not be accepted for training. The use of special ear tests and the correlations of swing sickness with airsickness have revealed valuable facts about the inner ear which may help in the solution of this problem.

The intensity of aircraft motor noise the loudest known to man has been a difficult problem. Even the loudest thunder cannot be heard while flying. Noise of this magnitude produces a definite though limited impairment in a part of the range of auditory perception. Owing to the shape of the ear and ear canal it has not been possible to design an ear phone which will satisfactorily exclude motor and propeller noise. The ratio of motor noise intensity to signal intensity has not yet been sufficiently reduced to permit ideal radio communication.

Air evacuation of wounded soldiers from the front lines to large surgical hospitals in the rear is one of the great advances of medical care in this war. The speed and ease of air evacuation establish a higher level of morale among troops. The flight surgeon is therefore charged with many responsibilities. He practices a highly specialized form of applied preventive medicine and assists in the development of equipment to increase the pilot's physiologic performance. He must basically be a good doctor, counselor and friend and in the personnel under his jurisdiction become sick or wounded in combat he sees to it that they receive adequate and prompt attention.

### AVIATION MEDICAL EXAMINERS

Graduation exercises were held recently at the School of Aviation Medicine in Texas for another class of aviation medical examiners. The didactic portion of this course was conducted in Texas and the practical portion at three army air forces classification centers elsewhere. A list of graduates of this class follows:

ARKANSAS		CONNECTICUT	
Jack R. Ellis 1st Lieut	Hot Springs National Park	Harold W. Duennel 1st Lieut	Hartford
David D. Fried 1st Lieut	Big Fort	Gershon B. Silver Capt	Hartford
Robert H. Jackson 1st Lieut	Little Rock	William E. Swift Jr 1st Lieut	Hartford
Elmer J. Ritchie Capt	North Little Rock	DISTRICT OF COLUMBIA	
Iett O. Scott Capt	Hot Springs National Park	George J. Fleury Jr 1st Lieut	Washington
George B. Talbot Capt	Pine Bluff	Harold A. Timreck 1st Lieut	Washington
CALIFORNIA		Fred J. Wertz 1st Lieut	Washington
Don J. Hunter 1st Lieut	Bakersfield	FLORIDA	
Thomas M. Tullenlove Capt	San Francisco	Julius Alexander 1st Lieut	Miami
Nicholas G. Maximov Capt	San Francisco	GEORGIA	
Thomas A. Collins 1st Lieut	Fresno	Jack K. Bleich Capt	Atlanta
Albert E. Fleming 1st Lieut	Fresno	James L. Campbell Jr Capt	Atlanta
Herbert W. Jenkins 1st Lieut	Palo Alto (Menlo Park)	Carroll E. McCarthy 1st Lieut	Columbus
George M. Plagens 1st Lieut	San Diego	John P. O'Brien Major	Albany
Frederick J. Northway 1st Lieut	San Francisco	ILLINOIS	
		Edmund R. Adler 1st Lieut	Chicago
		George P. Ballard Capt	Chicago

Arnold Black 1st Lieut	Chicago	Julius Levine 1st Lieut	Bo ton
Theodore R. Marquardt 1st Lieut	Lombard	Donald K. McCluskey Capt	Worcester
INDIANA		Charles C. Minter Jr 1st Lieut	Boston
Paul K. Byrne 1st Lieut	New Albany	Francis A. Sullivan 1st Lieut	Danvers
Fred O. Clark 1st Lieut	Syracuse	MICHIGAN	
Roymond D. Miller 1st Lieut	Martinsville	Felix S. Alfemto 1st Lieut	Grand Rapids
Harold T. Moore 1st Lieut	Indianapolis	Bernard H. Fried Capt	Detroit
James M. Pfeifer 1st Lieut	Lawrenceburg	Lyman E. Ihle 1st Lieut	Detroit
Wendell C. Stover 1st Lieut	Boonville	Richard F. Kuhn 1st Lieut	Detroit
Bryce P. Wells 1st Lieut	Hartford City	Harry A. Lusk 1st Lieut	Ann Arbor
Paul I. Zwerner 1st Lieut	Terre Haute	Daniel C. Thomson 1st Lieut	Ann Arbor
IOWA		MINNESOTA	
Iowell E. Martin 1st Lieut	Harmburg	Bradley C. Brownson Capt	Rochester
Harold J. Parks 1st Lieut	Des Moines	William H. Keffer 1st Lieut	Rochester
LOUISIANA		Earl H. Koepke 1st Lieut	St Paul
William M. Hall 1st Lieut	Shreveport	Robert F. Rushmer 1st Lieut	Rochester
Robert M. Shepard 1st Lieut	New Orleans	MISSISSIPPI	
MAINE		Rufus K. Simpson Capt	Meridian
Burton S. Marsh 1st Lieut	Greenville Junction	MISSOURI	
MASSACHUSETTS		Howard S. Cowley 1st Lieut	Kansas City
Dante Del Campo 1st Lieut	Lynn	Edgar L. Tversky Capt	St Louis
Richard H. Grogan 1st Lieut	Watertown	NEBRASKA	
Donald H. Haselhuber 1st Lieut	Springfield	Clayton E. Buhl Major	Mullen
		NEW JERSEY	
		John W. Hardy 1st Lieut	Farm ingdale

John E. Leach Capt Paterson  
John F. Moran Jr Capt Lumbertonville

## NEW YORK

George F. Brattleton 1st Lieut., Rochester  
George M. Cooper 1st Lieut Buffalo  
Oren A. Fillingson 1st Lieut Brooklyn  
Oliver T. Ghent 1st Lieut Warrenton  
Mortimer Goldberg 1st Lieut, Brooklyn  
George R. Horning 1st Lieut, Glen Head  
Sanford Katz 1st Lieut New York  
Donald M. Kennett 1st Lieut Massapequa  
Maurice L. Malins Capt New York  
George C. Mueller, 1st Lieut New York  
Daniel E. Nathan 1st Lieut New York  
Richard E. Nitschke 1st Lieut New York  
Ira I. Schiffer 1st Lieut New York

Myron F. Sesit Capt New York  
Stanley F. Unger Capt New York  
Edwin C. Weinraub Capt New York

## NORTH CAROLINA

Elbert C. Anderson 1st Lieut Wilmington

## OHIO

William R. Calland Capt Barberton  
Woodron S. Hazel Capt Youngstown

## OKLAHOMA

Leonidas A. S. Johnston Capt Holdenville  
Francis C. Murphy 1st Lieut Oklahoma City

## PENNSYLVANIA

Joseph C. Anderson 1st Lieut Ebensburg  
Russell A. Barnhardt Capt Pittsburgh  
Milton Harrison Capt Philadelphia  
David O. Helms 1st Lieut Bethlehem

Charles H. Hiles Capt Edgewood  
Paul J. Walter 1st Lieut Wernersville

## SOUTH CAROLINA

Isaac E. Harris Jr Major Columbia

## SOUTH DAKOTA

Harry R. Matsum 1st Lieut Alexandria

## TENNESSEE

George H. McCain Capt Memphis  
Joseph H. Savers 1st Lieut Nashville

## TEXAS

Thomas W. Brewer 1st Lieut Houston  
Thomas A. Bunkley 1st Lieut Stamford  
Frank F. Glover 1st Lieut Houston  
Robert A. Koonen 1st Lieut Hamilton

Edgar P. McKinney 1st Lieut Nacogdoches  
John R. Mast 1st Lieut Wichita Falls  
Hubert W. Miller Capt El Paso  
Neill O. Simpson Capt Waco  
Oscar W. Stull Capt Dallas

## UTAH

Roy B. Hammond 1st Lieut Provo  
Thomas S. Sexton Capt Ogden

## VIRGINIA

Joseph L. Mann 1st Lieut Hampton  
William R. Watkins 1st Lieut South Boston

## WASHINGTON

Allen E. Prie 1st Capt Pullman  
Clude L. Wagner 1st Lieut Seattle

## WISCONSIN

James L. Moffett Capt Montfort  
Earl L. Siebeker Jr 1st Lieut Wauwatosa

### ARMY NEUROPSYCHIATRY SCHOOL OPENED

The War Department announced on January 2 that the first class at the Army's School of Military Neuropsychiatry began on January 4 at Lawson General Hospital Atlanta, Ga. The course will last four weeks. Only medical officers who have had a minimum of twelve months' full time training or practical experience in neurology or psychiatry will be eligible to attend. Each service command, the Office of the Surgeon General and the Army air forces will have quotas. Col William C. Porter Medical Corps, former chief of the neuropsychiatric division at Walter Reed Hospital, will be commandant of the school. He will have on his staff Major M. Ralph Kaufman, M. C. Major Joseph Fetterman M. C., and Capt William H. Exerts M. C.

### FIELD TRAINING AT CARLISLE BARRACKS

Four hundred and eighty more officers of the Medical Department qualified for field duties on Dec. 30, 1942 when they graduated from the Medical Field Service School at Carlisle Barracks. They departed immediately for their respective units. All except four are experienced physicians, dentists, veterinarians or public health specialists. The officers' class composed chiefly of first lieutenants, who were recently commissioned after completing their internship and R. O. T. C. training, were mostly Medical Corps officers. The subjects taught in this short intensive course included military art, military sanitation, logistics, field medicine and administration. The officers were from 43 states, the District of Columbia and Canada.

The number of Medical Department officers to be trained for field duty will be increased, starting this month. Three classes will be in session simultaneously, with one being graduated every two weeks.

In the class graduating on December 30 were 1 colonel, 2 lieutenant colonels, 8 majors, 133 captains and 224 first lieutenants of the Medical Corps, 1 lieutenant colonel, 1 major, 9 captains and 59 first lieutenants of the Dental Corps, and 2 majors, 3 captains and 24 first lieutenants of the Veterinary Corps, 2 captains and 5 first lieutenants of the Sanitary Corps, 1 first lieutenant of the Quartermaster Corps and 1 first lieutenant and 2 second lieutenants of the Medical Administrative Corps.

### ARMY PERSONAL

Lieut. Col. James W. Howard has been assigned by Brig. Gen. Roy C. Heflebower, commanding general, Medical Replacement Training Center, Camp Barkeley, Texas, to be director of the operations and training division of the training center. Colonel Howard has been at the center since February 1942 in other capacities and has been in the Regular Army since 1933.

### GRADUATE CLASS OF MEDICAL INSPECTORS

Forty-six officers in a class of medical inspectors received diplomas at graduation exercises at the Medical Field Service School at Carlisle Barracks, Pa., on December 31. Following the ceremonies the men left for their new posts. The duties of medical inspectors are to supervise sanitation and other medical preventive measures in army camps and to make recommendations for the correction of insanitary conditions. The class, composed entirely of Medical Corps officers, included four majors, forty-one captains and one first lieutenant. Another medical inspectors class of about fifty officers began in January.

### ARMY AIDS NORTH AFRICAN NATIVES

The War Department announced on January 1 that when the American invasion fleet first landed in northern Africa it brought along hundreds of thousands of dollars' worth of tea, sugar and cotton cloth as barter goods in lieu of currency. Since then many shiploads of commodities have arrived, their distribution under the direction of the American high command helping to solve the labor problems and food supplies necessary to troop operations. North Africa needs commodities and above all medical supplies.

### WAR MEDICINE MADE AVAILABLE TO BRITISH INSTITUTIONS

On recommendation of the Committee on Medical Research of the Office of Scientific Research and Development and with the collaboration of the American Medical Association, the Josiah Macy Jr. Foundation is making the periodical *War Medicine* available to a group of British institutions selected by the liaison representative of the British Medical Research Council in Washington, D. C.

### PROMOTIONS IN MEDICAL DEPARTMENT

Major Wayland R. Swanson, Post Hospital, Kearns, Utah, promoted to lieutenant colonel—Capt Robert J. Tenner, Billings General Hospital, Fort Benjamin Harrison, Indiana, promoted to major, and First Lieuts. I. Joseph Aprile, Donald Ross and John B. Burrett of the Billings General Hospital promoted to captains.

### FLIGHT SURGEONS' ASSISTANTS

Another routine course of instruction qualifying enlisted men as flight surgeons' assistants began on Dec. 7, 1942 at the School of Aviation Medicine in Texas. The course will continue for six weeks.

## NAVY

NAVY MEDICAL OFFICER AWARDED  
SILVER STAR

The Navy Department announced on January 6, among decorations awarded to other navy medical personnel, the award of the Silver Star Medal to Lieut. John H. Peterson, M. C., U. S. N. R., of Springfield, Mass., for gallantry in the battle of Midway. Lieutenant Peterson's citation reads:

'For extraordinary gallantry and conspicuous intrepidity as Medical Officer of U. S. S. *Hammann* during and after action against enemy Japanese forces in the vicinity of Midway Island on June 6, 1942. Although he had been struck down and slightly injured by the shock of a torpedo explosion, Lieutenant Peterson, after abandonment of the sinking ship, persisted in manning a boat and directing the rescue of many seriously wounded men who might otherwise have drowned. For three days afterward he rendered constant medical attention to a great number of wounded and injured men aboard another destroyer en route to

its base until the strenuous exertion from his efforts weakened him to a point of complete physical exhaustion. His courageous initiative and tireless devotion to duty were in keeping with the highest traditions of the United States Naval Service.'

LAHEY CLINIC TRAINS SPECIALISTS  
FOR ARMY AND NAVY

Almost since the beginning of the war the Lahey Clinic has been training anesthetists for the Navy and at present has a small group which will return to the service within a few days. The clinic is also training naval medical officers in roentgenology and navy corps men as laboratory and x-ray technicians.

The Lahey Clinic now has assigned to it also a small group of Army men for training in medicine, and shortly another small group will be assigned to the clinic for training in physical therapy. In addition the clinic is cooperating with the Massachusetts General Hospital in the training of thoracic surgeons.

## CIVILIAN DEFENSE

## BLOOD PLASMA RESERVES

The Office of Civilian Defense, Washington, D. C., issued Circular Medical Series No. 25 on December 21, which was as follows:

Plasma reserves are now available in every civilian defense region for use in the event of casualties resulting from enemy action or sabotage. The regional medical officer will keep all chiefs of Emergency Medical Service hospitals and Red Cross disaster relief chairmen informed concerning the amount and distribution of plasma reserves available in the state and how localities may secure additional supplies in emergencies. In cities where reserves are stored they may be obtained by hospitals through the local chief of Emergency Medical Services. If a community is without plasma or if its supplies are depleted, the local chief of Emergency Medical Service may obtain additional plasma in emergencies from the state chief of Emergency Medical Service. These instructions should not be construed to prevent the use of this plasma for life saving purposes in any disaster. If Office of Civilian Defense plasma is used in non-war related incidents, its use may be considered as a loan, and arrangements may be made later for its replacement.

The Office of Civilian Defense, Washington, D. C., reported on December 29 that civilian reserves of blood plasma large enough to meet the requirements of more than thirty disasters as great as the recent Boston night club fire have been established at strategic locations throughout the country and are being added to constantly under the joint program of the Public Health Service and the Office of Civilian Defense.

As of December 1 there were 50,742 units of prepared plasma in its emergency reserves. Several thousand units have been added during the month, and the full quota of 133,130 units is expected to be reached within a few months. A unit is the

amount of plasma obtained from 500 cc. of blood and is sufficient for transfusion. The victims of the Boston fire required about 1,500 such units.

Although the reserves established under the blood plasma program of the Office of Civilian Defense are intended primarily for the protection of civilian casualties resulting from enemy action, they are available for saving lives in any disasters.

Liquid plasma reserves are maintained in more than a hundred and fifty hospitals which have received grants of federal funds for processing and storing plasma. Each of these hospitals maintains a reserve of at least 1 unit of plasma for each bed in the hospital. These will soon total at least 63,130 units.

In addition a number of hospitals which did not require grants for equipment are setting up plasma banks which will comprise an additional reserve of about 50,000 units for local authorities in case of emergency.

Frozen plasma has been obtained through the Army and Navy from blood collected by the Red Cross in excess of immediate service requirements. It is stored by the Office of Civilian Defense in refrigeration depots in important hospitals in the area if needed. A quota of 29,500 units of frozen plasma has been obtained for this purpose. Finally, 50,000 units of dried plasma is being stored in centrally located depots. Most of the plasma reserves are concentrated in the areas where enemy air raids are deemed most probable. Deposits are also maintained in inland regions.

In Boston at the time of the night club fire there were on hand in the city almost twice as many units as were required for treatment of victims of that disaster. More than 75 per cent of those hospitalized as the result of the fire required administration of some plasma. The superintendent of the Boston City Hospital estimated that it saved the lives of at least 75 persons who were treated there.

## MISCELLANEOUS

## PUBLIC HEALTH UNDER HITLER

According to *Curieux Marcellin* of Nov. 6, 1942, the German authorities have requisitioned the Beaujon, Lariboisière and La Pitié hospitals in Paris, comprising 3,280 beds. Owing to the creation of temporary hospitals, Paris patients still dispose of 36,800 beds, which is little for a population estimated at 4,200,000. Since the beginning of war, no important epidemic has broken out with the exception of smallpox at the beginning of 1942, which was checked by intensive vaccination. Cases of scabies have increased from 1 to 70 per cent. Tuberculosis has doubled among 6 to 8 year old children and adolescents of 18 to 25. No general mortality figures have been published but the annual rate of deaths at the Cochin Hospital has increased from 1,200 to 1,400. People go to hospitals only in the last extremity because food cards must be deposited and inter-

minable formalities are required to get them back on leaving the hospital. British patients remaining in Paris are looked after at the Val de Grâce and Jewish patients at the Rothschild foundation. All Paris hospitals suffer from enormous transport difficulties. There are hardly any ambulances. Patients are brought to the hospital with the help of the police first aid. For the return journey patients are grouped in the same ambulance, which makes a round trip like a motor bus.

*Reggeli Ursag*, Nov. 12, 1942, states that the health statistics of Budapest children are deplorable. Of 100,000 children 55,000 are suffering from nervous complaints—that is ten times as many as are suffering from consumption. It has been possible to reduce the number of cases of contagious disease, but the number of neurotic children has increased fourfold over the same period.

# ORGANIZATION SECTION

## TEXT OF THE OPINION AFFIRMING GUILT OF TWO MEDICAL SOCIETIES

DECISION WRITTEN BY JUSTICE ROBERTS

(From the Chicago Sun)

Washington, Jan 18—The text of Justice Owen J. Roberts' opinion in the Supreme Court's settlement of the antitrust act charges by the government against the American Medical Association and the Medical Society of the District of Columbia, both corporations, follows:

Petitioners have been indicted and convicted of conspiring to violate Section three of the Sherman Act, by restraining trade or commerce in the District of Columbia. They are respectively corporations of Illinois and of the District of Columbia. Joined with them as defendants were two unincorporated associations and 21 individuals, some of whom are officers or employees of one or other of the petitioners, the remainder being physicians practicing in the District of Columbia and members of the petitioners serving as to some of them, on various committees of the petitioners having to do with professional ethics and with the practice of medicine by petitioners' members.

### CHARGES EXPLAINED

For the moment it is enough to say that the indictment charged a conspiracy to hinder and obstruct the operations of Group Health Association, Inc., a nonprofit corporation organized by government employees to provide medical care and hospitalization on a risk-sharing prepayment basis. Group Health employed physicians on a full-time salary basis and sought hospital facilities for the treatment of members and their families. This plan was contrary to the code of ethics of the petitioners. The indictment charges that, to prevent Group Health from carrying out its objects, the defendants conspired to coerce practicing physicians, members of the petitioners, from accepting employment under Group Health; to restrain practicing physicians, members of the petitioners, from consulting with Group Health's doctors who might desire to consult with them, and to restrain hospitals in and about the city of Washington from affording facilities for the care of patients of Group Health's physicians.

The District Court sustained a demurrer to the indictment on the grounds, among others, that neither the practice of medicine nor the business of Group Health is trade as the term is used in the Sherman Act. On appeal the Court of Appeals reversed, holding that the restraint of trade prohibited by the statute may extend both to medical practice and to the operations of Group Health.

### CITES RECORD OF CASE

The case then went to trial in the District Court. Certain defendants were acquitted by direction of the judge. As to the others the case was submitted to the jury, which found the petitioners guilty and all the other defendants not guilty. From judgments of conviction the petitioners appealed to the Court of Appeals, which reiterated its ruling as to the applicability of Section 3 of the Sherman Act, considered alleged trial errors, and affirmed the judgments.

We granted certiorari limited to three questions which we thought important: 1. Whether the practice of medicine and the rendering of medical services as described in the indictment are "trade" under Section 3 of the Sherman Act. 2. Whether the indictment charged or the evidence proved "restraints of trade" under Section 3 of the Sherman Act. 3. Whether a dispute concerning terms and conditions of employment under the Clayton and Norris-La Guardia acts was involved and, if so, whether petitioners were interested therein and therefore immune from prosecution under the Sherman Act.

First. Much argument has been addressed to the question whether a physician's practice of his profession constitutes trade under Section 3 of the Sherman Act. In the light of what we shall say with respect to the charge laid in the indictment, we need not consider or decide this question.

### GROUP HEALTH A BUSINESS

Group Health is a membership corporation engaged in business or trade. Its corporate activity is the consummation of the cooperative effort of its members to obtain for themselves and their families medical service and hospitalization on a risk-sharing prepayment basis. The corporation collects its funds from members. With these funds physicians are employed and hospitalization procured on behalf of members and their dependents. The fact that it is cooperative and procures service and facilities on behalf of its members only, does not remove its activities from the sphere of business.

If, as we hold, the indictment charges a single conspiracy to restrain and obstruct this business it charges a conspiracy in restraint of trade or commerce within the statute. As the Court of Appeals properly remarked, the calling or occupation of the individual physicians charged as defendants is immaterial if the purpose and effect of their conspiracy was such obstruction and restraint of the business of Group Health. The court said: "And, of course, the fact that defendants are physicians and medical organizations is of no significance, for Section 3 prohibits any person from imposing the proscribed restraints."

It is urged that this was said before this court decided *Apex Hosiery Co. vs. Leader*, 310 U. S. 469. But nothing in that decision contradicts the proposition stated. Whether the conspiracy was aimed at restraining or destroying competition, or had as its purpose a restraint of the free availability of medical or hospital services in the market, the *Apex* case places it within the scope of the statute.

### REFERS TO INDICTMENT

Second, This brings us to consider whether the indictment charged, or the evidence proved, such a conspiracy in restraint of trade. The allegations of the indictment are lengthy and detailed. After naming and describing the defendants and the Washington hospitals, it devotes many paragraphs to a recital of the plan adopted by Group Health and alleges that, principally for economic reasons, and because of fear of business competition, the defendants have opposed such projects.

The indictment then recites the size and importance of the petitioners, enumerates means by which they can prevent their members from serving Group Health plans, or consulting with physicians who work for Group Health and can prevent hospitals from affording facilities to Group Health's doctors.

In charging the conspiracy, the indictment described the organization and operation of Group Health and states that, from January, 1937, to the date of the indictment, the defendants, the Washington hospitals, and others cognizant of the premises facts, have combined and conspired together for the purpose of restraining trade in the District of Columbia.

In five paragraphs the pleading states the purposes of the conspiracy. The first is the purpose of restraining Group Health from doing business, the second, that of restraining members of Group Health from obtaining adequate medical care according to Group Health's plan, the third, that of restraining doctors serving Group Health in the pursuit of their calling, the fourth that of restraining doctors not on Group Health's staff from practicing in the District of Columbia in pursuance of their calling, and the fifth, that of restraining the Washington hospitals in the business of operating their hospitals.

### REFERS TO HOSPITAL INFLUENCE

After reciting certain of the proceedings and plans adopted to forward the conspiracy, the indictment alleges that the conspiracy and the intended restraints which have resulted from it, have been effectuated in the following manner and by the following means and alleged that the defendants have combined and conspired with the plan and purpose to hinder and obstruct Group Health Association Inc., in procuring and retaining on its medical staff qualified doctors and to hinder and obstruct



the doctors serving on that staff from obtaining consultations with other doctors and specialists practicing in the District of Columbia. It states that, pursuant to this plan and purpose, the defendants have resorted to certain means to accomplish the end, and recounts them.

In another paragraph, the defendants are charged to have conspired with "the plan and purpose to hinder and obstruct Group Health Association, Inc., in obtaining access to hospital facilities for its members and to hinder and obstruct the doctors on the medical staff of Group Health from treating and operating on their patients in Washington hospitals." It is alleged that, pursuant to this plan and purpose, defendants have done certain acts to deter hospitals with which they were connected and over which they exercised influence, from affording hospital facilities to Group Health's doctors.

The petitioners' contention is, in effect, that the indictment charges five separate conspiracies defined by their separate and recited purposes, namely, conspiracy to obstruct the business of Group Health to obstruct its members from obtaining the benefit of its activities, to obstruct its doctors from serving it to obstruct other doctors in the practice of their calling and to restrain the business of Washington hospitals. The petitioners say that they were entitled to have the trial court rule upon the sufficiency in law of each of these charges and as this was not done the general verdict of guilty cannot stand.

#### CITIZENS APPEALS COURT ACTION

They urge that even though some of the named purposes relate to the business of Group Health, and that business be held trade within the meaning of the statute act, as the practice of medicine by doctors not employed by Group Health is not trade, and the operations of Washington hospitals are not trade, the last two purposes specified cannot constitute violations of section 3 and the jury should have been so instructed. In this view they insist that the jury may have convicted them of restraining physicians unconnected with Group Health, or of restraining hospitals, and, in so the verdict and judgment cannot stand.

If in fact the indictment charges a single conspiracy to obstruct and restrain the business of Group Health and if the recited purposes are really only subsidiary to that main purpose or aim or merely different steps toward the accomplishment of that single end, and if the cause was submitted to the jury on this theory these contentions fail.

When the case first went to the Court of Appeals that tribunal construed the indictment as charging but a single conspiracy. It said:

The charge, stated in condensed form is that the medical societies combined and conspired to prevent the successful operation of Group Health's plan, and the steps by which this was to be effectuated were as follows: (1) To impose restraints on physicians affiliated with Group Health by threat of expulsion or actual expulsion from the societies; (2) To deny them the essential professional contacts with other physicians, and (3) To use the coercive power of the societies to deprive them of hospital facilities for their patients.

#### AGREES WITH LOWER COURT

In the trial the District Court conformed its rulings to this decision and submitted the case to the jury on the theory that the indictment charged but one conspiracy.

We think the courts below correctly construed the indictment. It is true that in describing the conspiracy five purposes are stated which the conspiracy was intended to further, but in a later paragraph, still in the charging part of the instrument it is alleged that the purpose was to hinder and obstruct Group Health in various ways and by various coercive measures which are identical with the "purposes" before stated. The trial judge after calling the jury's attention to the juxtaposition of these two formulations of the charge added:

These purposes, it is alleged, were to be attained by certain coercive measures against the hospitals and doctors designed to interfere with employment of doctors by Group Health and use of the hospitals by members of its medical staff and their patients.

In immediate context the judge added:

"To sustain that charge the government must prove beyond a reasonable doubt that a conspiracy did in fact, exist to restrain trade in the district in at least one of the several ways alleged, and according to the particular purpose and plan set forth."

At another point the trial judge summarized the government's claim that the evidence in the case showed opposition by the petitioners to Group Health and its plan, that they feared competition between the plan and the organized physicians and that to obstruct and destroy such competition the petitioners conspired with certain officers and members and hospitals to prevent successful operation of Group Health's plan by imposing restraints upon physicians affiliated with Group Health by denying such physicians professional contact and consultation with other physicians, and by coercing the hospitals to deny facilities for the treatment of their patients.

#### QUOTIS LOWER COURT

Again the judge charged:

"Was there a conspiracy to restrain trade in one or more of the ways alleged? And again: If it be true that the District Society acting only to protect its organization, regulate its dealing among its members and maintain and advance the standards of medical practice, adopted reasonable rules and measures to those ends not calculated to restrain Group Health, there would be no guilt though the indirect effect may have been to cause some restraint against Group Health."

We need add but a word as to the sufficiency of the proof to sustain the charge. The petitioners in effect challenge the sufficiency in law of the indictment. They hardly suggest that if the pleading charges an offense there was no substantial evidence of the commission of the offense. But however the argument is viewed we agree with the courts below that the case was one for submission to a jury. No purpose would be served by detailed discussion of the proofs.

Third: We hold that the dispute between petitioners and their members, and Group Health and its members, was not one concerning terms and conditions of employment within the Clayton and the Norris-La Guardia Acts.

Section 20 of the Clayton Act is expanded by section 13 of the Norris-La Guardia Act is the only legislation which can have any bearing on the case. Section 20 applies to cases between "an employer and employees or between employers and employees or between employees or between persons employed and persons seeking employment involving or growing out of, a dispute concerning terms or conditions of employment and provides that none of the acts specified in the section shall "be considered or held to be violations of any law of the United States."

#### DEFINES LABOR DISPUTE

Section 13 of the Norris-La Guardia Act defines a labor dispute as including "any controversy concerning terms or conditions of employment or concerning the association or representation of persons in negotiating fixing, maintaining, changing or seeking to arrange terms or conditions of employment regardless of whether or not the disputants stand in the proximate relation of employer and employee."

It also provides that "a case shall be held to involve or to grow out of a labor dispute when the case involves persons who are engaged in the same industry, trade, craft or occupation or have direct or indirect interests therein or who are employees of the same employer or who are members of the same or an affiliated organization of employers or employees whether such dispute is (1) between one or more employers or associations of employers and one or more employees or associations of employees (2) between one or more employers or associations of employers and one or more employers or associations of employees or (3) between one or more employees or associations of employees and one or more employees or associations of employees or when the case involves any conflicting or competing interests in a 'labor dispute' (as defined in this section) of 'persons participating or interested' therein (as defined in this section)."

Citing these provisions the petitioners insist that their dispute with Group Health was as to terms and conditions of employment of the doctors employed by Group Health since the District Medical Society objected to its members, or other

doctors, taking employment under Group Health on the terms offered by that corporation

They assert that section 20 of the Clayton Act, as expanded by section 13 of the Norris La Guardia Act, includes all persons and associations involved in a dispute over terms and conditions of employment who are engaged in the same industry, trade, craft, or occupation, or have direct or indirect interests within. And they rely upon our decisions in *New Negro Alliance vs Sanitary Grocery Co*, 303 U S 552, and *Drivers Union vs Lake Valley Co*, 311 U S 91 as bringing within the coverage of the acts a third party, even though that party be a corporation not in trade, and employers and employers associations even though they be only indirectly interested in the controversy. They insist that as the petitioners and Group Health, its members and doctors other doctors and the hospitals, were either directly or indirectly interested in a controversy which concerned the terms of employment of doctors by Group Health the case falls within the exemption of the statutes and they cannot be held criminally liable for a violation of the Sherman Act

#### CITES PETITIONERS' PURPOSE

It seems plain enough that the Clayton and Norris La Guardia Acts were not intended to immunize such a dispute as is presented in this case. Nevertheless, it is not our province to define the purpose of Congress apart from what it has said in its enactments, and, if the petitioners' activities fall within the classes defined by the acts, we are bound to accord petitioners especially in a criminal case, the benefit of the legislative provisions.

We think however, that, upon analysis, it appears that petitioners' activities are not within the exemptions granted by the

statutes. Although the government asserts the contrary, we shall assume that the doctors having contracts with Group Health were employees of that corporation. The petitioners did not represent present or prospective employees. Their purpose was to prevent anyone from taking employment under Group Health. They were interested in the terms and conditions of the employment only in the sense that they desired wholly to prevent Group Health from functioning by having any employees. Their objection was to its methods of doing business. Obviously there was no dispute between Group Health and the doctors it employed or might employ in which petitioners were either directly or indirectly interested.

In truth the petitioners represented physicians who desired that they and all others should practice independently on a fee for service basis where whatever arrangement for payment each had was a matter that lay between him and his patient in each individual case of service or treatment. The petitioners were not an association of employees in any proper sense of the term. They were an association of individual practitioners each exercising his calling as an independent unit. These independent physicians and the two petitioning associations which represent them were interested solely in preventing the operation of a business conducted in corporate form by Group Health.

In this aspect the case is very like *Columbia River Packers Association Inc. vs Hinton*, 315 U S 143. What was there decided requires a holding that the petitioners' activities were not exempted by the Clayton and the Norris-La Guardia Acts from the operation of the Sherman Act.

The judgments are affirmed.

Mr Justice Murphy and Mr Justice Jackson took no part in the consideration of the decision of this case.

## OFFICIAL NOTES

### ANNUAL CONGRESS ON MEDICAL EDUCATION AND LICENSURE

Program of Meetings to Be Held in Chicago,  
February 15 and 16

The Thirty-Ninth Annual Congress of the Council on Medical Education and Hospitals of the American Medical Association will be held at the Palmer House Chicago, February 15 and 16. The Federation of State Medical Boards of the United States will participate in the congress. The program follows:

MONDAY, FEBRUARY 15 10 A M

*Report of the Council on Medical Education and Hospitals of the American Medical Association*

RAY LYMAN WILBUR M D Stanford University Calif  
Chairman of the Council on Medical Education and Hospitals

*Education and the War*

EDWARD C ELLIOTT LL D Washington D C  
Chief Professional and Technical Employment and Training Division  
War Manpower Commission

*Premedical and Medical Education as Related to the United States Army*

BRIGADIER GENERAL JOSEPH N DALTON, Washington D C  
Assistant Chief of Staff for Personnel United States Army

*Medical Education as Related to the Procurement and Assignment Service*

HAROLD S DIEHL M D Minneapolis  
Member Directing Board Procurement and Assignment Service for  
Physicians Dentists and Veterinarians

*Graduate Education and the War*

DONALD C BALFOUR M D Rochester Minn  
Director Mayo Foundation for Medical Education and Research

MONDAY, FEBRUARY 15, 2 15 P M

MEDICINE AND THE WAR

COL GEORGE F LULL M D Washington D C  
Chief Personnel Division United States Army Medical Corp (Representing the Surgeon General of the United States Army)

REAR ADMIRAL ROSS T MCINTIRE M D Washington D C  
Surgeon General United States Navy

THOMAS PARRAN M D Washington D C  
Surgeon General United States Public Health Service

*Medical Licensure and Civilian Medical Needs*

HARVEY B STONE M D Baltimore  
Member Directing Board Procurement and Assignment Service for  
Physicians Dentists and Veterinarians

*Mobilization of Canada's Health Resources for War*

THOMAS C ROUTLEY M D Toronto Ontario  
General Secretary Canadian Medical Association

THE FEDERATION OF STATE MEDICAL BOARDS

MONDAY, FEBRUARY 15

FEDERATION DINNER

6 30 P M

*Medical Schools in Wartime*

WILLARD C RAFFLEY M D New York  
Dean Columbia University College of Physicians and Surgeons

*Presidential Address*

JULIAN F DUBOIS M D St Paul  
Secretary Minnesota State Board of Medical Examiners

*Round Table Discussion—State Board Problems*

TUESDAY, FEBRUARY 16, 9 30 A M

*Medical Licensure in New York State*

ROBERT R HANSON M D Albany N Y  
Secretary New York State Board of Medical Examiners

*Medical Licensure and Public Health*

FELIX J UNDERWOOD M D Jackson Miss  
President Elect American Public Health Association Secretary Mississippi State Board of Health

*Necessary Legislation for Graduates of Accelerated Medical Courses and Temporary Interstate Relocation of Physicians*

J W HOLLOWAY JR Chicago  
Director Bureau of Legal Medicine and Legislation American Medical Association

TUESDAY, FEBRUARY 16

FEDERATION LUNCHEON

12 30 P M

TUESDAY, FEBRUARY 16 2 P M

*Basic Science Laws Boards and Practices in the United States*

ORIN E MADISON PH D Detroit  
President Michigan State Board of Examiners in the Basic Sciences  
*Materia Medica and Therapeutics The Inadequacy of Present Day Instruction*

ADAM P IERINGTON M D Portland Maine  
Secretary Maine Board of Registration of Medicine

*Uniform Interstate Endorsement as a War Emergency Measure*  
Speaker to be announced  
Business Session

## Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

### ALABAMA

**Dr. Carver Dies**—George Washington Carver, D.Sc., since 1896 a member of the staff of the Tuskegee Institute, Tuskegee, died at his home on January 5 at the institute, aged 78. He had been in ill health for some months and was confined to his bed for ten days preceding his death. Dr. Carver, at the time of his death, was director of the department of agricultural research at the institute and, since 1935, had been coordinator in a survey conducted by the division of mycology and diseases, Bureau of Plant Industry, U. S. Department of Agriculture. He had studied at the high school in Minneapolis, Kan., graduating in 1894 at the Iowa State College of Agriculture and Mechanic Arts, Ames.

### CALIFORNIA

**Human Case of Plague**—A case of human plague in a child 2½ years of age was reported in Siskiyou County recently. The onset of the disease was about November 8. The diagnosis was confirmed at the U. S. Plague Laboratory, San Francisco.

**Purple Heart Cross Awarded to Dr. Rogers**—Dr. Henry S. Rogers, Petaluma, formerly president of the California Medical Association, recently received the purple heart cross on order of the adjutant general's office in Washington, D. C., "for meritorious army service" in World War I and in recognition of "injuries received in action Sept. 26, 1918 in the Argonne forest on Vauquihill."

**Medical Care of Strangers**—The San Francisco County Medical Society recently instituted a twenty-four hour service through which any person entering San Francisco, who has no private physician, may be referred to one of its members. The office of the society has been furnishing lists of five names to any one inquiring for a physician between the hours of 9 a. m. and 5 p. m. Recently, however, through the aid of one of the direct wire exchanges, the same service has been instituted between the hours of 5 p. m. to 9 a. m. The names are taken in rotation from the list of members of the society who have signified their willingness to serve.

**Dr. Pinkham to Retire as Secretary of State Board**—Dr. Charles B. Pinkham, San Francisco, secretary-treasurer of the California Board of Medical Examiners since 1913, will retire from this position in February when he reaches the mandatory age limit for leaving state service according to *California and Western Medicine*. He will continue as a member of the board. At a recent meeting of the board he was reelected secretary. Other officers are Drs. Percival Dolman, San Francisco, president, and George Thomson, Los Angeles, vice president. Dr. Pinkham graduated at the New York Homeopathic Medical College and Hospital in 1899.

**Physicians Needed**—The Los Angeles County Civil Service Commission announces vacancies for the position of a physician and of an autopsy surgeon. Applicants for the physician's position, which pays from \$235 to \$270 a month, must have a degree of medicine and must have completed a one year internship in an approved hospital. In addition to these qualifications, the applicants for the position of autopsy surgeon with a starting salary of \$235 a month, must have at least two years of professional experience in the pathology laboratory of an accredited hospital, medical school or public agency. There will be no written examination for this position. Candidates will be rated on their professional training and experience and on their ability and personal suitability for work as an autopsy surgeon as evidenced by investigation or interview. There are no residence requirements for either position and no age limitations for the "duration of the war" positions. Interested persons should obtain full information and file an application at Room 102, Hall of Records, Los Angeles, on or before January 25 for the physician's position and on or before February 5 for the position of autopsy surgeon.

**New Surgical Essay Contest**—The San Francisco Surgical Society announces the inauguration of an annual contest in the field of general surgery for young physicians in San Francisco and vicinity. First prize is \$150 and second prize \$100. The author must be a physician in the field of general surgery who is in the period of graduate training not more than six years removed from graduation from medical school. The paper submitted must represent original work in the field

of experimental or clinical surgery but not necessarily based on an original idea. The author may be aided by associates. The paper must not have been presented or printed, as submitted in its final form, prior to its submission to the society. All papers must be received by the secretary of the society, Dr. John W. Chinc, 490 Post Street, San Francisco, and the return address must also be that of the secretary of the society. Papers must be submitted without marks that would identify the author, hospital or institution of origin, and a sealed non-transparent envelope enclosing the name and address of the author must be furnished. If the papers are published they shall be designated as the prize winning essays of the San Francisco Surgical Society.

### COLORADO

**First Training School for Control of Cancer**—The Colorado Society for the Control of Cancer held its first training school for city and district chairmen in Denver, Dec. 9-10, 1942, under the direction of Mrs. Emily G. Bogert, state commander, Women's Field Army. Among the speakers were:

Dr. Charles Smith, Relationship of Colorado Society to the American Society for the Control of Cancer, the Colorado Medical Society, and Public Health.  
Dr. William W. Harkart, Organization and Function of a Cancer Clinic.  
Dr. Roy I. Cleere, Cancer a Public Health Problem.  
Dr. John S. Bouslog, Diagnosis and Treatment of Cancer.  
Dr. Edward J. Meister, Importance of Follow Up Work in Cancer Control.  
Dr. Osbourne S. Philpott, Cancer Education in the Control of Cancer.  
Mrs. Mary H. Huberton, The Nurse in Cancer Control.  
Lieut. Col. Wallace D. Hunt, regional medical officer, Seventh Service Command, subject not announced.

The objectives of the school were to afford a background for cancer control, understanding of cancer control needs, overview of cancer organizations and a knowledge of cancer control program activities.

### CONNECTICUT

**Physiologist Goes to McGill**—Dr. Hebbel E. Hoff, associate professor of physiology at Yale University School of Medicine, New Haven, has been appointed professor of physiology at McGill University, Montreal. The appointment was effective Dec. 1, 1942.

### DISTRICT OF COLUMBIA

**Course in Ocular Surgery**—George Washington University School of Medicine, Washington, announces a postgraduate course in ocular surgery, pathology and orthoptics to be given February 15-20. Additional information may be obtained from the secretary, Miss Louise Wells, 927 Seventeenth Street N.W., Washington, D. C.

### ILLINOIS

**New Advisory Members on Cancer Control**—Governor Green recently appointed the following as members of the advisory board to the division of cancer control in the state department of public health: Drs. Gauntleroy Flinn, Decatur; James Scott Templeton, Pinckneyville; Edwin F. Hirsch, and James P. Simonds, Chicago; and William M. Cooley, Peoria. Unexpired terms are those of Drs. Roswell T. Pettit, Ottawa, and John A. Wolfer, Chicago.

**Course on Psychoanalysis and Psychosomatic Medicine**—The Institute for Psychoanalysis opened at the University of Illinois a course on the fundamentals of psychoanalysis and psychosomatic medicine, January 13. The series of lectures, which will be held on Wednesdays through May 26, will cover the following subjects: The nature of psychologic understanding, historical development of the fundamental concepts of psychoanalysis, the fundamentals of psychodynamics. The principle of inertia and the principle of surplus, the fundamentals of psychodynamics, continued (repression, regression, fixation, reaction formation, projection, rationalization, substitution), the process of biologic and psychologic maturation, theory of dreams, development and structure of the personality, psychoanalytic theory of neuroses and psychoses, the principles of psychosomatic medicine, principles of psychoanalytic therapy (adult analysis), other therapeutic applications of psychoanalysis (brief psychotherapy, child analysis, treatment of psychoses).

### Chicago

**The Christian Fenger Lecture**—William H. Taliaferro, Ph.D., Elrakim Hastings Moore Distinguished Service professor of parasitology and dean of the division of biological sciences, University of Chicago, will deliver the sixth Christian Fenger Lecture of the Institute of Medicine of Chicago and the Chicago Pathological Society, February 8, at the Palmer House. His subject will be "Antigen-Antibody Mechanisms in Immunity to Mammalian Parasites."

## INDIANA

**Secretaries' Conference**—The annual secretaries' conference of the Indiana State Medical Association will be held at the Indiana World War Memorial, Indianapolis, January 24. The speakers will include

Dr. John H. Fitzgibbon, Portland, Ore., Oregon Medical Service and Situation in Kaiser Shipyards  
Mr. Rollen W. Waterson, Gary, executive secretary, Lake County Medical Society, Lake County  
Dr. Albert S. McCown, Washington, D. C., Red Cross Activities and Medicine  
Dr. Harold S. Diehl, Minneapolis, 1943 Program of Procurement and Assignment Service for Physicians  
Dr. Charles R. Bird, Indianapolis, Indiana Doctors Carry On  
Dr. Carl Peterson, Chicago, Industrial Health and the War Emergency

At the dinner session, Brig. Gen. David N. W. Grant, M. C., U. S. Army, Washington, D. C., will discuss "Aviation Medicine and Victory," and Brig. Gen. Fred W. Rankin, M. C., U. S. Army, Washington, President American Medical Association, "American Medicine at War."

## KANSAS

**Changes in Health Officers**—Dr. Daniel C. Barrett, formerly of Bloomington, Ind., has been detailed by the U. S. Public Health Service to serve as health officer of Montgomery County, with headquarters in Independence.—Dr. Garfield A. Reutter, formerly of Bigfork, Minn., is the new health officer of Cherokee County.

**Salina First City in State to Pass Restaurant Ordinance**—Salina is the first city in the state to pass the U. S. Public Health Service Standard Restaurant Ordinance sponsored by the state board of health. The ordinance regulates eating and drinking establishments and was passed by Salina to control sanitation conditions brought about by the establishment of military centers. The food and drugs division will aid in enforcing the ordinance until it is in complete operation, according to the *Neus Letter* of the state board of health.

## MARYLAND

**Night Chest Clinics Opened**—The Baltimore City Health Department recently opened its third diagnostic chest clinic on the fifth floor of the Druid Health Center. The new clinic is for members of the Negro race. Another clinic is for white and Negro patients and one is for white patients only. The city department of health introduced a new night service in these clinics on December 1.

**Lewis H. Steiner Fund**—The late Dr. Walter R. Steiner has made the Medical and Surgical Faculty of Maryland the residuary legatee of his estate as a memorial to his father. Dr. Lewis H. Steiner of Frederick and Baltimore. A trust fund will be designated the Lewis H. Steiner Fund, the income of which will be used "in perpetuity for the purchase of medical periodicals and of books and monographs dealing with special branches of medicine or surgery." Dr. Steiner also gave his medical books to the association. Dr. Lewis H. Steiner was an active member of the faculty after the period from 1855 until he became librarian of the Enoch Pratt Free Library in 1884. During the Civil War he was chief inspector, U. S. Sanitary Commission, Army of the Potomac. In 1856 he delivered the annual oration before the Medical and Surgical Faculty on "The Physiological Properties and Chemical Detection of Strychnia." Many rare and valuable volumes are included in the late Dr. Walter Steiner's gift, which represents a collection of forty years.

## MINNESOTA

**Physician Awarded Distinguished Service Cross**—Capt. William Wilmerding Moir, Jr., M. C., U. S. Army, formerly of Minneapolis, has been awarded the Distinguished Service Cross for extraordinary heroism in action in Northern Africa. According to the *Bulletin* of the Hennepin County Medical Society, Captain Moir, together with members of his paratroop unit, was shot down in a plane near Oran on November 8. His citation reads: "During the attack in the air and the ensuing strafing on the ground, Captain Moir distinguished himself by extraordinary heroism against the armed enemy by inspiring administration of medical attention to wounded personnel before attention to himself, despite severe wounds to his head and back."

**Abortinist Sentenced**—On January 2 Sophia Peck, Minneapolis, aged 62, was sentenced by Judge Frank E. Reed of the District Court of Hennepin County to a term of not to exceed four years of hard labor at the Women's Reformatory at Shakopee. Mrs. Peck had been convicted by a jury Dec. 3, 1942. The testimony at the trial showed that the defendant attempted to perform an abortion on an unmarried Minneapolis

girl on July 17, 1942 by the use of a rubber catheter. The attempted abortion was a failure and the same procedure was repeated again on September 19 and 24. The patient became seriously ill and was hospitalized twice in October. She subsequently recovered and testified for the state at the trial. The state also had as evidence catheters, instruments and medicinal preparations seized by the Woman's Bureau of the Minneapolis Police Department at the time the defendant was arrested. The defendant told the court that she was a tailor by occupation but had also engaged in the selling of cosmetics. She holds no license to practice any form of healing in Minnesota. Mrs. Peck was tried for a similar offense in October 1937 but was found not guilty by a jury.

## NEW YORK

**Postgraduate Lectures**—The following series of lectures on general medicine will be presented before the Columbia County Medical Society at the Hudson City Hospital, Hudson.

Dr. Clarence E. de la Chapelle, New York, March 11, Management of Acute Cardiovascular Emergencies  
Dr. Norman H. Plummer, New York, March 25, Newer Chemotherapeutic Methods  
Dr. J. Maxwell Chamberlain, Oneonta, April 8, Benign and Malignant Neoplasms: Diagnosis, Clinical Effects and Treatment  
Dr. Harvey B. Matthews, Brooklyn, April 22, Pelvic Tumors Complicating Pregnancy, Labor and the Puerperium  
Dr. Marjorie F. Murray, Cooperstown, May 6, The Physical Examination of the Child: Its Importance in Diagnosis

Dr. Abraham C. Silverman, Syracuse, gave a lecture on "Preventive Pediatrics and the Periodic Health Examination" before the Cortland County Medical Society, January 15. These and similar lectures are offered under a cooperative program between the state medical society and the state department of health.

## New York City

**Anniversary Discourse of Academy of Medicine**—Sir Norman Angell, London, author and lecturer, will deliver the anniversary discourse of the New York Academy of Medicine, January 28, on "The Scientific Method and the World Crisis." The lecture is one of a series of "lectures to the laity," announced in *THE JOURNAL*, Oct. 31, 1942, page 708.

**Atypical Pneumonia and Keratoconjunctivitis Now Reportable**—At a meeting, January 12, the city department of health added to its list of reportable diseases those of primary atypical pneumonia and keratoconjunctivitis. The action was taken because primary atypical pneumonia, also known as virus pneumonia, is reported to be increasing throughout the country and because of the widespread distribution of keratoconjunctivitis in an epidemic form.

**Lisa Award for Research in Medicine**—The Alumni Society of the New York City Hospital, Welfare Island, has established the James R. Lisa Award to be given for meritorious work in research medicine done in the laboratories of the hospital under Dr. Lisa's direction. The award to be made by Dr. Lisa at appropriate times to the worker deemed by him to be worthy of it. The prize will consist of a medalion or parchment and an honorarium of several hundred dollars. Dr. Lisa, who graduated at the University of Michigan Medical School, Ann Arbor, Mich., in 1914, is an alumnus and pathologist to the New York City Hospital, Welfare Island.

**Courses for Training in Kenny Method**—The National Foundation for Infantile Paralysis announces that courses of instruction in the Kenny method of treatment for infantile paralysis will be given at the school of education of New York University in cooperation with the college of medicine. The course for physical therapists will be arranged on a part time basis and will continue throughout the semester starting February 3. Registration will be limited to those who are members of the American Physiotherapy Association or the American Registry of Physical Therapy Technicians. Other graduates of recognized schools of physical therapy will be admitted only on special consideration of the qualifications of the applicant. Instructions for physicians and nurses will be offered later. Further inquiries concerning the courses should be directed to Dr. George G. Deaver, School of Education, New York University.

**Macy Foundation to Finance Tropical Medicine Research**—A five year program of research and teaching in tropical medicine will be launched soon at the Columbia Presbyterian Medical Center with the aid of a \$150,000 grant from the Josiah Macy Jr. Foundation. According to the *New York Times*, the program has been formulated to meet "a great responsibility of this country to train doctors and students in tropical medicine." A regular department of tropical medicine will be set up in the De Lamar Institute of Public Health, a division of the medical school of Columbia. The institute is housed in the Washington Heights Health Center. It is

expected that the medical center and the city's health department will cooperate in the new project. Existing laboratory and clinical facilities will be used and the staff of the bacteriology and parasitology laboratories of the various clinical departments will join in the new work. The *Times* also reported that Columbia is endeavoring to obtain the services of the leading men in the tropical field, including a director for the program. Columbia maintains a school of tropical medicine at the University of Puerto Rico, San Juan. This school will be used as a field station whose work will be coordinated with the program in New York. After completing their training in New York, medical personnel will receive additional field training at Puerto Rico and other points throughout the world. In a statement to the press Dr Wilfrid C. Rappleye, dean of the Columbia University College of Physicians and Surgeons, New York, said that after the war there will be a tremendous amount of tropical diseases in this country as the result of members of the armed forces returning in large numbers from countries where tropical diseases are widespread. Such areas as Africa, the Solomon Islands, New Guinea, India and Burma were listed as places from which soldiers, sailors and marines will undoubtedly transport diseases. Malaria and dysentery will be the two principal diseases, he stated. The Macy foundation, which recently has concerned itself with medical research as it is related to difficult phases of the war, was established in 1930 by Mrs. Walter Graeme Ladd of Fair Hills, N. J., with an initial endowment of \$5,000,000 as a memorial to her father.

### OHIO

**Dr. Ruiz Studying at Health Museum**—Dr. Manuel Uribe y Ruiz, who is director of the National Hygiene Museum, Mexico City, is taking a three-months internship at the Cleveland Health Museum at the suggestion of the Pan American Sanitary Bureau.

**General Morgan Gives Morris Lecture**—The sixth annual Roger S. Morris Memorial Lecture was delivered January 8 in the auditorium of the University of Cincinnati College of Medicine by Brig. Gen. Hugh J. Morgan, chief consultant in medicine to the surgeon general of the U. S. Army, Washington, D. C. General Morgan's subject was "Reflections of an Irregular Army Medical Officer."

**Twenty-Eight Years as Society Secretary**—Dr. Alexander S. McCormick, Akron, has retired as secretary of the Summit County Medical Society after holding the position for twenty-eight years. Dr. McCormick, who graduated at the Western University Faculty of Medicine, London, Canada, in 1911, served as secretary of the county medical society from 1913 to 1918 when he refused reappointment. In 1921 he was named to the combined office of secretary-treasurer, serving in this capacity until 1940 when the position was separated. He has been secretary since 1940. He was historian of the society from 1919 to 1920. In 1926 he established the *Bulletin* of the society and served as editor and business manager until 1940. Dr. McCormick is still conductor of the Doctors' Symphony Orchestra, which he founded in Akron in 1926. Just recently he was appointed a committee of one to record the medical history of the society.

### PENNSYLVANIA

**Mr. Rowland Dies**—Mr. Leslie B. Rowland, head of the medical textbook division of the J. B. Lippincott Company, died January 2 at his home in Swarthmore.

**X-Ray Survey Among Union Workers**—Twenty-two cases of tuberculosis were reported out of the first 1,564 persons given x-ray examinations in an effort to determine the extensiveness of tuberculosis among industrial workers carried out by the Erie County Health and Tuberculosis Association. The arrangement was made with the United Electrical, Radio and Machine Workers Local 506 for x-ray examinations of its members and their families using the rapid paper method. Most of the members were employed at the Erie plant of the General Electric Company. Of the total 14 were found with cardiovascular disease and 22 with other diseases. The analysis includes studies as to age, sex and occupation. According to the *Bulletin* of the Pennsylvania Tuberculosis Society, the study is being continued for other members.

### Philadelphia

**Dr. Eberhard Honored**—The sixty-fifth birthday of Dr. Harry M. Eberhard, since 1925 professor and head of the department of gastroenterology, Hahnemann Medical College and Hospital, was observed with the dedication to him of the November-December issue of the *Review of Gastroenterology*.

Dr. Eberhard graduated at Hahnemann in 1898, serving as a member of the teaching staff since 1915 and as vice president of medical affairs since 1940. He has been associate editor of the *Review of Gastroenterology* since 1934.

**Courses in Public Health and Preventive Medicine**—The department of public health and preventive medicine at the University of Pennsylvania School of Medicine will begin a series of part-time courses sometime in February to cover such subjects as public health administration and communicable disease control. Each course will continue for six or eight weeks. On completion of one course another will be started in order that students may eventually complete all the work required for the master of public health degree. *Philadelphia Medium* points out that while the project is planned in response to requests from physicians, it will be carried out only if the registration of physicians seems to justify the undertaking.

### WEST VIRGINIA

**New X-Ray and Laboratory Fee Schedule in Effect**—On January 1 changes in the rules and regulations governing the handling of roentgenograms and the payment of x-ray and laboratory fees by the Workmen's Compensation Department went into effect. The new regulations provide that roentgenograms made by hospitals and physicians in connection with the treatment of compensable injuries must be labeled so as to show the date that the film was made, the claim number, the name of the claimant and the name of the employer and must be retained in the files of the hospital or of the physician making the same for a period of five years from the date of injury. They are to be furnished to the compensation commissioner on written request. Instead of making the x-ray films to the commission, the physician in charge of the case will now submit a full written report in triplicate together with the fee bill on which x-ray charges are made. The regulations further affect the number of roentgenograms and provide flat fees for blood transfusions, operations, anesthesia and laboratory work.

### GENERAL

**Meetings Postponed**—The Association for the Study of Internal Secretions has indefinitely postponed its 1943 session which was tentatively scheduled to be held in Cleveland on April 5 and 6. The 1943 meeting of the Tri-State Medical Association of the Carolinas and Virginia will not be held.

**Campaign Opens for Infantile Paralysis Funds**—"Tomorrow's America Will Be as Strong as Today's Children" is the theme of the 1943 campaign to raise funds for the National Foundation for Infantile Paralysis. The drive opened on January 15 and will conclude with the annual celebration of President Roosevelt's birthday on January 30.

**New Medical Director of National Drug Company**—Dr. D. Olin Meeker, New York, has been appointed medical director of the National Drug Company. Dr. Meeker has been in general practice in New York and once served as head of the research department of Murray Breece Associates. Herman J. Schneiderwirth, Ph.D., has been appointed director of the research laboratories of the company.

**Safety Campaign Opened**—On January 18 a national campaign was launched under the auspices of the War Production Fund to Conserve Manpower to stimulate interest in its program to reduce accidents. William A. Irvine, New York, national chairman of the fund, and Col. John Stilwell, New York, president of the National Safety Council, opened a lecture tour to take them to various places throughout the country where they will sponsor programs to focus interest on the national program to conserve manpower and reduce accidents.

**Decrease in Holiday Deaths**—Only ninety-four accidental deaths occurred in twenty-four states on Christmas Day as compared with 394 reported throughout the country on Christmas Day a year ago according to a nationwide survey by the Associated Press. The greatest decrease was in highway traffic deaths, fifty-two this year as compared with 301 in 1941. Two persons were killed in a railroad accident in Illinois; the rest of the deaths occurring in different ways. In Buffalo a 14-year-old girl was killed by an electric shock when an electric heater fell into a tub of water in which she was bathing. Another "freak" accident occurred in upstate New York when a man, chopping ice from the eaves of his house, fell to his death.

**Dr. Schneider Honored for Work on Aviation Medicine**—Edward C. Schneider, Sc.D., Middletown, Conn., since 1919, Daniel Ayres professor of biology at Wesleyan University and who during World War I, developed a physical fitness

index for testing pilots will be presented with the John Jeffries Award for 1942 by the Institute of Aeronautical Sciences at its "Honors Night Dinner" in New York, January 26. The award will be given to Dr. Schneider for his pioneering research in aviation and particularly for his development of the physical fitness index which has been used by the Army and Navy and in civilian aviation for more than twenty years. The award given annually "for outstanding contributions to the advancement of aeronautics through medical research" is named for Dr. John Jeffries, a Boston physician and the first American to make scientific observations from the air. Dr. Jeffries made his first aerial observations in 1784 from a balloon over London.

**Board Examinations**—The next examination of the American Board of Neurological Surgery will be held at the Illinois Neuropsychiatric Institute, Chicago, February 15 and 16. Dr. R. Glen Spurling, 404 Brown Building, Louisville, Ky., is the secretary. In view of transportation difficulties, the American Board of Psychiatry and Neurology, Inc., will hold regional examinations in May. Proposed places are Boston, Minneapolis, San Francisco, New Orleans and Ann Arbor. The exact time will be settled later, but the practical examinations will take place late in April and early in May, ending just before the meeting of the American Psychiatric Association in Detroit on May 10. One or more of the designated cities may be omitted from the schedule if less than twenty candidates apply for examination there. Written examinations will be given in March in each candidate's immediate vicinity as soon after March 1, the closing date for applications as arrangements can be made. For details, communicate with the secretary, Dr. Walter Freeman, 1028 Connecticut Ave. N.W., Washington, D. C.

**Pharmaceutical Manufacturers' Award Goes to Dr. Doisy**—Edward A. Doisy, Ph.D., professor and director of the department of biochemistry, St. Louis University School of Medicine, St. Louis, was presented with the annual award of distinction of the American Pharmaceutical Manufacturers Association at its annual meeting in New York, December 7. The presentation was made by Dr. Torald H. Sollmann, dean and professor of pharmacology and materia medica, Western Reserve University School of Medicine, Cleveland, "in recognition of Dr. Doisy's 'isolation in pure form of the female sex hormone estrone (theelin) and his other valuable contributions to knowledge of estrogenic substances important in therapy and research'." Dr. Sollmann's address of presentation was entitled "Those Busy Hormones." Other speakers included George R. Cowgill, Ph.D., New Haven, Conn., on hormone developments, Oscar Riddle, Ph.D., Cold Spring Harbor, N. Y., on hormone therapy, and Dr. Ephraim Shorr, New York, on the future of hormone therapy. In reply, Dr. Doisy gave a brief history of his experiments.

**Children's Tumor Registry**—The establishment of a Children's Tumor Registry at the Memorial Hospital for the Treatment of Cancer and Allied Diseases, New York, has been announced. The project was developed under the auspices of the American Academy of Pediatrics to gather clinical case records under a single committee's supervision in the hope that enough data can be accumulated to warrant accurate conclusions for each of the many forms of childhood cancer from the following aspects: etiology and incidence; pathology of childhood cancer; difficulties in diagnosis; frequency and reasons for delay in diagnosis; average clinical course and response to various forms of therapy such as radiation and surgery. The varieties of case material include all malignant tumors, with Hodgkin's disease and leukemia; certain benign tumors, tumors that histologically are unusual; those so situated in the body as to endanger life or to be incompatible with it. All hospitals, clinics and members of the medical profession are urged to submit preliminary data on cases believed to be those of malignant tumors in children less than 15 years of age. If the preliminary review of these data indicates that the case is a proper one for acceptance, blank forms will be returned so as to obtain further details including roentgenograms and microscopic slides. If requested, the registry will obtain and forward immediately opinions by recognized authorities as to diagnosis and recommendation for treatment. The registry assumes the responsibility to collect and record follow-up data relating to the further clinical course and end results in all cases. All data and slides should be sent to the Memorial Hospital for the Treatment of Cancer and Allied Diseases, 444 East Sixty-Eighth Street, New York. The case records will be kept at the hospital until the executive committee of the American Academy of Pediatrics directs otherwise. Lieut. Comdr. Harold W. K. Dargeon, M.C.U.S., Navy pediatrician at the hospital, now on leave of absence

for war duty, originated the idea for the registry. A consulting board of pathologists will review the microscopical sections submitted to the registry. It is composed of Dr. Sidney Farber, Boston; Alvin G. Foord, Pasadena, Calif.; Howard T. Karners, Cleveland; Roy R. Kracke, Atlanta, Ga.; Robert A. Moore, St. Louis; John R. Schenken, New Orleans; Paul C. Steiner, Chicago; and Fred W. Stewart, New York. According to an announcement from the Memorial Hospital, cancer in children is a rare disease compared with that in the adult. On the other hand, the anatomic and histologic forms of malignant tumors which occur in children are more numerous than those which occur in adults. Furthermore, it was stated, the mortality rate of cancer during childhood is extremely high.

**Traffic Deaths Show Decrease**—About 28,000 traffic deaths have been reported on traffic death figures for the first eleven months of the year plus observed trends for December according to a statement from the National Safety Council. The estimate shows a decrease of about 12,000 as compared with the total of 39,969 reported for 1941. Despite the reduction, the council regards the 1942 toll as the greater blow to the nation's productive effort since it included among its dead almost 18,000 workers. The nation cannot feel too much satisfaction over the 1942 decrease because most of it resulted automatically from the decline in driving due to gasoline and tire rationing. From the standpoint of the national survey, the deaths of 18,000 irreplaceable workers and the injury of half a million more is a more serious loss than the larger casualty lists of previous years, it was stated. With national gasoline rationing and lower driving speed, the traffic death toll undoubtedly will decline still further in 1943. The council points out, however, that car pooling means more victims per accident. Progressive deterioration of tires, brakes and cars will increase the hazard. Reports show a definite increase in drinking drivers; it was stated. Any decrease in the 1943 total probably will be chiefly among nonworkers as in 1942. With more and more men, women and even children going into war work, traffic casualties among workers will be nearly as great as in 1942 unless police, engineers and the individual drivers and pedestrians do their utmost to prevent accidents. November traffic deaths totaled 2,260, a 43 per cent reduction from the 3,960 for November 1941. Even so, the November reduction did not equal the October drop of 49 per cent. The eleven month toll was 25,580, a 29 per cent drop from the 35,770 killed in the first eleven months of 1941. Travel during October, the most recent month for which figures are available, was 20 per cent below 1941. This was no greater than the September drop and is considerably smaller than the decrease in August. Except for the Mountain Region, whose relatively small death totals tend to fluctuate widely, the North Atlantic Region still had the smallest decrease in fatalities of any region. Its November drop was only 26 per cent against 51 per cent for the South Atlantic Region and 52 per cent in the South Central States. All of the states showed a decrease in traffic accidents for the first eleven months. Rural traffic fatality decreases exceeded urban drops by sizable margins for the eleven month period. November was no exception with cities showing an average fatality drop of 29 per cent as contrasted with a national decrease of 43 per cent. Rural deaths in November numbered only half as many as in November 1941. In the first eleven months of the year, urban fatalities dropped 16 per cent below the totals for the corresponding period in 1941. Rural fatalities decreased 36 per cent. Except for the very largest cities, those over 500,000, fatality decreases were greatest in the smaller cities. Although cities over 500,000 showed a 17 per cent fatality drop for the first eleven months, the next group of cities, from 250,000 to 500,000 population, showed death reduction averaging only 5 per cent. Toledo, Ohio, continued to lead the death reduction list for large cities with a 46 per cent drop for the first eleven months. Columbus, Ohio, was second with a 41 per cent reduction. Los Angeles and Atlanta, Ga., were in third and fourth places with 37 and 36 per cent drops.

#### Deaths in Other Countries

Sir William Arbuthnot Lane, consulting surgeon to Guy's Hospital and to the Hospital for Sick Children, London, died in London on January 16, aged 87. He was born in Fort George, Scotland, in 1856 and was educated at St. Andrew's House, Bridge of Allan, and Guy's Hospital Medical School. He had written numerous articles on surgery and anatomy and books on the operative treatment of fractures and cleft palate. Sir William visited the United States in 1925.



## Foreign Letters

### LONDON

(From Our Regular Correspondent)

Dec 18, 1942

#### Civilian Casualties Sustained in Eleven Months of Air Raids

A book published by the Ministry of Home Security tells the story of the heavy air raids on this country for the eleven months that began in the middle of June 1940, when, unlike the present, we had no adequate defenses and millions of men, women and children found themselves in the front line of the war. In the previous great war 300 tons of bombs were dropped on Britain and killed 1,400 persons. In the present war about 36,000 high explosive bombs weighing about 6,600 tons, together with thousands of incendiaries, were dropped in three months on the London region alone and 12,696 civilians were killed. In one night, May 10, 1941, 1,436 persons were killed in London. Up to the end of 1941 some 190,000 high explosive bombs were dropped on Britain as a whole, and they killed 43,667 civilians, including 5,460 children. Added to this loss of life there were injuries to thousands, and still greater numbers lost their homes.

What was intended to be a knockout blow to London opened on a fine Saturday afternoon, Sept 7, 1940, when 375 bombers and fighters attacked Woolwich Arsenal and the gas works at Beckton and set docks ablaze. After a break of two hours came a procession of 250 night bombers, guided straight to its target by huge riverside fires. When the big raids began, four fifths of London's auxiliary firemen had never seen a fire. They now had a concentrated experience without parallel in years of peacetime fire fighting. At Woolwich Arsenal men fought the flames in the midst of boxes of live ammunition and crates of nitroglycerin. London was bombed for fifty-seven nights without a break, and then the enemy widened the front to include the arms towns and the ports. First there was the vicious raid on Coventry on Nov 14, 1940, about which the Germans boasted as something new in the annals of war. The provincial towns shared this special ordeal of the bombardment in a more concentrated form than London, as much smaller spaces were attacked. Merseyside was Hitler's "target number one" outside London. Here many concentrated attacks were made, including one on seven consecutive nights. Today air attacks on this country are so small and so few that already we are beginning to forget what one is like.

#### The New Regulation for Compulsory Treatment of Venereal Disease

The new regulation making the treatment of venereal disease compulsory in certain cases was described in a previous letter to THE JOURNAL. In a debate in the House of Lords Lord Winster said that more than 70,000 new infections occurred in 1941 and that syphilis had increased 50 per cent in the civilian population. If the fighting services were added the increase would be in the neighborhood of 70 per cent. The position was rendered more serious by the presence in this country of large numbers of service men and women from abroad. There had been complaints among the chiefs of these forces, particularly as to London.

Viscount Dawson of Penn, himself a physician, said that owing to the wartime increase in venereal disease we were back in the same position as in 1932. The women likely to contract the disease belonged to more classes than was formerly the case. In a crowded country such as this we should lose more than we gained by compulsory notification. One woman was known to give syphilis to seven men in the forces in succession, three of them were married and infected their wives. It was

the hard core of irresponsible women who must be dealt with. The new regulation making treatment compulsory for any person found to have infected two others was the best under the circumstances.

The bishop of Norwich said that opposition to the new regulation was widespread among people who understood the social aspects of the problem. The anonymous informer was alien to this country. There was a danger that an increase of venereal disease would result from the regulation. There should be more treatment centers. More should be done to appeal for self control as the only way of escape, and there should be a nationwide campaign to instruct young people in the danger of promiscuous relationships.

For the government Lord Snell said that its policy was to control and, if possible, to destroy venereal disease. Before the war it had been reduced, but during the war there had been an increase of 70 per cent, including the forces. We had in Great Britain 249 treatment clinics, of which 18 had been opened since the war began. Five more would shortly be opened. A new scheme had been started in rural areas for providing free treatment under special physicians. The new regulation had been carefully framed to provide equality of treatment for men and women. The tracing of persons who spread infection was not a new practice, for most clinics tried to ascertain the source of infection. Every precaution was taken against the dangers suggested. There were heavy penalties for false information. He would be afraid to trust himself to speak about the injury done by self righteous pharisees in regard to this matter. If these diseases were hidden it was because those who contracted them were afraid to be considered social outcasts. They thrived in the conditions of secrecy which had existed for many years. The community should take every step to reduce them. It should be the duty of the individual to refrain from contracting such diseases, or, if he did contract them, to get himself cured as soon as possible.

#### Treatment of Bacillary Dysentery with Sulfaguanidine

At a meeting of the Royal Society of Tropical Medicine Col N Hamilton Fairley FRS, presented on behalf of himself and Col J S K Boyd the results of work done in the Middle East on the diagnosis and treatment of bacillary dysentery. The disease was mild even with Shiga dysentery the mortality was lower than was expected. But, as the stay in the hospital averaged three to four weeks the waste of manpower was great. Fly transmission was the rule. In the forward areas all exposed excreta and animal carcasses were burned or promptly treated with insecticides. Where possible trench latrines were immediately dug and provided with fly proof covers if available. Failing this, earth was immediately used to cover the stools, which were sprinkled with powdered borax or some insecticide. Shiga dysentery accounted for 10 per cent of the cases.

From a military point of view any one who had colicky pain followed by febrile diarrhea with stools containing flakes of mucus or mucus and blood should be regarded as having dysentery and should be sent away without delay. In the majority of cases ultimate recovery occurred under rest, copious fluids and magnesium sulfate. In milder infections milk drinks could be allowed at a relatively early stage. Serum treatment proved disappointing. It relieved toxic features, presumably by neutralizing circulating toxins, but the benefit was rarely more than temporary.

#### SULFAGUANIDINE TREATMENT

Two of the first patients treated with sulfaguanidine had received other treatment for three months but none had made any real difference to the ulcers. Within fourteen days of beginning sulfaguanidine treatment the ulcers completely healed and the symptoms disappeared. In a third case of six months' dura-



tion complete healing took place in a fortnight. A much wider investigation was then undertaken in a series of over 500 cases. Care was taken to combat dehydration when present. Administration of sulfaguanidine was followed in some cases by headache or nausea and in a few cases by rash and fever. In 135 proved cases of Shiga dysentery in which recovery occurred under sulfaguanidine, there was usually early astonishing improvement. In 32 cases with an interval from the onset to the beginning of treatment of six to ten days there was an average of 21.7 stools in the twenty-four hours. The number of stools fell to four in three to five days and to two or less in 5.4 days. The stools became formed in an average of 7.15 days. These results were held to indicate an active bacteriostatic effect on the dysentery organism in the bowel wall. Of 12 more chronic cases complete cure was obtained in 9, as shown by sigmoidoscopy. In 2 some diarrhea persisted and there was evidence of sluggish healing.

#### Precaution Against Dangerous Radiation

Some workers in X-ray departments have fears as to the possible effect on their health of the radiation to which they are exposed. The minister of health has therefore issued a circular letter to hospital authorities on the subject. He is advised that in a well-run department where proper precautions are taken the risk to health is small. But he feels that it would be useful to hospitals and would allay groundless apprehension if they had at their disposal a service for the regular measurement of the radiation received by workers in X-ray departments, so that any excessive or dangerous radiation may be discovered and dealt with. He accordingly approached the National Physical Laboratory on the matter. The laboratory has agreed to organize a service for testing the amount of radiation received by the workers, and to advise what action should be taken. The service is designed primarily for diagnostic workers but can be used for therapy workers. It is available to workers in clinics or for private physicians as well as for those employed in hospitals.

The initial test, which should suffice in the majority of cases, consists in the worker carrying a dental film in the breast or waistcoat pocket. These films will be issued and examined by the laboratory and a report on the amount of radiation received by each worker will be sent to the hospital authority. Should the film test show a dose approaching or exceeding the tolerance value laid down by the British X-Ray and Radium Protection Committee, the hospital should arrange for the testing of the X-ray equipment by ionization methods, and for investigation of the workers' technique. These tests may be made by a physicist attached to the hospital, but, if desired, the laboratory will undertake the investigation and advise on the matter. The dental film test should be repeated at regular intervals of three months.

The minister of health advises hospital authorities and others concerned to make the fullest use of the National Physical Laboratory. Although the risks in a well-conducted laboratory should be small, X-ray tubes may not under war circumstances reach the high standards of peace time. The laboratory makes the small charge of half a dollar for reporting on each film. Where use is made of the laboratory by the emergency hospital scheme (established for the treatment of civilians injured in air attacks) the minister states that the fees paid will be a proper item for including in the running costs of the hospital in the periodic statement of expenditure.

#### Pensions for War Injuries

The government has adopted a new scale of pensions for war injuries. The 100 per cent disability pension is \$9 a week, apart from family allowances and rank additions. The loss of one eye is now assessed at 40 per cent, compared with 50 in the last war, amputation below the knee with a stump exceed-

ing 4 inches has undergone the same change. Loss of both hands or arms, 100 per cent, amputation at or below the shoulder, 50 to 80 per cent, loss of thumb 30 per cent, four fingers, 40 per cent, three fingers, 30 per cent, with reduction of 10 per cent if on the left hand, two fingers, 20 per cent. Double amputation of legs, 100 per cent, both feet, 80 per cent, one foot 30 per cent, amputation at or below the hip, 40 to 80 per cent, loss of all toes on both feet, 20 to 30 per cent, loss of one eye (the other normal), 40 per cent, loss of vision of one eye (the other normal), 30 per cent, loss of a hand and a foot 100 per cent, severe facial disfigurement, 100 per cent. Total deafness 100 per cent, as compared with 70 in the last war.

#### Medical Aid from South Africa for Russia

It is announced from Johannesburg that 10,000 doses of anti-gangrene serum and 2,000 doses of antibacterial dysentery serum are to be sent from the South African Institute of Medical Research to Moscow by air at the urgent request of the Soviet government. It is planned to dispatch a similar consignment each month at a cost to the Medical Aid to Russia Fund of about \$24,000. Later between 30,000 and 40,000 doses of antityphus vaccines will also be sent each month at a cost of between \$6,000 and \$8,000. It is estimated that thousands of Russian lives will be saved by the timely administration of the serums, which should reach the Russian fronts within ten days or a fortnight of leaving South Africa.

#### Cod Liver Oil and Fruit Juices for Young Children and Expectant Mothers

Under the rationing system of the war, the government entirely controls our food supply. Great attention has been paid to the supply of vitamins, such as cod liver oil and fruit juices for young children and expectant mothers. But the minister of health regrets that only a comparatively small percentage of children eligible are now being given the benefit of these special preparations. With the minister of food he will undertake an extensive publicity campaign to impress on mothers their value, particularly during the winter months. It is recognized that not all women can take cod liver oil, but those who can should be encouraged to do so.

#### Anglo-Soviet Medical Collaboration

The Anglo-Soviet Medical Council was formed soon after the attack of Germany on Russia to promote medical collaboration between Britain and Russia. It provides translations of the articles which have appeared in one country for publication in the other. A team of thirty-five translators have recently completed the translation into Russian of Reviews of British War Medicine. The book was formally presented to Mme Mursky, wife of the Russian ambassador, by Sir Alfred Webb-Johnson, president of the council and also of the Royal College of Surgeons. Three thousand copies of volume 1 have gone to Russia, and volume 2, which deals mainly with thoracic surgery, has gone to press.

#### Government Inaugurates Scheme for Cleaner Milk

As a first step toward a cleaner milk supply, laboratory equipment for testing has been installed at more than a thousand large depots where milk is received. Arrangements for training testers, mainly young women, as the scheme develops are being made. It is hoped that one result will be great reduction in the waste through souring next summer. Other openings in the milk industry are forecast in the decision to set up a national milk recording scheme. This will provide for monthly weighings of each cow's milk. Production will then influence rationing allowances. The scheme is also intended to help in the breeding of high milk production stock.

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#### The New Regulation for Compulsory Treatment of Venereal Disease

The new regulation making the treatment of venereal disease compulsory in certain cases was described in a previous letter to *THE JOURNAL*. In a debate in the House of Lords Lord Winster said that more than 70,000 new infections occurred in 1941 and that syphilis had increased 50 per cent in the civilian population. If the fighting services were added the increase would be in the neighborhood of 70 per cent. The position was rendered more serious by the presence in this country of large numbers of service men and women from abroad. There had been complaints among the chiefs of these forces, particularly as to London.

Viscount Dawson of Penn, himself a physician, said that owing to the wartime increase in venereal disease we were back in the same position as in 1932. The women likely to contract the disease belonged to more classes than was formerly the case. In a crowded country such as this we should lose more than we gained by compulsory notification. One woman was known to give syphilis to seven men in the forces in succession, three of them were married and infected their wives. It was

the hard core of irresponsible women who must be dealt with. The new regulation making treatment compulsory for any person found to have infected two others was the best under the circumstances.

The bishop of Norwich said that opposition to the new regulation was widespread among people who understood the social aspects of the problem. The anonymous informer was alien to this country. There was a danger that an increase of venereal disease would result from the regulation. There should be more treatment centers. More should be done to appeal for self control as the only way of escape, and there should be a nationwide campaign to instruct young people in the danger of promiscuous relationships.

For the government Lord Snell said that its policy was to control and, if possible, to destroy venereal disease. Before the war it had been reduced, but during the war there had been an increase of 70 per cent, including the forces. We had in Great Britain 249 treatment clinics, of which 18 had been opened since the war began. Five more would shortly be opened. A new scheme had been started in rural areas for providing free treatment under special physicians. The new regulation had been carefully framed to provide equality of treatment for men and women. The tracing of persons who spread infection was not a new practice for most clinics tried to ascertain the source of infection. Every precaution was taken against the dangers suggested. There were heavy penalties for false information. He would be afraid to trust himself to speak about the injury done by self-righteous pharisees in regard to this matter. If these diseases were hidden it was because those who contracted them were afraid to be considered social outcasts. They thrived in the conditions of secrecy which had existed for many years. The community should take every step to reduce them. It should be the duty of the individual to refrain from contracting such diseases, or if he did contract them, to get himself cured as soon as possible.

#### Treatment of Bacillary Dysentery with Sulfaguanidine

At a meeting of the Royal Society of Tropical Medicine Col. N. Hamilton Fairley, F.R.S., presented on behalf of himself and Col. J. S. K. Boyd the results of work done in the Middle East on the diagnosis and treatment of bacillary dysentery. The disease was mild, even with Shiga dysentery the mortality was lower than was expected. But, as the stay in the hospital averaged three to four weeks the waste of manpower was great. Fly transmission was the rule. In the forward areas all exposed excreta and animal carcasses were burned or promptly treated with insecticides. Where possible trench latrines were immediately dug and provided with fly proof covers if available. Failing this, earth was immediately used to cover the stools, which were sprinkled with powdered borax or some insecticide. Shiga dysentery accounted for 10 per cent of the cases.

From a military point of view any one who had colicky pain followed by febrile diarrhea with stools containing flakes of mucus or mucus and blood should be regarded as having dysentery and should be sent away without delay. In the majority of cases ultimate recovery occurred under rest, copious fluids and magnesium sulfate. In milder infections milk drinks could be allowed at a relatively early stage. Serum treatment proved disappointing. It relieved toxic features, presumably by neutralizing circulating toxins, but the benefit was rarely more than temporary.

#### SULFAGUANIDINE TREATMENT

Two of the first patients treated with sulfaguanidine had received other treatment for three months but none had made any real difference to the ulcers. Within fourteen days of beginning sulfaguanidine treatment the ulcers completely healed and the symptoms disappeared. In a third case of six months' dura-

tion complete healing took place in a fortnight. A much wider investigation was then undertaken in a series of over 500 cases. Care was taken to combat dehydration when present. Administration of sulfaguanidine was followed in some cases by headache or nausea and in a few cases by rash and fever. In 135 proved cases of Shiga dysentery in which recovery occurred under sulfaguanidine, there was usually early astonishing improvement. In 32 cases with an interval from the onset to the beginning of treatment of six to ten days there was an average of 21.7 stools in the twenty-four hours. The number of stools fell to four in three to five days and to two or less in 5.4 days. The stools became formed in an average of 7.15 days. These results were held to indicate an active bacteriostatic effect on the dysentery organism in the bowel wall. Of 12 more chronic cases complete cure was obtained in 9, as shown by sigmoidoscopy. In 2 some diarrhea persisted and there was evidence of sluggish healing.

#### Precaution Against Dangerous Radiation

Some workers in X-ray departments have fears as to the possible effect on their health of the radiation to which they are exposed. The minister of health has therefore issued a circular letter to hospital authorities on the subject. He is advised that in a well-run department where proper precautions are taken the risk to health is small. But he feels that it would be useful to hospitals and would allay groundless apprehension if they had at their disposal a service for the regular measurement of the radiation received by workers in X-ray departments, so that any excessive or dangerous radiation may be discovered and dealt with. He accordingly approached the National Physical Laboratory on the matter. The laboratory has agreed to organize a service for testing the amount of radiation received by the workers, and to advise what action should be taken. The service is designed primarily for diagnostic workers but can be used for therapy workers. It is available to workers in clinics or for private physicians as well as for those employed in hospitals.

The initial test, which should suffice in the majority of cases, consists in the worker carrying a dental film in the breast or waistcoat pocket. These films will be issued and examined by the laboratory and a report on the amount of radiation received by each worker will be sent to the hospital authority. Should the film test show a dose approaching or exceeding the tolerance value laid down by the British X-Ray and Radium Protection Committee, the hospital should arrange for the testing of the X-ray equipment by ionization methods, and for investigation of the workers' technique. These tests may be made by a physicist attached to the hospital, but, if desired, the laboratory will undertake the investigation and advise on the matter. The dental film test should be repeated at regular intervals of three months.

The minister of health advises hospital authorities and others concerned to make the fullest use of the National Physical Laboratory. Although the risks in a well-conducted laboratory should be small, X-ray tubes may not under war circumstances reach the high standards of peace time. The laboratory makes the small charge of half a dollar for reporting on each film. Where use is made of the laboratory by the emergency hospital scheme (established for the treatment of civilians injured in air attacks) the minister states that the fees paid will be a proper item for including in the running costs of the hospital in the periodic statement of expenditure.

#### Pensions for War Injuries

The government has adopted a new scale of pensions for war injuries. The 100 per cent disability pension is \$9 a week, apart from family allowances and rank additions. The loss of one eye is now assessed at 40 per cent, compared with 50 in the last war, amputation below the knee with a stump exceed-

ing 4 inches has undergone the same change. Loss of both hands or arms, 100 per cent, amputation at or below the shoulder, 50 to 80 per cent, loss of thumb, 30 per cent, four fingers, 40 per cent, three fingers, 30 per cent, with reduction of 10 per cent if on the left hand. Two fingers, 20 per cent. Double amputation of legs, 100 per cent. Both feet, 80 per cent. One foot, 30 per cent, amputation at or below the hip, 40 to 80 per cent, loss of all toes on both feet, 20 to 30 per cent, loss of one eye (the other normal), 40 per cent, loss of vision of one eye (the other normal), 30 per cent, loss of a hand and a foot, 100 per cent, severe facial disfigurement, 100 per cent. Total deafness, 100 per cent, as compared with 70 in the last war.

#### Medical Aid from South Africa for Russia

It is announced from Johannesburg that 10,000 doses of anti-gangrene serum and 2,000 doses of antibacterial dysentery serum are to be sent from the South African Institute of Medical Research to Moscow by air at the urgent request of the Soviet government. It is planned to dispatch a similar consignment each month at a cost to the Medical Aid to Russia Fund of about \$24,000. Later between 30,000 and 40,000 doses of antityphus vaccines will also be sent each month at a cost of between \$6,000 and \$8,000. It is estimated that thousands of Russian lives will be saved by the timely administration of the serums, which should reach the Russian fronts within ten days or a fortnight of leaving South Africa.

#### Cod Liver Oil and Fruit Juices for Young Children and Expectant Mothers

Under the rationing system of the war, the government entirely controls our food supply. Great attention has been paid to the supply of vitamins, such as cod liver oil and fruit juices for young children and expectant mothers. But the minister of health regrets that only a comparatively small percentage of children eligible are now being given the benefit of these special preparations. With the minister of food he will undertake an extensive publicity campaign to impress on mothers their value, particularly during the winter months. It is recognized that not all women can take cod liver oil, but those who can should be encouraged to do so.

#### Anglo-Soviet Medical Collaboration

The Anglo-Soviet Medical Council was formed soon after the attack of Germany on Russia to promote medical collaboration between Britain and Russia. It provides translations of the articles which have appeared in one country for publication in the other. A team of thirty-five translators have recently completed the translation into Russian of Reviews of British War Medicine. The book was formally presented to Mme. Minsk, wife of the Russian ambassador, by Sir Alfred Webb-Johnson, president of the council and also of the Royal College of Surgeons. Three thousand copies of volume 1 have gone to Russia and volume 2, which deals mainly with thoracic surgery, has gone to press.

#### Government Inaugurates Scheme for Cleaner Milk

As a first step toward a cleaner milk supply, laboratory equipment for testing has been installed at more than a thousand large depots where milk is received. Arrangements for training testers, mainly young women, as the scheme develops, are being made. It is hoped that one result will be great reduction in the waste through souring next summer. Other openings in the milk industry are forecast in the decision to set up a national milk recording scheme. This will provide for monthly weighings of each cow's milk. Production will then influence rationing allowances. The scheme is also intended to help in the breeding of high milk production stock.

## BRAZIL

(From Our Regular Correspondent)

Nov. 12, 1942

## Pollen Allergy

The problem of pollen allergy is a new one in Brazil. Dr. Ernesto Mendes of São Paulo in a recent paper says that allergic conditions with such a seasonal character that one could assume the pollen to be their cause are not found in Brazil. His conclusions were reached after the examination of 124 patients, 63 per cent of whom had bronchial asthma and 37 per cent had perennial rhinitis. He used one hundred extracts and among these twenty were made with pollens from plants of the city of São Paulo and its vicinity. Of the total number of patients 10.5 per cent showed slight cutaneous reactions to the pollen extracts but among those who were subjected to allergic rhinitis the positive reactions to pollen reached the higher rate of 13 per cent. Nearly all the patients reacted to more than one extract. The plants that elicited more reactions were those of the species *Eucalyptus globulus* (32 per cent), *Amarantus* sp. (16 per cent), *Chenopodium ambrosioides* (16 per cent) and *Ambrosia polystachia* (16 per cent). Cutaneous reactions to pollen alone were not observed and many positive cutaneous reactions to pollen extracts should be regarded as nonspecific, since the passive transfer test which was performed in 9 cases, gave positive results in only 2. The findings apparently demonstrate that pollen allergy is exceptional in the particular subtropical area referred to and it can be detected only through allergy tests as no clinical symptoms are observed. The extremely low incidence of pollen allergy in Brazil is due to the environment rather than to the individual peculiarities as the potent allergenic plants are few in this country, and the meteorologic conditions do not favor high concentrations of the pollens in the air, particularly in the region of the city of São Paulo. The pollens which reach in the atmosphere of São Paulo sufficiently high concentration to produce pollen allergy are of doubtful allergenic action (*Eucalyptus* and *Parthenium hysterophorus*, between November and February and *Meliss minutiflora* in June and July). The pollens of potent allergenic plants were found in number lower than 15 per cubic centimeter (*Cynodon dactylon* in January and February, *Ambrosia polystachia* from December to March and *Amarantus* from January to April). Some interesting clinical facts have also to be recalled, as for example people who suffer from pollinosis in other countries are relieved by moving to Brazil.

Wild Fire (*Pemphigus foliaceus*)

For the past few years an ever increasing number of cases of a malignant type of pemphigus foliaceus has been reported mainly in the rural areas of the state of São Paulo but also in the central states of Mato Grosso, Minas Geraes, Bahia and Goiás and in the neighboring regions of Paraguay and Bolivia as well. Although the clinical symptoms of pemphigus foliaceus in Brazil are the same as found elsewhere—the itching, burning and acute pain are much more severe and have given rise to the popular name of 'fogo selvagem' (wild fire). In São Paulo alone there are now about 700 cases of the disease. The classic writers stated that the disease was neither epidemic nor contagious, and some of them have ignored the existence of its peculiar manifestations concerned with the tropics—the condition being attributed to toxins, to neuropathic influences, to *Bacillus pyocyaneus* and the like. Dermatologists apparently agree that, whatever its origin the disease is rare. But the Brazilian experience of recent years contradicts many of these views. The problem became so acute that the state of São Paulo created a special service against the disease, provided with a special hospital of 100 beds and the federal government is building three more of them. It is now proved that the condition is not trans-

missible by direct contact. Well and sick people live in close association during a considerable period of time, and new cases do not arise. The rural areas that constitute the foci are well defined. Suddenly the disease appears in a new area, without any apparent connection with the former. In the large cities there are no autochthonous cases but only those that come to the hospitals. The incidence is higher among women than among men (in the ratio of 3:2) and also higher among people of poor social and economic conditions. Some authors believe in a food deficiency cause, but the poorer zones of the state of São Paulo (the littoral and the northern zones, for instance) are clearly spared. All the lowlands are also free from the disease. The characteristic elementary lesion is a scrofulous purulent bulla on the face, chest and legs, and then the eruption tends to generalize. It must be distinguished from Duhring's dermatitis (which has a different localization with a good general health), from subacute Brocq's type of pemphigus with extensive bullae, from the true acute infectious pemphigus and from bullous impetigo. Once initiated wild fire may develop into one of four types: acute, subacute (most common), superacute (generally fatal after a short period of illness) or chronic. In the chronic cases nails take a yellowish tint as if dipped in iodine (Vicia sign). In most cases itching is a predominant symptom but a warm burning sensation is usually commoner.

After failing to find a visible microbial cause of the disease, Lindenberg, of São Paulo, decided that in view of the obvious infective nature of wild fire a virus must be responsible. He tried the transmission of the disease to rabbits and thinks that he succeeded but J. P. Vieira, an authority on the subject, failed to confirm Lindenberg's results. The low alkali reserve of the blood suggests the necessity of some special diet. The treatment must be begun early with antiseptic baths, quinine by mouth and protection of the skin with a heavy layer of borated petrolatum or else the disease goes on and there is no cure possible. The Brazilian pemphigus foliaceus is a serious problem awaiting particular attention and continuous study.

## Marriages

HENRY WILLIAM SCOTT JR., Graham, N. C., to Miss Mary Louise Vaname of Cape Elizabeth, Maine at Portland, Maine, October 17.

WILLIAM A. VAN NORTWICK, Greenville, N. C., to Miss Grace C. Taylor in Morehead City, November 7.

ROBERT HENRY CLIVLAND to Miss Hannah Elizabeth Hubank, both of Jacksonville, Fla., October 10.

MARION LAWRENCE WHITE JR., Reedville, Va., to Miss Emma Cassandra Mecon at Orange, November 22.

JAMES LAFAVETTE JORDAN JR. to Miss Mary Katherine Boswell, both of Huntsville, Ala., recently.

ELLEN WHITTEMORE BANE, Prunedown, Minn., to Mr. Henry Longfellow of Beloit, Wis., December 9.

WILLIAM H. WAITERS JR., Iracoochee, Fla., to Miss Helen Hancock in Jacksonville in November.

IRVING E. MITCHELL, Asheville, N. C., to Miss Margaret John Holland in Detroit, October 17.

PETER JOHN FILIPIN JR. to Miss Helen Marguerite Cruze, both of Knoxville, Tenn., October 24.

PAUL J. ISRA, Fort Howard, Maryland, to Miss Regina Nelson of New York, December 20.

ABRAHAM BERRY, Columbia, S. C., to Miss Bernice Frances Coleman of Charleston, October 18.

OREN A. ELLINGSON, Brooklyn, to Miss Florence Rosamond Carson at Nashville, Tenn., recently.

JENNINGS KERR OWENS, Bennettsville, S. C., to Miss Grace S. Buie of Denmark, November 28.

JAMES J. O'HALLORAN, Moline, Ill., to Miss Camille Nolan of Davenport, Iowa, November 26.

HUBERT CLAYTON JR., Hopkins, S. C., to Miss Florence Rivers Armour at Eastover, October 18.

## Deaths

**Howard Atwood Kelly** \* world famed as a pioneer in gynecology, died at the Union Memorial Hospital, Baltimore, January 12, aged 84, of generalized arteriosclerosis and uremia. His death preceded by a few hours that of his wife, who lay ill in an adjoining room.

Dr Kelly was born in Camden, N J, Feb 20, 1858, he received his bachelor of arts degree at the University of Pennsylvania Philadelphia in 1877 and his medical degree at the same university in 1882. While a resident physician in the Episcopal Hospital, Dr Kelly developed a gynecologic dispensary clinic. On completion of his internship he established a two room hospital, which later became the Kensington Hospital, to be supported by voluntary contributions. He was called from his position as associate professor of gynecology at the Pennsylvania Department of Medicine to become the first professor of gynecology and obstetrics at Johns Hopkins University and obstetrician in chief to the Johns Hopkins Hospital Baltimore. In these early days Dr Kelly's hospital work was limited to gynecology. The opening of the medical school in 1893 and the need for obstetric facilities were responsible for the separation in 1899 of the department of obstetrics and gynecology into two divisions. From then on Dr Kelly concentrated all his efforts on the development of gynecology. He had been emeritus professor of gynecology at the medical school since 1919 and consulting gynecologist to the hospital since the same year. In 1892 he was responsible for the establishment of the sanatorium which bore his name. In 1913 the institution which closed in 1938 became the Howard A. Kelly Hospital. Here he served at various times as radiologist and surgeon physician in chief and superintendent.

Throughout the years, Dr Kelly showed himself to be a pioneer in numerous forms of medical study. He was one of the first to use cocaine for local anesthesia. His work in abdominal surgery was revolutionary and his early interest in cancer and radiation resulted in many brilliant contributions. He is the inventor of the Kelly pad, rectal and vesical speculums and an operative technic which bears his name. In 1933 at a special assembly to honor him on his seventy fifth birthday, Dr Kelly was credited by Max Brodel with the successful development of medical illustration as a specialty.

During his career many honors were bestowed on him. He was an honorary member and fellow of numerous scientific societies, including the Chicago Gynecological Society, American Urological Association, Seaboard Medical Association, Virginia and North Carolina medical societies, American Radium Society, American Association for the Advancement of Science, American Geographic Society, Maryland Academy of Sciences, of which he was a life member, Natural History Society of Maryland, Philadelphia Academy of Natural Sciences, New York Zoological Society, New York Botanical Gardens, American Museum of Natural History and American Society of Ichthyologists and Herpetologists. In addition, Dr Kelly held honorary memberships in many European groups. He was president of the Southern Surgical and Gynecological Society in 1907 and of the American Gynecological Society in 1912. He was secretary of the Section on Obstetrics and Diseases of Women of the American Medical Association from 1890 to 1891 and a founder member of the American College of Surgeons in 1913. In 1928 he gave the Hunterian Lecture in the Mansion of the Lord Mayor of London. The occasion marked the two hundredth anniversary of the birth of John Hunter.

Dr Kelly wrote extensively on a variety of subjects. His works include *Operative Gynecology* (two volumes, 1898, 1906),

*Vermiform Appendix and Its Diseases* (with Elizabeth Hurdon), 1905, *Walter Reed and Yellow Fever* 1906, 1907 and 1923, *Gynecology and Abdominal Surgery* edited with C P Noble volume 1, 1907, volume 2 1908. *The Stereo Clinic* (eighty-four sections), 1908. *Medical Gynecology*, 1908 and 1912. *Appendicitis and Other Diseases of the Vermiform Appendix* 1909. *Myomata of the Uterus* (with T S Cullen) 1909. *Cyclopedia of the American Medical Biography*, two volumes, 1912. *Some American Medical Botanists* 1913. *Diseases of the Kidneys, Ureters and Bladder* (with C F Burnham two volumes), 1914 and 1922. *American Medical Biographies* (with W L Burrage), 1920. *A Scientific Man and the Bible* 1925, *Gynecology* 1926. *Dictionary of American Medical Biography* (with W L Burrage), 1928, *Electrosurgery* (with Grant E Ward), 1932.

Frequently referred to as the father of gynecology, Dr Kelly is the last of the memorable four of medicine represented in Sargent's famous portrait of Osler, Halsted and Welch.

Dr Kelly was a man of broad interests and great enthusiasms. His active mind, his arresting personality and his extraordinary skill attracted to him students from all over the world. His intellectual curiosity in many fields apart from medicine kept him in the forefront of public interest.

Besides gynecology and surgery he was competent in the fields of botany, natural history and anthropology and he did not hesitate to express himself regarding politics and religion. His religious beliefs inclined toward fundamentalism and he was at the time of his death a member of the board of the William Jennings Bryan University at Dayton Tenn. He was also an ardent advocate of prohibition of alcoholic liquors and of strict observation of the Sabbath. In behalf of these interests he spoke and wrote frequently. He had been in his youth a champion swimmer, a competent cowboy and an expert canoeist and his knowledge of poisonous snakes made him a recognized authority in that field. His friends and correspondents were legion. Even those with whom he debated fiercely and at length honored him for his intellectual integrity.

**Aaron Joshua Rosanoff** \* Beverly Hills Calif. Cornell University Medical College, New York, 1900, director of state institutions from 1939 to 1942, for many years a member of the Los Angeles County Lunacy Commission, member of the American Psychiatric Association, a charter member, board member and past president of the Southern California Academy of Criminology.

a charter member, board member and past president of the Southern California Society for Mental Hygiene, at one time professor of medicine (psychiatry), College of Medical Evangelists, Los Angeles, lecturer in psychiatry at Columbia University, New York, from 1919 to 1921 and formerly at the University of Southern California, Los Angeles, during World War I served in the neuropsychiatric service of the U S Army, treating victims of shell shock and similar injuries. For his work in this field was the recipient of a special citation from the government, a captain and major in the medical corps of the U S Army from 1917 to 1919 and a lieutenant colonel in the medical reserve corps from 1920 to 1930, organized and founded the Langley Porter Clinic, San Francisco, specialist certified by the American Board of Psychiatry and Neurology, Inc., junior assistant physician at the Kings Park (N Y) State Hospital from 1902 to 1905, assistant physician from 1905 to 1908, senior assistant physician from 1908 to 1911 and clinical director from 1911 to 1922, owner and medical director of the Alhambra Sanatorium, Rosemead, consulting psychiatrist to the Kaspary Cohn Hospital, Los Angeles, from 1923 to 1928, co-author of 'Etiology of Mental Deficiency with Special Reference to Its Occurrence in Twins,' psychologic monographs published in 1937, author of 'Manual of Psychiatry and Mental Hygiene,' seventh edition published in 1938, an associate editor of the *American Journal of Psychiatry*, aged 64, died January 7, of carcinoma of the lungs.



HOWARD ATWOOD KELLY, M D, 1858 1943

**A Noah Schiller** ⊕ New York, Columbia University College of Physicians and Surgeons, New York, 1907, member of the American Academy of Ophthalmology and Otolaryngology, one of the founders of the Jewish Memorial Hospital, where he was honorary chairman and chairman of the medical board, consulting otolaryngologist and for many years chief of the department of otolaryngology, consulting otologist and attending physician in the ear, nose and throat division of the New York City Hospital, Welfare Island, aged 58, died, December 17, in Miami Beach, Fla, of coronary occlusion

**Seavy Highsmith** ⊕ Fayetteville, N C, University College of Medicine, Richmond, 1901, member of the Southern Medical Association, past president of the Cumberland County Medical Society, member and in 1939 president of the Fifth District Medical Society member and past vice president of the Tri-State Medical Society vice president of the North Carolina League for Crippled Children, aged 68, co owner and secretary of the Cumberland General Hospital from 1917 to 1927, from 1905 to 1917 on the staff of the Highsmith Hospital, where he died, December 8, of heart disease

**John Mitchel Johnson Jr**, San Sabá Texas, Tulane University of Louisiana School of Medicine, New Orleans 1936, practiced at Longview, where he served on the staff of the Van Sickie Clinic-Hospital aged 31, was commissioned a lieutenant, junior grade, in the medical corps of the U S Naval Reserve and began active duty in March 1942 had recently been promoted to lieutenant senior grade, was killed in action recently somewhere in the Pacific

**James Gordon Henderson**, Beverly Hills, Calif Stanford University School of Medicine, San Francisco, 1925, formerly assistant clinical professor of surgery (genitourinary) at his alma mater, member of the American Urological Association resident physician, St Francis Hospital, 1925-1926, resident in urology at the Stanford University Hospital from 1926 to 1928, visiting urologist, Laguna Honda Home, from 1928 to 1931, assistant visiting urologist at the San Francisco Hospital for many years, urologist San Francisco Polyclinic, from 1929 to 1935, aged 44, died in November

**Charles Blanchard Bard**, Water Valley, Ky University of Louisville Medical Department 1912, member of the Kentucky State Medical Association, served overseas during World War I, aged 54, died, December 3, at the Mayfield (Ky) Hospital of coronary heart disease

**L Ernest Belanger**, Montreal, Que, Canada, MB, School of Medicine and Surgery of Montreal, Faculty of Medicine of the University of Laval at Montreal in 1907, and MD in 1909 aged 60, died November 12

**Edward J Broderick**, St John, N B, Canada McGill University Faculty of Medicine, Montreal, Que, 1890, aged 76, died, December 1

**Eugene Carmichael**, Cedar Rapids, Iowa State University of Iowa College of Homeopathic Medicine, Iowa City, 1900, aged 74, died, November 29 of angina pectoris

**George Bradford Curry**, Bolivar, Tenn Memphis Hospital Medical College, 1903, aged 66, died, November 28, in the Baptist Memorial Hospital, Memphis, of intestinal obstruction

**Albert Downing**, Carleton Place, Ont, Canada, University of Toronto Faculty of Medicine, 1895, for a number of years served as a member of the board of education and as deputy reeve, medical officer of health for Carleton Place, appointed a coroner for the county of Lanark while practicing at McDonald's Corners and continued to serve in that capacity during his residence in Carleton Place, aged 68, died, October 16

**Rufus Cecil Franklin** ⊕ Swainsboro, Ga, University of Maryland School of Medicine, Baltimore, 1907 member of the Southeastern Surgical Congress president and secretary of the Emanuel County Medical Society, had been a member of the city council and chairman of the local school board director of the Citizens' Bank, medical superintendent and owner of the Franklin Hospital, aged 61, died, December 4, in a hospital at Atlanta of hemiplegia

**Albert Lincoln French**, Lincoln, Neb, Medical School of Maine Portland, 1882, aged 82, died, December 3, in St Elizabeth Hospital of carcinoma of the liver

**Ralph Winward French** ⊕ Fall River Mass, Harvard Medical School, Boston, 1910, specialist certified by the American Board of Surgery, member of the New England Surgical Society, fellow of the American College of Surgeons, aged 59, was instrumental in establishing a training school for nurses and a member of the surgical staff of the Truesdale Hospital, where he died, December 7, of a spontaneous subarachnoid hemorrhage

**John Phillip Gibbs** ⊕ Chicago, Harvey Medical College, Chicago, 1905, for many years on the staff of St Elizabeth Hospital aged 79, died, December 5, in Spring Grove, Ill, of arteriosclerosis

**Lindon Lemuel Gillett**, Suffern, N Y, University of Wooster Medical Department, Cleveland, 1887, aged 77, died, November 8, in the Hackensack (N J) Hospital of diabetes mellitus and a fracture of the femur resulting from a fall

**Charles Judson Gordon**, Sicily Island, La, Kentucky School of Medicine, Louisville, 1898, member of the Louisiana State Medical Society, aged 69, died, December 4, of heart disease

**Richard H Greenwell**, Bardstown Ky Hospital College of Medicine Louisville, 1906, member of the Kentucky State Medical Association secretary of the Nelson County Medical Society health officer of Nelson County, aged 64, died December 6

**James Richard Greer**, Danville, Ill, Rush Medical College, Chicago, 1912, formerly assistant clinical professor of medicine at his alma mater member of the medical staff of the Presbyterian Hospital, Chicago, from 1913 to 1929 aged 66, died, December 1 of acute dilatation of the heart following chronic myocardial degeneration

**J L Griffin**, Vandalia Ark Memphis (Tenn) Hospital Medical College 1903 member of the Arkansas Medical Society, aged 67, died December 2

**Emery Fremont Griffith**, Peru Iowa College of Physicians and Surgeons, Keokuk 1887, aged 81, died November 9, of cerebral hemorrhage

**Edward Cleveland Hagler**, Tuscaloosa Ala Medical College of Alabama Mobile, 1904 member of the Medical Association of the State of Alabama served in the medical corps of the U S Army during World War I, aged 63, died December 4

**Joseph W Halford**, Raleigh N C George Washington University School of Medicine Washington D C 1904 was vice president of the bank of Lillington, had served as chairman of the county board of commissioners and as mayor of Lillington, aged 72, died November 28 in Lillington of burns received when he fell asleep while smoking

**William Heston Harper** ⊕ Columbus, Ohio Ohio Medical University Columbus, 1901, aged 69, died, December 6

**Gray Godwin Holladay**, Portsmouth Va, Bellevue Hospital Medical College, New York, 1893 fellow of the American College of Surgeons, served in the U S Navy during World War I in 1917 was senior medical officer of the transport *George Washington*, which brought the King and Queen of Belgium to the United States, was decorated by the King with the Belgian Order of Leopold for many years surgeon for the Seaboard Air Line Railway, and city coroner of Portsmouth aged 72, died, November 26 in the King's Daughters' Hospital of chronic myocarditis and carcinoma of the jaw

**Walter B Holmes**, Wadley, Ga Baltimore Medical College 1892 member of the Medical Association of Georgia, aged 72, died recently

**John H Horne**, Robesonia, Pa, Jefferson Medical College of Philadelphia, 1891, member of the Medical Society of the State of Pennsylvania, aged 77, died November 14

**Edwin Everett Jack**, Brookline, Mass Harvard Medical School, Boston, 1887 member of the Massachusetts Medical Society, the American Ophthalmological Society, the Association for Research in Ophthalmology Inc, and the New England Ophthalmological Society, specialist certified by the American Board of Ophthalmology consultant, Children's Hospital Boston, from 1895 to 1918, member of the consulting staff, Massachusetts Eye and Ear Infirmary, Boston, aged 79, died, November 16, of angina pectoris

### KILLED IN ACTION



LIEUT JOHN MITCHEL JOHNSON JR,  
M C, U S N R, 1911-1942

**Leo Harold Joyce** \* Passaic N J , Baltimore Medical College, 1902, was president of the Passaic County Maternal Welfare Association, aged 64, formerly chief of staff of St Mary's Hospital where he died December 7

**Maurice Kahn** \* Chicago Baltimore University School of Medicine, 1903, on the staff of the Evangelical Hospital aged 66, died, December 8, in the Albert Merritt Billings Hospital of carcinomatosis

**Enos E Kincheloe**, Church Hill, Tenn University of Tennessee Medical Department Nashville, 1891, aged 79 died, November 5

**August E Kipp**, Cincinnati Cincinnati College of Medicine and Surgery, 1890, aged 93 died, November 12, of intestinal obstruction and peritonitis

**William Sherman Lessenger**, Mount Pleasant, Iowa, State University of Iowa College of Medicine, Iowa City, 1890 member of the Iowa State Medical Society, aged 74, died November 28

**Samuel Stockton Miles**, Baltimore Johns Hopkins University School of Medicine, Baltimore 1940 had been medical resident to the City Hospital, Winston-Salem, N C since July 1, 1941, commissioned a lieutenant (j g) in the medical corps of the U S Naval Reserve in May 1942, attached to the Marine Corps, aged 28, was killed in action at Tulagi on the Florida Island in the Solomons, August 7

**George Samuel Laird** \* Westfield N J , University of Michigan Department of Medicine and Surgery, Ann Arbor, 1901 served as a lieutenant in the medical corps of the U S Army during World War I, recently chief of the medical staff of the Selective Service Board number 4, for many years member of the board of health and chief medical inspector for the school system, director of the First National Bank, aged 65, on the staff of the Children's Country Home and the Elizabeth (N J) General Hospital, where he died, December 1

**Ardashes H Merdinyan**, Pawtucket, R I Medico Chirurgical College of Philadelphia 1905 member of the Rhode Island Medical Society, past president and secretary of the Pawtucket Medical Association medical examiner for the local board, division number 1, during World War I served as medical inspector of the schools of Central Falls, aged 65 died November 26 of coronary thrombosis

**Edward Sanford Montgomery**, Santa Cruz, Calif Rush Medical College, Chicago, 1894 aged 70, died, November 29

**Edith Taft Morehouse**, Westfield, N J Woman's Medical College of Pennsylvania, Philadelphia 1913, in 1918 went to France with the American Woman's Hospital of the American Red Cross to engage in rehabilitation work among children in areas devastated by World War I, at one time appointed by the foreign missionary society of the Methodist Church as superintendent of a hospital at Kolar, South India aged 68 died December 13 in the Muhlenberg Hospital Plainfield, of Parkinson's disease

**Joseph D Morgan**, Dixon, Ohio Georgia Eclectic Medical College, Atlanta 1881, served as state senator for two terms aged 85 died December 11, of senility

**Andrew B Nelles**, Blacklick Ohio, University of Michigan Homeopathic Medical School, Ann Arbor, 1890 for many years on the staff of the Children's Hospital, Columbus aged 73, died, November 23, of pneumonia

**John S Nelson**, Fort Dodge Iowa State University of Iowa College of Homeopathic Medicine, Iowa City 1888, aged 82, died November 12 of cardiorenal vascular disease

**George Harvey Parmenter** \* St Petersburg Fla , University of Vermont College of Medicine, Burlington 1902, member of the Vermont State Medical Society, at one time chief of the medical staff of the U S Veterans hospitals in Des Moines and Fort Harrison, Mont aged 66 died, November 27, in Veterans Administration Facility, Bay Pines, of arteriosclerosis and myocardial failure

**Arthur Madison Phillips**, New York University of Buffalo School of Medicine 1902 member of the Medical

Society of the State of New York and the American Psychiatric Association instructor of psychiatry at the Cornell University Medical College, assistant superintendent of the Manhattan State Hospital Wards Island where he began active duty in 1904, aged 64 died, December 16 in the New York Hospital of aneurysm of a ruptured abdominal aorta

**Isaac William Powell**, Bellingham Wash Kentucky School of Medicine, Louisville 1894 formerly health officer of Bellingham at one time acting assistant surgeon in the U S Public Health Service served during World War I aged 68, died, November 17

**James Daniel Renick**, Smiths Grove Ky Vanderbilt University School of Medicine, Nashville, Tenn 1880 aged 86 died November 28

**James C Rush**, Waynesboro, Miss University of Louisville (Ky) Medical Department, 1892 aged 75 died November 23 in the Rush's Infirmary, Meridian of sarcoma of the prostate and angina pectoris

**Harry Johnson Schott**, Los Angeles Rush Medical College Chicago 1911 member of the American Academy of Orthopaedic Surgeons fellow of the American College of Surgeons specialist certified by the American Board of Orthopaedic Surgery Inc served during World War I chief orthopedic consultant to the city schools aged 55 on the staffs of the Orthopaedic Hospital and St Vincent's Hospital where he died November 24 of an intracapsular fracture of the right femur due to a fall and pulmonary embolism

**James F Simkins**, Circleville Ohio, Western Pennsylvania Medical College, Pittsburgh, 1891, aged 83 died, November 27

**Walter E Storm**, Wilmington, N C , New York Homeopathic Medical College, New York, 1877 member of the Medical Society of the State of North Carolina, aged 87, died November 12

**Ernest Hamilton Streit**, Portland Ore Jefferson Medical College of Philadelphia, 1912 served during World War I, aged 56, died, November 6

**Hal Shackelford Tucker**, Laurel, Miss , Medical Department of Tulane University of Louisiana, New Orleans, 1887, aged 88, died December 1

**Edwin Hugh Van Patten**, Dayton, Wash Rush Medical College, Chicago, 1883 aged 87 died, November 28

**Robert Reynolds Vogt**, Cleveland, University of Wooster Medical Department Cleveland, 1894 aged 70, died, November 8 of cerebral hemorrhage

**Edward Everett Watts**, Gifford, Idaho, Eclectic Medical Institute Cincinnati 1892, aged 88 died November 14, in St Joseph's Hospital, Lewiston of myocarditis

**John Horace Wrork** \* Shelburn Ind , Illinois Medical College Chicago, 1904, president of the Sullivan County Medical Society for many years member of the Sullivan County Council, aged 72, died, December 1, in the Mary Sherman Memorial Hospital, Sullivan of cerebral hemorrhage

## DIED WHILE IN MILITARY SERVICE

**Frederick James Cunningham Smith** \* Ardmore Okla , Harvard Medical School, Boston, 1932 a diplomate of the National Board of Medical Examiners commissioned a first lieutenant in the Army of the United States called to active duty Feb 13, 1941, later held the temporary rank of captain aged 35 died, September 9, while in Australia

**Leo Paul Martin** \* Missoula, Mont Creighton University School of Medicine Omaha 1927 captain in the medical corps of the Army of the United States, died October 25, at Walla Walla Wash where he was station complement flight surgeon, aged 38

## KILLED IN ACTION



LIEUT SAMUEL STOCKTON MILES,  
M C, U S N R, 1913-1942



## Bureau of Investigation

### DANGEROUS TO HEALTH

#### When Used as Directed

[EDITORIAL NOTE—These abstracts differ from other abstracts of Notices of Judgment issued by the Food and Drug Administration of the Federal Security Agency which have appeared in these pages in that they include reference to the fact that these nostrums were specifically declared to be dangerous when used in accordance with the directions given on the label by the manufacturer. The abstracts that follow are given in the briefest possible form (1) the name of the product, (2) the name of the manufacturer, shipper or consigner, (3) the date of shipment, (4) the composition, (5) the type of nostrum (6) the reason for the charge of misbranding and (7) the date of issuance of the Notice of Judgment—which is considerably later than the date of the seizure of the product and somewhat later than the conclusion of the case by the Food and Drug Administration.]

**B D Mint Powders**—South Bluefield Pharmacy Inc. Bluefield W. Va. Shipped Oct. 25, 1940. Composition in each powder approximately 343 grains of acetophenetidin, 223 grains of acetanilid, 15 grains of extracted caffeine and 36 grains of sodium bicarbonate with unreported amounts of milk sugar, saccharin for sweetening and peppermint oil for flavoring. Adulterated because label fully claimed that each powder contained not over 2½ grains of acetophenetidin. Misbranded because dangerous to health if used as directed in the labeling. Also misbranded because claims on display card no harmful ingredients among others and the designation B D Mint were false and misleading since the product contained potentially harmful ingredients was not free from danger, might cause serious after effects and the chief active ingredients were not derived from mint. Also misbranded because claims on wrapper that product offered quick relief from pain and discomfort arising from simple head ache, neuralgia, muscular aches and pains and head colds, was a nerve sedative and relieved female pain, rheumatism, crache, toothache and fever were false and misleading and likewise was the statement. Prepared by B D Medicine Co. Pulaski, Va. since the product had actually been prepared by the South Bluefield Pharmacy, Bluefield, W. Va. Further misbranded because label failed to bear the common or usual name of each active ingredient and a correct statement of the quantity or proportion of acetanilid and acetophenetidin present as well as adequate directions for taking and sufficient warnings against use in those pathologic conditions or by children when its employment might be dangerous to health and against use in the dosage or methods or duration of administration.—[D D N J F D C 429 September 1942]

**Casey's Compound**—George E. Madison Company, San Francisco, Calif. Shipped Feb. 12, 1941. Composition a flavored syrup containing 19.8 grains of potassium iodide per fluid ounce. Misbranded because dangerous to health when used in the dosage and with the frequency and duration prescribed suggested and recommended in the labeling. Also because label failed to bear adequate directions for taking or sufficient warning against use in conditions wherein it may be dangerous to health or caution against unsafe dosage or duration of administration. Further misbranded because of false representations in leaflets supplied to customers on request namely that the product is efficacious in relieving arthritis, neuritis, rheumatism and sciatica, improving the user's health and enabling him to enjoy a good night's rest.—[D D A J F D C 431 September 1942]

**Catawba's Nervine**—W. B. Coehel trading as Botanical Medicine Company, Kannapolis, N. C. Shipped between June 7 and 10, 1940. Composition in each ½ fluid ounce not more than 397 grains of sodium bromide, 37 grains of potassium bromide and not less than 0.91 grain of ammonium bromide whereas the respective amounts of these drugs were represented to be 4½, 4½ and ½ grain hence adulterated. Misbranded for the same reason and because product would be dangerous to health when used according to directions on label. Further misbranded because bottle label represented product to be a safe and appropriate treatment for the conditions mentioned thereon (which were not named in the government's abstract of the case) and did not give adequate directions for taking, or warn against use by children or in those pathologic conditions wherein it might be dangerous to health or caution against unsafe dosage or methods or duration of administration for protection of users.—[D D N J F D C 426 September 1942]

**Cold Special No. 2 Red** (also called Cold Special Capsules and Capsules Cold Special)—Found offered for sale at Albany Pharmacy, Southern Drug Company and National Press Pharmacy, all located in the District of Columbia. Composition each capsule contained approximately 2 grains of acetanilid and ½ grain of quinine sulfate with unnamed amounts of camphor, podophyllin and aloin. Misbranded because among other things dangerous to health when used in the dosage or with the frequency and duration prescribed in the labeling because labeling failed to give adequate warning against use in those pathologic conditions and by children when such use might be dangerous to health or against unsafe dosage or duration of administration for protection of users further because designation

'Cold Special' was false and misleading, since the product did not constitute a treatment or preventive for the condition commonly known as cold.—[D D N J F D C 432 September 1942]

**Halomist**—Halomist Inc. Seattle, Wash. Shipped between May 27 and June 6, 1941. Composition essentially racemic epinephrine hydrochloride (in one specimen 23 grains in the other, 24 grains per hundred cubic centimeters) chlorobutanol and water. Misbranded because dangerous to health when used in the dosage or with the frequency or duration prescribed in labeling, further misbranded because of false and misleading label claims that it would be efficacious for relieving paroxysms of bronchial asthma, treating hay fever or sinusitis, preventing asthma attacks, building up natural resistance strength and weight, enabling user to eat what he pleased, soothing the membranes acting as an ideal anti-septic for the sinuses, building up resistance against sinus disorders and catarrhal conditions and toughening the tissues against infection and irritation. Also misbranded because carton did not give common or usual names of active ingredients or state quantity or proportion of chlorobutanol present, manufacturer's name and address were not prominently placed on the carton and carton did not bear an accurate statement of the quantity of contents.—[D D N J F D C 433 September 1942]

**Happy Day Headache Powders**—Shipped Sept. 16, 1940 in part by Max Kaplan, owner of the Capital Drug Company, Roanoke, Va. and in part by the Sessions Specialty Company, manufactured by Culf Laboratories Inc., Lafayette, La. Composition essentially acetanilid (2½ grains per powder), aspirin, caffeine, phenolphthalein and milk sugar. Misbranded because dangerous to health when used as recommended in the labeling, also because labeling failed to give adequate directions for use and did not contain necessary warnings against employment in those pathologic conditions or by children when its use might be dangerous to health. Also because of false labeling, representations as to its efficacy for relief of discomfort arising from head colds, hay fever, nervousness, menstrual disturbance, tonillitis, sinus trouble, headache, rheumatism, influenza and throat irritations and because label did not bear the common or usual names of the active ingredient or an accurate statement of their quantity.—[D D A J F D C 444 September 1942]

**Hillman's D Compound**—David Hillman trading as Hillman Pharmacy, Chicago, Ill. Shipped Feb. 5, 1940. Composition capsules each containing aminopyrine (1.44 grain) and a small amount of ephedrine sulfate with milk sugar flavored with peppermint oil. Misbranded because dangerous to health when used in the dosage or with the frequency or duration prescribed recommended or suggested in the labeling because labeling did not bear adequate directions for use or sufficient warnings against unsafe dosage or methods or duration of administration in the manner necessary for the protection of users and because label gave the impression that the product was a safe and appropriate treatment for the conditions mentioned (dysmenorrhea and the cramps, backache and headache which accompany menstruation) whereas it was a dangerous product and the label failed to reveal that its use might cause serious blood disturbance.—[D D A J F D C 427 September 1942]

**Samaritan Treatment Preparations—Suppletive Formula Number 1 Supportive Formula S G M A and Formula Number 1—E. S. Miller Laboratories Inc., Los Angeles** Shipped between May 3 and Oct. 17, 1940. Composition Suppletive Formula Number 1—emetine hydrochloride. Supportive Formula S G M A—entirely glandular material and water. Formula Number 1—entirely compounds of ephedrine, pilocarpine, emetine and strychnine with sulfate chlorides and water. Suppletive Formula Number 1 misbranded because dangerous to health when used in the dosage suggested in the labeling. The product and Formula Number 1 were misbranded because labeling failed to warn adequately against use in those pathologic conditions (or by children in the case of Formula Number 1) when their use might be dangerous to health or against unsafe dosage or methods or duration of administration necessary for protection of user. All three products misbranded because labeling failed to give adequate directions for use and because they were fabricated from two or more ingredients and labeling failed to give common or usual names of active ingredients.—[D D N J F D C 435 September 1942]

**Syn O Scope and Synex**—Syn O Scope Laboratories, Los Angeles Shipped Aug. 24, 1940. A device (Syn O Scope) and accompanying liquid (Synex). Composition Synex—essentially 10.5 per cent of alcohol by volume with camphor, eucalyptus oil and water. Syn O Scope misbranded because dangerous to health when used in dosage which label specified or as label recommended for the application of medicaments to irritated and congested nasal passages. Since these and other directions fully represented that the product was efficacious for the purposes recommended. Device and liquid misbranded in that carton and label containing the liquid did not bear the common or usual names of the active ingredients including the quantity of alcohol or the name and address of the manufacturer, packer or distributor.—[D D N J F D C 437 September 1942]

**Wondersalve**—Brookgate Remedy Company, Evansville, Ind. Shipped Dec. 21, 1939. Composition phenolic compounds including carbolic acid (5.44 per cent) camphor and turpentine in an ointment base. Misbranded because of false and misleading claims on the label that it would be efficacious for all cases of inflammation or infection. For misbranded members cinders or any other foreign substances in the eye. Further misbranded because dangerous to health when used according to directions in the labeling. Also misbranded under the Federal Cautious Poison Act as reported in Notice of Judgment 103 published under that Act.—[D D A J F D C 438 September 1942]

**Medical Examinations and Licensure****COMING EXAMINATIONS AND MEETINGS**

**ANNUAL CONGRESS ON MEDICAL EDUCATION AND LICENSURE**  
CHICAGO Feb 15 16 Sec Council on Medical Education and Hospitals Dr H G Weiskotten 535 North Dearborn Street Chicago

**NATIONAL BOARD OF MEDICAL EXAMINERS  
EXAMINING BOARDS IN SPECIALTIES**

Examinations of the National Board of Medical Examiners and Examining Boards in Specialties were published in THE JOURNAL Jan 16 page 213

**BOARDS OF MEDICAL EXAMINERS**

**ALABAMA** Montgomery June 15 16 Sec Dr B F Austin 519 Dexter Ave Montgomery  
**ARKANSAS** \* Medical Little Rock June 3-4 Sec Dr D L Owens Harrison Eclectic Little Rock June 3-4 Sec Dr C H Young 1415 Main St Little Rock  
**CALIFORNIA** Los Angeles March 8 11 Sec Dr C B Pinkham 1020 N St Sacramento  
**CONNECTICUT** \* Hartford March 9 10 Endorsement Hartford March 23 Sec to the Board Dr Creighton Barker 258 Church St New Haven  
**DELAWARE** Dover July 13 15 Sec Medical Council of Delaware Dr Joseph S McDaniel 229 S State St Dover  
**DISTRICT OF COLUMBIA** \* Washington May 10 11 Sec Commission on Licensure Dr George C Ruhland 6150 E Municipal Bldg Washington  
**FLORIDA** \* Jacksonville June 21 22 Sec Dr William M Rowlett Box 786 Tampa  
**GEORGIA** March Sec State Examining Boards Mr R C Coleman 111 State Capitol Atlanta  
**ILLINOIS** Chicago April 6 8 Superintendent of Registration Department of Registration and Education Mr Philip M Harman Springfield  
**IOWA** \* Iowa City Feb 22 24 Dir Division of Licensure and Registration Mr H W Greife Capitol Bldg Des Moines  
**KANSAS** Kansas City May 19 20 Sec Board of Medical Registration and Examination Dr J F Hrsing 905 N Seventh St Kansas City  
**KENTUCKY** Louisville March 2 4 Sec State Board of Health Dr A T McCormack 620 S Third St Louisville  
**MAINE** Portland March 9 10 Sec Board of Registration of Medicine Dr Adam P Leighton 192 State St Portland  
**MARYLAND** Medical Baltimore March 23 26 Sec Dr J T O'Mara 1215 Cathedral St Baltimore Homoeopathic Baltimore June 15 16 Sec Dr J A Evans 612 W 40th St Baltimore  
**MASSACHUSETTS** Boston March 9 12 Sec Board of Registration in Medicine Dr H Q Gullupe 413 F State House Boston  
**MICHIGAN** \* Ann Arbor and Detroit June 11 13 Sec Board of Registration in Medicine Dr J Earl McIntyre 100 W Allegan St Lansing  
**MISSOURI** St Louis Feb 16 18 and March 23 25 Sec. State Board of Health Dr James Stewart State Capitol Bldg Jefferson City  
**MONTANA** Helena April 6 7 Sec Dr Otto G Klein First National Bank Bldg Helena  
**NEVADA** Reciprocity Carson City Feb 1 Sec Dr R A Petty 215 N Carson St Carson City  
**NEW HAMPSHIRE** Concord March 11 12 Sec Board of Registration in Medicine Dr Deering G Smith State House Concord  
**NEW MEXICO** \* Santa Fe April 12 13 Sec Dr Le Grand Ward 135 Sena Plaza Santa Fe  
**NEW YORK** Albany Buffalo New York and Syracuse Jan 25 28 Chief Bureau of Professional Examinations Mr H L Field 315 Education Bldg Albany  
**OHIO** Columbus March 16 19 Endorsement Columbus April 6 Sec Dr H M Platter 21 W Broad St Columbus  
**UTAH** Salt Lake City June Dir Department of Registration Mr G V Billings 324 State Capitol Bldg Salt Lake City  
**VERMONT** Burlington March 25 27 Sec Dr F J Lawless Richford  
**VIRGINIA** Richmond March 24 27 Sec Dr J W Preston 30 1/2 Franklin Rd Roanoke  
**WEST VIRGINIA** Charleston March 13 Commissioner Public Health Council Dr C F McClintic State Capitol Charleston  
**WYOMING** Cheyenne Feb 12 Sec Dr M C Keith Capitol Bldg Cheyenne.

\* Basic Science Certificate required

**BOARDS OF EXAMINERS IN THE BASIC SCIENCES**

**COLORADO** Denver March 10 11 Sec Dr E B Starks 1459 Ogden St Denver  
**CONNECTICUT** Feb 13 Address State Board of Healing Arts 1945 Yale Station New Haven  
**DISTRICT OF COLUMBIA** Washington April 19 20 Sec Commission on Licensure Dr George C Ruhland 6150 E Municipal Bldg Washington  
**FLORIDA** Deland June 9 Sec Dr J F Conn John B Stetson University Deland  
**MICHIGAN** Ann Arbor and Detroit Feb 12 13 Sec Miss Eloise LeBeau 101 N Walnut St Lansing  
**NEW MEXICO** Albuquerque Feb 1 Sec Miss Pia Joerger State Capitol Santa Fe  
**OKLAHOMA** Oklahoma City May Sec Dr Oscar C Newman Shattuck  
**OREGON** Portland Feb 13 Sec Board of Higher Education Mr Charles D Byrne University of Oregon Eugene  
**RHODE ISLAND** Providence Feb 17 Chief Division of Examiners Mr Thomas B Casey 366 State Office Bldg Providence  
**SOUTH DAKOTA** Aberdeen June 4 5 Sec Dr G M Evans Yankton  
**WISCONSIN** Madison April 3 Prof Robert N Bauer 152 W Wisconsin Ave Milwaukee

**Pennsylvania July Report**

The State Board of Medical Education and Licensure reports the written examination for medical licensure held at Philadelphia and Pittsburgh July 7-9, 1942. The examination covered 5 groups and included 50 questions. An average of 75 per cent was required to pass. Four hundred and thirty-seven candidates were examined. 420 of whom passed and 17 failed. The following schools were represented:

School	PASSED	Year Grad	Number Passed
College of Medical Evangelists	(1941)	(1942)*	2
Stanford University School of Medicine	(1942)		1
George Washington University School of Medicine	(1941)	2	
Georgetown University School of Medicine	(1941 9)	(1941)*	10
Howard University College of Medicine	(1941)	2	
Rush Medical College	(1941 2)	2	
University of Chicago The School of Medicine	(1941)	1	
Louisiana State University School of Medicine	(1941)*	1	
Johns Hopkins University School of Medicine	(1940)	(1941 4)	5
University of Maryland School of Medicine and College of Physicians and Surgeons	(1941 2)	2	
Harvard Medical School	(1940)	(1941)	2
Tufts College Medical School	(1940)	1	
University of Michigan Medical School	(1941)	1	
University of Minnesota Medical School	(1935)	1	
St Louis University School of Medicine	(1941 1)	1	
Washington University School of Medicine	(1941)	1	
Creighton University School of Medicine	(1941)	1	
University of Nebraska College of Medicine	(1941 2)	2	
Cornell University Medical College	(1940)	(1941)	2
New York University College of Medicine	(1941)	1	
Syracuse University College of Medicine	(1941)	1	
University of Buffalo School of Medicine	(1941)	1	
University of Rochester School of Medicine and Dentistry	(1941)	1	
Ohio State University College of Medicine	(1941)	1	
Western Reserve University School of Medicine	(1941)	(1941)*	2
University of Oregon Medical School	(1941)	1	
Hahnemann Medical College and Hospital of Philadelphia	(1941 55)	55	
Jefferson Medical College of Philadelphia	(1940 13)	71	
Temple University School of Medicine	(1940 19)	74	
University of Pennsylvania School of Medicine	(1938)	92	
University of Pittsburgh School of Medicine	(1941 53)	53	
Woman's Medical College of Pennsylvania	(1940 2)	(1941 9)	11
Medical College of the State of South Carolina	(1941)	1	
Meharry Medical College	(1941)	1	
Marquette University School of Medicine	(1942)	1	
University of Wisconsin Medical School	(1941)	1	
University of Toronto Faculty of Medicine	(1941)	1	
McGill University Faculty of Medicine	(1939)	(1940)	3
Medizinische Fakultät der Universität Wien	(1934)	(1935)	2
Université Libre de Bruxelles Faculté de Médecine	(1939)	1	
Regia Università degli Studi di Bologna Facoltà di Medicina e Chirurgia	(1937)	(1938)	2
Regia Università di Napoli Facoltà di Medicina e Chirurgia	(1938)	1	

School	FAILED	Year Grad	Number Failed
University of Oklahoma School of Medicine	(1941)	1	
Hahnemann Medical College and Hospital of Philadelphia	(1941 7)	7	
University of Pennsylvania School of Medicine	(1941)	1	
University of Pittsburgh School of Medicine	(1941)	1	
Medizinische Fakultät der Universität Wien	(1923)	4	
Christian Albrechts Universität Medizinische Fakultät Kiel	(1913)	1	
Ludwig Maximilians Universität Medizinische Fakultät München	(1939)	1	
Magyar Királyi Pazmany Petrus Tudományegyetem Orvosi Fakultása Budapest	(1936)	1	

Twenty-five physicians were licensed to practice medicine by reciprocity and 12 physicians so licensed on endorsement of credentials of the National Board of Medical Examiners from Feb 19 through Aug 26 1942. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad	Reciprocity with
Howard University College of Medicine	(1928) N Carolina	(1925)	Michigan
Loyola University School of Medicine	(1928)		California
University of Illinois College of Medicine	(1925)		Indiana
State University of Iowa College of Medicine	(1923)		Iowa
Tulane University of Louisiana School of Medicine	(1940)		Mass
Johns Hopkins University School of Medicine	(1920)		Virginia
Harvard Medical School	(1921) Ohio	(1921)	Connecticut
Tufts College Medical School	(1924) Georgia (1934) New York	(1937)	Connecticut
University of Minnesota Medical School	(1928)		Montana
Washington University School of Medicine	(1901)		New York
Columbia University College of Physicians and Surgeons	(1901)	(1940)	New York
Cornell University Medical College	(1939)		New York
New York Homeopathic Medical College and Flower Hospital	(1934)		New York

University of Buffalo School of Medicine	(1931)	New York
Ohio State University College of Medicine	(1932)	Ohio
Hahnemann Medical College and Hospital of Philadelphia	(1936)	Delaware
Woman's Medical College of Pennsylvania	(1922)	New York
University of Tennessee College of Medicine	(1936)	Florida
University of Virginia Department of Medicine	(1939)	Virginia
University of Wisconsin Medical School	(1932)	Wisconsin

School	LICENSED BY ENDORSEMENT	Year Grad
George Washington University School of Medicine		(1928)
Georgetown University School of Medicine		(1939)
Howard University College of Medicine		(1940)
Cornell University Medical College		(1941)
University of Buffalo School of Medicine		(1941)
Duke University School of Medicine		(1941)
Western Reserve University School of Medicine		(1923)
Temple University School of Medicine		(1940, 2)
University of Pennsylvania School of Medicine	(1919)	(1920), (1941)

\* Licenses have not been issued

### Oregon Reciprocity Report

The Oregon State Board of Medical Examiners reports 6 physicians licensed to practice medicine by reciprocity and 2 physicians so licensed on endorsement of credentials of the National Board of Medical Examiners on Oct. 23, 1942. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad	Reciprocity with
University of Minnesota Medical School		(1938)	Minnesota
University of Nebraska College of Medicine		(1925)	Nebraska
Cleveland Homeopathic Medical College		(1904)	California
University of Oregon Medical School		(1941)	California
Osteopaths *			New Mexico, New Mexico

School	LICENSED BY ENDORSEMENT	Year Grad
College of Medical Evangelists		(1939)
Cornell University Medical College		(1937)

\* Licensed to practice surgery only

## Bureau of Legal Medicine and Legislation

### MEDICOLEGAL ABSTRACTS

#### Medical Practice Acts Sale of Asthmanol by Layman

—An information was filed against the defendant, charging, in part, that he did unlawfully practice the healing art by examining, treating, and prescribing for one Mamie L. Murphy, without having first obtained a license so to do from the Commission on Licensure for the District of Columbia against the form of the statute in such case made and provided, "From a conviction in the police court, where it was conceded that the defendant did not have a license to practice, the defendant appealed to the United States Court of Appeals for the District of Columbia.

For about eighteen years the defendant had been manufacturing an asthma remedy called "asthmanol," which he sold for \$10 a bottle. In connection with the sale of "asthmanol" the defendant made certain recommendations concerning the general health of the purchasers, and when they were suffering acutely from asthma and needed special care the defendant had facilities in his home to render it. The evidence showed that a Mrs. Murphy consulted the defendant and told him that she had asthma and heart trouble. The defendant gave her some little pink pills and she arranged with him to return to his home the next week and to stay for a period of three weeks for treatments. The defendant told Mrs. Murphy that he would cure her and that the price would be \$100. Mrs. Murphy returned at the appointed time and the defendant gave her more pills. She was then put to bed in a rear bedroom, which was occupied by other "patients." She was put on a diet and the defendant gave her pills and "asthmanol" when he thought it necessary. Some of the pills administered by the defendant contained pure salts, cascara and capsicum, and others contained sodium bicar-

bonate. The "asthmanol" consisted largely of whisky and contained also a small amount of gentian. Mrs. Murphy and the other patients all called the defendant "doctor."

The defendant first contended that the information was insufficient because it failed to allege that the defendant practiced "for a fee, gift or reward, or in anticipation of a fee, gift or reward, whether tangible or intangible." The degree of particularity required in the averments of an information, the court said, is that which is necessary to enable the accused to understand the nature of the charge against him, intelligently to meet it and to plead the result, whether conviction or acquittal, as his protection against another prosecution for the same offense. The averments must be sufficient to inform the court of the facts alleged so that it may decide whether they are sufficient in law to support a conviction and that the offense may judicially appear to the court when it pronounces judgment. The court was satisfied that in the present case the information conformed to the rule.

The defendant introduced the testimony of two physicians, referred to in the decision of the court as Dr. Dull and Dr. Butz. One of them stated that he had diagnosed Mrs. Murphy's condition as bronchial asthma and that in his opinion the acts done by the defendant amounted to nothing more than ordinary nursing services and did not constitute the practice of medicine. The other said that Mrs. Murphy was a former patient of his, that he had told her about the defendant and had given her the defendant's address but that she had gone to the defendant's house of her own volition. He, too, testified that in his opinion the things done by the defendant were only the usual functions of a nurse and that it was going too far to say that the defendant was practicing medicine in the ordinary sense of that term.

The defendant argued that the healing arts practice act exempted the manufacture and sale of medicines as well as "nursing" and said that everything done by him beyond the selling of his medicine constituted no more than nursing. He further contended that the act expressly exempted the use of ordinary hygienic, dietetic or domestic remedies and that the remedies which he applied in this case were domestic remedies. It is true said the court, that people frequently administer remedies to themselves in their own homes, it is true that nurses acting under the instruction of doctors, sometimes perform duties which doctors themselves would otherwise perform and which, otherwise, would come clearly within the scope of the practice of medicine. But neither people in the privacy of their own homes nor nurses acting under the instruction of physicians represent to persons who are otherwise strangers to them that they will cure them of disorders for a price specified, as was done in this case. The defendant's activities, the court thought brought him clearly within the proscription of the act. The definition of "the healing art" set out in the act is made up of a series of clauses stated disjunctively. Proof of any one would be sufficient to establish the practice which is contemplated by the act. That the defendant did in the present case at least attempt "to prevent, relieve, correct, or cure any disease," concluded the court cannot be seriously questioned. The judgment of conviction was affirmed.—*Peters v. United States*, 128 F. (2d) 300 (1942).

## Society Proceedings

### COMING MEETINGS

Annual Congress on Medical Education and Licensure Chicago Feb. 15-16  
Dr. H. G. Weiskotten, 535 North Dearborn St. Secretary

American Society of Anesthetists New York Feb. 4 Dr. Paul M. Wood  
745 Fifth Avenue New York Secretary

Southern Section American Laryngological, Rhinological and Otolological Society Chattanooga Tenn. Jan. 28 Dr. Francis B. Blackmar, 1301 Broadway Columbus Ohio Chairman

Western Section American Laryngological, Rhinological and Otolological Society, Portland Ore. Jan. 31 Dr. Irving M. Lupton 1020 S.W. Taylor St. Portland Ore. Chairman

## Current Medical Literature

### AMERICAN

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#### Alabama State Medical Assn. Journal, Montgomery 12 129-160 (Nov) 1942

- Electroshock Treatment in Psychiatric Disorders F A Kay J D Smith and N H Reim Tuscaloosa—p 129  
Practical Factors in Spinal Anesthesia E M Chenault Decatur—p 132  
Intravenous Alcohol in Postoperative Analgesia F H Craddock Jr and F H Craddock Sr Sylacauga—p 134  
Value of Cystoscopies in Female Urology Preliminary Report on Use of Intracaine as Topical Anesthetic G F Douglas Birmingham—p 137  
Fracture of Upper Humerus Advances in Treatment F W Pickell Baton Rouge La—p 145

#### American Journal of Diseases of Children, Chicago 64 771-962 (Nov) 1942

- Dental Development in Congenital Syphilis B G Sarnat and N G Shaw Chicago—p 771  
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Incidence of Pinworm Infection in White and in Negro Hospitalized Children Eugenia Cuvillier Jones Atlanta Ga—p 803  
\*Dietary Ratios for Child with Diabetes Mellitus R L Jackson and Juanita Kenefick Iowa City—p 807  
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Congenital Malformations Induced in Rats by Maternal Nutritional Deficiency II Use of Varied Diets and of Different Straus of Rats J Warkany Rose C Nelson and Elizabeth Schraffenberger Cincinnati—p 860  
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Congenital Atresia and Stenosis of Great Cardiac Vessels Aortic Atresia Pulmonary Stenosis J I Rossman Chicago—p 872  
Nutritional Requirements in Infancy and in Childhood A M Butler Boston—p 898

**Dietary Ratios in Diabetes**—Jackson and Kenefick used 4 children with diabetes mellitus of recent onset as subjects after their exogenous insulin requirement under controlled conditions was definitely established. Each child received their standard diet designed to meet all the known nutritional requirements. The diets were based on a unit formula of 7 Gm of protein, 15 Gm of carbohydrate and 11 Gm of fat, with a fatty acid dextrose ratio of 1:15. The food was given in three meals. This dietary regimen was then changed for approximately one week to a diet of high carbohydrate content and then for about the same time to a diet of high fat content. Each diet had the same caloric value and was always adequate as to nutritional requirements. Two times a week a series of blood sugar analyses was made for each subject. No difference in the utilization of any of the three diets was noticed. The insulin requirement remained constant, and the blood sugar fluctuations approximated the normal range in each study. The high carbohydrate meals were absorbed more rapidly, resulting in slightly higher postprandial blood sugar values. Sugar was not excreted in the urine. On the high carbohydrate diet the 10 p m blood sugar values were slightly higher than the 11 a m values, but this was probably because the children retired at 7 p m and hence had less exercise after the evening meal than in the morning. The close range of the blood sugar

values during fasting implied that the carbohydrate metabolism of these stabilized patients with diabetes mellitus was comparable to that of normal persons. The basic nutritional requirements of the child with diabetes mellitus should not differ from those of the child who does not require exogenous insulin.

#### American Journal of Hygiene, Baltimore 36 243-376 (Nov) 1942

- \*Carbon Disulfide in Control of Sylvatic Plague Vectors M A Stewart Berkeley Calif—p 243  
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Behavior of Influenza A Virus in Rabbit Rat and Guinea Pig R A Hyde Baltimore—p 338  
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Observations on Untreated Infections with Plasmodium Lophurae in 1200 Young White Pekin Ducks R I Hewitt A P Richardson Memphis Tenn and L D Seager Wilson Dam Ala—p 362

**Control of Sylvatic Plague**—Stewart points out that all mammals (ground squirrels, mice and skunks) in ground squirrel burrow systems fumigated with 2, 3 and 4 ounces (60, 90 and 120 cc) of carbon disulfide per burrow opening were found dead. However, the effect on the adult fleas, both in the nests and on the dead hosts, was not lethal. Methyl bromide should be employed when sylvatic plague is known to exist in the rodents. This is necessary because there is no assurance that the burrow openings which were closed during fumigation will not be reopened by migrating mammals before the surviving fleas die of starvation. This would permit the escape of infective fleas searching for a blood meal. The employment of methyl bromide as a fumigant for fleas and ground squirrels in plague suppression is particularly important where military personnel are quartered and especially when they maneuver in areas containing infected rodents.

#### American J Obstetrics and Gynecology, St Louis 44 743-924 (Nov) 1942

- Studies on Head Molding During Labor H C Moloy New York—p 762  
Classification of Obstetric Pelvis Based on Size Mensuration and Morphology K B Steele and C T Javert New York—p 783  
\*Observations of Development of Pelvic Conformation D G Morton San Francisco—p 799  
Solution of Posterior Pituitary Sulfonate (Pit Sulfonate) in Labor W J Dieckmann and M S Kharasch Chicago—p 820  
Intestinal Injuries Resulting from Irradiation Treatment of Uterine Carcinoma A H Aldridge New York—p 833  
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Partial Colpocleisis as Approach to Vesicovaginal Fistula Following Total Hysterectomy F C Holden New York—p 880  
\*Morphine Sulfate as Obstetric Analgesic Clinical Analysis W F Mengert Iowa City—p 888  
Gynecologic and Other Implications Which Relate to the Aging Female Population G W Kosmak New York—p 897

**Development of Pelvic Conformation**—Morton discusses the evolution of the shape of the female pelvic inlet and the development of the sexual differences in bony pelvis. He examined 10 fetal female and 17 male pelvis varying in age

from 3½ to 10 months, and the pelves of 98 girls and 45 boys varying in age from 3 to 18 years. He found the shape of the inlet to be broader than it was long at all periods of fetal life. There were no significant sexual differences. In children less than 6 the inlet was still either broader than long or round in most instances. From 6 to 11 the pelvic inlet was invariably longer than broad. Before puberty the outline showed an inward bowing in the acetabular regions, presumably resulting from the upward thrust of the femurs. After puberty the pelvic inlet of the female pelves tended to flatten, so that many again became broader than long. No significant sexual differences were observed in the fetal period. In the years before puberty a comparison of the roentgenograms of male and female pelves revealed in male pelves a shorter posterior segment at the pelvic inlet and a downward angulation of the sacrum. The well known characteristics of adult male and female pelves were observed after puberty. A common type of pelvis up to puberty suggests that sex hormones play a large role in its development. Hereditary, nutritional and possibly other as yet unknown factors may also play a role.

**Morphine Sulfate as Obstetric Analgesic**—The reports of clinically normal babies being born after large doses of morphine had been administered to their mothers prompted Mengert to inquire into the actual and potential dangers of using it as an obstetric analgesic. A total of 564 women received morphine alone or in combination with some other analgesic drug. A comparison of 727 women receiving no analgesia, of those with morphine alone or in combination and of the 243 given all other analgesic drugs indicates that morphine, alone and in combination, was associated with the highest percentage of respiratory and circulatory difficulties at birth and of fetal death. Also low forceps operations were three times higher among these patients than among those receiving other analgesics and nine times greater than in the control group. After certain standard exclusions (extraneous factors other than the analgesic) were made the discrepancies for no analgesia, morphine alone and sodium pentobarbital alone were not so large. Nevertheless, morphine still appeared to be attended with considerable respiratory embarrassment, some interference with breast feeding, too many fetal deaths and too many low forceps operations. The factors which combine to determine the effect of the drug on the newborn infant are the time of its administration in relation to delivery, the trauma of labor, the size of the dose, the anesthetic and accessory drugs. Its administration during the second and third hours preceding delivery should be avoided. There is no good reason to discontinue its use completely as an analgesic in normal labor, but its limitations must be recognized.

### American Journal of Ophthalmology, Cincinnati

25 1277-1408 (Nov.) 1942

- Some Observations and Experimental Studies on Physiology of Ciliary Muscle. E. Sachs. Detroit—p. 1277
- \*Sulfadiazine Iontophoresis in Pyocyanus Infection of Rabbit Cornea. L. von Sallmann. New York—p. 1292
- Aqueous Veins. II. Local Pharmacologic Effects on Aqueous Veins. III. Glaucoma and Aqueous Veins. K. W. Ascher. Cincinnati—p. 1301
- Fusion Projection and Stereopsis. I. Franklin. Milwaukee—p. 1316
- Primary Sarcoma of Choroid. Report of Case. A. Barlow. Philadelphia—p. 1337
- Anatomic Factors That Influence Depth of Anterior Chamber, Their Significance. H. S. Sugar. Vancouver, Wash.—p. 1341
- Use of Pseudoisochromatic Charts in Detecting Central Scotomas Due to Lesions in Conducting Pathways. Louise L. Sloan. Baltimore—p. 1352
- Evaluation of Ultraviolet Light in Ophthalmologic Diagnosis. J. B. Feldman. Philadelphia—p. 1357
- White Rings in Cornea (Corns). J. Waldman. Philadelphia—p. 1362

**Sulfadiazine Iontophoresis**—Experiments with sulfapyridine, sulfacetamide and sulfadiazine iontophoresis were carried out by Sallmann on rabbits under general anesthesia. Greater amounts of sulfadiazine than of the other drugs entered the eye by iontophoresis. The drug remained in the anterior parts of the eye for four hours in a bacteriostatic concentration. When there was an ulcer or an abrasion of the cornea, a still greater amount was found. The results of sodium sulfadiazine in pyocyanus infection of the rabbit cornea were superior to those obtained with other local or general methods of treatment. The results were still more favorable when iontophoresis was com-

bined with sulfadiazine orally and when treatment was initiated within eighteen hours of the inoculation of pyocyanus. The most favorable treatment twenty-four to thirty hours after inoculation was sodium sulfadiazine iontophoretically and sulfadiazine powder locally and orally. The experimental results of this therapy of advanced pyocyanus ulcers of the cornea have been confirmed clinically in 2 cases.

### American Journal of Public Health, New York

32 1209-1318 (Nov.) 1942

- Health Education in Extracantonment Zones. Lucy S. Morgan. Bethesda, Md.—p. 1209
- Pulmonary Tuberculosis Resulting from Extrafamilial Contacts. C. W. Twinn. Lakeville, Mass. and A. S. Pope. Boston—p. 1215
- New York State Mutual Aid Plan for Water Service. E. Devendorf. Albany, N. Y.—p. 1219
- False Positive Phosphatase Test from Thermophil in Pasteurized Milk. T. C. Buck, Jr. Baltimore—p. 1224
- Method for Determining Number of Beds Required for Convalescent Care of Rheumatic Infection. Bernice G. Wedum and A. G. Wedum. Cincinnati—p. 1237
- Some Epidemiologic Aspects of Tooth Decay. B. R. East. New York—p. 1242
- Syphilis Control in State Prison. III. Centralized Syphilis Control Program for State Prisons of New York. I. J. Brightman and B. I. Kaplan. New York—p. 1251
- Efficacy of Standard Purification Methods in Removing Poliomyelitis Virus from Water. H. J. Carlson, G. M. Ridenour and C. F. McKinnon. Ann Arbor, Mich.—p. 1256
- Improvement of Local Housing Regulation Under the Law. Exploration of Essential Principles. Subcommittee on Housing Regulations—p. 1263

### American Journal of Surgery, New York

58 157-312 (Nov.) 1942

- Conditions of Biliary Tract Requiring Urgent Surgery. F. Glenn. New York—p. 160
- Treatment of Burns for Medical Defense Unit with Reference to Early and Late Therapy. K. M. March. Fergus, Pa.—p. 174
- Diets in General Surgery. K. B. Lawrence and Genevieve S. Connick. Boston—p. 181
- Fundamentals in Gastrointestinal Surgical Technique. Observations in Experimental Surgical Laboratory. H. C. Saltzstein and H. M. Podolsky. Detroit—p. 192
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- Postoperative Vesicovaginal Fistula. Genesis and Therapy. W. Latzko. New York—p. 211
- Sterility of American Made Surgical Catgut Sutures. Twelve Year Study. R. O. Clock. Brooklyn—p. 229
- Immediate Covering of Denuded Area of Skull. G. M. Dorrance and J. W. Bransfield. Philadelphia—p. 236
- New Method of Alveolar Gastrostomy. M. E. Steinberg. Portland, Ore.—p. 240
- Acromioclavicular Dislocation Fixed by Titanium Screw Through Joint. G. T. Tyler, Jr. Greenville, S. C.—p. 245

**Sterility of Sutures**—From his twelve year survey of the status of the sterility of fourteen American made surgical catgut sutures, comprising 1,381 lots and 17,386 sutures, Clock found that only five brands (the products of five different manufacturers) were uniformly and continuously sterile every year. The first seven years of the study revealed that certain sutures were subjected to entirely inadequate heat or none was used for sterilizing them, reliance having been placed on chemical methods of sterilization. Since then much improvement has occurred by the adoption of an improved bacteriologic method that the author has perfected and that has been accepted by workers everywhere and has been adopted with certain additional procedures and modifications by the United States Pharmacopoeia XI as the standard technic for "Tests for the Sterility of Solids," which test is now enforced by the Federal Food and Drug Administration.

**Immediate Covering of Denuded Skull**—Dorrance and Bransfield suggest that whenever the pericranium of the skull is removed surgically or by trauma the defect should be covered immediately with a full thickness pedicle flap of adjacent scalp. The pedicle flap is raised from the pericranium but does not include it. The defect created by the pedicle flap has pericranium for its base and may be covered by a free graft from the abdomen or thigh.

**Am J Syphilis, Gonorrhea and Ven Dis, St Louis**

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- Individual Support in Unified Wartime Venereal Disease Control Program R A Vonderlehr Washington D C—p 661  
Further Observations on Trisodarsen for Treatment of Syphilis Resume of Eight Years Experience H Beerman H Pariser Philadelphia and J H Gordon Washington D C—p 670  
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Value of Cystoscopic Session in Male Gonorrhea Dispensary H M Spence and E W Featherston Dallas Texas—p 685  
Gonococcus and Gonococcal Infections Report of Committee on Surgery of Research of American Neisserian Medical Society Ruth Boring Thomas Dover Foxcroft Maine—p 691

**American Review of Tuberculosis, New York**

46 475-586 (Nov) 1942

- \*Management of Patients with Occasionally Positive Sputum After Apparently Adequate Therapy Clinical Aspects A M Stokes Ontario N Y—p 475  
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\*Tuberculin Sensitivity in Children with Bone Tuberculosis P J Howard J A Johnston and C L Mitchell Detroit—p 532  
Hastings on Catheter Drainage of Tuberculous Cavities J H Elliott Toronto Ontario Canada—p 546  
\*Survival of Tubercle Bacilli in Books How Contaminated Books May Be Rendered Noninfectious C R Smith Los Angeles—p 549  
Media for Tubercle Bacilli Evaluation of Different Media for Diagnostic Cultures of Tubercle Bacilli H J Corper and M L Cohn Denver—p 560  
Silicon Dioxide in Guinea Pig Inoculation for Tuberculosis Harriett Hollon Marian Sprick Elizabeth Conroy and Elizabeth Wilson Powers Mich—p 568

**Occasionally Positive Sputum**—The management of the patient whose sputum after adequate therapy is occasionally positive and a complete clinical reappraisal reveals no obvious source of the bacilli, Stokes says, will largely depend on economics. In arriving at an equitable decision as to what patients shall be isolated and what ones are to return to their former environment the type, age and extent of the pulmonary lesion, the age, sex and resistance of the patient, his intellectual and economic status, his economic usefulness, his personal, family and civic responsibilities and finally his vocation must be considered. The presence of any bacilli in the sputum of patients less than 25 is of serious import and almost always indicates the necessity for further active treatment. The careless patient and sanatorium "repeater" must be permanently isolated. The actual dollar cost of this may well be less than caring for secondary contact cases. The patient whose disease is healed by extensive fibrosis which reduces his pulmonary reserve to the point that he is a permanent respiratory cripple and who can never be rehabilitated must also remain under custodial care. Rarely it may be necessary to extirpate surgically a focus that may be shedding occasional tubercle bacilli, notably the post-tuberculous bronchiectasis. However, the management of these patients cannot stop here. The physician has a moral obligation to see that treatment remains constantly adequate. The contacts of these patients should have roentgenograms of the chest taken periodically. Never should these patients be allowed to engage in occupations that require the handling of children or food.

**Tuberculin Test in Bone Tuberculosis**—Howard and his associates carried out the tuberculin test for ten years on 19 children with bone tuberculosis. The initial threshold reactions of 4 children at the start of the involvement were 0.1 to 0.001 mg of old tuberculin. These levels subsequently rose to 0.0001 to 0.0000001 mg and then receded again to levels of 0.01 and 0.001 mg with the healing of the process. The sensitivity of a group of 7 children followed the same rise and fall but these children did not appear for treatment at the start of bone involvement. The allergy pattern of 5 children showed

a high plateau of sensitivity for from three to six years associated with a poor healing ability and the death of 1 patient from constant spread of the tuberculous infection. All children showed a positive test at the start of infection 1 four months before bone destruction could be seen on the roentgenogram. It is concluded that a rise to a high level of sensitivity with a subsequent fall is characteristic of the evolution of the healing process in bone tuberculosis and that sustained high levels of allergy have characterized lesions which have failed to heal.

**Survival of Tubercle Bacilli in Books**—To determine whether books and magazines handled by sputum positive patients are infectious, Smith smeared artificially or naturally positive sputum in 0.05 cc amounts on 1 inch squares cut in but not removed from the leaves of books, magazines or stacks of paper. The books were immediately closed while the pages were still wet and stored in a dark cupboard in an unheated room. At intervals these paper squares were removed with sterile forceps and shaken by machine with a weak alkaline solution to recover the tubercle bacilli for culture and guinea pig inoculation. The tubercle bacilli remained alive for two weeks to three and a half months. They were not recoverable at from three weeks to five months. In general, they lived about as long on paper as on glass. They lived as long on printed as on blank paper. The period of recoverability was longer when the dose was large and was deposited during the winter season when average temperature and relative humidity were lowest. Occasional uncovered coughing into books is fairly common among sanatorium patients. Thumb wetting occurs but is infrequent. Therefore books and magazines used by sputum positive patients are possible sources of infection. They should not be read by nontuberculous persons. Contaminated books ought to be rendered safe and noninfectious in most cases by a quarantine period of one month.

**Anesthesiology, New York**

3 611-730 (Nov) 1942

- \*Shock H D Green Cleveland—p 611  
Technics of Spinal Anesthesia L F Schuhmacher Jr and U H Eversole Boston—p 630  
Response of Digitalized Heart to Cyclopropane and Epinephrine J W Stutzman C R Allen and W J Meek Madison Wis—p 644  
Development of Anesthesia (continued) T E Keys Rochester Minn—p 650  
\*Insulin Shock During Sodium Pentothal and Cyclopropane Anesthesia E M Papper M Stern E Bueding and E A Rovenstine New York—p 660  
Intractable Pain W Bates and B D Judovich Philadelphia—p 663  
Essential Characteristics of Local Anesthetics R Beutner and B Calcsnick with assistance of L Lapinsohn Philadelphia—p 673

**Shock**—Shock is initiated by any factor that causes an acute but persistent diminution of the minute volume of the circulation. This reduction may be of cardiac origin due to loss of plasma externally, due to a primary combined diminution of blood volume from increased capillary permeability and/or an increase of the capacity of the circulation caused by dilatation of capillaries and venules. With the latter a change in the chemical or physical character of the blood may also impair the general circulation. When the diminished circulation throughout the body of itself increases permeability and dilatation of the capillaries and venules it augments the already impaired capillary function. When this begins to occur, true shock is said to be present. In part at least, by direct effects on the capillaries such substances as anesthetics, heparin, dyes, toxins and other chemical agents in excessive quantities may also contribute to or even induce shock. Most of the symptoms of shock are explainable on the basis of the depression of the circulation and the associated depression of the functions of the body. Because shock tends to perpetuate itself once the minute volume of circulation has become sufficiently decreased it is most important to prevent the initiating factors and to restore the blood volume before the vicious cycle is firmly established and before irreversible damage occurs in the various tissues of the body. Green is convinced that it is better to give fluid, preferably blood, during an operation, even though it is continuously lost by unavoidable hemorrhage, than to allow the blood pressure to become dangerously low and then to attempt to restore the fluid loss after the operation is completed. The term shock for



this condition is unfortunate as it implies something sudden, whereas shock appears to be a relatively slowly developing progressive condition, for which an apt term would be acute progressive circulatory failure

**Insulin Shock During Sodium Pentothal Anesthesia**—The management of the anesthesia of a diabetic patient undergoing surgical intervention includes the administration of insulin, saline solution and dextrose, preoperatively and postoperatively. During anesthesia the symptoms (nervousness, tremor, anxiety, irritability and convulsions or coma) of insulin shock are not present in the anesthetized patient. To establish criteria whereby insulin shock during anesthesia could be recognized, Papper and his colleagues studied the insulin shock in 3 volunteer normal men aged 25 to 32. They were admitted in an acute alcoholic episode but were clear mentally, were cooperative and were not nutritionally deficient. Insulin shock was induced during cyclopropane anesthesia and during pentothal sodium anesthesia by an initial intravenous injection of 30 units of insulin and 20 units for three doses every half hour. The first injection was given after a dextrose tolerance test during anesthesia, that is, two and a half hours after the intravenous administration of 100 Gm of dextrose. Experiments were conducted seven days apart in the postabsorptive state. Anesthesia was maintained in the surgical second plane. Premedication drugs were not used. The first evidence of insulin shock was moderately profuse perspiration one hour after the first dose of insulin during pentothal sodium anesthesia, with cyclopropane profuse perspiration occurred one and a half hours after the first dose of insulin. The perspiration was followed in twenty minutes by an increased pulse pressure (due almost entirely to a fall in diastolic blood pressure), a slight tachycardia and a full bounding pulse of the Corrigan type. These manifestations of insulin shock were the same with the two agents except that the latent period was longer with cyclopropane. The administration of dextrose intravenously reverses the changes immediately. The rise in pyruvic acid levels during pentothal anesthesia was decided, whereas with cyclopropane if they changed they were decreased. Cyclopropane, while affecting the fasting blood sugar level little, caused definite changes in the dextrose tolerance curve with a diabetoid type of reaction. This impairment was less definite with pentothal anesthesia.

### Annals of Internal Medicine, Lancaster, Pa

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- \*Electrocoma Therapy of Psychoses J. J. Fetterman Cleveland—p. 775
- \*Chronic Constrictive Pericarditis Follow Up Study of Thirty Seven Cases M. B. Harrison and P. D. White Boston—p. 790
- \*Surgical Treatment of Hypertension (Results in Fifty Four Cases) E. C. Bartels J. L. Poppen and R. I. Richards Boston—p. 807
- \*Physiologically Directed Therapy in Pneumonia A. L. Bartels New York—p. 812
- Oxygen Mask Metered for Positive Pressure A. I. Barach and N. Molomut New York—p. 820
- Functional Mitral Stenosis M. Rohmow and H. T. Harper Jr. Augusta Ga.—p. 823
- Association of Atrophic Gastritis with Hypothyroidism Preliminary Report of Eleven Cases F. C. Golding, Denver—p. 825
- Parenteral Use of Sulfonamides Clinical and Experimental Study L. T. Hall, E. Thompson, R. J. Wyrens, A. M. Harris and Violet Wilder Omaha—p. 835
- Painful Feet J. J. Nutt New York—p. 842
- Comparative Value of Calcium Gluconate Magnesium Sulfate and Alpha Lobeline Hydrochloride as Agents for Measurement of Arm to Tongue Circulation Time in Fifty Patients With and Fifty Patients Without Heart Failure H. H. Hussey, D. P. Cyr and S. Katz Washington D. C.—p. 849

**Electrocoma Therapy of Psychoses**—The clinical results of electro shock therapy in 70 patients with various mental disorders are recorded by Fetterman, who offers some interpretation of the results obtained in the light of the modern concept of psychoses. Although the clinical results of the therapy have been extremely satisfactory, certain disturbing but usually temporary reactions occur. They are decided amnesia, periods of elation and states of confusion. In addition to these psychologic side actions, which are temporary, certain complications, possibly of a more permanent nature, of electro shock therapy may be divided into immediate reactions and possible later sequelae. The immediate complications are chiefly the injuries to the muscular and bony systems, and the possible late sequelae are cerebral, which Cerletti and Kalinowsky believe are reversible

and do not produce serious damage. The most significant clinical observation is the high rate of improvement and the willingness of the patients to take this treatment. A course of electrocoma treatment influences the mood of the patient first. There is a tendency for the saddened patient to become more cheerful. In patients who are troubled by serious hallucinations and delusions this improvement in mood pushes into the background the hallucinatory experiences, which are later ultimately lost. Recovery in mental function requires the accumulated benefits from a series of treatments. Previous mental clouding with decided forgetfulness or confusion does not interfere with recovery. Recovery is obscured by the clouding, but despite this delay the clouding lifts and the goal is reached. The treatment achieves its success through direct electrical or chemical alteration in cerebral functions. The therapeutic effect is not attained through fear, patients do not emphasize any terror reaction as they do with metrazol. Recovery is highest in depressed patients, there is improvement in many with schizophrenia, and there is a tendency toward improvement in manic states. During treatment there is a change in the patient's direction of interest and thought. He tends to look outward, to notice external stimuli and to interpret them in line with reality. Recovery is thus not so much a gain in total cerebral function as an improvement in the direction of thought. On the basis of these observations, Fetterman makes the following conjectures. The brain is the seat of or the major link of all psychoses which are caused by disturbances in cerebral function and are believed to be organic, even if the disorder cannot be established microscopically. The mechanism of recovery depends on an electrochemical change in cerebral cells. Each treatment appears to damage the function of either cortical cells or association pathways, and thus those elements which are responsible for the abnormal direction of thought are either reduced or destroyed. The damage is reversible and there is a tendency for the abnormally functioning cells to regain their activity. Each succeeding treatment removes this tendency. In the depressions, when this change has been effectively brought about, recovery ensues. In many types of schizophrenia this improvement is temporary because there is an inherent tendency for a downward course. One is sometimes surprised at the renewed intellectual interest in life that is awakened in an apparently deteriorated patient following the therapy. Only time can determine the permanence of recovery and the possibility of later complications.

**Chronic Constrictive Pericarditis**—A follow up study of 37 patients with constrictive pericarditis that Harrison and White saw at the Massachusetts General Hospital and in whom the clinical diagnosis was confirmed in all but a few at operation or at necropsy is presented. Nineteen of the patients are living, 17 are dead and 1 has not been examined lately. Twenty eight of the group have had pericardial resection and 9 have not. The average age of the entire group was 30.2 years of those operated on 28.8 years and of those not operated on 45.5 years. Fourteen of the 28 operated on were clinically cured although in a few a slight increase in venous pressure above the average normal remains, and 1 of the 14 died of pneumococcal pleurisy a year after operation. Of the other 14, 3 were much improved, 2 died of the disease itself, the death of 5 was related to the operation and 4 died of other complications from one month to seven years postoperatively. The condition of 3 of the 9 who did not have pericardial resection was so mild that operation was not necessary, 3 were too ill to undergo operation, 1 died of military tuberculosis before the operation could be carried out, 1 died before this type of operation was begun and 1 patient was lost sight of.

**Surgical Treatment of Hypertension**—During the last ten years, according to Bartels and his collaborators, 54 patients with hypertension have been operated on at the Lahey Clinic. This is sufficient time to justify an evaluation of the results. The first 13 patients were subjected to a supradiaphragmatic splanchnicectomy and gangliorhizotomy and the others to a two stage subdiaphragmatic or transdiaphragmatic resection of the greater and lesser splanchnic nerves, with the removal of the twelfth thoracic, first and second lumbar ganglia, the visualization of the adrenal glands and biopsy of each kidney. If a sufficient amount of omentum was available, the left kidney



was decapsulated and a nephro omentopexy was carried out, but if large accessory arteries penetrated the capsule of the kidney or the omentum was adhesive from previous operative procedures nephropexy was not attempted. The results confirm the experiences of others that surgery of the sympathetic nervous system may have an ameliorating effect on the blood pressure of patients with essential hypertension. The best results were obtained on patients with grade 2 or 3 hypertension whose ages were less than 40 and whose blood pressure responded to sedation. Age appears of considerable importance in selecting patients likely to obtain a satisfactory drop in blood pressure. Of 20 patients more than 40, only 2 had a drop in blood pressure as against 22 of 32 less than 40. Of the patients more carefully selected, 13 (34 per cent) of 38 had an excellent result and 11 had a slight drop in pressure. The blood pressure of the others was not altered. Symptomatic improvement occurred in 71 per cent, in half of these the blood pressure remained elevated. The operation appears justified when patients fulfil the selective criteria and when they understand that satisfactory lowering of the blood pressure is obtained in about one third of the cases.

**Physiologically Directed Therapy in Pneumonia**—Barach proposes to show that recent advances in physiologically directed treatment may crucially alter the course in bronchopneumonia or lobar pneumonia of patients who do not respond to sulfonamide compounds. The measures employed were the administration of positive pressure, inhalations of helium-oxygen mixtures and inhalation of the vaporized solutions of neosynephrin and epinephrine. In the treatment of 4 patients with bronchopneumonia of undetermined origin and of 1 with lobar pneumonia the physiologically directed therapy was of crucial value as regards anoxia, respiratory obstruction and pulmonary edema. The importance of maintaining respiratory function in pneumonia and bronchopneumonia not responding to specific chemotherapy was illustrated by the response of the 5 patients to inhalational therapy.

## Archives of Neurology and Psychiatry, Chicago

48 689-864 (Nov) 1942

- \*Toxoplasmic Encephalomyelitis VI Clinical Diagnosis of Infantile or Congenital Toxoplasmosis Survival Beyond Infancy D Cowen A Wolf and Beryl H Paige, New York—p 689
- \*Acute and Subacute Toxic Myelopathies Following Therapy with Arsphenamines B W Lichtenstein, Chicago—p 740
- Insulin Sensitivity of Patients with Mental Disease Factors in Their Serum Affecting Action of Insulin M M Harris New York—p 761
- \*Effects of Destruction of Hypothalamus by Tumor V P Collins Boston—p 774
- Spinal Epidural Granuloma Report of Case J V Warren and J Romano Boston—p 789
- \*Effect of Iodized Poppyseed Oil on Spinal Cord and Meninges Experimental Study R L Craig Durham N C—p 799
- Use of Testosterone Propionate in Treatment of Involutional Psychosis in Male E Davidoff and G L Goodstone Syracuse N Y—p 811
- Fatality Following Intravenous Administration of Magnesium Sulfate Report of Case M Rosenbaum and S D Lipton Cincinnati—p 818
- Amphetamine Sulfate in Treatment of Spasmodic Torticollis Report of Two Cases A Myerson and J Loman, Boston—p 823

**Toxoplasmic Encephalomyelitis**—Cowen and his colleagues encountered 6 children who exhibited some or all of the features of infantile or congenital toxoplasmosis. Toxoplasmas have been isolated and positive serologic reactions have been obtained from all. Nine other instances were recognized at necropsy. Most of the latter 9 children died during the early weeks or months of life in the acute or subacute stage. The syndrome was characterized by the concomitant occurrence in infants at or soon after birth of multiple focal, bilateral areas of chorioretinitis, microphthalmos, nystagmus and ocular palsies, and of convulsions, hydrocephalus and multiple foci of intracerebral calcification. The first 6 clinically identified cases in which survival beyond infancy occurred indicate that, contrary to previous experience, the infection is not uniformly fatal and may become chronic, healed or latent. The clinical picture consists chiefly of the residual effects of the lesions occurring in the acute or the subacute stage. The principal symptom is usually diminution in vision due to the effects of multiple foci of healed chorioretinitis, which are readily identifiable ophthalmoscopically. Strabismus, microphthalmos and minor congenital ocular defects may also be present. Generalized convulsions or

petit mal attacks may persist or make their appearance later. Internal hydrocephalus may become chronic and progressive. Foci of intracerebral calcification persist and may at first increase in number and size. Retardation in the development of speech and minor degrees of mental deficiencies occur. In many, if not all, the disease was congenital; therefore this form of toxoplasmic encephalomyelitis should be referred to as infantile or congenital to distinguish it from that which may be acquired during the juvenile period and in adult life. Infantile or congenital toxoplasmic encephalomyelitis is evidently not a rare disease, many cases have probably been erroneously classified as congenital malformation of the brain, cerebral birth injury, epilepsy, congenital hydrocephalus and the like. The identification of additional cases may suggest the epidemiology of the disease. At present the infection appears to be widespread in the United States, it also has been encountered in South America and Europe. Various mammals, and perhaps birds, are probably the animal reservoirs of the infection. The mode of transmission to man is not yet known.

**Toxic Myelopathies**—In most cases of toxic myelopathy following arsphenamine therapy the changes in the spinal cord are so different from those in the brain that doubt arises as to the pathogenic relationship between the action of the drug and the alterations. Lichtenstein reports the data of his case and a review of similar ones recorded in the literature. The microscopic changes in his case consisted of extensive areas of demyelination in the central portions of the thoracolumbar segments of the spinal cord and of focal areas in the medulla oblongata, dense perivascular infiltrations with lymphocytes and plasma cells in the demyelinated areas and similar infiltrations in the forebrain and in the spinal cord unassociated with alterations in the parenchyma, focal leptomeningitis in regions in which the leptomeninges bordered on demyelinated tissue, proliferative alterations in the astrocytes in the demyelinated areas and slight degenerative changes in the peripheral nerves. No foci of softening, necrosis or signs of secondary degeneration were present. Postarsphenamine toxic myelopathy is apparently more common in the male than in the female, all the reported cases have occurred in adults. Most of the patients were symptom free prior to the myelopathy, the positive serologic reaction was the only abnormal finding. The onset of the myelopathy and the time of the syphilitic infection varied from a few years to forty. The only definite relationship was the onset of the myelopathy in a day to many weeks after arsphenamine therapy. The presenting motor or sensory symptoms, which were soon followed by flaccid paralysis, were referable to the lower extremities. With severe involvement urinary retention occurred early, and when the process was slow difficulty in micturition was present for some time before retention developed. The course of the disorder is characterized by an ascension of the motor and sensory disturbances, and for this reason many cases have been described as instances of Landry's paralysis. In the acute form, in which the disorder spreads to the medulla, death from respiratory paralysis may ensue in two weeks, and in the subacute form as much as ten weeks may elapse between onset and death from respiratory failure. Rarely the upward spread of the disorder stops spontaneously and the patient may be discharged with flaccid paralysis of the lower extremities, anesthetics and sphincteric disturbances. When the evolution of the disorder is slow, death may occur from sepsis or pneumonia. Another wrong diagnosis made frequently is syphilitic myelitis. Such a diagnosis is dangerous as it may cause the clinician to give more antisyphilitic treatment, which may hasten the progress of the disorder.

**Destruction of Hypothalamus by Tumor**—The clinical and pathologic sequelae of a slowly growing tumor which involved the floor and walls of the third ventricle and destroyed all nuclei of the hypothalamus and severed functionally the hypothalamic stalk, but which did not disturb the adjacent regions or obstruct the flow of cerebrospinal fluid, is reported by Collins. The following abnormalities were ascribable to the destruction of the hypothalamus by tumor: diabetes insipidus, suppression of the function of the anterior lobe of the pituitary, the thyroid, the ovaries and the adrenal glands and the disturbance of fat metabolism, sleep, thermal regulation and personality. The role of the thyroid in diabetes insipidus is demonstrated, and infor-

mation bearing on the anatomic and physiologic relationship between the hypothalamus and the anterior lobe of the pituitary gland is presented

**Iodized Poppyseed Oil**—Craig studied the toxicity on the spinal cord and meninges of iodized poppyseed oil 40 per cent from an experimental point of view. In the experiments he made an attempt to adjust the amount of the oil injected to the size of the dog so that it should be comparable to the maximal amount used clinically. The 6 dogs used were killed fourteen to three hundred and fourteen days after injection. In 5, examination of the spinal cord revealed that an inflammatory process involved the leptomeninges and the spinal blood vessels. The reaction tended to be more acute in animals killed early than in those killed late. A lesion within the cord was not observed in any dog. In 1 dog there was no reaction. These experimental results are at variance with those of other investigators, and it is suggested that the difference is related to the relative amount of the oil injected.

## Archives of Ophthalmology, Chicago

28 959-1148 (Dec.) 1942

- Applied Pharmacology of Skin in Ophthalmologists' Everyday Practice. A. Linksz, Hanover, N. H.—p. 959.  
Papilledema in General Diseases. P. J. Leinfelder and W. D. Paul, Iowa City.—p. 983.  
\*Multiple Sclerosis as Etiologic Factor in Retrobulbar Neuritis. W. L. Benedict, Rochester, Minn.—p. 988.  
Simple Quantitative Test for Acuity and Reliability of Binocular Stereopsis. F. H. Verhoeff, Boston.—p. 1000.  
Hereditary Corneal Dystrophies. E. H. McBain, San Francisco.—p. 1020.  
\*Results of Desensitization in Tuberculous Iritis. F. V. I. Brown, E. E. Irons and S. R. Rosenthal, Chicago.—p. 1028.  
Cataract in Rats Fed Low Protein Diet. C. Rezende and I. A. de Moura Campos, Sao Paulo, Brazil.—p. 1038.  
\*Adie's Syndrome (Pupillotonic Pseudotabes). O. Lowenstein and E. D. Friedman, New York.—p. 1042.  
Hemorrhage After Cataract Extraction: Clinical and Experimental Investigation of Its Cause and Treatment. G. DeVoe, New York.—p. 1069.

**Retrobulbar Neuritis**—Benedict reviewed the records of more than 400 patients with retrobulbar neuritis, seen at the Mayo Clinic between 1920 and 1940, to determine whether patients for whom a tentative diagnosis of multiple sclerosis was made experienced further evidence of the disease. By eliminating other factors which might cause blindness, multiple sclerosis was suspected in 90 of the 400 patients. In 41 of the 90 further evidence of the disease has appeared. In not 1 of the remaining 49 have the retrobulbar neuritis and the scotoma been found to be due to another cause. At the first appearance of blindness it was often possible to make a diagnosis of arteriosclerosis, diabetes, cerebral tumor, encephalitis, arachnoiditis and neuritis arising from exogenous toxins as the cause of the retrobulbar neuritis. Sometimes a tentative diagnosis was made of one or another of these probable etiologic factors, for example alcohol-tobacco amblyopia, just as at other times multiple sclerosis was suspected because of the history and of the ocular and general symptoms. It seems reasonable to the author, in the absence of signs or symptoms of other causes, to presume that the retrobulbar neuritis is due to multiple sclerosis, even though the etiology of the disease cannot be substantiated on any other grounds.

**Tuberculous Iritis**—Brown, Irons and Rosenthal observed that the exposure of 2 patients with tuberculous iritis recurrent for four and thirteen years, respectively, to the inhalation of fumes from saline suspensions of dead tubercle bacilli was followed by a definite reduction of sensitivity for two years. This was determined by periodic titrations with dilutions of tuberculin administered intracutaneously. No final conclusion can be arrived at from the observation of only 2 cases, but for the present the authors wish to report only what they observed. The inhalation method was discovered accidentally in the Tice laboratory of the Municipal Tuberculosis Sanitarium of Chicago. In certain members of the laboratory staff symptoms varying from malaise to chills, fever up to 104 F., a tickling sensation in the posterior part of the pharynx, cough, vomiting, headache and backache developed periodically. After several months the attacks lessened and finally abated. Previously positive reac-

tions to tuberculin tests of these affected persons were decreased. It was inferred that the issuing vapors might be the causative agent, and experimentation on more than 100 guinea pigs confirmed the assumption. The agent responsible for decreasing sensitivity is not known, but some volatile substance is suspected. In planning inhalation treatment for their first patient the authors had no experience other than that with the guinea pigs to guide them.

**Adie's Syndrome**—The following conclusions are given by Lowenstein and Friedman in their discussion of Adie's syndrome. 1. Pupillotonic reactions may be caused by postganglionic and preganglionic peripheral lesions of the third nerve and by lesions in the great vegetative centers of the diencephalon and their connections with the mesencephalon. 2. Adie's syndrome, characterized by pupillotonic reactions with irritative sympathetic symptoms and absent tendon reflexes, is due to a hereditary degenerative disease localized in the great autonomic centers of the diencephalon and their connections with the mesencephalon. It generally is not of syphilitic origin, but as a syndrome it may be produced by asymptomatic syphilis nervosa. 3. As the nervous manifestations of congenital syphilis are more frequently localized in the sympathetic center than are those of acquired syphilis, it is possible that in some cases the syndrome is due to congenital syphilis. 4. The pupillographic picture of Adie's syndrome is generally *unequalocal*. 5. Physostigmine contracts the Adie pupil (as it does the normal pupil) and restores its ability to react to light and to dilate to distant vision in twelve to twenty minutes after its local application. 6. The physostigmine test enables one to differentiate Adie's syndrome from similar syndromes due to acquired syphilitic infection. 7. Neurotonia (prompt contraction of the pupil to light but sluggish and retarded dilatation and diminished or absent convergence reaction) appears to be an inversion of Adie's syndrome. The relation with Adie's syndrome is that either syndrome may be substituted for the other in the hereditary sequence, therefore the basic processes must be considered identical. 8. The entities neurotonia and pupillotonic pseudotabes include many minor and abortive forms which can be detected by pupillography, they are rather frequent anomalies and have the value of a focal degenerative stigma in the nervous system.

## Archives of Otolaryngology, Chicago

36 619-772 (Nov.) 1942

- External Nasal Deformities and Methods Used in Their Repair. W. B. Davis, Philadelphia.—p. 619.  
Gunshot Lesions of Larynx. V. Trutnev, Moscow, Soviet Union.—p. 629.  
\*Rationale of Estrogen Therapy of Primary Atrophic Rhinitis (Ozena). Relationship of Pharyngeal Pituitary to Ozena. S. L. Ruskin, New York.—p. 632.  
Manifestations of Dermatologic Diseases in Upper Respiratory Tract. V. A. Wood, St. Louis.—p. 650.  
Scleroma. D. S. Canning and Du P. Guerry, 3d, New York.—p. 667.  
Foreign Bodies of External Canal, Middle Ear and Mastoid and Their Complications. Report of Three Cases. W. F. Mosher, Ventura, Calif.—p. 679.  
Treatment of Cysts of Larynx. G. B. New, Rochester, Minn.—p. 687.  
Effects of Various Types of Motion on Differences in Hydrostatic Pressure Between Ends of Semicircular Canal. Theoretical Analysis. R. Morgan, College Park, Md.; R. D. Summers, Westminster, Md.; and S. P. Reimann, Philadelphia.—p. 691.  
Tie Douloureux of Glossopharyngeal Nerve. P. H. Streit.—p. 704.  
Efficiency of Vasoconstrictor Agents in Obstructed Nose. Quantitative Evaluation. H. J. Sternstein, Boston.—p. 713.

**Atrophic Rhinitis**—The intimate relation of the vascular supply of the nasal and of the nasopharyngeal mucosa suggested to Ruskin a direct hormone action of the pharyngeal pituitary on the nasal mucosa. This led him to study the physiologic properties of the pharyngeal pituitary in mice, with the result that a hormone mechanism related to the pituitary gland and possessing estrogenic properties appeared to be a normal constituent of the nasal mucosa. He and others have since tried clinically (1) a nasal spray of estrogen in oil alone, (2) a nasal spray of estrogen in oil combined with parenteral injections and (3) oral administration of estrogen tablets. The combined nasal spray and parenteral injection of estrogen in oil appeared the most effective. Amniotin in oil and *a*-estradiol dipropionate as a nasal spray have seemed equally effective. One patient

was given diethylstilbestrol in oil, 10,000 international units of estrogen per cubic centimeter, for three months. During this time the patient used intranasally as drops three 10 cc vials, a total of 300,000 international units. There were no unpleasant by effects. The nasal mucosa appeared to be definitely improved, and the patient has not required more than an occasional observation for more than a year. The crusting had diminished, and there was little nasal discomfort. Diethylstilbestrol may further aid the therapy of primary atrophic rhinitis (ozena). However, the first essential is to differentiate between primary atrophic rhinitis of vascular origin and secondary atrophic rhinitis from severe nasal infection.

**Glossopharyngeal Neuralgia**—True glossopharyngeal neuralgia is extremely rare. In the approximately 30 cases that Streit collected from the literature the clinical picture was strikingly uniform. The unilateral excruciating paroxysms of pain always strike some part of the glossopharyngeal sensory area—the tonsil, the back of the tongue or the pharynx. The pain is variously described as lancinating, as knifelike or as a stab of a red hot iron. Each pain usually lasts only a few seconds. The paroxysms tend to occur in a series over a few days to a few weeks, in nearly every case intermissions of several months have occurred. The pain usually radiates to the ear, the tongue and ear or the tongue and pharynx. The method *par excellence* of starting attacks of glossopharyngeal neuralgia is to drink hot or cold liquids—cold is most effective. The attacks may also be induced by swallowing talking, yawning, coughing, shouting, sneezing and touching the angle of the mandible. Often the attacks seem to occur spontaneously. For treatment the injection of alcohol is not to be considered, as the glossopharyngeal nerve is extremely near the vagus nerve and large blood vessels. Therefore surgical procedures (external approach for extirpation of the glossopharyngeal nerve in the neck and intracranial section of the glossopharyngeal nerve) must be resorted to. The latter gives complete and permanent relief. If this procedure is contraindicated peripheral section, which is complicated, difficult and delicate but possible, can be performed. The subjective signs of section are anesthesia of the retropharynx and tonsil on the affected side and loss of taste in the posterior third of the tongue. The swallowing of solids may also be interfered with. If extreme hypertension or cardiovascular disease contraindicates intracranial intervention, section and extirpation of the glossopharyngeal nerve in the neck are means of obtaining relief. The greatest difficulty in this operation is to recognize the nerve.

### Endocrinology, Springfield, Ill

31 481-572 (Nov.) 1942 Partial Index

- Phosphorylation of Fat in Absence of Adrenal Glands as Measured with Radioactive Phosphorus. N. Stillman, C. Entenman, E. Anderson and I. L. Chaikoff. Berkeley, Calif.—p. 481.
- Regeneration of Adrenal Gland Following Enucleation and Transplantation with Special Reference to  $\lambda$  Zone. M. K. McPhail and H. C. Read. Halifax, N. S. Canada.—p. 486.
- \*Metabolism of Estrone in Men and Nonpregnant Women. G. Pincus and W. H. Pearlman. Worcester, Mass.—p. 507.
- Excretion of Estrogen in Bile. A. Cantarow, A. E. Rikoff, K. E. Paschke, L. P. Hansen and A. A. Walking. Philadelphia.—p. 515.
- Anterior Pituitary Stimulating Action of Yohimbine. N. W. Fugo and E. G. Gross. Iowa City.—p. 529.
- Fertility of and Sex Ratios from Adult Female Rats and Rabbits Treated While Immature with Gonadotropic Hormone. L. E. Casida and R. L. Murphree, Madison, Wis.—p. 545.
- Response of Metrial Gland to Treatment with Various Steroids. G. Masson and H. Selye. Montreal, Canada.—p. 549.
- Influence of Sex on Carbohydrate Metabolism. Isabelle Grayman, N. Nelson and I. A. Mirsky. Cincinnati.—p. 553.
- Endocrine Action of Thyroglobulin Antibodies. J. Lerman. Boston.—p. 558.
- Effect of Vitamin B<sub>1</sub> and Yeast on Calory Intake and Weight Balance of Hyperthyroid Dogs. V. A. Drill and C. B. Shaffer. Princeton, N. J.—p. 567.

**Estrogen Metabolism**—The data that Pincus and Pearlman present demonstrate a close resemblance in the physical and chemical properties of the estrogenic material of the three principal urine fractions and those of the presumed corresponding crystalline estrogens. The principal phenolic fractions of the pooled urines of 8 male and 13 female patients (with no

endocrine disorders) were the strong phenolic, the weak phenolic nonketonic and the weak phenolic ketonic. By the application to such fractions of certain partitioning between solvents and an alcoholic separation, evidence was obtained that these three principal fractions behave as though they contain theelin, dihydrotheelin and theelin. After injection of theelin the titer of all three fractions increased. The calculated recoveries indicate a conversion of the injected theelin principally to theelin but also to dihydrotheelin. Less than 2 per cent of the injected estrogen could be accounted for by increased urinary excretion. Although the female patients had higher preinjection levels, the calculated recoveries in the urine showed no decided differences between the sexes.

### Georgia Medical Association Journal, Atlanta

31 409-436 (Nov.) 1942

- Complications in Matching of Blood for Transfusions. J. Funke. Atlanta.—p. 409.
- Blood Registry Plan of West End Civitan Club. Atlanta, Ga. C. K. Howard, Atlanta.—p. 411.
- What Every Physician Should Know About Cross Examination. M. Sulzberger Jr. New York.—p. 414.
- Excerpts from Shall Organized Medicine Lead or Follow? G. W. Cottis. Jamestown, N. Y.—p. 425.

### Journal of Allergy, St. Louis

14 1-104 (Nov.) 1942

- Reactions of Ragweed Sensitive Individuals to Skin Tests with Nucleic Acids and Related Compounds. W. B. Sherman. New York.—p. 1.
- Chemistry of Allergens. VII. Nature of Unidentified Allergens of Cottonseed. J. R. Spies, Dorris C. Chambers, H. S. Bernton and H. Stevens. Washington, D. C.—p. 7.
- \*Cutaneous Reactions as Index to Desensitization to Histamine. H. C. Browne. Rochester, Minn.—p. 19.
- Newer Interpretation of Positive Skin Reactions. B. G. Efron. New Orleans.—p. 49.
- Spontaneous and Induced Sensitivity to Foodstuffs. X. Rav. Studies of Small Intestine in Man and Guinea Pig. W. M. Wing and C. A. Smith. New York.—p. 56.
- Skin Reactions to Electrophoretic Fractions of Timothy Pollen Extract. H. A. Abramson, M. G. Engel and D. H. Moore. New York.—p. 65.
- Respiratory Allergy from Arspenamines. Personal Case Report. T. S. Saunders. Portland, Ore.—p. 76.
- Hypersensitivity to Sulfonamides. F. Kalz and Lea C. Steeves. Montreal, Canada.—p. 79.
- Chronic Otorrhea Due to Food Sensitivity. L. J. Noun. Des Moines, Iowa.—p. 82.
- Biotin and Skin Sensitivity. E. B. Keller Jr. Philadelphia.—p. 87.
- Seasonal Somnolence Possible Pollen Allergy. Case Report. L. Sternberg. New York.—p. 89.

### Cutaneous Reactions and Desensitization to Histamine

—Browne describes the response of the skin to gradually increased intradermal injections of histamine. He observed that histamine flares, to be correctly evaluated, must be produced under a constant environmental temperature, a standard posture of the individual and the arm to be tested, a standard source of light and a uniform technic. A room at 78 F with 40 per cent humidity and the patient in the supine position with the arm at a straight angle was satisfactory. A 75 watt Mazda lamp 2½ feet above the flare zone is preferable to daylight for the reading of flares. It appears that only a slight change in cutaneous temperature is necessary to cause a great change in the area of the flare. The most useful dilution of histamine for cutaneous testing was 1:100,000 (histamine acid phosphate used, dilution calculated as base). The histamine wheal is not a good criterion to use in comparative studies of endermic reactions. Histamine flares provoked at intervals over a period of approximately two weeks in subjects treated with gradually increasing amounts of histamine administered subcutaneously twice a day disappear in 40 per cent of cases, are significantly reduced in 25 per cent and are insignificantly changed in 35 per cent. There is an apparent correlation between the clinical result of treatment and the state of the histamine flare. If the cutaneous reaction is assumed to be an index to systemic desensitization (as it is in allergic states), it can be said that 40 per cent of the patients treated showed a complete desensitization, 25 per cent partial desensitization and 35 per cent no desensitization. The desensitization phenomenon probably varies in the individual and is perhaps relatively short lived.

## Journal of the Mount Sinai Hospital, New York

9 213-892 (Nov-Dec) 1942 Partial Index

- Historical Fragments on Neurologic and Psychiatric Specialties Factors and Results in Eminent Medical and Specifically Neurologic Career A Meyer Baltimore—p 213
- Arrested Cerebral Development with Special Reference to Its Cortical Pathology B Sachs New York—p 283
- Reflections Aroused by Unusual Tumor of Cerebellum P Bailey Chicago—p 299
- \*Boeck's Sarcoid Report of Six Cases with One Necropsy S S Bernstein and B S Oppenheimer New York—p 329
- \*Recent Advances in Diagnosis and Treatment of Ruptured Intervertebral Disks W E Dandy Baltimore—p 384
- \*Disturbances in Lipid Metabolism and Central Nervous System C Davison New York—p 389
- Atypical Acoustic Neuromas E D Friedman, New York—p 435
- Inhibitory Effect of Steroid Sex Hormones on Gonadotropic Activity of Hypophysis S H Geist and U J Salmon New York—p 446
- \*Amaurotic Family Idiocy J H Globus New York—p 451
- Histopathologic Observations on Changes of Eyes in Case of Amaurotic Family Idiocy (Infantile Type of Tay Sachs Disease) G B Hassin, Chicago—p 536
- Interrelationship of Mind and Body F Kennedy New York—p 607
- Some Observations Concerning Relationship Between Multiple Sclerosis and Chronic Epidemic Encephalitis K H Krabbe Copenhagen, Denmark—p 617
- Type of Personality Susceptible to Parkinson Disease I J Sands Brooklyn—p 792
- Chemical Differentiation of Tay Sachs Disease and Other Lipidoses H Sobotta New York—p 795

**Sarcoidosis**—Bernstein and Oppenheimer report 6 cases of sarcoidosis and state that, although it is said to be characterized by a generally benign course, 1 of their patients died from diffuse visceral sarcoidosis, 1 is completely invalided as a result of chronic failure of the right side of the heart secondary to advanced pulmonary sarcoidosis and a nephrotic syndrome and 1 has suffered progressive loss of vision due to sarcoid infiltration of the uveal tract. The sarcoidosis of 2 patients is limited to the peripheral lymph nodes without any systemic manifestations and 1 patient, with lymphadenopathy involving the left cervical chain, who had intermittent fever and lost considerable weight, remains chronically ill. Microscopic confirmation was attained in all cases by biopsies of lymph nodes, tonsils, iris or skin. At necropsy the patients who died disclosed diffuse visceral sarcoidosis. The tendency of the disease to chronicity and spontaneous retrogression may at times give a misleading picture of its extent. Positive tuberculin reactions, strong in only 1 instance, were obtained from 4 patients. Tubercle bacilli were never isolated, and associated active tuberculosis was never established. The hematologic picture was not unusual and the sedimentation rate, contrary to the experience of some observers, was not accelerated. Bone changes were not disclosed and 3 patients had no cutaneous manifestations. The temperature of 2 patients exceeded 103 F for relatively long periods. Iridocyclitis was present in 2, hyperproteinemia did not occur and there was a reversal of the albumin globulin ratio with a nephrotic syndrome in 1. Although most observers consider the lesions radioresistant, the authors' experience with roentgen therapy has been most encouraging. Three of 4 patients so treated showed some improvement, and in the fourth a huge mass of cervical nodes disappeared within two weeks. Radiosensitivity may vary with the stage of the disease. In an involutionary phase the response may be much more prompt than when the disease is in the process of evolution and hence radioresistant, this was exemplified by 1 patient whose cervical masses retrogressed but were subsequently resistant and the disease, preceding the patient's death, became widely disseminated. The cause of sarcoidosis remains unknown, there is some evidence of its relationship to tuberculosis.

**Ruptured Intervertebral Disks**—Since the elimination of contrast mediums in April 1941, Dandy has made a correct diagnosis in 65 cases by clinical examination alone. He believes that iodized oil and air injections into the spinal canal do far more harm than good, their avoidance is most enthusiastically welcomed by the patient. In view of the fact that 96 per cent of all ruptured vertebral disks are at the fourth, fifth and sixth lumbar spaces and since unilateral exposure (hemilaminectomy) is adequate to disclose the disk, regardless of the interspace that is involved, it is only necessary to make the diagnosis of a ruptured lumbar vertebral disk. The diagnosis is almost pathognomonic from signs and symptoms alone.

**Lipid Metabolism and Central Nervous System**—The diseases of lipid metabolism, according to the type of lipid deposit, are three: amaurotic family idiocy and Niemann-Pick disease, Gaucher's disease and xanthomatosis. Davison observes that the generalized disturbance (deposition) of lipid in amaurotic family idiocy and Niemann-Pick disease involves not only the central nervous system but also the entire reticuloendothelial system. Careful study is required to find a generalized instead of a localized lipid disturbance as seen in the central nervous system. The lipid deposits in the nervous and reticuloendothelial systems consist of phosphatides. In Niemann-Pick disease a specific increase of sphingomyelin has been demonstrated. Gaucher's disease, a disorder of lipid metabolism of the reticuloendothelial system, may occasionally affect the central nervous system. The predominating lipid consists of kerosin of the cerebroside group. Xanthomatosis consists of granulomatous masses deposited throughout most of the organs. The calvarium may also be invaded and the nervous system compressed or actually infiltrated. The disturbed lipid metabolism involves the reticuloendothelial system, the predominating substance is cholesterol.

**Amaurotic Family Idiocy**—Globus gives a brief historical review of amaurotic family idiocy, clinical histories are reviewed briefly and detailed anatomic observations are presented of 12 cases of the infantile form (in 1 case the affliction was combined with Niemann-Pick disease) and of 1 case of the juvenile form of the disease. The clinical and anatomic features of the late infantile, adult and congenital forms are described and their relationship to the entity is discussed. New observations on the ubiquity of the disease process include the disclosure of isolated cell groups outside the central nervous system exhibiting cell alterations characteristic of the disease. Changes in the posterior lobe of the pituitary are advanced and the numerous globoid granular bodies found there are unusually large. The several forms of the disease including one which is associated with Niemann-Pick lipid histiocytosis, belong to a single disease entity characterized by a disturbance in lipid metabolism. Too great emphasis has been placed on focal variations in the intensity of the pathologic process as observed in the several variants of the disease. A study of the endocrine organs in several of the cases which the author reports failed to provide evidence supporting the view that their dysfunction is at the base of the disease process. The presence of nerve cell groups within the territorial domain of some glands of internal secretion (adrenal, posterior lobe of the pituitary body) is thought by him to be no more than an item in the ubiquitous disease process which universally affects nerve cells. The general conclusion is that amaurotic family idiocy is a malformation characterized by defective constructive material in the affected cells or by their (the cells) lack of capacity for assimilating available material. Either of these difficulties is capable of causing regressive morphologic changes, resulting in dysfunction and finally in total disintegration of the affected cells.

## Journal of Nat Cancer Inst, Washington, D C

3 131-226 (Oct) 1942

- Induction of Hepatic Lesions, Hepatomas, Pulmonary Tumors and Hemangioendotheliomas in Mice with  $\alpha$ -Aminoazotoluene H B Anderson, H G Grady and J E Edwards—p 131
- Production of Subcutaneous Sarcomas in Mice with Tars Extracted from Atmospheric Dusts J Leiter, M B Shumkin and M J Shear—p 155
- Production of Tumors in Mice with Tars from City Air Dusts J Leiter and M J Shear—p 167
- Adenocarcinoma of Pyloric Stomach and Other Gastric Neoplasms in Mice Induced with Carcinogenic Hydrocarbons H L Stewart and E Lorenz—p 175
- Spontaneous Fibrosarcoma of Foreleg and Paw in C3H Mouse J E Edwards, A J Dilton, J White and T N White—p 191
- Review of Some Spontaneous Neoplasms in Mice S W Lippincott, J E Edwards, H G Grady and H L Stewart—p 199
- Carcinogenic Effectiveness of Ultraviolet Radiation of Wavelength 2537 Å H F Blum and S W Lippincott—p 211
- Influence of Limited Application of Methylcholanthrene on Epidermal Iron and Ascorbic Acid C Carruthers and V Sontzoff—p 217
- Reduction of Total Lipid Protein Nitrogen Ratio of Mouse Epidermis by Single Application of Methylcholanthrene L F Wicks and V Sontzoff—p 221

**Journal of Nervous and Mental Disease, New York**

96 493 616 (Nov ) 1942

- Sign of Babinski in Macaca Mulatta F M Forster and J B Campbell New Haven Conn—p 493
- Electrical Shock Treatment of Psychoses W Furst Indianatown Gap Pa and J T Stouffer Philadelphia—p 499
- Encephalomyelodaculitis C G Polin and A B Baker Minneapolis—p 508
- One Hundred Cases of Indecent Exposure A J Arieff and D B Rotman Chicago—p 523
- Francis X Dercum Physician Teacher and Philosopher T B Throckmorton Des Moines Iowa—p 529
- Cerebral Air Embolism Question of Arterialization of Intravenous Air Across the Barrier of Pulmonary Capillaries Report of Case Following Assumption of Knee Chest Position Post Partum with Recovery L Rangell New York—p 542
- Acute Cardiovascular Collapse After Insulin Shock Treatment Report of Case A A Weil, Augusta Maine—p 556
- Megasigmoid in Catatonic Stupor L Kerschbaumer Clarinda Iowa—p 562

**Journal of Neuropath & Exper Neurology, Baltimore**

1 129-240 (April) 1942

- Hemochromatotic Pigmentation of Central Nervous System F H Lewey and S R Govons Philadelphia—p 129
- 'Motor Cortex of Cat H W Garol New Haven Conn—p 139
- Glioblastoma Arising in Hypothalamic Teratoid and Invading Neurohypophysis P M Levin Dallas Texas—p 146
- Cerebral Vascular Changes in Carbon Monoxide Poisoning Report of Case G Eros and G Priestman, New York—p 158
- Brain Changes in Electrically Induced Convulsions in the Human B J Alpers and J Hughes Philadelphia—p 173
- Post Traumatic (Concussion) Changes in Spinal Cord Roots and Peripheral Nerves I M Scheinker Cincinnati—p 181
- Neuropathologic Findings in Brain of Three Additional Cases of Schizophrenia Treated with Insulin A Ferraro New York—p 188
- Softening of Central Nerve Tissues G B Hassin Chicago—p 200
- Tumors of Aqueduct of Sylvius Blastomatous Formations of Varied Origin Limited to Mesencephalon J H Globus New York, H Kuhlbeck Philadelphia and D Weller New York—p 207
- Neural Mechanisms of Athetosis and Tremor P C Bucy, Chicago—p 224

**Journal of Nutrition, Philadelphia**

24 307-404 (Oct) 1942 Partial Index

- Effect of Glucose and Sucrose on Respiratory Quotient and Muscular Efficiency of Exercise Margaret Wrightington Rochester N Y—p 307
- Thiamine Requirement of Albino Rat as Influenced by Substitution of Protein for Carbohydrate in Diet W W Wainio State College Pa—p 317
- Calcium Phosphorus and Nitrogen Metabolism of Young College Women H McKay M B Patton M A Ohlson M S Pittman R M Levertson A G Marsh G Stearns and G Cox—p 367
- Body Fats in Rat Acrodynia F W Quackenbush and H Steenbock Madison Wis—p 393

**Medical Annals of District of Columbia, Washington**

11 419 464 (Nov ) 1942

- War Conditions in Royal Navy W R Patterson Washington—p 419
- Medical Experiences in Naval Warfare A J White Washington—p 424
- Communicable Diseases of Children Their Prevention Control and Treatment J S Wall Washington—p 428
- \*Arteriovenous Fistula Between Ascending Aorta and Superior Vena Cava Report of Case J M Barker and W M Yater Washington—p 439

**Arteriovenous Fistula**—Barker and Yater report a case in which it was impossible to determine whether one dealt with a superior vena cava occlusion or with an arteriovenous communication between the superior vena cava and the aorta. The patient, a Negro of 44, was admitted to the Georgetown University Hospital complaining of swelling of the eyes, face, neck and the right upper extremity for nine hours. He had been perfectly well until 5 o'clock on the morning of his admission, when he was awakened by a "stiffness and pulling in the throat." Although the diagnosis of spontaneous arteriovenous fistula between an aneurysm of the ascending aorta and the superior vena cava was considered the absence of a continuous harsh murmur with systolic accentuation, thrill, red venous blood and venous pulsations made a definite diagnosis impossible. These signs are evidently not essential for such a diagnosis. The sudden appearance of edema of the upper half of the body with cyanosis and great elevation of the venous pressure in a patient

with an aneurysm of the ascending aorta probably usually denotes the onset of a spontaneous arteriovenous fistula between the aneurysm and the superior vena cava. The only other possible condition, thrombosis of the superior vena cava, is even rarer. The authors' patient died one hundred and eleven days after the onset and death was caused by asphyxia from laryngeal obstruction due to edema of the larynx. At necropsy the anatomic diagnoses were syphilitic aortitis, syphilitic aortic aneurysm of the ascending aorta, arteriovenous fistula between the aneurysm of the ascending aorta and the superior vena cava produced by spontaneous rupture of the former into the latter, varices of the great veins of the head, neck and thorax, stenosis of the glottis due to edema, edema of the upper half of the body and a healed Ghon tubercle.

**New England Journal of Medicine, Boston**

227 575 616 (Oct 15) 1942

- Minor Psychiatric Disturbances in War and Civilian Life Diagnosis of the Psychoneuroses D J MacPherson Boston—p 575
- Id Psychiatric Components in Medical Disease Psychosomatic Medicine J E Finesinger Boston—p 578
- Id Therapeutic Procedures in Psychoneurosis E Lindemann Boston—p 584
- Clinical Features of Pancreatic Lithiasis Report of Two Cases R E Moss and E D Freis Boston—p 590
- Diseases of Thyroid Gland J H Means Boston—p 594

227 617-652 (Oct 22) 1942

- Audiometry in General Practice W Mueller Boston—p 617
- Hearing Handicaps in Children of Today Importance of Clinic Programs for Their Early Study and Remedial Guidance Ruth P Guilder Boston—p 619
- Work of Boston Guild for the Hard of Hearing Eunice Achon Pugh Boston—p 624
- Castration for Carcinoma of Prostate Report of Forty One Cases C H Neuwanger and V Vermooten New Haven Conn—p 626
- Premortem Symptoms of Myocardial Infarction N H Boyer Boston—p 628
- Proteinuria and Associated Renal Changes W Dock New York—p 633
- Regional Anesthesia M Brown and M J Nicholson Boston—p 636

227 653-690 (Oct 29) 1942

- Eczema and Pruritus in the Aged L E Anderson Springfield Mass—p 653
- Intraocular Aneurysm of Internal Carotid Artery T W Botsford Boston—p 657
- Gastrointestinal Symptoms and Inguinal Hernia R S Myers and R Zollinger Boston—p 660
- Emergency Medical Service for a Small City F T Hill Waterville, Maine—p 662
- Is Tuberculosis Increasing? J A Foley Boston—p 664
- Bile Pigments C J Watson Minneapolis—p 665

**New York State Journal of Medicine, New York**

42 2079-2174 (Nov 15) 1942

- Pregnandiol Excretion in Normal Women G P Heckel Rochester—p 2103
- Some Observations on Anesthesia for Neurosurgery B B Hershenson Brookline Mass—p 2111
- \*Functional Disorders of Feet and Their Treatment D J Morton New York—p 2119
- Experiments on Cadaver Nerve Graft and Glue Suture of Divided Peripheral Nerves N de Rezende Rio de Janeiro Brazil—p 2124
- Pilonidal Cysts Safe Effective Office Treatment C G Heyd New York—p 2129
- Tuberculosis in Adolescents and Young Adults R Horton Oncont—p 2131
- Androgens in Treatment of Dysmenorrhea B L Cinberg New York—p 2138

**Disorders of Feet**—Morton states that the most direct cause of metatarsalgia trouble is shortness of the first metatarsal, the second source is a rearward position of the sesamoid bones and the third and most common cause is a looseness or laxity of the basal joints of the first metatarsal segment. The whole range of symptoms are not unlike those present in any other chronically strained joint persistently subjected to continued strains of similar violence or intensity. Therefore cases of chronic joint strain are due to improper weight distribution, and the symptoms are maintained and exaggerated through daily persistent abusive function. Consequently the immediate phases of treatment are (1) restriction of activities and weight bearing in accordance with the severity of symptoms, (2) rest, (3) fre-

quent brief periods of rest during the day with the legs and feet supported at hip level, (4) removal of all sources of surface irritation (corns, calluses, warts) and avoidance of badly fitting shoes, (5) contrast plunges daily (late afternoon preferably) to counteract the irritative effects of each day's activities and to establish improved circulatory conditions and (6) other therapeutic measures (physical therapy or drugs) as indicated. The signs of faulty shoes and those due to internal foot disorder must be distinguished. A helpful working rule is to assume (in general) that pain on the top and sides of the foot calls for a check on the shoe, when it is on the bottom or the sole of the foot the trouble is generally inside the foot. At least a dorsoplantar roentgenogram should be taken of both feet in every case. Soft tissues and nerves that have been more or less irritated for months or years do not become normal in a few hours or days. Permanent results require intelligent and patient treatment.

### Northwest Medicine, Seattle

41 367-400 (Nov.) 1942

Roentgen Diagnosis of Obstructing Bronchial Lesions G W Holmes Boston —p 370

Psychoneurosis in World War II N K Rickles Seattle —p 373

Water Balance in Pregnancy R D Reckie Spokane Wash —p 377

Pro tignine in Delayed Menstruation D Parrella Brooklyn —p 384

\*Criteria for Diagnosis of Brucellosis J F Griggs Claremont Calif —p 389

**Criteria for Diagnosis of Brucellosis**—The acute well known form of brucellosis is characterized by a high, usually persistent, fever and profuse perspiration. The patient may feel as if he had a severe, prolonged influenza or dengue fever or he may be remarkably comfortable and clear headed for the severity of his fever. Physical changes are rare but an enlarged spleen may be present. The diagnostic criteria are a positive blood agglutination test, a positive blood culture, a leukopenia relative to the fever, a history of consuming raw milk or its products, the handling of infected cattle or their carcasses or exposure to *Brucella* in the laboratory. For a positive diagnosis of the chronic form Griggs declares, the first criterion is a really ill patient. A long and searching history must be taken otherwise the disease is not likely to suggest itself. The typical history reveals a rather long total period of ill health. The course may be an undulant one with some constant features or it may include complete remissions of good health interspersed with recurrent periods of vague or atypical illness. The symptoms may be decidedly varied. The history often suggests a psychoneurosis. The temperature should be taken daily in the late afternoon for at least five minutes. Fever, if present, reveals that a probable infection is present. However, fever may be absent in active chronic brucellosis. When fever is present it should be compared with other observations particularly the blood count. If it is absent the diagnosis must be confirmed by other data. The physical examination, except for fever, is negative as is the roentgen examination except for pulmonary or bone lesions in about 5 per cent of patients. The bone lesions show destruction of cortical tissue in a localized manner with a relative absence of periosteal reaction. The blood picture may vary widely, but it tends to show a relative lymphocytosis and leukopenia and/or a mild anemia with a high color index. The exclusion of other probable or possible diseases is most important. Coincident conditions must be identified and assigned their proper share in the total symptomatology. The power of the polymorphonuclear leukocytes to ingest living *brucella* organisms from a fresh culture of fresh citrated blood should be tested before cutaneous or vaccine tests are performed. If some of the patient's cells ingest as many as thirty-one or forty or more bacteria and if all phagocytose some bacteria, the test is diagnostically significant. Like the agglutination test, this opsonocytophagic test is not an index of infection but an expression of specific resistance. A positive test is only a part of an integrated diagnostic pattern. The blood agglutination test is the least useful of all the tests in the diagnosis of chronic brucellosis. However, if positive it may be significant of probable brucellosis. Positive cultures of *Brucella* from the blood or other body fluids are irrefutable proof. The intradermal test, performed after the blood tests

and fever record are completed, is the most important of the objective tests. If other tests are conclusive the cutaneous test should be omitted, as necrosis of the skin or premature desquamation of epidermis (near necrosis) is easily caused by a strong concentration of *brucella* protein in sensitized persons. A definitely favorable response to *brucella* vaccine therapy is diagnostically confirmatory. This therapeutic test may not be evident until after months or years of therapy. An unfavorable but diagnostic reaction is hypersensitivity, that is, local tissue intolerance, to vaccine. If this is anticipated, it can and should be avoided. The diagnosis emerges out of certain combinations of diagnostic data and not from any one or two air tight criteria.

### Public Health Reports, Washington, D C

57 1599-1634 (Oct 23) 1942

Production of Carious Lesions in Molar Teeth of Hamsters (*Cricetus auratus*) F A Arnold Jr —p 1599

Analysis of Sanitary Facilities in United States J M DallaValle and R H Britten —p 1604

Present Status of State Cancer Control Programs I A Scheele —p 1613

Disabling Morbidity Among Industrial Workers Second Quarter of 1942 W M Cafaer —p 1620

57 1635-1678 (Oct 30) 1942

Variation in Hospitalization with Size of City Family Income and Other Environmental Factors Based on Records for 9,000 Families in Eighteen States Visited Periodically for Twelve Months 1928-1931 S D Collins —p 1635

57 1679-1714 (Nov 6) 1942

Summary of Census Data on Water Treatment Plants in the United States S R Weibel —p 1679

Contribution on Toxicity of Alkyl R F Wheeler J B Lackey and S Schott —p 1695

**Carious Lesions in Molar Teeth of Hamsters**—Arnold's studies indicated that diets containing cereal, like those used to induce caries in rats, were also effective in hamsters. He determined whether the size of the cereal had the same etiologic influence on dental caries in hamsters as it does in rats. Carious lesions were not as was the case in rats, dependent on the coarse particle cereal in the diet, as caries was most extensive in animals fed a finely ground cornmeal ration. This result suggests the possibility of adapting a strictly synthetic diet to the study of experimental caries in these animals. The two distinct types of lesions observed were caries in the pits and fissures of the occlusal area of the molar teeth and caries in the cervical portions of the proximal surfaces, mostly in the upper and lower first molars.

### Quarterly J Studies on Alcohol, New Haven, Conn

3 165-344 (Sept) 1942

Effect of Alcohol in Experimental Liver Cirrhosis J A Lowry L L Ashburn F S Dift and W H Sebrell Bethesda Md —p 168

Alcohol and Tuberculosis F Bogen Olive View Calif —p 176

Alcoholism and Induction into Military Service A Myerson Boston —p 204

Alcohol Legislation and Taxation in Britain in Wartime J A Dent London England —p 221

Alcohol and the War Recent Proposals for Federal Legislation Controlling Use of Liquor E A Rostow New Haven Conn —p 230

Some Casual Data on Drinking Habits Among Two Strata of Civilian War Workers J Dollard New Haven Conn —p 236

Alcohol Problem in Military Service M Moore Boston —p 244

Alcohol and the War Some Implications of Expansion in War Industries J B Fox Boston —p 257

Interpretation of Alcohol Consumption Rates with Special Reference to Statistics of Wartime Consumption E M Jellinek New Haven Conn —p 267

Alcohol and the War Effort H F Willkie Louisville Ky —p 281

War and Wine Industry H A Caddow San Francisco —p 288

Beer and Brewing in Nation at War A Griesedieck New York —p 293

### Rocky Mountain Medical Journal, Denver

39 733-820 (Nov) 1942

Modern Mexican Medicine C H Darrow Denver —p 750

Acute Surgical Conditions of Abdomen A S Jackson Madison Wis —p 756

Subvesical (Vaginal) Fibroma Case Report W G Schulte and R P Middleton Salt Lake City —p 762

Virus Pneumonia T D Cunningham Denver —p 764



## FOREIGN

An asterisk (\*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

## British Medical Journal, London

2 473-504 (Oct 24) 1942

- Some Aspects of Carditis T F Cotton—p 473  
Reactions Following Transfusions of Stored Blood R A Jones—p 476  
\*Bagassosis Industrial Lung Disease L I M Castleden and J L Hamilton Paterson—p 478  
Intramural Intestinal Hemorrhage D Crome—p 480  
Chronic Leg Ulcer in Myelogenous Reticulosis Report of Case C J Polson—p 481

**Bagassosis**—According to Castleden and Hamilton Paterson, directly after machinery was installed for dry bale-breaking of bagasse (the waste of sugar cane after the sugar has been extracted), instances of respiratory illness began to appear among the laborers in the plant who fed the bales into the machine and the engineer who supervised its construction and running. Workers engaged in the cutting and trimming of finished bagasse boards were never affected. As soon as it was realized that the dust liberated at the initial stage of manufacture was injurious, measures to suppress it consisted of a water spray and a suction draft applied to the site of its generation. Since these measures were adopted no further cases have occurred. The clinical appearance of the patients suggests an acute inflammatory pulmonary disease with urgent and extreme dyspnea but with little or no febrile reaction. Although bagasse contains 5 to 7 per cent of silica, an amount capable of producing silicosis, the acute pneumonic phase of the illness was unlike any known form of silicosis previously described, and as men who at the final stage of the process were also exposed to a silica-containing dust but never became ill it seemed possible that an allergic factor might be responsible for the disease, that is, that the workers became sensitized to a protein present in the dust of bagasse. Extracts for skin tests were made and it was found that whole bagasse contains an antigen soluble in isotonic solution of sodium chloride to which workers who inhale the dust can become sensitized. The acute phase of bagassosis is possibly an allergic response of the lungs to this antigen with, but more probably without, an infective element. The chronic pathologic process might be due to a form of silicosis which supervenes on the allergic phase during or after the latter's resolution, a response on the part of the lungs to crystalline cellulose or a chronic process of fibrotic nature occurring in tissues edematous from their allergic response to the antigen. Attempts to reproduce the disease in animals have so far failed. The disease should be called bagassosis and not bagasscosis, as it has been

## Journal of Pathology and Bacteriology, Edinburgh

54 407-542 (Oct) 1942

- Development of Colors from Sulfonamides (*p*-Nitrobenzenesulfonamide) Under Bacterial Action and Bearing of Such Phenomena on Theory of Bacteriostatic and Bactericidal Activities of Sulfonamides H Burton J W McLeod Anna Mayr Harting and N Walker—p 407  
Effect of Surface Active Agents on *Bacillus Proteus* I Lominski and A C Lendrum—p 421  
Medium Showing Distinctive Green Coloration with Growths of Corynebacterium Diphtheriae Intermedius M Gordon and Constance Higginbottom—p 435  
Effect of Blood Charcoal on Growth of Tubercle Bacillus E Nassau—p 443  
Growth of Coliform Bacilli in Water Containing Various Organic Materials J H Nelson—p 449  
\*Aortic Size Status Lymphaticus and Accidental Death W G Millar and T F Ross—p 455  
Changes in Adhesiveness of Blood Platelets Following Parturition and Surgical Operations Helen Payling Wright—p 461  
Selective Mediums for Organisms of Salmonella Group R Knox, P G H Gell and M R Pollock—p 469  
Neoplastic Diseases of Testis in Animals J R M Innes—p 485  
Modified Leifson Mediums for Isolation of *Bacillus Dysenteriae* and Pathogenic Members of Colon Typhoid Group J Brodie—p 499

**Aortic Size and Accidental Death**—As the most constant characteristic of status lymphaticus appeared to be the narrowness of the aorta, Millar and Ross measured 300 consecutive aortas at necropsy to discover whether any connection exists between poor vascular development and frankly accidental death,

that is, from causes which in themselves could not be of sufficient power to produce death in a normal subject. The measurements were studied in relation to age, body weight, height and sex. The mean size of the aorta, corrected for these four variants, of patients dying from accident is significantly lower. Evidence shows that this difference is due, not to dilatation of the aorta in disease, but to developmental hypoplasia of the arterial system in the fatal accident group. This hypoplasia is regarded as connected, probably indirectly with liability to accident. Therefore arterial hypoplasia may be the most reliable guide to the existence of so-called status lymphaticus. In this sense status lymphaticus is regarded as an entity and one to which importance should be attached as a factor in sudden and unexpected death.

## Medical Journal of Australia, Sydney

2 335-352 (Oct 10) 1942

- \*Modern Treatment of Burns A D Smith—p 335  
Id F M Richardson—p 337  
Id J P Ainslie—p 339  
Some Aspects of Pathology of Carcinomas of Biliary Tract R A Willis—p 340

**Modern Treatment of Burns**—Richardson stresses the fact that in the modern treatment of burns the secondary physiologic change, water and protein loss secondary to burns, which heretofore has been neglected, must be recognized and replacement instituted. The two simple and speedy laboratory methods, the hematocrit value and protein value are important in illustrating the trends in patients and in guiding therapy.

## South African Journal Medical Sciences, Johannesburg

7 85-172 (July) 1942

- Nicotinic Acid Excretion in Normal Men and in Cases of Vincent's Gingivitis L Goldberg and J M Thorp—p 85  
Survey of Vitamins in African Foodstuffs I Thiamine Content of Wheat L Goldberg and J M Thorp—p 95  
\*Vitamin A Deficiency in Tuberculosis and Diabetes and Effect of Various Therapeutic Preparations B A Dormer and M Gibson—p 109  
Preimplantation Abortion in Elephantulus C I van der Horst and J Gillman—p 120  
Spontaneous Development of Deciduomas in Elephantulus C J van der Horst and J Gillman—p 127  
Critical Analysis of Early Gravid and Premenstrual Phenomena in Uterus of Elephantulus Macaca and Human Female C J van der Horst and J Gillman—p 134  
Structure of Basal Granular Cell (Argentaffine) in Human (Bantu) Alimentary Canal with Special Reference to Antianemic Factor J Gillman—p 144  
Rats as Vectors of Disease Survey of Rats of Johannesburg L C Harris and R G Saner—p 160

**Vitamin A Deficiency**—The Frober Faybor biophotometer test was used by Dormer and Gibson to determine the vitamin A deficiency in 92 apparently normal healthy young adults (university students), 86 tuberculosis sanatorium inmates (on a diet with an adequate amount of vitamin A for normal requirements), 10 persons suffering from diabetes and that of persons with a vitamin A deficiency after taking various preparations containing vitamin A. Of the first group the curve of 73 per cent was normal, of 16 per cent borderline and of 11 per cent subnormal. The respective figures for the tuberculous group were 43, 27 and 30 per cent. The curves of the 10 diabetic patients were all subnormal. All the subnormal curves of the college students could be explained by food fads or an inadequate intake of vitamin A. In the tuberculous group the deficiency was probably due to excessive metabolism and inefficient absorption. All patients whose vitamin A content had been raised felt better subjectively. The biophotometric reading of tuberculous persons cannot always be improved beyond the borderline, a maintenance dose must be given. Also in spite of large doses of concentrated vitamin A the curves of none of the diabetic patients ever reached normal levels. The metabolism (from absorption to transformation in the retina) of vitamin A is apparently interfered with in diabetes. Of the various vitamin A preparations used a sample of crude cod liver oil with a vitamin A content of 1,483 international units per gram appeared to have no effect in improving the biophotometric curve, but concentrates gave good results.



## Cardiologia, Basel

6 57-168 (Nos 2/3) 1942

- \*Benign Celothelioma A Tumor sui Generis of Atrioventricular Node with Heart Block I Mahaim—p 57
- Electrocardiographic Changes After Occlusion of Pulmonary Artery or Aorta B Kisch A A. Goldbloom and G Zucker—p 83
- Contribution to the Problem of the Electrical Alternation of the Heart B Kisch—p 95
- Microscopic Structure of Coronary Vessels Particularly the Occurrence of Autonomic Vascular Regions in Human Heart S Hirsch—p 105
- Human Electrocardiogram Derived Simultaneously from Left and Right Ventricle G Nylin and C Crafoord—p 136
- Gallop Rhythm and Atrioventricular Dissociation G Dagnini—p 146
- Auricular Fibrillation in Course of Protracted Digitalis Therapy E Schill—p 165

**Celothelioma of Atrioventricular Node**—Mahaim's patient acquired pulmonary tuberculosis when she was 22. The following year there developed abdominal symptoms caused by an ovarian tumor which was considered inoperable. Necropsy disclosed the ulcerative type of pulmonary tuberculosis and epithelioma of the right ovary. There were no metastases in the internal organs. There was a tumor of the atrioventricular node which was identified as a celothelioma. This type of tumor was first described by Monckeberg as a lymphoangioendothelioma. In reality the tumor is of embryonal origin. It develops from the epicardic celothelial cells (cover cells). The literature contains reports of only 5 similar cases. A review of the 4 cases reported respectively by Armstrong Monckeberg, Lloyd, Perry and Rogers, and Resek is presented.

## Helvetica Medica Acta, Basel

9 217-346 (April) 1942 Partial Index

- Etiology and Pathogenesis of Megacolon and Dolichocolon J A Mathez—p 224
- \*Studies on Respiration and Sickness at High Altitudes and on Respiratory Regulation K Lenggenhager—p 269
- Study of Function of Human Patella Question Whether Its Presence Modifies Traction of Quadriceps on Tibia Question of Usefulness E Duboux—p 331
- New Method of Determining Chloride Content in Blood Corpuscles M Duboux et C Tschappat—p 338

**Respiration and Sickness at High Altitudes**—Lenggenhager's extensive studies furnish arguments against the theory of carbon dioxide or hydrogen ion as regulators of respiration. Since carbon dioxide is the terminal product of combustion, its accumulation, according to the law of mass effect, must inhibit the utilization of oxygen. For this reason respiration in a given volume of air is possible longer when carbon dioxide is absorbed. Oxygen consumption is reduced when, in the presence of the breathing of air, carbon dioxide is accumulated. If there is an oversupply of oxygen in the blood, a high carbon dioxide content is tolerated. In the presence of deficient oxygen supply a less than normal carbon dioxide content is tolerated. If carbon dioxide had a direct stimulating effect on the respiratory center the respiratory volume would have to remain the same in the presence of various oxygen containing gas mixtures that have a constant carbon dioxide content, this, however is not the case. The alveolar carbon dioxide is noticeably higher in the presence of high than of low blood oxygen. The consumption of oxygen is made more difficult not only by carbon dioxide but also by severe acidosis (diabetic coma, acid intoxication and uremic coma). This could be a direct action of the hydrogen ion or an indirect effect of the metabolic carbon dioxide. On the other hand, every alkalosis improves the oxygen consumption either because of a reduction of the hydrogen ions or because of a decrease in carbon dioxide. It is possible that this factor explains the slight metabolic increase at moderately high altitudes. If the body loses too much carbon dioxide on account of hyperventilation, the tissues, particularly those of the brain, are gradually damaged by the resulting alkalosis. The respiratory center becomes less responsive. Anesthetized animals can be killed by passive hyperventilation. Respiration becomes deeper with increasing oxygen depletion if carbon dioxide is added to keep its content constant. The former explanation of the increase in the respiratory volume in oxygen deficient air by way of the formation of hypoxemic acids in the respiratory center or in the peripheral "chemo-

ceptors" cannot be correct. Bohr's law which applies to blood in vitro plays a subordinate role in living tissues. High altitude sickness is probably caused not so much by oxygen deficiency as by the acute alkalosis. This view was supported by experiments in a low pressure chamber. At 9,000 meters addition of carbon dioxide to the inspiratory air completely counteracted the threatening symptoms. After alkalosis has acted on the brain tissues for a while the cerebral functions become more difficult. High altitude sickness presents the cumulative effect of impairment of the cerebral functions by alkalosis and oxygen deficiency.

## Schweizerische medizinische Wochenschrift, Basel

72 581-608 (May 30) 1942 Partial Index

- Meningioma A Jentzer—p 581
- Factors of Ophthalmologic Diagnosis and Therapy Important for Practitioner P Kurrer—p 586
- Practical Aspects of Lumbar Puncture and of Examination of Lumbar Fluid M Wieland—p 590
- \*Relation Between Paget's Osteitis Deformans and Hyperthyroidism E Lyon—p 592
- Psoriasis and Icteria R de Preux—p 596

**Paget's Osteitis Deformans and Hyperthyroidism**—According to Lyon the thyroid hormone exerts an important influence on the skeletal system. Hyperthyroidism is almost regularly accompanied by progressive osteoclastic bone atrophy. Osteitis deformans of Paget is less often encountered in hyperthyroidism. When the two disorders occur the question arises whether this association is accidental or whether there exists a causal connection. The author reports a case in which hyperthyroidism had existed for years. Paget's osteitis deformans had been demonstrated in the pelvis since 1934 and osteoporosis of the vertebral column in 1939. Paget's osteitis deformans is an osteoclastic bone atrophy with mass production of inferior bone. Its active stage is characterized by increased serum phosphatase, positive calcium balance, increase in the blood cholesterol and A hypovitaminosis, which readily yields to vitamin administration. A constitutional predisposition to osteoclastic bone atrophy is the underlying cause of Paget's osteitis deformans, and this predisposition is made manifest by A hypovitaminoses of various origins. Hyperthyroidism was responsible in the author's case. The therapy aims to transform the disease into the stage of remission. The cause of the vitamin A deficiency must first be ascertained and counteracted. In the reported case the hyperthyroidism was treated by roentgen irradiation. Prolonged and intensive treatment with vitamin A is indicated in all cases.

72 609-636 (June 6) 1942. Partial Index

- Bronchial Asthma O Muller—p 609
- Virus and Virus Proteins P Jadowig—p 613
- \*Electrocardiographic Records Under Influence of Digitalis A Sellmer—p 617
- Case of Adrenal Pheochromocytoma P Hahn—p 622

**Electrocardiographic Records Under Influence of Digitalis**—Sellmer studied the effects of digitalis on electrocardiograms of 60 patients with and without heart disease. His investigations concerned the minimal dose which produces digitalis effects, the time of its first appearance and the persistence of electrocardiographic changes. To obtain exact data, the majority of patients were subjected daily to electrocardiographic examinations and sometimes hourly tests were made. The quantities of digitalis administered and the duration of the medication varied greatly. Extremely small as well as large doses (0.1 to 6.4 Gm) were administered for from one to forty-two days. Typical digitalis changes such as the lowering of the ST and the flattening of the T wave were observed after extremely small doses (0.1 to 0.5 Gm) and usually in the course of the first three days, in exceptional cases after from one to several hours. The changes persisted for from five to forty days, the average time was two to three weeks. There was no essential difference between the reaction of the diseased and the healthy heart. The customary digitalis effects were observed also in the healthy heart. The individual differences in reaction were pronounced and must be ascribed to disparity in the susceptibility to digitalis.

## An Cáted de Pat y Clin Tuberc, Buenos Aires

3 221-458 (Dec) 1941 Partial Index

- Sequels of Pulmonary Tuberculosis and Allergy to Tuberculin R F Vaccarezza —p 221
- \*Physicochemical Study of Serum Precipitation Reaction by Sulfuric Acid F Modern J A Tabanera and G Ruff —p 238
- Influence of Lateral Decubitus on Pulmonary Rest Separate Functional Study of Each Lung R F Vaccarezza A Lanari A E Bence and F Labourt —p 254
- Culture of Bacillus of Bovine Tuberculosis A R Arena and A Cetrangolo —p 268
- \*Importance of Roentgenologic Examination of Thorax with Caudal and Cranial Direction of Rays B Enquin —p 287
- Experimental Tomography G Pollitzer and C Lanari —p 312
- Extrapleural Pneumothorax R F Vaccarezza O A Vaccarezza and J C Rey —p 345
- Pulmonary Atelectasis by Aspiration of Residual Air A E Bence and A Lanari —p 372
- Pulmonary Pictures in Ocular Tuberculosis R F Vaccarezza B Courtis and J B Gomez —p 392
- \*Perforation of Tuberculous Ulcers of Intestine C E Lamberti —p 397
- Postthoracoplastic Cavitory Gangrene R Consigliere and O A Vaccarezza —p 433

**Serum Precipitation by Sulfuric Acid**—Tabanera treats 0.2 cc of human serum with 3 cc of an 8½ per cent solution of sulfuric acid in twice distilled water. The blood is taken when the patient is fasting and with a dry sterilized syringe. The serum must not show signs of hemolysis. The test tubes are kept at a temperature of from 18 to 20 C and the results can be read at the end of twenty-four hours. Normally, formation of a precipitate is observed (negative reaction). In certain morbid conditions such as tuberculosis, particularly with an intestinal localization, no precipitate is formed within a fixed time (positive reaction). In order to learn the nature of the precipitate normally obtained, color reactions were made to identify the amino acids. Other factors investigated were the isoelectric point of the precipitate, its relation to nitrogen in its protein fractions and the protective action of human serum on animal serum and other substances. The precipitate produces the positive reaction of amino acids, and the relation between its nitrogen and dry extract corresponds to the conversion of nitrogen to protein (6.25). Electrodialyzed serum is not precipitable with sulfuric acid. The pseudoglobulin of normal serum does not prevent precipitation, whereas the pseudoglobulin of serums with positive reaction have a great protective power and the increase of its quantity is proved by protein fractionation. The absence of precipitation (positive reaction) can be explained by the increase of the pseudoglobulin fraction or by the presence of a protective substance in it. The positive human serum protects the normal serum of man and of various animals the same as a hydroalcoholic solution of casein.

**Roentgenologic Examination of Thorax with Caudal and Cranial Direction of Rays**—Enquin studied the value of the x-ray exploration of the thorax with cranial and caudal projection of the rays. These angles of projection permit the visualization in frontal exposure and are free from bony obstruction to the apical and subapical pulmonary fields, the two hili, particularly the left one, the anterior and posterior slopes of the diaphragm, the apex and the lower border of the heart. The pictures obtained with these projections differ greatly from those obtained with standard angles of projection. The theoretical foundations and the diagnostic value of these differences are discussed. The diagnostic value of the exposures described is often superior to that of tomography. These angles of projection are of particular importance for the examination of apical and subapical lesions and for the study of incisional and juxtancusural processes and for the diagnosis of cavities.

**Perforation of Tuberculous Ulcers of Intestine**—Lamberti reports that necropsies on 464 patients with pulmonary tuberculosis revealed ulcerative intestinal lesions in 258 (55.6 per cent). A perforation of the intestine was found in 9 cases in 1.93 per cent of those with pulmonary tuberculosis and in 3.48 per cent of those with intestinal tuberculosis. The perforation was located in the ileum in 4 cases in the ileum and appendix in 1 case and in the appendix in the 4 remaining cases. The clinical diagnosis was established in 7 cases which presented the symptomatology of a generalized peritonitis.

## Bol Oficina San Panamericana, Washington, D C

21 955-1060 (Oct.) 1942 Partial Index

- \*Coconut Water as a Culture Medium C Picado T —p 960

**Coconut Water as a Culture Medium**—Picado T directs attention to the value of coconut water as a culture medium. The war, with its interruption of transportation has prevented many small laboratories from obtaining their usual supplies of culture mediums. San Juan de Dios Hospital has employed coconut water as a culture medium for the past twenty-five years. Coconut water contains magnesium nitrogen phosphorus, sodium, potassium sulfur, zinc iron sucrose, calcium aluminum and chlorine and closely resembles Raulin's liquid. The natural acid coconut water sterilized by boiling used as liquid or jelled serves as an excellent medium for the growth of fungi of human and plant mycoses for industrial yeasts for plant bacteria, for acidophilus bacilli for the germination of orchids and for the development of fruit fly larvae. Bacteria pathogenic to man and animals require that the coconut water be alkalinized. The economy of the medium in tropical countries is obvious.

## Gaceta Médica de México, Mexico City

72 337-457 (Aug 31) 1942 Partial Index

- \*Staining Treponema Simple Rapid and Reliable Technique T G Perrin —p 404

- \*Digitalis Lanata Clinical Effects S Aceves —p 410

**Staining Treponema**—Dark field examination of Treponema, according to Perrin, has the disadvantage that the material cannot be preserved. With his method it is possible to stain Treponema either in fresh or in dried preparations. The reagent is prepared with 10 cc of a 10 per cent formaldehyde solution, 4 cc of Zielhl's fuchsin and 1 cc of acetic acid. Fresh preparations may be stained with or without previous fixation. The slide is stained for two minutes if heat is used and for six minutes if heat is not used. It is then washed in distilled water, dried and observed under the oil immersion lens. Dried preparations are covered with a slide having a fine layer of balsam or of oil of cedar. The reagent can be used in staining nuclei and tissue sections. The author employed this technique for staining bacteria in serous exudate of a syphilitic chancre, in pus of maxillofacial polyarthritis and in the lymph of dyschromic skin in experimental pinto. The technique proved to be rapid and reliable. Treponema stains uniformly and is clearly differentiated.

**Digitalis Lanata**—Aceves treated 25 patients with decompensated heart disease by rest in bed and diet followed by administration of the glucosides of Digitalis lanata (digitalin). The drug was given intravenously or by mouth in a dose slightly larger than that of Digitalis purpurea. The effect of Digitalis lanata on the heart is similar to that of Digitalis purpurea. The drug corrects the insufficiency by increasing the contractility of the myocardium. The effects are rapid when the drug is administered intravenously. Adequate therapeutic doses are well tolerated for a long period. Larger doses of the drug may cause gastrointestinal and nervous disorders and changes in the electrocardiogram characteristic of digitalis intoxication.

## Revista Clínica Española, Madrid

5 81-160 (April 30) 1942 Partial Index

- Electroencephalography J Rof Carballo —p 81
- \*Acute Perforations of Malignant Tumors of Stomach A Garcia Barón —p 96
- \*Studies on Casal's Disease Constitution and Pellagra M Diaz Rubio —p 101
- Continuous Aspiration in Gastric Surgery R Canals Mayner —p 105
- New Aspects of Indications in Treatment of Pulmonary Cavities M Lopez Sendon —p 113
- Kidney of Pregnancy and Acid Base Equilibrium F Orengo Diaz Del Castillo —p 123
- \*New Method of Selective Staining of Rickettsias M Gracian Calvo —p 127

**Acute Perforations of Malignant Gastric Tumors**—The rarity of acute perforations of malignant gastric tumors induced Garcia Barón to report 3 such cases. The first patient had a primary carcinoma without a history of gastric disturbances. The first symptom was the perforation. The second patient had apparently an ulcer carcinoma. The third had a

sarcoma with a history of hyperacidity, of a subacute perforation leading to a subphrenic abscess and an apparent surgical cure which was followed within a few months by the development of a stenosing tumor, the sarcomatous nature of which was discovered by biopsy. Diagnosis of perforation was made in all cases before the operation, but in none was it recognized as cancerous. Aird reported in the *British Journal of Surgery* in 1935 79 cases culled from the literature. At the author's hospital there were four hundred ulcer perforations in twelve years but only three cancer perforations. The male sex was predominant, 75 per cent of the 79 patients in the world literature and all 3 of the author's patients being men. Surgical treatment is indicated, for without it the patient is lost. The surgical mortality is approximately 68 per cent. The cancers are usually prepyloric. The intervention should be limited in the majority of cases to simple closure of the perforation, which in some cases is combined with a gastroenterostomy. Roentgenologic examination is valuable in the diagnosis because spontaneous pneumoperitoneum is often a pathognomonic sign of perforation.

**Constitution and Pellagra**—Díaz-Rubio points out that when the etiology of pellagra is considered the pellagrigenic diet generally receives most attention. Poor hygiene, physical and mental overwork, the concurrence of infections and intoxications and the seasonal factor are usually regarded as contributory factors but a predisposition is not considered. The author cites factors which indicate the presence of a special predisposition or resistance for or against pellagra, the most important being existence of a familial pellagra, age, pregnancy and menopause, clinical multiformity, failure of the disease to develop in spite of a prolonged pellagrigenic diet, cures of spontaneous cure in spite of the diet and failure of an early antipellagral diet in other cases. The basis of the predisposition is to be found in the endocrine system and in the constitutional habitus. The pellagral symptomatology is severe in asthenic and hypoplastic persons and is comparatively mild in persons with a pyknic build. The endocrine formula manifested by an increased functional tonus of thyroid and pancreas and by a deficient function of the anterior pituitary and of the adrenals and by a follicular predominance create a considerable susceptibility to pellagra, whereas in persons with the opposite endocrine formula the predisposition to pellagra is slight. The function of the adrenals seems to be the most important one among the endocrine elements that play a part in the pathogenesis of pellagra.

**Selective Staining of Rickettsias**—Gracín Carado points out that the microscopic examination of materials containing rickettsias presents difficulties because of the extreme smallness of these parasites and because a differential stain is hard to obtain particularly when the vitelline sac of the chicken embryo is used for the culture of rickettsias in the preparation of the antityphus vaccine. The following method was developed by the author: 1. Make a thin smear on a slide and let it dry well. 2. Without previous fixation cover the smear with xylene for three minutes. 3. Drain off the xylene and wash twice with 90 per cent alcohol. 4. Wash with water. 5. Cover the preparation for three minutes with a saturated solution of potassium bichromate. 6. Wash thoroughly with water. 7. Cover with a 10 per cent Giemsa solution from ten to twenty minutes. Wash with water, dry and examine. The preliminary treatment with xylene and bichromate stains the rickettsias intense red or dark blue on a colorless or slightly stained background. In the thicker parts of the preparation the micrometer screw makes it possible to see the well stained rickettsias in different planes. This method of staining clearly differentiates the rickettsias from cell and egg protein remnants.

## Revista de Medicina y Cirugía de la Habana, Havana

47 434-390 (Aug. 31) 1942

\*Acute Leukemia in Adults O. Montoro—p. 345

**Acute Leukemia in Adults**—Montoro points out that acute leukemia differs from chronic leukemia in its clinical and hematologic manifestations. The disease is rapidly fatal, its etiology unknown and its onset sudden. It is more frequent in children than in adults, in men than in women and during the menopause than at any other age for adult women. It is excep-

tionally rare in old persons. Pregnancy, abortion, infections and trauma to the spleen or bones can act as determining factors in the development of the disease, which may manifest itself in asthenic and febrile, agranulocytic, hemorrhagic, typhoid, neoplastic and comatose types and as typical acute leukemia. In all types, however, the number of immature cells is increased although the peculiar type depends on the predominant type of immature cells. From the point of view of the predominant type of immature cells, acute leukemia in adults corresponds to any of the six different types, namely (1) the hemocytoblastic (2) the myeloblastic, (3) the paramyeloblastic, (4) the myelocytic, (5) the lymphoblastic and (6) the monoblastic. In all forms of acute leukemia the hemogram corresponds to any of the following changes in the blood or in the hemopoietic organs: (1) an acute increase of immature leukocytes, up to 85 per cent; (2) a subacute increase of immature leukocytes; (3) acute diminution of platelets; (4) normal or delayed coagulation time and prolonged time of hemorrhage; (5) resistant anemia of the normocytic or microcytic type, of rapid development with globular values which vary from 1 to 1.2; (6) acute hyperplasia of the hemopoietic organs with predominance of myeloblastic, lymphoblastic and monocytic cells in the various forms of acute myelosis, acute lymphatic leukemia and acute monocytic leukemia. The oxidase reaction is of value in differentiating monoblasts and myeloblasts by showing certain characteristics of the monoblastic and myeloblastic granulations during the reaction. The presence of Auer's bodies in the hemogram is pathognomonic of the myeloblastic type of leukemia. The disease is fatal in one to three months. Treatment consists in the massive administration of liver, blood transfusions, arsenic preparations and symptomatic measures.

## Revista Mexicana de Pediatría, Mexico, D. F.

12 201-230 (June 10) 1942 Partial Index

Infection Factor in Cholera in Infants Sulfanilamide Therapy J. Muñoz. Turnbull—p. 201

**Sulfanilamide Therapy in Cholera**—Muñoz Turnbull believes that infection is the predominant factor in cholera of infants and that dehydration and malnutrition are secondary. He treated successfully 5 cases with sulfanilamide. The drug was administered by mouth in doses of from 0.1 to 0.2 Gm. every five hours up to a daily dose of from 0.4 to 0.8 Gm. for two consecutive days, after which a dose of 0.1 Gm. was given every five hours up to a daily dose of 0.4 Gm. for two more days. The patients also were given intravenous injections of 140 cc. of a mixture of equal parts of Hartmann's solution and of 20 per cent dextrose solution and 10 per cent dextrose solution by mouth. All of the patients recovered.

## Zentralblatt für Gynäkologie, Leipzig

65 1965-2012 (Nov. 8) 1941 Partial Index

Corpus Luteum Action of Adrenal Cortex Extract on Mucosa of Uterus O. Neumann—p. 1969

Quantitative Behavior of Estrogenic Substances in Intrauterine Death of Fetus T. Koller and F. Leuthardt—p. 1972

New Breast Pump H. O. Klein—p. 200

**Corpus Luteum Action of Adrenal Cortex Extract on Mucosa of Uterus**—Neumann cites factors which indicate close relationship between gonads and adrenal cortex. Progesterone action with desoxycorticosterone has been reported by a number of investigators and this is understandable in view of the close chemical relationship between progesterone and desoxycorticosterone. Since animal experiments had succeeded in transforming the uterine mucosa by means of desoxycorticosterone, an attempt was made to do the same in human subjects. Two castrated women were given in the course of fifteen days six doses of estrogenic substance. After their endometrium had been thus prepared they were given for a week daily injections of desoxycorticosterone acetate. The result was the development of the secretory phase of the uterine mucosa. Bleeding set in which resembled menstruation. To produce this transformation of the uterine mucosa approximately 300 mg. of desoxycorticosterone acetate was necessary. These large doses were well tolerated. Although the adrenals do not produce or contain sex hormones, their own hormone so closely resembles progesterone that in large doses it can produce the effects of the corpus luteum hormone.

## Book Notices

**Occupational Tumors and Allied Diseases** By W. C. Hueper M.D. Assistant Director and Principal Pathologist Warner Institute for Therapeutic Research New York City Cloth Price \$8 Pp 896 Springfield Illinois & Baltimore Charles C Thomas 1942

This volume includes essentially a review of the available medical literature dealing with tumors arising in industry. The author apologizes for the unevenness in the presentation of various aspects, which he feels is due to the fact that the amount of information available regarding each type of tumor varies. Following each section of the work is a bibliography indicating the sources that have been consulted in preparing the material. Obviously such a compilation is useful, since it fills a field not previously covered.

While most of the chapters are well written and conform with accepted views on the subject, the author contradicts himself in some in the evaluation of the statistics and papers which he reviews. In the chapter on arsenic he quotes statistics from England stating that there occurred "during the last five decades a total of seventeen arsenical cancers of the skin, of which four must be regarded as doubtful." This is an incidence of 1 case in three years, surely almost negligible. And yet the author concludes that the statement of Schwartz "that he had not seen a single case of occupational arsenical keratosis or epithelioma among the arsenic workers he examined" shows an "extraordinary immunity of American workers to arsenical malignancy" and that "actual evidence available presents a picture quite different."

The author's statement "that the United States has furnished not only the largest number of frank industrial arsenical cancers during the last ten years but seems to lead all other countries in the number of chronic arsenical dermatoses of occupational origin, according to the data recorded in the literature" is not borne out by the records of the industrial compensation boards. There is not 1 case of industrial arsenical cancer among all the records of the state compensation boards sent to the Section of Dermatoses Investigations of the United States Public Health Service during the last five years. That this is not due to the fact that reporting physicians overlook the skin lesions caused by arsenic exposure is evidenced by the many cases of occupational arsenical dermatitis which are reported.

Another example of faulty evaluation of the literature which might be due to lack of experience can be found on page 764. The majority of the authorities on melanin do not believe that melanin is found in the blood or urine under normal conditions. In discussing the incidence of pigmented epitheliomas among Negroes there must be a careful use of terms and consideration of differential diagnosis. Certainly no one has ever suggested that melanomas are of occupational origin. Besides, an occupational epithelioma in a Negro might very well be pigmented. The book contains other instances of such faulty reasoning.

On the whole, the special character of the book tends to give an exaggerated picture of the frequency of occupational cancers of the skin, since the data thus far available are hardly sufficient on which to make certain the differential diagnosis between occupational and nonoccupational tumors.

**You Must Relax: A Practical Method of Reducing the Strains of Modern Living** By Edmund Jacobson M.D. New edition Cloth Price \$1.75 Pp 261 with 27 illustrations New York & London Whittlesey House McGraw-Hill Book Company Inc 1942

In the revised edition improvements have been made in style, and in the illustrations a shapely young woman replaces an indifferent looking man, in addition are a new chapter on war nerves and two new chapters on sleep, also an index. In the new material the author states that the basal metabolic rate is below normal when one consumes less oxygen and gives off more carbon dioxide. He also challenges the view that motility during sleep is a normal phenomenon. Essentially the author's thesis is unchanged: there is a difference between "ordinary and cultivated relaxation." "The additional relaxation is slight indeed. Yet this slight advance is precisely what is needed." Although the volume is intended for "persons who lack opportunity for medical consultation on matters of tension

and relaxation the patient without help from the physician "is often mistaken as to whether he has been successful and consequently may fall into wrong habits of tension. But where aside from Dr. Jacobson is the physician who can help him?" The criticism made in the review of the first edition of this book (*THE JOURNAL*, July 21, 1934 p 210) that "the book would be of great practical value if the author had already succeeded in 'selling his theory and practice of progressive relaxation to the medical profession and now wished to tell the lay public what it was all about' is justified more than ever by the failure of the author to secure general acceptance for the detail of his therapeutic method in the intervening eight years."

**Introduction to the Psychoanalytic Theory of the Libido** By Richard Sterba M.D. Nervous and Mental Disease Monographs No 68 Hard Price \$2 Pp 81 New York Nervous and Mental Disease Monographs 1942

This monograph represents a condensed, simplified review of Freud's theory of instincts. The criticism has been voiced that it is oversimplified and that further elaboration of Freud's original theories, which are quite generally accepted by progressive psychoanalysts, should have been included in the presentation. The title of the book, however, indicates that only an introduction to the study of instincts is intended. It is certainly true as the author states in the preface, that "psychoanalysis successful as a therapy and increasingly accepted by science as it is, has nevertheless to face a real danger nowadays. An attempt is being made by some analysts to teach and practice psychoanalysis without acknowledging the fundamentals of Freud's theory of instincts. In their papers they try to deal with the problems of the mind in general and of neurosis in particular, without taking into account the instinctual forces, those gigantic powers discovered by Freud, which operate behind the mental manifestations of mankind. For these instinctual forces they substitute cultural influences in order to explain neuroses, and they regard themselves as being advanced in comparison with Freud and his theory of instincts. The public is impressed. Once more they spare the polite world the recognition of the 'all powerful melody of the instinctual forces,' just as did Adler and Jung thirty years ago. It seems timely, therefore, to recapitulate Freud's findings in the domain of the instincts, and particularly of the sexual instinct." This book is instructive and easy to read. Dr. Sterba expresses in simple understandable language a sound fundamental condensation of acceptable, and for the most part accepted, theory of the libido.

**Personality and Sexuality of the Physically Handicapped Woman** By Carney Landis Ph.D. Associate Professor of Psychology Columbia University New York and M. Marjorie Bolles Ph.D. Research Fellow Psychiatric Institute and Hospital New York Cloth Price \$3 Pp 171 New York & London Paul B. Hoeber Inc 1942

In this book the authors report a study of the psychosexual development of 100 physically handicapped women. The subjects were 25 women with an orthopedic disability, 25 with spastic paralysis, 25 with chronic heart disease and 25 who had been diagnosed as epileptic. The information was obtained by means of a controlled interview, a medical history and the Rorschach test. On the basis of this information the authors concluded that personality manifestations and disturbances do not correlate with specific physical disturbances. They found that any persistent physical handicap resulted in hyposexuality and psychologic immaturity. They also concluded that in most cases psychosexuality was not an important component in personality formation. Their findings showed that no existent psychologic or psychiatric theory could be used to explain the growth of personality and sexuality of the physically handicapped woman. They therefore concluded that the reaction tendencies which become formalized in childhood determine the later personality. A temporary physical defect causes the same type of reaction as a permanent defect. In those who recover from physical defects, personality and sexuality may develop normally. For example personality deviations and psychosexual immaturity are found in normal women who have had frequent illnesses during childhood.

The book is well written and the material is clearly presented. The details of the findings and the various scales which were used are given in the appendix. The distribution of case

materials is not adequate, however, for the sweeping conclusions. No details are given by the authors regarding the distribution of the severity of the physical defects. One might infer that all the cardiac cases represented mild heart conditions or possibly individuals with very serious cardiac conditions. The authors state that the women were intensely interested in the project and volunteered their service and therefore were honest, and their answers fully represented their attitudes. This is only problematic, however, for every psychiatrist knows how difficult it is to obtain the true attitudes of a patient in spite of his professed willingness to tell everything about himself.

**Effects of Alcohol on the Individual. A Critical Exposition of Present Knowledge. Volume I. Alcohol Addiction and Chronic Alcoholism.** Edited on Behalf of the Scientific Committee of the Research Council on Problems of Alcohol by F. M. Jellinek. Cloth. Price \$4. Pp. 336. New Haven: Yale University Press, London: Oxford University Press, 1942.

This is the first volume of three, outlined in the introduction, proposing the independent and unbiased study of the medical and sociological aspects of alcohol. The present volume is given over chiefly to a discussion of the clinical aspects of the problem of alcohol and the clinical effects of its prolonged ingestion. It is divided into two parts. Part I contains chapters on alcohol addiction and its treatment by Karl Bowman and E. M. Jellinek, and on alcoholic mental disorders by the same authors. These are excellent and comprehensive reviews of the subjects. Probably nowhere in the literature is the subject of alcoholic mental disorders so clearly presented as in this chapter. Part II contains chapters on vitamin deficiencies in chronic alcoholism by Norman Jolliffe, on alcoholic encephalopathies and nutrition by Norman Jolliffe, Herman Wortis and Martin Steine, on Marchiafava's disease by Giorgio Lolli and on cirrhosis of the liver by Norman Jolliffe and E. M. Jellinek. While this section does not make such easy reading as part I, owing to the diversity of the subjects and the differences in the style of its writers, it is well up to standard. To devote an entire chapter to so rare and obscure an entity as Marchiafava's disease seems a little out of proportion but this is a minor point of criticism. The bibliography is exhaustive and constitutes no small part of the value of the book. The authors are to be congratulated on their objective point of view, and it is only in rare instances that any personal scientific prejudice has shown itself. Both the scientific committee and the authors are to be congratulated on producing a volume which may well serve students of the problems of alcohol as an authoritative work of reference.

**Lymph Node Metastases. Incidence and Surgical Treatment in Neoplastic Disease.** By Grantley Walder Taylor, A.B., M.D., F.A.C.S., Instructor in Surgery, Harvard Medical School, Boston, and Ira Theodore Nathan, M.S., M.D., Instructor in Surgery, Harvard Medical School. With a foreword by Shields Warren, M.D., Assistant Professor of Pathology, Harvard Medical School. Cloth. Price \$8. Pp. 198, with 61 illustrations. New York: Toronto & London: Oxford University Press, 1942.

This book presents the results of a study of lymph node metastasis in cancer and its treatment. The first part describes the anatomy of the lymphatic drainage of the neck, the axilla and arm, the groin, the pelvis and abdomen, and the thorax. The second part deals with regional lymph node metastasis and is based on an analysis of some 5,500 cases, almost all of carcinoma, treated in the Massachusetts General, the Huntington Memorial and the Pondville hospitals. The cases in each part of the body have been studied with respect to secondary lymph node involvement, which occurred in about half of the cases observed, roughly averaged. Answers are recorded to questions like these: The location, duration, size, grade and control of the primary carcinoma? The particular nodes involved? The time and curability of lymph node metastases? Details are summarized clearly in the text and in one hundred and seven tables. In the third part the surgical removal of lymph node metastases is considered. Dissections of the cervical, axillary and inguinal lymph nodes and other operative procedures are described. At the end of each chapter are listed references to the publications discussed in the text. The drawings illustrate nicely lymph nodes, lymphatic drainage systems and dissections. The indexes, subject and author, seem to be complete. The book is the outcome of extensive and thorough work. It will be of interest and aid to all who are concerned with the diagnosis and treatment of cancer, to the literature of which it is an important and substantial addition.

**Chronic Pulmonary Disease in South Wales Coalminers. I. Medical Studies. A Report by the Committee on Industrial Pulmonary Disease. B. Medical Survey.** By P. D. Arey Hart and E. A. Aslett, with contributions by D. Hicks and R. Yates. C. Pathological Report. By T. H. Belt with assistance from A. A. Ferris. Medical Research Council Special Report Series No. 217. Boards. Price 10s. 6d. Pp. 222, with illustrations. London: His Majesty's Stationery Office, 1942.

This is an excellent report representing clinical and pathologic investigation into the unusual incidence of certified silicosis in South Wales. Students of the subject will be interested in the use of the new term "reticulation" in the classification of x-ray patterns. There is sound justification for this use since the modified form of silicosis with which these observers dealt definitely differs from others produced by most of the mineral mixtures. Belt makes out an excellent case for this terminology pathologically as well. In order to grant compensation in certain cases in which apparently disablement exists without x-ray evidence of nodulation, all these cases are classified under the heading "the pneumoconiosis of coal miners." The whole method of presentation is most impressive. Cuts are good and the argument is clear and forceful. Presumably, final judgment on the conclusions reached will need to await the provision of data on conditions of exposure, which evidently will be the subject of a subsequent report.

**Civilian Health in Wartime.** By Francis R. Dinealide, M.D., Associate Professor of Medicine, Harvard Medical School, Massachusetts General Hospital, Boston. Cloth. Price \$2.50. Pp. 328. Cambridge, Mass.: Harvard University Press, London: Oxford University Press, 1942.

This book is easy to read and gives sound information on the subject of civilian health. The chapters on nutrition and diet make excellent reading and give dependable information. Of special interest is the statement concerning concentrated diets, which the public is led to believe make the "German armies invincible." The author states: "It is notable that German soldiers immediately ransack the restaurants and lodgers of newly occupied territory with an avidity which has greatly impressed American correspondents." Especially pertinent at this time is the chapter entitled "About Our Doctors and Nurses." The list at the end of the book for additional reading is worth while.

**Group Differences in Urban Fertility. A Study Derived from the National Health Survey.** By Clyde A. Kiser. Cloth. Price \$2.50. Pp. 284, with 70 illustrations. Baltimore: Williams & Wilkins Company, 1942.

Interest in population facts and population trends has reached a peak in recent years. Most of the facts of population distribution now are quite accurately determined by the decennial census, the projection of probable population trends into the future and the interpretation of their meanings are being subjected to searching study by a considerable group of qualified investigators. This book deals primarily with the fertility rate in urban areas and the various factors which affect it, such as occupation, educational attainment and family income. The conclusions are not particularly astonishing to any one who has been familiar with recent investigations in the field. It has been well known for some time, for example, that large urban populations in this country do not reproduce themselves. Nevertheless this book represents a careful documentation and interpretation by one of the leading workers in the field. Sound fundamental information of this nature is necessary if work in the social field is ever to reach the stature of a true science.

**Manual of War Time Hygiene.** By Dean Franklin Smiley, A.B., M.D., Professor of Hygiene and Preventive Medicine in Cornell University, New York, and Adrian Gordon Gould, D.B., M.D., Attending Physician and Assistant Professor of Hygiene and Preventive Medicine in Cornell University. Supplement to A College Textbook of Hygiene. Paper. Price \$1. Pp. 86, with 11 illustrations. New York: Macmillan Company, 1942.

This small book is intended as a supplement to "A College Textbook of Hygiene" by the same authors. It is divided into three parts, on military hygiene, civilian defense and wartime first aid. The authors believe that in wartime the college student's work in hygiene must be considerably reoriented. Personal hygiene will have increased importance because the student is fitting himself for the health of men in the armed forces. Community hygiene must, in these wartimes, deal largely with problems of field sanitation and military organization for combating infectious disease, wounds and gassing. This booklet can be recommended as a supplement to the author's college textbook on hygiene.

## Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

### HYPNOTISM AS THERAPEUTIC PROCEDURE

*To the Editor*—Will you please inform me about the present status of hypnotism as a therapeutic procedure? Is there any actual danger in its indiscriminate use by laymen? Please suggest bibliographic references on the subject.

M D Puerto Rico

ANSWER—Hypnotism suffered the fate of other methods of therapy which have become associated with charlatanism and which have been hailed with undue enthusiasm. It fell into disrepute with physicians because, unlike psychoanalysis, it deals largely with symptoms rather than causes. It is essentially for this reason that this valuable therapeutic technic may be dangerous in the hands of the public, for symptoms may be created or intensified without a proper knowledge of the underlying pathologic condition. All physicians are aware of the power of suggestion, and in the state of hypnosis conscious resistance is reduced to a minimum. The patient is put in a condition of heightened suggestibility and he accepts suggestions without criticism.

One of the greatest obstacles in psychotherapy is to get the patient to accept therapeutic suggestions consciously. Under hypnosis it is possible to implant therapeutic ideas on the "sub-conscious" and to have them take effect when endless numbers of suggestions given in the waking state would be ignored or even actively resisted. Also under hypnosis former dissociated experiences and amnesic material can be rendered available for reassociation and reorganization. Of course, like any form of psychotherapy, the results of hypnosis are individually limited, and they vary in degree and variety with every subject, depending on the innate endowment of the patient.

The mechanism of normal sleep and that of hypnosis are the same. Normal sleep, like hypnosis, is a condition of dissociation. In fact, the physician can frequently influence by suggestion a normally sleeping person and transport him into hypnosis without awakening him. All persons are in a condition of hypnosis, or dissociation, during the course of normal sleep and confuse dream thoughts with actual occurrences. It is for this reason that sleep is advantageous for the application of suggestion.

Some of the compulsion neuroses and the hallucinations of the psychoses may be explained on heightened suggestibility. Spontaneous hypnosis has been known to occur and to be mistaken for absentmindedness, spontaneous trance, the loss of identity or the amnesia found in the hysteroid epileptic. Just as these psychopathologic symptoms have occurred, so they may be removed by the same process.

The physician who wishes to use hypnosis must know how to convince his patient that he is capable of doing so, and he must be able more or less to induce an enthusiasm for this form of treatment. Thus the practitioner must either be convinced himself or, failing this, possess a dramatic personality in order to convince others. Everything which fills a person with enthusiasm gains control over his brain activity, easily conquers all the contrary impressions and leads the person into receptivity. Therefore the hypnotizability of a person increases with his enthusiasm and with his confidence as well as with the enthusiasm and former success of the practitioner.

As will be evident from the following bibliography, hypnosis has a definite place in psychotherapy. It is not a mysterious art, but a scientific technic.

McCartney J L. Hypnosis: A Rational Form of Psychotherapy in the Treatment of the Psychoneuroses. *J Nerv & Ment Dis* 86: 405 (Oct) 1937.

McCartney J L. Psychotherapy with Special Reference to the Use of Hypnosis. *Ann Int Med* 12: 1279 (Feb) 1939.

Schilder, Paul and Kauders Otto. Hypnosis. New York, Nervous and Mental Disease Publishing Company, 1927.

Cannon Alexander. The Science of Hypnotism. New York, E P Dutton & Co., 1937.

Binister Harry. Psychology and Health, New York, Macmillan Company, 1935.

### ROENTGENOGRAPHY IN DIAGNOSIS OF AORTITIS— POSITIVE WASSERMANN TEST IN LATE SYPHILIS

*To the Editor*—A man aged 50, 6 feet 2 inches (188 cm) tall, weight 180 pounds (82 Kg) had been active and in excellent health. In February 1940 he fractured a fibula in an accident. While in a hospital for treatment of the fracture he was found through routine blood examination to have a strongly positive Wassermann reaction. He did not remember ever having had primary or secondary lesions of syphilis. Careful physical and neurologic examinations with syphilis in mind disclosed nothing but perhaps some increased dullness across the aortic area. The spinal fluid was not examined. The report on the x-ray examination of the cardiac area was: "Transverse diameter of heart 13.3 cm, aorta 8.2 cm, dilatation of transverse arch of aorta typical of syphilitic aortitis." Two other Wassermann tests were done by different laboratories and they too were reported strongly positive. It was explained to the patient that he had a syphilitic infection of perhaps twenty years duration which although latent had damaged his aorta and that he now had an early aneurysm. Treatment was started immediately by weekly injections of a bismuth compound of which he received fifteen followed by twelve of nearsphenamine in 0.3 Gm doses which was increased to 0.45 Gm as it was well tolerated. This was followed by twenty-three injections of the bismuth compound after which came ten injections of nearsphenamine beginning with 0.45 Gm increased to 0.6 Gm, as the Wassermann reaction was still strongly positive. He then was given fifteen injections of the bismuth compound followed by fifteen injections of bismarsen. All these injections were given at weekly intervals. Thus in one year and eleven months of continuous treatment he received fifty-three injections of bismuth preparations and thirty-seven of arsenicals. The Wassermann reaction was strongly positive. He was given a six months rest for business reasons; he still felt well and had no symptoms at all attributable to his heart. He played golf and hunted and he was in perfect health. This year he has received a bismuth compound intramuscularly at intervals of two weeks. He still feels well and still has strongly positive Wassermann and Kahn reactions. He has received regularly every six months an x-ray examination with the same technic as the first examination. At the end of one year's treatment the report was: "No further dilatation of any part of aortic arch. Heart not enlarged. Successful arrest of syphilitic aortitis." At the end of 1942 the report was: "Transverse diameter of heart 14 cm, aorta 8.8 cm, the difference in measurements from 1940 of questionable significance. Impression relatively unchanged aortitis over period February 1940 to November 1942." The man is in excellent health except that he still has a positive Wassermann and Kahn reaction. Treatment has not changed the size of his aorta. What should be the further treatment?

M D Georgia

ANSWER—The diagnosis of uncomplicated syphilitic aortitis cannot be made on the basis of posteroanterior teleroentgenography alone. An aortic width of 8.2 cm demonstrated by this x-ray technic is not at all uncommon in nonsyphilitic persons 50 years of age or older. For a discussion of the importance of this point see Kemp, J E, and Cochems, K D. Studies in Cardiovascular Syphilis. I. Teleroentgenography in the Diagnosis of Early Syphilitic Aortitis. A Comparison of Findings in 1,000 Syphilitic and 600 Non-Syphilitic Individuals, *Am Heart J* 13: 297 (March) 1937. Arteriosclerosis and hypertension, either one alone or in combination will produce this degree of widening of the supracardiac shadow, and indeed as much as this may be expected as a physiologic process in a certain proportion of elderly persons.

The diagnosis of uncomplicated aortitis cannot be made in any case on the basis of x-ray findings alone, whether the teleroentgenographic technic includes, as in this instance, only posteroanterior roentgenography or the more desirable fluoroscopic and teleroentgenographic examination in the left anterior oblique position. The latter permits a demonstration of the silhouette of the aorta and is a much more accurate measure of aortic dilatation and its localization as contrasted with the aortic elongation and tortuosity accompanying arteriosclerosis or advancing age than is the technic employed in this case. Essential for the diagnosis of syphilitic aortitis, in addition to x-ray evidence of aortic widening, is the presence of symptoms, physical signs or both. The most important physical signs, in the absence of hypertension, are a rough systolic murmur in the aortic area and a tympanic bell-like tambour accentuation of the second aortic sound. In this case it is distinctly stated that the physical findings were normal.

The term "aneurysm" is certainly an unjustifiable diagnosis in this case unless actual sacculcation has been demonstrated. This does not appear to have been done.

This patient has had enough antisyphilitic treatment. In the absence of symptoms or physical signs of cardiovascular disease, the positive serologic test in the blood may be disregarded. Seroresistance in this situation, i.e. late syphilis, is the rule rather than the exception and is not of importance in prognosis.



## GREEN DISCOLORATION BETWEEN TOES

**To the Editor**—A girl aged 18 has a green pigment occurring between the layers of skin between the toes of both feet. There is no irritation of the skin and no scaling or any other pathologic condition noted. The family history is negative and the patient's past history is negative except that she has sinusitis. For this she has been using only salt water in the nose and has been taking no drugs. The urine is negative for albumin and sugar, and the Wassermann reaction is negative. This condition has been coming on since August 1942, and I should like to know what could possibly be the cause. No local applications of any sort, including talcum powder have been used and there is no sign of dye on her shoes or in her shoes.

Robert S. McCeney, M.D., Laurel Md

**ANSWER**—Except for the temporary green color seen during the absorption of hemorrhage into or beneath the skin, green discoloration of the skin is seldom seen. There are few references to it in the literature. The principal possibilities are (1) dye from the stockings or shoes, (2) dye applied by the patient with intent to deceive, (3) color produced by the growth of some bacterium or fungus or (4) excretion of copper in the sweat.

1 The statement in the query that no dye has been found on the stockings or shoes makes this explanation unlikely. Stains between the toes without any discoloration on the dorsum of the feet or on the soles would be possible only if the dye was easily washed off and the patient carefully refrained from washing between the toes.

2 In all cases difficult of explanation, this possibility should be carefully considered.

3 Unless there is a chance that copper has been absorbed in large amount, the theory that the color was produced by fungus growth seems the best. Scrapings from the discolored areas should be stained and examined directly and other specimens should be examined in the moist condition, preferably in potassium hydroxide solution, from 10 to 40 per cent strength depending on the thickness of the specimen if shreds of skin are included. Cultures should be made on suitable mediums for growth of bacteria or higher fungi.

4 Stains of the skin and hair by the dust of copper and certain salts of chromium are common among workers in these metals as mentioned by Schwarz and Tulipan (*Occupational Diseases of the Skin*, Philadelphia Lea & Febiger, 1939 p 728). White (R. Prosser, *The Dermatogoses*, ed 4 London, H. K. Lewis & Co., 1934, p 67) also mentions the use of copper in some hair dyes, in paints, especially those intended for use on metals, and in the fixers of color in cotton goods.

Less common are cases of green sweat. Clifton (*Cases of Copper Poisoning Occurring Among the Outpatients of St. Thomas's Hospital*, *M. Times & Gaz.*, June 20 1868, p 658) noted in addition to green sweat staining the clothing especially after a hot bath, that these patients showed a green line on the gums next to the teeth and extending a short distance on the teeth. His patients, besides copper-smiths, included a sailor who had been given lemon juice kept in a copper tank and a girl who used Scheele's green, copper arsenite in marking artificial flowers.

No record of any case of green discoloration between the toes has been found.

## REMOTE TRAUMA AND DETACHMENT OF RETINA

**To the Editor**—I have a case of retinal detachment which is of the flat detachment type with disinsertion at the ora serrata. There is a question as to whether it can be due to an injury received. The injury consisted in the patient's head having come in contact with a solid brick wall or with a shelf which was placed firmly against the wall. There were mild concussion symptoms following the injury for several weeks. As far as has been ascertained there was no preexisting disease in the eye. The refractive error in the eye before the accident was minus 3.25 with plus 3.00 cylinder axis 65 with no appreciable change following the accident. I should like to have an opinion as to whether this case might be considered as of traumatic origin. The insurance company in this case has offered about one half of the amount that would normally be due on the policy as a compromise on what it terms as pay for the damage allegedly suffered from the concussion.

Mallory P. Weems, Captain M. C. A. U. S.

**ANSWER**—This is one of the hardest questions that can be put to an ophthalmologist and ranks with a similar question as to the possible traumatic etiology of an interstitial keratitis in the presence of a positive Wassermann reaction.

Remote trauma, as in the instance cited, undoubtedly can and does play a role in the production of detachment of the retina, probably acting as the exciting mechanism in a diseased eye. The following quotation from Duke-Elder expresses the consensus on this subject:

"To a very large extent, these indirect injuries, which are usually small, act not as a primary cause of detachment but merely as the precipitating agent in an eye already prone to this accident. As we shall see later, the sudden strain determines the formation of a tear in the retina after other factors, such as

degenerative or inflammatory processes, have produced a region of weakness. In this sense, by acting as a trigger in starting a chain of events which have already been predetermined by other and more fundamental factors, minor and indirect traumas figure very constantly in the etiology of the condition.

"One point noteworthy in connection with contusions as an etiologic factor is the possibility of a considerable interval elapsing between the receipt of an injury and the recognition of symptoms. The occurrence of a delayed detachment may be due to several reasons, but probably the most common is that the retina is torn at the time of the accident but does not become detached or so extensively detached as to attract notice until some time has elapsed."

It must be noted that this deals only with indirect traumas. Direct trauma to the eye itself with subsequent detachment is another question.

## PARAFFIN SULFANILAMIDE TREATMENT OF BURNS

**To the Editor**—Under the auspices of the Office of Civilian Defense a course in the treatment of war injuries has recently been given in the Los Angeles area. The local treatment of burns advised in this course was powdered sulfanilamide in paraffin. The prescription follows:

Paraffin wax	670 Gm
Petrolatum	250 Gm
Liquid petrolatum (heavy)	150 cc
Cod liver oil	50 cc
Sulfanilamide powder	50 Gm
Menthol	1 Gm
Camphor	1 Gm
Oil of eucalyptol	1 cc

It was advised that this material be heated in a water bath and sprayed on burned areas without any preliminary cleansing or debridement. It was further stated that this form of therapy had been widely used in industrial plants and was the accepted treatment of burns in the Naval Hospital Mare Island. It was assumed that this form of treatment had the acceptance of the Office of Civilian Defense. If this treatment is efficacious there is no question of its adoption but I have been unable to find reference to its use or any attempt to compare it with other more usual local treatments of burns such as tannic acid either alone or in conjunction with silver nitrate, gentian violet or the triple dye application. Further, it was my belief that at least reasonable cleaning of burned areas was as much a factor in the prevention of subsequent infection as was the local application of medicaments. An obvious theoretical objection to the paraffin wax and sulfanilamide treatment is that most of the sulfanilamide will remain suspended in an inert medium (paraffin), where it will be unable to exert any bacteriostatic or bactericidal effect. Furthermore, it is my belief that paraffin and various oils have been used extensively in the past in the local treatment of burns and that most of these treatments had been discarded because of the superior results obtained from tanning agents or in some instances from wet dressings alone. I would appreciate any references to articles on this subject (paraffin and sulfanilamide spray) and also would like to know how extensively it has been used in industrial plants and with what results.

Kenneth B. Olson, M.D., Olive View, Calif.

**ANSWER**—The form of burn therapy cited in the query is a modification of the ambrine and paraffin methods used since the time of the last war. Ambrine is a patented paraffin preparation introduced by Barthle de Sandfort in 1914. As the formula was kept secret several other paraffin preparations have been used since. Sherman (*W. O. The Paraffin-Wax or Closed Method of Treatment of Burns*, *Surg. Gynec. & Obst.* 26:450 [April] 1918) remains to the present day an earnest supporter of the paraffin method of burn treatment, stating that he and his staff have treated over 100,000 cases in this manner at the Carnegie Steel Company, Pittsburgh. Few others, however, have continued this type of therapy since the close of the first world war despite the vogue that it enjoyed at that time.

An appraisal of any method of burn treatment is difficult because of many variables. These include the nature, extent, depth and duration (time after the burn when treatment is applied) of the particular burns involved. It would seem that the fourth variable (duration of the burn) would be the one most appropriate to a consideration of the cases treated at Mare Island. Reports in the popular press indicate that many of these burns were old, having already passed the initial period with its shock and other attendant dangers. These cases would therefore have reached the stage where tanning agents and certain other definitive treatments would not be applicable any way. To appraise a type of treatment accurately, a series of cases of fresh burns should be treated with the method and the series controlled with regard to all the variables listed.

It would seem likely that there would be only minimal absorption from or local action of sulfanilamide suspended in paraffin. Sulfonamides or cod liver oil have little proved specific advantage over a simple bland petrolatum dressing with careful preliminary cleansing and pressure as advocated by Koch (Siler, V. E., and Reid, M. R., *Clinical and Experimental Studies with*



the Koch Method of the Treatment of Heat Burns, *Ann Surg* 115 1106 [June] 1942) Furthermore, while the Mare Island treatment may not take so long to apply the daily reapplications will certainly take as much time in the end as sealed methods (tanning or Koch petrolatum pressure) which require no change for at least ten days to two weeks. It is also difficult to see how any remedy for fresh burns can be useful which does not depend on a thorough preliminary cleansing of the wound as is especially advised by Koch. Since this is less essential—and in fact even useless—in old burns perhaps this may explain the apparent success of some of the Mare Island cases.

In conclusion, it can be stated that this method presents only slight apparent practical advantages over the standard paraffin treatment. The most recent recommendations of the National Research Council (*War Med* 1 334 [March] 1942) make no mention of either the original or the revised form of paraffin application. Finally, before being condemned or accepted, the treatment should be tried on a controlled series of burns and contrasted with other methods in popular use.

### CHILOMASTIX IN INTESTINES

To the Editor—A man aged 57 with symptoms of chronic appendicitis was found to have an eosinophil count of 7 per cent. This with the history of having worked in the Philippine Islands for four years led to a thorough study of the intestinal tract. After a saline purge *Chilomastix mesnili* was found in the third and fourth stools. Even though amebae could not be found the patient was treated with emetine hydrochloride and carbarsone for ten days and placed on a high protein diet. After a rest period his appendix was removed. Six weeks later stool examination was repeated and *Chilomastix mesnili* was still present in the third and fourth stools. All available literature has revealed little or nothing about the pathogenicity and method of eradication of these organisms. Will you please give an outline of methods used for the eradication of intestinal flagellata?

James C Coffey MD Salisbury N C

ANSWER—*Chilomastix* inhabits the colon of man. It does not invade the tissues. Although it is often found in the presence of diarrhea, it is more often found in the absence of symptoms. It is possibly the cause of diarrhea when present in huge numbers. It is doubtful that it had any pathologic significance in relation to the chronic appendicitis in the case cited. Carbarsone has apparently been responsible for the removal of this infection in a few cases. It can be given by mouth in doses of 0.25 Gm four times a day for seven to ten days. This is twice the usually recommended dose for amebiasis, but the drug can be used in this dosage for either infection with practically no fear of toxic symptoms. The elimination of carbohydrates from the diet also assists in reducing and possibly eliminating *Chilomastix*. The same regimen of treatment may eliminate *Trichomonas hominis*, which also inhabits the colon. *Giardia*, which inhabits the duodenum and jejunum, is not affected by the treatment outlined but can often be eliminated by atabrine dihydrochloride 0.1 Gm two or three times a day by mouth after meals for three to five days.

### AIR STERILIZATION WITH GLYCOL VAPORS

To the Editor—A newspaper publisher has just asked me about a spray containing a small portion of one of the glycols which so he heard might be incorporated into the humidifying system of the building and by sterilizing the air perhaps might lessen the incidence of respiratory infections among employees. I realize that no disinfectant can prevent droplet infection such as would come from a cough or sneeze but if decreasing the number of bacteria in office air is at all practicable (without rendering the air irritating or odorous) it should be valuable. Can you give me any information or refer me to the proper authority? Ultraviolet generators would not do.

D G Ornston MD Philadelphia

ANSWER—The studies on air sterilization with glycol vapors and in particular propylene glycol which are being carried on by O H Robertson and his associates at the University of Chicago have not yet reached the point where practical application can be advocated. These workers feel that definite information concerning any possible deleterious effect on the lungs resulting from prolonged inhalation of propylene glycol vapor must be obtained in appropriate animals before exposing human beings to such atmospheres. Observations on long term animal toxicity tests of this nature in both rats and monkeys have been under way for many months. Furthermore, certain problems concerning the best means and most suitable apparatus for distributing glycol vapors are not yet solved. While introduction of propylene glycol vapor into an air conditioning system of a building would seem to promise a simple means of distributing this vapor, little information is yet available concerning the possibility of obtaining adequate concentrations of the vapor in all parts of an enclosed air space. Such questions as to how much of it would be absorbed on various kinds of surfaces, the

effect of dust, and the like need to be elucidated. Preliminary reports on this work by the authors mentioned may be found in the *Journal of Experimental Medicine* (75 593 [June] 1942) and *Science* (94 612 [Dec. 26] 1941).

### VIABILITY OF KIDNEY AFTER URETERAL OBSTRUCTION

To the Editor—Will you kindly give me an opinion as to the length of time a kidney may remain viable and retain its normal function when its ureter has been completely blocked by an impacted calculus producing complete anuria on the affected side if the calculus is removed surgically? I do not have reference to complete blockage resulting in acute fulminating symptoms since it is fully understood that such a condition demands immediate surgical intervention but rather to complete blockage with resultant anuria without constitutional symptoms. This complete blockage was proved by numerous cystoscopies and no excretion of urine was found to exist. Methylene blue was injected and the catheter left in the ureter for over an hour on several occasions so there is no possibility of error having been made. The injection of the dye was intravenous.

John E Hall MD Miami Fla

ANSWER—The duration of viability of the human kidney following complete ureteral obstruction is not known with certainty, but from clinical experience and experimental evidence available such kidneys are capable of a return of function even after several weeks of complete ureteral occlusion. In some cases with ureteral obstruction a diagnosis of functionless kidney is made because of failure of renal visualization in the excretory urogram and the absence of dye in chromocystoscopy from the affected kidney. Such cases have been observed in which visualization was absent over a period of several months and when renal drainage was reestablished, renal function returned to normal within a short time. However, failure of urographic visualization is not necessarily an indication of complete anuria, since in many cases of this type cystoscopic inspection of the ureteral orifices may reveal spurts of a pale, water-like urine which has a low specific gravity and may contain no dye following chromocystoscopy. Such secretion would indicate a limited activity of the kidney. Moreover, in most of these cases of partial occlusion intermittent symptoms of dull pain are present, which would also indicate persisting renal function. After the obstruction has been removed the kidney often returns to normal, even after months of partial occlusion. Partial renal occlusion, however, is quite different from the case cited in this query, in which there is complete absence of any renal secretion, apparently over a period of several weeks, and without any constitutional symptoms. This type of case is not frequently reported but undoubtedly is not of rare occurrence.

The experimental evidence available suggests that the duration of complete ureteral obstruction required for total destruction of the kidney depends to some extent on the size and consistency of the animal's kidney. Approximately forty days is required for complete destruction of the kidney in the rat and eighty-four days in the rabbit. Working with dogs Caulk and Fischer found that after complete ligation of the ureter the kidney was severely damaged at the end of two weeks. Joelson Beck and Moritz however found that, if the dog's ureter was completely ligated for periods of from twelve to nineteen days renal function could be restored in from forty to seventy days by reimplantation of the ureter or by nephrostomy. It would be logical to assume that if a ureter was completely ligated the renal function would be so completely destroyed at the end of a month that ureteral reimplantation or renal drainage would permit little recuperative power. It is possible, however, that under favorable circumstances the human kidney may have somewhat greater recuperative power.

Another factor which exercises an influence on the time interval required for destruction of the kidney is the level of interpelvic pressure present after ureteral occlusion. It has been shown experimentally that immediately following complete ureteral occlusion the intrapelvic pressure rises to 75 or 100 mm of mercury pressure, which, after a period of several hours falls to a much lower level. This is due both to diminished renal excretion and to reabsorption of the urine. Since the high initial pelvic pressure, or the force serving to dilate the kidney, is present for only a short while, it is perhaps easily understood why complete ureteral obstruction over a period of several weeks might be required for destruction of the kidney. Furthermore despite complete ureteral obstruction, some degree of renal excretion and reabsorption is continuously taking place and it therefore hardly seems correct to assume that the renal function has been held in complete abeyance all this while.

Clinical and experimental evidence would lead one to believe that in case of carefully proved complete absence of urinary secretion resulting from obstruction continued over a period of a month or longer, and in the absence of recent pain or constitutional symptoms the affected kidney has been so severely damaged that removal of the stone and reestablishment of renal

drainage will not restore renal function. It would seem probable that in the case cited the affected kidney has suffered irreparable damage and is largely, if not completely, destroyed. In fact, in the absence of urgent clinical data, surgical intervention is hardly indicated.

#### References

- Caulk, John R. and Fischer, R. F. An Experimental Study of Ureteral Ligation. *Tr Am A Gen Urin Surgeons* 12: 165, 1919.  
Joelson, James J., Beck, Claude S. and Moritz, Alan R. Renal Counterbalance. *Arch Surg* 19: 673 (Oct.) 1929.

#### ITCHING FROM BURNS IN BOY AGED FOUR

To the Editor—A 4 year old boy is now convalescing from a rather extensive burn of his chest and back. Although he is up and around and his wounds are completely healed he is subject to periodic recurrences of intractable itching of the scarred areas which initiate a sudden wild frenzy of scratching, thumping his chest and back accompanied by crying and screaming. Could you advise me of any local application which could be used for a long period and yield a satisfactory analgesic effect locally without any systemic sedation or toxic effects?

Leo Dobrin, M.D., New York

ANSWER—It is quite possible that what this patient actually needs is a skin grafting procedure. However further details would be of help in answering this question. These involve especially the type of original burn treatment, how large a granulating surface resulted if any, and the time which has elapsed since the original burn and since the healing of the granulating wound, if any. If a large granulating wound was produced by the burn (which would therefore have been a third degree injury) the resultant scar tissue is entirely different from that which follows a first or second degree burn. This scar tissue is prone to break down to cause contractures and—what is especially apropos to the patient under discussion—to not keep up in rate of growth with the surrounding more normal tissues of a boy of 4 years. It has been shown (Brown, J. B. Covering of Raw Surfaces. *Internat Abstr Surg* 67: 105, 1938, in *Surg, Gynec & Obst*, Aug. 1938), that the scar base following a third degree burn is composed of flat epithelium without hair, glands or papillae. Because of lack of supporting rootlike action of the normal papillae, such skin is readily stripped up in sheets as the result of relatively mild trauma.

The most successful method of treating such scar tissue is by means of skin grafting. Since it is extremely difficult to obtain satisfactory thick split grafts of sufficient size taken with a razor or Blair-Brown knife from a 4 year old child, dermatome grafts usually give the most satisfactory result. Before applying the grafts, the entire scar should be excised and the graft applied to the normal tissue beneath. This advice is given on the premise that a third degree burn existed. The technique of applying dermatome grafts is described by Pridgett (*Skin Grafting*, Springfield, Ill., Charles C. Thomas, 1942).

In case the burn was not third degree, skin grafting would not be indicated. The use of daily applications of cocoa butter or of anhydrous wool fat should be tried. This may be continued for some time while medicated remedies (e. g. calamine lotion with phenol) should be used for only a few weeks at a time and should not be placed under occlusive dressing.

Calamine lotion with phenol alternated with plain olive oil or with calamine liniment (N. F.) may be useful as an antipruritic.

R.	Calamine	(m or G)
	Zinc oxide	of each 15
	Glycerin	
	Sodium borate	of each 8
	Phenol	2
	Solution of calcium hydroxide	to make 240

#### INFANT FEEDING DURING EARLY HOURS OF LIFE

To the Editor—Will you give me the current opinion regarding the following: When using artificial feeding for the newborn which method prevails (a) sterile water and Karo for the first twenty-four to forty-eight hours (b) small feedings of formula and (c) use of laxatives?

R. F. DeWitt, M.D., Plymouth, N. H.

ANSWER—At one large hospital newborn infants do not receive any food other than sterile water and the breast during the first seventy-two hours. No laxatives are prescribed. The objective in omitting feedings is to create a desire for food on the part of the infant which will lead him to stimulate the mother's breast. Six hours after birth the infant is placed to the breast for the first time and thereafter at four hour intervals, five times daily.

#### DANGERS OF SULFUR DIOXIDE TO REFRIGERATOR WORKER

To the Editor—One of my patients is a refrigerator service man, and in the course of his work he frequently brings his hands into contact with sulfur dioxide. This chemical stains and irritates his hands and causes him a great deal of discomfort. Will you be kind enough to advise me what chemical he may use with safety to neutralize the irritant after exposure? He has tried wearing protective gloves but finds that they interfere with the manipulation of his fingers.

J. Joseph Klar, M.D., Springfield, Mass.

ANSWER—The chief danger to refrigerator workers from sulfur dioxide is from freezing. A needle sized jet from a leak will freeze an eyeball immediately. Chilling of other portions of the body from contact with liquid sulfur dioxide is rapid but less significant than eye freezing. Much sulfur dioxide as used in refrigerators is dissolved in oil. This practice diminishes the prospect of injury to workers. Ordinarily sulfur dioxide does not stain in the ordinary sense but instead bleaches, as is well known from its wide use in bleaching dried fruits. If retinal staining occurs, this is more likely to be associated with grime from contact with oil. It is well established that sulfur dioxide is a hygroscopic agent leading to skin desiccation from the extraction of water, which eventuates in the formation of an acid. No chemical application can be expected to overcome chilling from sulfur dioxide, but irritation may be prevented by the application before and during the course of work, of a small amount of any tenacious substance such as sodium bicarbonate. The quantity required, two or three times daily as rubbed on the skin of the hands, is so slight as not to interfere with work and not to be unsightly. It is not sufficient to use such protection only after exposure, as implied in the query. Benefit will arise chiefly by preventing contact between the skin and the sulfur dioxide.

#### UNUSUAL REACTION TO MECHOLYL CHLORIDE

To the Editor—Recent literature dealing with the toxicity of the glycols prompts the following case history. A woman aged 45 suffered urinary retention for approximately six weeks following cystoscopy performed for diagnosis and treatment of a left-sided pyelitis of mild degree. When all usual attempts to relieve the retention failed and the patient was leading a catheter life with no signs or symptoms of genitourinary disease a neurologic consultation was obtained. The ultimatum was that psychogenic factors alone caused the condition. It was suggested that mecholyl chloride be administered hypodermically in doses of 25 mg each. The patient had a course of twelve injections. The drug was packaged as a dry powder in an individual ampule to be dissolved in distilled water. Before each injection the blood pressure cuff was attached and the patient made comfortable in bed. A hypodermic containing atropine sulfate 1/100 grain (0.00065 Gm) was kept in readiness. The initial arterial tension was 145 systolic, 85 diastolic and within two minutes of administration of the mecholyl, in each of the twelve doses, the systolic pressure began to fall. Concomitantly the patient complained of a flush of a musty unpleasant odor and of profound perspiration. The pressure reached its lowest point in approximately eight minutes averaging 95 systolic and 70 diastolic. After this it slowly climbed until in fifteen to twenty minutes from the start it attained its original level. Aside from the urethral sweat there was no aftermath in any instance. After the second injection the patient voided urine spontaneously before retiring making catheterization necessary only in the morning. This situation obtained for the rest of the course. The third purchase of mecholyl consisted of 25 mg in each ampule but it was already dissolved in propylene glycol. The usual precautions were taken and the substance was injected hypodermically. In about one minute the patient complained that she felt warmer than usual. In another minute I noted that the systolic pressure began to rise and the pulse which previously had remained fairly constant throughout the effect also increased. When sweating failed to appear I realized that a different reaction was in progress. When the systolic pressure reached 210 and the pulse 130 (in the fifth or sixth minute) the patient had a generalized tonic convulsion. She had not made a sound since complaining of the flush but simply lapsed into a coma. The pupils could not be examined because the eyes were rolled upward and rigidly fixed in that position. The fingers of the clenched fists could not be pried open, the forearms could not be extended nor could the lower limbs be moved in any manner. Respiration was about 18 to 20 per minute and shallow. I administered 1/10 grain (0.0013 Gm) of atropine followed in two minutes by a similar dose. The peak of blood pressure (250/140) and pulse (something over 150) came just prior to the second injection of atropine and about twenty minutes after the mecholyl. Gradually the signs abated. In about forty-five minutes the extremities could be moved with some difficulty and in another fifteen minutes the patient stirred voluntarily and made a grimace of pain. In a half hour she could answer questions but indicated that every effort gave bodily pain in particular a severe frontal headache. It took two days for the last of the symptoms to subside and the arterial tension and pulse to reach their former level. Total retention again set in and on the day of writing (five days after injection) has not been relieved.

Louis Spitz, Jr., M.D., Philadelphia

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## SULFONAMIDE COMPOUNDS IN THE PREVENTION AND TREATMENT OF WOUND INFECTION

A CONSIDERATION OF THE PRINCIPLES  
WHICH GOVERN THEIR USE

PERRIN H LONG, M D  
BALTIMORE

The introduction of the use of sulfonamide compounds as prophylactic and curative agents in the field of surgery has not been an unmitigated blessing for surgeons because of a growing tendency to neglect fundamental principles of good surgical judgment and technic and to rely instead on the wholesale use of the "wonder drugs." This undesirable condition has been brought about by a false impression that the sulfonamide compounds are "cure-alls" and represents a current trend toward an ignorant complacency in respect to the elective and selective uses of these agents.

There can be no questioning the fact that these drugs have frequently saved the patient of the careless surgeon from disaster, but when the sulfonamides fail because of neglect of the use of sound judgment and surgical technic, coupled with a lack of knowledge of the fundamental principles of sulfonamide therapy, then too often these drugs are berated as being worthless, when the truth of the matter is that the primary principles of the surgical aspects of the patient's care have been cast aside. One must remember (and too often in the present this fact is being forgotten) that the use of sulfonamide compounds is an adjunct to surgical therapy and cannot replace it. However, these drugs can be valuable aids when properly employed and have permitted the development of certain advances in surgical practices which were considered unattainable before the advent of sulfanilamide and its derivatives.

With the establishment of the proposition that sulfonamide therapy is a valuable adjunct to adequate surgical treatment, the problem of their use in the prophylaxis and therapy of contaminated and infected wounds becomes simplified. In civilian practice it has been established that many contaminated wounds can be closed directly after an adequate toilet of the wound has been completed. However, in war wounds (except for very minor lacerations) experience has shown that primary closure is dangerous, and with few exceptions (perforations of the chest or abdomen) such wounds should be left open. It is of interest to recall at this point that the adequate use of locally implanted sulf-

anilamide in the wounds of our casualties in Hawaii prevented wound infection, thereby permitting the debridement of some wounds many hours after they had been incurred. Then after a few days the wounds were so clean that some were secondarily sutured and healing by first intention occurred.<sup>1</sup> Infected wounds should always be left open.

In any consideration of the use of sulfonamide compounds in the prophylaxis or treatment of wound infection, several factors must be considered and among these are the type of surgical procedure employed, the condition of the wound at the completion of surgical treatment, the determination of whether oral and/or local sulfonamide therapy will be used, the proper selection of the drug for peroral or local use, the dosage to be used, the duration of treatment and finally the utilization of the correct postoperative care in order that the greatest benefits may be derived from the employment of the sulfonamide compounds.

It has been established that the sulfonamides can be used in the treatment of wounds regardless of the type of surgical procedure that has been employed. As far as is known at the present time, the administration of these drugs is compatible with the use of standard intravenous, inhalant or local anesthetics, and they will not influence adversely either the course or the treatment of traumatic or infectious shock.

The condition of the wound at the time sulfonamide therapy is used is of importance. Obviously a poorly debrided, carelessly drained fresh wound is an unsuitable site for the implantation of the sulfonamides and under such conditions the drugs may eventually fail to exert their prophylactic effect. The method of wound closure is important. Implanted sulfonamide compounds may cause an exudation of tissue fluids into the wound, and sloughing of the wound edge has been noted as a result of the tension created by these fluids when wounds have been closed too tightly. This possibility should be kept in mind when one is dealing with lacerations in which especial consideration must be given to the final cosmetic effect. It has been shown<sup>2</sup> that necrotic material or pus contains sulfonamide inhibitors, hence every effort should be made to eliminate and neutralize these substances before sulfonamide therapy is started.

The experience of the last few years has shown that oral, topical or oral plus topical medication with the sulfonamides will prevent wound infection. However, the best evidence available at the present time shows that the administration of these drugs by the peroral

<sup>1</sup> Moorhead J J. Surgical Experience at Pearl Harbor. *J A M A* 118 712 (Feb 28) 1942. Ravidin I S and Long P H. *Army M Bull* April 1942 no 61 p 1. U S Nav M Bull 40 353 (April) 1942.

<sup>2</sup> Lockwood J S. *J Immunol* 35 155 (Sept.) 1938. Lockwood J S and Lynch H M. Studies on Mechanism of Action of Sulfanilamide. Influence of Proteolytic Products on Effectiveness of Sulfanilamide. *J A M A* 114 935 (March 16) 1940. *Surgery* 10 493 (Sept) 1941.

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and local routes is to be desired in the prophylaxis of infection in moderate or serious wounds of the soft tissue, compound fractures, compound skull or facio-maxillary injuries and penetrating wounds of the abdomen or chest. Infection can generally be prevented in minor lacerations involving the skin and subcutaneous tissues or superficial muscle layers, without extensive destruction of tissue, by the topical application of a sulfonamide compound.

In the selection of the drug of choice for the peroral prophylaxis or therapy of wound infection, the effectiveness of the drug and its toxicity are primary considerations. It has been shown that sulfadiazine is clinically effective against systemic infections produced by staphylococci, hemolytic streptococci, colon bacilli and members of the aerogenes group. In clostridial infections this drug has been proved active against experimental infections produced by *Clostridium perfringens* or *Clostridium septicum*. It offers a wide range of protection against the common primary contaminating and infecting organisms in wounds.

A recent survey which we have made of the occurrence of the important toxic reactions (fever, rash, acute hemolytic anemia, leukopenia, acute agranulocytosis, renal complications and hepatitis) of sulfanilamide, sulfapyridine, sulfathiazole and sulfadiazine shows that a total of 11.9 per cent of such reactions occur in the course of sulfanilamide therapy, 15.9 per cent when sulfapyridine is employed, 18.6 per cent if sulfathiazole is used and but 6.5 per cent when therapy is conducted with sulfadiazine.

In addition, sulfadiazine produces comparatively little nausea and vomiting and rarely any degree of cyanosis, mental disturbances and incoordination are uncommon, endurance is not seriously affected, and acidosis or a lowering of the plasma carbon dioxide content does not occur. The lack of these side effects is of importance in any consideration of the ambulatory wounded and in the transportation by air of injured patients. Against these favorable factors is the known ability of the drug to produce renal damage. Observations made by my associates and me show that one can expect that in about 17 per cent of patients receiving average doses of this drug either microscopic or gross hematuria will develop while in 0.4 per cent oliguria, azotemia or anuria develops. It is known that a decreased fluid intake with a resulting decrease in the output of urine predisposes a patient to this type of renal complication. Hence, when water is scarce, as in desert warfare, or when temperatures are high and loss of body water is great, the threat of kidney damage might be considered a deterrent to the use of sulfadiazine. However, the occurrence of this complication appears to be greater when sulfapyridine or sulfathiazole is administered, and one must remember that sulfanilamide produces hemolytic anemia in about 2 per cent of patients to whom it is given. After an evaluation of the various factors involved, it seems reasonable to conclude that, while sulfadiazine can produce serious toxic reactions, it is the least toxic of the four commonly used sulfonamide drugs and is the drug of choice for the peroral prophylaxis of contaminated wounds and for the peroral therapy of infected wounds. If sulfadiazine is not available, sulfanilamide or sulfathiazole should be used in the order named in the peroral prophylaxis or therapy of contaminated or infected wounds.

Confusion exists in respect to the topical use of sulfonamide compounds. For example it is commonly assumed that because sulfathiazole is more effective

than sulfanilamide in the systemic therapy of staphylococcal infections, its topical use is always indicated when the possibility or the presence of staphylococcal infection exists. This assumption is not necessarily correct because various factors such as the physical characteristics and solubility of the drug, its antibacterial effect in the upper ranges of its solubility, its rate of diffusion and absorption from the local lesion, the effect produced by its local implantation on tissue repair and wound healing and the systemic toxic effects which the drug may produce enter into any consideration of the selection of the drug of choice for topical use in the prevention or treatment of contaminated or infected wounds.

It has often been observed that when too finely powdered sulfonamide compounds are placed in wounds they tend to "cake." Sulfonamide compounds for topical use, consisting of large crystals or coarsely ground forms of these drugs, dissolve slowly in wounds and tend to initiate foreign body reactions. While the ideal crystal size of these compounds is not definitely known it has been shown that satisfactory results can be obtained when crystalline sulfanilamide screened to 40 to 80 mesh is used.

The solubility and diffusibility of the compounds under consideration for local use is of importance. Sulfanilamide is soluble in tissue fluids to the extent of from 1,200 to 1,500 mg per hundred cubic centimeters and has been shown by Hawking<sup>3</sup> to diffuse rapidly through living tissue and fairly well through dead tissue. This observer has demonstrated that sulfathiazole, sulfapyridine and sulfadiazine are much less soluble (184, 61 and 124 mg per hundred cubic centimeters in human serum at 36 C respectively) than is sulfanilamide and that sulfapyridine and sulfathiazole diffuse more slowly through living tissues. In our experience sulfadiazine behaves like sulfapyridine as far as diffusion is concerned. This variation in the solubility of the drugs is important in estimating the possible antibacterial effects of these compounds when they are employed as topical agents, and it has been shown in vitro that in the upper range of its solubility sulfanilamide seems to be as effective an antibacterial agent as are the other sulfonamide compounds at their limits of solubility. This observation is important in the consideration of the sulfonamide drug of choice for local use in the prophylaxis and treatment of wound infections.

As has been pointed out, sulfanilamide diffuses more rapidly from the site of its implantation than do the other sulfonamides, and following the topical use of crystalline sulfanilamide in closed wounds peak concentrations of the drug in the blood can be expected in from six to twelve hours, with absorption and excretion of the drug being practically completed within forty-eight hours unless massive doses of sulfanilamide have been used locally. The peak concentrations of this drug in the blood are considerably higher than those noted following the local use of sulfathiazole, sulfapyridine or sulfadiazine in wounds that are closed.

The latter compounds, because of their lower solubilities and rates of diffusion, are absorbed and excreted more slowly than is sulfanilamide, and in the instance of sulfadiazine we have noted that following the implantation of 5 Gm of the drug in an extraperitoneal wound of the abdominal wall absorption of the drug continued for more than two weeks.

3 Hawking, Frank. *Lancet* 1 786 (June 21) 1941.

There is not a great deal of information available regarding the absorption of sulfonamide compounds from open wounds. Veal and Klepser<sup>4</sup> have reported that the instillation of 7.5 Gm of sulfanilamide into an "open clean wound (pilonidal sinus excision)" produced a peak concentration of the drug of 2 mg per hundred cubic centimeters within five hours and at forty-two hours very small amounts (less than 0.5 mg per hundred cubic centimeters) of the drug were found in the blood. Another of their patients suffering from an open wound of the abdominal wall was given the daily implantations of 5 Gm of sulfanilamide, followed by a gradual rise of the concentration of the drug in the blood to 12 mg per hundred cubic centimeters on the sixth day. At the end of thirty-six hours the concentration of sulfanilamide in the blood was 3 mg per hundred cubic centimeters. These observations, coupled with those of our own, lead us to believe that excessive concentrations of sulfanilamide are not to be expected following its use in open wounds. In burns, the opposite seems to be true. Hooker and Lam<sup>5</sup> have shown that when crystalline sulfanilamide is applied to second or third degree burns absorption may be rapid and excessive concentrations of the drug may occur in the blood. Our own observations show that sulfathiazole and sulfadiazine are less readily absorbed from open wounds than is sulfanilamide.

The differences in the solubility of the various sulfonamide drugs appear to bear some relation to their effects on wound healing. It has been shown<sup>6</sup> that in concentrations up to approximately 500 mg per hundred cubic centimeters, sulfanilamide has little if any effect on the multiplication of fibroblasts in tissue cultures and that, while this drug does inhibit certain cellular functions in higher concentrations, the recovery of the cells from its unfavorable action is rapid and complete when they are removed from excessive concentrations of the drug. Sulfathiazole<sup>7</sup> has been shown to be the least favorable for growth at any assigned concentration, and as far as sulfapyridine and sulfadiazine are concerned their limited solubility does not permit the accurate testing of their effects on cells in tissue cultures.

It seems well established that the degree of solubility of the various sulfonamide drugs has a definite bearing on their ability to produce foreign body reactions when they are implanted locally. Sulfanilamide, because of its high solubility, is least likely to produce this reaction within wounds, with sulfathiazole, sulfapyridine and sulfadiazine in the order named having increasing possibilities of producing such a reaction.

As far as direct toxic effects on various types of tissue are concerned, there is disagreement concerning the action of the sulfonamide drugs. Russell and Falconer<sup>8</sup> reported that the application of finely powdered sulfanilamide or sulfapyridine to the leptomeninges or the cortex of the rabbit did not produce appreciable damage within four days. Hurteau<sup>9</sup> has confirmed and extended these observations and has further reported that while sulfadiazine is slowly absorbed from brain tissue no glial reaction occurs after the implantation and but a slight foreign body

reaction in the meninges. Taffel<sup>10</sup> on the other hand, has noted that all of the commonly used sulfonamides produced a mild inflammatory reaction when applied to the cortex in monkeys. Sulfathiazole seemed to produce the most intense inflammatory response while sulfadiazine caused the most severe foreign body reaction. These observations are of especial interest in view of the recent report of Watt and Alexander<sup>11</sup>. These observers noted that the application of crystalline sulfathiazole to the frontal cortex in both human beings and dogs frequently produced epileptiform convulsions. This phenomenon did not occur when sulfanilamide, sulfapyridine or sulfadiazine was used.

Taffel and Harvey<sup>12</sup> reported that the local application of crystalline sulfanilamide did not interfere with the healing of experimental wounds in the stomachs of rats. Harbison and Key<sup>13</sup> have confirmed this observation and have further reported that the implantation of crystalline sulfanilamide did not disturb the healing of wounds produced in the abdominal walls of rats nor did this drug produce adhesions when introduced into the peritoneal cavity of rats.

Glynn<sup>14</sup> states that crystalline sulfanilamide has "a slight but definite toxic reaction on striped muscle" but that this drug does not inhibit fibroblastic proliferation in wounds produced in rabbits. Taylor<sup>15</sup> however, has reported that all these drugs produce inflammatory tissue reactions when implanted into wounds in dogs and that in the case of the less soluble drugs the reactions may be so severe that actual tissue destruction and sterile abscess formation occurs. Finally, Bick<sup>16</sup> has recently observed that "the local application of sulfonamide drugs to wounds of the soft tissues or cleancut operative incisions in which primary suture is indicated retards healing by at least 50 per cent of the time factor and promotes extensive cutaneous scarring."

As has been previously described the local application of the sulfonamide drugs to wounds may cause an exudation of tissue fluids, which in the instance of a tightly sutured wound may cause tension and delay wound healing. Our observations lead us to believe that sulfathiazole and sulfadiazine are more likely to produce such an exudation of fluid than is sulfanilamide.

Out of the welter of conflicting experimental and clinical reports which I have just reviewed one fact seems to emerge, namely that, while the local implantation of sulfanilamide may interfere to a certain degree with wound healing it appears to be the least harmful of the commonly used sulfonamides to regenerating tissues.

Thus when all the factors have been considered it seems reasonable to choose sulfanilamide as the drug of choice for the prophylaxis and treatment of contaminated and infected wounds.

In considering the peroral prophylactic dose of sulfadiazine needed for the prevention of wound infections, civilian injuries must be differentiated in general from war casualties. In the first instance, definitive surgical treatment will probably be given promptly and in most cases the administration of sulfadiazine by mouth can

10 Taffel Mav and German W J Yale J Biol & Med 14 139 (Dec) 1941

11 Watt A C and Alexander G L Lancet 1 493 (April 25) 1942

12 Taffel Mav and Harvey S C Proc Soc Exper Biol & Med 47 202 (June) 1941

13 Harbison S P and Key J A Local Implantation of Sulfanilamide and Its Derivatives in Wounds Its Relation to Wound Healing and to Peritoneal Adhesions Arch Surg 44 22 (Jan) 1942

14 Glynn L E J Path & Bact 53 183 (Sept) 1941

15 Taylor F W Misuse of Sulfonamide Compounds J A M A 118 959 (March 21) 1942

16 Bick E M Observations on Topical Use of Sulfonamide Derivatives J A M A 118 511 (Feb 14) 1942

4 Veal J R and Klepser R G M Ann District of Columbia 10 61 (Feb) 1941

5 Hooker D H and Lam C R Surgery 9 534 (April) 1941

6 Gey G O Personal communication to the author Jacoby Medawar and Willmer

7 Jacoby F Medawar P B and Willmer E N Brit. M J 2 149 (Aug 2) 1941

8 Russell R S and Falconer M A Lancet 2 100 (July 27) 1940

9 Hurteau E F Canad M A J 46 15 (Jan) 1942

be deferred until just prior to or after definitive surgical treatment. In the case of persons wounded as the result of enemy action, definitive surgical treatment may be delayed for many hours, therefore, the prophylactic dose of sulfadiazine should be given as soon as possible after the wound has been incurred.

For adult civilian injuries, the initial peroral dose of sulfadiazine should be 2 to 4 Gm given either immediately before or after definitive surgical treatment, this to be followed by 1 Gm of the drug every six hours for two days, following which doses of 0.5 Gm every six hours should be administered for eight days.

For adults wounded as the result of enemy action the initial peroral dose of sulfadiazine should be 4 Gm. This should be given as soon as possible. After this initial dose no more of the drug should be given by mouth until after definitive surgical treatment has been completed. Then sulfadiazine 1 Gm every six hours should be administered day and night for from seven to ten days. If infection occurs despite the attempt at prophylaxis, the administration of the drug should be continued until the infection is under control. It is important to maintain a daily output of urine of at least 1,000 cc during the period of treatment in order to lessen the possibility of the occurrence of renal complications. If sulfadiazine is not available, sulfanilamide or sulfathiazole prescribed in the same dosage may be used. For injured children doses of these drugs should be adjusted according to the weight of the child in comparison with the adult dose.

There is a tendency at the present time to dump sulfonamide compounds haphazardly into wounds. This is a bad practice, and it should be emphasized that the implantation of sulfanilamide should be done carefully in order that all parts of the surface of the exposed wound will be in contact with the drug. A shaker-top container makes this easy, although many physicians prefer to use a powder atomizer for applying sulfanilamide locally.

In wounds that are closed by primary suturing, the amount of crystalline sulfanilamide implanted should approximate 0.05 Gm per square inch of wound surface. This represents a light "frosting" of the wound. In contaminated wounds in which closure is not indicated or in infected wounds 0.1 Gm of crystalline sulfanilamide per square inch (2.5 cm) of wound surface should be used. This represents a heavy "frosting" of the wound. On the basis of our present experience it would seem that not more than 10 Gm of sulfanilamide should be given locally to any given patient within a twenty-four hour period.

The combination of sulfadiazine by mouth and sulfanilamide locally will produce sulfonamide concentrations in the blood of from 6 to 16 mg per hundred cubic centimeters in the first twenty-four hours in patients whose wounds are closed. If however, the wounds are left open, concentrations of the sulfonamide in the blood of from 5 to 10 mg per hundred cubic centimeters will generally be noted in the first twenty-four hours of therapy.

It has been mentioned previously that peroral therapy with sulfadiazine may be discontinued in from seven to ten days if symptoms and signs of infection are lacking. However, experience has repeatedly shown that it is necessary to repeat the local application of sulfanilamide to wounds at each dressing period if both primary and secondary wound infection is to be prevented. Local therapy with sulfanilamide should be continued until healing is complete.

As has been pointed out before, the successful treatment of contaminated or infected wounds is influenced by the amount of necrotic tissue or purulent material in the wounds, because these substances act as sulfonamide inhibitors. Therefore, if a wound shows evidence of infection it should be gently irrigated with isotonic solution of sodium chloride at each dressing or, perhaps better, with a mild oxidizing agent such as a 1:3,300 solution of azochloramid. (Such solutions should be stored away from the light in brown glass bottles.) It has been shown that the latter compound is effective in neutralizing the effects of sulfonamide inhibitors and indeed there is some evidence<sup>17</sup> that azochloramid acts synergistically with the sulfonamides. Recent experience has also shown the value of utilizing dressings moistened with a 1:3,300 solution of azochloramid in the prophylaxis of contaminated and the treatment of infected wounds. These dressings can be placed in the wound after crystalline sulfanilamide has been applied and sealed over with boric acid ointment or petrolatum gauze to prevent them from drying. It is important to keep the wound dressing moist in order to prevent the caking of implanted sulfonamides.

Other substances have been reported as being effective in removing the effects of the sulfonamide inhibitors found in pus and necrotic material. Veal and Klepser<sup>4</sup> used allantoin in combination with sulfanilamide in an ointment base and reported that this mixture stimulated the growth of healthy granulation tissue. Holder and MacKay<sup>18</sup> have reported that a carbamide-sulfanilamide mixture gave excellent results when used in the local prophylaxis and treatment of contaminated or infected wounds.

#### SUMMARY AND CONCLUSIONS

The use of sulfonamide compounds for the oral and topical prophylaxis or treatment of contaminated or infected wounds is a valuable adjunct to careful surgical treatment but cannot replace it. However, the rational use of the sulfonamides has permitted the development of certain advances that were considered unattainable before the advent of sulfanilamide and its derivatives.

The broad general principles which govern the chemotherapy of wounds are applicable regardless of the anatomic location of the wound. On the basis of present evidence, it would seem that a combination of systemic with local therapy offers the best chance for the prevention of wound infection and for its cure once an infection has become established. On the basis of current evidence, sulfadiazine by mouth seems to be the drug of choice for systemic therapy, and the dose of the drug should be adjusted so that concentrations of from 4 to 7 mg per hundred cubic centimeters are obtained in the blood. Higher concentrations of the drug are probably unnecessary. From all points of view, sulfanilamide seems at the present time to be the drug of choice for topical application. It is to be remembered that necrotic tissue and pus contain sulfonamide inhibitors and that every effort should be made to eliminate these inhibitors before sulfanilamide is applied locally. Care should always be taken to prevent the caking of sulfanilamide in the wound, and this can be accomplished by applying moist gauze dressings following the application of sulfanilamide to the wound. In the absence of clinical infection, there is little reason to continue oral therapy with sulfadiazine for more than five to seven days. However, to prevent secondary

<sup>17</sup> Schmelkes, F. C. and Wyss, O. *Proc. Soc. Exper. Biol. & Med.* **49**: 263 (Feb.) 1942.

<sup>18</sup> Holder, H. G. and MacKay, E. M. *Mil. Surgeon* **90**: 509 (May) 1942.



infections from occurring after primary prophylaxis has been successful, it is necessary to apply sulfanilamide powder locally until wound healing is complete

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#### ABSTRACT OF DISCUSSION

DR JOHN E CANNADAY, Charleston, W Va My experience with sulfonamide compounds in wounds has been that both sulfanilamide and sulfathiazole may be used satisfactorily in both clean and infected wounds, that they lower the incidence of infection in both types of wound and that when used in moderation they do not cause appreciable delay in wound healing I spread these drugs evenly throughout the wound and, in the case of sulfathiazole, rub it into the tissues in order to avoid the formation of lumps such as others have described It has been well established that sulfanilamide, when used in wounds is completely absorbed in the course of about two days and that under similar conditions sulfathiazole requires five or six days for absorption Likewise it has been amply demonstrated that if sulfathiazole is placed in the wound in lumps or masses it probably will not be entirely absorbed and may act as a foreign body A recent check-up on 1,281 consecutive abdominal surgical cases of myself and my associates in the surgical service of the Charleston General Hospital, the general surgical technic being the same in all cases, shows that of 910 uninfected wounds closed with cotton thread used in accordance with the Halsted silk technic there were 7 infections, or 0.77 per cent Of 129 uninfected wounds closed with catgut there resulted 8 infections, or 6 per cent Of contaminated wounds, 175 sutured with cotton, there were 30 infections, or 17 per cent Of 31 contaminated wounds closed with catgut there were 8 infections, or 26 per cent All these wounds, both uninfected and contaminated, were irrigated thoroughly with saline solution and either sulfanilamide or both sulfanilamide and sulfathiazole were placed in them In this series there were 18 gastric resections for ulcer with no apparent infections but with 1 wound disruption which followed a persistent cough This disruption was closed soon after it took place and healed without infection In the entire series of uninfected wounds there were approximately 12 that had a brief serous leakage for a few days but healed without pus formation While we cannot expect everything from the use of sulfonamide compounds in wounds, we do believe that when used in conjunction with adequate hemostasis, wound irrigation or accurate suturing (especially with cotton thread) they definitely help to lower the incidence of infection in both uninfected and contaminated wounds, and that if infection does follow their use the severity is at least lessened

DR PHILIP LEWIN, Chicago I should like to ask Dr Long to discuss combinations of the sulfonamide compounds and their use in ointments, in tetanus, in gas gangrene and in burns

DR PERRIN H LONG, Baltimore Combinations of these drugs for local use such as sulfanilamide plus sulfadiazine or sulfathiazole have to be handled much more carefully, otherwise one will get the adverse effects of the less soluble drugs I further believe that the evidence from Pearl Harbor shows that sulfanilamide by itself is an adequate chemoprophylactic agent against wound infection Sulfonamide ointments are of value in the treatment of infected wounds I don't know anything about their use in prophylaxis of wound infection, but in superficially infected wounds sulfonamide ointments are effective, and I should think that the ointment described by Dr Vella, in which there is hydrous wool fat, would be a satisfactory ointment Zinc peroxide is excellent in the treatment of anaerobic or microaerophilic infections Technically it would be difficult to use adequately in the prophylaxis of wound infection if there were large numbers of casualties As far as we know there was no tetanus in Hawaii from military casualties Gas gangrene serum has not been conclusively proved to be of value in either the prophylaxis or the therapy of clinical clostridial infection What we need for the treatment of burns is a method which every one of us can use and get good results Unfortunately no method gives good results when used by all physicians The one that comes closest in the opinion of many who are interested in burns in this country is tannic acid, but, as every one knows, that does not represent the perfect treatment

## SULFONAMIDE TOXICITY AS A CAUSE OF DEATH IN NEW YORK CITY IN 1941

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It is imperative that comprehensive information on the frequency of fatal sulfonamide reactions be obtained in order that the physician may employ the sulfonamide drugs with a definite knowledge of the dangers involved in their administration To fill this need, the Pneumonia Control Division of the New York City Department of Health<sup>1</sup> and the Bureau of Vital Records and Statistics cooperated with the New York City Chief Medical Examiner's Office to obtain clinical records for all deaths in New York City during 1941, in which some type of sulfonamide toxicity was a factor

#### SOURCES OF REPORTS<sup>2</sup>

The medical examiner's certification provided the greatest proportion of useful records, namely 16 out of 19 Such certification includes a critical examination of the clinical history furnished by the physician or institution and in some cases postmortem examination Reports received by the health department without the intervention of the medical examiner provided a smaller proportion of useful records, namely 9 out of 17 In these cases either sulfonamide administration was mentioned on the death certificate but was not definitely stated as responsible for death or the case was recorded in a scientific publication A questionnaire on sulfonamide toxicity to physicians reporting pneumonia deaths during parts of April and May 1941 gave only a small number of useful reports, namely 4 out of 21 cases that were studied because serious toxic symptoms were reported on the questionnaire One of these 4 cases had been reported and certified by the medical examiner before its report by questionnaire The primary function of the questionnaire was to serve as a check on the completeness of the reporting from the two other sources

#### CRITERIA FOR THE DIAGNOSIS OF SULFONAMIDE TOXICITY AS A CAUSE OF DEATH

Twenty-eight cases were selected for description and analysis in this report All presented toxic reactions which developed coincident with drug administration In each case the reaction was of a type produced by sulfonamide drugs and was considered the sole or a contributory cause of death

In 13 cases, the diagnosis was as well established as present knowledge permits These include 5 cases of

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<sup>1</sup> Drs M J Hammsberg S H Taylor and Arnold Treisman New York City Department of Health pneumonia control division consultants in pneumonia therapy assisted by abstracting clinical records

<sup>2</sup> Three of these cases (5 14 and 15) were described by other authors



agranulocytosis (1, 2, 3, 4 and 5) 1 case of acute hemolytic anemia (9), 2 cases of purpura hemorrhagica (11 and 12), 4 cases of crystalline urinary concretions (13, 14, 15 and 16) and 1 case of dermatitis exfoliativa

assigning a cause of death. Such cases are essential to a discussion of the incidence of deaths related to sulfonamide toxicity. Questions as to the pathogenesis of the toxic condition might be raised in 12 of the 15

TABLE 1—Cases of Fatal Sulfonamide Toxicity Reported in New York City in 1941

Patient	Age	Sex	Principal Reaction	Drugs	Total Amount Gm	Disease Treated	Cause of Death
<b>A. Toxicity Primarily Affecting the Blood Cells and Blood Forming Organs</b>							
1 A G	53	♂	*Agranulocytosis	Sulfanilamide	103	Infected foot (diabetic, Lankrene)	Agranulocytosis
2 C H	50	♂	*Agranulocytosis	Sulfanilamide (33.3 Gm) Sulfapyridine (51.0 Gm)	117	Bacterial endocarditis (Streptococcus)	Agranulocytosis, bacterial endocarditis
3 L W V	63	♂	Agranulocytosis	Sulfathiazole	93	Cystitis	Agranulocytosis, prostatic hypertrophy (operation), peritonitis
4 C S	44	♀	*Agranulocytosis	Sulfanilamide (in wound 60.0 Gm) Sulfathiazole (24.5 Gm)	84	Infected operative wound, cystitis	Agranulocytosis, cancer of sigmoid (operation), bronchopneumonia
5 R F	13	♂	*Agranulocytosis	Sulfanilamide (33.1 Gm) Sulfathiazole (intra venous 3.8 Gm)	57	Rheumatic fever, inactive	Agranulocytosis, septicemia, Staphylococcus aureus, Pneumococcus type 3
6 A M	10	♀	Agranulocytosis	Sulfanilamide	50	Pharyngitis	Agranulocytosis, bronchopneumonia
7 F M	6	♀	Agranulocytosis	Sulfapyridine	16	Upper respiratory infection	Agranulocytosis
8 R E M	60	♀	Agranulocytosis	Sulfathiazole (17.0 Gm) Neoprontosil (17.0 Gm)	1	Tonillitis	Agranulocytosis, aminopyrine 7 Gm
9 C G	43	♂	Acute hemolytic anemia, hemoglobin nephrosis	Sulfanilamide	10	Infected accidental wound	Acute hemolytic anemia, hemoglobin nephrosis, pneumonia
10 M R	45	♂	Aplastic anemia	Sulfathiazole	7	Lobar pneumonia type 14	Aplastic anemia, type 13 pneumonia, bacteremia
11 B H	66	♀	Purpura hemorrhagica	Sulfathiazole	1	Lobar pneumonia	Purpura hemorrhagica
12 N F	60	♀	Thrombocytopenic purpura	Sulfadiazine	24	Infected operative wound	Thrombocytopenic purpura (operation), Staphylococcus aureus, sepsis
<b>B. Toxicity Primarily Affecting the Kidney</b>							
13 C T V	45	♀	*Crystalline urinary concretions	Sulfathiazole	3	Lobar pneumonia type 14	Renal obstruction, crystalline concretions, uremia
14 H K	69	♂	*Crystalline urinary concretions	Sulfathiazole	44	Postoperative pneumonia	Renal obstruction, crystalline concretions, uremia, bronchopneumonia
15 R N	15	♀	Crystalline urinary concretions	Sulfathiazole	18.5	Acne	Renal obstruction, crystalline concretions, uremia
16 C N	89	♀	*Crystalline urinary concretions	Sulfadiazine	13	Lobar pneumonia type (not confirmed)	Uremia, pyelitis, chronic cholecystitis and lithiasis
17 E C D	6	♂	Acute nephrosis	Sulfathiazole	5	Carbuncle of neck	Acute nephrosis, uremia
18 M McG	56	♀	Acute nephrosis	Sulfapyridine	14	Bronchopneumonia	Acute nephrosis, uremia
19 F R	48	♂	Azotemia	Sulfathiazole (intravenous)	21	Postoperative pneumonia	Uremia, bilateral renal calculi, operation, peritonitis, pneumonia
20 W J D	57	♂	Azotemia	Sulfathiazole	40	Pneumonia (not confirmed)	Uremia, chronic hypertension, cardiovascular disease, pulmonary edema
21 N L	6	♂	Azotemia	Sulfadiazine	27	Bronchopneumonia	Uremia, hypertension, nephrosclerosis
22 L K	56	♀	Azotemia	Sulfapyridine	31	Bronchopneumonia	Uremia, chronic nephritis (histologic copy), bronchopneumonia
23 P M	39	♀	Azotemia	Sulfapyridine	12	Pneumonia	Uremia, arteriosclerosis, nephritis
24 G B	70	♂	Azotemia	Sulfathiazole	29	Infected chronic leg ulcers	Uremia
<b>C. Toxicity Primarily Affecting the Skin and Other Toxic Manifestations</b>							
25 E A W	31	♀	*Dermatitis exfoliativa	Sulfapyridine	24	Gonorrheal vaginitis	Dermatitis exfoliativa
26 J M	42	♂	Dermatitis hyperpyrexia	Sulfathiazole (intravenously 6 Gm)	70	Lobar pneumonia	Sulfathiazole toxicity, lobar pneumonia
27 R P	52	♂	Dermatitis pulmonary edema	Sulfathiazole (8 Gm) Sulfapyridine (11 Gm) (29 Gm intravenously)	83	Bronchopneumonia	Sulfonamide toxicity, bronchopneumonia, pneumonococcosis
28 M L	11 mos	♀	Convulsions	Sulfathiazole (7.2 Gm) Sulfapyridine (1.2 Gm) (0.5 Gm intravenously)	9	Bronchopneumonia	Convulsions due to intravenous administration of sodium sulfapyridine, bronchopneumonia

\* Diagnosis well established

(25) In 5 of these 13 cases the toxic reaction was the sole cause of death.

The remaining 15 cases, in which the diagnoses were merely acceptable, are included in this report because they represent a reasonable application of our knowledge of sulfonamide toxicity to the difficult problem of

acceptable cases, namely 3 cases of agranulocytosis (6, 7 and 8) and 1 case of aplastic anemia (10) because blood counts were not recorded before the conditions were recognized, 2 cases of acute nephrosis (17 and 18) because this condition has not received adequate critical study, 6 cases of azotemia (19, 20, 21, 22, 23 and 24)

because no complete mechanical obstruction of the urinary tract was recognized, and in 5 of the latter because some evidence of other kidney disease was present. Questions as to whether the toxic manifestations were severe enough to cause death might be raised in 3 of the 15 acceptable cases (26, 27 and 28), in which reactions of types not heretofore described occurred in cases in which intravenous therapy was administered for pneumonia and in which the pneumonia as well as

in the seventh decade of life. The 4 exceptions were 1 infant of 11 months and 3 young adults of 13, 15 and 19 years of age. They were equally divided as to sex into 14 males and 14 females. Characteristic features of the reactions are listed in tables 1 and 2.

*Types of Principal Reactions and Drugs Administered*—The symptoms of toxicity affected primarily the blood cells and blood forming organs in 12 of the 28 cases (table 1, section A). Of these 8 had agranulo-

TABLE 2—Number of Days Elapsing Before the Development of Toxicity and Death

Patient	Principal Reaction	Other Toxic Symptoms	Drugs	Days of Treatment	Number of Days from First Dose of Drugs to		
					First Toxic Symptoms	Principal Toxic Reaction	Death
A Toxicity Primarily Affecting the Blood Cells and Blood Forming Organs							
1 A G	Agranulocytosis	Fever * dermatitis	Sulfanilamide	20	18	21	23
2 C H	Agranulocytosis	Fever (due to endocarditis ?)	Sulfanilamide (8 days)	31		28†	24
			Sulfapyridine (23 days)	(89 day period)		22‡	25
3 L W V	Agranulocytosis	Fever * dermatitis	Sulfathiazole	17	17	22	22
4 C S	Agranulocytosis	Fever * dermatitis	Sulfanilamide (in wound 37 days)	37	31	35	37
			Sulfathiazole (7 days)				15
5 R F	Agranulocytosis	Fever, angina (due to sepsis)	Sulfanilamide (31 days in 32 days)	32	29	30	35
			Sulfathiazole (intravenously 1 day)	(in 30 day period)			
6 A M	Agranulocytosis	Fever (due to bronchopneumonia ?)	Sulfanilamide	16		23	25
				(19 day period)			
7 F M	Agranulocytosis	Fever (due to respiratory infection ?)	Sulfapyridine	3		2	14
8 R E M	Agranulocytosis	Fever (due to tonsillitis ?)	Sulfathiazole (2 days) Neoprontosil (3 days)	5		4	9
9 C G	Acute hemolytic anemia	None	Sulfanilamide	1		1	10
10 M R	Aplastic anemia	Fever (due to pneumonia ?)	Sulfathiazole	2		6	23
11 B H	Purpura hemorrhagica	None	Sulfathiazole	2		5	7
12 A F	Thrombocytopenic purpura	Fever (due to sepsis ?)	Sulfadiazine	6		6	8
B Toxicity Primarily Affecting the Kidney							
13 C T V	Crystalline urinary concretions*	Fever * dermatitis chill delirium convulsions	Sulfathiazole	8	7	9	11
14 H K	Crystalline urinary concretions*	Fever * chill * dermatitis sulfathiazole retention	Sulfathiazole	10	8	11	14
15 R N	Crystalline urinary concretions*	General aches and pains * vomiting delirium fever * convulsions	Sulfathiazole	31	30	30	33
			Sulfadiazine retention				
16 C N	Crystalline urinary concretions*		Sulfadiazine	22		23	22
17 E C D	Acute nephrosis	Fever * chill * dermatitis	Sulfathiazole	13	11	16	25
				(10 day period)			
18 M McG	Acute nephrosis	Fever * dermatitis delirium	Sulfapyridine	4	3	6	10
				(5 day period)			
19 F R	Azotemia		Sulfathiazole (intravenously)	5		2	5
20 W J D	Azotemia	Urticaria*	Sulfathiazole	5	5	7	20
21 N L	Azotemia	Oliguria * severe emesis	Sulfadiazine	6	5	6	11
22 L K	Azotemia	Oliguria	Sulfapyridine	8		7	11
23 P M	Azotemia	Coma *	Sulfapyridine	3	3	7	12
24 G B	Azotemia	Fever * dermatitis * sulfathiazole retention	Sulfathiazole	6	7	12	14
C Toxicity Primarily Affecting the Skin and Other Toxic Manifestations							
25 E A W	Dermatitis exfoliativa	Fever	Sulfapyridine	16		23	38
				(19 day period)			
26 J M	Dermatitis hyperpyrexia		Sulfathiazole (intravenously on 11th day)	11		11	12
27 R P	Dermatitis pulmonary edema	Jaundice	Sulfathiazole (7 days) Sulfapyridine (9 days some intravenously)	15		15	16
28 M L	Convulsions	Hyperpyrexia (due to bronchopneumonia ?)	Sulfathiazole (9 days in 11 days) Sulfapyridine (2 days) (0.5 Gm. intravenously 11th day)	10		12	13
				(in 13 day period)			

\* Indicates first toxic symptoms observed

† Sulfanilamide

\* Sulfapyridine

other concurrent disease were present at death. In 5 of the 15 acceptable cases the toxic reaction was considered the sole cause of death. Autopsy protocols were studied and confirmed the diagnosis in 8 of the 13 well established cases and in 4 of the 15 cases that were considered merely acceptable.

#### DESCRIPTION OF REACTIONS

The 28 patients presenting the diagnosis of sulfonamide toxicity associated with death were, with 4 exceptions, 31 years of age or over, the largest number being

cytosis, 1 acute hemolytic anemia, 1 aplastic anemia and 2 purpura hemorrhagica. Each of the common sulfonamide drugs used alone or in combinations with other sulfonamide drugs, accounted for one or more of these reactions. Agranulocytosis followed the administration of one drug in 4 cases, i.e., sulfanilamide in 2, sulfapyridine in 1 and sulfathiazole in 1, and agranulocytosis followed the administration of two drugs in 4 cases, in one of which sulfanilamide and sulfapyridine were administered, in 2 sulfanilamide and sulfathiazole

and in 1 azosulfamide, sulfathiazole and aminopyrine. The 1 case of acute hemolytic anemia followed sulfanilamide. One case of aplastic anemia followed sulfathiazole. Purpura followed sulfathiazole in 1 case and sulfadiazine in another.

Toxicity primarily affected the urinary tract in 12 of the 28 cases (table 1, section B). Obstruction by crystalline concretions occurred in the ureters, kidney pelvis or kidney tubules in 4 of these cases. Acute degenerative nephrotic lesions almost entirely confined to the tubular epithelium, without evidence of obstruction by crystalline concretions, were found in 2 cases. Azotemia increasing progressively to death appeared following sulfonamide drugs in 6 cases, in 5 of which some evidence of previous renal damage due to other disease was also present. Three cases of crystalline urinary concretions followed sulfathiazole administration, and 1 followed sulfadiazine. One case of acute nephrosis followed sulfapyridine, and 1 followed sulfathiazole. Two cases of azotemia followed sulfapyridine. 3 followed sulfathiazole and 1 followed sulfadiazine.

The remaining 4 of the 28 cases in which sulfonamide toxicity was diagnosed, and related to the cause of death, constitute a miscellaneous group of reactions that have been the subject of few or no reports in the medical literature. The first of these 4 patients had dermatitis exfoliativa, the second patient had acute generalized dermatitis and hyperpyrexia, the third patient developed acute generalized dermatitis and pulmonary edema. The fourth patient was an 11 month old infant girl who had convulsions and hyperpyrexia. The first patient had received sulfapyridine, the second sulfathiazole and the third and fourth both sulfapyridine and sulfathiazole. The 3 cases with acute dermatitis and fever all followed unusually large doses of the drugs, part of which was administered intravenously, and death occurred within twenty-four hours of the appearance of toxic symptoms.

No cases of death from acute liver degeneration following the use of sulfonamide drugs were reported in New York City in 1941.

In the whole series of 28 cases sulfanilamide was used in 6 cases, azosulfamide in 1, sulfapyridine in 8, sulfathiazole in 16 and sulfadiazine in 3. One drug only was used in 22 cases and two drugs in 6 cases.

**Drug Dosage**—There is a tendency for serious toxic reactions to follow doses of sulfonamide drugs that are greater than those usually required for therapeutic effect. Twenty of the 28 patients received 20 Gm or more of sulfonamide drugs. The dosage of sulfonamide drugs was highest in the first 6 patients with agranulocytosis, all of whom received 50 Gm or more. Drug dosage was also high in 3 patients who had reactions characterized chiefly by drug fever and rash, 2 adults who received 70 Gm or more, and an 11 month old girl who received 89 Gm. In 1 case with renal toxicity 128 Gm was given but in the remaining 11 cases with renal toxicity the drug dosage was lower, ranging from 12 to 44 Gm. In the 6 remaining cases, in 5 of which the blood was affected by the toxic reaction, and in 1 case of dermatitis exfoliativa, the dosage was even lower, ranging from 7 to 24 Gm per case.

**Number of Days Elapsing Before the Development of Toxic Reactions**—The number of days from the beginning of sulfonamide administration to the appear-

ance of toxic symptoms and death tended to be similar in individuals with certain reactions (table 2). Agranulocytosis in 6 cases was recognized twenty-one or more days after the drugs were begun. In the 2 remaining cases of agranulocytosis the intervals between the beginning of treatment and recognition of toxicity were very short, two and four days respectively, but in these cases blood counts were not made before treatment was begun, and the possibility that agranulocytosis was present even before drug administration should not be overlooked. Acute hemolytic anemia appeared within twenty-four hours of the first dose of sulfanilamide. Aplastic anemia and purpura hemorrhagica were recognized on the fifth or sixth day after therapy was begun. Toxicity primarily affecting the kidney was recognized at variable periods after therapy began, up to thirty-two days, most often at the end of the first week. Dermatitis exfoliativa was recognized twenty-three days after sulfonamide therapy was begun. Acute toxemia in patients receiving intravenous sulfonamide drugs appeared about the end of the second week of treatment of 3 patients.

Fatal termination followed the first symptoms of toxicity in 6 of the cases of agranulocytosis at an interval of five or six days. In the 2 remaining cases of agranulocytosis death occurred in two and twelve days respectively, after recognition of agranulocytosis. One case each of acute hemolytic anemia and aplastic anemia resulted in death ten and seventeen days respectively after they were recognized. Two cases of purpura hemorrhagica, on the other hand, had very short durations, death occurring in two days in both. Renal toxicities were variable in duration, ranging from one to nine days in all but 2 cases, in which the durations were fourteen and thirty-four days respectively. The 1 case of dermatitis exfoliativa resulted in death fifteen days after the skin reaction was first recognized. In the 3 cases of sulfonamide reactions in which the drugs were administered intravenously death occurred acutely within twenty-four hours after onset of the reactions.

**Drug and Fever Skin Reactions**—These alone or in combination preceded other signs of drug toxicity in 9 cases. One or both of these symptoms were present in a total of 14 of the 28 cases, in 3 of 8 cases of agranulocytosis, in 3 of 4 cases in which crystalline urinary concretions were present, in 2 cases of acute nephrosis, and in all 4 miscellaneous cases in which a cutaneous reaction or hyperpyrexia were an essential part of the principal toxic reaction. In only 2 of 6 cases of azotemia was drug fever or cutaneous reaction present. In 7 of the remaining 14 cases in which toxicity affected the blood, fever occurred which could not be distinguished from that due to the disease under treatment, while in 7 there were no sustained fever and no cutaneous reactions. When one or both of these two symptoms are attributed to drug toxicity their possible association with other serious toxic manifestations should be considered.

**Diseases for Which Sulfonamide Drugs Were Administered**—Pneumonia treatment was responsible for 14 of the 28 cases reported in this series. This predominance was especially pronounced in the 12 cases of toxicity affecting the kidney, in 9 of which treatment was given for pneumonia. Gonorrhea, on the other hand, was the disease under treatment in only 1 case. The infrequency of toxic reactions in the treatment of gonorrhea has been noted by others and has been

attributed to the relatively small doses of sulfonamide drug administered for gonorrhea. Other diseases for which sulfanilamide treatment was given were local infections 3 cases, upper respiratory infections 3 cases, infected surgical wounds 2 cases, bacterial endocarditis 1 case, cystitis 1 case, carbuncle 1 case, acne 1 case and rheumatic fever 1 case.

#### FREQUENCY OF DEATHS DUE TO SULFONAMIDE TOXICITY

Experience shows that case reporting is rarely complete. More complete reporting of sulfonamide toxicity was therefore sought by specific inquiries to physicians and hospitals reporting deaths due either to primary pneumonia or to pneumonia classified as secondary to another disease. Pneumonia was chosen as the subject of the questionnaire because treatment of pneumonia is the commonest source of reports of fatal sulfonamide toxicity. Questionnaires were sent out for 1,000 consecutive cases and filled out and returned for 993. One or more sulfonamide drugs were administered in 645 of these. Complete case records were studied for 20 that presented the most serious toxic symptoms. In 1 the diagnosis of sulfonamide toxicity was well established (11, purpura hemorrhagica), and in 3 evidence for the diagnosis of sulfonamide toxicity associated with death was acceptable (7, agranulocytosis, 22, azotemia and 23, azotemia). Four of these cases are included in the 28 cases of fatal sulfonamide toxicity. Only 1 of these 4 fatal cases of sulfonamide toxicity (7) had been reported through ordinary channels before the questionnaire was submitted. Evidence was therefore obtained that reporting by the usual methods was not complete. A rough calculation of the degree of completeness may be made by comparing the proportion of the cases of fatal sulfonamide toxicity among the pneumonia deaths the subject of questionnaire with the proportion of cases of fatal sulfonamide toxicity reported as occurring in cases of pneumonia among the estimated total number of cases in the city in which sulfonamide treatment was administered. The ratio of toxic deaths in the questionnaire was 4 in 645, or 1 death due to sulfonamide toxicity in 161 pneumonia deaths. The ratio for the city as a whole was 8 in 5,480 estimated pneumonia deaths,<sup>3</sup> or 1 death due to sulfonamide toxicity in 685 pneumonia deaths. In one borough with the best record of case reporting, however, the ratio was 5 fatal reactions in an estimated 1,778 pneumonia deaths in cases in which sulfonamide drugs were administered, or 1 death due to sulfonamide toxicity in 356 pneumonia deaths. These calculations confirm our impression that reporting of sulfonamide deaths by the ordinary methods is incomplete but that it can be increased considerably under certain conditions.

The questionnaire also furnished additional information as to the frequency with which drugs were employed. During this period sulfathiazole was the drug most often used for the treatment of pneumonia. Sulfathiazole was given in 329, or 51 per cent, of the 645 cases, sulfapyridine in 168, or 26.1 per cent, sulfanilamide in 23, or 3.8 per cent, sulfadiazine in 18,

or 2.8 per cent, and more than one drug in 107, or 16.6 per cent. Despite the frequent use of sulfathiazole only 1 of the 4 cases of sulfonamide toxicity associated with death revealed by the questionnaire followed sulfathiazole, while 3 followed the use of sulfapyridine. It has been noted, however, that sulfathiazole was the drug most often administered in the 27 cases described. This may have been due merely to the more frequent use of sulfathiazole during this period in the treatment of disease. There is no evidence in this study that sulfathiazole is more often followed by fatal toxicity than the other commonly used sulfonamide drugs.

#### SUMMARY

The 28 reported cases of sulfonamide toxicity associated with death conform to one standard of diagnosis. They were reported almost entirely by ordinary methods in one year in a city in which a total of 74,553 deaths from all causes occurred, or approximately 1 fatal case of sulfonamide toxicity in every 2,571 deaths from all causes. One fatal sulfonamide reaction was reported by ordinary means among every 685 estimated pneumonia deaths. The highest frequency was found to be 1 sulfonamide death among 161 reported pneumonia deaths by supplementary inquiries on sulfonamide toxicity to physicians reporting deaths from pneumonia. Since the present fatality rate of pneumonia is in the neighborhood of 10 per cent, it may be estimated that there is as many as 1 sulfonamide death for every 1,610 pneumonia cases in which sulfonamide drugs are employed. These numbers are believed to be as near to the actual incidence of death due to sulfonamide toxicity as one may approach by ordinary methods of reporting at this time. Difficulties encountered in making positive assertions as to causes of death in such cases are illustrated by the necessity for considering the diagnosis as well established in some cases and merely acceptable in others. Such diagnostic difficulties must often deter physicians from reporting sulfonamide toxicity as a cause of death. It was therefore assumed that reporting would be incomplete, and this assumption was substantiated by the results of the questionnaire. The incidence of sulfonamide toxicity associated with death as found here is an improvement on previous data because of the relatively large numbers involved, and it is therefore useful despite its known incompleteness as a basis for discussing the present significance of sulfonamide deaths. These data will also be of value as a comparative figure for other similar studies.

#### COMMENT

Although few individual physicians treat enough patients with sulfonamide drugs to make the risk of fatalities approach certainty within periods of one or even several years, every physician using sulfonamide drugs runs some risk of observing such a fatality among his own patients. The serious problem presented by the combination of great therapeutic value with definite toxic hazards must be faced by the profession.

The frequency of fatal sulfonamide toxicity makes it necessary to consider the possibility of reducing their numbers. Measures are being actively sought to avoid serious toxic reactions, but so far with little success. It seems possible, however, that the use of less drug in each case would prevent the occurrence of some reac-

<sup>3</sup> Estimated to correspond with those considered in the questionnaire as follows: 3,380 recorded primary pneumonia deaths times 2.49 equals an estimated total of 8,431 deaths in which pneumonia was the primary or contributory cause. 65 per cent of 8,431 equals 5,480, the number of pneumonia deaths in which it is estimated that sulfonamide treatment was given.

tions. Emphasis on early diagnosis of susceptible infections and early treatment with resulting more rapid and more complete therapeutic effects is the most desirable method of decreasing the amount of drug needed in each case. It is not advisable to change standard dosage schedules which are known to be successful, since they are based on experimental demonstration of the necessity for certain minimum blood levels of the drugs for maximum therapeutic effect.

Even after the onset of toxic symptoms, measures may be taken to reduce the number of fatalities. Early recognition of serious toxic symptoms, followed by prompt cessation of drug therapy, is of considerable importance. Symptomatic therapy, such as transfusion in blood dyscrasias, alkalization of urine in hemoglobin nephrosis and instrumental relief of gross urinary tract obstruction may also save some patients. But symptomatic therapy can be only partially successful, and some fatal toxic reactions will continue to occur. It is to be hoped that biochemists will develop therapeutic agents which are less toxic or devise ways of lessening the toxic effects of present drugs.

The frequency of fatal sulfonamide toxicity makes it necessary to consider whether the beneficial results of sulfonamide drug therapy are sufficient to justify the continued use of these drugs as now practiced. Since low fatality rates have been shown to result from sulfonamide therapy in many infections, the changes in reported deaths from diseases for which sulfonamide drugs are now used should give some indication as to whether lives are actually being saved. Striking changes have occurred in the number of reported deaths in New York City from the fourteen following infections for which sulfonamide drugs are used to treat the infection itself, to treat predisposing conditions, or to treat serious complications: cerebrospinal (meningococcic) meningitis, scarlet fever, erysipelas, measles, meningitis (not meningococcic), diseases of the ear and mastoid process, pneumonia (all forms), empyema, diseases of the pharynx and tonsils, appendicitis, abortion with mention of infection, infection during childbirth and through the puerperium, phlegmon and acute abscess, and osteomyelitis and periostitis. It is estimated that if the average mortality rate from these causes of 137.5 deaths per hundred thousand of population during the five years 1932 through 1936, before the introduction of sulfonamide drugs had persisted through 1941, 10,341 deaths would have occurred instead of the 4,475 reported, a difference of 5,866 deaths.<sup>4</sup> While the number of deaths from many of these diseases was decreasing before this period and were subject to other influences than the introduction of sulfonamide drugs, it may reasonably be assumed that some part of the decrease in each of these conditions was due to sulfonamide therapy. It is safe to say that the number of lives saved by sulfonamide drugs in New York City in 1941 was very much greater than the number of deaths caused by the toxic action of these drugs.

Bacterial endocarditis presents a special application of sulfonamide drug treatment, because the disease is almost invariably fatal and therefore fatalities which appear to be due to the drug are also usually considered due in part to the disease. The number of recoveries resulting from drug therapy is, however, small, and it would be well to demonstrate that the number of

recoveries from sulfonamide treatment of bacterial endocarditis is greater than the number of cases in which serious terminal toxic reactions occur in evaluating drug therapy of this disease.

In acute gonococcic infections, few or no lives are saved, but since 85 per cent of the cases result promptly in cure by one course of a relatively small dose of sulfathiazole, the prospect of eradicating this disease is considered well worth the few serious toxic reactions that result from sulfonamide treatment.

Our present satisfactory experiences with sulfonamide treatments encourage their extension to other diseases. Such extensions should be based on therapeutic trial carried out to assemble clear information as to therapeutic and toxic effects. Such extension may, however, be directed toward the prevention of sequelae of the disease under treatment, the prevention of infections resulting from operative procedures, the prevention of recurrences of disease such as acute rheumatic fever or toward the cure of the carrier state for various pathogenic bacteria. It is essential that such preventive use of sulfonamide drugs should be considered successful only when fatal toxic reactions are entirely avoided.

This study of fatal toxic reactions following the use of sulfonamide drugs in one year in New York City presents no evidence that would modify the course that is being pursued in the routine use and in the experimental extension of the use of sulfonamide drugs. The benefits derived from this course are much greater than the risk of serious toxic reactions incurred.

#### ABSTRACT OF DISCUSSION

DR PERRIN H. LONG, Baltimore. Dr. Sutliff and his co-workers are to be congratulated because theirs is the first attempt to find out how many people have died as the result of treatment with sulfonamide compounds. Some of our more pessimistic friends were not completely right, as the report shows, that sulfonamide therapy is not a leading cause of death. This study brings up another question: What is happening to our population from the point of view of becoming sensitized to sulfonamide drugs? Recently I reviewed many figures dealing with the incidence of sulfonamide toxicity in adults and, if one considers fever, rash, acute hemolytic anemia, leukopenia, granulocytopenia, hematuria, oliguria, azotemia, anuria and liver damage as the important toxic reactions, one finds that with sulfanilamide one gets a total of 11.9 per cent complication, with sulfapyridine 15.9 per cent, with sulfathiazole 18.6 per cent and with sulfadiazine 6.5 per cent. These percentages are based on records from thousands of adults and probably are statistically correct. In 1941 there were probably about 750,000 pounds of sulfapyridine produced in this country, 1,200,000 pounds of sulfanilamide and between a million and million and a half pounds of sulfathiazole. A certain amount of this production was used in veterinary medicine, a small amount in dentistry and a fair amount was exported, but that still leaves a great deal of the sulfonamides for use in this country. One can judge that somewhere in the neighborhood of 10 to 15 million people received one of the sulfonamide derivatives last year. With this in mind, and with our knowledge of the frequency with which sensitivity to these drugs arises, it shows that these drugs should not be administered unless definite indications for their use is present, otherwise we shall gradually sensitize a large section of our population. The authors stressed the question of the relation of the size of the dose to the occurrence of toxic reactions. There can be no question that there is a definite relation between the amount of the drug administered to the occurrence of toxic reactions, but there is also another factor, especially with granulocytopenia, namely the time factor. A survey of the literature (there are about 250

cases of granulocytopenia from sulfonamide compounds reported) shows that with but few exceptions this toxic reaction occurs after the twelfth day of treatment. That is why the total dosage often seems great. If one determines incidence in respect to time, one will find that granulocytopenia occurs most frequently between the seventeenth and the twenty-fifth day of treatment with the earliest case occurring in the first week and the latest cases occurring as late as the sixtieth or seventieth day of treatment.

DR RUSSELL L CECIL, New York. Dr Sutliff and his co-workers have made an important contribution to the subject of sulfonamide intoxication as a cause of death. It is clear from their figures that a great majority of the fatal reactions from sulfonamide treatment result either from damage to the kidneys or from depression of the hemopoietic system. In my experience renal damage has usually taken the form of crystalline obstruction in the pelvis or tubules, but apparently a nephrosis or even a nephritis with azotemia may also occur. We must not forget, however, that many of the infections, such as pneumonia, in which sulfonamide therapy is used, are capable of producing by themselves, considerable tubular and glomerular damage. It is quite possible, therefore, that the sulfonamides in such cases may occasionally augment an already damaged tissue. The fatalities resulting from injury to the hemopoietic system may result from granulocytopenia or less frequently from hemorrhagic purpura and aplastic or hemolytic anemia. I was particularly interested in Dr Sutliff's reference to those cases of granulocytopenia which had developed in 6 cases twenty-one or more days after the drug was begun. These delayed reactions are something we must keep in mind, and their occasional occurrence makes it necessary to watch the blood for several weeks after the drug treatment has been discontinued. It is also obvious from Dr Sutliff's study that any one of the four commonly used sulfonamides may be responsible for a fatal reaction. Toxic reactions are much less prevalent with sulfadiazine than with the other sulfonamides, but already a number of deaths have been reported from sulfadiazine therapy. Dr Norman Plummer has determined the incidence of toxic reactions in 1,000 patients treated in our wards at the New York Hospital with sulfadiazine or sodium sulfadiazine. One hundred and five of these patients showed some form of toxic manifestation, but the great majority of these were of a very mild character. Renal irritation, skin rashes and drug fever made up the greater number of the reactions, and none of these were of a serious nature. The one fatal reaction was a thrombocytopenic purpura. Strangely enough, the only fatal reaction which I have encountered in private practice was also due to hemorrhagic purpura. This occurred in a middle aged man with lobar pneumonia and followed the administration of about 40 Gm of sulfapyridine. Finland has recently reported 445 cases in which sulfadiazine therapy was employed with no deaths. His percentage of toxic reactions was about the same as that observed by Dr Plummer. Perhaps the surest way to avoid fatal toxic reactions is to use the minimum amount of drug necessary to control the infection.

**The Average Doctor**—Honour the physician with the honour due unto him for the uses which ye may have of him'. So wrote Jesus Ben Sirach, the son of Sirach. The usefulness of the doctor, then, is his mark of distinction, and the wish to spend his life in a useful manner is probably the closest approach to altruism that most physicians achieve. There are some, undoubtedly, who hear the call to minister to humanity as a sacred duty, and if they are sincere they are worthy of special respect, but an intimate acquaintance with the medical profession leads me to believe that the average doctor has neither more nor less nobility of character than has the average decent citizen of the same breeding, environment and education, he simply happens to be more interested than are they in helping people to get well, that is his work, and he loves it but it is not his religion—Irrving, Frederick C. Safe Deliverance, Boston Houghton Mifflin Company, 1942.

## THE SODIUM SALTS OF SULFAPYRIDINE SULFATHIAZOLE AND SULFADIAZINE

THEIR CLINICAL USE BY HYPODERMOCLYSIS

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In a previous communication from this clinic<sup>1</sup> the use of sodium sulfapyridine by hypodermoclysis was discussed. Our purpose in this paper is to describe in more detail our experience with the subcutaneous use of the sodium salts of sulfathiazole and sulfadiazine in addition to that of sulfapyridine and to emphasize that these drugs may be administered safely and conveniently by hypodermoclysis. During the past three years the aforementioned sulfonamide compounds have been administered by this route in 160 cases of pneumonia and other conditions for which this group of drugs was indicated but in which oral administration was difficult or impossible. More recently concentrations of these drugs in the blood have been followed at frequent intervals after hypodermic administration in 19 of these cases. The results of these studies are presented here.

### METHOD OF PREPARATION AND ADMINISTRATION OF SULFONAMIDE SOLUTIONS

The majority of the patients were treated with 0.5 per cent sodium sulfonamide solutions made by dissolving 5 Gm of the sodium sulfonamide in 1 liter of isotonic solution of three chlorides isotonic solution of sodium chloride or one-sixth molar sodium lactate solution. Concentrations of the sulfonamide compounds as high as 0.8 per cent were used. Isotonic solution of sodium chloride was the vehicle most commonly employed.

The solutions were prepared in one of the following ways: 1. The sodium sulfonamide was added to the vehicle and the mixture heated to the boiling point and allowed to cool to body temperature before administration. 2. The vehicle was first heated to the boiling point and allowed to cool slightly and then the drug was added. After cooling, the solution was ready for use. The first method is the more convenient but either may be used without apparent difference in blood concentration or therapeutic response.

The  $p_H$  values of the sulfonamides in saline solution as determined by the Beckman apparatus were as follows: sodium sulfapyridine 10.0, sodium sulfathiazole 9.5 and sodium sulfadiazine 9.2. In spite of the decided alkalinity, these solutions caused no local reactions when injected under the skin.

The solutions described were injected into both thighs by hypodermoclysis over periods of from two to five hours. Some patients were given an initial intravenous injection of from one fifth to one third of the prepared 0.4 per cent to 0.8 per cent sulfonamide solution over a twenty to thirty minute period. The remain-

Dr N. L. Kaltreider assisted the authors in this study.

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<sup>1</sup> Taplin G. V., Jacob R. F. and Howland J. W. Use of Sodium Sulfapyridine by Hypodermoclysis. J. A. M. A. 114: 1733 (May 4) 1940.

ing portion of the solution was then given by hypodermoclysis

From 19 patients blood samples for sulfonamide determinations were taken, in most instances at the following intervals after treatment was started two, four, six, eight, twelve, twenty and twenty-four hours. In some instances, when indicated, a second or even a third hypodermoclysis was given. As a rule it was possible to give the drugs orally after the patient had received from 5 to 20 Gm of the sulfonamide compound subcutaneously. All blood concentrations were done by the method of Bratton and Marshall.<sup>2</sup>

#### BLOOD CONCENTRATION CURVES FOLLOWING HYPODERMIC ADMINISTRATION

The trend of blood concentrations after hypodermic administration of three sulfonamide compounds is illustrated in the charts. The cases selected were chosen because they illustrate the variations encountered and show the limits within which most of the curves fall.

The patients employed in this investigation were all hospitalized, and sulfonamide therapy was indicated for all of them. Most of the patients had pneumococcal pneumonia. Kidney function, as judged by urinalysis and by determinations of the blood nonprotein nitrogen was normal in most instances. The average intake was 3,000 cc in twenty-four hours.

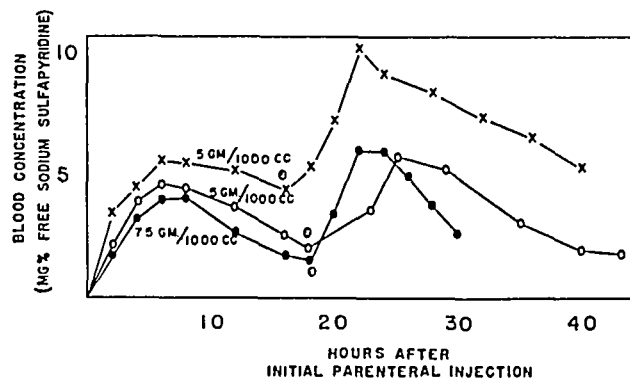


Chart 1—The blood concentration curves following the parenteral administration of sodium sulfapyridine to 3 patients. The 2 patients whose curves are indicated by solid dots and hollow dots received an initial hypodermoclysis of 7.5 Gm and 5 Gm respectively of sodium sulfapyridine in 1,000 cc of saline solution. The patient whose curve is indicated by 'x's' received an initial intravenous injection of 2 Gm of sodium sulfapyridine in 400 cc of saline solution. Immediately thereafter a hypodermoclysis of 3 Gm of sodium sulfapyridine in 600 cc of saline solution was administered. At the points indicated by a circled plus sign a second hypodermoclysis of 1,000 cc was given to each patient. The concentration of the second clysis was the same as that previously given.

When sulfapyridine was employed the maximum blood concentration was reached six hours after the first clysis was started (chart 1). This maximal value varied between 4 and 5.6 mg per hundred cubic centimeters. No obvious relationship was apparent between the dosage and the type of blood concentration curve. The renal function was normal and the fluid intake and output were comparable for each of 3 patients. From twelve to sixteen hours after the first subcutaneous dose was started the blood concentration decreased rapidly. At the end of this interval a second clysis was started. The blood concentration curves following the second hypodermoclysis showed a summation, the second series of values being higher than the first, but they followed the same pattern.

Among the patients receiving sodium sulfathiazole the maximum concentration was attained in from five to eight hours after the first hypodermoclysis (chart 2).

<sup>2</sup> Bratton A C and Marshall E K, Jr. New Coupling Component for Sulfanilamide Determination, J Biol Chem 128: 537 (May) 1939

Approximately the same interval elapsed before the maximum concentration was reached after the second subcutaneous injection. The highest concentrations varied between 3 and 12.4 mg per hundred cubic centimeters. As in the group of patients treated with sulfapyridine, it was impossible to correlate accurately the

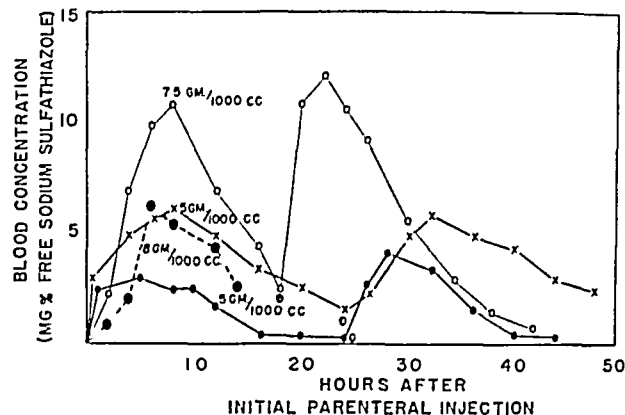


Chart 2—The blood concentration curves after parenteral administration of sodium sulfathiazole to 4 patients. The 2 patients whose curves are indicated by 'x's' and small solid dots received an initial intravenous dose of 1 Gm of sodium sulfathiazole in 200 cc of saline solution. This was followed immediately by a hypodermoclysis of 800 cc of the same 0.5 per cent solution. The 2 patients whose curves are indicated by hollow dots and large solid dots received hypodermoclysis initially of 1,000 cc of 0.75 per cent and 0.8 per cent sodium sulfathiazole in saline solution respectively. At the points indicated by a circled plus sign 3 patients received second hypodermoclyses of 1,000 cc. Each of the latter doses corresponded in strength to that previously administered to each patient.

blood concentration with the dosage, fluid balance and renal function. Likewise as in the group of sulfapyridine treated patients the optimum time for a second hypodermoclysis was from twelve to sixteen hours after the first subcutaneous dose. The blood concentration curves after the second injection followed a pattern similar to that observed in patients treated with sulfapyridine.

The maximum concentrations of sulfadiazine in the blood after hypodermic injection varied from 4.5 to 16 mg per hundred cubic centimeters (chart 3). These values were reached in from four to eight hours after the administration was started. The optimum time for giving the second hypodermoclysis was twenty to thirty hours after the first had been started. The results obtained in this group of patients also illustrate the

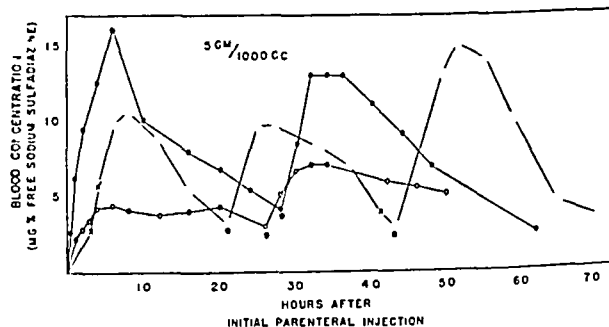


Chart 3—The blood concentration curves after the parenteral administration of sodium sulfadiazine to 3 patients. Each of these patients received an initial intravenous dose of 200 cc of 0.5 per cent sodium sulfadiazine in saline solution after which 800 cc. of the same solution was given as a hypodermoclysis. At the points indicated by a circled plus sign each patient received a second hypodermoclysis of 1,000 cc. of the 0.5 per cent sodium sulfadiazine solution. One patient received a third hypodermoclysis of the same strength and amount.

lack of correlation between dosage, renal function, fluid balance and the pattern of the blood concentration curve. The patient having the lowest blood concentration values had a blood nonprotein nitrogen of 83 mg per



hundred cubic centimeters, while the patient showing the highest blood concentration had apparently normal renal function. In both cases the fluid intake and output were adequate and comparable. In most instances summation was noted in the curves for the second and third hypodermoclyses of sodium sulfadiazine, although there is little evidence of this in the curves selected for illustration in chart 3.

#### COMMENT

From the data presented it is apparent that there are wide variations in the blood concentration curves of different patients following the hypodermic administration of each of the sulfonamide solutions studied. Plummer and Wheeler<sup>3</sup> noted this unpredictable variation in the blood concentration of sodium sulfadiazine when repeated doses were given intravenously. Because of the decided variations in the blood concentrations of the sulfonamide compound attained in different patients following the subcutaneous injections of these drugs, one can neither adopt a standard dosage nor give subsequent doses at arbitrarily fixed intervals. If such a routine was followed 1 patient might receive a toxic dose while another might receive an inadequate one. In order to circumvent these difficulties it is necessary to guide treatment by following the blood concentrations at frequent intervals. By so doing one may determine the pattern of the blood concentration curve for each patient and give subsequent doses at an optimal time, also the dosage may be altered to suit the case in question.

An idea of the pattern of the blood concentration curve may be obtained by determining blood sulfonamide levels between four and eight hours and again between fourteen and eighteen hours after treatment has been started. Subsequent treatment may be guided by the use of these two determinations.

In general, it has been found necessary to give the following approximate amounts per thousand cubic centimeter hypodermoclysis to achieve adequate blood concentrations: sulfathiazole 7.5 to 8 Gm (the blood concentrations may be low even with this dosage), sulfapyridine 5 to 7 Gm and sulfadiazine 5 Gm. In general, the blood concentrations were higher and more prolonged after the use of sulfadiazine subcutaneously than after the use of the other sulfonamide compounds. This difference in the metabolism of sulfadiazine conforms to that noted by others.<sup>4</sup>

It is apparent that the intravenous doses given to several of the patients included here were too small to achieve an immediate high blood concentration. The intravenous doses in the amounts used caused little appreciable difference in the blood concentration curves as compared with those obtained following initial subcutaneous doses. Hence, if one desires to obtain an immediate high blood concentration a larger intravenous dose must be given than was used in this study.

No attempt has been made in this study to evaluate the therapeutic effect of these drugs when given subcutaneously. However, the impression was gained that this route of administration gives results comparable to those achieved by oral administration.

This paper is not an attempt to promote the subcutaneous mode of administration when the drugs can be

given orally. Most patients can and should be treated by the oral mode of administration. However it is felt that giving the drugs by hypodermic injection is a great convenience and gives satisfactory results for patients who are unable to take the sulfonamides by mouth for one reason or another—such as an unfavorable mental state, persistent vomiting and sometimes after an operation.

#### CONCLUSION

1 The sodium salts of sulfapyridine, sulfathiazole and sulfadiazine may be conveniently and safely administered subcutaneously when the patient cannot take the drugs orally. The subcutaneous administration of the sodium sulfonamides to 160 patients caused no local reactions.

2 These drugs may be given subcutaneously in concentrations of from 0.4 per cent to 0.8 per cent in isotonic solution of three chlorides isotonic solution of sodium chloride or one-sixth molar sodium lactate solution.

3 Decided variations in the blood concentrations of the sodium sulfonamides were encountered when given by hypodermoclysis. These values were not predictable. Treatment must therefore be based on the blood concentrations encountered for each individual patient.

4 Sodium sulfadiazine was the most convenient drug to use hypodermically. A 1000 cc hypodermoclysis containing 5 Gm of this drug usually gave satisfactory blood concentrations for about twenty hours.

## AN OUTBREAK OF STREPTOCOCCIC SEPTIC SORE THROAT IN AN ARMY CAMP

### CLINICAL AND EPIDEMIOLOGIC OBSERVATIONS

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This report of an outbreak of streptococcic sore throat in an army camp is made because there were clinical and epidemiologic features of unusual interest.

#### BACKGROUND

The outbreak occurred on June 17, 1942 and the next succeeding few days in a Western army camp. The camp is an assembly center for troops coming from various parts of the country. It is situated in a flat area, the weather is hot and dry in June and ordinarily there is no streptococcic sore throat during this season. At the time of the outbreak the camp was still partly under construction.

#### THE OUTBREAK

The outbreak began with explosive suddenness at a time when there was no illness in the camp. There were, however, a number of men who had had "tonsillitis" at other establishments within the past few weeks before coming to this camp. The number of men reporting sick each day is shown in table 1.

All the cases occurred in the personnel of a single unit (area 1) of some 3000 men. Thus the incidence was approximately 10 per cent. However it is not cer-

Lieutenant Colonel Culpepper and other medical officers gave the authors assistance and advice.

This investigation was aided through the Commission on Hemolytic Streptococcal Infections, Board for the Investigation and Control of Influenza and Other Epidemic Diseases in the Army, Preventive Medicine Service, Office of the Surgeon General, United States Army.

3 Wheeler, Charles, and Plummer, Norman. Sulfadiazine and Sodium Sulfadiazine. A Comparison of Certain of Their Clinical and Pharmacologic Values. *Ann. Int. Med.* 16: 269 (Feb.) 1942.

4 Reinhold, J. G., Flippin, H. F., Schwartz, Leon, and Domm, A. H. The Absorption, Distribution and Excretion of 2 Sulfanilamido-Pyrimidine (Sulfapyridine Sulfadiazine). *Am. J. M. Sc.* 201: 106-115 (Jan.) 1941. Peterson, O. L., Strauss, Elias, Taylor, F. H., and Finland, Maxwell. The Absorption, Excretion and Distribution of Sulfadiazine (2 Sulfanilamido-Pyrimidine). *ibid.* 201: 357 (March) 1941.

tain that all the members of the unit were exposed, so that the exact morbidity in relation to ingestion of streptococci is not known.

#### GROSS EPIDEMIOLOGIC FEATURES

The explosiveness of the outbreak with the great number of cases on the first day without reports of sore throats during the preceding week suggested ingestion

TABLE 1—Incidence of Cases

Date	Number of Cases
June 17	135
18	166
19	37
20	5
21	8
Total	341

TABLE 2—Complications

Total patients	11
Peritonsillar abscess	16
Incised	2
Rupture	2
Spontaneous resolution	14
Otitis media	7
Incised	0
Rupture	1

of streptococci in large numbers. The fact that each area has its own kitchen and mess halls and that the men were all from one area is in harmony with this idea. However, milk, which is the commonest vehicle for infection in outbreaks of this sort, seemed to be ruled out, since it was obtained in individual pasteurized half-pint bottles from a high class dairy. No other article of food could be positively incriminated but it was our impression that some dish which a large number of men ate had become highly contaminated with hemolytic streptococci.

There was no evidence of spread of the infection from person to person. Not a single case occurred among the medical officers or hospital personnel even though they were intensively exposed and were unable to use the usual isolation precautions because the hospital was not yet fully equipped at the time of the outbreak. It seems probable that the streptococci causing the outbreak were relatively "avirulent" and produced disease only because they were ingested in huge numbers. Further evidence to this effect will be presented later.

#### CLINICAL FEATURES

The men came down abruptly with sore throat and malaise and in the more severe cases with chills and high fever. On the whole, very few of the patients seemed dangerously ill, and there were no deaths. The appearance of the throat was typical of acute streptococcal tonsillitis. The tonsils were swollen, in some cases to huge proportions, and they were stippled with white patches of exudate. In those whose tonsils had been removed there was inflammation of the bits of lymphadenoid tissue in the pharynx and tonsillar fossae. In approximately one fourth of the cases there was a classic scarlatinal rash which ran the usual course, with eventual desquamation of the glove type. In other patients there were only traces of the exanthem, and in the majority a rash was not seen at any time. After a few days of fever, sore throat resolved and

general symptoms quickly cleared. Aside from a few insignificant local lesions to be mentioned presently there were none of the usual complications of outbreaks of septic sore throat—no general sepsis, suppurative adenitis or peritonitis.

#### COMPLICATIONS

As already stated, there were no deaths or serious septic complications. The medical officers at the camp furnished the data given in table 2.

These figures were supplemented by our own study of 127 men. Among them there was 1 who gave a story of "abscess in the throat" bursting during the acute attack but with no further trouble. Two men said that about a week after onset they had a running ear (not opened), but there was no drainage at the time of our examination two weeks later.

To sum it up, then, there were to all intents and purposes no septic complications in this outbreak. Whether this unusual state of affairs was due to sulfonamide therapy or to infection with an organism of "low virulence" is not clear.

TABLE 3—Arthralgic Symptoms in Convalescents

Series No.	Severity of Original Attack	Symptoms	Objective Findings July 9	Condition of Throat July 9
110	Moderate	About a week after onset had vague aches and pains—fairly bad—lasted 3 days	None	Throat clear
48	Severe	About a week after onset relapse with a little fever, left knee hurt for 1 day	None	Throat clear, small tonsil
68	Mild	Headache and pain in back ever since onset, left knee hurt for 1 day	None	Throat clear, tonsils out
4	Moderate	Well for a week—then back ached for 2 days, feels well again now	None	Small clean tonsils, large glands at angles of jaws
8	Mild	A little pain in left knee today	None	Throat clear, small tonsils
93	Severe	About 1 week ago right elbow was sore for a day, not since and all right now	None	Large congested tonsils
10	Moderate	Feels stiff and tired each morning	None	Throat clear
112	Mild	Well until today, this morning nausea, malaise and knee ache, temperature subnormal	None	Throat clear, tonsils small and clean
118	Severe	Feels tired, has no energy, has aching through back	None	Tonsils out
115	Severe	Aching of lower part of back since onset—not bad	None	Large clean tonsils
113	Severe	Left fairly well until today, this morning had temperature of 100 F. and has pain in neck and over eyes	None	Huge congested tonsils
109	Moderate	A few days ago both wrists were sore for 2 days, well now	None	Large congested tonsils
114	Mild	Muscles around left knee have been sore	None	Throat clear
21	Mild	Has ached all over ever since onset, not specially in joints	None	Throat clear

#### SEQUELAE

An outbreak of this sort under highly uniform conditions seemed to offer an especially good opportunity for the study of sequelae. We interviewed and examined 127 men on July 9, twenty-two days after onset.

*Septic Sequelae*—There were no late septic complications.

*Adenitis*—There were no instances of general adenitis, although a good many of the men still had

enlarged glands at the angle of the jaw, probably associated with persisting tonsillar infection

*Arthritis, Arthralgia and Rheumatic Fever*—The view is widely held that rheumatic fever may be "activated" by acute hemolytic streptococcal infection.<sup>1</sup> Some observers, however, are not certain that the arthralgia or mild arthritis which often is noted about three weeks after an attack of septic sore throat is true rheumatic fever. It is not our purpose to enter into this discussion now, we shall merely report findings. Fourteen men, or 11 per cent of those interrogated, gave a story of mild symptoms which perhaps fall into this group. The details are given in table 3. It is seen that disability was slight and that there were no objective findings in any case at the time of our examination. So that while the significance of these phenomena is not entirely clear, we are not inclined to interpret them as rheumatic fever but rather to class them with the mild aches and pains which are noted during convalescence from any acute infectious disease and which are not followed by further trouble.

*Blood Pressure*—The readings were made with the subject sitting. With a very few exceptions the men were still in the hospital although ambulatory. The temperature of the room was high and the humidity low. The conditions were such as to promote low rather than high blood pressure. We had no previous control observations. Whenever the reading seemed high it was carefully checked. The results are given in table 4. One gets the impression that there are more men with slight hypertension than one would expect in a group of this sort.

*The Urine*—Here was an unusual opportunity to make careful studies of urinary sediment in a large group of young men who had been subjected simultaneously to a highly specific type of streptococcal infection. Through the cooperation of the medical officers it was possible to collect 59 specimens, which were concentrated according to the specifications of Addis.<sup>2</sup> Specimens of urine were obtained as well from most of the other men in the group. We are indebted to Dr. Thomas Addis for personally examining many of these. It may be said that the quantitative studies of the urinary sediment were conspicuously negative. In no case were there any findings to suggest the presence of nephritis. The few hyaline and granular casts, the occasional red blood cells and white and epithelial cells were within the normal limits laid down by Addis.<sup>2</sup> In case 48 there was a slight proteinuria which we had no chance to investigate further. This outbreak was followed by no case of clinical nephritis and three weeks after onset there were no urinary findings to indicate renal injury. This is not entirely in accord with the observations of Lytle<sup>3</sup> but agrees with our previous experience that, whereas acute nephritis is often preceded by streptococcal sore throat, only an occasional case of septic sore throat is followed by nephritis.

*The Local Condition of the Throat*—Following a streptococcal septic sore throat it is often observed that the tonsils remain large and have a succulent congested appearance for a considerable time before they shrink to their previous proportions. At the time of our

investigation 29, or 23 per cent of the group examined still had tonsils which were definitely congested and obviously had not returned to their usual state although only 2 men complained of dryness and irritation on swallowing.

*Convalescence and General Well-Being*—Tonsillitis is usually considered a mild disease which entails no great disability. The men in this study were carefully interrogated three weeks after onset as to their general strength and well-being. Ninety or 71 + per cent still felt below par generally, tired easily and did not consider themselves ready for duty. Seven or 5.5 per cent, were definitely unwell with great fatigue on slight effort, definite lack of well-being or vague aches and pains. No significant difference was noted between men who had had a rash ("scarlet fever") and those without rash. It is clear, then, that after any variety of streptococcal septic sore throat full recovery in the sense of restoration of physical fitness may often take more than three weeks, a fact which we do not believe is fully appreciated by physicians.

#### BACTERIOLOGIC FINDINGS AND CLINICAL INTERPRETATION

Throat cultures taken on June 20 at the height of the outbreak from a generous random sample of sick men including patients both with and without rash in

TABLE 4—Blood Pressure Readings of One Hundred and Twenty-Six Men

Systolic			Diastolic		
Blood Pressure Mm. Hg.	Number of Men	Per Cent	Blood Pressure Mm. Hg.	Number of Men	Per Cent
Up to 100	9	7.3	Up to 60	7	5.8
101-110	34	27.0	61-70	31	25.2
111-120	43	33.0	71-80	30	23.3
121-130	19	15.0	81-90	27	21.9
131-140	16	12.5	91-100	9	7.3
141+	7	5.5	101-110	21	16.9
	127			117	

\* 110/80 120/80 130/80 140/90 150/90 160/90 170/110

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various wards all showed group A hemolytic streptococci in large numbers. These turned out in every case to be of the same Griffith subtype, namely type 15. This furnishes final proof of a single source of infection, especially as this type has been uncommon in the region and was found by Rantz<sup>4</sup> only seven times among 260 strains.

At this point a digression on the clinical interpretation of the cases with and without scarlatinal rash is necessary, since there is still confusion in the minds of some as to this matter. Briefly, both clinical "tonsillitis" and clinical "scarlet fever" are now known to be specific hemolytic streptococcal infections of the tonsils and lymphadenoid tissue in the pharynx. Certain strains of streptococci produce a soluble toxin which in nonimmune people causes the scarlatinal rash. Absorption of this "rash toxin" is followed by antitoxic immunity to its effects,<sup>5</sup> hence if a person who has had

1 Coburn A. F. The Factor of Infection in the Rheumatic State. Baltimore: Williams & Wilkins Company, 1931. Note J. R. and Jones T. D. Studies of Hemolytic Streptococcal Antibodies. *J. Immunol.* 41: 61-87 (May) 1941.

2 Addis Thomas. The Number of Formed Elements in the Urinary Sediment of Normal Individuals. *J. Clin. Investigation* 2: 409 (June) 1926.

3 Lytle J. D. The Addis Sediment Count in Scarlet Fever. *J. Clin. Investigation* 12: 95 (Jan.) 1933.

4 Rantz L. A. The Serological Typing of Hemolytic Streptococci of the Lancefield Group A. *J. Clin. Investigation* 21: 217 (March) 1942.

5 Bloomfield A. L. and Feltz A. R. Bacteriological Observations on Acute Tonsillitis with Reference to Epidemiology and Susceptibility. *Arch. Int. Med.* 32: 483 (Oct.) 1923.

6 Dick G. F. and Dick Gladys H. Experimental Scarlet Fever. *J. A. M. A.* 81: 1166 (Oct. 6) 1923.

7 Dick G. F. and Dick Gladys H. Scarlet Fever Toxin in Preventive Immunization. *J. A. M. A.* 82: 544 (Feb. 16) 1924. Stock A. H. Further Purification and Concentration of Scarlet Fever Toxin. *J. Biol. Chem.* 142: 777 (Feb.) 1942.

8 Davies J. A. Postscarlatinal Immunity in Patients Treated with Antitoxin. *J. Clin. Investigation* 3: 423 (June) 1926.

"scarlet fever" is later reinfectd with the same organism he may have no rash but only what is ordinarily called tonsillitis.<sup>9</sup> These relations, which explain the paradox of permanent immunity following one attack of "scarlet fever" with susceptibility of the same person to frequent attacks of "tonsillitis," are diagrammed in table 5.

One may raise the question of whether the use of the term "scarlet fever" with the implication of a fundamental difference from acute "tonsillitis" does not serve to maintain confusion and diagnostic quibbling. The entire group should perhaps be referred to as streptococcic septic sore throat (with or without associated scarlatinal rash), and the same rules for isolation and quarantine should hold for all. Health departments that quarantine "scarlet fever" but not "tonsillitis" show complete lack of understanding of the subject.

This position was fully supported by the present study. Among 77 men of whom we had a definite record, 52 had no rash and 25 did have a rash. Eleven among the 77 gave a history of scarlet fever in the past, they were all in the group who had no rash now. Statistical analysis shows only about one chance in a hundred of this finding not being significant. Furthermore, since the same strain of streptococcus was responsible for all the cases, it is clear that absence of

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rash must be explained by immunity to "rash toxin," unless one assumes that the organisms unaccountably failed to produce erythrogenic toxin in certain persons.

Finally, there was no relation between presence or absence of rash and severity of the disease or incidence of complications. This is an important observation, since the question of whether the so-called scarlet fever toxin produces clinical effects other than the rash and whether antitoxin does more than neutralize the rash has never been finally settled. The Dicks, in the early days of the subject,<sup>6</sup> pointed out that their toxin when injected into susceptible human beings produced not only rash but nausea, vomiting, malaise and fever as well. Trask,<sup>10</sup> on the other hand, showed that the clinical severity of the attack did not parallel the amount of "toxin" in the blood serum, finally, the highly purified "erythrogenic" toxin recently isolated by Stock and his associates<sup>11</sup> by electrophoretic methods in such concentrations that there were 100 to 150 million skin test doses per milligram of the material has not been yet tried out for systemic effects.

At any rate, there was no clinical indication in the present outbreak that the patients with rash were suffering from any other symptoms not equally present in the men without rash.

#### RELATION OF TONSILS TO INCIDENCE OF SEPTIC SORE THROAT

It is well known that tonsillectomy confers a high degree of protection against acute streptococcic septic sore throat. Bloomfield and Felty<sup>5</sup> found in the case of an institutional group of 179 persons that among 77 without tonsils 6, or 7.8 per cent, had septic sore throat whereas during the same season among 102 whose tonsils had not been removed 27, or 26.5 per cent, had attacks. Only 6 of 33 cases, or 18 per cent, occurred in persons who had had a tonsillectomy. In the present outbreak we unfortunately have no data on the number in the whole unit with and without tonsils. However, among a group of 127 men whom we examined the condition occurred in only 20, or 16 per cent, who had had a tonsillectomy.

#### PERSISTENCE OF STREPTOCOCCI IN TONSILS DURING CONVALESCENCE IN RELATION TO CASES

During the acute stages of septic sore throat hemolytic streptococci are obtained in huge numbers from the surface of the tonsils and pharynx. In convalescence fewer colonies are isolated from the pharynx, although many can still be recovered from the surface of the tonsils. After a variable number of weeks, surface swabs may no longer yield any hemolytic streptococci, but cultures of material aspirated from tonsillar cysts show that the organisms persist in the depths of the lymphadenoid tissue.

On July 9, approximately three weeks after onset and just before discharge, we took cultures from 36 convalescents. Of these 19, or 53 per cent, yielded hemolytic streptococci from surface swabs. In every case but 1 the organisms were of the same type (Griffith type 15) as those obtained during the acute stage of the disease. The 1 exception was a type 8. It can be concluded, therefore, that when the convalescents were discharged to barracks approximately one half were carriers. In spite of contact with the other men only 1 further case of septic sore throat was reported, on July 7. A culture taken from this man yielded hemolytic streptococci (Griffith type 15), so that he was undoubtedly a "return" case.

A good deal of work has been done recently on the Griffith subtyping of streptococci recovered from the same patient during the acute stages of septic sore throat and later on during convalescence. Some workers have found striking changes in the streptococcic flora of the throat almost from day to day.<sup>12</sup> Furthermore, it has been pointed out that the complications or sequelae which occur in the second or third week after scarlet fever or septic sore throat often seem to be due to a streptococcus of different type from that originally isolated during the acute attack.<sup>13</sup> Some of the work that has been reported is open to criticism on technical grounds, but in the main it is probably correct. It is therefore of note that in the present outbreak cultures made after three weeks showed either the original type of streptococcus (Griffith type 15), with the exception of 1 case, or no hemolytic streptococci at all. The question may be raised (but cannot be answered now) whether the absence of secondary infection with other types of streptococci is to be correlated with the lack of complications in our group.

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It is of great interest that the introduction of large numbers of convalescent carriers into the uninfected group was not followed by more "return" cases, but this is exactly what one would expect on the basis of knowledge of "normal" hemolytic streptococcus parasitism in the throats of healthy persons. It has been shown, first, that under ordinary conditions a person does not become a contact carrier without going through a clinical attack of tonsillitis,<sup>14</sup> and second, that acquisition of disease from a convalescent carrier, again under ordinary conditions of parasitism, occurs only if there is a very high degree of intimate contact.<sup>15</sup> Furthermore, to be infected the person will usually not be a carrier and he must have a low natural resistance to hemolytic streptococcus infection.<sup>6</sup> These considerations are of course altered under conditions of true epidemic spread of streptococci such as occurred in the Army camps in 1918 following measles and influenza.

We are now in a position to interpret the present outbreak. It was clearly not an epidemic in the sense of disease occurring by spread from man to man but rather a mass infection of the entire group from a common source. The failure of contacts to acquire sore throat suggests that the organism was not highly "virulent" and that infection was the result of ingestion of huge doses of organisms. This view is finally confirmed by the fact that when large numbers of convalescent carriers were returned into the general group only 1 case of septic sore throat resulted. In other words, a "normal" state of streptococcal parasitism existed of such a sort that intensive contact with carriers would have been necessary before further disease could be produced. There was no tendency to those obscure upsets of immunologic balance which lead to epidemic spread of streptococci through a group by person to person passage with high incidence of infection.

#### THERAPY AND EFFECTS

Treatment consisted of rest in bed, general measures and the sulfonamides. We are unable to draw definite conclusions as to the efficacy of the sulfonamide therapy. Whether the extraordinary lack of complications and the generally mild course of the disease is to be attributed to the drugs cannot be stated.<sup>16</sup> It should be noted, however, that the sulfonamides have not been found by others to be highly effective in this type of streptococcal infection.<sup>17</sup>

#### CONCLUSIONS

1 A violent outbreak of septic sore throat which occurred in an Army camp was shown to be due to mass infection with hemolytic streptococcus Griffith type 15, a rare organism in the locality in which it occurred.

2 The contaminated article of food was not determined, but milk seemed ruled out as a source of infection.

3 An unusual feature of such a violent outbreak was the absence of complications. There were no deaths.

4 Sulfonamide therapy may have played a part in producing the mild clinical course.

5 From the epidemiologic standpoint it was shown that this outbreak was a mass infection occurring on a background of normal hemolytic streptococcus parasitism which remained essentially undisturbed.

2398 Sacramento Street

## A MILK BORNE EPIDEMIC OF BRUCELLOSIS

CAUSED BY THE PORCINE TYPE OF BRUCELLA  
(BRUCELLA SUI) IN A RAW MILK  
SUPPLY

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Brucellosis of man, or undulant fever, is nearly always of sporadic occurrence. Animals chiefly concerned in the spread of infection are the cow, the hog and the goat. Organisms ordinarily causing infectious (contagious) abortion in these animals are respectively the bovine (*Brucella abortus*), the porcine (*Brucella suis*) and the caprine (*Brucella melitensis*) strains of *Brucella*. Infection in the cow is also known as Bang's disease and in the hog as Traub's disease. Although the possibility of occurrence of infection traceable to the goat needs to be kept in mind, the bovine and porcine strains of *Brucella* are probably the main offenders in most areas of the United States.

Main modes of conveyance of brucellosis to man are (1) through direct contact with infected animals or their abortion products and (2) through use of raw dairy products from infected sources. Brucellosis may occur in epidemic form when raw milk is consumed from cattle infected with a porcine strain of *Brucella* or a highly virulent strain of the bovine variety.

In animal inoculation work at the State Hygienic Laboratory, wide variation has been noted in the virulence of *brucella* strains as isolated from animal and human sources. Difference in virulence may help to account for the varied number of cases which occur among persons using a contaminated raw milk supply or having special forms of contact with infected animals.

In 1929 Farbar and Mathews<sup>1</sup> reported a milk borne outbreak of brucellosis (26 cases) and found that infection was caused by *Brucella abortus*. The agglutination test for Bang's disease proved positive in 7 of 23 dairy cows. *Brucella abortus* was isolated from the milk of 3 of the cows. Huddleson identified the *brucella* strain as of bovine origin.

A milk borne epidemic, comprising 30 cases and caused by *Brucella suis*, occurred in Council Bluffs, Pottawattamie County, Iowa, in 1933, this outbreak was

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reported by Beattie and Rice<sup>2</sup> *Brucella suis* was isolated from the milk of a reacting dairy cow and from the blood of 6 patients

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#### THE MARCUS OUTBREAK

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attributed to the insidious nature of brucellosis and to the long incubation period, which Hardy, Frant and Kroll<sup>5</sup> found to vary from a week to four months

#### TREATMENT

Acute brucellosis is a febrile disease, requiring strict bed rest during the course of illness and for ten days to two weeks after the temperature has returned to normal. An ample bed rest period is probably the best assurance against extended illness, as recurrence, complications and chronicity are less frequent when this regimen is followed.

In recent years the sulfonamide drugs have been used with varying success in the treatment of brucellosis. In the Marcus epidemic these drugs were used very sparingly, owing chiefly to the fact that all patients showed some degree of secondary anemia. In most instances the secondary anemia was a prominent finding, therefore sulfonamide therapy was withheld to avoid the possibility of adding insult to injury.

All the patients received brucellin, as developed by Huddleson and produced by the Iowa State Hygienic Laboratory. This preparation, a culture filtrate of brucella organisms, was given intramuscularly at intervals of three to five days dependent on symptoms. Brucellin is given subcutaneously in amount calculated to produce fever of 102 F or above within a short time following injection. In general, the initial injection was 0.1 cc and the dosage increased or diminished to achieve the desired febrile reaction. Maximum dosage was 1 cc. These treatments were administered until the patient received 1 cc of brucellin without febrile reaction. In most cases three repeated doses were given after the febrile reaction had ceased. The average number of injections was fifteen. After four treatments many of the patients had a temperature not exceeding 100 F in spite of increased strength of injections. One patient had a total of thirty treatments before the desired afebrile condition was achieved.

#### COURSE

The average duration of fever was six to eight weeks. One patient was severely ill and bedfast for twelve weeks. There were no fatalities—all patients were reported (May 21, 1942) as having made satisfactory recovery.

#### SOURCE OF INFECTION

1 *Blood Culture Findings*—In October and early November, blood cultures were obtained from 29 patients, specimens being incubated for a number of days, forwarded to the State Hygienic Laboratory and examined by one of us (I. H. B.). Of this number, *Brucella suis* was isolated from 13 or 45 per cent, had blood cultures been taken earlier in the course of the disease, a higher percentage of positives would have been expected. These findings confirmed the original conjecture that *Brucella suis* was the infecting agent. All the brucella strains isolated from this outbreak and identified as *Brucella suis* by the Huddleson method<sup>6</sup> were verified by the author of the method.

2 *Findings on the Dairy Farm*—(a) *Dairy Cows*. Among 43 cows belonging to the W. H. Dairy, 4 reacting animals were encountered, 3 of which were definitely positive and a fourth one suspicious. *Brucella suis* was isolated from the milk of 2 of the reacting animals on direct culture of the gravity cream, using the Huddle-

son dye method and on blood and tryptose agar medium. On guinea pig inoculation *Brucella suis* was isolated from the cream of 3 of the reacting animals.

Lesions produced in guinea pigs inoculated with cream and with pure cultures isolated from the blood of ill patients at Marcus were mild in nature compared with lesions produced by other strains of *Brucella suis* previously isolated from similar sources. The laboratory and clinical findings suggest a *Brucella suis* strain of relatively low virulence. Whether virulence might have been reduced by residence in the cow's udder is a matter of speculation.

(b) *Sows on the Farm*. Inspection of the farm showed that hogs and dairy cows were allowed to mingle freely in the same lot. No history of frank abortion among sows was obtained, although the owner stated that about 20 young pigs, littered in the spring of 1941, were found dead after delivery, some living as long as a month. Blood tests on these animals, however, left no doubt as to their being infected. Twenty-four sows were tested of which 11 showed positive and 3 suggestive agglutination reactions for infectious abortion.

#### COMMENT

1 In recent years articles by Alice Evans<sup>7</sup> and Simpson<sup>8</sup> have emphasized the importance of the blood culture and of repeated agglutination tests in the diagnosis of brucellosis, in particular the chronic form of this disease.

2 In spite of the apparent efficacy of brucellin when administered early in the course of illness, there are individuals who react with extreme elevation of temperature and exhaustion following the initial dosages. Three such patients in the Marcus outbreak were given sulfathiazole with satisfactory response and recovery.

3 On farms regarded as the source of infection of *Brucella suis* as isolated from the blood of patients, we have found it not unusual to fail to secure a history of abortion among hogs. This observation is in agreement with the following quotation from McNutt<sup>9</sup>: "Although abortion is one of the symptoms of *Brucella suis* infection in swine, it does not occur in the larger portion of cases." Agglutination tests are essential to the discovery of infectious abortion among hogs.

4 One of the patients in the Marcus outbreak, an expectant mother with one healthy child, acquired brucellosis in moderately severe form, being confirmed by a positive agglutination test. She aborted twin embryos during the fourth or fifth month of gestation, there was no other discernible cause for the abortion.

5 Among multiple cases which occurred in different homes during this epidemic, it is of interest to note that all 6 members of one family and, in another home, 6 of a family of 12, suffered an attack of brucellosis.

#### SUMMARY AND CONCLUSIONS

An epidemic of brucellosis included 77 persons who showed positive clinical or agglutination findings caused by the porcine strain of *Brucella* (*Brucella suis*) in a raw milk supply.

1 Isolation of *Brucella* from a blood culture stands first as a diagnostic aid in confirming the clinical diagnosis of brucellosis. Such isolation, moreover, when

<sup>7</sup> Evans, Alice C. Studies on Chronic Brucellosis. *Pub. Health Rep.* 52: 1072-1077 (Aug. 6), 1419-1427 (Oct. 8), 1937. Evans, Alice C., Robinson, Frank H. and Baumgartner, Leona. *ibid.* 53: 1507-1525 (Aug. 26), 1938.

<sup>8</sup> Simpson, Walter M. The Diagnosis and Management of Brucellosis. *Ann. Int. Med.* 15: 408-430 (Sept.) 1941.

<sup>9</sup> McNutt, S. H. *Brucella Infection in Swine*. *Proc. 42d Ann. Meet. U. S. Live Stock Sanit. A.* 1938-1939, pp. 90-97. *abstr. Bull. Hyg.* 16: 580 (Nov.) 1941.

<sup>5</sup> Hardy, A. V., Frant, Samuel and Kroll, M. M. The Incubation Period in Undulant Fever. *J. Med.* 19: 408-412 (Oct.) 1938.

<sup>6</sup> Huddleson, I. Forrest. Differentiation of the Species of the Genus *Brucella*. *Am. J. Pub. Health* (May 21) 1931.



supplemented by the Huddleson dye method, reveals the species of organism and is of great value in establishing the animal source of infection

2 The agglutination test, repeated when negative, is second as a diagnostic aid to isolation of *Brucella* from the blood stream

3 A positive intradermal test with brucellergen indicates recent or past exposure to brucella infection but "does not mean that the symptoms from which the patient is suffering at the time are necessarily due to brucellosis" (Simpson<sup>8</sup>) The skin test is much less reliable than the agglutination test in diagnosis

4 Careful pasteurization of all dairy products is an essential safeguard against milk borne brucellosis

5 Hogs should not be permitted to run on the same lot with dairy cows

6 Prevention of the occurrence of brucellosis in human beings requires a continuing program and effective measures for the eradication of infectious abortion among farm animals

## THE PREVENTION OF LIVER DAMAGE

### AND THE FACILITATION OF REPAIR IN THE LIVER BY DIET

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Although it is generally believed that attempts to improve the resistance of the liver to injury from hepatotoxic agents is a contribution of the present century, elaborate studies in this field were undertaken during the nineteenth century<sup>1</sup> It was, however, the experiments of Opie and Alford<sup>2</sup> which led clinicians, at least in this country, to believe that a diet high in carbohydrate offered direct protection of the liver from the necrotizing effects of chloroform Their work received confirmation in the later experiments of Davis, Hall and Whipple<sup>3</sup> and Graham<sup>4</sup>

The unfortunate interpretation which clinicians placed on the results of these investigations led them to conclude that a high concentration of liver glycogen would in itself protect the liver from injury from a wide variety of agents, that the detoxifying power of the liver was proportional to its glycogen content and finally that hepatic regeneration would proceed more rapidly on a high carbohydrate diet than on any other

In the early 1920's less and less emphasis came to be placed on the oral intake of foodstuffs in preparing the bad risk liver patient for operation and greater emphasis on the administration of intravenously injected dextrose The rationale which led to this extension

of therapy has been recently summarized by Soskin and Hyman<sup>5</sup> Authors have repeatedly referred to the fact that larger amounts of dextrose could be deposited in the liver when the carbohydrate was administered intravenously than when equivalent amounts of carbohydrate were given orally (Banks and Sears<sup>6</sup>), although it rarely has been considered that larger amounts of foodstuffs can be given by the latter route than by the former

It can be accepted as a fact that storage in important viscera will depend on a food intake sufficient to meet energy requirements on the one hand and to provide for food storage on the other To believe that storage over any period of hours can take place when food intake falls below the needs for energy requirements is to disregard the fundamental laws governing metabolism To perpetuate the statement that "cellular repair of the liver is best facilitated by a carbohydrate diet"<sup>6</sup> violates the fundamental knowledge available to us on cellular repair, for such repair in the main is dependent on protein components available to the regenerating tissue, and on a strictly carbohydrate diet repair would have to depend entirely on the breakdown of endogenous protein Sanders and Garrison<sup>7</sup> have shown that the products of endogenous protein breakdown do not take the place of the protein in an adequate diet during wound repair

In 1924 Moise and Smith<sup>8</sup> called attention to the fact that the diets used by the earlier investigators were neither pure (in the sense of consisting of single foodstuffs) nor adequate in amount for young growing dogs, which were the animals used by the investigators In spite of this, many of us continued to place complete confidence in the carbohydrate diet as a means of protecting the liver from the assault of anesthesia and operation (Ravdin<sup>9</sup>)

It was better to provide in part for the energy requirements of the patient than to bring the patient to operation following a period of starvation Where intravenous dextrose therapy reinforced oral feeding, the program accomplished a good deal and the morbidity and mortality of operations on many of the patients with serious liver dysfunction fell considerably

In 1939 Goldschmidt, Vars and Ravdin<sup>10</sup> reported that maximum protection could not be afforded the liver against chloroform necrosis unless the diet was adequate in composition and amount, and administered for a sufficient time prior to exposure to the hepatotoxic agent They concluded that a liver high in lipid content and high in available protein was maximally protected against injury

Carbohydrate protected the liver from injury if, during the deposition of glycogen in the liver, fat was displaced, according to the hypothesis of Rosenfeld,<sup>1</sup> and if the ingested carbohydrate spared the body stores of protein Protein, on the other hand, was found to be a much more active lipotropic agent than carbohydrate (Johnson, Ravdin, Vars and Zintel<sup>11</sup>) and, in addition, certain components of the protein molecule directly

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From the Harrison Department of Surgical Research University of Pennsylvania School of Medicine and the Surgical Service of the Hospital of the University of Pennsylvania

1 Rosenfeld G *Ergebn d Physiol* 2 50 1903

2 Opie E L and Alford L B The Influence of Diet on Hepatic Necrosis and Toxicity of Chloroform *J A M A* 62 895 (March 21) 1914 *J Exper Med* 21 1 and 21 1915

3 Davis N C Hall C C and Whipple G H The Rapid Construction of Liver Cell Protein on a Strict Carbohydrate Diet Contrasted with Fasting *Arch Int Med* 23 689 (June) 1919

4 Graham E A Toxic Factors of Some of the Common Anesthetic Substances *J Exper Med* 22 48 1915 *J A M A* 69 1666 (Nov 17) 1917

5 Soskin Samuel and Hyman Myer Physiologic Basis of Intravenous Dextrose Therapy for Diseases of Liver *Arch Int Med* 64 1265 (Dec) 1939

6 Banks B M and Sears J B *Am J Digest Dis* 6 83 (April) 1939

7 Sanders G B and Garrison W S *Arch Surg* to be published

8 Moise T F and Smith A H *J Exper Med* 40 13 (July) 1924

9 Ravdin I S Some Aspects of Carbohydrate Metabolism in Hepatic Disease *J A M A* 93 1193 (Oct 19) 1929

10 Goldschmidt Samuel Vars H M and Ravdin I S *J Clin Investigation* 15 277 (May) 1939

11 Johnson Julian Ravdin I S Vars H M and Zintel H A Symposium on Preoperative and Postoperative Treatment Effect of Diet on Composition of Liver in Presence of Obstruction of Common Bile Duct *Arch Surg* 40 1104 (June) 1940



protected the liver from the harmful effects of certain hepatotoxic agents. Messinger and Hawkins<sup>12</sup> found that a similar diet protected the liver from arsphenamine necrosis. Schultz<sup>13</sup> found it to protect against selenium injury, while M. I. Smith<sup>14</sup> reported that it protects against experimental sulfonamide hepatitis.

TABLE 1—Composition of Diet in Calories

Carbohydrate	74	%
Protein	20	%
Fat	6	%
3 000 calories a day in three meals and three interval feedings		

usually with stones in the common duct and many of them had been or were jaundiced at the time of admission to the hospital. Most of them were, in addition, moderately or decidedly obese, a factor which we have come to realize must be considered in deciding whether the patient should or should not be placed on a diet for some days prior to operation.

It was not always possible to get the patient to eat as much as we thought was necessary, and in such instances we have at times resorted to tube feeding, a method which is not used as frequently as it should be. In addition to the diet the patients received 100 mg. of thiamine hydrochloride and one of the potent bile salt preparations. Such accessory therapy is, we believe, useful.

TABLE 2—The Relation of Obesity to Hepatic Fatty Acid

Build	No. of Patients	Fatty Acid Gm. per 100 Cc
Average	31	3.9
Under normal	7	3.2
Obesity +	12	4.6
Obesity ++	21	6.4
Obesity +++	5	10.3±

A few years ago we found that approximately 29 per cent of patients with long standing gallstone disease had abnormally high amounts of lipid present in the liver. We have now studied the composition of the liver in 127 patients operated on for biliary tract disease. The operations were all done under local or spinal anesthesia. Some of the patients were not on a special diet prior to operation, while others were on a diet which we considered adequate in composition and amount for from five days to one month prior to operation.

The diet consisted of approximately 74 per cent of carbohydrate, 20 per cent of protein and not more than 6 per cent of fat. The carbohydrate was in large part obtained from the banana, for this foodstuff was found to be well tolerated by the patients. The protein in large part consisted of casein in the form of cottage cheese, skimmed milk and Casec. (A sample diet is given in table 1.) The diet must be varied in order to encourage the patient to eat a sufficient amount of food.

Only those patients were placed on a diet who gave evidence of long standing disease or serious interference with biliary function or who were jaundiced at the time of admission to the hospital. The patients operated on shortly after admission to the hospital did not appear to be ill or gave little or no evidence of serious hepatic injury.

This paper is based on the data obtained from 127 patients. Of these 37 were maintained for five days or more prior to operation on a diet adequate in composition and in caloric intake. In any consideration of diet it is important to select a diet which is adequate in the various constituents and which, at the same time, is sufficiently variable so that it will not become monotonous. It is important not only that the patients be offered a satisfactory diet but that they eat it. It cannot be too strongly pointed out that a high caloric intake is just as important as the composition of the food.

The patients we have had on a diet were all bad risk patients who had long standing biliary tract disease.

## THE RELATION OF OBESITY TO HEPATIC FATTY ACID

An accurate record was kept of the build of 76 patients not on the diet. The data are given in table 2. It can be seen that increasing obesity is, as a rule, associated with an increasing concentration of hepatic lipid. It is interesting to note that the supposed inverse relationship between hepatic lipid and glycogen concentrations was not always present in these patients. Some of the highest hepatic glycogen concentrations were found in patients whose hepatic fatty acid concentrations were above 12 per cent. Conversely, some of the very low hepatic glycogen concentrations, 1 per cent or below, were found in patients with a normal fatty acid concentration. The reciprocal relationship between glycogen and fat described by Rosenfeld,<sup>1</sup> as a rule, was not found in these patients. No reliance, therefore, must be placed on the concentration of liver glycogen as an indicator of the lipid concentration.

## THE RELATION OF HISTOLOGIC DIAGNOSIS TO HEPATIC FATTY ACID

We have come to know that the amount of fatty acids found by chemical analysis does not always closely parallel the amount found by histologic staining meth-

TABLE 3—Microscopic Diagnosis of Fatty Infiltration

	No. of Patients	Glycogen	Fatty Acid Gm. per 100 Cc
Mild fatty infiltration	18	2.8	4.6
Moderate fatty infiltration	31	3.5	5.4
Marked fatty infiltration	11	3.5	10.9

TABLE 4—Composition of the Liver

	No. of Patients	Mean Glycogen Gm. per 100 Cc	Mean Fatty Acid Gm. per 100 Cc
Patients not on diet	90	3.0	5.1
Patients with microscopically normal livers	16	2.8	4.1
Patients with severe disease not receiving the diet	10	3.2	14.2
Patients with severe disease receiving the diet	37	7.3	4.2

ods. It can be seen, however, from table 3 that the presence of large amounts of lipid as determined by staining methods does closely follow the chemical determinations.

## THE EFFECT OF DIET ON HEPATIC LIPID

In table 4 are given data which we believe demonstrate that an adequate diet, administered in sufficient amounts and for a long enough period, can condition

12 Messinger W. J. and Hawkins W. B. *Am. J. M. Sc.* 199 216 (Feb.) 1940.

13 Schultz Julius. Unpublished data.

14 Smith M. I., Lillie R. D. and Stohlman E. F. *Pub. Health Rep.* 56: 24 (Jan. 3) 1941.

a liver to minimal injury from a wide variety of hepatotoxic agents. The 37 patients who were on the diet had advanced biliary tract disease. The great majority of such patients without a period of preparation prior to operation run the risk of a variable degree of further degeneration or even necrosis subsequent to anesthetization and the trauma of operation.

The highest fatty acid concentration in the 37 patients on the diet was 7.4 Gm per hundred cubic centimeters while the mean fatty acid concentration was 4.2 Gm per hundred cubic centimeters. On the other hand, a group of 10 patients who were not so well prepared but who had comparable degrees of hepatic injury as determined by microscopic examinations had a mean fatty acid concentration of 14.2 Gm per hundred cubic centimeters.

These data should be compared with those obtained from patients operated on for gallbladder disease but whose livers were reported as histologically normal. In these the hepatic fatty acid and glycogen concentrations were approximately the same as those which were obtained from the livers of patients with advanced hepatic histologic change but who had been on a diet for five or more days prior to operation.

The data demonstrate that one can by diet bring about a change in the liver so that the concentrations of glycogen and fatty acids are practically identical with those found in histologically normal livers. It is interesting to note that the mean concentration of glycogen in the last two groups was the same, while the mean fatty acid concentration varied by more than 300 per cent.

#### THE REGENERATION OF THE LIVER

It is generally agreed that hepatic regeneration takes place rapidly when circumstances favorable to regeneration are offered. For regeneration to proceed at a maximum rate it is necessary that the organism be offered foodstuffs which supply in maximum amount those components which must be utilized for cellular repair. Schultz and Vars<sup>15</sup> have found in the rat that repair is associated with a change in the ratio between the total liver protein and the nucleoprotein, the latter fraction increasing in amount during the period of repair. Such repair can be facilitated greatly if foodstuffs containing nuclear material are present in the diet during this period. Regardless of any other factors which may be involved, it has been found by them that the food best suited for facilitating this repair is liver itself.

During the past year we have placed our convalescing bad risk biliary tract patients on a diet which while similar in caloric intake and distribution to that used prior to operation, contains a generous share of the protein as liver. While it is difficult to evaluate such a procedure in man without further chemical and histologic data, we have been impressed with the smoothness of the convalescence of these patients and with the rapidity with which abnormalities of function which existed prior to operation have returned to normal thereafter. While casein is an active lipotropic agent and provides in maximal amounts those components of protein which provide protection from hepatotoxic agents, liver protein is more useful during periods when repair is desirable. Thus specificity in the protein provided during different phases of care receives additional significance.

#### SUMMARY

1 The ingestion of carbohydrate alone does not afford maximal protection to the liver against a variety of hepatotoxic agents.

2 Glycogen cannot be accumulated in the liver over a considerable number of hours unless the individual is receiving a caloric intake in excess of his basal requirements.

3 Dextrose injected intravenously frequently fails to raise the liver glycogen because the total caloric requirement of the patient is not being provided.

4 Chemical analyses of liver biopsies showed striking correlation between the obesity of the patient and the lipid content of the liver.

5 Chemical analyses of the liver tissue of 37 patients obtained at operation indicates that a dietary regimen based on animal experimental work previously reported is effective in restoring the liver glycogen and liver lipid concentration of patients with severe microscopic damage to the values found in patients with simple cholecystic disease.

6 The average lipid content of severely damaged livers from 10 patients who were not prepared by diet was 14.2 per cent. The average lipid content of 37 patients who were prepared five days or longer with diet was 4.2 per cent. The glycogen content in the latter group was 3.3 per cent as compared with 2.8 per cent in a control group composed of specimens from 16 patients not receiving diet but with microscopically normal livers.

The diet employed consisted of at least 20 per cent protein, not over 6 per cent fat and 74 per cent carbohydrate. An adequate caloric intake is most important and was insisted on.

Before operation most of the protein content was in the form of casein. Following operation calf's liver is preferred on the basis of the experiments of Vars and Schultz,<sup>16</sup> which indicate that it facilitates the regeneration of liver tissue most effectively.

#### ABSTRACT OF DISCUSSION

DR. WALTER C. LEE, Philadelphia: This work, if confirmed, will mean the necessity for abandoning our faith in carbohydrates as the only agent to prepare patients with liver damage for surgery, the appreciation that, in addition, we must use protein, and that the ideal protein is liver tissue itself. The early work of Opie, Alfred, Davis and Hall and Whipple, which dates to 1914, and their conclusions that a high concentration of liver glycogen amply provided the necessary protection from a wide variety of agents, such as trauma, anesthesia and other toxic substances, was generally accepted, even by Ravdin, as late as 1929. In 1939 he first called attention to the fact that it was only when the liver was high in lipid content and available protein that its maximum protection against injury existed, and as a corollary that protein was far more active as a hepatotrophic agent than the carbohydrates. His suggestions as well as his experiments on animals and human beings are that this ideal diet which Drs. Ravdin and Rhoads have outlined is all right but it must be so palatable that the patients can eat it. Ravdin has found that, if it is not palatable and the patient refuses to take it, its need is so definite that it should be given by tube. As a result of their continued animal experiments and clinical work he is convinced that an adequate diet, as outlined in this paper, in sufficient amounts and given for a long enough time, will condition the liver against a large number of hepatotoxic agents and that when the liver is not so conditioned preoperatively there always exists the risk of liver damage in the form of degeneration and necrosis, as follow the routine anesthetic agents and operative trauma. Ravdin claims that patients when prepared by protein in addition to carbohydrate

<sup>15</sup> Vars, H. M. and Schultz, Julius. Personal communication to the authors.

will have but one third of the fatty acid concentration present, compared to those who are not so prepared, in other words, one third of those not prepared will have two thirds more fatty acid concentration. By taking tissue from the liver at the time of operation of patients who have been prepared with protein, they have found that it is quite possible to place the liver in a normal condition and that when they are not so prepared the figures already stated have been more or less constant. It would seem that he has demonstrated the fallacy of our depending entirely on the carbohydrate diet for the preoperative preparation of patients with damaged livers and he has made a constructive suggestion that by adding adequate protein to the carbohydrate diet it is possible preoperatively to place the liver of the patient in almost a normal condition.

## TREATMENT OF BRONCHIAL ASTHMA

A SURVEY OF THE VALUE OF TREATMENT IN  
FOUR HUNDRED AND FIFTY-NINE CASES  
DURING TWENTY YEARS

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AND

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The practice of allergy has developed into a major medical science within the past twenty years. It now seems advisable to analyze the results obtained in the treatment of the most important allergic condition, bronchial asthma.

This survey is divided into two parts. The first deals with the condition at this time in 207 cases previously reported<sup>1</sup>. The second concerns an additional 252 cases. No case was included unless the period of at least one year had elapsed since treatment was started, and this period of observation ranged up to twenty years. Cases from private practice were utilized in both studies because the cooperation of this group is greatly superior to and the information obtained much more reliable than that which can be secured in the clinic.

### METHODS OF INVESTIGATION

Every effort was made to obtain correct information. With patients no longer under treatment, the data were usually secured by a questionnaire (fig. 1), with a return self addressed, stamped envelop, this brought in a fairly large number of answers, but in some cases a follow-up letter was more successful. Personal telephone calls were sometimes necessary, and, in a number of instances, the physician who had referred the patient was able to comment on the present status. A summarizing card (fig. 2) was made out for each patient and those still under observation or treatment had the card filled out directly from the history chart.

### DIAGNOSIS OF BRONCHIAL ASTHMA

By means of a careful history and physical examination, all patients in the two groups were definitely diagnosed as suffering from bronchial asthma. Scratch tests were made at first, and, in cases in which sufficient information was not secured, intracutaneous tests followed. Ophthalmic and nasal tests and passive transfer tests were carried out when indicated. Clinical experiments

with suspected allergens were made whenever possible and constitute our most authentic method of obtaining accurate information.

In addition complete blood counts, urinalyses and Wassermann or Kahn tests were routinely done, and the sputum was examined both for tuberculosis and for eosinophils. Most of the patients were examined with a fluoroscope and chest films were also taken in suspicious cases. Other laboratory tests e. g. electrocardiograms, basal metabolic readings and studies of the blood chemistry, were made in many of the cases.

In the course of the investigation, many patients, for various reasons, were not included. In some the diagnosis of bronchial asthma was in doubt. Those with silicosis, tuberculosis or definite cardiac disease were excluded even though true bronchial asthma may have coexisted. Patients who cooperated poorly also were not included in the study, and in a fairly large number of instances the present condition of the patient could not be discovered.

### METHODS OF TREATMENT

The treatment, whenever possible is that based on the concept of allergy, namely elimination of the offending cause or causes, with great emphasis on the strictness of such elimination. This alone was sufficient in a number of cases. Hyposensitization, or desensitization, was carried out of those patients sensitive to allergens which cannot be completely avoided. These include such inhalant substances as pollen, molds, house dust,orris root, horse dander, feathers and cottonseed. Eggs, wheat and milk are so essential as also to deserve efforts at desensitization, either by the oral or by the hypodermic method.

But, when elimination and desensitization were unsuccessful, or in cases in which the causative factor could not be discovered, we were forced to use various non-specific measures. These are many and varied and time will permit only brief mention of a few. Epinephrine or aminophylline usually gives more or less relief from attacks. Other valuable drugs are ephedrine, the iodides, apomorphine, dextrose intravenously and ether by rectum or by inhalation. Vaccines, stock or autogenous, are often very helpful but probably act nonspecifically. Roentgen therapy, oxygen and helium, hyperpyrexia, instillation of iodized oil in the bronchi, bronchoscopic aspiration, surgery of the nose and sinuses and other procedures all have their advocates in selected cases. In one's enthusiasm for the allergic methods of treatment one must not overlook general hygienic measures.

More detailed observations on various methods of treatment will be found in such textbooks as that of Tuft,<sup>2</sup> they have also been dealt with in various papers<sup>3</sup>

### RESULTS OF TREATMENT

*Follow-Up of Cases Previously Reported*—In 1935 one of us (L. U.) reported on the results of treatment in a series of 207 patients with bronchial asthma who were under observation for a period of one to thirteen

2 Tuft, Louis. Clinical Allergy. Philadelphia W. B. Saunders Company, 1937.

3 Unger, Leon. Food Desensitization in Bronchial Asthma. Illinois M. J. 44: 40 (July) 1923. Clinical Investigations in Allergy. J. Lab. & Clin. Med. 12: 1159 (Sept.) 1927. Prognosis and Treatment of Bronchial Asthma with Special Reference to Pediatrics. Illinois M. J. 58: 270 (Oct.) 1930. Preventive Treatment of Bronchial Asthma and Hay Fever. Ann. Int. Med. 4: 1328 (April) 1931. The Heart in Bronchial Asthma. J. Allergy 2: 17 (Nov.) 1930. Treatment of Bronchial Asthma. South M. J. 28: 35 (Jan.) 1935. Paroxysmal Dyspnea. Diagnosis and Treatment. Illinois M. J. 68: 268 (Sept.) 1935. The Use of Sulfonamide Drugs in Bronchial Asthma. J. Allergy 12: 528 (Sept.) 1941.

Read before the Section on Experimental Medicine and Therapeutics at the Ninety Third Annual Session of the American Medical Association Atlantic City N. J. June 11, 1942.

1 Unger, Leon. Bronchial Asthma—Results of Treatment in Two Hundred and Seven Patients Under Observation for a Period Varying from One to Thirteen Years. J. Allergy 7: 364 (May) 1936.

years.<sup>1</sup> We now wish to discuss these same 207 patients with reference to their condition during the past seven years.

Table 1 shows the results of treatment in 1942 as compared to those in 1935. It can readily be seen that the percentages of those who obtained 100 per cent relief from symptoms for over a year or more were approxi-

You were under my care for Asthma in \_\_\_\_\_  
As a part of an intensive study of Asthma it becomes important to know what has become of you. I would appreciate it if you would answer the following questions as accurately as you can.

- 1 If you are cured when did the Asthma leave you? \_\_\_\_\_
- 2 Have you had any Asthma since I last saw you on \_\_\_\_\_?  
If so how much trouble (mild, moderate, severe)? \_\_\_\_\_ What time of year? \_\_\_\_\_  
Have you had to take injections or \_\_\_\_\_  
Are you exposed to animals if so kind \_\_\_\_\_?  
Do you sleep on feather pillows? \_\_\_\_\_ Rubber covered? \_\_\_\_\_
- 3 Have you taken or are you taking treatment for your Asthma from some other physician \_\_\_\_\_? If so what sort of treatment \_\_\_\_\_?  
What results \_\_\_\_\_?  
Have you had any surgical operation for Asthma \_\_\_\_\_?  
If so what kind and what results \_\_\_\_\_?
- 4 Have you at any time changed climate because of Asthma \_\_\_\_\_?  
If so for how long where did you go and what were the results \_\_\_\_\_?

In any case I am anxious to know about you and I ask that you write any additional information about yourself and your Asthma on the back of this letter. All this will be of great service to those who suffer from Asthma. I would appreciate it if you would return this letter and answers promptly to me in the enclosed stamped envelope. What is your present address?

Yours sincerely

Fig. 1—Questionnaire employed in this study.

mately the same. Likewise, the percentages of those who obtained 25 to 95 per cent relief were almost the same. The number of patients who received no benefit was less in 1942 than in 1935, chiefly because the num-

#### CLINICAL CLASSIFICATION

Name	Age at Onset	Sex	A	First Rec.
Address	Occupation	Source		L. H. Rec.
<b>HISTORY</b>				
<b>EXAMINATION</b>		Wt.	B.P.	<b>RESULTS</b>
Type				Diagnosis
Chest & f. r. m. l.				Co. d. l. m.
C. m. Onset				Stair lead seen
Course				At present
Season				Where is
D. r. m. l.				Pyrexia
Freq. exp.				Emphysema
C. m. f. t. r. m.				H. r. t.
R. l. r. d. by				Old. Red. ngs
Other				X-ray chest
II. Bet. Att. k.				Endonephr.
Dyspnea				Blind
Cough				Sp. t. m.
Expectoration				Sk. Tests
Other				C. to voice
Environmental factors				I. r. c. u. l. a. n. e. u. s.
Occup. l. i. f. e. f. a. c. t. o. r. s.				Nose Thro. L. Teeth
Food l. i. f. e. f. a. c. t. o. r. s.				Pyrexia Op.
Drug l. i. f. e. f. a. c. t. o. r. s.				Fl. d. i. s.
Previous tests and res. l. i. f. e.				<b>TREATMENT</b>
Previous treatment				Elimin. t. f.
Change f. l. i. f. e.				Desensit. t. f.
Family History				Vacc.
Past History				Drugs
				Humor. l. f. a. c. t.
				Other l. i. f. e. f. a. c. t.
				Dietary treatment
				Cooperation
<b>REMARKS</b>				

Fig. 2—Summarizing card made out for each patient.

ber of deaths, many of which were not due to asthma, had increased during this period of seven years.

Table 2 analyzes the follow-up in each group. This shows that almost all of those who were entirely symptom free in 1935 were still entirely or almost entirely relieved. One of the 2 who died was accidentally killed, and the other died of lobar pneumonia. Unfortunately, we are unable to trace 9 of these 45 patients.

Nineteen of the 104 patients previously classified as improved have by now been symptom free for over a year, but 4 are worse and 6 have died. Of the 37 patients previously reported as unimproved, only 9 are now improved and 8 have died.

The best results were obtained in youngsters and especially in those in whom the offending cause was found and eliminated.

**Survey of Entire Group of 459 Cases**—In addition to the 207 patients just analyzed, an additional 252 patients have been added, this making a total of 459. The second group has been under observation for from one to eight years.

In the 1935 report, we divided our cases into "extrinsic" and "intrinsic," in accordance with the suggestion of Rackemann. An "extrinsic" patient is one who has been found hypersensitive to one or more allergens. All patients whose causative allergens were not discovered were placed in the "intrinsic" group, wherein it is

TABLE 1—Follow-Up After Seven Years of 207 Cases of Bronchial Asthma, with Results of Treatment

Results	1935		1942	
	Number of Cases	Percentage	Number of Cases	Percentage
100% (cured)	45	21.7	43	24.3
Improved	101	50.2	82	40.3
Unimproved	37	18.0	10	9.0
Dead	21	10.0	36	20.3
Not traced			30	
Total	207	100.0	207	100.0

TABLE 2—1942 Follow-Up of Groups of Cases Reported in 1935

Results	1935 Number of Cases	Results in 1942				
		100% (Cured)	Im proved	Unim proved	Dead	Not Traced
100% (cured)	45	23	11 (90-95% relieved)		2	9
Improved	104	19	63	4	6	10
Unimproved	37	1	8	10	8	8

thought that the asthma is due to something within the body, possibly bacteria. The best results were naturally found in the "extrinsic" group.

In the present study we have classified the patients as "paroxysmal" or "chronic," because we believe that this grouping is superior in that it can be made at the time of the first visit and because it indicates a much more accurate prognosis than any other classification. Our good results are usually obtained in the paroxysmal group. Chronic asthma is often complicated by emphysema and chronic bronchitis. While it is true that most patients with paroxysmal asthma show definite positive cutaneous reactions and are therefore classed as "extrinsic," this is not always the case, since some of these patients classified as "extrinsic" have acquired chronic asthma.

Table 3 refers to the sex and age of onset in the entire group. For some unknown reason males predominate in the paroxysmal group and females in the chronic. The most outstanding observation is the high incidence of paroxysmal asthma in the first decade, comprising 144 of the 459 cases. The number of paroxysmal cases diminishes as age increases, and cases are

uncommon in the age group past 50, on the other hand, chronic asthma occurs at all ages, even in patients whose asthma begins in the first ten years of life

The results of treatment are found in table 4, which reveals that the number of those who obtained 100 per cent relief from symptoms was far greater in the paroxysmal group, 93 to 4, likewise, this group included 173 patients who were improved as compared to 72 in the chronic group. Death was much more common among the chronic group, 37 of 161 patients with chronic asthma died, an incidence of approximately 23 per cent as opposed to only 11 of 298 patients with paroxysmal asthma (3.7 per cent)

One also notes that the best results are obtained in those whose paroxysmal asthma begins in the first decade of life. The prospect for complete relief or improvement lessens with increasing age although the table shows that this is not entirely true in each decade. The prognosis is especially good for paroxysmal asthma in the age group 20 to 29

Table 5 summarizes the cause of death in the 48 cases. In 21 instances, death was known or presumed to be due to asthma. When a patient with severe asthma died and the cause of death was not stated and there were no other known contributory factors, asthma was presumed to be the cause of death. This may, of course,

TABLE 3—Sex and Age of Onset of 459 Cases of Bronchial Asthma (Entire Group)

Age at Onset	Paroxysmal		Chronic	
	Male	Female	Male	Female
0-9	95	49	13	25
10-19	10	98	12	16
20-29	18	32	5	17
30-39	17	14	9	14
40-49	10	14	15	14
50-59	3	2	7	10
60-69			2	2
Totals	150	130	62	98

not be correct, and our percentage in this group is probably too high. Sixteen patients died who had both asthma and some other serious condition, e. g. hypertension, cerebral hemorrhage, pneumonia or cardiac decompensation. The asthma of the other 11 patients had been entirely or almost entirely relieved and they might well be classified in the 100 per cent or improved group, but death occurred from some cause other than asthma, e. g. accident, pneumonia, meningitis, carcinoma or bleeding peptic ulcer.

In the first group of 21 who died during asthmatic seizures morphine was known to have been injected in 6 shortly before death, and one may well believe that others in the group may also have received this drug. Autopsy on 2 of those who received morphine revealed almost complete blocking by mucous plugs of the smaller bronchi and bronchioles. Our own experience and that of others has led us to the conclusion that morphine should never be given during an attack of bronchial asthma. Morphine probably kills patients with asthma by depressing the cough reflex so that they cannot cough up the sticky sputum which blocks the air passages, it probably harms also by depressing the cerebral respiratory center and, in some instances, by a hypersensitivity to the drug. We might add that since we abandoned the use of morphine some ten years ago no patient under our care has died of asthma.

Table 6 summarizes the results of therapy in 459 cases. Ninety-seven of the patients obtained 100 per cent relief (21.1 per cent), 245 patients showed improvement varying from 25 to 95 per cent (53.3 per cent), 69 patients were unimproved (15.1 per cent), and 48 were dead (10.4 per cent). The excellent results obtained in the paroxysmal group are clearly shown.

TABLE 4—Results of Treatment in 459 Cases of Bronchial Asthma

Age at Onset	Paroxysmal				Chronic			
	(Cured) 100%	Improved	Unimproved	Dead	(Cured) 100%	Improved	Unimproved	Dead
0-9	55	81	5	2		23	2	2
10-19	9	99	6		2	13	2	4
20-29	17	27	4	1		8	10	4
30-39	8	17	5	1		11	7	1
40-49	4	17		2	2	7	9	11
50-59		2	1	2		9	4	4
60-69						1		3
Totals	95	173	21	11	4	72	48	37

#### REVIEW OF THE LITERATURE

The task of gathering statistics as to results of treatment in large series of cases is so great that very few reports can be found. The early studies of Walker,<sup>4</sup> Larsen and Bell,<sup>5</sup> and Rowe<sup>6</sup> either gave no tables of results or the duration of observation was less than one year which we believe to be the minimum requirement. Menagh<sup>7</sup> in a study of 300 patients with asthma reported that 85 were well, 83 improved and 38 not improved. He states that surgery of the nose and throat cleared up 31 per cent of his cases and that vaccines aided another 44 per cent. Browning<sup>8</sup> in a series of 244 cases of bronchial asthma obtained 95 to 100 per cent relief in 89 instances and 75 to 95 per cent

TABLE 5—Causes of Death in Bronchial Asthma

1 Asthma main or sole cause	21 cases
2 Asthma a contributory factor	16 cases
3 Other causes (asthma not a factor)	11 cases

\* Morphine known to have been injected prior to death in 6 of these patients.

TABLE 6—Summary of Results of Therapy in 459 Cases of Bronchial Asthma

	100% (Cured)	Improved	Unimproved	Dead	Total
Paroxysmal	9	17	9	11	298
Chronic	4	7	43	7	161
Total	97	245	69	48	459

in another 117. He points out that the shorter the duration the better the prognosis and therefore urges early examination. His results with patients whose

4 Walker, I. C. Clinical Study of Four Hundred Patients with Bronchial Asthma. *Boston M. & S. J.* 179: 288 (Aug. 29) 1918.

5 Larsen, N. P. and Bell, S. D. Classification and Management of Asthma in Childhood. *Am. J. Dis. Child.* 24: 441 (Nov.) 1922.

6 Rowe, A. H. Bronchial Asthma in Children and Young Adult. *Am. J. Dis. Child.* 31: 51 (Jan.) 1926.

7 Menagh, F. R. The Result of Treatment in Bronchial Asthma. *Ann. Clin. Med.* 5: 656 (Jan.) 1927.

8 Browning, W. H. The Treatment of Bronchial Asthma in Two Hundred and Forty Four Cases. *New Orleans M. & S. J.* 90: 277 (Nov.) 1937.

asthma begins in the first ten years of life are, like those of ours, much the best obtained in any decade

Claude<sup>9</sup> states that thoracic deformity is especially common when asthma begins during infancy. While Edrington<sup>10</sup> gives no definite statistics, he does say that results obtained by the present day treatment are a vast improvement over those obtained twenty or thirty years ago and that the outlook for the asthmatic patient is not nearly as hopeless as it was in former years. Time and a better understanding of many factors concerned will still further improve our results. Copeland and Keating<sup>11</sup> obtained good results in 80 per cent of 58 children with pollen asthma and hay fever.

We are especially indebted to Rackemann for his surveys as to results of treatment. In 1927 he reported a series of 1,074 private and clinic patients with asthma who had been followed for at least two years.<sup>12</sup> His results were about the same as ours, i. e. about 20 per cent of his patients are in the "cured" class, another 50 per cent are more or less improved, about 20 per cent are no better, and the other 10 per cent are dead. In his series, as in ours, the percentage of "cured" and improved patients is high among those whose asthma begins in the first decade and decreases with each decade. In both series the best results occur in those cases in which the cause can be found and can be eliminated.

In 1928<sup>13</sup> and in 1932<sup>14</sup> Rackemann reviewed his so-called cured group and found that 49 of these 213 patients had had a relapse. From this it is apparent that Vander Veer<sup>15</sup> was probably correct when he stated that "once an asthmatic, a patient is usually a potential asthmatic for the rest of his life." Or, as Rackemann puts it, "the results in the extrinsic group show that cure has been accomplished by the removal of the trigger which fired the attack, but obviously the gun remains loaded in most and probably in all cases. Fundamental allergy is evidently a remarkably persistent trait."

The good results reported in this country by many observers are apparently not obtained by some in other lands. Witts<sup>16</sup> of London stated that after five years of work at the asthma clinic he was very much dissatisfied with the treatment of asthma. He said, "Many American books on allergy read like a detective story. One sees the allergist studying the most intimate details of the patient's life, entering his bedroom and holiday camp, placing in position his greased slides and Petri dishes, estimating the leukopenic index and supervising an elimination diet until the offending allergen is tracked down. Like psychoanalysis, it makes exciting reading, but it is difficult, if not impossible, to apply on a large scale in practice. In any event, the detection of allergens is very different from the cure of asthma." Most of us, I am glad to say, do not agree with these amusing remarks.

#### COMMENT

Despite the probability that the tendency to asthma continues to exist in all asthmatic patients, one must not be downcast. On the contrary, we have shown that by the allergic method of treatment, if carefully supervised and if coupled with good hygienic measures, the results obtained are often phenomenal and long lasting. Not 1 of 36 patients reported as being entirely symptom free in 1935 had a relapse to any extent in the past seven years, and many of the patients previously reported to have improved are now free from asthma.

The outstanding finding in these and in similar studies has been the excellent results obtained in those whose asthma starts in early life, and especially in those whose causative factor has been removed. When we compare the paroxysmal group with the chronic, we are struck with the great difference between the two. The results in the paroxysmal group are excellent, as contrasted to the results in those in whom symptoms are more or less constant. Improvement occurs in about half of the chronic cases, but complete relief is rarely obtained.

It would seem, then, that three important observations can be made. In the first place, one should try to prevent the very onset of asthma, this is especially successful if children of allergic parents are shielded from known causes of asthma, e. g. pets and feather pillows. Second, if allergic symptoms begin, cutaneous tests and other methods of allergic survey should be carried out at once, it is sheer folly to wait until chest deformities, bronchitis and emphysema occur and the symptoms have become chronic. Lastly, since allergic persons may suffer a relapse, they should be kept under observation as long as possible. They may not need treatment but they should not be discharged. They should report for reexamination every few months at first and then perhaps once a year. Patients are very apt to become careless of their environment or diet.

#### SUMMARY AND CONCLUSIONS

1 A follow-up study in 207 cases of bronchial asthma revealed that after an additional seven years almost all patients who previously were symptom free were still in excellent condition. Nineteen of 104 patients previously reported as improved are now 100 per cent relieved, and a few are worse or have died. Those who were unimproved in 1935 were for the most part still unimproved or had died.

2 In addition to these 207 cases, an additional 252 patients have been added to the study, making a total of 459 patients who have been under observation from one to twenty years.

3 Because of the simplicity and because of the more accurate prognosis, the cases have been classified as "paroxysmal" and "chronic." The paroxysmal cases occur chiefly in early life, but chronic asthma is prevalent at any age.

4 Ninety-three of the 298 patients with paroxysmal asthma obtained 100 per cent relief from symptoms as compared to only 4 of the 161 patients with chronic asthma, the percentage of improvement was also much higher in the paroxysmal group, while death occurred in 23 per cent of the chronic cases as contrasted to only 3.7 per cent in the paroxysmal group.

5 The best results are obtained in those who have paroxysmal asthma caused by some allergen which can be found and which can be eliminated. Symptoms in these successful cases are apt to begin in the first decade of life.

<sup>9</sup> Claude F. The Prognosis of Asthma in Infancy. *Bruxelles med* 18: 1054 (June) 1938.

<sup>10</sup> Edrington N. K. *Bronchial Asthma*. New Orleans: M. & S. J. 92: 32 (July) 1939.

<sup>11</sup> Copeland S. C. and Keating J. P. *Pollen Asthma*. Pennsylvania M. J. 43: 1137 (May) 1940.

<sup>12</sup> Rackemann F. M. *Studies in Asthma. I. A Clinical Survey of 1,074 Patients with Asthma Followed for Two Years*. *J. Lab. & Clin. Med.* 12: 1185 (Sept.) 1927.

<sup>13</sup> Rackemann F. M. *Studies in Asthma. II. An Analysis of Two Hundred and Thirteen Cases in Which Patients Were Relieved for More Than Two Years*. *Arch. Int. Med.* 41: 346 (March) 1928.

<sup>14</sup> Rackemann F. M. *Asthma. Two Hundred and Thirteen Cured Patients Followed up Four Years Later*. *Arch. Int. Med.* 50: 819 (Dec.) 1932.

<sup>15</sup> Vander Veer A. Jr. *The Present Status of the Treatment of Hay Fever and Asthma*. *Am. J. M. Sc.* 164: 97 (July) 1922.

<sup>16</sup> Rackemann F. M., Witts L. J. and Boland E. R. *Discussion on Certain Aspects of the Problem of Asthma*. *Proc. Roy. Soc. Med.* 31: 529 (Jan.) 1938.

6 Death occurred in 48 cases, or approximately 10 per cent of the entire series. Of these, asthma was the sole or main cause in 21 cases and was a contributory factor in another 16 instances. The other 11 fatalities occurred accidentally or from disease not related to asthma.

7 Morphine was known to have been given prior to death in 6 cases, and probably caused death by preventing the expulsion of obstructing mucous plugs. Since we have abandoned the use of morphine several years ago we have not had a fatality due to asthma.

8 To prevent chronic asthma, with its relatively poor prognosis, preventive measures should be instituted in the children of allergic parents, and an allergic survey should be made at once if symptoms begin.

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#### ABSTRACT OF DISCUSSION

DR RALPH G. MILLS, Decatur, Ill. There is no such thing as a normal lung unless one accepts as normal the organs of an infant at birth. Immediately after birth the lung becomes the scene of conflict between invading bacteria and the tissue protecting mechanism. The changes that result from this and similar assaults make it possible for asthma to develop in certain individuals. Asthma does not appear immediately after birth but at a somewhat later date. This may be a few months or it may be many years. Sufficient time must have elapsed for organic change to take place as well as disturbed physiology. In some way H substance, perhaps histamine, is formed during antigen-antibody contact and thus is initiated the sequence of events called asthma. The neutralization of this substance and the elimination of the product of its action—mainly mucus—is the ultimate aim of treatment. The earlier this is accomplished, the lighter the attack. I wish the authors had presented more in detail the methods employed in counteracting the effects of histamine. One might roughly classify the methods enumerated into two groups. All those are good that loosen the mucous plugs in the bronchioles, and those are useless that fail to do so. Morphine is properly placed in the latter class. I am none too sure about oxygen and helium. They relieve distress, it is true, but chiefly by reducing the tendency to cough, a mechanism by which drowning is avoided. Iodized oil introduced into the bronchi does not arouse my enthusiasm. The mention of intravenous dextrose is proper, for there is much evidence that blood sugar levels may run quite low at times. An attack of asthma is a physical ordeal, and the body needs additional calories. No mention was made of glandular therapy. I feel that thyroid should surely be mentioned, and possibly also adrenal and anterior pituitary. The results of treatment are seemingly better in the second period than in the first. Definite progress is being made in therapy, and it is to be expected that later reports will be even better.

DR GEORGE F. HARSH, San Diego, Calif. A study like this is especially valuable, because I find among my colleagues a most distressing pessimism about the results of treatment of allergic disorders. The authors properly warn against the use of morphine. I was trained in a school which taught that you should never use morphine in a case of asthma. I experimented gingerly and I believe I have detected a certain small group of asthmatic patients for whom the use of morphine is justifiable, and that is the type of patient who is going along perfectly normally and then suddenly gets a violent attack of asthma. He is terrified. He thinks he is going to die. Epinephrine will relieve him partially, but he is still almost literally scared to death. A small dose of morphine may completely abort that patient's attack. If it comes back as soon as the effect of the opiate has worn off, morphine should not be repeated. Some physicians use apomorphine. I should like to ask the authors whether there is not the same danger with apomorphine as with morphine. There is one other drug that is at least as dangerous as morphine, and that is atropine. The one asthmatic patient for whom I had the misfortune of officiating at

death was given atropine. This patient incidentally was also unable to tolerate iodides so that adequate treatment of his asthma was seriously hampered. One method of treatment which is conspicuous by its absence in this discussion is "change of climate." That seems to be the treatment *par excellence* in the mind of the public and in the minds of many physicians. I live in a part of the country where we get a great many patients for whom this treatment has been advised. A change of climate is a drastic form of treatment. A man who is established in a community has to leave his friends and his job and dispose of his property at a loss. The very type of patient who would be a candidate for such a drastic form of treatment is the one who is likely not to benefit by it. In other words the patient with severe asthma is the one who is apt to become sensitive to whatever there is in the environment to be sensitive to. After a change of climate he may for a short time show some improvement, but soon the old condition will return.

DR HERBERT F. ROBB, Belleville, Mich. I believe the older practitioner will recognize that there are more cases of asthma today than there were twenty-five years ago. In the etiology of asthma we recognize the hereditary factors along with others in the cause of allergy. We should also recognize that asthma is a psychosomatic disease and as such is under a greater influence in our urban civilization than it was back in the agricultural era. When we consider that the individual is developed from the union of two microscopic cells planted in the uterus of the mother, grown there for nine months and then cast out into a misunderstanding world we cannot help but realize the innumerable and varied environmental forces to which the human organism is subjected. Before and after birth the individual is dominated by five forces: hunger—hunger for air, water, food and chemicals, sex, a force which becomes dominant in the parents and individual at the age of puberty; intelligence, which may be negative or positive, and social and economic forces which are positive or negative. In asthma of the child we may consider that it is possibly the functional and organic result of a psychosomatic problem in the parents. In the urban centers there is a reduced birth rate and the greater problem of birth control. It would be well in our study of the etiologic factors in the cause of asthma to consider the sex problem between husband and wife to discover any psychic conflicts or sexual maladjustments which may be factors in the development or exacerbation of this disease.

DR LEON UNGER, Chicago. There are three schools of thought with relation to allergy and psychoneurotic disturbances. There are those who believe that the psychoneurotic effects are most important, those who pay no attention whatsoever to them, and those who believe that the psychoneurotic influences do play a part. I belong to the latter group. There is no doubt that psychic and neurotic influences increase the severity and the frequency of attacks of asthma but I deny emphatically that psychosomatic influences can initiate asthma. In treatment we must make every effort to reduce the psychosomatic disturbances in order to reduce the frequency and severity of the attacks. The role of histamine or H substance in asthma has never been proved. We believe that, when the antigen-antibody contact is made, something similar to histamine is elaborated. It probably is some substance which is related to histamine to which the name H substance is given. Dr. Mills spoke of the method of neutralizing this substance. That is theoretical. However, his point of dividing the methods for counteracting histamine into those which loosen mucus in the bronchioles and those that do not is good because death in asthma and the symptoms in asthma are definitely due to the obstruction in the bronchioles, and anything one can do to increase the lumen of the bronchioles is beneficial to the asthmatic. Morphine may kill the patient because it prevents the expulsion of these mucous plugs. As to the role of oxygen and helium, I too am not sure. We use it in our hospital in Chicago. Helium conveys the oxygen more readily into the bronchioles. I used iodized oil for treatment years ago but have stopped using it. Dextrose intravenously is excellent for two reasons. First of all it is nourishing and second, in severe cases the addition of 1 cc. of 1,000 epinephrine into a liter of 5 per cent dextrose often gives good results. The use of the endocrines



has been disappointing. Solution of posterior pituitary has not given good results. We advise change of climate if a patient has been under treatment for six months or a year and has followed the treatment intelligently but still has asthma. I want to emphasize two things. Don't use morphine in bronchial asthma, use it in cardiac asthma. Second, see these patients early, before their condition becomes chronic, and good results will follow, but if one waits until they are in the chronic stage, one will have a problem on one's hands.

## PULSATING EXOPHTHALMOS

### REVIEW OF ALL REPORTED CASES

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Unilateral pulsating exophthalmos was first described by Benjamin Travers in 1809<sup>1</sup>. Since then there have been approximately 812 cases reported in the literature. Any retrobulbar mass may produce an exophthalmos, but usually vascular disease is the basis for the pulsating form. The bruit and pulsations of the orbit usually occur from the synchronous movements of the blood through an arteriovenous fistula. These pathologic processes have been verified by many autopsies.

An attempt is being made to present evidence justifying the diagnosis of these conditions and to report a series of cases. A complete summary of all additional reports since Locke's review is submitted.

Travers's conception of the etiology was incorrect, although it was realized that compression of the common carotid caused a cessation of the bruit and a decrease in the degree of the exophthalmos. In 1812 Dalrymple reported a second case of this nature. Before 1823 it was believed that the condition was due to a circoid aneurysm, but Guthrie found at autopsy an aneurysm of the ophthalmic artery. In 1835 a new theory was formulated by finding at autopsy a communication between the cavernous sinus and the internal carotid artery. Warren in 1837 described the first case which was produced by trauma. Burke in 1839 confirmed Guthrie's findings in a second autopsy. Nunneley in 1862 believed that the etiologic factor was such a fistula. In 1880 Sattler concluded from a review of the literature that the cause was due to an abnormal arteriovenous communication. De Schweinitz and Holloway in 1907<sup>1</sup> reviewed and clarified the reports of these conditions. Locke<sup>1</sup> in 1924 made a complete review of the literature to this date and summarized the methods of treatment.<sup>2</sup>

### ANATOMIC DISCUSSION

The majority of the cases of pulsating exophthalmos are unilateral. The most frequent causes of a nonpulsating unilateral exophthalmos are retrobulbar tumors of soft tissues, bony orbital tumors or vascular lesions such as varicocele of the ophthalmic veins. Infections of the sinuses, soft tissues and bones of the

orbit may produce an exophthalmos. Prominence of the eye may occur as a result of an anterior staphyloma or a high myopia.

The pulsating form usually follows trauma and is the result of a fistula between the internal carotid artery and the cavernous sinus. In some instances a fracture through the base of the skull involving the body of the sphenoid may be demonstrated. It is in this relatively immobile area that the greatest damage to the vessels occurs. Pulsating exophthalmos may result from penetrating wounds in this region. Spontaneous cases may occur from rupture of the artery within the sinus, caused by arteriosclerotic plaques, miliary septic aneurysms or congenital weakness of the vessel wall.

The relations of the internal carotid artery and cavernous sinus are peculiar in that they constitute the only example of an artery lying within and entirely surrounded by a venous channel. This arrangement may permit the formation of arteriovenous fistulas with a minimum of trauma.

The cavernous sinus is an irregularly shaped venous space situated between the meningeal and periosteal layers of the dura mater on the side of the body of the sphenoid bone.<sup>3</sup> It extends from the medial end of the superior orbital fissure in front to the apex of the petrous portion of the temporal bone behind. Its lateral wall contains the oculomotor and trochlear and the ophthalmic division of the trigeminal nerves, in order from above downward. The internal carotid artery and abducens nerve are contained in the thinner medial wall of the sinus. The two cavernous sinuses communicate across the midline by the small intercavernous sinuses situated before and behind the hypophysis.

The internal carotid artery enters the floor of the base of the skull through the foramen lacerum in the temporal bone (ensheathed by a prolongation downward of the dura).

Turning forward, it traverses the cavernous sinus, separated only by a covering of endothelium. Near the anterior end of the venous space, it curves upward along the medial side of the anterior clinoid process, gives off the ophthalmic artery and perforates the dura mater again to unite with its fellow of the opposite side in the circle of Willis. The ophthalmic artery enters the orbital cavity through the optic foramen below and lateral to the optic nerve.

Anteriorly the two ophthalmic veins lie within the orbital cavity and join the sinus either separately or by a common trunk.

Posteriorly the cavernous sinus is drained through the superior and inferior petrosal sinuses, which in turn empty into the lateral sinuses.

The pathologic physiology of pulsating exophthalmos resulting from an arteriovenous fistula in the cavernous sinus is apparent. There is a difference in pressure in the two vascular channels and the venous communications of the sinus. A rupture results in a sudden engorgement of the venous space with arterial blood under high pressure. There is a retrograde flow into the ophthalmic veins, with transmitted arterial pulsations and a venous engorgement of the orbital contents and eyelids. These changes may occur to a less degree on the opposite side as a result of the aforementioned communications between the two cavernous sinuses.

Help was received from Dr. Roy Robertson in the preparation of this paper.

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<sup>1</sup> Locke, E. C. Jr. Intracranial Arteriovenous Aneurysm of Pulsating Exophthalmos. *Ann. Surg.* 80:124 (July) 1924.

<sup>2</sup> A complete bibliography of all reported cases since 1924 can be obtained from the authors.

<sup>3</sup> Gray, Henry. *Anatomy of the Human Body*, ed. 22. Philadelphia: Lea & Febiger, 1930, p. 658.

After ligation of the cervical portion of the internal carotid, collateral circulation is afforded through the circle of Willis. In the ligation of the common carotid, further collateral circulation is obtained through a retrograde flow from the external carotid into the internal

TABLE 1—Symptoms in Order of Frequency as Shown in Cases in Literature Since Locke's Review

Symptoms Reported in 224 Cases	
Symptom	Number
Bruit	191
Pulsation	179
Chemosis	159
Diplopia	76
Headache	71
Visual disturbance	66

carotid on the same side. In many cases there is sufficient collateral to bring about incomplete regression or recurrence of symptoms.

#### DIAGNOSIS

The diagnosis of unilateral exophthalmos is usually easy depending on the degree of proptosis. It has been noted in many cases that pulsation does not always exist. In those which occur spontaneously, pulsation may be absent. Following head injuries a bruit, thrill and pulsation usually are present. The symptoms most often encountered are headache, disturbance in vision and intraocular noises. The sounds may vary from minor sensations to an almost continuous roaring. The visual field may show a wide range of disturbance. Diplopia may result from an increase in internal or extraocular pressures. The presence of chemosis accounts for some of these changes. Blindness may be due to atrophy of the optic nerve, to glaucoma or to cataract.<sup>4</sup>

The extrinsic movements of the eye are limited by the proptosis and the alterations in the nerve mechanism of the extraocular muscles. The retinal findings are not constant and depend on the duration of symptoms. Compression of the common carotid artery will result in a cessation of a bruit, thrill and pulsation when present. Arteriograms<sup>5</sup> may be obtained by the injec-

TABLE 2—Results in Treatment of 188 Cases (Total Reported Since 1914)

Method Used	No. of Cases	Cured	Im proved	Unim proved	Deaths	Hemi plegia
Ligation of internal carotid artery	47	25	15	3	2	2
Ligation of common carotid artery	43	30	9	1	3	
Combination of ligations (veins and arteries)	41	27	11	0	2	1
Direct intracranial ligation (Dandy)	6	4			2	
Nonoperative treatment	51	9	22	17	3	

tion of thorium dioxide in the carotid arteries. This procedure is useful in the diagnosis of obscure cases. The radioactivity of this or similar substances should limit its use.

4 Dupuy Dutemps, M. L. Pulsating Exophthalmos with Glaucoma. Ligation of Internal Carotid. Bull. Soc. d'opht. de Paris, March 1927, pp. 136-143.

5 Terry, T. L. and Myer, Philip. Pulsating Exophthalmos Due to Internal Carotid Jugular Aneurysm. Use of Thorium Dioxide Solution in Localization. J. A. M. A. 103: 1036-1041 (Oct. 6) 1934.

#### REPORT OF CASES

CASE 1—E. C., a Negro aged 62, admitted to Emory University Division of Grady Hospital, Dec. 26, 1940, was struck by an automobile in October 1940 and was temporarily unconscious. He was seen immediately in the outpatient clinic and at that time had regained consciousness. A small scalp wound was then sutured. There were no complaints until November, when he heard a loud noise in his left ear which was synchronous with the heart beat. Soon afterward his left eyelid gradually increased in size until he was unable to close it. There were no visual defects. A definite chemosis of the left eye was noted with a protrusion of the orbital contents, which did not pulsate. Extraocular movements were well performed. Both pupils were round, regular in size and reacted to light. There was a moderate thrill and bruit heard over the left supraorbital ridge. Roentgenograms of the skull revealed a long, linear fracture arising in the region of the left frontoparietal bone near the junction of the sphenoid. Blood pressure on admission was 150 systolic and 70 diastolic. Daily digital compressions of the left carotid artery were begun. Following this there was a slight decrease in the swelling and chemosis of the eye.

A partial occlusion of the left common carotid artery was made with an aluminum band. On Jan. 21, 1941 the left common carotid artery was ligated with braided silk proximal



Fig. 1 (case 1)—Exophthalmos with pronounced chemosis before operation.

to the site of the previously applied band. No evidence of cerebral anemia was manifested following this procedure. The bruit was inaudible and the chemosis almost subsided. Two months later no return of symptoms had been noted.

CASE 2—F. S., a Negro aged 24, admitted to Emory University Division of Grady Hospital, July 26, 1936, was struck over the right eye when he was overturned in a truck on May 2, 1936. He received a small abrasion over the eye but did not lose consciousness. A swelling was present on the upper eyelid which continued to increase in size. About a month before he was admitted to the hospital the lower lid became swollen and edematous. The patient complained of a continuous noise within the cranium. Physical examination was negative except for the right eye. There was definite proptosis with a protrusion of the lower bulbar conjunctiva. Movements of the eye were somewhat slow; the pupils were round and active, but the right was slightly larger and more sluggish. Tension in the right eye was 25 mm. and in the left eye 20 mm. In the right fundus was a large flame-like hemorrhage on the upper and inner disk margin. The veins and artery ratio was 4 to 1 but no pulsations were noted. There was sclerosis in the retinal vessels more pronounced in the superior nasal artery. The left fundus was essentially negative except for a slight sclerosis. The vein and artery ratio in the left eye was 3 to 2. Vision was good in both eyes with no disturbances in the visual fields. A loud bruit was audible over the right eye which disappeared on compression

of the right common carotid artery. The blood pressure in the right arm was 150 systolic and 102 diastolic. In the left arm it was 120 systolic and 80 diastolic. X-ray examination of the skull revealed a linear fracture passing from the region of the upper portion of the right supraorbital ridge obliquely upward and through the lower anterior portion of the right

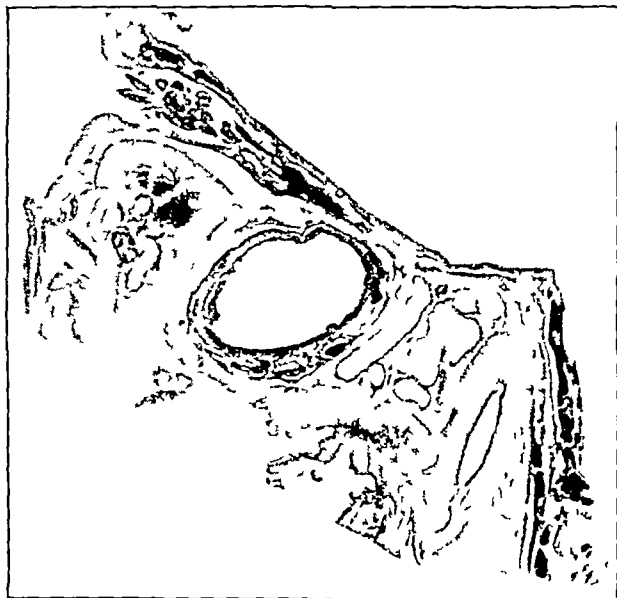


Fig. 2—Anatomic section demonstrating internal carotid artery in the center of the cavernous sinus also showing relative position of nerves in sinus wall

frontal bone. There was no comminution or depression of these fragments. An area of increased density was visible in the region of the right orbit and optic foramen.

The contours of the superior orbital fissures were obliterated. Periodic digital compressions were instituted to increase collateral circulation within the brain. On August 4 the right internal carotid was ligated with two heavy braided silk ligatures. The bruit immediately stopped. Convalescence from this procedure was uneventful.

CASE 3—J. T. B., a white man aged 43, admitted to Emory University Hospital on Nov. 3, 1938, stated that the

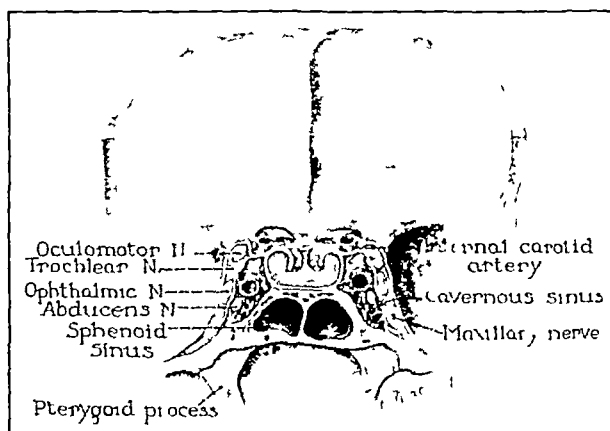


Fig. 3—Relationship of the sinus to the arteries and nerves and the reflections of the dura

left eye suddenly became swollen eight months prior to admission and began to protrude from its normal position. Shortly after this a roaring was noted which could be controlled by pressure on the left side of the neck. The patient complained of severe headaches and had been treated for hypertension several months before the onset of the exophthalmos. There

was no history of trauma. Physical examination was essentially negative except for hypertension. The blood pressure in the left arm was 170 systolic and 114 diastolic. In the right arm the blood pressure was 180 systolic and 110 diastolic. The left eye protruded definitely. There was a chemosis and engorgement of the conjunctival vessels. Compression was applied for five minute intervals on the left common carotid three times daily for about a week. On November 8 he was operated on by Dr. D. C. Elkin. The left common carotid artery was completely occluded by an aluminum band. Postoperative convalescence was satisfactory. The exophthalmos improved considerably but the venous congestion in the conjunctiva still remained. At the present time no change in his condition has been noted.

CASE 4—E. M., a white man aged 22, admitted to Emory University Hospital on March 7, 1936, had been in an automobile accident six months before. Following this a roaring noise was heard in the right ear. There was a swelling of both eyes, more pronounced in the right. The exact nature of the injury was not determined at the time of the accident, and the patient did not interrupt his usual activities.

The patient was well developed and well nourished and appeared normal in every respect except for the eyes. There was some edema of both eyes, the right being more prominent.



Fig. 4 (case 5)—Tortuosity of vessels occupying the orbital fossa

with edema of both upper and lower lids. The ciliary vessels of the right eye were engorged. Vision was not affected. The fundi were normal except for venous engorgement. Pulsations of the eye were not present. A thrill was felt and a bruit was heard over the entire skull, most pronounced over the supraorbital region on the right side. The blood pressure was normal. It was thought that the patient probably had a traumatic arteriovenous fistula involving the cavernous sinus.

Preliminary preparations were made for ligation of the carotid artery by compression of the vessels in the neck to stimulate collateral circulation in the brain. After about ten days, on April 27, ligation of the right internal carotid artery was done. A small Matas aluminum band was placed around the internal carotid artery, which completely compressed it at the bifurcation of the common carotid artery. There was an immediate cessation of the thrill and bruit in the region of the right eye. No untoward symptoms were noted. For some time the patient noticed that on severe exertion a numbness occurred in the left side of the body, which disappeared on resting. No motor symptoms were ever exhibited. His condition in July 1941 was still unchanged.

CASE 5—J. D., a white man aged 33, admitted to Emory University Hospital on July 8, 1940, was shot in the left eye thirteen years before and removal of the eye was necessary. Six years before admission he noticed a mass beneath the eyelid which had gradually increased in size. On examination there was a mass which filled the entire orbital fossa and protruded from beneath the lid about 3 cm. There was a definite dilata-

tion of the superficial vessels both on the surface of this mass and also to the outer side of the orbital fossa. There was a palpable thrill and bruit heard over this area. This was stopped by pressure over the common carotid artery. The remainder of the physical examination was negative. On July 12 a partial occlusion of the left common carotid artery was made with a metal band by Dr D. C. Elkin. Three days later the artery was completely occluded with heavy braided silk. On July 15 the entire mass of veins and arteries were removed through an incision beneath the lid. There were multiple communications between the ophthalmic arteries and veins. Convalescence was uneventful except for some purulent drainage, which had cleared up on Aug. 1, 1940, when he was dismissed from the hospital.

This case presents an example of traumatic unilateral exophthalmos with symptoms usually seen in ones involving the deeper structures. The previous removal of the eye permitted a more accessible approach to the arteriovenous fistula and allowed for the usual treatment for such conditions.

#### TREATMENT

The treatment of arteriovenous aneurysm of the cavernous sinus and the branches of the internal carotid artery cannot necessarily be approached in the manner for similar lesions elsewhere. The usual treatment for arteriovenous aneurysms is quadruple ligation with excision of the aneurysmal sac. It is obvious that the anatomic location prohibits any such procedure. Many approaches have been made to this problem, none of which are based on good reasoning. Proximal arterial

Various methods of occluding the vessels have been attempted, extending from digital compression to external occlusions of the common and internal carotid with an apparatus similar to the type described by Matas.<sup>6</sup> Partial closures have also been made with aluminum bands, fascial grafts and other types of surgical liga-

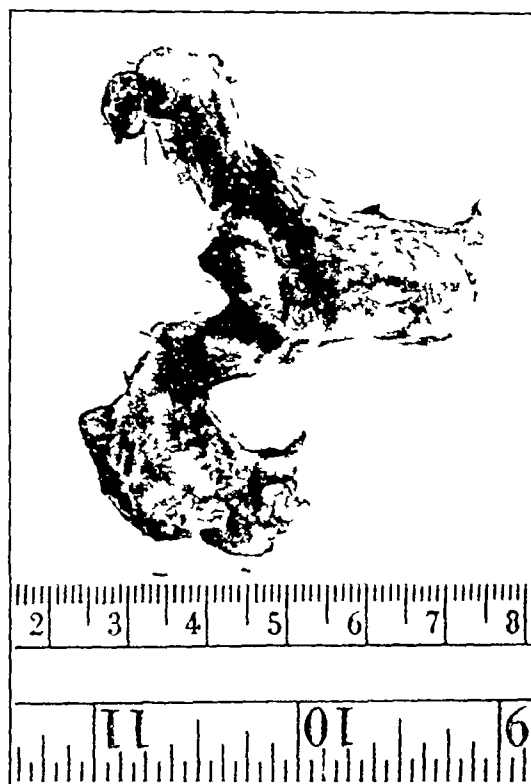


Fig. 6 (case 5)—Arteries and veins after removal

tures such as tape and silk and, more recently, the use of cellophane.<sup>7</sup> The latter is used for partial occlusion. This is based on the belief that when cellophane is used it is followed by a gradual constriction. It is hoped that partial constriction may become complete after a short time. This gradual closure may lessen the likelihood of the production of cerebral aneurysm. Dandy<sup>8</sup> has devised as nearly a surgical approach to this condition as is done in ordinary arteriovenous aneurysms. His procedure is to occlude the artery as it emerges to form the circle of Willis with metal clips to obliterate the blood supply at the fistula. A previous study of the anatomy, however, has shown that the blood supply is derived, both proximally and distally to the arteriovenous communication, from one side, as well as from the face, through the communicating veins. It is also derived through the communications of the arterial supply from the circle of Willis on the opposite side. Therefore unless a complete extirpation of the aneurysm is made along with total ligations a cure should not be effected. Dandy reports satisfactory results using such a procedure.

<sup>6</sup> Matas, Rudolph. Discussion on Vascular Surgery with Special Reference to the Surgery of the Carotid Tracts. The Use of Special Compressors and Aluminum Bands. *Am. J. Surg.* 24: 692-698 (Dec.) 1933.

<sup>7</sup> Pearce, H. E. Experimental Studies on the Gradual Occlusion of Large Arteries. *Ann. Surg.* 112: 923-937 (Nov.) 1940.

<sup>8</sup> Dandy, W. E. Carotid-Cavernous Aneurysms (Pulsating Exophthalmos). *Zentralbl. f. Neurochir.* 2: 77 (March) 1933. Dandy, W. F. and Pollis, R. H. On the Pathology of Carotid-Cavernous Aneurysms (Pulsating Exophthalmos). *Am. J. Ophth.* 24: 366-385 (April) 1941.

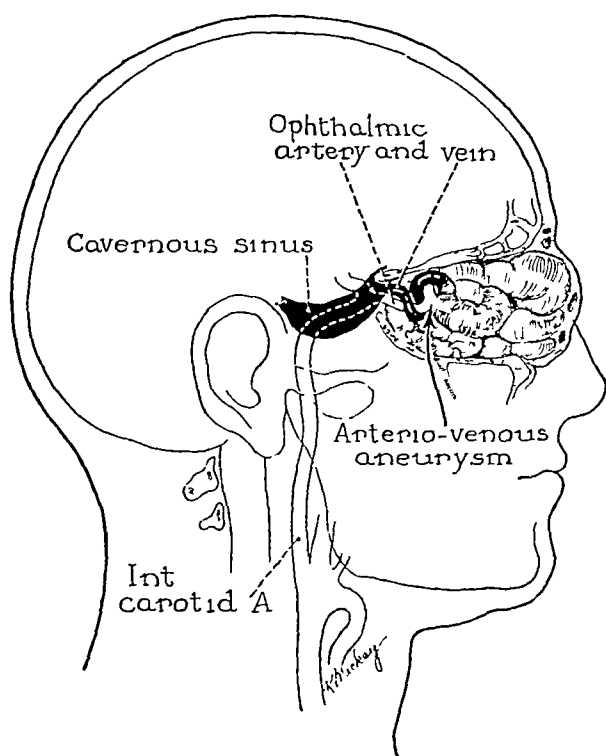


Fig. 5 (case 5)—Position of arteriovenous fistula

ligations have been done in the majority of instances and with the greatest benefit. The common carotid artery has been ligated, as well as the internal and external, individually and concurrently. Carotid ligations have also been carried out on the contralateral side. These have been performed singly as well as simultaneously, depending on the results obtained.

Arterial plugging<sup>9</sup> has been attempted by the injection of paraffin into the carotid artery with the hope that it would obliterate the arteriovenous fistula. Muscle plugs<sup>10</sup> have also been inserted into the artery for the same reason. These procedures for the most part have been discarded because they have not proved beneficial. Various forms of medical therapy have been undertaken. The administration of gelatin to increase the coagulation of the blood, with the idea of slowing the blood flow through the fistula and allowing thrombus formation, has been given consideration. Treatment has been directed toward the extirpation and obliteration of the veins.<sup>11</sup> Electrocoagulation<sup>12</sup> and sclerosing agents have been used to promote thrombosis of the orbital veins. The use of these procedures has not been universally adopted. In the advanced cases in which the eye has been lost, evacuation of the orbital contents has been carried out. At the time of this procedure an attack can be made on the fistula from the apex of the orbit. The exposure here is inadequate for proper surgical approach.

The treatment which probably offers the most to the patient is, first, preoperative digital compression of the carotid artery. This is undertaken for the purpose of stimulating collateral circulation, preventing the development of cerebral anemia after ligation of the carotids. The procedure should always be attended with the knowledge that some individuals may have a hypersensitive carotid sinus reflex.<sup>13</sup> Pressure could result in a syncopal attack or perhaps a more serious outcome. Therefore initial compression of the artery should be done with extreme care to determine the patient's reactions. These develop immediately after compression, whereas the symptoms of cerebral anemia occur late.

There is little evidence to substantiate the preference of ligation of the internal or common carotids. The latter is more commonly ligated, probably because it is more accessible. A reflux flow from the contralateral vessels through the external carotid may result in a failure of cure. If partial ligation is done it may be necessary to occlude the vessel totally after the danger of cerebral anemia is over. When an aneurysm has been present for a long time, sufficient collateral circulation will usually be established from the opposite side through the circle of Willis. Cases not benefited by ligation may be improved by a direct approach advocated by Dandy. In view of the number of cases improved and cured by proximal ligations alone, this preliminary procedure should be carried out in all instances. The results offer little support for medical therapy in the progress and termination of these conditions.

#### SUMMARY OF REPORTED CASES

There have been one hundred and sixty-three articles in major journals on pulsating exophthalmos since Locke's review in 1924, 224 additional cases have been reported through December 1941. Essentially all reports deal with the same problem previously discussed by Locke and others. It is noted that the choice

of treatment is primarily operative. Ligation of the internal carotid was performed in 47 cases, of this number 25 were reported as cured. The common carotid was ligated in 43 instances with cures in 30. The ligation of multiple vessels, a combination of either the internal, external or common carotid and orbital veins, was carried out in 41 cases with twenty-seven cures. It is evident from such a summary that the results in all types of treatment are the same. The greatest contribution since 1924 has been, perhaps, the work of Dandy in ligating intracranially the carotid artery for the purpose of trapping the aneurysm. This procedure has been carried out six times, with 4 cases being reported as cured. It is advisable in many instances to undertake this operation when other methods fail.

#### CONCLUSION

In this report a complete review of the literature since 1924 has been made. This brings the total reported cases to 812. Five additional operative cases are submitted by us. An explanation for the development of these conditions is made on the basis of anatomic studies of the cavernous sinus. This is the only example of a major artery within and a part of a large venous channel. Any trauma or disease to the artery would therefore allow an interchange of arterial and venous blood between these structures, thus an arteriovenous fistula would be formed. Basal fractures involving this area should be attended with the thought that a fistula may occur. In view of the progress of the disease, early treatment, namely ligation of the carotid artery, should be undertaken before extensive proptosis develops. This would decrease the danger of further destruction and blindness. Surgical treatment is beneficial, although many cases are followed by slight improvement and sometimes no change. There is no satisfactory direct operation to obliterate the fistula. This primarily is due to its location and association with vital structures.

#### ABSTRACT OF DISCUSSION

DR HARRY H. KERR, Washington, D. C. Pulsating exophthalmos is a symptom most commonly seen in fractures of the base of the skull passing through the anterior fossa. Ligation of the common carotid artery is the best treatment. I thought we could demonstrate a direct connection between the external and internal carotid arteries intracranially. Moss and King of the Wilmer Ophthalmological Institute at Baltimore have recently shown that there is a very free communication between the external carotid artery and the ophthalmic artery. My first patient was a righthanded man aged 42 with pulsating exophthalmos of the left side. Digital compression of the common carotid demonstrated that complete occlusion promptly led to difficulty with speech and with the use of the right hand. Partial compression, however, reduced the bruit and the pulsation without producing cerebral symptoms. We therefore hit on the idea of fractional ligation. Under local anesthesia, with the patient conscious and able to cooperate, we exposed the left common carotid artery, placed a fascial band around it and constricted the artery down to a position where he had no cerebral symptoms and no disturbance of speech or function of the right hand. We then fastened the band in situ. We found that we had occluded the artery about 50 per cent. The wound was closed, and two weeks later, after experimenting with compression again, we ligated completely the common carotid artery. I reexamined this man nineteen years later and made a complete ophthalmologic study. He had remained completely cured, and his eyes were perfectly normal for a man then aged 61. I have since operated on 7 additional patients with similar results and have found that the late return of a slight bruit best heard in the neck was due to recanalization of the common

9. Dawbarn, R. H. M. The Starvation Operation for Malignancy in the External Carotid Area. *J. A. M. A.* 43: 792-795 (Sept. 17) 1904.

10. Gurdjian, E. S. Packing of Internal Carotid Artery with Muscle in Treatment of Carotid Cavernous Arteriovenous Aneurysm. *Arch. Ophthalmol.* 19: 936-940 (June) 1938.

11. Valiere, Valere. Cure of Traumatic Pulsating Exophthalmos by Ligation of Orbital Veins at Point of Entry into Orbit. *Ann. d'ocul.* 170: 747-760 (Sept.) 1933.

12. Fioletov, S. S. Treatment of Pulsating Exophthalmos by Diathermic Caustery. *Soviet vestnik oftal.* 3: 395-396, 1933.

13. Weiss, Soma; Capps, R. B.; Ferris, E. B. and Monro, Donald. Syncope and Convulsion Due to a Hyperactive Carotid Sinus Reflex. *Arch. Int. Med.* 58: 407-417 (Sept.) 1936.

carotid artery, so that now, in the last few cases, in addition to fractional ligation I divide the artery. Six of the 8 cases were the result of fractured skull. One was a spontaneous pulsating exophthalmos in a woman of 73 and 1 case was due to gunshot wound from birdshot in which the other eye had been destroyed. Secondly, ligation or division was carried out on an average of sixteen days after the first partial ligation.

DR. ALTON OCHSNER, New Orleans. There are two points that I should like to emphasize. Occasionally one will find persons whom ligation of either the internal carotid or the common carotid will not help. In such instances it is necessary to combine ligation of the carotid with the intracranial clip, as suggested by Dandy. Recently Dr. DeBakey has shown that the gradual occlusion of the artery by cellophane does not work. In an extensive experimentation he was unable to verify Pierce's work concerning this. He has had 2 patients on whom, in an attempt to increase the intracranial vascularity, he has done a sympathectomy. One of these persons was greatly improved following the sympathectomy. This is based on the observations of Gage that in patients with peripheral arteriovenous aneurysms, by decreasing the peripheral resistance and by increasing the vascularity, the aneurysm can be attacked with impunity. One of these patients was definitely improved following the sympathectomy, so that the ligation could be done safely. The other patient was cured by sympathectomy, simply indicating that by slowing the blood stream through the arteriovenous anastomosis, clotting was made possible, so that I think in the older person in whom hemiplegia is likely to occur, the use of cervicodorsal sympathectomy is of value and should be tried.

DR. JAMES RUDOLPH JAEGER, Denver. It is obvious if we remember the anatomy concerned in the carotid-cavernous arteriovenous communications that a good many of these cases will not be cured by ligating the carotid in the neck or intracranially because the internal carotid has branches inside and near the cavernous sinus which connect up with the external carotid branches, and these branches enlarge to a tremendous extent in an attempt to feed this communication. Recently I had a case which had been treated conservatively without benefit, and there is no reason why these cases should not be treated first by the conservative ligations as mentioned by the speaker. This little 11 year old fellow had had the common carotid ligated in the neck. After three months I ligated the carotid proximal to the ophthalmic artery intracranially, and there remained a tremendous bruit and a pronounced exophthalmos. At a third operation I opened the internal carotid artery in the neck and placed a muscle strip with a silver clip on the end of it, as an embolus, and then ligated the external carotid. It progressed upward to the fistula, and x-ray examinations showed the silver clip in the cavernous sinus. Before the external carotid was ligated, and before I had inserted the muscle embolus inside the internal carotid, after closing it temporarily with a tape, we could still hear the bruit, showing that the communication was being fed by the tremendously overdilated branches of the internal carotid through which the circulation had been reversed by their connections with the meningeal vessels, which are external carotid branches. This boy has stayed entirely well now for six months. His eyesight is normal. There is not the least pulsation, bruit or exophthalmos. Of course I do not think we should completely evaluate these cases until we have observed them for five years, because frequently the circulation will be cut down through these communications to such an extent that one may think one has effected a cure, but give them time, time for the collateral circulation to develop, and a great many of them will recur.

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**The Indispensable Amino Acids**—If all ten of these are provided in suitable amounts, the body can form from them the remaining amino acids which enter into the composition of its proteins. The amino acids now called "indispensable" or "nutritionally essential" in the sense that they must be furnished through the nutriment, are arginine, histidine, isoleucine, leucine, lysine, methionine, phenylalanine, threonine, tryptophan and valine.—Sherman, Henry C. *Chemistry of Food and Nutrition*, New York: Macmillan Company, 1941.

## DELAY IN THE TREATMENT OF CANCER

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Cancer ranks second only to cardiorenal disease in our mortality statistics. The attempt to reduce this appalling figure has been directed along two chief lines, namely the prevention and the cure of the disease. In order to accomplish either of these ends it is now generally recognized that both the medical profession and the public must be better informed regarding the cancer problem. Various national, state and local organizations have instituted educational programs better to accomplish this purpose. The need for such an educational program has been clearly recognized by many physicians for well over a century. While considerable progress has been made, we are nevertheless far short of the goal and the cancer death rate during the past century has been steadily increasing. The present study was undertaken in order better to evaluate the effectiveness of our present educational program.

It is generally recognized that the treatment of cancer by the methods which are now available must be early and adequate in order to be successful. The successful treatment of cancer may be divided into four steps, namely:

1. Early recognition of the signs and symptoms by the patient. He must at least be aware of the possibility of cancer in order that he may call on his physician for advice.

2. Early diagnosis by the physician, who must also be aware of the possibility and the steps that are necessary in order to make the diagnosis.

3. Prompt treatment, which requires the cooperation of both the patient and the physician.

4. Adequate treatment, which also requires the cooperation of the patient and specialized knowledge and technic by the doctor.

The present study is an attempt to determine the factors responsible for delay in the recognition, diagnosis and treatment of cancer. These factors cannot be adequately determined from a study of the usual clinical record, hence 158 successive cancer patients were interviewed as they were admitted to the New Haven Hospital or Tumor Clinic. Of these patients 153 were of either ward or dispensary status.

The definition of delay due either to the patient or to the physician must necessarily be arbitrary. It is also well known that the time required to recognize and diagnose a cancer which is visible on the exterior will be quite different from that on the interior of the body. However, it is not necessary to justify any arbitrary time chosen to define delay, since the facts may be so presented as to enable any one to draw his own conclusions. Furthermore, it is not our purpose

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in this paper to make excuses for delay but rather to attempt to determine the steps which are needed in order to recognize, diagnose and treat cancer at a time when the disease is still localized and offers an opportunity for cure

Delay by the patient may be defined for purposes of discussion as having persistent symptoms for one

TABLE 1—*Distribution of Responsibility for Delay*

Type of Cancer	Total Number of Cases	Number in Which Patient Was Responsible	Number in Which Physician Was Responsible	Both Patient and Physician Responsible	Median Total Delay in Months
Total number	158	85	27	43	8.46
Percentage	100%	54.8%*	17.4%*	27.8%*	
Lung	8	1	2	5	9.00
Stomach	11	3	2	5	14.00
Larynx	6	5	1	0	5.70
Esophagus	4	3	0	1	
Face and skin	17	12	0	5	12.25
Mouth tongue palate alveolar ridge hypo pharynx	13	8	1	4	4.75
Lip	4	4	0	0	
Bladder	5	2	3	0	
Prostate	6	3	0	3	
Uterus	15	7	2	5	5.50
Rectum	23	11	3	8	12.00
Large bowel	13	5	5	3	12.73
Breast	23	18	3	2	12.00
Reticuloendothelial	8	3	3	2	7.00
Metastatic	1	0	1	0	
Bone	1	0	1	0	
No delay	3				

\* These percentages are based on a total of 155 cases

month or longer before consulting a physician. Delay by the physician may also be arbitrarily defined as waiting for any period longer than three weeks after the patient is first seen during which a diagnosis may be established or a consultation requested.

The distribution of the cancer by site may be seen in table 1. Three patients came immediately to the hospital for emergency treatment, 1 because of intestinal obstruction and 2 because of hemorrhage. The other 155 patients presented delay factors with responsibility distributed as follows: Eighty-five patients alone, or 54.8 per cent, were responsible for the delay, while 27 physicians, or 17.4 per cent, were responsible. Both the patient and the physician were responsible for the delay in 43 instances, or 27.8 per cent.

The patient was found to be either wholly or in part responsible for the delay in 128 instances, or 82.6 per cent. All but 7 of the 128 patient delays (121, or 94.5 per cent) were initial delays. The other 7 did not follow the physician's advice in spite of his efforts. The problem, therefore, appears to be mainly the initial delay or the interval between the onset of symptoms and the first visit to the doctor.

The cause for the delay by the patient is shown in table 2. The patients who thought their symptoms were "not serious enough" were capable of recognizing them but used poor judgment. Their information as to the possible serious nature of their symptoms was not enough to result in positive action. Those who were negligent knew the importance of their symptoms but allowed themselves to be sidetracked by other matters. The distinction between the negligent and the ignorant group is difficult to determine. Those patients were called "ignorant" who seemed to have a defect

in fact as well as in judgment and who displayed that defect generally and not limited to the problems of health.

Failure to attach sufficient importance to recognized signs and symptoms accounts for most of the delay. This is primarily an educational problem which is obviously not being met by present methods. The second most important factor defined as negligence may also in large part be corrected by proper education. The economic factor accounts for 10 per cent of the group. These patients recognized their symptoms for what they were, or at least as deserving medical care, but put off seeking attention because they did not know how to pay for it. It is noteworthy that fear of cancer plays a minor role.

The effectiveness of an educational program can best be judged by the content of knowledge possessed by the group as well as its effectiveness in producing appropriate action. The following general questions were asked in order to evaluate the information regarding cancer possessed by the group: How many patients with malignant tumors think of cancer as the cause of their complaints? Only 21, or 13 per cent, answered in the affirmative. Breast cancer was responsible for 13 of these. The median delay for patients who thought they had breast cancer was 3.25 months, while the median delay for all breast cancer was 6.5 months. This suggests that the delay could be halved if all patients were aware of the significance of their symptoms. It was also found that only 42, or 26 per cent, of the patients had read about cancer. Forty of the 42 readers had obtained their information from newspapers and popular magazines, while only 2 admitted reading public health pamphlets. Only 2, or 1.2 per cent, had ever heard a lecture on cancer, and both of these had been while attending National Hospital Day. Although the entire group seemed poorly informed regarding cancer, 80 per cent thought that cancer was curable and 91 per cent thought that treatment was urgent.

Patients may be expected to delay a short time after the onset of symptoms before consulting a physician. However, the median delay for the total group was 3.77 months. They were not aware of the serious

TABLE 2—*Cause for Delay*

Cause for Delay	Number of Patients	Per Cent
Total	158	100
Symptoms 'not serious enough	90	56.9
Negligence	18	11.3
No delay on the part of the patient	18	11.3
Expense	16	10.1
Ignorance*	11	6.9
Fear of cancer	2	1.4
Fear of doctors	2	1.4
Christian science or other cult	1	0.6

\* Limited to patients thought to be ignorant by observer

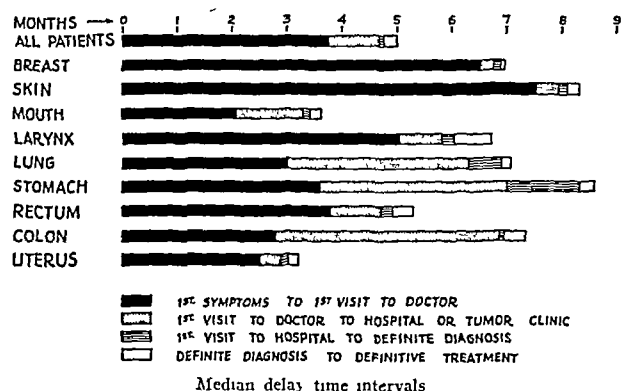
nature of their symptoms for part of this time. However, this group was aware of the seriousness of their symptoms for an average of 4.4 weeks before they consulted their physicians. Twenty-one per cent decided for themselves to consult their doctor, while the remainder were advised by their family (64 per cent) or friends (15 per cent).

Delay by the physician in making a diagnosis is also an important factor. It is appreciated that some of



this delay is unavoidable, however, every effort should be made to reduce this to a minimum. Table 1 shows that the physician alone was responsible for the delay in 27 instances (17.4 per cent) and that both the patient and the physician were responsible for delay in another 43 instances (27.8 per cent). The physician was therefore either totally or in part responsible for the delay in 45.2 per cent.

The information on which these data are based was obtained chiefly from the patient, and it is likely that



many of these patients did not cooperate by returning to their physicians for further study. For accurate information it would be necessary to interview both the patient and the physician.

The median time interval from the first visit to a physician until a definite diagnosis was made was four weeks. Thus, approximately one half of the patients had a definite diagnosis within a one month interval. When these patients were grouped according to location of tumor it was found that the tumors diagnosed within one month included larynx, skin, lip, prostate, uterus and breast. Those having a delay of more than one month included lung, stomach, esophagus, mouth, colon, rectum and bladder. The longest median delay was found in lung (15.45 weeks), stomach (18.75 weeks), bladder (13.74 weeks) and colon (16.35 weeks). While a portion of this delay was inherent in the greater difficulty of making a diagnosis, it was also obvious that the greater part was due to failure to carry out the more difficult and expensive diagnostic procedures until a diagnosis was fairly certain. General physical examinations were done by 62.6 per cent of the physicians, while local examinations directed at the complaint were done in 35.5 per cent. Three patients (1.9 per cent) received no examination. A history of some kind was taken on all patients, although it was impossible to determine the quality of the history. The delay by the physician usually was due to poor advice or incorrect diagnosis as a result of failure to carry out the indicated diagnostic procedures. The most common errors were failure to take a roentgenogram or do an endoscopic examination. The median overall delay between the onset of symptoms and proper treatment for all cases was 8.46 months.

#### COMMENT

It is generally acknowledged that the successful treatment of cancer by the methods now available is dependent on early diagnosis and treatment. How much may be accomplished by these methods in lowering the

present high mortality is unknown. Undoubtedly some cancers are so insidious in their onset that an early diagnosis and successful treatment are impossible. However, only the future can answer this question since so few patients receive treatment (8 per cent within two months) during the early stage of the disease as measured by symptoms. The medical profession has been discussing the need of public and professional education on the cancer problem for more than a century, and only recently has an attempt been made to put this into effect. The effectiveness of such an educational program can be measured only in terms of results.

The present study, which is based on 158 patients, is inadequate to give an accurate picture for the state. However, it does yield information as to the need of cancer education in the city of New Haven and particularly in the ward and dispensary groups.

Only 3 patients presented themselves for treatment within one month of the onset of symptoms, and these because of acute conditions rather than the presence of cancer. Ninety-two per cent of all patients required two months or longer and 84 per cent required three months or longer before adequate treatment was instituted. The median interval between the onset of symptoms and proper treatment was 8.46 months. These findings clearly indicate that there is unnecessary delay in obtaining proper treatment for cancer. Considering our knowledge of the growth and spread of cancer, good results in the total group cannot be expected under these circumstances.

The patient was responsible for the delay in more than three fourths of the instances. The patient was also responsible for the greater part of the time lost with a total median delay of 3.77 months. The physician was responsible for the delay in less than 25 per cent of the instances. The median time required by the physician to make a diagnosis was four weeks. Thus 50 per cent of all patients required more than four weeks to establish a diagnosis after first consulting their physician. It is apparent that the patient delay constitutes the major problem in the diagnosis and treatment of cancer. However, the physician also must assume a share of the responsibility.

The major cause for the patient delay is primarily lack of proper information on the cancer problem. A failure to recognize the serious nature of symptoms was responsible for 56.9 per cent of the patient delay, while expense, negligence and ignorance accounted for 10.1, 11.3 and 6.9 per cent respectively. Thus the failure of the educational program to furnish the patient with sufficient information may be held responsible for delay in at least 85 per cent of the cases.

Cancer education of this group of patients appears to be quite inadequate. Their information was obtained chiefly from newspapers, only 26 per cent had ever read about cancer, while only 1.2 per cent had ever seen a cancer pamphlet. Only 1.2 per cent had ever heard a lecture on cancer. It is apparent that more widespread and effective educational methods are needed if the public is to be made aware of cancer problems.

Delay on the part of the physician was found chiefly in cancer of the internal organs. The major part of this delay was due to the failure to request x-ray or endoscopic examination. The responsibility of the

physician cannot be fairly estimated in this study, since in most instances the physician was not interviewed and the information was obtained from the patient. The early investigation of cancer of the internal organs is a difficult problem because of the expense involved. Many of the early symptoms of cancer of the internal organs are difficult to distinguish from functional disorders, which constitute such a large proportion of the general practice of medicine. In order to evaluate this problem properly, studies should be carried on with the cooperation of physicians engaged in the general practice of medicine. This is also a problem which will grow in importance as patients present themselves for earlier diagnosis.

#### SUMMARY

1 Delay in the diagnosis and treatment of cancer is one of the most important factors in the failure to obtain better results by the methods of treatment now available.

2 The patient is responsible for the major part of this delay both in numbers and in the time consumed.

3 This delay by the patient is chiefly due to lack of information as to early signs and symptoms of cancer.

4 The education of the people on the cancer problem is a mutual responsibility of the public and the medical profession. This educational program is still inadequate and ineffective.

## Clinical Notes, Suggestions and New Instruments

### STREPTOCOCCIC MENINGITIS FOLLOWING CRANIO CEREBRAL TRAUMA

#### RECOVERY FOLLOWING THE USE OF SULFAPYRIDINE AND SULFADIAZINE

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The introduction of the sulfonamide drugs in 1935 by Domagk<sup>1</sup> has radically influenced the treatment of the bacterial meningitides. Symptomatic supportive treatment and an attitude of hopeful, purposeless expectancy have given way to positive specific therapy. The efficacy of the sulfonamides can be gaged by a review of the mortality statistics of the various types of meningitides, the lowered mortality rate and the increased incidence of survival of patients reflecting clearly the worth of chemotherapy.

The mortality of epidemic cerebrospinal meningitis in the period from 1926 to 1938 was estimated at 47 per cent.<sup>2</sup> In 1941 it was reported as 12 per cent in a large series of unselected sulfonamide treated patients.<sup>3</sup> Similar reductions have taken place in the mortality rates of the other bacterial meningitides, notably of the streptococcic type.

Streptococcic meningitis prior to 1935 claimed a mortality of 95 to 97 per cent,<sup>4</sup> despite heroic regimens of symptomatic treatment. However, in 1936, when Causse, Loiseau and Gissel-

brecht<sup>5</sup> reported the first case of streptococcic meningitis with recovery following the use of azosulfamide, a new therapeutic era was inaugurated. Subsequently the literature began to see many reports of cases of streptococcic meningitis in which recovery occurred following the use of specific chemotherapy.<sup>6</sup>

A review of these published survivals following successful positive therapy with the sulfonamides reveals that the great majority have been secondary to otitis. There has been a scarcity of published reports of cases of post-traumatic streptococcic meningitis successfully treated with the sulfonamides. In addition, most of the recovered cases appearing in the literature, whether secondary to otitis or post-traumatic in nature are those in which sulfanilamide or azosulfamide has been used.<sup>7</sup>

Since later clinical investigation<sup>8</sup> indicates that the newer sulfonamides sulfapyridine and especially sulfadiazine are effective against streptococcic meningitis, we believe that this report of a case of post-traumatic streptococcic meningitis treated successfully with sulfadiazine is of interest.

#### REPORT OF CASE

W. L., a man aged 33, an iron worker, entered the hospital Feb. 2, 1942 after he had fallen from a staging, landing on his face and outstretched hands. He had been unconscious for about ten minutes.

On admission he was conscious and rational. There were multiple abrasions and areas of ecchymosis on the right side of his face and forehead. There was no bleeding from the ears but the nares showed some crusted blood. Both wrists were swollen and painful with typical dinner fork deformities. The right elbow was swollen and painful with decided limitation of motion. The temperature was 37 C (98.6 F), the pulse rate 88 and the respiratory rate 22. The blood pressure was 120 systolic and 80 diastolic. Roentgenograms showed bilateral Colles' fractures, a simple fracture of the head of the right radius and a linear fracture involving the left frontal bone and extending laterally from the left frontal sinus.

Since there was no evidence of shock, both Colles' fractures were promptly reduced under intravenous pentothal sodium anesthesia.

The course for forty-eight hours after admission was uneventful. Soon thereafter, however, the patient became increasingly restless, irritable and drowsy. There was extreme rigidity of the neck and positive Kernig signs. His temperature rose to 41.2 C (106.2 F), with a pulse rate of 68. His respirations were deep and stertorous. The blood pressure was 200 systolic and 100 diastolic. A lumbar puncture at this time showed a spinal fluid pressure of 550 mm, with turbid fluid containing 15,000 polymorphonuclear cells per cubic millimeter. The spinal fluid protein was 85 mg, the chlorides 670 mg per hundred cubic centimeters. The sugar was too low to be accurately determined by the ordinary tests. A stained smear of the

5 Causse, Loiseau and Gisselbrecht. Meningite purulente otogène à streptocoques hémolitiques traitée exclusivement par un colorant azoïque. Guérison. Ann. d'oto-ling. 1936, February, pp. 194-199.

6 Schwenker, F. F. and others. Use of Para-Amino Benzene Sulfonamide or Its Derivatives in the Treatment of Beta-Hemolytic Streptococcal Meningitis. Bull. Johns Hopkins Hosp. 60: 297-306 (April) 1937. Trachsel, W. H., Frauenberger, G. S., Wagner, Carl and Mitchell, A. G. Streptococcic Meningitis with Special Emphasis on Sulfanilamide Therapy. J. Pediat. 11: 248-269 (Aug.) 1937. Silverthorne, Nelles and Brown, Alan. Treatment of Meningitis Due to Hemolytic Streptococcus with Sulfanilamide. ibid. 12: 504-506 (April) 1938. Lewis, R. B. Use of Protosil and Sulfanilamide in the Treatment of Otogenic Meningitis. Report of Eight Cases. Ann. Otol. Rhin. & Laryng. 46: 1096-1111 (Dec.) 1937. Toomey, J. A. and Kimball, E. R., Jr. Meningitis Caused by Streptococcus Hemolyticus and Treated with Sulfanilamide. J. A. M. A. 112: 2586-2589 (June 24) 1939.

7 Gurdjian, E. S. Management of Traumatic Meningitis. Am. J. Surg. 53: 352-355 (Aug.) 1941.

8 Finland, Maxwell and Dingle, J. H. Medical Progress. Treatment of Meningitis. New England J. Med. 225: 825-832 (Nov. 20) 1941. Keefer, C. S. Personal communication to the authors.

From the Surgical Service, U. S. Marine Hospital.

1 Domagk, Gerhard. Ein Beitrag zur Chemotherapie der bakteriellen Infektionen. Deutsche med. Wchnschr. 61: 250-253 (Feb. 15) 1935.

2 Commonwealth of Massachusetts Department of Public Health Annual Reports (1926-1938).

3 Place, E. H. Sulfanilamide in Meningococcal Infections. M. Clin. North America 23: 1159-1172 (Sept.) 1939.

4 Gray, H. J. Streptococcic Meningitis. Report of a Case with Recovery. J. A. M. A. 105: 92-95 (July 13) 1935.

spinal fluid showed a gram positive diplococcus which morphologically resembled the pneumococcus

With the signs and symptoms indicative of meningeal infection, the administration of sulfapyridine was begun. Four Gm of sodium sulfapyridine was given intravenously followed by an additional 2 Gm in six hours. Subsequently, sulfapyridine was given by mouth in doses of 2 Gm every four hours for four doses.

At this time (twenty-four hours after onset of signs of meningeal infection) the culture of the spinal fluid was reported as showing a nonhemolytic streptococcus. The sulfapyridine was then discontinued and sulfadiazine was started in doses of 2 Gm every four hours. After three days the amount of this drug was reduced to 1 Gm every four hours. The patient was considerably improved, although the temperature remained at 38 C to 39 C (100.4 F to 102.2 F) and there was still definite rigidity of the neck and positive Kernig signs. Culture of the spinal fluid remained positive. Despite these findings, the patient was rational, oriented and was able to take nourishment and medication orally. The accompanying restlessness, irritability and severe headaches were alleviated greatly by lumbar drainage.

After twelve days of this medication, the patient showed pronounced general improvement and the drug was discontinued. At this time the spinal fluid was clear, the cell count was 110, the dynamics were normal and the culture was negative.

Within seventy-two hours after cessation of the drug the patient began to complain of severe headache and showed increasing restlessness. Sulfadiazine was begun in doses of 1 Gm every four hours. In twenty-four hours the headache and restlessness had disappeared and the temperature was normal. The drug was continued for eight more days. The patient remained rational and comfortable, with no complaints other than occasional slight headache and very slight rigidity of the neck. There was no recurrence of either the symptoms or the fever. A lumbar puncture done thirty-three days after the onset of the meningitis (ten days after final discontinuance of the drug) showed normal dynamics and clear spinal fluid with normal cell count, sugar, chlorides and total protein and negative culture. There were no psychic changes or neurologic sequelae demonstrable. The patient was discharged from the hospital as recovered on March 25, 1942.

#### COMMENT

In analyzing this case we believe that the following points are worthy of emphasis:

1 Despite the numerous reports of cases of streptococcal meningitis following otitis successfully treated with the sulfonamides, a review of the literature reveals a comparative rarity of cases following cerebral trauma which have been successfully treated by chemotherapy. To our knowledge this is one of the earliest cases treated with sulfadiazine with recovery.

2 The mortality of streptococcal meningitis, which in the presulfonamide era was almost 100 per cent, has been reduced materially through the introduction of chemotherapy. The minimal toxicity of the newer sulfonamides such as sulfadiazine should lead to a more obvious decline in the mortality rates of these infections.

3 The effectiveness of sulfadiazine as a therapeutic agent coupled with its low toxicity makes this the drug of choice in the treatment of streptococcal meningitis. In this case no single symptom which could be classified as due to toxicity of the drug was noted. There was no nausea or vomiting, no cutaneous eruption, no hematuria, no elevation of the nonprotein nitrogen and no decided change in the blood picture other than a mild secondary anemia, despite the administration of rather large doses for long periods.

## Special Article

### HANDBOOK OF NUTRITION XXI

#### NUTRITIVE REQUIREMENTS IN PREGNANCY AND LACTATION

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*These special articles on foods and nutrition have been prepared under the auspices of the Council on Foods and Nutrition. The opinions expressed are those of the authors and do not necessarily reflect the opinion of the Council. These articles will be published later as a Handbook of Nutrition.—Ed*

The ideal normal nutritional state for pregnancy would be one in which the maternal body was endowed with the proper nutritional elements before, during and after the pregnancy, to ensure the optimum needs of the fetus in its intrauterine development, to supply stores for its needs in early infancy, to ensure adequate nutrition for the normal physiologic requirements of the mother, and for the added requirements resulting from pregnancy and lactation. It is therefore not enough to discuss the question of diet for the expectant mother by simply saying that her needs are those of any healthy woman. While we have been accustomed to thinking of the fetus as parasitic and therefore obtaining its nutritional needs even at the expense of the maternal stores, perhaps we should consider more optimum development of the fetus by making all needs readily available. Gross nutritional deficiencies are seldom encountered in the population today, but, as our knowledge of nutrition increases, more and more evidence is presented that there are minor deficiencies which impair to varying degrees the health and efficiency of our population. Such minor or subclinical deficiencies, which in the average individual would take weeks or months to develop, could be exaggerated and hastened by the increased nutritional needs during pregnancy.

To serve as a basis for discussion of the nutritive factors needed during pregnancy and lactation, without considering special obstetric problems, such as vomiting, it might be well to use table 1, which is a reproduction of the standards set by the Food and Nutrition Board of the National Research Council and adopted by the Washington National Nutrition Conference in May 1941 and by the Council on Foods and Nutrition of the American Medical Association.

#### DIET DURING NORMAL PREGNANCY

In order to supply the food essentials in the recommended amounts it would be necessary to provide the following foods daily in approximately the amounts specified: milk, 40 ounces (2½ pints), cheese, 1 ounce, butter, 2 ounces, egg, 1 serving, meat, 1 serving (liver once a week), potato, 1 serving, yellow or green leafy vegetable, such as carrots, spinach, chard, string beans, or green peas, 1 serving, vegetable such as cabbage, turnip or tomato, 1 serving, orange juice, 3 ounces, or grapefruit juice, 4 ounces, or tomato juice, 7 ounces, other fruits 1 serving, whole grain or enriched bread 4 slices, whole grain or restored cereal, 1 serving. Extra calories necessary would be provided in the other foods.

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eaten in the daily diet according to the individual needs and taste. A supplement of fish liver oil or its equivalent should be prescribed to provide 400 to 800 units of vitamin D.

#### CALORIES

McCollum<sup>1</sup> states that during pregnancy there is a rise in basal metabolism which is 23 per cent higher at term than at the fourth month. The gain in weight, however, is only 14 per cent. The fetal tissues have a higher specific metabolism per unit of weight than maternal tissues. While there is increased metabolism toward the end of pregnancy, this is to some extent compensated by the necessary restriction of muscular activity during this period. The normal desirable weight gain in pregnancy according to some authorities is 20 to 25 pounds, spaced to gain 3, 10 and 10 pounds in the three trimesters.<sup>2</sup> The appetite is often diminished during the first trimester, and caloric requirements may be difficult to maintain. In the latter half of pregnancy the appetite may be increased.

#### FAT AND CARBOHYDRATE

Fats and carbohydrates supply the energy in the normal diet and are usually present in sufficient quantity. Their importance apart from being a source of calories, is in the absorption of vitamins by the fat

experience, in which it was found that the average birth weight of babies born to a group of mothers who were given extra food during the latter months of pregnancy was 7 pounds 7 ounces, compared with an average of 7 pounds 10 ounces in a group whose mothers were left on a poor diet which was much lower in total calories.<sup>3</sup>

#### PROTEIN

Metabolism studies as reported by several workers<sup>4</sup> indicate the increased requirements for protein during pregnancy and lactation. The needs of the normal nonpregnant woman of about 1 Gm per kilogram of body weight must be increased to a total of from 90 to 125 Gm daily in order to provide for the growth of the fetus and the uterus.

The role of protein in kidney damage and its place in the cause and course of toxemia of pregnancy are still debatable.<sup>5</sup> Protein is still restricted by many in the management of toxemia, and it is believed that clinical experience supports the view that toxemia is improved or prevented by protein restriction.

Williams<sup>6</sup> says that a deficiency of protein may lead to nutritional edema and tends to anemia, poor muscle tone, lowered resistance to disease and poor milk supply.

Barker<sup>10</sup> found protein poor diets in about 50 per cent of both clinic and private patients. A condition

TABLE 1—Recommended Daily Allowances of Dietary Essentials for Women

	Calories	Protein Gm	Calcium, Gm	Iron Mg	Vitamins				
					A I U	B <sub>1</sub> Mg	C, Mg	Riboflavin, Mg	Nicotinic Acid Mg
Woman 56 kg nonpregnant	2 500	60	0.8	12	5 000	1.5	70	2.2	15
Pregnancy (latter half)	2 500	85	1.5	15	6 000	1.8	100	2.5	18
Lactation	3 000	100	2.0		8 000	2.3	150	3.0	23

(Formulated by the Food and Nutrition Board of the National Research Council 1941.)

and the protein sparing action of carbohydrate. The ratio of carbohydrate and fat to protein and other so-called protective foods usually varies with the economic level of the family. The lower the income, the lower the intake of animal protein and vitamin containing foods.<sup>3</sup> Obesity and excessive gain of weight during pregnancy can be controlled to a certain degree by the regulation of the intake of fat and carbohydrate.

Rucker<sup>4</sup> feels that a carefully controlled diet will determine the weight of the baby. By keeping a low fluid, fat and carbohydrate intake and by increasing the protein, while keeping the total calories about 1,800 a day, he claims that the length of labor is shortened and that there is a minimum of prematurity. However, most observers feel that only gross curtailment of food intake can affect the size of the fetus. In such cases there is always the danger of some or many specific deficiencies. Garry and Stiven,<sup>5</sup> in a review of the available data up to 1935, find that the weight of the newborn is not influenced by the maternal diet unless there are extreme deficiencies. This has been my

of edema, sallow pasty complexion and puffiness of the face cleared up when his patients were put on a high protein diet.

An increase in protein in the diet tends to increase the yield of breast milk, while a decrease lowers the quantity of milk secreted.

Coons and Blunt<sup>11</sup> found that, the greater the retention of nitrogen in the last months of pregnancy, the better the chance of successful lactation.

One half of the protein in the diet should come from meat, eggs and dairy products.

6 Ebbs J H, Tisdall F F and Scott W A. The Influence of Prenatal Diet on the Mother and Child. *J Nutrition* 22: 515-526 (Nov.) 1941.

7 Macie Icie G and Hunscher, Helen A. An Evaluation of Maternal Nitrogen and Mineral Needs During Embryonic and Infant Development. *Am J Obst & Gynec* 27: 878 (June) 1934. Harding V J, and Potter C T. Excretion of Acetone and Nitrogen in Nausea and Vomiting of Pregnancy. *Brit J Exper Path* 4: 105-116 (June) 1923. Hunscher Helen A., Donelson, Eva Nims Betty, Kenyon Fanny and Macy Icie G. Metabolism of Women During the Reproductive Cycle. V. Nitrogen Utilization. *J Biol Chem* 90: 507-520 (Jan.) 1933. Coons and Blunt<sup>11</sup>.

8 Oberst, F W, and Plass E D. Calcium Phosphorus and Nitrogen Metabolism in Women During Second Half of Pregnancy and in Early Lactation. *Am J Obst & Gynec* 40: 399-413 (Sept.) 1940. Strauss M B. Observations on the Etiology of the Toxemias of Pregnancy. The Relation of the Nutritional Deficiency Hypoproteinemia and Elevated Venous Pressure to Water Retention in Pregnancy. *Am J M Sc.* 190: 811-824 (Dec.) 1935. Dieckmann W J and Swanson W W. Dietary Requirements in Pregnancy. *Am J Obst & Gynec.* 38: 523-533 (Sept.) 1939. Dieckmann W J. Comparative Studies of Blood in Nonconvulsive Toxemias of Pregnancy. *ibid* 26: 543-555 (Oct.) 1933.

9 Williams P F. Nutrition in Pregnancy. *Am J Surg* 48: 118-124 (April) 1940.

10 Barker M H. Blood Chemistry Observations in Protein Deficient and Toxic Pregnancies. *Am J Obst & Gynec* 35: 949-953 (June) 1938.

11 Coons Callie M, and Blunt Katharine. Retention of Nitrogen Calcium Phosphorus and Magnesium by Pregnant Women. *J Biol Chem* 86: 116 (March) 1930.

1 McCollum E V. Diet of Pregnant Woman. *Am J Obst & Gynec* 36: 586-596 (Oct.) 1938.

2 Conn L C, Vant J R and Malone M M. Some Aspects of Maternal Nutrition. *Surg, Gynec & Obst* 62: 377, 1936.

3 McCance, R A, Widdowson E M and Verdon C M. A Study of English Diets by the Individual Method. III. Pregnant Women at Different Economic Levels. *J Hyg* 38: 596, 1938. Ebbs J H and Moyle, W J. The Importance of Nutrition in the Prenatal Clinic. *J Am Dietet. A* 18: 12-15 (Jan.) 1942.

4 Rucker M P. The Effect of Diet on the Outcome of Pregnancy. *Kentucky M J* 35: 329, 1937.

5 Garry R C and Stiven D. A Review of Recent Work on Dietary Requirements in Pregnancy and Lactation with an Attempt to Assess Human Requirements. *Nutrition Abstr & Rev* 5: 855-887, 1936.

## CALCIUM, PHOSPHORUS AND VITAMIN D

One of the most important elements of the diet during pregnancy and lactation is calcium. With this mineral one can also link phosphorus and vitamin D. A decrease in the serum calcium in the last months of pregnancy has been shown,<sup>12</sup> with a return to normal after the pregnancy has terminated. In successive pregnancies with only short periods between, the serum calcium has been shown to be even lower. Mendenhall and Drake<sup>13</sup> have ascribed numerous symptoms and complaints to a lack of calcium during pregnancy. They cleared up such complaints as muscle soreness, spasms, numbness, tingling and neuritis by giving calcium and viosterol to these patients.

Swanson and Iob,<sup>14</sup> in a chemical analysis of the fetus, have shown that the calcium and phosphorus retained in the last two lunar months is 65 and 64 per cent respectively of the total body content of the full term fetus. In order to supply these needs, a daily intake of 1.5 to 2.0 Gm. of calcium is necessary.<sup>15</sup>

The relationship between calcium, phosphorus and vitamin D has been the subject of much research. It seems clear that vitamin D is related to the utilization and retention of calcium and phosphorus in the body. Vitamin D requires an adequate supply of calcium and phosphorus in order to provide a retention. In rats vitamin D causes an increased retention of calcium and phosphorus in the offspring when the diet is adequate.<sup>16</sup> In a review by Jeans and Stearns<sup>17</sup> it is pointed out that some persons can retain calcium in ample amounts if the intake is from 1.6 to 2.5 Gm., even without added vitamin D, but in rapidly succeeding pregnancies and periods of lactation, unless vitamin D is given there may be poor retention of calcium and phosphorus regardless of the intake.

That the amount of calcium and vitamin D in the mother's diet affects the density of the infant's bones and the structure of the teeth has been observed.<sup>18</sup> Evidence has been presented to show the relation of the maternal diet to the development of rickets in the offspring. Maxwell<sup>19</sup> has reported fetal rickets. Mellanby<sup>20</sup> has stated that calcium and vitamin D are often deficient in the mother's diet and feels that this is one of the predisposing factors in the development

of rickets. Grant and Goettsch<sup>21</sup> have shown a greater and earlier tendency to rickets in rats born of mothers on diets low in calcium, phosphorus and vitamin D.

Macy and her co-authors<sup>22</sup> reported that the addition of cod liver oil and yeast to the diets of nursing mothers resulted in improved calcium assimilation and a greater feeling of well being.

The amount of vitamin D which is necessary for adult mineral metabolism is not definitely known and the amount suggested in table 1, of 400-800 units, is largely arbitrary. The administration of vitamin D in some form seems to be indicated.

In supplying the calcium in the food, the requirements for phosphorus are usually automatically supplied.

## IRON

A great deal of interesting work has been published in the past few years which has given us a clearer understanding of the relation of the maternal diet to the development of anemia in the mother and the infant. Studies in the anemia of rats have done much to help in the understanding of anemia in the human infant. Parsons, Hickmans and Finch<sup>23</sup> showed that rats fed on an iron deficient diet can rear their litters, but the second generation fed on the same diet will have diminished reproductive ability, the young will not grow properly and they will show a pronounced anemia. The hemoglobin at birth is lower in the second litter of rats on an iron deficient diet.<sup>24</sup> Murphy and Bowes<sup>25</sup> found that anemia was twice as frequent among mothers using an inadequate diet as among those using an adequate diet. Once the anemia is established, whether the so-called physiologic anemia of pregnancy or an iron deficient anemia, it is then impossible to raise the level by diet, no matter how nourishing or how much iron is available. It is therefore necessary to provide iron in such cases. Both maternal anemia and anemia of infants can be prevented by prophylactic iron therapy. Labate,<sup>26</sup> in studying three groups of women on different diets, reported that iron increased the hemoglobin whether the diet was good or not.

Neale and Hawksley<sup>27</sup> give as the cause of anemia in the mother (1) transfer of maternal reserve to fetus, (2) poor diet, (3) rapidly repeated pregnancies and twin pregnancies and (4) gastric anacidity or hypoadicidity. The cause of anemia in the infant, according to Parsons and Hawksley,<sup>28</sup> is either a deficient ante-

12 Nicholas H. O., Johnson H. W. and Johnston R. A. Diffusible Serum Calcium in Pregnancy. *Am J Obst. & Gynec.* 27: 504-510 (April) 1934. Mull J. W. and Bill A. H. Variations of Serum Calcium and Phosphorus During Pregnancy. *I Normal Variations* ibid 27: 510-517 (April) 1934.

13 Mendenhall A. M., and Drake J. C. Calcium Deficiency in Pregnancy and Lactation. Clinical Investigation, *Am J Obst. & Gynec.* 27: 800-807 (June) 1934.

14 Swanson W. W. and Iob, L. Vivian. The Growth of Fetus and Infant as Related to Mineral Intake During Pregnancy, *Am J Obst. & Gynec.* 38: 382-391 (Sept.) 1939.

15 Macy Icie G. and Hunscher Helen A. An Evaluation of Maternal Nitrogen and Mineral Needs During Embryonic and Infant Development. *Am J Obst. & Gynec.* 27: 878-888 (June) 1934. Oberst F. W. and Plass E. D. Calcium, Phosphorus and Nitrogen Metabolism in Women During Second Half of Pregnancy and in Early Lactation. ibid 40: 399-413 (Sept.) 1940. Garry R. C. and Stiven D. A Review of Recent Work on Dietary Requirements in Pregnancy and Lactation with an Attempt to Assess Human Requirements. *Nutrition Abstr. & Rev.* 5: 855-887 (April) 1936. Coons and Blunt.<sup>24</sup>

16 Swanson, W. W., and Iob, L. Vivian. Calcium and Phosphorus Content of the Offspring After Feeding Vitamin D to the Mother Rat, *Am J Dis Child* 49: 43-46 (Jan.) 1935.

17 Jeans P. C. and Stearns Genevieve. The Human Requirements of Vitamin D. *J. A. M. A.* 111: 703-711 (Aug. 20) 1938.

18 Toverud K. D. and Toverud G. Studies on Mineral Metabolism During Pregnancy and Its Bearing on Disposition to Rickets and Dental Caries. *Acta paediat.* 12 (Supp. 2): 1116-1931. Finola G. C. Trump R. A. and Grimsom M. Bone Changes in the Fetus Following the Administration of Dicalcium Phosphate and Viosterol to the Pregnant Mother. *Am J Obst. & Gynec.* 34: 955-968 (Dec.) 1937.

19 Maxwell J. P. Hu C. H. and Turnbull H. M. Fetal Rickets. *J. Path. & Bact.* 35: 419-440 (May) 1932.

20 Mellanby May. Diet and Teeth. III. The Effect of Diet on the Dental Structure and Disase in Man. Great Britain Medical Research Council Special Report Series 191 1934.

21 Grant A. H. and Goettsch M. The Nutritional Requirements of Nursing Mothers. The Effect of a Deficiency of the Antirachitic Vitamin Only in the Diet of the Mothers on the Development of Rickets in the Young. *Am J Hyg.* 6: 211-227 (March) 1926. Grant, A. H. The Nutritional Requirements of Nursing Mothers. The Effect of Lowering Both the Antirachitic Vitamin and Calcium in the Diet of the Mother on the Development of Rickets in the Young. ibid 6: 228-237 (March) 1926.

22 Macy Icie G. Hunscher Helen A. McCosh S. S. and Nims Betty. Metabolism of Women During the Reproductive Cycle. III. Calcium, Phosphorus and Nitrogen. Utilization in Lactation Before and After Supplementing the Usual Home Diets with Cod Liver Oil and Yeast. *J Biol Chem* 86: 59-74 (March) 1930.

23 Parsons L. G. Hickmans Evelyn M. and Finch Ethel. Studies in Anemia of Infancy and Childhood. VI. The Effect of Iron Deficient Diets on the Size of the Red Blood Cells in Rats and in the Production of Microcytic Anemia in Their Offspring. *Arch Dis Childhood* 12: 369-380 (Dec.) 1937.

24 Alt H. L. Iron Deficiency in Pregnant Rats. *Am J Dis Child* 56: 975-984 (Nov.) 1938.

25 Murphy D. P. and Bowes A. DeP. Food Habits of Mothers of Congenitally Malformed Children. Report of 545 Families. *Am J Obst. & Gynec.* 37: 460-466 (March) 1939.

26 Labate J. Classification and Treatment of Anemia of Pregnancy. *Am J Obst. & Gynec.* 38: 48-56 (July) 1939.

27 Neale A. V. and Hawksley J. C. Studies in Anemias of Infancy and Early Childhood. Nutritional Anemia in Mother and Child. *Arch Dis Childhood* 8: 227-240 (Aug.) 1933.

28 Parsons L. G. and Hawksley J. C. Studies in Anemias of Infancy and Early Childhood. Anhematopoietic Anemias, *Arch Dis Childhood* 8: 117-144 (April) 1933.

natal storage of iron or a deficient postnatal supply, or both. A prime factor in this deficiency is the presence of anemia in the mother. Strauss<sup>29</sup> pointed out that anemia was present during the first year of life in babies born of anemic mothers although the hemoglobin was normal at birth. Mackay<sup>30</sup> showed that there was a lower level of hemoglobin in every month of the first six months of life in infants born of anemic mothers than in infants born of mothers without anemia.

The minimum requirement during pregnancy seems to be 15 mg, and according to Macy and Hunscher<sup>31</sup> it may be 20 mg daily. Corrigan and Strauss<sup>32</sup> showed the value of supplementing the antepartum diet with medicinal iron. The results obtained in the blood of the mothers were equally striking in the blood of infants in similar studies by Gottlieb and Streen<sup>33</sup>.

#### VITAMIN A

The daily requirement of vitamin A is as yet unknown, but, from various surveys and as a result of correlated dark adaptation tests, suggested requirements have been set forth. That these are far from being completely acceptable is seen when one considers the difficulties and discrepancies in the methods of measurement. The manifestation of vitamin A deficiency in any gross form is extremely rare. The incidence of minor or subclinical deficiencies is as yet unknown, but newer methods of detection may bring these to light in the near future. Again, the widespread distribution of vitamin A and its precursor carotene in our common foods suggests that it is probably not seriously deficient. However, pregnancy and lactation place extra demands on the normal physiologic processes of the female, and it is probably wise to aim at an optimum level of vitamin A and thus be within the margin of safety until our present knowledge of requirements is extended.

The part played by vitamin A in reproduction is uncertain. Mason<sup>34</sup> noted an increased rate of premature births and stillbirths in animals on vitamin A deficient diets. The young were not suckled as long and lived a shorter time than normal. On the other hand, Cannon<sup>35</sup> found that congenital anomalies were not induced in the young of rats with a lack of vitamin A in the diet. They did, however, show abnormalities of pregnancy and labor as well as a tendency to sterility.

Williams, Hark and Fralin,<sup>36</sup> in observing a group of pregnant women, found 62 per cent with a low vitamin A content in an analysis of their dietary records. Only 37.5 per cent of these women had poor dark adaptation. Hirst and Shoemaker<sup>37</sup> found no significant obstetric complications among the women with vitamin A deficiencies.

Ricketts<sup>38</sup> has described severe deficiency manifestations of vitamin A simulating toxemia of pregnancy. His report deals with 2 cases.

The role of vitamin A in the development of the fetus and therefore its importance in pregnancy is strongly suggested by the work of Wollbach and Howe<sup>39</sup>. They have shown changes in the structure of the developing teeth in vitamin A deficient rats and guinea pigs. Mellanby<sup>40</sup> has shown defective teeth in rats born of mothers on a diet deficient in vitamin A and feels that vitamin A deficiency is responsible for absent or defective enamel and dentin.

While the newborn infant has very low stores of vitamin A,<sup>41</sup> the colostrum and early human milk are rich in this vitamin. Human milk contains the same amount of carotene and vitamin A as cow's milk but at the beginning of lactation contains five to ten times more.

It seems safe in our present knowledge of vitamin A requirements to believe that the requirements during pregnancy and lactation will be met by diet and the same supplement which provides vitamin D, namely 4 to 6 Gm of cod liver oil or its equivalent.

#### VITAMIN B COMPLEX

Cowgill<sup>42</sup> has shown that the requirement of the average person for vitamin B<sub>1</sub> depends on the basal metabolism and the caloric intake. Since these are increased in pregnancy and lactation, the intake of vitamin B<sub>1</sub>, or thiamine, must be increased. Polyneuritis can occur during pregnancy,<sup>43</sup> and signs of minor deficiencies of vitamin B<sub>1</sub> are not uncommon. We<sup>44</sup> have been impressed by the changes which occurred when the intake of vitamin B<sub>1</sub> was doubled or trebled in women attending the antepartum clinic who had been on poor diets. Many of the minor aches and pains and numerous complaints disappeared. The mental attitude of many of these patients changed from one of apathy and discontent to one of interest in the outcome of their pregnancy. Williams and his co-workers<sup>4</sup> in a nutrition study of pregnant women found practically one third of their patients on an inadequate intake of vitamin B<sub>1</sub>, according to the Cowgill standard. Thirty per cent of those with an inadequate intake had moderate to pronounced nausea and vomiting compared with only 10 per cent of those with an adequate intake. Fatigue, cramps, paresthesias and dyspnea were also found more frequently in those with a low vitamin B<sub>1</sub> intake. Strauss and McDonald<sup>46</sup> point out that such evidences of polyneuritis should be treated with vitamin B complex.

29 Strauss M B. Anemia of Infancy from Maternal Iron Deficiency in Pregnancy. *J. Clin. Investigation* 12: 345-353 (March) 1933.

30 Mackay H M M. Nutritional Anemia in Infancy with Special Reference to Iron Deficiency. London: His Majesty's Stationery Office 1931. (Great Britain Medical Research Council Special Report Series No. 157).

31 Macy Icie G and Hunscher Helen A. An Evaluation of Maternal Nitrogen and Mineral Needs During Embryonic and Infant Development. *Am. J. Obst. & Gynec.* 27: 878-888 (June) 1934.

32 Corrigan J C and Strauss M B. Prevention of Hypochromic Anemia in Pregnancy. *J. A. M. A.* 106: 1088-1090 (March 28) 1936.

33 Gottlieb R and Streen G J. The Prevention of Maternal and Infant Anemia. *Surg., Gynec. & Obst.* 68: 869-871 (May) 1939.

34 Mason K E. Fetal Death Prolonged Gestation and Difficult Parturition in Rat as a Result of Vitamin A Deficiency. *Am. J. Anat.* 57: 303-349 (Sept.) 1935.

35 Cannon M D. Failure of Maternal Vitamin A Depletion to Produce Congenital Anomalies in the Young of Rats. *Proc. Soc. Exper. Biol. & Med.* 44: 129-132 (May) 1940.

36 Williams P I, Hark B and Fralin Florence G. Nutrition Study in Pregnancy. Correlation Between Dietary Survey of Vitamin A Content and Dark Adaptation Time. *Am. J. Obst. & Gynec.* 40: 111 (July) 1940.

37 Hirst J C and Shoemaker R E. Vitamin A in Pregnancy. Average Capacity According to Feldman Adaptometer. *Am. J. Obst. & Gynec.* 40: 12-16 (July) 1940.

38 Ricketts W A. Vitamin A Deficiencies in Pregnancy. *Am. J. Obst. & Gynec.* 38: 484-488 (Sept.) 1939.

39 Wollbach S B and Howe P R. The Incisor Teeth of Albino Rats and Guinea Pigs in Vitamin A Deficiency and Repair. *Am. J. Path.* 9: 275-294 (May) 1933.

40 Mellanby Helen. Defective Tooth Structure in Young Albino Rats as a Result of Vitamin A Deficiency in the Maternal Diet. *Brit. Dent. J.* 67: 187-194 (1939).

41 Dann W J. Transmission of Vitamin A from Parents to Young in Mammals. The Vitamin and Carotenoid Contents of Human Colostrum and Milk. *Biochem. J.* 30: 1644-1651 (Sept.) 1936.

42 Cowgill G R. Human Requirements for Vitamin B<sub>1</sub>. *J. A. M. A.* 111: 1009-1016 (Sept. 10) 1938.

43 Neuwiler W. Polyneuritis During Pregnancy. *Med. Klin.* 2: 1179 (1940) abstr. *Internat. Abstr. Surg.* 73: 249-250 (Sept.) 1941.

44 Allen L. Nutritional Requirements and Deficiencies of Pregnancy and Lactation. *S. Clin. North America* 20: 259-268 (Feb.) 1940.

45 Ebbs J H, Tisdall F I and Scott W A. The Influence of Prenatal Diet on the Mother and Child. *J. Nutrition* 22: 515-526 (Nov.) 1941.

46 Williams P I, Griffith G C and Fralin Florence G. The Relation of Vitamin B<sub>1</sub> to the Reproductive Cycle. Correlation Between Vitamin B<sub>1</sub> Content of Diet and Electrocardiographic Findings in Ninety One Pregnant Women. *Am. J. Obst. & Gynec.* 40: 181-193 (Aug.) 1940.

46 Strauss M B and McDonald W J. Polyneuritis of Pregnancy. A Dietary Deficiency Disorder. *J. A. M. A.* 100: 1320-1323 (April 29) 1932.

The need of the lactating woman for vitamin B<sub>1</sub> is obviously higher than for the normal nonlactating woman. Cowgill<sup>47</sup> sets this at 15 or 20 units per hundred calories, which would be 500 to 700 units daily. The amount of vitamin B<sub>1</sub> in the milk depends to some extent on the amount in the mother's diet.<sup>48</sup> There is practically no storage of this vitamin in the body. The stimulating action of B<sub>1</sub> on the secretion of milk has been observed.

Riboflavin, or vitamin B<sub>2</sub> (G), is associated with oxidation processes of the cell. With the increased metabolism during pregnancy, the requirement of this vitamin is probably increased. Forms of keratitis have been described as evidence of deficiency of this vitamin.<sup>49</sup> The condition described by Sebrell and Butler<sup>50</sup> as a result of deficiency of riboflavin has been observed in 1 patient in our own clinic.

Riboflavin is found in milk, egg white, liver and leafy vegetables in such proportions that most diets should contain a sufficient amount.

Nicotinic acid and vitamin B<sub>6</sub> have not been demonstrated as having any particular significance during pregnancy, except that the requirement is probably increased in proportion to those of the other vitamins.

If the diet contains an adequate amount of whole grain products, milk, meat, egg and vegetable, the components of the vitamin B complex will be supplied in sufficient amounts.

#### VITAMIN C

With the perfection of methods for determining vitamin C in the body, the approximate needs have been fairly clearly determined for the average woman during pregnancy and lactation. Snelling and Jackson<sup>51</sup> in this clinic found a slight fall in the ascorbic acid level of the blood plasma toward the end of pregnancy. This and a further drop during and after labor might be explained by the decreased intake at this time and by increased needs of the fetus.

Being water soluble, vitamin C is not retained in the body and therefore the level in the blood is directly affected by the amount in the diet.<sup>52</sup>

The average plasma vitamin C of two groups of women measured during pregnancy is shown in table 2. Both groups were on poor diets when the blood was first examined. One group was then given one orange and 4½ ounces of canned tomatoes daily until the end of pregnancy. It will be noted that the average level of ascorbic acid in this group was higher in the eighth month and at term than in the other group. The parasitic nature of the fetus is demonstrated by the average level of vitamin C in the cord blood, which is higher than the level in the maternal blood at this time. Even when the maternal blood was practically depleted of ascorbic acid, the cord blood would contain appreciable though below normal amounts. The average levels in table 2 are lower than the desired level during pregnancy.

47 Cowgill G R. Human Requirements for Vitamin B<sub>1</sub>. *J. A. M. A.* 111: 1009-1016 (Sept. 10) 1938.

48 Sure Barnett. Influence of Massive Doses of Vitamin B<sub>1</sub> on Fertility and Lactation. *J. Nutrition* 18: 187-194 (Aug.) 1939.

49 Kruse H D, Sydenstricker V P, Sebrell W H and Cleckley H M. Ocular Manifestation of Ariboflavinosis. *Pub. Health Rep.* 55: 157-169, 1940.

50 Sebrell W H and Butler R E. Riboflavin Deficiency in Man. Preliminary Note. *Pub. Health Rep.* 53: 2282-2284, 1938.

51 Snelling C E and Jackson S H. Blood Studies of Vitamin C During Pregnancy, Birth and Early Infancy. *J. Pediat.* 14: 447-451 (April) 1939.

52 Teel H M, Burke Bertha S and Draper Ruth. Vitamin C in Human Pregnancy and Lactation. Studies During Pregnancy. *Am. J. Dis. Child.* 56: 1004-1010 (Nov.) 1938.

Sellig and King<sup>53</sup> have shown that the amount of vitamin C in the breast milk is dependent on the dietary intake of the mother. Totally breast fed babies are well supplied with vitamin C if the vitamin C content of breast milk is more than 4 mg. per hundred cubic centimeters. Mothers on low vitamin C diets can secrete enough vitamin C in the breast milk to give levels in the plasma of the infant which are higher than their own. While cases of scurvy in breast fed infants have been known, it is an extremely rare occurrence. Of 20 consecutive babies with scurvy admitted to the Hospital for Sick Children, Toronto, all were bottle fed.

It seems clear that the vitamin C intake during pregnancy and lactation should be increased above the amount usually required. Particular attention should be paid to the intake during the latter weeks of pregnancy, during lactation and during periods of vomiting or other dietary restriction. The diet should contain liberal amounts of orange, grapefruit or tomato juice as well as other fruits and vegetables.

#### VITAMIN E (APHIA-TOCOPHEROL)

The need for vitamin E in normal pregnancy has been suggested recently. Its widespread distribution in foodstuffs makes it unlikely that any serious deficiency can occur. Reports of Vogt-Möller<sup>54</sup>, Currie Shute,<sup>55</sup> Collins<sup>56</sup> and Watson<sup>57</sup> on the use of wheat germ oil in habitual abortion have been very encouraging.

TABLE 2—Plasma Vitamin C During Pregnancy

Group	8th to 6th Month	5th Month	Term	Cord Blood	Mother's Blood
	Mg. per 100 Cc.	Mg. per 100 Cc.	Mg. per 100 Cc.	Mg. per 100 Cc.	Mg. per 100 Cc.
Diet poor in vitamin C	0.47	0.40	0.47	1.0	0.1
Improved diet added orange and tomato	0.46	0.11	0.7	1.4	0.8

Further reports continue to appear. Buchrach<sup>58</sup> summarizes the recent reports by suggesting that there is at least presumptive evidence that it is needed for normal pregnancy in women.

#### VITAMIN K

Evidence has been brought forward practically to establish the usefulness of vitamin K.<sup>59</sup> The administration of this substance to the mother just before the onset of labor or during this during labor has a definite effect on the prothrombin time of the infant.<sup>60</sup> A reduction in the incidence of hemorrhagic disease in the newborn period has been shown when mothers have been treated, and the use of this substance also seems to be indicated in the treatment of cases of hemorrhagic disease of the newborn.<sup>61</sup>

53 Sellig E V and King C C. The Vitamin C Content of Human Milk and Its Variation with Diet. *J. Nutrition* 11: 229 (June) 1937.

54 Vogt-Möller P. Treatment of Habitual Abortion with Wheat Germ Oil (Vitamin E). *Lancet* 2: 182-183 (July 2) 1931.

55 Currie David. Vitamin E in the Treatment of Habitual Abortion. *Brit. M. J.* 1: 1218-1219 (Dec. 18) 1937.

56 Shute E V. An increase in Fetal Alkaline Phosphatase Previa. *Am. J. Obst. & Gynec.* 37: 633 (April) 1939.

57 Collins C C, Weed J C and Collins J H. The Treatment of Spontaneous Threatened or Habitual Abortion. *Surg. Gynec. & Obst.* 70: 737-786 (April) 1940.

58 Watson E M and Tew W J. Wheat Germ Oil (Vitamin E) Therapy in Obstetrics. *Am. J. Obst. & Gynec.* 31: 333-338 (Feb.) 1936.

59 Buchrach A J. Vitamin E and Habitual Abortion. *Brit. M. J.* 1: 890 (June 1) 1940.

60 Shettles I B, Delf J and Hellman J A. Factor Influencing Plasma Prothrombin in the Newborn Infant. II. Antepartum and Neonatal Intake of Vitamin K. *Bull. Intern. Hosp. & Hosp. Clin.* 419-426, 1939.

61 Beck A C, Taylor F S and Colburn J L. Vitamin K Administered to the Mother During Labor as a Prophylactic Against Hemorrhage in the Newborn Infant. *Am. J. Obst. & Gynec.* 11: 127-131, 1941.

62 Snelling C E and Nelson Wm. Hemorrhagic Disease of the Newborn. *J. Pediat.* 1: 55-60 (Nov.) 1930.



## RELATION OF NUTRITION TO TEETH

Studies of the incidence and control of dental caries in the pregnant woman indicate that diet is a factor. There appears to be some truth in the old saying "For every child a tooth," and the observation has been commonly made that dental decay is increased during pregnancy.

The teeth, while requiring relatively little mineral salts in comparison to the skeleton are nevertheless dependent on maternal supplies for their normal development. Deficiencies in the maternal stores of essential food elements, such as minerals and vitamins, will probably be reflected in the structure of the teeth of the infant. Toverud<sup>63</sup> has found defects in the teeth under such conditions, and Mellanby<sup>64</sup> feels that deficiencies in antepartum diet are an important factor in dental caries appearing in the child.

In observations on three groups of patients in an antepartum clinic Daro<sup>65</sup> found a poorer condition of the teeth and gums in those who were on inadequate diets compared to those who were eating plenty of milk, raw fruits and vegetables. He points out the importance of deficiencies which might occur as the result of vomiting early in pregnancy.

Howe<sup>66</sup> makes a strong point. "The dentist may and should indicate to the medical practitioner that the teeth are calcifying and the bones which carry the teeth are undergoing ossification during fetal life, and it is his duty to see that the normal processes of growth and development here go on uninterrupted. It is recognized that these processes are influenced more strongly by nutritional states than by any other factor."

While there are undoubtedly other factors in the production of dental caries, it seems reasonable that the period of development of the teeth is a most important one and the mother should be provided with the optimum requirements.

## NUTRITION A FACTOR IN PREGNANCY

Is nutrition a factor of importance in the management of pregnancy? This question could be answered by general statements covering the knowledge that improved nutrition improves the general health and thus results in healthier mothers. Common sense and practical experience suggest the importance of proper food for the expectant mother. Poverty goes hand in hand with poor diets, but not all people with adequate incomes provide proper diets. Ignorance, illness and other circumstances also interfere with proper dietary habits.

The incidence of successful pregnancies is conceded to be better in those of good or moderate means in comparison to those who are on low income. A recent communication by Baird and Wiper<sup>67</sup> from Aberdeen makes such a comparison. In private specialist practice the rate for stillbirths and neonatal deaths was 12 per thousand in hospital practice it was 54.5 per thousand and in the homes it was 78.5 per thousand live births. While there are several probable factors entering the outcome of these three classes of pregnant women, such as economic nursing and medical, the authors say:

There is thus a large wastage of child life associated

with childbirth in Scotland, intimately connected with unfavorable economic conditions and malnutrition and fatigue in the mother."

Ross and his associates<sup>68</sup> reported that, in two groups of pregnant women, one group on a poor diet and another group on a well balanced diet, the incidence of toxemia and the levels of hemoglobin and serum protein were not significantly different. Church, Foster and Asher<sup>69</sup> showed that the diet of the mother was a factor in the survival of the offspring from the risks of infection.

In a recent study in this clinic<sup>70</sup> a group of pregnant women found to have very poor diets were divided into two groups. One group of 120 women on poor diets and with low incomes were followed during the last half of pregnancy as controls for 90 women on equally poor diets and low incomes who were supplied with milk, eggs, cheese, oranges, canned tomatoes, wheat germ and vitamin D capsules and who were instructed in the type of diet necessary for pregnancy. The observations made throughout pregnancy, during convalescence and on the baby showed a striking difference. The incidence of miscarriages, premature births and stillbirths, the number of infections in the mother and her general condition, both mental and physical, were much better in those who received the extra food. Changes in the blood of the mothers given extra food gave evidence that they were in a better condition during the stress of pregnancy. The general condition of the babies born of mothers who received the extra food was much better than the condition of those born of mothers who were left on their poor diets. The incidence of illness among the babies was much greater in the poor diet group.

While it is well recognized that there are many factors in the successful outcome of pregnancy, it seems reasonable that proper nutrition will ensure a more optimum general condition of the mother which will possibly prevent or at least minimize the complications that occur in pregnancy. The tired, depressed and physically poor women in this study, with a past history of a high percentage of complications, were poor obstetric risks. But even in four or five months of proper feeding this condition was greatly improved and the outcome of pregnancy was not only better than with those who were left on their poor diet but resulted in a lower rate of complications than they had experienced in previous pregnancies. This series is small and should be extended in women equally poor.

A much larger experiment was conducted in Great Britain,<sup>71</sup> and, while the results were obtained in several districts and the experiment was not confined to one hospital, the series is so large and the results are so striking that they have some significance. Milk and egg products containing added vitamins A and D and another food rich in vitamin B were supplied during the last three months of pregnancy to needy mothers in the special areas of England and South Wales. The maternal death rate in 10,384 obstetric cases in which these foods were supplied was 1.66 per thousand total births as against a rate of 6.15 among 18,854 other cases in the same districts during the same period. There

63 Toverud K. L. and Toverud G. Studies on Mineral Metabolism During Pregnancy and Its Bearing on Disposition to Rickets and Dental Caries. *Acta paediat.* 12 (supp. 2) 1:116 1931.

64 Mellanby May. Diet and Teeth. III. The Effect of Diet on the Dental Structure and Disease in Man. Medical Research Council Special Report Series No. 191. London: His Majesty's Stationery Office, 1934.

65 Daro A. J. Dental Problems Arising During Pregnancy. *J. Am. Dent. A.* 27: 51-57 1940.

66 Howe P. R. What Consideration Shall Be Given to Prenatal Care in Preparation for Good Teeth? *J. Am. Dent. A.* 26: 373-374 1939.

67 Baird Dugald and Wiper J. J. B. High Stillbirth and Neonatal Mortalities. *Lancet* 2: 65, (Nov. 29) 1941.

68 Ross R. A., Perlzweig W. A., Taylor H. M., McBride A. Lites A. and Kondrizer A. A. Study of Certain Dietary Factors of Possible Etiologic Significance in Toxemias of Pregnancy. *Am. J. Obst. & Gynec.* 35: 426-440 (March) 1938.

69 Church C. F., Foster Claire and Asher Dorothy W. Diet and Resistance to Infection. Effect of Maternal Diet. *Am. J. Pub. Health* 27: 1232-1239 (Dec.) 1937.

70 Ebbs J. H., Tisdall F. I. and Scott W. A. The Influence of Prenatal Diet on the Mother and Child. *J. Nutrition* 22: 305-376 (Nov.) 1941.

71 Balfour M. I. Nutrition Therapy During Pregnancy. *Proc. Roy. Soc. Med.* 31: 911-914 (June) 1938.

was only one death from sepsis in the assisted group, as against forty-five in the nonassisted group. The number of stillbirths and neonatal deaths was 43 per cent less in the experimental group than in the nonassisted category.

#### SUMMARY

From the evidence presented it is apparent that the pregnant and lactating woman requires more calories, minerals, vitamins and protein than the nonpregnant woman. As shown by McCance and his associates<sup>72</sup> the intake of these elements is influenced by the economic level in that "a rise in spending power led to an increased consumption of milk, fruit, vegetables and meat and a decreased consumption of bread and total cereals." They found the women on the better diets to be taller and less anemic.

The management of the nutritional needs of the expectant mother requires more care in the selection of a daily diet than does that of a normal nonpregnant woman. The increased requirements for protein, minerals and vitamins, if they are to be met by the food consumed, necessitate some instruction in most cases. This instruction can be given by the physician or by the dietitian in the clinic. Simple directions stressing the importance of eating the foods which supply the greatest amounts of the protective food elements are usually sufficient. The importance of milk, citrus fruits, green and yellow vegetables and whole grain bread and cereal are obvious. Apart from vitamin D, the requirements for the other food elements can be met by the food, provided the income is adequate.

### Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORTS  
HOWARD A. CARTER, Secretary

#### VIBRAPHONE NOT ACCEPTABLE

Manufacturer: European Vibraphone Company, 120 Wigmore Street, London, W. I. American Representatives, European Vibraphone Company, Inc., 4687 Hollywood Boulevard, Los Angeles.

The following description of the Vibraphone has been taken from the advertising used to promote the device:

"The Vibraphone is a tiny hollow instrument made of pure silver. A minute silver shell, within which is a vibration chamber, acts as a receiver of sound. It fits snugly into your ear. The tube of the instrument goes into the opening of your ear until the ball settles comfortably into position. The shell, or vibration chamber, rests in the curve of the outer ear. There are no wires, no batteries, nothing electric and there are no head bands, no trumpets, nothing to fit behind the ear, or to carry in the pocket or handbag."

In the firm's advertising is the following description of how the Vibraphone will aid the deafened person to hear:

"This principle is a valuable development of science. When sounds enter the Vibraphone a strong vibration is set up which transmits the sound impulses to the inner ear. With daily use, the affected ear accustoms itself to this helpful stimulation, and normal sounds may be heard with natural clarity in many cases."

The remarkable quality of these sound waves from the Vibraphone lies in the fact that they tend to set up vibrations in affected ears which normally have lessened power to transmit sound to the brain. Ears which are too sluggish, ears which have become out of order, and partially deaf by reason of causes already mentioned, tend to liven up under the continuous 'massage' of this amplified and concentrated sound from the Vibraphone. Hearing functions gradually tend to waken into

activity and your ear begins to live once more. Improved hearing is evidence of this.

"The progress of the improvements is more evidence still. Time will tell how perfect your hearing may become. The fact that your hearing is improved shows that your deafness may be bettered. Your confidence is justified. Your patience is rewarded."

The theory of gradually massaging the organs back to sensitivity by means of vibration has been exploited in other instances, and in no case has any critical evidence been submitted to substantiate it. The manufacturer of the Vibraphone asks the purchaser to withhold judgment of the aid until it has been used several weeks.

According to a statement, 'Your Deposit is Insured' in the promotional material, 'said European Vibraphone Company, Inc., warrants in its customers' contract to refund to the purchaser of its Vibraphone products the purchase price thereof less service charge of Six and no/100 Dollars (\$6.00) per pair or Three and no/100 Dollars (\$3.00) on a single Vibraphone if such product be found not satisfactory during the thirty (30) day trial period offered.' This financial arrangement seems to be very advantageous to the firm. Even though the customer has derived no benefit from the device and returns it he pays enough for the privilege of trying it. The manufacturer thus collects the 'service charge' and also receives the instrument, which he may resell.

It is not known whether the Vibraphone now promoted by the European Vibraphone Company and the Vibraphone referred to in the following paragraph are one and the same instrument but the claims made for the two instruments are identical and photographs of the devices show them to be very similar in appearance.

According to the article 'Deafness Cure Quackery and Pseudo-Medicine' by Dr. Arthur J. Cramp, former director of the Bureau of Investigation of the American Medical Association (*Hygeia* 4:21 [Jan.] 1926), the Vibraphone is an offspring of the "Radium Ear" or 'Audiophone' device promoted by one Charles Fensky. The Fensky device was a similarly shaped instrument which was 'improved' by the addition of a 'vibrator.' A St. Louis firm, the Vibraphone Company, took over promotion of the instrument.

The Better Business Bureau sent out a report on the Vibraphone in 1929 in which the results of an investigation made by the bureau were given. Several hundred letters were written to persons said by the manufacturer to be satisfied users of the instrument. By far the majority of the replies indicated that the device had been of no value as an aid to hearing. Many said that they could not wear it because it was so uncomfortable.

No evidence that this device, when tried under controlled conditions, would amplify sound and improve the hearing of a deafened person was made available. The Council voted not to include the Vibraphone in its list of accepted devices.

#### ALLERGEN-PROOF ENCASINGS ACCEPTABLE

Manufacturer: Allergen Proof Encasings Inc., 4060 Superior Avenue, Cleveland.

The Allergen-Proof Encasings were declared acceptable for inclusion in the Council's list of accepted devices in the *JOURNAL* of March 20, 1937, page 972. Designed to protect persons allergic to dust, feathers, cottonseed or kapok, the covers (fitted for various sized mattresses, pillows and box springs) were made of a rubber fabric composition treated by a process which increased the resistance of rubber to oxidation.

Because of priority restrictions the manufacturer is now unable to obtain a supply of the original fabric. A substitute has been found by the firm. This material is a cotton fabric impregnated with paraffin. According to the Council tests the material stands washing and ironing as claimed by the firm. It was tested against the effects of dilute acids, alkalis and soap. It stands up fairly well but is not as satisfactory as the original material. The Council believes it to be as good as can be obtained at the present time and that it will give satisfactory service if the manufacturers' directions are followed.

The Council voted to retain the Allergen Proof Encasings on its list of accepted devices.

72 McCance, R. A., Widdowson, E. M. and Verdon-Roe, C. M. A Study of English Diets by the Individual Method. III. Pregnant Women at Different Economic Levels. *J. Hyg.* 38: 596-622 (Sept.) 1938.

# THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY JANUARY 30 1943

## POSTOPERATIVE NITROGEN LOSS

Much of the tremendous advance in surgery in the past decade or more has been achieved because of the recognition of various biochemical deficiencies and their correction by appropriate replacement therapy. Loss of water, loss of electrolyte, loss of plasma have all been studied and now are corrected rapidly and effectively by the parenteral route. Indeed with the purification of vitamins many of them can also be administered parenterally and replacement therapy carried out along with the intravenous injection of saline solution, dextrose and plasma.

Nitrogen loss after operation has been largely overlooked even though such loss, unless replaced immediately, means depletion of tissue protein. More important the loss leads to hypoproteinemia, which if severe, produces many serious clinical manifestations. Especially significant therefore, are the recent studies of Brunschwig and his co-workers<sup>1</sup> at the University of Chicago. They observed the nitrogen loss by 41 patients who were operated on for various reasons; the results were given in three groups and averaged 25, 51 and 89 Gm daily. The greatest loss was by a patient who had had a gastric resection and who, during ten days after operation was unable to take food and lost 175 Gm of nitrogen. This figure represented his negative balance and corresponds to 1100 Gm of protein, which actually means 5,500 Gm of tissue protein. In other words, this patient lost, during his first ten postoperative days over 12 pounds of muscle tissue or its equivalent. The significance of this loss, however, lies not in the loss of muscle tissue, for after all voluntary muscle is not needed for an immobile patient at rest in bed. The important point to emphasize is that all protein tissues of the body are affected even though in varying degrees. Of these, plasma protein is of primary importance and postoperative hypoproteinemia has in fact been amply observed

by many surgeons, of these perhaps one of the earliest was that of Jones and Eaton.<sup>2</sup> Doubtless with further study other manifestations of this excessive loss of nitrogen will become known. For example, depletion of liver protein provokes or at least aggravates the possibility of hepatic insufficiency, particularly when disease of the liver is present or is developing. Significant too, as indicating a deficiency are the observations of Farr and his co-workers,<sup>3</sup> who found a fall in the amino acid nitrogen of the plasma during general anesthesia, which proceeded to an even lower level after operation.

Other observations<sup>4</sup> on the tremendous loss of nitrogen following trauma, burns and operations amply justify the implications which flow from the Billings Hospital study. For example, it was obviously impossible to correct this loss by the usual methods of therapy. Oral alimentation helped, but after abdominal operations eating is often contraindicated and in many instances was in any event limited because of anorexia. Intravenous dextrose spared protein breakdown and reduced nitrogen loss to a considerable extent but could do so only by supplying adequate calories, unfortunately the loss of nitrogen is only in part due to this factor. Plasma transfusions are useful but, for the small amount of protein food introduced, are expensive and inconvenient. Actually the loss was corrected by supplying nitrogen in the form of the building stones of protein (amino acids and polypeptides), which were prepared from a digest of casein and pork pancreas and injected intravenously, thus relieving a physiologic short cut over the natural method by sparing the need for digestion and absorption in the gastrointestinal tract. In many of the cases a sufficient dose was injected so that positive nitrogen balance was achieved. One patient with an obstruction of the sigmoid took nothing by mouth yet 50.8 Gm of nitrogen was retained during ten days or, in terms of muscle tissue, a gram of nearly 3½ pounds. In others the magnitude of the protein depletion was significantly lowered. The importance of dextrose in the metabolism of amino acids was shown by the failure to achieve nitrogen balance with the protein digest alone. Other observers also have used intravenous injections of hydrolyzed protein and have confirmed these results.

It may be pertinent now to emphasize the importance of covering postoperative loss of nitrogen in this way as a routine. Dextrose is widely given after operation to supply calories, yet nonessential tissue fat can easily substitute in part for it, nitrogen loss on the other hand, must be met by exogenous sources unless

<sup>2</sup> Jones C M and Eaton France B Postoperative Nutritional Edema Arch Surg 27 1-9 (July) 1933

<sup>3</sup> Farr L E and others Proc Soc Exper Biol & Med 50 256 1942

<sup>4</sup> Cuthbertson D P Lancet 1 43 (April 11) 1942 Lucido Joseph Ann Surg 111 640 (April) 1940 Elman

<sup>5</sup> Elman Robert Ann Surg 112 594 (Oct) 1940 Gardner C E Jr and Trent J C Surg Gynec & Obst 75 657 1942

<sup>1</sup> Brunschwig Alexander Clark D F and Corbin Nancy Ann Surg 115 1091 (June) 1942

depletion of essential body and plasma protein is to be avoided. In this sense consideration of nitrogen loss after operation deserves more serious consideration than caloric needs. This is particularly true in view of the ease and simplicity with which the loss can now be covered. The intravenous injection of protein nourishment with protein digests is certainly now as convenient as the administration of dextrose and saline solution, this contrasts strikingly with the inconvenience and expense of giving large transfusions of plasma as a source of protein food. Many hitherto unexplained postoperative complications are undoubtedly due to excessive nitrogen loss and will be avoided by extensive use of this new method of parenteral protein alimentation.

### ADVANCES IN MUSCLE PHYSIOLOGY

One of the unsolved problems of muscle contraction has been the bridging of the gap between the chemistry of the energy producing reactions involved and the physical processes of shortening and lengthening of the muscle fiber. The detailed chemical transformations of the energy producing mechanisms and their inter-relationships have been elucidated during the course of the past two decades, and the energy changes involved have been measured quantitatively. The phosphorylation cycles whereby energy is transferred from carbohydrate breakdown to the muscle fiber have been worked out in detail<sup>1</sup>. Physical studies, chiefly with the aid of x-ray analysis, have yielded a rather complete picture of the alterations which occur in the muscle fiber when subjected to varying amounts of tension *in vitro*. Muscle contractility is essentially a molecular contractility of the protein (myosin) chains<sup>2</sup>. However, the means by which the energy produced by the chemical processes is linked or transferred to the muscle fiber so that the latter may actively shorten and relax has been entirely a matter of speculation. Now experiments have been presented which yield data for partial solution of this problem. The story promises to be one of the great contributions of biochemistry to modern medicine.

This important contribution to the integration of the chemical and the mechanical features of muscle contraction has come from a laboratory in the Soviet Union. Englehardt and Ljubimova<sup>3</sup> in 1939 discovered that the enzyme adenylypyrophosphatase is either myosin itself or some closely associated protein. This observation has been confirmed and extended in three other laboratories<sup>4</sup>. Its significance is twofold. 1 The breakdown of adenylypyrophosphate is of the various

processes occurring in the metabolism of muscle the nearest in time to the contraction of the muscle fibrils. 2 The quantitatively largest part of the breakdown of adenylypyrophosphate probably occurs by splitting off of free phosphate under the influence of the enzyme adenylypyrophosphate, now suggested to be identical with myosin.

The acceptance of the foregoing suggestion rests at present on the failure of all attempts to separate the enzyme adenylypyrophosphatase from the protein myosin. In addition, important supporting evidence comes from detailed observations now available on the physical alterations which occur in the protein myosin as an accompaniment to the combination of myosin with adenylypyrophosphate (enzyme-substrate combination) and the subsequent enzyme action (splitting of inorganic phosphate from the adenylypyrophosphate). Englehardt and his colleagues<sup>5</sup> treated partially dried myosin fibers, still retaining some adenylypyrophosphatase activity, with a variety of substances. Only adenylypyrophosphate showed any effect and this was to produce an increase in extensibility of the fibers. Needham and his collaborators<sup>6</sup> have demonstrated that adenylypyrophosphate has a direct influence on the relative optical anisotropy and on the shape of myosin particles. The physical changes which take place in the myosin fiber, and the capacity of the latter to catalyze the breakdown of adenylytriphosphate to adenylydiphosphate, are catalyzed by the calcium ion. The importance of the latter ion in maintaining the response of isolated muscle to stimulation has been known from the earliest studies in muscle physiology.

From the available data, a number of interesting concepts are suggested. The essential feature of excitation and contraction in muscle may be, as Bruley<sup>7</sup> has proposed, the liberation of the calcium ion in the vicinity of the adenylypyrophosphate grouping which can thus, by the almost instantaneous catalysis of adenylypyrophosphate breakdown, make available a large amount of energy. The contraction of the myosin fiber would accompany the combination of the adenylypyrophosphate with the enzyme myosin, as indicated not only by the far reaching changes in myosin observed optically and accompanying the enzyme-substrate combination but also by the enzyme action itself. With this concept the energy producing phosphorylation cycles become coupled with the physical changes in the myosin fiber observable during shortening and lengthening. Indeed, myosin now becomes a "contractile enzyme". One may view the muscle of the body, comprising approximately 25 per cent of the total body weight, as a collection of enzymes.

1 Parnis J. K. *Ergebn. d. Enzymforsch.* **6** 57 1937. Needham D. M. *Enzymologia* **5** 158 1938.

2 Astbury W. T. *Ann. Rev. Biochem.* **8** 113 1939. Astbury W. T. and Dickson S. *Proc. Roy. Soc. series B* **129** 307 1940.

3 Englehardt W. A. and Ljubimova M. N. *Nature* **144** 668 (Oct. 14) 1939. *Biochimica* **4** 716 1939.

4 Szent-Gyorgyi Albert and Banga I. *Science* **93** 158 (Feb. 14) 1941. Needham Dorothy M. *Biochem. J.* **36** 113 (Feb.) 1942. Bailey

5 Englehardt W. A., Ljubimova M. N. and Meitner R. A. *C. R. Acad. Sc. (U. S. S. R.)* **20** 644 1941.

6 Needham Joseph Shen Shih-Chung, Needham Dorothy M. and Lawrence A. S. C. *Nature* **147** 766 (June 21) 1941. Needham Joseph, Kleinzeiler Ernest, Wall Margaret, Dainty Mary, Needham Dorothy M. and Lawrence A. S. C. *ibid.* **150** 46 (July 11) 1942.

7 Bruley Kenneth. *Biochem. J.* **34** 121 (Oct.) 1940.

### PREDETERMINATION OF SEX

From earliest antiquity scientists, philosophers and magicians have speculated as to why the offspring is male or female. Biologists have attempted to discover means by which the desired sex could be produced at will. Only with the advent of this century, however, has any scientific foundation for this eventuality been developed. Among the most important early observations was the demonstration that sex among higher animals is determined by genes. Thereafter it became clear that sex is determined in human beings (as in some lower animals) at the time of the fertilization of the egg. Subsequent activity, whether dietary or metabolic, does not change the sex of the child. Furthermore, to the astonishment and possibly distress of some of those with preconceived ideas, human sex is determined by the presence or absence of a particular gene or set of genes of the father rather than by the mother. No longer may the wife be blamed for failure to produce the wished for son!

With the ground work thus laid for scientific approach to predetermination of sex the subject is emerging from folklore into science. In predetermination of sex of insects and possibly mammals extensive advances have been made. Gowen and Nelson<sup>1</sup> say that "many problems of sex differentiation and distribution are, of course, left, but, in the sense of establishing means for sex control through specific agencies under man's guidance, the problem of the predetermination of sex may be said to be solved."

The work on which much of this astounding assertion is based has been done by many investigators and is based largely on observations on *Drosophila melanogaster*—a fly which has served geneticists as the perfect laboratory animal. As Gowen and Nelson point out, the unbalanced condition of one or more chromosome pairs in one sex furnishes the mechanism whereby the distribution of sex in a population is random with a mean approximating an equality for the two sexes. The occurrence of sex linked lethals (a type of gene which results in death and which occurs spontaneously or can be produced by x-rays and other means) gave students of inheritance the first positive means of controlling the sex of the progeny of a set of parents. By refinements of technique involving the introduction of one or more lethal genes in each of the sex chromosomes with prevention of crossing over (i.e. prevention of exchange of genes between homologous chromosomes) it was shown that sex control could be made practically perfect with no males to 100 per cent adult females. As the final step in the voluntary control of sex determination, Gowen and Nelson presented an example of genotypic control (control of genetic type) which led to progeny of 100 per cent males. In crosses intended for cer-

tain other genetic studies a pair mating of *Drosophila melanogaster* was observed which produced 136 males and no females. The male progeny of this cross were able to transmit the male producing characteristic to certain of their daughters without regard to the characteristics of the males to which they were bred. In something over five hundred matings covering a period of eight generations from the original parents, failures in finding the expected male producing genotype did not occur. The daughters with the genotype for all male progeny produced all male offspring without regard to the mates with which they were bred. The males, however, gave no phenotypic expression (i.e. no visible expression) of this inheritance. The male producing genotype is thus without effect on the adult males which carry it. The inheritance is therefore sex limited in its action, affecting only the females which have it, acting as a dominant. Thus, Gowen and Nelson believe, is the final proof that genotypes may be established which can be genetically controlled for the most divergent sex ratios possible—100 per cent female in one progeny and 100 per cent male in the other.

This startling discovery does not of course signify that it will be possible in the foreseeable future for parents to choose in advance the sex of their children. But it does establish for the first time on a scientific basis the fact that this can be done experimentally among lower animals by man devised methods.

### Current Comment

#### PORTS OF ENTRY OF POLIOMYELITIS

Despite much clinical and experimental work, the usual port of entry of poliomyelitis virus has not been precisely determined. The accumulated evidence suggests that the olfactory system is not as a rule primarily involved and that invasion generally occurs through the alimentary tract. The part of the canal most vulnerable to virus penetration however, is still undetermined. New experimental evidence developed by Faber and his colleagues<sup>1</sup> suggests that the oropharyngeal surfaces are the commonest port of entry. Using cynomolgus monkeys and Sabín's "Per" strain of the virus, the Stanford clinicians were unable to infect monkeys by oral administration of massive doses enclosed in capsules covered with a digestible fat. The same monkeys resisted infection by a high enema consisting of 5 cc of a 20 per cent virus suspension. Some months later, after zinc sulfate olfactory blockade, the mouth of one of these monkeys was sprayed on three successive days with 5 cc of a 10 per cent cord suspension supernatant. Five days after the first spraying, fever, slight weakness of the arms and mild head tremors were noted, the usual symptoms of incipient poliomyelitis. At this stage the animal was etherized, exsanguinated and perfused with isotonic solution of sodium chloride and 10 per cent solution of formaldehyde. Careful microscopic study was made of the

<sup>1</sup> Gowen, John W. and Nelson, Ronald H. Predetermination of Sex. *Science* 96: 558 (Dec. 18) 1942.

<sup>1</sup> Faber, H. K. and Silberberg, R. J. *Science* 96: 775 (Nov. 20) 1942.

central and peripheral nervous system. Typical lesions of poliomyelitis consisting of small cell infiltrations, chromatolysis, neuronal necrosis and neuronophagia were noted in several ganglions, the heaviest lesions being in both gasserian and in both nodose (tenth nerve) ganglions. Moderately severe lesions were noted in both petrosal (ninth nerve) ganglions, in three of six cervical sympathetic and in two of ten upper thoracic ganglions. Small lesions, few in number, were found in one geniculate (seventh nerve) ganglion, in one lumbar sympathetic ganglion and in two of fourteen thoracic spinal ganglions. In the medulla a few typical parenchymal and perivascular infiltrations were noted, but without definite cell necrosis. Lesions were not found elsewhere in the brain stem, in the olfactory bulbs, the lower thoracic sympathetics, the celiac and cervical spinal or lumbar spinal ganglions or in the spinal cord. Assuming that the few slight lesions in one lumbar sympathetic ganglion resulted from an inapparent infection from the earlier virus enema, Faber concludes that the lesions found in this monkey could all be explained on the assumption of a nerve borne infection entering through the oropharyngeal surfaces. He believes this entrance was "mainly through the fibers of the fifth, ninth and tenth nerves (probably including the gustatory) and to a lesser extent through the sympathetics." Thus the mouth and the pharynx appear to be more vulnerable to penetration by this virus than the lower portions of the alimentary tract.

#### TREND OF INFANT MORTALITY

No other country approaching the United States in race complexity and climatic diversity has as low a rate of infant mortality, according to a recent special report of the Bureau of the Census.<sup>1</sup> "In 1940," says this report, "the United States, with a rate of 47.0 per thousand live births, occupied the seventh position in the international rank order of infant death rates."

The lowest death rates were recorded for Norway, Sweden, Netherlands, Australia and New Zealand, the rates for these countries ranging between 37 and 39 infant deaths per thousand live births. Switzerland, with a rate of 46 per thousand live births in 1940, was the other country with a lower infant mortality rate than the United States.

The report also notes "that the 1940 infant death rate for Germany was 65 per thousand live births and for Italy 104, while the latest available rate (1936-1938) for Japan was 112 per thousand live births." Germany has had the most comprehensive system of compulsory sickness insurance for the longest period of any nation. The Nazis have succeeded in increasing the birth rate from 14.7 in 1933 to 20.4 in 1940 but the opinion is expressed that "this success was due to increased reemployment of the population and not to any elaborate 'population blueprints'." This opinion seems to be confirmed by the increase in the United States from 16.6 in 1933 to 18.9 in 1941. The Monthly Vital Statistics Bulletin, Dec. 8, 1942, brings the information concerning the birth rate since that "for the first ten months of 1942 the provisional rate is 20.5 with indications that the rate is still rising."

The most important period of infancy, from the standpoint of mortality, is at birth. In 1940 13.0 per thousand infants born alive died during the first twenty-four hours after birth.

After the first day of life the chances of survival of the newborn infant improve considerably. The death rate for the 1 day old infant is 3.5 per thousand live births as compared with that of 1.39 per thousand live births for infants under 1 day of age.

However when infant mortality statistics are correlated with the births attended by physicians and by midwives holding total births constant, it is found that infant deaths are negatively associated with births attended by physicians and positively correlated with births attended by midwives. In each case the partial correlation coefficient is highly significant but these coefficients cannot be interpreted to mean that there is a causal relationship between infant deaths and births attended by physicians or by midwives. The correlation coefficients merely indicate that there is a highly significant association existing between these factors and that infant mortality is lower in states with a large proportion of births attended by physicians and higher in states with a large proportion of births attended by midwives. Approximately the same degree of statistical association exists for infants of the white race but not for infants of other races.

#### DEMAND FOR FREE HEALTH SERVICE DECREASING

A comparison of the first quarter of 1941 with the same quarter in 1942 shows that there has been an increase in hospital inpatient care and a decrease in all other health programs, including clinic visits, home medical visits, medical social service, mental hygiene clinics, public health nursing and school health programs. The increase in hospital patient days is largely accounted for by increased service given in hospitals for tuberculosis. An analysis of the total inpatient days shows that there has been a decrease of 12.5 per cent in free patient days and an increase of 11.9 per cent in days paid for. This is primarily a reflection of improved economic conditions. When maternity care alone is considered there is a decrease of 6 per cent in those provided care under public auspices and an increase of 26 per cent in those paid for by the patients. The largest decrease (29 per cent) was in medical services provided by social agencies in the home and in doctors' visits to patients' homes reported by health and welfare agencies. These figures were obtained by a sampling test covering forty-five urban areas and other hospital statistics.<sup>1</sup>

#### THE JOURNAL OF THE NATIONAL MALARIA SOCIETY

The first volume of a new journal devoted to malaria has just appeared. It is the official organ of the National Malaria Society, formerly the National Malaria Committee. It is to be made a quarterly of fifty pages as soon as financial support and sufficient material justify such action. The first issue, which is the entire volume for 1942, contains some sixteen original contributions on various phases of the malaria problem. In view of the worldwide importance which is attached to control of malaria this new journal will doubtless serve as a highly useful medium for disseminating information.

<sup>1</sup> Mortality Summary. The Infant. Nov. 30, 1942.

<sup>1</sup> Social Statistics. November 1942. Supplement 1 to the Child Vol. 7. U. S. Department of Labor. Children's Bureau. Washington, D. C.

# MEDICINE AND THE WAR

*In this section of The Journal each week will appear official notices by the Committee on War Participation of the American Medical Association, announcements by the Surgeon Generals of the Army, Navy and Public Health Service, and other governmental agencies dealing with medicine and the war and such other information and announcements as will be useful to the medical profession*

## PROCUREMENT AND ASSIGNMENT SERVICE FOR PHYSICIANS, DENTISTS AND VETERINARIANS

### PROCUREMENT OF MEDICAL OFFICERS FOR THE ARMY IN 1943

*NOTE—The following is an official statement from the Medical Corps of the United States Army indicating the procedure to be followed in procuring medical officers for the Army during 1943—Lb*

The Surgeon General is responsible for the procurement of medical officers for the Army of the United States. There is an Office Procurement Service set up by the War Department for the procuring of applications of individuals for commission in the Army. The War Manpower Commission has set up a Procurement and Assignment Service for Physicians, Dentists and Veterinarians to designate the individuals who are essential to the community and those available for duty with the armed forces.

In order to coordinate the work of these two agencies the Surgeon General has outlined the following procedure for the procurement of officers during the year 1943.

The state chairmen of the Procurement and Assignment Service for Physicians, Dentists and Veterinarians will from time to time prepare lists of individuals who are declared available for duty. Their names will be sent to the Central Office of the War Manpower Commission in Washington, D. C. There a card will be prepared and sent to the individual informing him of the fact that he has been classified as available for military service and requesting that he send the attached card to the state chairman of the Procurement and Assignment Service signifying his interest in applying for a commission, and stating his preference for duty with the Army or Navy. Those who choose to serve in the Army may request that their papers be processed with the idea of assigning them to duty with the Air Forces.

The state chairmen will furnish the candidate to the designated field office of the Office Procurement Service of the War Department. This office will request the individual physician, dentist or veterinarian to complete the proper application blanks and return them to that office and to have a final type physical examination, which will be accomplished at the nearest properly equipped army post.

The Office Procurement District's office will forward the papers to the Surgeon General in Washington, who will then review the application for commission

in the Medical Corps, Army of the United States. Those applications with the notation "Air" as designated will be referred to the Office of the Air Surgeon for further classification and assignment. Those applicants who are favorably considered will be notified at the earliest possible date by the Office of the Adjutant General that their recommendation is accepted and will receive orders to proceed to their proper station.

It is hoped by following this procedure that the Surgeon General will be able to provide an adequate medical service for our armed forces. It is contemplated that all individuals who are classified as essential to the civilian medical needs will not be asked to apply for a commission. No individual so classified need contact the Surgeon General or apply for a commission unless he can make arrangements with the state chairman of the Procurement and Assignment Service to have his classification changed from essential to available. The cooperation and interest of all physicians who are interested in military medical service will be appreciated, in that by proper application and processing of their case it will be much easier to provide necessary medical care for all parts of both the civilian and military services.

Concurrent with the changes in the military and civilian requirements for physicians and the changes in the recruiting procedures, the Surgeon General has announced the following policy, which will govern action to be taken in the consideration of ages and grades of initial appointments on all applicants effective Feb 15, 1943.

1 Eligible applicants for appointment in the Medical Corps, Army of the United States under the age of 38 will be appointed in the grade of first lieutenant only.

2 Eligible applicants between the ages of 38 and 55 will be appointed in the numbers and in the grade for which specific position vacancies exist.

There is an acute need for medical officers under 38 years of age. Applications are being solicited from physicians of this age group in those localities that have not furnished their quotas of physicians and where they are designated by the Procurement and Assignment Service as available for military service.

Appointments will be made by the Adjutant General of eligible applicants recommended by the Surgeon General and approved by the Secretary of War's Personnel Board.



## NAVY

## NAVAL MEDICAL SCHOOL GRADUATES

The following medical officers recently completed the basic course of instruction at the Naval Medical School Bethesda, Maryland. Included also is each officer's home town and the hospital in which he served an internship. These medical officers were all lieutenants (jg) at the time of the completion of the course on November 28 except Ferdinand E. Chatard, Dan Alexander Weeks and Harold E. Williamson, who are lieutenants.

BARTON HARRY IOLIS Chicago (G) U S N Ravenswood Hospital Chicago 1940-41  
BATEMAN JAMES GORDON Giffen Mont U S N Highland Alameda County Hospitals Oakland Calif 1941-42  
BRESKY TIBOR ANDREW Chicago U S N Kings County Hospital Brooklyn 1941-42  
BERGMAN GEORGE R Los Angeles U S N Naval Hospital San Diego Calif 1941-42  
BOND THOMAS ARTHUR Des Moines Iowa (G) U S N P Ancker Hospital St Paul 1937-38  
BRODY SIDNEY IRVING Philadelphia U S N Frankford Hospital Philadelphia 1941-42  
BROWN LEO THEROME Carbondale Ill (C) U S N R City Hospital St Louis 1937-38  
BROWN MURRAY H Rochester Minn U S N Hartford Hospital Hartford Conn 1938-40  
BURMAN RICHARD GEORGE Jeffersonville Ind (C) U S N R Harper Hospital Detroit 1937-38  
CAMPBELL JOHN ALLEN Akron Ohio V(G) U S N R City Hospital of Akron Ohio 1941-42  
CHATARD FERDINAND EDME IV Baltimore U S N Union Memorial Hospital Baltimore 1939-40  
CHRISTENSEN ROLAND ARNOLD Philadelphia (Leadon) U S N Wichita General Hospital Wichita Falls Texas 1938-39  
DEYO GEORGE WILLIARD New York U S N New York Medical College Hospital New York 1940-41  
DONELAN EARL WILLIAM Springfield Ill (G) U S N R Cook County Hospital Chicago 1941-42  
DOWNS ROGER SHERMAN Litchfield Conn U S N Strong Memorial Hospital Rochester N Y 1936-37  
DUFF IVAN FRANCIS Ann Arbor Mich (C) U S N R University of Michigan Hospital Ann Arbor 1940-41  
DULLIGAN PETER JAMES JR Brooklyn U S N St Mary's Hospital Brooklyn 1941-42  
EMERSON ROGER HILL South Weymouth Mass (G) U S N R Strong Memorial Hospital Rochester N Y 1941-42  
EPPLI WALTER GEORGE Manchester N H (C) U S N R Vancouver General Hospital Vancouver B C 1941-42  
FINCH THOMAS VERNON McComb Miss U S N Philadelphia General Hospital 1940-41  
FUNKE ROBERT EDWARD Long Beach Calif U S N Los Angeles County General Hospital 1941-42  
GAILLARD RICHARD A Yonkers N Y U S N Roosevelt Hospital N Y 1941-42  
GALBAILY JAMES FRANCIS Cermantown Pa U S N Philadelphia General Hospital 1941-42

GASKILL CORNELIA JANE New York WA(S) U S N R Jersey City Medical Center 1937-38  
GAUNT JAMES JENNINGS Milwaukee (C) U S N R Milwaukee County General Hospital 1938-41  
GREENE HIRAM MOE Fremont Ohio U S N U S Naval Hospital Chelsea Ma 1941-42  
GREER DUDWARD JR Oakland Calif U S N Highland Alameda County Hospitals Oakland Calif 1941-42  
HAYLES ALVIN BEASLEY Washington D C U S N U S Naval Hospital Great Lake Ill 1941-42  
HOPKINS ARTHUR GEORGE Brooklyn U S N Kings County Hospital Brooklyn 1941-42  
HOUSTON WILLIAM BROCK Akron Ohio (C) U S N R City Hospital of Akron Ohio 1940-41  
JONES EMORY EILSWORTH TR Mount Hope W Va (C) U S N R Mercy Hospital Baltimore 1937-40  
MAGUIRE FRANCIS HARBIN JAMES San Diego Calif U S N St Agne Hospital Baltimore 1937-40  
NOCKTON RANSOM ANDREW Crowley Ia (C) U S N R Shreveport Charity Hospital Shreveport Ia 1938-40  
PATTERSON WALTER Alden Ia U S N Hahnemann Hospital Philadelphia 1941-42  
PHYFE HENRY PINKNEY New York (C) U S N R Presbyterian Hospital New York 1941-42  
RAZZANO CARMEN ITALIO William Park N Y (C) U S N R Knickerbocker Hospital New York 1940-41  
REYNOLDS JOHN LUCIEN Seattle U S N Stanford University Hospital San Francisco 1940-41  
ROBERTSON WILLIAM CRAIG Atlanta Ga U S N Employee Hospital Tennessee Coal Iron and Railroad Co Fairfield Ala 1940-41  
ROBNETT ALSEY H Coronado Calif U S N U S Naval Hospital San Diego Calif 1941-42  
ROGERS JOSEPH Brooklyn U S N U S Naval Hospital Brooklyn 1941-42  
RUSSELL GEORGE WASHINGTON Little Rock Ark U S N U S Naval Hospital Bethesda Md 1941-42  
SCHROEDER PAUL C Wernersville Pa U S N Reading Hospital Reading Pa 1940-41  
SWINEY MERRILL ALPHFUS III Bayonne N J (B) U S N R St Mary Hospital Hoboken N J 1941-42  
TEBOW LOUIS FLIOTT Peoria Ill U S N Norfolk Naval Hospital Portsmouth Va 1941-42  
TRIMBLER NEVIN RAY Aile Ohio U S N Youngstown Hospital Association Youngstown Ohio 1939-41  
TURNER ROBERT CORRELI Mankato Minn (C) U S N R University of Kansas Hospitals Kansas City Mo 1941-42  
VAIL GEORGE ALVIN Port Wayne Ind U S N U S Naval Hospital Great Lake Ill 1941-42  
VEDDER JAMES SHERMAN Marshfield Wis (G) U S N J Wesley Memorial Hospital Chicago 1937-38  
VFNAR ROBERT BROWNING Hartman Nc U S N Jacon Hill Hospital New York 1941-43  
WEIKS DANA ALFANDER Peru N Y (S) U S N R Phyicians Hospital of Plattsburgh N Y 1936-36  
WILEY JASON T JR Brooklyn U S N Kings County Hospital (Long Island Col of Med Div) Brooklyn 1941-42  
WILLIAMSON HAROLD F Arlington Va U S N Memorial Hospital Worcester Ma 1940-42

## CIVILIAN DEFENSE

## THE EMERGENCY WATER SUPPLY PROGRAM

The Office of Civilian Defense Washington D C issued on December 22 Circular Medical Series No 26 which contains the following recommendations for the guidance of state and local councils of defense in the emergency water supply program.

1 *Appointment and Duties of State Water Supply Coordinator*—Responsibility for the organization and administration of the state emergency water supply program should be delegated to the state water supply coordinator, to be appointed as an official of the state defense council on recommendation of the state department of health. A member of the state agency having supervision over municipal water supplies would be a desirable appointee. He should be provided with technical and clerical assistants.

The state water supply coordinator should be responsible for the administration and organization of the state emergency water supply program and should represent the state in all matters pertaining to water supply as related to civilian defense. He should work in close cooperation with the state department of health or other state agency responsible for waterworks and with the regional sanitary engineers of the Office of Civilian Defense.

His duties should be to (1) prepare plans rules and regulations for adoption by the state defense council and be responsible for administering the rules and regulations adopted (2) institute and develop the mutual aid plan with the state as suggested in U S Office of Civilian Defense Sanitary Engineering Bulletin

No 1 and be responsible for its operation at the state level during emergencies (3) coordinate the emergency water supply program with other civilian defense activities at the state level (4) develop a program for and coordinate the efforts of zone water supply coordinators and (5) cooperate with the regional sanitary Engineer U S Office of Civilian Defense and develop interstate mutual aid.

2 *Appointment and Duties of Assistant State (Zone) Water Supply Coordinators*—To facilitate execution of this program zones or districts should be established with boundaries coterminous with other political or administrative divisions. Assistant state (zone) water supply coordinators should be appointed for these areas by the appointing authority on recommendation of the state water supply coordinator. Assistant state (zone) water supply coordinators should be selected from leading water works officials residing in the area. To assist this official an engineer from one of the public health departments in the area may be appointed as deputy or assistant zone water supply coordinator. Individuals or small communities may also be designated by the zone water supply coordinator on a temporary basis to make special studies or investigations.

The duties of the assistant state (zone) water supply coordinator should be to (1) negotiate among the localities within the zone pacts for the operation and financing of the mutual aid plan and be responsible for the administration of the mutual aid program within the zone during emergencies (2) establish and maintain contact with local councils of defense and integrate the local emergency water supply program within the state

program, and (3) advise local waterworks authorities on (a) technical aspects of emergency water works engineering, (b) recruitment and training of auxiliary personnel and emergency training of regular personnel, (c) procurement of materials and funds to execute plans and (d) integration of emergency water supply program with other local protective services

3 In states where emergency water supply programs are being carried on by regular state departments as an adjunct to their regular duties, it is recommended that the program be officially recognized as a part of the civilian defense program of the state and its leaders be designated, as outlined in this letter

4 In the administrative organization and operation of the emergency water supply program it is most important that

there be integration of the activities of local waterworks officials, state water supply coordinators and their assistant (zone) coordinators, and the regional sanitary engineers and the sanitary engineering section of the medical division of the U S Office of Civilian Defense

### WOMEN TO CARE FOR CHILDREN

The Office of Civilian Defense, Washington, D C, announced on January 2 that civilian defense classes throughout the country have trained 38,676 women to care for war workers' children in day nurseries. These figures are based on reports from 745 local defense councils. Three hundred other councils have not yet reported.

## MISCELLANEOUS

### PUBLIC HEALTH UNDER HITLER

*Nya Dagligt Kålahanda* of Nov 6, 1942 reports from Berlin that as a result of a court verdict in the case of a man who had acted against his doctor's instructions and thus prolonged his illness, every German worker who falls ill and is unable to work is in duty bound to do everything possible to recover as soon as possible and avoid everything that is likely to make his condition worse or delay his recovery. He is absolutely bound to follow the doctor's instructions and should he fail to do this or should he otherwise neglect his duty to recover he cannot count on receiving his wages during the time of his illness.

The *Völkischer Beobachter* Vienna edition of Nov 1, 1942 states that from the 250,000 applications with which the medical council is dealing at present it must be concluded that apart from the several thousand patients who are in hospitals just now, there are 250,000 Viennese who are sick, this means that every seventh person is suffering from some ailment or other, apart from those weaklings who get contusions, sprains and broken ribs through riding in a tram between the Margaretenplatz and the Laudongasse. The diseases to which we are referring here are of a worse and more secretive character. No plaster casts, x-rays or medicine will help these patients. The only thing that could really save them from collapse is additional food, i.e., meat, rice, eggs, butter, fats, unskimmed milk and coffee. Because people lack this additional food, they feel sick and consult the doctor.

The *Brüsseler Zeitung*, Oct 17, 1942, reports that the German Academy in Brussels gives lectures for Belgium doctors 'thus enabling them to learn the German medical terminology and to hear about the development of hygiene in Germany.'

According to *Minsker Zeitung* of Oct 15, 1942, Dr Wagner has published an article in the *Deutsches Ärzteblatt* on the measures taken to prevent the spread of epidemics in the Ostland which gives a complete survey of the conditions prevailing in the commissariats Ostland and Ukraine. It is said, *inter alia*

'Statistics of the epidemics published by the Soviet authorities are false and are intended for propaganda purposes only. It can be assumed with certainty that on the average two or three million people succumbed annually to malaria in European Russia, of whom half were in the Ukraine 200,000 to 500,000 to spotted typhus, particularly in White Ruthenia and in the northern Ukraine, and at least as many to typhus and dysentery.

'In 1942 every one had to report for medical examinations at first every four weeks, as from April last every week, and in the Ukraine every ten days. In addition measures were introduced in the Ostland to check the spread of lice among the population. A special scientific department was established in Riga for dealing with the spread of epidemics.

Special importance was attached to the obtaining of vaccine lymph, medicaments, disinfectants and so on. These had first to be imported from Germany, however, serum institutes had been established in Kaunas, Riga, Dorpat, Kiev and Dnepropetrovsk on the German model.'

As stated in *Uj Magyarasag* of Oct 14, 1942 a central x-ray institute has been founded in Kolozsvár (Cluj) and is now in operation. It contains wards with 15 beds and with 2 beds

It possesses radium to the value of 50,000 pengo and is primarily concerned with cancerous diseases.

According to the *Hamburger Fremdenblatt* of Oct 30, 1942 the OKW has explained that also medical officers and personnel may win the sturmabzeichen if they operate under the same fighting conditions as the attacking infantry and care for the wounded in areas where there is close fighting. Similarly they may win the panzerkampfwagenabzeichen if they attend to the wounded during the fighting while riding in tanks.

*Frois Allt* of Oct 8, 1942 states that the physiologist Richet has stated that the French food position is particularly dangerous for the young. Nine out of ten children are threatened with tuberculosis and on the basis of the food rations nine tenths of the adults receive 1,030 calories instead of 3,000-4,000, which is necessary for working persons. Heavy workers receive 1,210 calories which is less than the need for completely inactive men, i.e., 2,300 calories.

### METHYL ALCOHOL UNDER COMPLETE ALLOCATION

Because of increased demands for military requirements, methyl alcohol, or methanol, was placed under complete allocation, effective January 15 with the issuance by the Director General for Operations of General Preference Order M-31 as amended. According to the Office of War Information there will be an apparent shortage for 1943 of about 10 million gallons excluding the methanol from wood distillation, unless the use of methanol for unessential items is curtailed as rapidly as possible. The increase in demand is caused primarily by the requirements for formaldehyde to produce hexamethylenetetramine, an ingredient in explosives used by both the United States and Great Britain. It also is caused by increasing demands for methanol to be used in the manufacture of methyl methacrylate resins for military aircraft and by increasing demands for hexamethylene tetramine for Russia.

### BUTTER MAKERS TO RESERVE 30 PER CENT OF PRODUCTION

Manufacturers of creamery butter have been directed by Secretary of Agriculture Claude R. Wickard to set aside 30 per cent of their monthly production for direct war requirements beginning February 1. The order, Food Distribution Order No 2, was issued to obtain sufficient supplies of butter to meet the needs of the armed forces and for minor export to Allied nations.

### CLASSIFICATION OF COMMISSIONED OFFICERS, PUBLIC HEALTH SERVICE

The National Headquarters of the Selective Service System, Washington, D C, issued Local Board Release No 174 on December 26 which directed that registrants who are commissioned officers of the Public Health Service or Public Health Service Reserve, whether on active duty or in an inactive status, will be classified in class IV-B.

# ORGANIZATION SECTION

## THE PHYSICIAN'S FEDERAL INCOME TAX—1943

PREPARED BY THE BUREAU OF LEGAL MEDICINE AND LEGISLATION

The Revenue Act of 1942 has been correctly described as the greatest revenue raising measure in the history of our country and finds its justification in the tremendous needs of our war program, needs having to do with the actual expenditures for war purposes plus needs in relation to inflation potentialities. The act not only will spiral the tax burden of prior taxpayers but will bring into the income tax picture many millions of persons whose low income has heretofore constituted exempt income. Already plans are under way for additional legislation to raise still more revenue, and the tax burden may reasonably be expected to assume even greater proportions.

During the time when the new act was being formulated by congressional committees and when it was being discussed first in the House and in the Senate advocates of the so-called Ruml pay-as-you-go plan for the payment of individual income taxes persistently suggested the undesirability of a continuation of the existing practice of taxing during a succeeding year the income received by an individual during a preceding year. There has recently been renewed interest in this plan, and the possibility is not remote that a changed policy may be adopted in the reasonably near future, perhaps by March 15. The President, the Treasury Department and leaders in the Congress have openly espoused the theory of the pay-as-you-go plan, and this espousal has given rise to some doubt on the part of taxpayers concerning the filing of returns this year. The doubt has been apparently so widespread as to call for a public statement by the chairman of the House Committee on Ways and Means, the committee that will initiate any change in our tax procedures, advising taxpayers that a return must be filed on or before March 15 and that that return must be based on the provisions of the 1942 Revenue Act. Despite the uncertainties of the future as to the pay-as-you-go matter, therefore it is essential that the broad requirements of the new act be fully understood by federal income tax payers.

The Revenue Act of 1942 reduces the personal exemptions of single persons from \$750 to \$500 and of married persons or heads of families from \$1,500 to \$1,200. It reduces the credit for dependents from \$400 to \$350. An additional exemption is allowed members of the armed forces below the grade of commissioned officers. If a serviceman is single then the first \$250 of the service pay he received during 1942 is exempt. If he is married or the head of a family, then the first \$300 is exempt. The determination of a taxpayer's status in the armed forces and his family status will be made as of the end of the taxable year for the purpose of this particular exemption.

The basic rate of taxation is increased from 4 per cent to 6 per cent. The surtax rate is elevated from 6 per cent on the first \$2,000 of surtax net income to 13 per cent with a constant increase in rates for

incomes in the higher brackets. The earned income credit of 10 per cent remains as heretofore. This credit may be claimed in connection with the normal tax but not with the surtax.

The act continues the provision for a simplified tax schedule for use by taxpayers having gross incomes of \$3,000 or less, derived wholly from salaries, wages or other forms of compensation for personal services, dividends, interest, rents, annuities or royalties. The use of the simplified form remains optional. If the taxpayer has no deductions, it will, generally speaking, be to his advantage to use this form. If he has deductions he should tentatively figure the tax under both the regular method and the optional method and use whichever method happens to be to his advantage.

Returns under the new act need not be made under oath, as has been the requirement heretofore. This will relieve taxpayers of the petty annoyance of having their returns sworn to before a notary public or some other official authorized to administer oaths. The taxpayer, however, who falsifies a return will be subject to heavy penalties even though he is not required to execute the return under oath.

### WHO MUST FILE RETURNS

*In General*—1 Returns must be filed by every unmarried person and by every married person not living with spouse, if gross income during 1942 was \$500 or more.

2 Returns must be filed by every married person who lived with spouse, if gross income during 1942 was \$1,200 or over. If both husband and wife had income and their combined gross income was \$1,200 or over, they must either file separate returns or if both are citizens or residents of the United States and if they were living together at the end of the taxable year, they may file a joint return. If a person was married and lived with spouse for only part of 1942, special rules apply with respect to the filing of returns, and physicians who come within this classification should read carefully the instructions given on the tax return blanks.

If the status of a taxpayer, so far as it affects the personal exemption or credit for dependents, changed during the year, the personal exemption and credit must be apportioned, under rules and regulations prescribed by the Commissioner of Internal Revenue with the approval of the Secretary of the Treasury, in accordance with the number of months before and after such change. For the purpose of such apportionment a fractional part of a month should be disregarded unless it amounts to more than half a month, in which case it is to be considered as a month.

*Physicians in Military or Naval Service*—The fact that a physician may be in service does not of itself excuse a failure to file a return, for the income tax act applies to persons in service as well as to persons engaged in civilian activities. Physicians who have

gone into service, therefore, should if at all possible file complete returns before the deadline. While, unfortunately, definite regulations have not been issued to cover the situation, it is understood that, if because of the inaccessibility of necessary records a physician in service is unable to file a complete return, he may file a tentative return on which he must estimate his income, deductions and taxes as best he can and indicate on the return his reasons for following this procedure. He will be required at a later date to file a complete return, and necessary adjustments in the tax will be made.

If a physician in service is on duty outside the United States no income tax return or payment of any income tax will become due, generally speaking, until the fifteenth day of the third month following the month in which the physician ceases (except by reason of death or incompetency) to be a member of the military forces on sea duty or in service outside the continental United States, or the fifteenth day of the third month following the month in which the present war is terminated as proclaimed by the President, whichever may be the earlier.

#### GROSS AND NET INCOMES WHAT THEY ARE

**Gross Income**—A physician's gross income is the total amount of money received by him during the year for professional services, regardless of the time when the services were rendered for which the money was paid, assuming that the return is made on a cash receipts and disbursements basis, plus such money as he has received as profits from investments and speculation and as compensation and profits from other sources.

If a physician receives a salary as compensation for services rendered and in addition thereto living quarters or meals, the value to the physician of the quarters and meals so furnished ordinarily constitutes income subject to tax. If, however, living quarters or meals are furnished for the convenience of the employer the value thereof need not be computed and added to the compensation otherwise received by the physician. As a general rule, the test of "convenience of the employer" is satisfied if living quarters or meals are furnished to a physician who is required to accept such quarters and meals in order to perform properly his duties. For example, if a physician employed by a hospital is subject to immediate service at any time during the twenty-four hours of the day and therefore cannot obtain quarters or meals elsewhere without material interference with his duties and on that account is required by the hospital to accept the quarters or meals furnished by it, the value thereof need not be included in the gross income of the physician.

**Net Income**—Certain professional expenses and the expenses of carrying on any enterprise in which the physician may be engaged for gain may be subtracted as "deductions" from the gross income, to determine the net income on which the tax is to be paid. An "exemption" is allowed, the amount depending on the taxpayer's marital status during the tax year as stated before. These matters are fully covered in the instructions on the tax return blanks.

**Earned Income**—In computing the normal tax, but not the surtax, there may be subtracted from net income from all sources an amount equal to 10 per cent of the earned net income, except that the amount so subtracted shall in no case exceed 10 per cent of

the net income from all sources. Earned income means professional fees, salaries and wages received as compensation for personal services, as distinguished from receipts from other sources.

The first \$3,000 of a physician's net income from all sources may be regarded under the law as earned net income, whether it was or was not in fact earned within the meaning set forth in the preceding paragraph. Net income in excess of \$3,000 may not be claimed as earned unless it in fact comes within that category. No physician may claim as earned net income any income in excess of \$14,000.

#### PHYSICIANS IN MILITARY OR NAVAL SERVICE

As previously pointed out, physicians in service are as much subject to the income tax law as are physicians engaged in civilian practice. The service pay of such physicians must be reported as income. Commutation of quarters and rental value of quarters occupied by medical officers, however, are not taxable income.

If the ability of physicians in service to pay income taxes is materially affected by such service, payment of the tax falling due before or during the service may be deferred for a period extending not more than six months after termination of service. This deferment is authorized by section 513 of the Soldiers' and Sailors' Civil Relief Act of 1940 and applies to all members of the Army, Navy, Marine Corps and Coast Guard, and to all officers of the United States Public Health Service detailed by proper authority for duty either with the Army or Navy, on active duty or undergoing training or education under the supervision of the United States preliminary to induction into service. This does not apply to the tax imposed on employers by section 1400 of the Federal Insurance Contributions Act. This deferment is not automatic. The taxpayer must present evidence to show that his ability to pay the tax is materially impaired by reason of military service. Proof of that impairment should be submitted at the time the tax is due on a form procurable from the offices of the collectors of internal revenue. A copy of the form was reproduced in the Feb. 28, 1942 issue of *THE JOURNAL* on page 737.

#### THE VICTORY TAX

The physician need give no consideration to the new 5 per cent Victory tax in making his return on or before March 15. As explained in *THE JOURNAL*, Dec. 5, 1942, this tax does not apply to income received during 1942 although physicians who are classifiable as employees will periodically have the tax withheld from their salaries during 1943.

#### TAXATION OF ACCOUNTS RECEIVABLE

The Revenue Act of 1942 remedies an unjust method of taxation that has heretofore prevailed in connection with the unpaid accounts on the books of a taxpayer at the time of his death. Under prior law, for the year of death, the value of such accounts has been included as income and subject to the income tax rates, even though the taxpayer actually received no income at all therefrom. Hereafter the value of the unpaid accounts will not be considered as a part of the income of the decedent for the year of death but will be taxable when paid, as a part of the income of the person receiving the money. A detailed discussion of this matter was published in *THE JOURNAL*, Jan. 10, 1942, page 149.

## DEDUCTIONS FOR PROFESSIONAL EXPENSES

A physician is entitled to deduct all current expenses necessary in carrying on his practice. The taxpayer should make no claim for the deduction of expenses unless he is prepared to prove the expenditure by competent evidence. So far as practicable, accurate itemized records should be kept of expenses and substantiating evidence should be carefully preserved. The following statement shows what such deductible expenses are and how they are to be computed.

**Office Rent**—Office rent is deductible. If a physician rents an office for professional purposes alone, the entire rent may be deducted. If he rents a building or apartment for use as a residence as well as for office purposes, he may deduct a part of the rental fairly proportionate to the amount of space used for professional purposes. If the physician occasionally sees a patient in such dwelling house or apartment, he may not, however, deduct any part of the rent of such house or apartment as professional expense, to entitle him to such a deduction he must have an office there, with regular office hours. If a physician owns the building in which his office is located, he cannot charge himself with "rent" and deduct the amount so charged.

**Office Maintenance**—Expenditures for office maintenance, as for heating, lighting, telephone service and the services of attendants are deductible.

**Supplies**—Payment for supplies for professional use are deductible. Supplies may be fairly described as articles consumed in the using, for instance, dressings, clinical thermometers, drugs and chemicals. Professional journals may be classified as supplies and the subscription price deducted. Amounts currently expended for books, furniture and professional instruments and equipment, "the useful life of which is short," generally less than one year, may be deducted, but if such articles have a more or less permanent value their purchase price is a capital expenditure and is not deductible.

**Equipment**—Equipment comprises property of a more or less permanent nature. It may ultimately wear out, deteriorate or become obsolete, but it is not in the ordinary sense of the word "consumed in the using."

The cost of equipment such as has been described for professional use, cannot be deducted as expense in the year acquired. Examples of this class of property are automobiles, office furniture, medical, surgical and laboratory equipment of more or less permanent nature and instruments and appliances constituting a part of the physician's professional outfit to be used over a considerable period of time, generally over one year. Books of more or less permanent nature are regarded as equipment and the purchase price is therefore not deductible.

Although the cost of such equipment is not deductible in the year acquired nevertheless it may be recovered through depreciation deductions taken year by year over its useful life, as described later.

No hard and fast rule can be laid down as to what part of the cost of equipment is deductible each year as depreciation. The amount depends to some extent on the nature of the property and on the extent and character of its use. The length of its useful life should be the primary consideration. The most that can be done is to suggest certain average or normal rates of depreciation for each of several classes of

articles and to leave to the taxpayer the modification of the suggested rates as the circumstances of his particular case may dictate. As fair normal or average rates of depreciation, the following have been suggested: automobiles, 25 per cent a year, ordinary medical libraries x-ray equipment physical therapy equipment, electrical sterilizers surgical instruments and diagnostic apparatus 10 per cent a year office furniture, 5 per cent a year.

The principle governing the determination of all rates of depreciation is that the total amount claimed by the taxpayer as depreciation during the life of the article, plus the salvage value of the article at the end of its useful life, shall not be greater than its purchase price or, if purchased before March 1913 either its fair market value as of that date or its original cost, whichever may be greater. The physician must in good faith use his best judgment and claim only such allowance for depreciation as the facts justify. The estimate of useful life, on which the rate of depreciation is based should be carefully considered in his individual case.

**Medical Dues**—Dues paid to societies of a strictly professional character are deductible. Dues paid to social organizations, even though their membership is limited to physicians, are personal expenses and not deductible.

**Postgraduate Study**—The Commissioner of Internal Revenue holds that the expense of postgraduate study is not deductible.

**Traveling Expenses**—Traveling expenses including amounts paid for transportation, meals and lodging, necessarily incurred in professional visits to patients and in attending medical meetings for a professional purpose, are deductible.

**Automobiles**—Payment for an automobile is a payment for permanent equipment and is not deductible. The cost of operation and repair, and loss through depreciation are deductible. The cost of operation and repair includes the cost of gasoline, oil, tires, insurance, repairs, garage rental (when the garage is not owned by the physician), chauffeurs' wages and the like.

Deductible loss through depreciation of an automobile is the actual diminution in value resulting from obsolescence and use and from accidental injury against which the physician is not insured. If depreciation is computed on the basis of the average loss during a series of years, the series must extend over the entire estimated life of the car, not merely over the period in which the car is possessed by the present taxpayer.

If an automobile is used for professional and also for personal purposes—as when used by the physician partly for recreation, or so used by his family—only so much of the expense as arises out of the use for professional purposes may be deducted. A physician doing an exclusive office practice and using his car merely to go to and from his office cannot deduct depreciation or operating expenses. He is regarded as using his car for his personal convenience and not as a means of gaining a livelihood. What has been said in respect to automobiles applies with equal force to horses and vehicles and the equipment incident to their use.

## MISCELLANEOUS

**Contributions to Charitable Organizations**—For detailed information with respect to the deductibility of charitable contributions generally physicians should

consult the official return blank or obtain information from the collectors of internal revenue or from other reliable sources. A physician may not, however, deduct as a charitable contribution the value of services rendered an organization operated for charitable purposes.

**Bad Debts**—Physicians who make their returns on a cash receipts and disbursements basis, as most physicians do, cannot claim deductions for bad debts.

**Taxes**—Taxes generally, either federal or state, are deductible by the person on whom they are imposed by law. Both real and personal property taxes are deductible, but so-called taxes, more properly assessments, paid for local benefits, such as street, sidewalk, and other like improvements, imposed because of and measured by some benefit inuring directly to the property against which the assessment is levied, do not constitute an allowable deduction from gross income. Physicians may deduct state gasoline taxes and state sales taxes. In some states sales taxes are imposed on the seller, but, if they are passed on to the buyer, the latter may deduct them.

State income and use taxes are deductible, federal income taxes are not. Among the federal taxes that a physician may deduct are those on admissions, dues, initiation fees, safety deposit boxes, tax on telegraph, telephone, cable and radio messages, and the federal use tax on automobiles. State automobile license fees are deductible. If a state or local fee is imposed for regulatory purposes, and not to raise revenue, the fee may not ordinarily be deducted as a tax. If such fees, however, are classifiable as a business expense, they are deductible as such. Annual registration fees imposed on physicians probably come within the category of regulatory fees and should be deducted as a business expense rather than as taxes. Local and state occupational taxes imposed on physicians are deductible either as taxes or as a business expense, depending on the purpose for which the tax is imposed.

The excise taxes imposed on employers by section 804, title VIII, and section 901, title IX, of the Social Security Act, commonly referred to as old age and unemployment benefit taxes, are deductible annually by employers in computing net income for federal income tax purposes. If the taxpayer's return is made on a cash basis, as are the returns of practically all physicians, the taxes are deductible for the year in which they are actually paid. If the return is made on an accrual basis, the taxes are deductible for the year in which they accrue, irrespective of when they are actually paid. Employees, including physicians whose employment brings them within that category, may not deduct the tax imposed on them by section 801, title VIII, of the Social Security Act, generally referred to as the old age benefits tax. If, however, the employer assumes payment of the employee's tax and does not withhold the amount of the tax from the employee's wages, the amount of the tax so assumed may be deducted by the employer, not as a tax paid but as an ordinary business expense.

**Medical Expense**—A taxpayer may deduct amounts expended for medical, dental and hospital care, not compensated for by insurance or otherwise, including amounts paid for accident and health insurance, according to a prescribed formula. Deductions will be permitted to the extent that such expenses exceed 5 per cent of the net income of the taxpayer but not in excess

of \$2,500 in case of the head of a family, or \$1,250 in case of other individual taxpayers.

**Equipment Necessitated by Military Service**—The cost of equipment of an Army officer to the extent only that it is especially required for his profession and does not merely take the place of articles required in civilian life is deductible. The cost of a uniform is considered a personal expense and hence not deductible.

**Laboratory Expenses**—The deductibility of the expenses of establishing and maintaining laboratories is determined by the same principles that determine the deductibility of corresponding professional expenses. Laboratory rental and the expenses of laboratory equipment and supplies and of laboratory assistants are deductible when under corresponding circumstances they would be deductible if they related to a physician's office.

**Losses by Fire or Other Causes**—Loss of and damage to a physician's equipment by fire, theft or other cause, not compensated by insurance or otherwise recoverable, may be computed as a business expense and is deductible, provided evidence of such loss or damage can be produced. Such loss or damage is deductible, however, only to the extent to which it has not been made good by repair and the cost of repair claimed as a deduction.

**Insurance Premiums**—Premiums paid for insurance against professional losses are deductible. This includes insurance against damages for alleged malpractice, against liability for injuries by a physician's automobile while in use for professional purposes and against loss from theft of professional equipment and damage to or loss of professional equipment by fire or otherwise. Under professional equipment is to be included any automobile belonging to the physician and used for strictly professional purposes.

**Expense in Defending Malpractice Suits**—Expense incurred in the defense of a suit for malpractice is deductible as a business expense.

**Sale of Spectacles**—Oculists who furnish spectacles etc, may charge as income money received from such sales and deduct as an expense the cost of the article sold. Entries on the physician's account books should in such cases show charges for services separate and apart from charges for spectacles, etc.

#### NONTRADING OR NONBUSINESS EXPENSES

A new provision in the Revenue Act of 1942 permits, in the case of an individual, the deduction of all the ordinary, necessary expenses paid or incurred during the taxable year for the production or collection of income, or for the management, conservation or maintenance of property held for the production of income. While the phraseology of this provision is very broad, the Commissioner of Internal Revenue has by regulation ruled that the following expenses, among others, are not deductible under it: Commuters' expenses, expenses of taking special courses of training, expenses in seeking employment or in placing one's self in a position to begin rendering personal services for compensation, bar examination fees and other expenses incurred in securing admission to the bar, and corresponding fees and expenses incurred by physicians, dentists, accountants and other taxpayers for securing the right to practice their respective professions.

## OFFICIAL NOTES

## DOCTORS AT WAR

Radio broadcasts of Doctors at War by the American Medical Association in cooperation with the National Broadcasting Company and the medical department of the United States Army and the United States Navy are on the air each Saturday at 5 p m Eastern War Time (4 p m Central War Time, 3 p m Mountain War Time, 2 p m Pacific War Time). An exception is the Chicago area, where the broadcasts are heard by transcription at 8 p m Central War Time Saturdays on station WMAQ.

Titles, subjects and guest speakers where scheduled for the next five programs are as follows:

- January 30 Wake Up America social hygiene and the war  
Guest speaker Surg Gen Thomas Parran United States Public Health Service
- February 6 Rumor Monger morale in wartime
- February 13 The Heart of a Soldier strong hearts in the Army
- February 20 Come and Get It —the story of how our fighting men are fed
- February 27 Community Fortress —health on the home front

## HOMEMAKERS' PROGRAM ON WLS

Beginning January 28 and each Thursday thereafter to and including May 27, the American Medical Association will broadcast during the Homemakers Hour on radio station WLS Chicago, a program intended to be helpful to the mothers of young children under the title Before the Doctor Comes. Common home health problems will be discussed in an interview program in which Dr W W Bauer, Director of the Bureau of Health Education, will be interviewed by Mrs Harriet H Hester. The program will be heard on radio station WLS (890 kilocycles) between 1:30 and 2 p m as a part of the Homemakers' Hour. Following are the topics for the first three broadcasts:

- January 28 The Child with Sniffles  
February 4 The Child with a Sore Throat  
February 11 The Child with a Cough

This is not a network program but station WLS is a 50,000 watt, clear channel station which has a primary daytime coverage of the states of Wisconsin, Michigan, Indiana and Illinois with portions of Iowa, Missouri, Ohio and occasionally Kentucky. The audience is 60 to 70 per cent down state.

## MEDICAL LEGISLATION

## DISTRICT OF COLUMBIA

*Bills Introduced*—S 242, introduced by Senator Capper, Kansas, provides for the issuance of a license to practice osteopathy in the District of Columbia to Maria G Waksmundzka. H R 741, introduced by Representative Randolph, West Virginia, provides for the registration of births in the District of Columbia that were not registered when the births occurred in the District.

## MEDICAL BILLS IN CONGRESS

*Bills Introduced*—S J Res 12, introduced by Senator Wheeler, Montana, proposes to amend an act passed by the Seventy-Seventh Congress to regulate the interstate sale of dentures by postponing the effective date of that act for a period of six months. S 72, introduced by Senator McNary, Oregon, proposes service pensions to all persons who served ninety days in foreign service under the jurisdiction of the Quartermaster General, Surgeon General of the United States Army, the Secretary of the Navy or the Marine Corps during the Spanish-American War, including the Philippine Insurrection and the Chinese Boxer Rebellion. S 77, introduced by Senator Caraway, Arkansas, proposes to authorize the Secretary of the Treasury to determine the total amount collected by the federal government from each physician during the period June 1, 1920 to June 30, 1931 for the privilege of prescribing the hot waters from the Hot Springs National Park and to refund to each such physician the total amount so determined to have been collected from him, with the proviso that not more than \$660 may be returned to any one physician. S 137, introduced by Senator Davis, Pennsylvania, provides that no person shall be discriminated against, in the administration of the civil service laws and regulations, in any case because of his or her blindness or impaired visual acuity. S 180, introduced by Senator LaFollette, Wisconsin, provides for the vocational rehabilitation education training and the rendition of other services to persons disabled while members of the armed forces or disabled in war industries or otherwise. S 186, introduced by Senator White for himself and Senator Brewster both of Maine, proposes to create a Division of Water Pollution Control in the United States Public Health Service. S 187, introduced by Senator Walsh, Massachusetts, provides for vocational rehabilitation and the return to civil employment of certain persons disabled under circumstances entitling them after discharge or separation from the military or naval forces of the United States to a pension or retirement pay. S 216, introduced by Senator Reynolds, North Carolina, proposes to amend certain provisions of the National Defense Act of June 3, 1916 by eliminating the Medical Administrative Corps in the Medical Department of the regular

Army and substituting therefor a Pharmacy Corps. S 250 introduced by Senator Clark, Missouri, proposes to amend existing veterans' regulations so as to grant hospitalization, domiciliary care and burial benefits to any officer enlisted member of the Army Nurse Corps (female) or Navy Nurse Corps (female) employed in the active military or naval service of the United States on or after Dec 7, 1941 and before the termination of the present war. S 281, introduced by Senator Green, Rhode Island, proposes to amend and extend the provisions of the Social Security Act, to extend the coverage of federal old age and survivors insurance, to provide insurance benefits for workers permanently and totally disabled, to provide hospitalization benefits, to provide special federal aid to states for public assistance, to provide federal grants to states for general public assistance and to amend the provision for federal grants to states for old age assistance aid to dependent children and aid to the blind. H R 121 introduced by Representative Cannon, Missouri, provides that all public laws granting medical and hospital treatment, domiciliary care, compensation and other allowances, pensions, disability allowance and retirement pay to veterans and the dependents of veterans of the World War which were repealed in 1933 shall be reenacted. H R 375, introduced by Representative Voorhis, California, proposes to amend the Social Security Act so as to provide that each state shall have the exclusive right to adopt its own interpretation of the phrases 'needy individuals who are blind' and 'blind individuals who are needy'. The purpose of the bill is to encourage the states to make more adequate provisions for blind persons. H R 376 introduced by Representative Voorhis, California, undertakes to amend the Social Security Act so that each state may have the exclusive right to adopt its own interpretation of the phrases 'needy individuals' as used in the act. The purpose of this bill is to encourage the states to make more adequate provisions for aged persons. H R 661 introduced by Representative Rogers, Massachusetts, proposes for the purpose of enabling the Public Health Service to assist state, counties, cities or other political subdivisions of the states to extend and improve measures through public and private institutions and organizations for the diagnosis, treatment and control of cancer including the provision of hospital diagnostic clinic and other facilities for the diagnosis and treatment of persons suffering from cancer or suspected of suffering from this disease that there be appropriated for the first fiscal year of the operation of the law the sum of \$2,300,000 and for each fiscal year thereafter such sum as may be necessary to carry out its purpose. H R 723 introduced by Representative Green, Florida, proposes to authorize an appropriation of \$1,550,000 for the con-



struction of a marine hospital in the state of Florida the site to be selected by the Federal Board of Hospitalization H R 724, introduced by Representative Green, Florida, proposes an appropriation of \$2 500,000 for the construction of a marine hospital at Jacksonville, Fla. H R 728, introduced by Representative Green Florida proposes to authorize the Administrator of Veterans' Affairs within the limits of Veterans Administration facilities, to furnish necessary dental care and treatment including necessary dental appliances and transportation to and from a Veterans Administration facility, to veterans of any war (including the Indian wars, the Boxer Rebellion and the Philippine Insurrection) who were not dishonorably discharged and are not entitled to the benefits provided by the bill under any law or veterans regulation in effect at the present time. H R 735, introduced by Representative Welch, California, proposes that all persons who served in a civilian capacity under the jurisdiction of the Quartermaster General during the war with Spain, the Philippine Insurrection or the China Relief Expedition on vessels owned by the United States and engaged in the transportation of troops, supplies ammunition or materials of war, and who were discharged for disability incurred in such governmental service in line of duty, shall be furnished medical and hospital treatment and domiciliary care in Veterans' Administration facilities in the same manner and to the same extent as provided for veterans of any war. H R 739, introduced by Representative Van Zandt, Pennsylvania and H R 891 introduced by Representative Rankin Mississippi, provide for the rehabilitation of disabled veterans of the present war. H R 782, introduced by Representative Voorhis California, proposes to direct the Administrator of Veterans Affairs to promulgate regulations pertaining to service connection containing additional provisions requiring that as to those veterans who are shown to have been engaged in combat with an enemy of the United States or who are shown to have been subjected to other arduous conditions of military or naval service any subsequent disability which could have resulted by way of incurment or aggravation traceable to such veterans' active military or naval service shall be considered as directly due to or aggravated by such service in line of duty. H R 783, introduced by Representative Voorhis California, proposes to grant permanent and total disability ratings to veterans suffering from severe industrial inadaptability as a result of war service. H R 786, introduced by Representative Tolson California proposes to amend section 40 of the United States Employees Compensation Act so as to authorize chiropractors to treat beneficiaries of that act. H R 788 introduced by Representative Tolson California, proposes to amend the Social Security Act so as to provide grants to states for needy disabled adults. H R 789, introduced by Representative Tolson California proposes to provide grants to the states for assistance in the rehabilitation of disabled persons incapacitated for normal employment. H R 790 introduced by Representative Rankin Mississippi, provides that all compensation, pension and hospital privileges granted to veterans of the first world war, their widows and dependents shall be extended to veterans of the present war their widows and dependents. H R 828 introduced by Representative Costello, California, proposes to authorize an appropriation of \$2 600,000 for the construction of a marine hospital in or near Los Angeles. H R 867 introduced by Representative Knutson Minnesota, proposes to exempt from the operations of the Social Security Act associations furnishing medical care or hospitalization to members or their dependents if no part of the net earnings of the association inures to the benefit of any private shareholder or individual and if 75 per cent or more of the income consists of amounts collected from members or contributed by the employer for the sole purpose of making such payments and meeting expenses. H R 868 introduced by Representative Knutson, Minnesota, proposes to amend the Social Security Act by providing for grants to states for furnishing aid to needy individuals who are physically handicapped. H R 874 introduced by Representative Knutson Minnesota, undertakes to amend the Selective Training and Service Act of 1940 by providing that each member of each local board shall receive as compensation for his services \$5 for each day on which he performs board duties and in addition shall receive travel expenses at the rate of 5 cents per mile and subsistence expenses while away from his official station on

duties of the board. H R 887, introduced by Representative Van Zandt, Pennsylvania, provides that any person who served in the military or naval forces of the United States during a recognized campaign or expedition and who was honorably separated from such service shall be granted hospitalization and domiciliary care by the Veterans' Administration subject to the same restrictions and limitations as are applicable to World War veterans. H R 889, introduced by Representative Van Zandt, Pennsylvania, proposes to provide total disability ratings for veterans with severe functional nervous diseases or psychoneurotic conditions. H R 891, introduced by Representative Voorhis, California, provides for the granting of permanent and total disability ratings to veterans suffering from severe industrial inadaptability as a result of war service. H R 899, introduced by Representative Kennedy New York, provides compensation for injuries or death sustained by volunteer civilian defense workers in line of duty. The bill also provides that for any injury sustained by an air raid warden or other volunteer worker engaged in civilian defense while in the performance of duty, whether or not disability has arisen the United States shall furnish to the injured person all services appliances and supplies prescribed or recommended by duly qualified physicians which, in the opinion of the United States Employees Compensation Commission are likely to cure or relieve or to reduce the degree or the period of disability or to aid in lessening the amount of the monthly compensation. H R 911, introduced by Representative Rees, Kansas provides that any veteran entitled to civil service preference shall have the right to be examined and to qualify for appointment to any position under classified civil service, notwithstanding his need of a prosthetic appliance to overcome a handicap if the duties of the position for which qualification is sought can be performed by such veteran. H R 913, introduced by Representative Rankin Mississippi, proposes to extend the privilege of hospitalization to veterans of World War II for the treatment of non service connected disabilities and to provide for preference of hospitalization to those veterans who were discharged by reason of disability and to those entitled to benefits for service connected disabilities.

## STATE MEDICAL LEGISLATION

### Arizona

*Bills Introduced*—S 9 proposes the enactment of a premarital examination law. The certificate to be obtained by each applicant for a marriage license must be executed by a licensed physician and shall certify that the applicant has been given an examination and been found not to be infected with syphilis in a communicable stage. The standard serologic test required shall be made at a laboratory either within or without the state which has been approved by the state board of health and the physician's fees and charges for making the examination and issuing the certificate required shall not exceed \$3 for each person examined. S 13 proposes the enactment of an occupational disease act. Occupational disease is defined to mean a disease which is due to causes and conditions characteristic of and peculiar to a particular trade occupation, process or employment and excludes all ordinary diseases of life to which the general public is exposed. Among other things, the bill proposes that in the event an employee though not actually incapacitated is found to be affected by silicosis or asbestosis, he may subject to the approval of the commission, waive in writing full compensation for any aggravation of condition that may result from continuing in the hazardous occupation. In case of total incapacity or death as a result of the disease after waiver, however compensation not to exceed \$3 000, whether for incapacity, death or both shall nevertheless be payable. The proposed bill further provides for the appointment of an advisory medical council of three members who shall be licensed practitioners of medicine in good professional standing and qualified in the diagnosis and treatment of occupational diseases, at least one of whom shall be an experienced roentgenologist. The council shall conduct examinations, make reports on controverted medical questions and assist in any postmortem examination directed by the commission, and the report of such advisory medical council shall become part of the record of the case and be accepted and considered by the commission as expert medical testimony unless a special hearing is requested by the claimant.

for the purpose of examining or cross examining members of the council. S 23 proposes to empower the state department of health to commit any person known to be infected with a venereal disease to an institution for care and treatment and to detain and quarantine such person for such time as may be necessary. The proposal would further provide that a person wilfully refusing to submit to treatment by the state board of health would be guilty of a misdemeanor.

#### Arkansas

*Bill Introduced*—S 13 proposes to amend the medical practice act by repealing Act No 368 of the Laws of 1941 which required an annual license and registration of licentiates and amended certain provisions regarding educational requirements and the granting of reciprocity certificates.

#### California

*Bills Introduced*—S 81 and A 186 propose to amend the sales tax by exempting therefrom the sale of medicines sold as dietary supplements or adjuncts. A 6 proposes to amend the osteopathic practice act by eliminating the existing requirement that osteopaths, at the time of the annual renewal of their licenses, present satisfactory evidence of the completion during the preceding year, of a minimum of thirty hours of professional educational work as approved by the osteopathic board. A 44 proposes to amend the Revenue and Taxation Code by exempting from the sales tax medicines or drugs, defined to include any substance or mixture of substances intended to be used internally or externally in the diagnosis, cure, treatment or prevention of diseases of man. A 80 proposes to amend the Revenue and Taxation Code so as to include the sales of medicines used as dietary supplements or adjuncts. A 129 proposes to amend the Revenue and Taxation Code by exempting from the sales tax the sale of medicines and drugs used in the diagnosis, cure, mitigation, treatment or prevention of disease in man, but not including any instrument or apparatus. A 152 proposes the appropriation of \$2,000,000 to the regents of the University of California to be expended for the erection and equipment of a hospital to be maintained and supported by the regents in conjunction with the medical school of the University of California. A 227 proposes to amend the law relative to the liability of innkeepers so as to include hospitals by providing that a hospital shall be liable for losses of or injuries to personal property belonging to patients to the same degree as would a depository for hire and providing further that if the hospital keeps a fireproof safe and notifies the patient to that effect then it is not liable for loss or damage to the personal property of a patient except so far as the acts of the hospital contribute thereto. A 230 proposes to authorize payments, out of the general funds of a city, city and county, or county, of a physician's fee for issuing a food certificate to any person needing more than the ration thereof might provide. A 292 proposes to amend the state labor code by prohibiting an employer or insurance company writing compensation insurance from contracting with any physician, hospital or other person for the medical or surgical care or hospitalization of any injured person on the basis of such physician, hospital or other person receiving a percentage of the gross premiums collected by such insurance company or on the basis of any percentage of such employer's payroll or on the basis of any fixed charges which are less than the reasonable value of such services as fixed by rates adopted by the industrial accident commission. The bill would further prohibit a physician, hospital or other person from paying over to an employer or insurance carrier any rebate for sums received for the medical or surgical care or hospitalization of any injured employee. A 326 proposes to amend the Business and Professions Code relating to the practice of nursing by exempting therefrom the performance of certain services in case of an individual emergency and during a national emergency arising out of war or during an epidemic or other public disaster. A 327 proposes to amend the health and safety code regulating the licensing of clinics, dispensaries and maternity hospitals by exempting from such regulation a hospital corporation organized and operated exclusively for charitable purposes. A 328 proposes an amendment to the civil code which would create a lien in favor of doctors and hospitals for reasonable charges for hospital care, treatment and maintenance

of an injured person including drug supplies and x-ray and laboratory services on any recovery of any sum had or collected by such injured person whether by judgment or by settlement not to exceed however 50 per cent of such recovery. The proposal then sets forth certain notice requirements which the hospital or physician must give and provides a penalty against any person making payment or settlement or a claim without paying the amount covered by the lien. These provisions would not be applicable to claims arising under the workmen's compensation act, claims for wrongful death or negligent injury to a minor or claims for wrongful death to an adult or minor leaving a husband, wife or children. A 329 proposes to amend the law relating to medical and hospital care to indigents by prohibiting the board of supervisors from letting the care, maintenance or attendance of such indigent sick or dependent poor by contract to any person except that in cases of unusual difficulty or which require treatment or the use of facilities not immediately available in the county and in cases of emergency the board may secure by contract hospital care within or without the county, including medical, surgical, x-ray, laboratory, nursing and general hospital service at a cost not exceeding the fair and reasonable value thereof in either a private or a state supported institution. A 334 proposes to amend the Business and Professions Code relating to the practice of chiropody by redefining chiropody to mean the diagnosis, medical, surgical, mechanical, manipulative and electrical treatment of the human foot and leg. The "and leg" is new and is substituted for the words "including the non-surgical treatment of the muscles and tendons of the leg governing the functions of the feet." A 335 proposes to amend the health and safety code by including a chiropodist in the class of persons who may purchase hypodermic syringes or hypodermic needles or may sign an authorization for such purpose.

#### Colorado

*Bill Introduced*—S 1 proposes to amend the law concerning vital statistics by making it the duty of the attending physician or midwife to file a certificate of birth within three days after the birth has occurred and setting forth the contents of such certificate.

#### Delaware

*Bill Introduced*—Senate substitute for S 7 proposes the enactment of a premarital physical examination law. Each applicant desiring to be married would be required to produce a certificate from a physician licensed by the Medical Council of Delaware or a nonresident licensed physician provided the qualifications of the said nonresident physician are equivalent to those required for license by the Medical Council of Delaware, certifying that he had undergone a thorough physical examination including a standard serologic test and a darkfield test, if indicated, and stating that in the opinion of the physician the applicant is not infected with syphilis in a communicable stage. The total fee to be paid to any physician by the applicant shall not exceed the sum of \$2.50 over and above the fee charged by the laboratory and the required serologic test may be performed by the Delaware State Board of Health Laboratory or at a laboratory approved for this purpose by the executive secretary of the Delaware State Board of Health.

#### Georgia

*Bill Introduced*—H 25 proposes the creation of a board of naturopathic examiners to define and regulate the practice of naturopathy. The practice of naturopathy is defined as the science of treating the human body by use of natural methods and shall include the following therapeutic measures: hydrotherapy, psychotherapy, phytotherapy, mechanotherapy, phototherapy, thermotherapy, electrotherapy, biochemistry and embracing such practices as massage, mineral thermal, electrical and vapor baths, external application and dietetics. The proposal would exempt from the operation of its terms persons now authorized or heretofore authorized to practice medicine or surgery, chiropractic, osteopathy and chiropody as well as persons engaged in the practice of naturopathy in Georgia at the time of the passage of the bill who were so engaged for at least one year and who were graduates of an accredited naturopathic school. The proposed bill would further authorize naturopaths to use narcotics for the relief of pain and would provide that

naturopaths licensed under the act should observe and be subject to all state, county and municipal regulations in regard to the control of contagious and infectious diseases, with equal rights to use the facilities of the state board of health and to report all births and deaths and to any and all other rights pertaining to the public health in the same manner as is required of other practitioners of the healing arts

#### Idaho

*Bill Introduced*—H 24 proposes the enactment of a prenatal examination law. The proposal would require every licensed physician attending a pregnant woman, at the first examination or within fifteen days thereafter, to cause to be taken from such woman a blood sample to be submitted to a laboratory of the department of public health or some other approved laboratory for a standard serologic test for syphilis. In submitting such sample the physician shall specify whether or not it is for a prenatal test or a test following recent delivery. The bill also proposes that persons not permitted to take blood samples, but who do attend pregnant or recently delivered women, must within fifteen days of the first examination cause a sample of blood of such woman to be taken by a licensed physician and submitted as described.

#### Illinois

*Bills Introduced*—S 24 proposes to amend the pharmacy practice act by limiting to four hours in any one day the time during which any assistant pharmacist shall have the right to act as clerk or salesman in a drug store or pharmacy during the temporary absence of the registered pharmacist. H 8 proposes the creation of a "Cancer and Tumor Fund" to be used for the treatment of persons afflicted with cancer or tumor and the appointment by the county board of each county of a duly licensed physician familiar with cancer and tumor cases who shall maintain an office in some convenient place during the entire year for the purpose of examining applicants for the benefits of the fund.

#### Indiana

*Bills Introduced*—S 4 proposes the enactment of a law for the licensing and regulating of nursing homes, defined as any institution for care or treatment of three or more sick, infirm, convalescent, invalid, feeble-minded, mentally ill, incompetent, decrepit blind, disabled, injured, infected or chronically ill person, drug addict, dipsomaniac or inebriate, and for which care or treatment a charge is made. Exempted from the operation of the bill is treatment in a private household and in any hospital, home or institution conducted by or for the members of any religious body or denomination or regularly organized patriotic, fraternal or charitable organization. Among other things, the bill also proposes that it shall be unlawful to conduct a nursing home unless the treatment and care of inmates in such nursing home are in charge of a registered nurse. S 7 and H 29, although not identical bills propose to amend the workmen's compensation act in certain particulars. Among other things, the bill proposes that an employer shall provide the necessary first aid, medical and surgical services and all necessary medical and hospital services which is reasonably required to cure or relieve the effects of the injuries. Failure of the employee to accept such services would bar the receipt of compensation, and failure of the employer to furnish such services would authorize the employee to consult a physician of his own choice at the employer's expense. An examination of an employee made at the request of the employer shall be performed in the presence of a duly qualified physician or surgeon provided and paid for by the employee, if the employee so desires, and where a physician chosen by the employee is not present the physician engaged by the employer shall furnish the employee with a statement in writing of the conditions evidenced by such examination not later than forty-eight hours before any hearing in the matter is set. H 66 proposes the enactment of a law regulating the operation of plants for the cold storage of food in individual lockers. Among other things the bill proposes that all employees of such locker plants shall undergo a semi-annual health examination by a physician and requires the employer to keep such health certificates on file at all times. Furthermore the bill proposes to prohibit any person suffering from a communicable disease, including any communicable skin

disease or with infected wounds, and any person who is a "carrier" of a communicable disease from being employed in any capacity in such a locker plant. H 78 proposes the creation of a state board of natural therapeutic physicians to examine and license practitioners of natural therapeutics, such board to consist of six members, including two chiropractors, two naturopaths and two physiotherapists. The bill defines the practice of natural therapy as the diagnosis and treatment of human ailments, by manual and mechanical manipulation and adjusting of the spine and its appendages, the use of herbal remedies, cell salts, diet and the application of heat, cold, air, water, light, electricity, radiant energy and exercise in the treatment of disease injury or deformity. After passing the required examination a license shall be granted to practice the system or systems for which the applicant is qualified, and the license shall designate the system of natural therapeutics which licensee is permitted to practice. Finally the bill proposes to authorize licensees thereunder to sign death certificates and execute all legal documents with the same authority as members of any other school or system of healing and proposes to exempt from its operation persons lawfully carrying on their particular profession of healing under any valid existing act of the state, persons rendering gratuitous services in cases of emergency, persons who administer to or treat the sick or suffering by spiritual means or prayer and persons giving baths and massage.

#### Kansas

*Bills Introduced*—H 25 proposes the granting of temporary licenses to nurses now licensed as such, or who at one time have been licensed as such, outside the state if they are found qualified to practice as nurses in the state during the present war emergency period. Holders of such temporary licenses shall be subject to the same rules and regulations and restrictions as regular licensees. H 40 proposes to abolish the present state board of medical registration and examination and state board of osteopathic examination and registration to create a state board of physicians and surgeons registration and examination to be composed of physicians in good standing in their profession who shall have received the degree of doctor of medicine or doctor of osteopathy and to amend the medical practice act in certain particulars so as to include osteopaths under the same terms as physicians and surgeons. Licenses issued by this board would grant the right to practice medicine and surgery and would grant rights to osteopaths equal in every respect to those granted to physicians and surgeons.

#### Massachusetts

*Bills Introduced*—S 42 proposes the enactment of a law to regulate the sale of apparatus designed as aids to hearing by, among other things requiring that such sales be made only on prescription of a registered physician who is not in the employ of the seller. S 62 proposes to authorize the board of registration of nurses, for a period of six months following the taking effect of such proposal to register without examination any nurse who is a graduate of a training school for nurses satisfactory to the board and who has practiced nursing for a period of five years last preceding the effective date of the act. S 106 proposes to add a new section to the employment security act providing that payment of benefits shall be made for a period of four weeks prior to the date of birth or delivery of a child and for the four weeks next ensuing after the date of birth or delivery of a child. H 82 proposes a resolution to the federal manpower commission requesting that public mental hospitals in the state of Massachusetts be classified as a "war industry." H 87 proposes that before a hospital or sanatorium can be licensed or have its present license renewed it must present a certificate of approval of the egresses, the means of preventing the spread of fire and the apparatus for extinguishing fire issued by a building inspector of the department of public safety or, in the case of a hospital or sanatorium located in the city of Boston, by a building inspector of said city. H 88 proposes to amend the law licensing dispensaries or clinics so as to include dental clinics as well as those furnishing medical or surgical advice and treatment and proposes to exempt from the operation of such licensing requirements dental clinics conducted by a licensed maternity hospital. H 89 proposes to amend the

in licensing clinics and dispensaries by providing that the term "dispensary" shall not include a clinic conducted by a regularly licensed maternity hospital. H 94 proposes numerous amendments to the food and drug act to make it more nearly conform to the federal food, drug and cosmetic act. Among other things the proposed bill would provide that a drug sold at retail and containing aminopyrine, barbituric acid, cinchophen, dinitrophenol sulfanilamide, or their derivatives, or any other drug which has been found by the department to be dangerous to health when used in the dosage, or with the required frequency or duration prescribed recommended or suggested in the labeling thereof, and so designated by it in a regulation adopted shall be misbranded unless it is dispensed on a written prescription signed by a member of the medical, dental or veterinary profession who is licensed by law to administer such drug, and its label bears the name and place of business of the seller, the serial number and date of such prescription and the name of such member of the medical dental or veterinary profession. It is further proposed that a drug dispensed on a written prescription signed by a member of the medical, dental or veterinary profession (except a drug sold in the course of the conduct of a business of selling drugs pursuant to diagnosis by mail) shall be exempt from the foregoing requirements if the person writing the prescription is licensed by law to administer such drug and if the drug bears a label containing the name and place of business of the seller, the serial number and date of such prescription and the name of such member of the medical, dental or veterinary profession. H 303 proposes that no health or accident policy which has been in force for a period of three or more years shall be canceled, annulled or renewal refused except for nonpayment of premium or assessment or for good cause shown.

#### Maryland

*Bills Introduced*—H 46 proposes to amend the workmen's compensation act by requiring the employer to provide medical, surgical or other attendance or treatment, nurse and hospital services, medicines, crutches, apparatus artificial hands, arms, feet and legs and also to repair or replace eyeglasses which are damaged or destroyed as the result of an accident during the course of the employment. H 53 proposes to amend the insurance code by exempting from the provisions thereof any policy or contract granting solely and exclusively hospitalization insurance. The present law exempts any policy or contract issued by a non-profit association. H 59 proposes to amend the workmen's compensation act by redefining the terms "injury," "personal injury" and "accidental personal injury" to include all hernias arising out of and in the course of employment. H 63 proposes to amend the workmen's compensation act by increasing the compensation to employees suffering from neither total permanent or total temporary disability. H 80 proposes to amend the workmen's compensation act by increasing the compensation for total loss of hearing of both ears. S 84 proposes to amend the medical practice act by eliminating the proviso that two courses of medical lectures, both of which shall be either begun or completed within the same calendar year, shall not satisfy the aforementioned requirements. This amendment is apparently for the purpose of enabling graduates of accelerated medical courses to obtain licensure in Maryland. S 92 proposes the creation by the state board of health of two institutions for the treatment of needy persons requiring medical, nursing or custodial care by reason of chronic illness or infirmity. Admission to such institution shall be on the basis of a statement by a physician and shall be limited to patients who are not suffering from tuberculosis in a transmissible form mental disease of the type requiring care in a mental hospital, an orthopedic disease of a type admissible to the special orthopedic hospitals and who are under the age of 16 years. H 76 proposes to repeal that section of the licensing law providing that no county city or other political subdivision of the state shall require a license to transact any business or occupation which is required to obtain a state license.

#### Michigan

*Bills Introduced*—S 9 proposes to amend sections 12883 to 12888 of the Compiled Laws of 1929 providing for free medical and surgical care at the University of Michigan Hospital for

certain dependent children. S 15 proposes the abolition of the office of coroner and the creation of a medical examiner system. The state medical examiner shall be a physician licensed to practice medicine within the state of Michigan and shall possess special training in pathology and the investigation of violent deaths. The board of supervisors of each county in the state would be required to appoint a county medical examiner who shall be a physician licensed to practice medicine within the state and a resident of the county or an adjoining county. The proposal then sets forth the duties of the state medical examiner and the various county medical examiners, among which is the duty, on the part of the state medical examiner, to organize equip and conduct a laboratory to facilitate the carrying out of the purposes of the act. H 40 proposes to amend the existing premarital examination law by providing that no such examination shall be required of persons serving in the armed forces of the United States during the continuation of the war.

#### Nebraska

*Bills Introduced*—Bill No 40 proposes the requirement of a premarital examination by each applicant for a marriage license. The necessary certificate shall be signed by a duly qualified physician licensed to practice medicine and surgery in any state or United States territory and shall certify that the applicant is not infected with syphilis in a communicable stage. Bill No 41 proposes the enactment of a premarital examination law. This bill would require every physician attending a pregnant woman to take a sample of blood of such woman at the first examination and submit such sample to an approved laboratory for a standard serologic test for syphilis. In reporting every birth and stillbirth, physicians and others required to make such reports shall state on the certificate whether a blood test for syphilis has been made on a specimen of blood taken from the woman who bore the child, but the birth certificate shall not show the result of such test.

#### New Jersey

*Bill Introduced*—A 41 proposes to amend the medical practice act by repealing chapter 115 of the laws of 1939. That law was a general amendment to the medical practice act making uniform the requirements for a license for all persons who practice any branch of medicine or surgery or use any method of treatment of human ailment disease, pain, injury, deformity, mental or physical condition except certain enumerated classes of persons already licensed within the state.

#### Ohio

*Bills Introduced*—S 13 proposes to amend the law relative to privileged communications by providing that a physician may testify by express consent of the patient or if the patient is dead by express consent of the executor or administrator of the patient and by providing further that if the executor or administrator of a patient voluntarily testifies the physician may then be compelled to testify on the same subject. S 17 proposes to exempt from the operation of the sales tax the sale of drugs or medicine compounded, prepared or sold in accordance with or under a prescription issued by a licensed practitioner of medicine.

#### Rhode Island

*Bill Introduced*—H 533 proposes the creation of a special commission, to be known as the Special Rhode Island Public Health Laws Survey Commission to make a comprehensive reexamination and survey of the public health laws of the state and municipalities thereof and to make recommendations for complete modernization of those laws in keeping with the most recent innovations and tried practices of other states. Such recommendations must be made in legislative form not later than April 12, 1943.

#### South Carolina

*Bill Passed*—S 17 passed the Senate on January 21. This bill proposes to eliminate from the educational requirements of physicians stated in the medical practice act the requirement that the necessary four full courses of lectures of at least twenty-six weeks each must have been given in four different years. The purpose of this proposal apparently is to enable graduates of accelerated medical courses to obtain licensure in South Carolina.

## Medical News

(PHYSICIANS WILL CONFERR A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF MORE OR LESS GENERAL INTEREST SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

### DISTRICT OF COLUMBIA

**Society Aids in Low Cost Care for Federal Women Workers**—The Medical Society of the District of Columbia is cooperating with the U. S. Public Health Service in providing low cost medical care to the women who will occupy the four new dormitories scheduled for early completion by the government according to the *Washington Daily News* January 20. Under the program private physicians still will operate independently and bill their patients separately but will base their fees on a special low priced schedule agreed on for workers making less than \$1620. Infirmarys will be set up in each of the four dormitories in charge of a chief nurse and an assistant to be paid out of public funds. They will give girls free infirmary care for minor illnesses and will present each girl with a medical society panel list of physicians from which to choose should she require care. The medical societies of Prince Georges and Arlington counties and the Medical and Chirurgical Faculty of Maryland are also cooperating in the project. Office space will be provided for physicians at each dormitory. Arlington Farms with six residence halls accommodating about 600 women will have a sixty bed infirmary, West Potomac Park with three halls a sixty bed infirmary, Langston Stadium for Negro girls a 12 bed infirmary and Sutherland will have accommodations for six beds. The plan was developed by the public health service which anticipates that the infirmaries will take some of the load off hospitals; it was stated.

### ILLINOIS

**Suits Against State Officials Dismissed**—The U. S. Circuit Court of Appeals ruled on Dec. 15, 1942 that private citizens may not sue state officials to recover damages alleged to have been sustained through official acts. Newspapers reported the decision was handed down in suits against A. L. Bowen, Springfield former state director of public welfare, Mrs. Blanche Fritz, former assistant director, Dr. Albert C. Baxter, Springfield former state director of public health and Dr. Ralph T. Hinton Payson, former superintendent of the Manteno State Hospital. The suits grew out of a typhoid epidemic at the hospital in 1939, when a number of persons died.

### Chicago

**Memorial Service for Physician Who Died in Military Service**—The Chicago Medical Society sponsored a memorial service in the Sauganash Community Church January 10 for Major Lemuel Edward Day, M. C., U. S. Army, who 'died in a New Guinea field hospital December 23, 1942 two days after he had won the silver star for heroism in a bombing raid on his hospital.' Major Day was a first lieutenant in the field artillery in World War I. He joined the army again last June.

**Branch Meetings**—Dr. Dallas B. Phemister will address the North Shore Branch of the Chicago Medical Society February 2 on 'Prevention and Treatment of Surgical Shock.' At a meeting of the North Suburban Branch, January 11, Drs. Paul S. Rhoads and Samuel J. Lang Evanston, Ill. discussed 'Nonspecific Pneumonia: Report of 100 Cases and Adrenal Cortical Insufficiency and Its Treatment' respectively. At a joint meeting of the South Chicago and South Side branches January 14 the speakers were Drs. Daniel H. Levinthal on 'Surgery of Derangements of the Knee Joint' and Sidney A. Portis 'Modern Treatment of Liver Disease.' The Northwest Branch was addressed January 15 by Drs. Frank F. Maple and Charles H. Pluifer on 'Bleeding in the Third Trimester' and 'Procurement and Assignment for Physicians' respectively. The Douglas Park Branch devoted its meeting January 19 to a showing of a new motion picture film on peptic ulcer. The Jackson Park Branch was addressed on January 21 by Dr. M. Edward Davis on 'The Therapeutic Role of the Estrogens in Gynecologic Practice.' John F. Svoboda, D.D.S., spoke on 'Oral Lesions of Interest to the General Practitioner' at a meeting of the West Side Branch January 21. A joint meeting of the Englewood and Stock Yards branches was addressed January 21 by Dr. Karl A. Meyer on 'Surgery of the Colon Exclusive of the Rectum.'

The Aux Plumes Branch was addressed, January 22, by Dr. Harold O. Jones on 'Office Gynecology.' Dr. Italo F. Volini spoke on 'Pneumonia—Typical and Atypical Types,' before the Calumet Branch, January 22.

### INDIANA

**Examination of Applicants for Reciprocity Suspended**—At a meeting January 12 the Indiana State Board of Medical Registration and Examination passed a resolution to suspend the practical examination for reciprocal applicants for the duration. It was also decided to suspend the requirement of one year's practice in the original licensing state for reciprocal applicants. The board also changed the regulation for graduates located outside the United States and possessions to read 'outside of the United States and its possessions, and outside the Dominion of Canada for the duration.'

**Dr. Stayton Retires as Editor of Bulletin**—Dr. Chester A. Stayton Indianapolis, has retired as editor in chief of the Indianapolis Medical Society Bulletin a position he had held since he established the bulletin in its present form in June 1931. Mr. Russell Campbell secretary to Mayor Sullivan of Indianapolis, is the new editor in chief on a part time basis. Prior to its establishment in its present form the bulletin was published weekly as a post card. Dr. Stayton, who was then secretary of the society, continued the new bulletin with the volume number that had been carried by this weekly card.

**Physician Recommended for Navy Cross**—Dr. Don M. Mattox Terre Haute lieutenant (j. g.), M. C., U. S. Navy, has been recommended for the Navy Cross and cited for decorations by both navy and army commands as a result of service rendered during the invasion of French Morocco, according to the state medical journal. Dr. Mattox entered the service on July 16, 1942 and was first assigned to duty with the U. S. Marine Corps at Parris Island, S. C. Later he was transferred to the amphibious forces of the navy and served with the naval medical units on the African beaches in the vicinity of Casablanca during the invasion which began on November 7.

### MARYLAND

**One Case of Smallpox Breaks Twelve Year Record**—The occurrence of a mild case of smallpox in St. Mary's County has broken a record of twelve years without a report of the disease. The case was traced to an Amish minister who had visited the Amish area in Pennsylvania where an outbreak had occurred in December (THE JOURNAL January 2, page 61). The minister had visited Charles and St. Mary's counties. Vaccination of all known contacts was under way within one hour after the information was received. All those known to have been exposed to the disease were vaccinated except one man who was not vaccinated until December 28. It was this man who developed a mild case of smallpox. Regular vaccination clinics are being conducted in localities where contacts and cases have come into Maryland from the parts of Pennsylvania where the disease had occurred.

**Premedical Study Reduced at University of Maryland**—The faculty of the University of Maryland School of Medicine and College of Physicians and Surgeons Baltimore, has agreed to reduce the period of premedical study for admission to two academic or scholastic years, or their equivalent consisting of not less than sixty semester hours provided the minimum number of semester hours of instruction in the prescribed basic subjects for a premedical education is included exclusive of physical education and military science in an approved college of arts and sciences. This is in conformity with the recommendations of the Association of American Medical Colleges and the Council on Medical Education and Hospitals of the American Medical Association. The reductions in admission requirements are to continue in force until further notice. The decision was made following the adoption of resolutions recommending the action by the Association of American Medical Colleges and the Council on Medical Education and Hospitals of the American Medical Association.

**Dr. Streeter Honored**—To mark his many years of service to the Carnegie Institution of Washington, volume 30 of the Contributions to Embryology which appeared Dec. 31, 1942 was dedicated to Dr. George L. Streeter Baltimore, who was director of the department of embryology at the institution from 1918 to 1940 and chairman of the division of animal biology from 1935 to 1940 when he became research associate. The tribute also recognizes the work of Dr. Streeter in serving as editor of the volumes 8 to 29 during the period 1917 to 1940. Science reports that it is customary, when such an achievement is to be honored, to assemble a testimonial volume of especially written articles. Dr. Streeter's colleagues chose, however, to convey their tribute by means of a regular volume.

of the series prepared in the usual course of scientific research thinking that in this way they might best call attention to the fact that the whole series is a testimonial to Dr Steeter. This volume represents workers of ten laboratories in three continents. Most of the investigations were carried out in the Carnegie Embryological Laboratory and all except one made use of its collections or other facilities. It is dedicated to Dr Streeter in the name not only of the present contributors but of all those investigators now scattered over the Americas Europe and Asia, many of them inaccessible or distracted by reason of the war, who have worked in this laboratory and published their results under his editorship. The volume also contains an article prepared by Dr Streeter testifying to his eminence as investigator as well as editor. Dr Streeter was born in Johnstown N Y. He graduated at Columbia University College of Physicians and Surgeons New York, in 1899. He was demonstrator in anatomy of the nervous system at Albany Medical College 1901-1902 later he served as assistant and instructor in anatomy at Johns Hopkins University School of Medicine Baltimore, and assistant professor of anatomy at the Wistar Institute of Anatomy and Biology at the University of Pennsylvania, Philadelphia. He was professor of anatomy and director of the anatomy laboratory at the University of Michigan Medical School, Ann Arbor, from 1907 to 1914 when he went to the Carnegie Institution as research associate. A member of many national scientific societies, Dr Streeter was president of the American Association of Anatomists in 1926. His research has been concerned with human embryology development of the central nervous system, the internal ear and experimental biology.

### MICHIGAN

**Program to Conserve Hearing**—The Michigan Department of Health and the state department of public instruction are cooperating in a new program especially planned to help hard of hearing children. The program aims to discover actual and potentially hard of hearing children. Medical attention will be arranged and educational opportunities offered for both the children and the parents. Audiometric hearing tests will be given by the state department of health.

**District Units for Industrial Hygiene**—Two new district offices have been set up by the state bureau of industrial hygiene bringing the total of such district units to five. One new unit is located in the Kalamazoo City-County Department of Health, with facilities for Kalamazoo Van Buren Berrien Cass and St Joseph counties. The second unit in the Washtenaw County Health Department in Ann Arbor serves Washtenaw, Jackson Hillsdale and Lenawee counties. Other units are located in Grand Rapids Saginaw and Pontiac.

**Victory Day Clinic**—The staff of Mount Carmel Mercy Hospital Detroit held a "victory day clinic" January 27. Participating in the clinic were

Drs Harold L. Morris and Samuel A. Flaherty Detroit Urology  
Dr. William L. Bendel Monroe L. Pelvic Inflammatory Disease Treatment and Its Course  
Dr. Carl E. Badgley Ann Arbor Treatment of Colles Fracture  
Dr. William Reid Morris on Boston Certain Aspects of the Problems of Gastric Surgery  
Dr. Charles F. McKinnon Ann Arbor Neonatal Care  
Dr. Edgar H. Norri Detroit (subject not announced)  
Dr. Albert C. Furstenberg Ann Arbor Diseases of the Salivary Gland  
Dr. F. A. Le Fevre Cleveland Treatment of Coronary Heart Disease  
Dr. Irving W. Potter Buffalo Why We Do Podalic Version

### NEW YORK

**The Lucien Howe Prize**—The Medical Society of the State of New York announces that all essays for the Lucien Howe Prize must be received by the chairman of the committee on prize essays of the society, Dr Charles G. Heyd, 292 Madison Avenue New York, not later than March 1. One hundred dollars will be presented for the best original contribution on some branch of surgery preferably ophthalmology during the annual meeting of the medical society in Buffalo in May.

**Plasma Education Program**—A graduate medical education program in the indications for and technique of using blood plasma is being prepared by the state medical society. Office of Civilian Defense and the state department of health and will be launched soon through the medical society's committee on public health and education. Plans are being patterned after the recent method of handling and treatment at the Massachusetts General and Boston City hospitals after the Coconut Grove disaster. According to *Health News* one of the hospitals was fortunate in having not only a complete burn unit organized in advance of the disaster but also a trained technical team. At the other hospital a similar unit was in process of organization and, although not completed at the time of the fire, the progress that had been made was clearly

reflected in the expeditious manner with which it was possible to care for the tremendous number of injured persons in a very short time. Dr Earle B. Mahoney who is in charge of the blood plasma unit at Strong Memorial Hospital Rochester and who is serving as consultant to the state department of health, and Dr Edward S. Rogers Albany assistant commissioner for medical administration on the department's staff studied the Boston situation shortly after the disaster.

**Dr Calkins Dies**—Gary A. Calkins Sc D professor emeritus of protozoology at Columbia University New York died in Scarsdale January 4 aged 73. After graduating in 1890 at the Massachusetts Institute of Technology Boston Dr Calkins was for the next three years assistant biologist to the Massachusetts Department of Public Health and a lecturer in biology at the institute. In 1894 he was made a tutor in zoology in the newly organized zoology department at Columbia in 1903 assistant professor of zoology and in 1904 a full professor. Three years later he became the first professor of protozoology retiring in 1939 as professor emeritus. From 1903 to 1908 he was biologist for the New York State Cancer Laboratory Buffalo and since 1937 had been a member of the Columbia Consulting Board for Cancer Research. During his many years at Columbia Dr Calkins had also taught parasitology and gave the invertebrate half of the general undergraduate course in biology. From 1928 to 1931 he was executive officer of the department of zoology at Columbia and in 1935 while on sabbatical leave delivered a series of lectures at the School of Tropical Medicine of Puerto Rico University San Juan. Dr Calkins was a member of numerous scientific organizations and from 1913 to 1914 was president of the American Society for the Control of Cancer and from 1919 to 1921 of the Society of Experimental Biology and Medicine.

### New York City

**Public Welfare Commissioner Killed in Airplane Crash**—William Hodson LL B commissioner of public welfare who had been carrying out a mission for Herbert H. Lehman, LL D federal director of foreign relief and rehabilitation, was killed in an airplane accident in Paramaribo Dutch Guiana January 15. Mr Hodson recently completed his ninth year of service as commissioner of public welfare and had been granted a two months leave of absence to undertake a mission for former Governor Lehman.

**Bacteriologist Dies**—Frederick Dixon Chester bacteriologist and chemist died at his home in the Bronx January 1, aged 82. Dr Chester was born in Santo Domingo Haiti in 1861. He received his MS degree at Cornell University, Ithaca N Y in 1885. He had served as professor of geology and botany at Delaware College bacteriologist and mycologist, Experimental Station Delaware, and director of the Delaware State Bacteriological Laboratory. He was a consulting chemist and bacteriologist from 1907 to 1924 when he became the chief chemist of the Strickpole Carbon Company in Pennsylvania a position he left in 1930 to become director of research of the Technical Sales Corporation.

**Course in Industrial Medicine and Surgery**—Columbia University announces a postgraduate course in industrial medicine and surgery to be held February 1-15. Members of the faculty of medicine the De Lamar Institute of Public Health and visiting lecturers will conduct the series. Among the speakers will be

Dr McIver Woody Organization of an Industrial Medical Service  
Dr John J. Wittmer Industrial Absenteeism  
Dr Leroy C. Cardner Syracuse Lake N Y Silicosis Asbestosis and Other Dust Disease  
Dr George M. Mackee Industrial Dermatology  
Frederick B. Flinn Ph D Poisoning Due to Metals Other Than Lead  
Dr Wolfgang F. von Oettingen Bethesda Md Poisoning Due to Chemicals  
Helmuth H. Schrenk Ph D Pittsburgh Poisoning Due to Hydrocarbons

**Report Shows Increase in Venereal Disease**—A "serious rise in venereal disease was noted for 1942 according to the annual report of the city health department. For the first eleven months of the year there were 28,068 cases of syphilis recorded, an increase of 13 per cent over the corresponding period of 1941. A total of 11,208 cases of gonorrhea was reported with the number of unreported cases thought to be many times greater according to the New York Times. Neither venereal disease nor any other vital statistics of service men on duty are included in the city reports. The birth rate was 17.4 per thousand and estimated population in 1942 the highest since 1930 when it reached 17.7. An all time low was noted in the city's infant mortality rate of 25.8 for 1,000 live births. The general death rate was 10 per thousand of estimated population. The rate for tuberculosis was 46.3 per hundred thousand and that for pneumonia 39.1. Seven deaths from diphtheria were recorded as against ten in 1941. 90 cases



and nine deaths from infantile paralysis, and 437 from appendicitis, giving a new low rate from this cause of 58 per hundred thousand. Accidents caused 3,643 deaths, accounting for a rate of 48.1 per hundred thousand.

### NORTH CAROLINA

**Report of Society**—The Buncombe County Medical Society in a report of its activities for the past year announces its decision to discontinue publication of its monthly bulletin and to hold only one meeting a month for the duration of the war. Among other activities, the society aided in advancing the development of a hospital for Negroes at Asheville, organized a blood plasma bank, and turned its management over to the city health department. It sponsored weekly radio talks by members. Thirty-six members of the society, being just one third of the active membership, are now serving with the armed forces of the United States.

### OHIO

**Department of Physical Medicine Created at State University**—The establishment of a department of physical medicine at the Ohio State University, Columbus, with quarters on the first floor of University Hospital has been announced. Dr. David E. Jones, clinical assistant in orthopedic surgery, University of Louisville School of Medicine, Louisville, Ky., has been placed in charge of the new department.

**Industrial Health Program Formulated**—Recommendations for an active industrial health program in Ohio were recently approved. They were submitted in a report of the newly formed committee on industrial health of the state medical association and are to form sound local educational programs on industrial health designed to curtail absenteeism of workers, especially in war industries, because of sickness and injury, to eliminate health hazards in plants, to educate workers and their families to keep themselves in good health, to encourage good health and medical services for employees, and to provide educational opportunities for members of the medical profession on matters of industrial health and the care of those disabled as a result of employment. The establishment of state and local organizations within the medical profession to carry out these objectives was also recommended. Dr. Barney J. Heim, Toledo, is chairman of the new committee on industrial health and other members are Drs. David W. Heusinkveld, Cincinnati, Herbert M. Platter, Columbus, George T. Sykes, Cleveland, Ernest O. Swartz, Cincinnati, Ralph M. Watkins, Cleveland, Orville J. Walker, Youngstown, Carl A. Wilzbach, Cincinnati, and the president, president-elect and past president of the state medical society, ex officio.

### RHODE ISLAND

**Midwinter Meeting of the State Medical Society**—The Rhode Island Medical Society will hold a special midwinter meeting at the Medical Library, Providence, February 4. Dr. James E. Paullin, Atlanta, Ga., President-Elect of the American Medical Association will discuss "The Contribution of the Physician in the Present Crisis." Other speakers will be Drs. James C. McCann, Worcester, Mass., and Herman C. Pitts, Providence, on "Prepaid Medical Care and the National Outlook" and "The Rhode Island Cash Sickness Act" respectively.

### TEXAS

**Hospital Group Plans War Conference**—The Texas Hospital Association will conduct a war conference February 18-19, at the Hotel Texas, Fort Worth. Among the speakers will be James A. Hamilton, New Haven, Conn., president of the American Hospital Association. Other speakers will include Major James H. Stephenson, U. S. Public Health Service on "Civilian Defense in Hospitals," F. Hazen Dick, Louisville, Ky., and Everett W. Jones, B.S.E., Washington, D. C., "Hospital Purchasing in Wartime," and Russell L. Dicks, Dallas, "Psychosomatic Medicine and Its Implications for the Treatment of the Patient." Other groups meeting at the same time are the Association of Records Librarians of Texas, Texas Association of Nurse Anesthetists and the Texas Association of Hospital Accountants.

### VIRGINIA

**Courses on Industrial and Military Medicine**—The state medical society is preparing a series of graduate courses on industrial and military medicine to be given in various sections of Virginia. The program will provide for afternoon, dinner and evening meetings in each of five centers comprising a circuit of a week. According to present plans the courses will begin the latter part of February or early in March with from three to five speakers on each program.

### WISCONSIN

**Personal**—Dr. Edwin Hall Jorris, Madison, supervisor of local health services and director of the division of tuberculosis control of the Wisconsin State Board of Health has been commissioned a lieutenant commander in the medical corps of the U. S. Naval Reserve.

**Information Please Program on Therapeutics**—The Medical Society of Milwaukee County devoted its meeting, January 8, to an "information please" program. Therapeutics was the theme of the program, and Drs. Edward H. Rynearson, Rochester, Minn., Ovid O. Meyer, Madison, Francis D. Murphy, Frederick W. Madison and Theodore L. Squier, Milwaukee, constituted the board of experts.

**Dr. Harper Retires After Thirty-Nine Years as Health Officer**—Dr. Cornelius A. Harper, Madison, retired on January 28 as state health officer, a position he has held since April 1, 1904. He has been a member of the board since February 1901. Dr. Carl N. Neupert, Madison, who has been assistant state health officer for six years, has been named secretary to the board of health and state health officer. Dr. Harper has been named medical specialist in public health to the state board. He graduated at the Columbian University Medical Department, Washington, D. C., in 1893.

### GENERAL

**Women Over Thirty Urged to Have More Babies**—

According to statisticians of the Metropolitan Life Insurance Company, American women of 30 and over must have more babies if the present high birth rate is to be maintained. The withdrawal of large numbers of men for military service will result in a decrease in births among younger women, it is pointed out. In the case of women of ages 30 and over, the contribution to total annual births was smaller at the end of the last two decades than at the beginning. In 1920 their contribution was 35 per cent of the total births as against 29 per cent of the total babies born in 1940. Most married women of these ages already have children so that their hands are for the most part, still out of the classes called for military service, it was stated. In addition, thousands of these families are now in a better economic position than ever to rear more children.

**New Motion Picture on Sulfonamide Therapy**—A new motion picture on sulfonamide therapy was recently released by Lederle Laboratories, Inc., and is available for bookings without charge to medical groups. The film was prepared by and under the supervision of Drs. Norman H. Plummer, assistant professor of clinical medicine at Cornell University Medical College, New York, and Charles H. Wheeler, assistant in pharmacy (therapeutics) at Cornell. The film reviews the development of the sulfonamides from 1908 to the present time. The chemical aspects are shown in scenes taken at the sulfonamide research division of the Lederle Laboratories, and therapeutic applications are revealed in scenes taken at the New York Hospital. By special arrangement, Drs. Edward F. Roberts, New York, and Florian E. Schmidt, Chicago, will present the film with comments, or the film may be borrowed by medical societies or hospital staffs.

**Mr. Fieser's Work Expanded for Red Cross**—Mr. James L. Fieser, Washington, D. C., who has been vice chairman in charge of domestic operations of the American Red Cross since 1922, has become vice chairman at large in accordance with organization changes made to meet the expanding activities of the national group. Mr. Fieser will report to the chairman and will assist the chairman and the operating departments and services in relations with the many national organizations which are becoming increasingly important to the Red Cross will assist with the War Fund Campaign, will be available for such special assignments and for attendance at such meetings as may be requested by the chairman, and will be of assistance to the operating departments and services. The department of domestic operations will report to the executive vice chairman, Mr. Lloyd B. Wilson, Washington, D. C., who will assume this responsibility in addition to his other duties.

**Walter Reed Medals Presented**—The American Society of Tropical Medicine presented two Walter Reed medals during its recent annual meeting in Richmond in November. One was presented to the United States of Brazil through its minister of education and public health, Dr. Gustavo Capanema, Rio de Janeiro, for outstanding work in eradicating Anopheles gambiae from Brazil. In the absence of Dr. Capanema, Dr. Mario Kroeff, Rio de Janeiro, director of National Cancer Service, received the award. The second medal was presented posthumously to Dr. Carlos J. Finlay for pioneer work in yellow fever. Dr. Finlay's son, Dr. Carlos E. Finlay, was to



have received the medal, but because of his illness it was received by Dr Domingo F Ramos director of the Finlay Institute Havana. Dr Wilbur A Sawyer, N Y, was chosen president elect of the American Society for Tropical Medicine and Dr N Paul Hudson Columbus Ohio was installed as president. Rear Admiral Charles S Stephenson, M C U S Navy, is vice president, Col Charles F Craig San Antonio Texas editor, and Dr Joseph S D'Antoni, New Orleans secretary-treasurer.

**Grants Available by Ella Sachs Plotz Foundation**—The Ella Sachs Plotz Foundation for the Advancement of Scientific Investigation announces that, during the present great need for funds, forthcoming grants will be given in the sciences closely related to medicine without reference to special fields, a policy somewhat neglected in the past. The maximum size of grants will usually be less than \$500. Applications for grants to be held during the year 1943-1944 must be received by the executive committee before April 1943. There are no formal application blanks but letters asking for aid must state definitely the qualifications of the investigator, an accurate description of the research, the size of the grant requested and the specific use of the money to be expended. Applicants should also state whether or not they have approached other foundations for financial assistance. Applications should be sent to Dr Joseph C Aub, Massachusetts General Hospital, Fruit Street, Boston. In its nineteenth annual report the Ella Sachs Plotz Foundation stated that twenty-six grants were made during the past year, one being a continued annual grant. Forty-four applications for grants were received by the trustees, thirty-six of which came from the United States, the other eight coming from six different countries in Europe, Asia and North and South America. The foundation has distributed four hundred and fifty-five grants to scientists throughout the world during its nineteen years' existence.

**Prize for Research on Problems of Alcohol**—The Research Council on Problems of Alcohol has announced the establishment of a \$1000 award for outstanding research on alcoholism during 1943. The research must contribute new knowledge in some branch of medicine, biology or sociology important to the understanding or prevention or treatment of alcoholism. The project may have been inaugurated at any time in the past or during the year, provided that a substantial part of the work is carried on during the year, that it is developed to a point at which significant conclusions are possible before the end of the year and that a report on the work has not been previously announced and described before a scientific body or previously published. It is desirable, but not necessary that those planning to work for the award send to the council before March 1 a statement of such intention. If the council receives such information it can be helpful in the prevention of undesirable duplication of effort. If a research project is conceived and inaugurated later in the year, a statement of intention may be sent to the council at a later date. A report on the work and resulting conclusions must be submitted to the Research Council on Problems of Alcohol on or before Feb 15, 1944. The council will provide an outline for use in the preparation of reports. The award will be in cash and will be given to an individual scientist whose work is judged sufficiently significant to merit the award. The committee of award will consist of five persons—an officer of the American Association for the Advancement of Science and four representatives of the scientific committee of the Research Council on Problems of Alcohol. Any scientist in the United States Canada or Latin America is eligible for the award. The council will send on request to any scientist an outline of basic policies governing its research program lists of council studies (completed, under way and contemplated), and information regarding the studies of other agencies. Scientists planning to do research in connection with the award may send a statement of intention to the director Research Council on Problems of Alcohol, 111 Pondfield Road West Bronxville, N Y.

#### LATIN AMERICA

**Personal**—Drs Jorge Millan Gutierrez Mexico, was recently chosen president of the Sociedad Mexicana de Dermatologia of Mexico City, Pedro Daniel Martinez was elected secretary and Robert Nunez Andrade treasurer.

**Medical Congress Marks Anniversary Centennial**—The first National Congress of Medicine was held at the University of Chile, Nov 17-21 1942 under the direction of the faculty of biology and medical sciences of the university as a part of the centennial celebration of the university. The University of Chile was founded on Nov 19 1842. According to the *Revista Medica de Chile* October 1942 it is deplored that the world conflict restricted the participation of medical men of North America.

#### FOREIGN

**Royal College of Physicians**—The annual meeting of the Royal College of Physicians of Edinburgh was held Dec 3 1942. Dr Charles McNeil was reelected president and Dr Lewis H F Thatcher, Alexander Murray Drennan Andrew Fergus Hewat David M Lyon Andrew Graham Ritchie and Andrew Rae Gilchrist were elected to form the council of the college for the ensuing year. Dr Hewat was nominated vice president.

**Scientists Honored**—Sir Robert Robinson D Sc, Oxford, authority on organic chemistry recently received the Copley Medal of the Royal Society. Sir William Wilson Jameson formerly dean of the London School of Hygiene and Tropical Medicine and now chief medical officer to the Ministry of Health and the Board of Education, London received the Buchanan Medal for "administrative and constructive work" of outstanding merit in the service of hygienic science. Other awards of the society went to Prof Walter N Haworth D Sc Birmingham for his work in organic chemistry and Dr William W C Topley London for his studies in bacteriology. The awards were announced by Sir Henry H Dale CBE fullierian professor and director of the laboratories of the Royal Institution London and president of the Royal Society, in an address commemorating the three hundredth anniversary of the birth of Isaac Newton.—Dr Alfred Vogt professor of ophthalmology at the University of Zurich Switzerland, since 1923 has been presented with the Gullstrand Medal by the Swedish Medical Society of Stockholm. The medal is awarded every ten years to an eminent ophthalmologist. *Science* reports.—Professor Von H Mooser director of the Institute of Hygiene of the University of Zurich, has been elected an honorary member of the Royal Academy of Medicine of Barcelona for his researches on typhus fever recently made in Spain.

#### CORRECTIONS

**The Typhoid Carrier State Treated with Sulfaguandine**—In the clinical note by Major Robert J Hoagland in *THE JOURNAL*, Dec. 12, 1942, page 1211, the dose of sulfaguandine used by Levi and Willen should have been written as 0.05 Gm per kilogram of body weight instead of 0.5 Gm.

**Protective Ointment for Welders**—In a Query and Minor Note entitled "Erythema from Welding" published in *THE JOURNAL*, January 9, page 162, an ointment for the protection of welders was suggested which would consist of zinc oxide ointment to which is added 10 per cent tannic acid or 5 per cent methyl salicylate. This should be menthyl salicylate, as should a similar reference below it.

#### Government Services

##### Urge Speedy Naturalization of Alien Physicians

Because of the acute shortage of civilian physicians throughout the United States, the Immigration and Naturalization Service has been directed to expedite the naturalization of alien physicians, according to a release from the Department of Justice January 16. Immigration Commissioner Earl G Harrison has issued instructions to expedite the filing of petitions for naturalization and to hold hearings in advance of their regular order on the calendar in the cases of practicing alien physicians or aliens who would be qualified to practice if they were citizens. In issuing the instructions, Commissioner Harrison pointed out that many states, either by statute or by the administrative ruling of licensing boards, require applicants to establish American citizenship before they are admitted to the state licensing examinations for the medical profession. Other states, he said, issue temporary licenses which are subject to cancellation unless citizenship is obtained within a specified period of time. The order expediting naturalization of physicians supplements instructions issued the service in January 1942 to expedite applications for citizenship submitted by aliens in the armed forces or engaged in national defense work. In the case of physicians they are not required under the new instructions to obtain a letter from a national defense agency testifying to the nature of their employment in order to secure national defense preference in naturalization. Attorney General Francis Biddle emphasized that the new procedure in no way affects the statutory requirements for naturalization but simply expedites the handling of applications.

## Foreign Letters

### BRAZIL

(From Our Regular Correspondent)

Dec 5, 1942

#### Neurosyphilis and Delinquency

The high incidence of syphilis, particularly neurosyphilis, in criminals in Rio de Janeiro was emphasized some time ago by Dr. Cerqueira Luz, who found that the percentage of positive Wassermann tests in the blood of criminals in a large penitentiary (Casa de Detenção) was much higher than that of patients in the hospitals of the city, even those with a special clinic for neurosyphilis. In a recent paper Dr. Heitor Carrilho reports a study of 600 inmates of a hospital for the criminal insane (Manicômio Judiciário). The study disclosed that 134 of them (22 2/3 per cent) had a positive Wassermann reaction in the blood. There was no especial difference in the percentage of positivity of the test in the blood among criminals according to the different types of delinquency: 197 per cent in crimes against persons, 24 per cent in crimes against property and 24 per cent in misdemeanors. The Wassermann test of the cerebrospinal fluid has been carried out on 500 inmates of the Manicômio Judiciário, 37 of them (7.4 per cent) having been positive. In this instance the percentage of positives is significantly different in the various classes of delinquency: 35 per cent in crimes against persons, 11.4 per cent in crimes against property and 8.6 per cent in misdemeanors. But these 37 cases do not represent all the instances of abnormality of the central nervous system among these persons. When all the various tests performed with the cerebrospinal fluid of the 500 inmates, i. e. the Wassermann reaction, the globulin reactions, the colloidal reactions and the cell count, are taken together, there are 277 cases in which one or more of these tests have been positive, showing that 55.2 per cent of the patients had inflammatory changes of the central nervous system, which strongly suggests neurosyphilis. In several cases of relapsing delinquency the repetition of the examination clearly demonstrated the presence of syphilis. Dr. Carrilho points out that the problem of relapsing delinquency finds in numerous cases an explanation which is well within the province of neuro-psychiatry.

#### The Health of Children of Persons Afflicted with Leprosy

In a recent paper Dr. Octavio Gonzaga and others of the Division of Leprosy of the São Paulo State Department of Health reported a survey of the health of children of leprosy patients inmates of the St. Teresinha Preventorium, founded in 1927. The institution at Carapicuíba, about 18 miles from the city of São Paulo, harbors 250 children from a few months to 13 years of age whose parents have leprosy and are now isolated in the state leprosariums. Among 73 deliveries at the maternities of these leprosariums during the year 1941 there were 9 stillbirths (12.3 per cent). The authors report a high morbidity and mortality rate for the children of the leprosy living in the crowded nurseries of the leprosariums (20 annual deaths per hundred infants received at the nurseries just after birth). The necropsy of 20 of these infants disclosed that 18 had died from acute infections of the respiratory tract, 1 from purulent meningitis and 1 from obstetric trauma. Many of the newborn have congenital debility, 85 per cent of them being under 7 pounds (3.2 Kg.) at birth and 25 per cent under 5 pounds (2.3 Gm.). The state of debility is much more com-

mon among the children from mothers affected with the lepromatous form of the disease than the ones from mothers with the pure nervous form. The leprosy of the fathers does not cause congenital malformations and degenerations among the children, who are normal in reference to stature, weight, morbidity and mortality rates, without any particular feature that may be related to a specific character of the father. No case of transplacental leprosy has been disclosed up to this date. In the careful observation of 300 children from leprosy parents, isolated just after birth up to the age of 13, as well as in 51 necropsies, the so-called congenital leprosy has been so rare that the authors believe this expression may be considered meaningless. Among the 51 necropsies only 1 case presented a small papulous lesion of the face but the suspicion of leprosy was not confirmed by the careful examination of all the organs. In another case a large Ghon pulmonary focus and tuberculous lymphangitis made the search for the Hansen bacillus useless, owing to the concomitant tuberculous infection. The authors believe that the isolation of the children from the leprosy parents just after birth is sure protection against the later appearance of the disease.

When they are infected a short time after birth the infants present a high resistance to the disease. The authors think that the relatively mild course of the leprosy in children of tender age may be explained by the existence of an "extinct precocious leprosy" rather than by any natural individual resistance. In a majority of the cases the infant leprosy is of the mild tuberculoid type with a tendency to spontaneous cure. In the preschool and school ages on the contrary, the disease frequently takes a malignant character with a tendency to generalization. The use of the Mitsuda test on the children in the preventorium is very useful in disclosing the state of specific immunity to leprosy.

#### Personal

Dr. Olinto de Oliveira, professor emeritus of pediatrics of the Porto Alegre University and director of the National Department of the Child of Brazil, has been elected an honorary member of the Society of Pediatrics of New York. At the recent meeting of the South American Confederation of Pediatric Societies at Buenos Aires Prof. Aroaz Alfaro of that city proposed to bestow on Professor Olinto de Oliveira the special title of "Dean of the South American Pediatricians," which was approved unanimously.

## Marriages

WENDELL PHILLIPS STAMPELI, Jr., Monahans, Texas, to Miss Carol Jean Wollins of Charleston, S. C. in Chicago, October 7.

DAVID SAMUEL GARNIR, Roanoke, Va., to Miss Wilhelmina Webb of Delray Beach, Fla., December 2.

IRVIN THOMAS BLANCHARD, Woodland, N. C. to Miss Lois Jean Bateman of Tarboro, November 17.

BEATY LEE BASS, Lenoir, N. C., to Miss Patsy Smith of Winston-Salem, in November.

IRVIN B. TRAPP to Miss Anne McGovern, both of Philadelphia, Miss., November 21.

CHARLES SWIFT JONES, New York, to Miss Frances Bird of Valdosta, Ga., December 18.

WALSH McDERMOTT to Miss Marion Ann MacPhail, both of New York, November 11.

WALTER ELISHA HOOK to Miss Jeanne Patricia Diehl, both of Chicago, December 26.

JACOB D. MATIS to Miss Rosalie B. Metzger, both of Brooklyn, October 11.

## Deaths

**Warren La Verne Babcock** \* Detroit, College of Physicians and Surgeons Baltimore, 1893 formerly associate clinical professor of neurology and psychiatry at the Detroit College of Medicine and Surgery, secretary of the American Hospital Association from 1908 to 1910 and in 1911 president, president of the Michigan Hospital Association, 1919-1920 and 1934-1935, president of the Wayne County Medical Society, 1917-1918 was commissioned a first lieutenant and later a major and a lieutenant colonel in the medical corps of the U S Army during World War I served as commanding officer of American Red Cross Hospital number 3 in Paris and later as commanding officer of Base Hospital number 6 in Bordeaux honorably discharged as a colonel in February 1919 was made an officer of the Legion of Honor of France in 1919 assistant physician at the Binghamton (N Y) State Hospital 1894-1895 and the St Lawrence State Hospital, Ogdensburg, from 1895 to 1902 chief surgeon of the New York State Soldiers' and Sailors' Home, Bath, N Y from 1902 to 1904, director of the Grace Hospital from 1904 to 1937 and treasurer and trustee since then treasurer and trustee of the Michigan Hospital Service, on the editorial board of *Hospitals* and formerly on the editorial board of *Modern Hospital*, aged 69, died, December 27, at his winter home in St Petersburg Fla, of coronary thrombosis

**Thomas Wood Hastings**, Kinderhook, N Y, Johns Hopkins University School of Medicine Baltimore, 1898 instructor of clinical pathology at the Cornell University Medical College, New York, from 1901 to 1906 and professor from 1906 to 1918, substitute clinical pathologist, Presbyterian Hospital, New York, from 1902 to 1904, assistant visiting physician Cornell Medical College Dispensary from 1901 to 1907, assistant visiting physician at the Bellevue Hospital, New York from 1908 to 1917 and acting visiting physician from 1917 to 1921 member of the consulting staff of the St Bartholomew's Clinic and Hospital, New York, 1920-1921 fellow of the American Association for the Advancement of Science, served in the Boer War in Africa, the Boxer Rebellion in China and during World War I, lieutenant in the medical reserve corps of the U S Army from 1910 to 1917, became a major in 1917 and retired with that rank in 1928, aged 69 died December 5

**Elliott Gray Brackett** \* Boston Harvard Medical School, Boston, 1886 member of the American Academy of Orthopaedic Surgeons, fellow of the American College of Surgeons at one time assistant in orthopedics at his alma mater served as a colonel and as a director of orthopedic surgery in the U S Army during World War I one of the founders of the Industrial School for Crippled and Deformed Children a trustee and the first president of the Boston School for Occupational Therapy, served as chief of the orthopedic service at the Massachusetts General Hospital and as assistant surgeon on the staff of the Children's Hospital, editor of the *Journal of Bone and Joint Surgery*, aged 82 died December 29

**George Riley Anderson** \* Brattleboro, Vt University of Vermont College of Medicine Burlington, 1898 fellow of the American College of Surgeons member of the New England Surgical Society, past president of the Vermont State Medical Society and of the Windham County Medical Society, veteran of the Spanish-American War served as chief surgeon on the staff of the Brattleboro Memorial Hospital consulting surgeon Brattleboro Retreat, the Rockingham General Hospital, Bellows Falls and the Springfield (Vt) Hospital surgeon to the Boston and Maine Railroad aged 67 died December 19 in Winter Haven Fla, of cerebral hemorrhage arteriosclerosis and diabetes mellitus

**Henry Clay Lindersmith**, Sherwood Ohio Barnes Medical College St Louis, 1894 member of the Ohio State Medical Association formerly served as health officer of Defiance County past president of the board of education of Sherwood and its first fire chief serving for many years, at one time member of the board of U S Pension Examining Surgeons and local surgeon for the Baltimore and Ohio Railroad aged 75 died, November 22, in the Mount Carmel Mercy Hospital Detroit of chronic myocarditis hemorrhages and gastric ulcers of long duration

**Nagib Tannous Abdou**, Utica N Y M B School of Medicine and Surgery of Montreal Faculty of Medicine of the University of Laval at Montreal in 1899 and M D in 1900 captain in the medical reserve corps of the U S Army not on active duty aged 67, died November 9, of coronary thrombosis

**Arne O Arneson** \* McVile N D George Washington University School of Medicine Washington D C 1911 served as vice president of the North Dakota State Medical Association president of the Community Hospital aged 63 died, December 11

**Bertha May Louise Lypps Bachelder**, Pontiac Michigan University of Michigan Department of Medicine and Surgery Ann Arbor, 1903 aged 65, died December 14 of carcinoma

**Solomon Beck**, New York Columbia University College of Physicians and Surgeons New York, 1910 formerly a pharmacist aged 76, died December 26

**Theodore Beck**, Pleasant Hill, Ohio Columbus Medical College 1892, aged 79, died, December 15

**Gordian Edward Benes**, St Louis National University of Arts and Sciences Medical Department St Louis 1913, aged 57 died December 9 of brain tumor

**Charles Albert Briggs** \* Assonet Mass Long Island College Hospital, Brooklyn, 1889 had been school physician in Freetown and Brookley for many years aged 78 died, December 14 of cerebral hemorrhage

**Thomas Preston Cochran**, Pittsburgh Jefferson Medical College of Philadelphia, 1893 member of the Medical Society of the State of Pennsylvania for many years president of the staff of St Joseph's Hospital and Dispensary formerly president of the Lyman Building and Loan Association and a director of the Hill Top Bank aged 76 died December 5

**John Elwood Cullum**, Tulsa Okla International Medical Missionary Institute, Chicago 1900, Gate City Medical College Texarkana Ark, 1906 member of the Oklahoma State Medical Association, aged 83, died, December 6 of pneumonia and senility

**Arthur Ward Detrick** \* New Carlisle, Ohio Starling-Ohio Medical College Columbus 1908 for many years had been a member of the advisory board of the Clark County Health Board aged 63, died December 3 of cerebral hemorrhage

**Henry Trawick Donovan**, Huntsville Ala Louisiana State University Medical Center, New Orleans 1934, formerly health officer of Shelby and Coffee counties aged 35, died December 7 in the Benevolent Society Hospital Decatur of injuries received in an automobile accident

**Leverette Saltanstill Early** \* Petersburg Va University College of Medicine, Richmond 1898 served in the medical corps of the U S Army during World War I local surgeon for the Norfolk and Western and Seaboard Air Line Railways member of the chamber of commerce aged 68 on the staff of the Petersburg Hospital where he died December 22 of multiple myeloma

**Joseph Benjamin Edwards** Swanser S C University of Maryland School of Medicine Baltimore 1911 member of the South Carolina Medical Association served as medical examiner for the Selective Service System during World War I served as a captain in the medical corps of the U S Army, won the Purple Heart and distinguished service citations chairman of the board of trustees of the Swanser public schools for many years aged 55 died December 14, in the Veterans Administration Facility Columbia of heart disease

**George R Ernst** \* Wauwatosa Wis Rush Medical College Chicago 1901 L R C P London and M R C S England, 1904 associate clinical professor of medicine at the Marquette University School of Medicine Milwaukee formerly superintendent of the tuberculosis division of the health department of Milwaukee at one time superintendent of the Blue Mound Sanatorium aged 73 died, December 3, of acute coronary thrombosis

**George W Fiske**, Rutland Vt University of the South Medical Department Sewanee Tenn, 1901 aged 81 died, December 6

**John Edward Knight Flannagan** \* Richmond Va University of Virginia Department of Medicine, Charlottesville 1925 formerly superintendent and medical director of the Roanoke City Tubercular Sanatorium Roanoke aged 43, died, December 2 in Wytheville of heart disease

**Louis Fuldner Tryon** N C Rush Medical College, Chicago 1895 aged 69 died, December 11

**Thomas Monroe Garner**, Somerset Ky University of Louisville Medical Department 1912 member of the Kentucky State Medical Association past president of the Pulaski County Medical Society aged 59 died December 6 of organic valvular disease of the heart

**George John Geisler** \* South Bend, Ind., University and Bellevue Hospital Medical College, New York, 1915, served in France in the medical corps of the U S Army during World War I major in the medical reserve corps, not in active duty, past president of St Joseph County Medical Society, on the staffs of the Epworth and St Joseph hospitals and the Children's Dispensary aged 55, died, December 14, of coronary thrombosis and transverse myelitis

**Clarke Houston Gillespy** \* Birmingham, Ala., Tulane University of Louisiana School of Medicine, New Orleans, 1935, secretary treasurer of the Jefferson County Medical Society member of the Southeastern Surgical Congress on the staffs of St Vincent's, Hillman and Children's hospitals, aged 37, died, December 14, of metastatic adenocarcinoma

**William N Goone** \* Chicago, College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1912, served as a captain in the medical corps of the U S Army during World War I, aged 56, on the courtesy staff of the Lutheran Deaconess Hospital where he died, December 27, of coronary occlusion

**Ivan Bowman Hards**, Denver Grand Rapids (Mich) Medical College, 1902, member of the New Mexico Medical Society, aged 64 died, December 14, of cardiovascular renal disease

**William A Hoelscher**, St Louis, St Louis College of Physicians and Surgeons, 1893, also a pharmacist, was vice president of the Cass Bank and Trust Company, where he had been a director for many years, aged 77, died, December 13, in Jacksonville, Fla

**George Michael Holley**, Harrisburg, Pa., Temple University School of Medicine, Philadelphia 1930, aged 36, died, December 9, in the Good Samaritan Hospital, Pottsville, of amebic dysentery, hepatic abscess and diabetes mellitus

**Joseph Henry Kenealy**, Chicago Harvard Medical School, Boston, 1900, aged 64, died suddenly, December 2

**Elmer O Laughlin** \* Paris, Ill Medical College of Ohio Cincinnati, 1893, past president of the Aesculapian Society of the Wabash Valley, for many years surgeon for the Pennsylvania Railroad, a member of the library board and the city council, author of books and poetry, aged 75 died, December 14, of cerebral hemorrhage

**Herbert Edward Markwort**, St Louis, St Louis College of Physicians and Surgeons, 1903, on the staffs of the Deaconess and St Mary's hospitals, aged 65, died, December 11, of heart disease

**Joseph Chandler Marshall**, Atlantic City, N J University of Pennsylvania Department of Medicine, Philadelphia, 1899, formerly on the staff of the Atlantic City Hospital, aged 69 died, December 20, of cerebral hemorrhage

**Henry Hamilton Mayne** \* Lockport, N Y, University of Buffalo School of Medicine, 1892, pension examiner for the United States government from 1905 to 1912 served as a captain in the medical corps of the U S Army during World War I coroner of Niagara County from 1895 to 1897 and again from 1900 to 1902, medical officer of the public schools of Lockport aged 78 for many years on the staff of Lockport City Hospital, where he died, December 17, of a cerebral hemorrhage

**Cicero M McCracken**, Asheville, N C (licensed in North Carolina in 1896), member of the Medical Society of the State of North Carolina, was a member of the school board of Fairview, served on the county board of health aged 74, died, December 8, of cardiorenal disease, hypertension and cerebral hemorrhage

**Thomas McLeod**, Webster, Fla., Atlanta (Ga) Medical College, 1892, aged 78, died, December 11

**Henry P Metcalf**, Rushville, Ind (licensed in Indiana in 1897) member of the Indiana State Medical Association, aged 86 died, December 15, of pulmonary embolus

**Robert Lewis Mitchell** \* Baltimore University of Maryland School of Medicine, Baltimore, 1905 aged 61, on the staffs of the University Hospital and the Maryland General Hospital, where he died, December 13, of coronary thrombosis

**James Gordon Murfin**, Portsmouth, Ohio University of Pennsylvania Department of Medicine, Philadelphia 1902, served as a captain in the medical corps of the U S Army during World War I, served on the staff of the Schirman Hospital, aged 64 died, December 3, of edema of the lungs

**Prince Wellington Mynns**, Brockton Mass University of West Tennessee College of Medicine and Surgery, Memphis, 1916, aged 60, was found dead December 4

**Elizabeth Naomi Newcomb**, Carleton, Mich., University of Michigan Homeopathic Medical School, Ann Arbor, 1916, formerly on the staff of the Woman's Hospital, Detroit, aged 57, died, December 7, in Detroit

**Arthur Thomas Piercy**, Los Angeles, State University of Iowa College of Medicine, Iowa City, 1886, aged 85, died, December 3

**George Harris Richardson**, Washington, D C, Howard University College of Medicine, Washington, 1890, formerly a lawyer, aged 88, died, December 2

**Howard Thomas Robinson** \* Cumberland, Maryland, University of Maryland School of Medicine, Baltimore, 1904, member of the American Academy of Ophthalmology and Otolaryngology on the courtesy staff of the Allegany Hospital of the Sisters of Charity on the staff of the Memorial Hospital, aged 62, died suddenly, December 3, of coronary occlusion

**Herbert Ulysses Seabrook**, Charleston, S C, University of West Tennessee College of Medicine and Surgery, Memphis, 1914 aged 56 died, November 17

**Albert Stein** \* Thompsonville, Conn., University of Maryland School of Medicine, Baltimore, 1917, served during World War I, on the visiting staff of the Wesson Memorial Hospital, Springfield, Mass., aged 48 died, December 5, in the George F Baker Clinic of the New England Deaconess Hospital Boston, of uremia, acute hemorrhagic nephritis and pulmonary edema

**George A Van Fradenburg**, Montross, Colo University of Denver Medical Department, 1898, aged 71, died, October 31, of carcinoma

**Richard Powers Wilkinson** \* Philadelphia, Medico-Chirurgical College of Philadelphia, 1899, formerly treasurer of the Philadelphia County Medical Society, aged 70, died, December 2

**William Douglas Wirt**, Washington, D C Columbian University Medical Department, Washington, 1887, aged 80, died, December 13

**Leo Zon**, Baltimore, University of Minnesota Medical School, Minneapolis 1931 specialist certified by the American Board of Pathology, Inc diplomate of the National Board of Medical Examiners passed assistant surgeon, U S Public Health Service reserve, aged 36 for many years research pathologist at the United States Marine Hospital where he died December 5, of meningococcal septicemia and cerebrospinal meningitis

#### DIED WHILE IN MILITARY SERVICE

**Maurice Marshall Berck** \* New York, Cornell University Medical College New York 1928 diplomate of the National Board of Medical Examiners specialist certified by the American Board of Surgery fellow of the American College of Surgeons on the staffs of the Mount Sinai and Gouverneur hospitals captain in the medical corps, Army of the United States entered active duty at the Army Medical Center, Washington D C Nov 24 1942 aged 38 died, January 4 in the Central Dispensary and Emergency Hospital, Washington, of asphyxiation carbon monoxide, universal burns of the body and extremities toxemia and shock, accidentally incurred when he probably fell asleep with a lighted cigaret in his hand and set his apartment on fire

**Lemuel Edward Day** \* Chicago Rush Medical College, Chicago, 1925, fellow of the American College of Surgeons member of the attending staff chairman 1940 1941, section of obstetrics and gynecology at the Ravenswood Hospital, where he was president of the medical staff 1933-1934 served as second lieutenant in the field artillery during World War I major in the medical corps in the Army of the United States began active duty June 14 1942, in command of the Second Field Hospital New Gunner, where he died, December 22, of heart disease aged 46

**Jacob Walter**, Chicago, University of Illinois College of Medicine, Chicago, 1939 a first lieutenant in the medical corps of the Army of the United States, was called to active service Feb 5, 1941, stationed at the Milwaukee District United States Army Recruiting and Induction Service aged 27, died October 14 in the Veterans Administration Facility Wood Milwaukee of lobar pneumonia

## Bureau of Investigation

### SOME MISCELLANEOUS MEDICAL FRAUDS

#### A Variety of Schemes Debarred from the Mails

Fraud orders issued by the Post Office Department have frequently been the subject of extensive articles by the Bureau of Investigation in these pages of THE JOURNAL. Following are brief abstracts of some fraud orders not dealt with previously.

**International Laboratories**—This is an outgrowth of or a new name for a Baltimore outfit that did an obesity cure mail order business under the name The Bradford Laboratories. The fraud order that banned the Bradford concern from the mails was dealt with in a lengthy article in this department of THE JOURNAL Jan 4 1941 pages 68-69. It was there shown that the Bradford outfit under one name or another had been in business over a period of more than forty years and at one time had claimed that its treatment was composed of a combination of roots and herbs no chemical preparations, whereas it was represented still to be the original nostrum which chemical examination had shown to contain among other ingredients such minerals as baking soda and some bismuth salt perhaps a subnitrate. The Post Office fraud order that closed the mails to this scheme was issued Dec 1 1939. Like many other swindles it did not actually go out of business but simply changed names and continued to operate as before but under a new trade style International Laboratories Box 983 Baltimore which had been contrived by E. L. Kincaid the owner of the Bradford Laboratories. The actual address was 38 Hopkins Place Baltimore the same location from which the original enterprise had been conducted but the new name and address were calculated to throw the Post Office off the scent. That agency however detected Kincaid's effort to dodge the original fraud order and on Sept 29 1941 issued a new one debarring from the mails the name International Laboratories.

**J. W. Dorman**—This person first came to the notice of the Bureau of Investigation when on Oct 15 1934, trading as Dorman Chemical Company Concord N. C. he was fined \$100 and placed on probation for eighteen months after pleading guilty to violating the Pure Food and Drugs Act by shipping his J. W. D. Blood Purifier and undesignated pills and capsules in interstate commerce under the fraudulent label representations that the complete treatment was a blood purifier and general reconstructive tonic as well as a cure for pellagra kidney and heart disorders ulcerated stomach high blood pressure gallstone trouble skin diseases and some other conditions. This case designated by the government as Notice of Judgment 24515 issued in March 1936 was abstracted in THE JOURNAL Sept 25 1937. Dorman using not only his name but also the title The Medicine Man also sold his treatment by mail playing it up chiefly as a treatment for pellagra. In his circulars he claimed that he had once suffered from this disease in its worst form and that a hospital which treated him for it discharged him as an incurable patient. Thereupon if one could believe him he sought to relieve himself by experimenting with different herbs. He discovered a combination by which he was completely relieved. Since that time he has been making and selling this medicine to relieve other sufferers. Thousands have been completely relieved and there is no case recorded that we know which has failed to be relieved when the medicine has been taken according to directions. Testimonials the usual stock in trade of the patent medicine exploiter also were played up but when asked to produce the alleged originals of these he was unable to do so. Analysis by government chemists revealed that one part of the treatment J. W. D. consisted essentially of tincture of digitalis Fowler's solution of arsenic salicylic acid coloring matter and water. The accompanying blue tablets contained copaba cubebs methylene blue santal and kava kava the white tablets were a mixture of aloes podophyllum colocynth scammony gamboge and about 0.8 grain per tablet of calomel the ointment contained sulfur petrolatum hydrous wool fat a hot principle a phenolic principle and a salicylate. As evidence of the scientific character of this treatment it is interesting to note that the Post Office investigation divulged that Dorman could neither read nor write and that the clerical details of his business had to be performed by his wife. When cited by the Post Office to appear at a hearing held on Jan 13 1937 and show cause why a fraud order should not be issued against his enterprise Dorman sent his attorney instead. Since the latter was unable to controvert the evidence presented by the expert medical witness for the government to the effect that Dorman's nostrums were wholly without value for pellagra his business was debarred from the mails by a fraud order issued Jan 25 1937 against the names J. W. Dorman.

The Medicine Man and Dorman Chemical Company. Some time thereafter according to a later Post Office investigation Dorman moved from Concord to Pineville N. C. where he continued to operate his scheme despite the original fraud order. In response to one inquiry he claimed that his present pellagra treatment was the same as the one he formerly had sold from Concord. When asked whether it would cure pellagra he sent the treatment through the mails for that purpose designating it as J. W. D. (An Alternative) Dorman's Diuretic Tablets and J. W. D. Laxative Tablets and ailing \$3.50 for the combination. A government chemist who analyzed the nostrums reported that the first named was a reddish pink liquid containing total medicinal matter amounting to 0.04 grain per teaspoon and containing in each teaspoon 0.009 grain of arsenic trioxide 0.02 grain of salicylic acid

and a trace of wintergreen. The diuretic tablets were found to contain copaba cubebs methylene blue santal oil and kava kava and the laxative tablets consisted of rhubarb colocynth compound and about 8/10 of a grain of calomel. When Dorman was notified by the Post Office to show cause why a second fraud order should not be issued against him he neither put in an appearance nor sent anyone to represent him his sole defense being a written answer to the charge. An expert medical witness familiar with pellagra testified for the government that this is a vitamin deficiency disease manifested by many symptoms and that the present recognized treatment for it is the administration of nicotinic acid in large dose together with an abundance of other vitamins such as thiamine (B<sub>1</sub>) and riboflavin (B<sub>2</sub>) as well as proper diet. Since it was shown that Dorman's group of nostrums would not cure or alleviate pellagra and that in fact the use of a laxative such as his treatment included might set up an intractable diarrhea endangering the very life of the sufferer it was declared to be a scheme for obtaining money through the mails by means of false and fraudulent pretenses representations and promises and an evasion of the fraud order of Jan 25 1937. A supplemental fraud order accordingly was issued on Oct 28 1942 against J. W. Dorman of Pineville N. C.

## Medical Examinations and Licensure

### COMING EXAMINATIONS AND MEETINGS

#### ANNUAL CONGRESS ON MEDICAL EDUCATION AND LICENSURE

CHICAGO Feb 15-16 1943. Sec Council on Medical Education and Hospitals Dr H. G. Weiskotten 535 North Dearborn Street Chicago.

#### BOARDS OF MEDICAL EXAMINERS

##### BOARDS OF EXAMINERS IN THE BASIC SCIENCES

Examinations of boards of medical examiners and boards of examiners in the basic sciences were published in THE JOURNAL Jan 23 page 281.

#### NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS Parts I and II. Various centers March 13. Exec Sec Mr Everett S. Elwood 225 S. Fifteenth St. Philadelphia.

#### EXAMINING BOARDS IN SPECIALTIES

AMERICAN BOARD OF ANESTHESIOLOGY. Oral Part II. New York May 15-16. San Francisco May 22. Chicago June 6-7. Final Date for filing application is 90 days prior to date of examination. Sec Dr P. M. Wood 745 Fifth Ave. New York.

AMERICAN BOARD OF NEUROLOGICAL SURGERY. Oral Chicago Feb 15-16. Sec Dr R. Glen Spurling 404 Brown Bldg. Louisville Ky.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY. Written Part I. Various centers Feb 13. Candidates in military service may take Part I at their place of duty. Oral Part II. Pittsburgh May 19-25. Sec Dr Paul Titus 1015 Highland Bldg. Pittsburgh.

AMERICAN BOARD OF OPHTHALMOLOGY. Oral All Groups Parts I and II. March 1. Sec Dr John Green 6830 Waterman Ave. St. Louis.

AMERICAN BOARD OF OTOLARYNGOLOGY. Oral New York May or June. Final date for filing application is March 1. Sec Dr Dean M. Lierle 1500 Medical Arts Bldg. Omaha Neb.

AMERICAN BOARD OF PEDIATRICS. Starting July 1 1943 Group I will be abolished. Sec Dr C. A. Aldrich 707 Fullerton Ave. Chicago.

AMERICAN BOARD OF PSYCHIATRY & NEUROLOGY. Various centers April or May. Final date for filing application is March 1. Sec Dr Walter Freeman 1028 Connecticut Ave. N. W. Washington D. C.

AMERICAN BOARD OF UROLOGY. Chicago Feb 12-14. Sec Dr Gilbert J. Thomas 1409 Willow St. Minneapolis.

### Montana October Report

The Montana State Board of Medical Examiners reports the written examination for medical licensure held at Helena Oct 6-7 1942. The examination covered 10 subjects and included 50 questions. An average of 75 per cent was required to pass. Eight candidates were examined, 7 of whom passed and 1 failed. Six physicians were licensed to practice medicine by reciprocity and 3 physicians so licensed on endorsement of credentials of the National Board of Medical Examiners. The following schools were represented:

School	PASSED	Year	Number
University of Minnesota Medical School		(1935)	1
Creighton University School of Medicine		(1942)	2
Ohio State University College of Medicine		(1942)	1
Medical Department of Grant University		(1942)	1
Marquette University School of Medicine		(1942)	1
Universite de Lausanne Faculte de Medecine		(1936)	1
School	FAILED	Year	Number
Universitat Zurich Medizinische Fakultat		(1940)	1
School	LICENSED BY RECIPROCITY	Year	Reciprocity
College of Medical Evangelists		(1930)	Calif. 1942
Rush Medical College		(1937)	Missouri
University of Minnesota Medical School		(1926)	Minnesota

University of Manitoba Faculty of Medicine	(1930)	N Dakota
University of Toronto Faculty of Medicine	(1895)	Michigan
LICENSED BY ENDORSEMENT		
School	Year	Grad
Johns Hopkins University School of Medicine	(1921)	
Tufts College Medical School	(1939)	
Universidad Central de España Facultad de Medicina Madrid	(1933)	

### Maryland June Report

The Board of Medical Examiners of Maryland (Homeopathic) reports the written examination for medical licensure held at Baltimore June 16 17, 1942. The examination covered 9 subjects and included 70 questions. An average of 75 per cent was required to pass. Four candidates were examined, all of whom passed. The following schools were represented:

School	PASSED	Year Grad	Number Passed
Hahnemann Medical College and Hospital of Philadelphia	(1941-3)	(1942)	4

## Bureau of Legal Medicine and Legislation

### MEDICOLEGAL ABSTRACTS

**Right to Require Alleged Incompetent in Guardianship Proceedings to Submit to Mental Examination**—Redfield applied to the superior court King County Washington, for the appointment of a guardian of the person and estate of his sister, alleging that she was incompetent mentally and physically to care for herself or her estate. Subsequently the trial court ordered three psychiatrists, named by Redfield, to examine the alleged incompetent to enable them to testify later as to her physical and mental condition at the hearing on the petition for the appointment of a guardian. The state, then, on the relation of the alleged incompetent, brought certiorari to the Supreme Court of Washington to review the propriety of the trial court's order.

While Redfield cited no court decision which specifically held that in a guardianship proceeding the trial court may, before a hearing, direct that the alleged incompetent submit to an examination by physicians named by the court to conduct such an examination, he contended that such power is included in the general inherent authority of the court to conduct guardianship proceedings and to take such steps as may be deemed advisable in order that a full and complete hearing may be had. Apparently as authority for an order such as was under question he relied on *Lane v. Spolane Falls & Northern R. Co.* 21 Wash. 119, 57 P. 367, in which the Supreme Court of Washington held that the trial court possessed inherent power to require a plaintiff in a tort action for personal injuries to submit to a pretrial examination by medical experts appointed by the court for the purpose of ascertaining the nature character and extent of the plaintiff's injuries. The Supreme Court, however distinguished that case from the facts here involved. Obviously said the court, when a person voluntarily brings an action for the recovery of damages on account of personal injuries alleged to have been suffered the court should have the power to direct that prior to the trial the plaintiff submit to a physical examination. There is no statute in this state authorizing such action in an adversary proceeding for the appointment of a guardian of an alleged incompetent nor would such a right seem to be vested in the court at common law. The right of a court to order a party to submit to a physical examination was recognized at common law in certain classes of actions such as proceedings for divorce in cases in which it was desired to make proof of cohabitation and in criminal prosecutions for mayhem. The right of the court in Washington is somewhat broader than at common law because of a Washington statute (Rem. Rev. Stat. sec. 6930) which provides that when it is charged under oath that a person by reason of insanity is unsafe to be at large the court can require the alleged incompetent to submit to examination by two reputable physicians. But this procedure applies only under and is limited to the circumstances mentioned

The authority assumed by the trial court, continued the Supreme Court, in ordering the alleged incompetent to submit to an examination to be conducted by physicians designated by the person seeking the appointment of a guardian trenches to a great extent on the liberty of the individual. One in the alleged incompetent's situation is not a voluntary participant in such a proceeding as this. The proceeding is adverse to her. It may be assumed that, in the great majority of cases no petition alleging incompetency would be filed unless at least some ground existed for such a charge. Assuming then, that the alleged incompetent is physically or mentally ill, the charge of incompetency itself would naturally have a bad effect on the person and tend to aggravate any unfortunate existing condition. If, in addition to the charge the alleged incompetent must submit to the ordeal necessarily involved in a lengthy physical and mental examination by three physicians known to have been chosen by the adverse party, the effect would probably be very bad and might be serious. There would be no way of terminating the examination until the examining physicians chose to end it and its undue extension might well be most unfair and harmful to the subject. Neither would there be any control of the questions that the examiners might ask and, even though the subject might be represented and advised by counsel, the mere persistent asking of improper questions might well irritate the person examined and produce unfortunate results.

A petition for the appointment of a guardian on the ground of mental incompetence continued the court may be filed against any person at any time. If the procedure embodied in the order now before this court for review may be established, it might be used improperly and for some ulterior purpose entirely disconnected from any question of guardianship. In the absence of any controlling authority, such as the presence of the judge much harm might result. Certainly no such step should be taken unless the judicial authority to make the order clearly appears and some very real emergency should be shown to exist. The order of appointing in court or even knowing that such a proceeding has been filed, is considerable but those consequences cannot be avoided. In open court the alleged incompetent has the benefit of judicial protection. If, in the course of the hearing before the court on the application for appointment of a guardian, the court feels that the evidence produced is inadequate or for any reason unsatisfactory and for its own information desires further testimony, a different situation might arise concerning which we here express no opinion. The effect of holding the procedure followed in entering the order under review proper would seem to encourage the filing of a petition for the appointment of a guardian since a petitioner could use physicians of his own selection by way of an exploring expedition to see what they could discover in examining an alleged incompetent. In this case the order provided that the three physicians named should make only one examination of the alleged incompetent and that the time should suit her convenience but even with that restriction the accomplishment of the order would require that the alleged incompetent undergo a very trying ordeal, which might have to her injurious consequences.

The order in question the court accordingly held, was entered without warrant of law and infringed the alleged incompetent's lawful rights to personal peace and security. The order requiring the alleged incompetent to submit to examination by physicians designated by her brother was reversed.—*State ex rel. Nelson v. Superior Court of King County* 131 P. (2d) 144 (Wash. 1942).

## Society Proceedings

### COMING MEETINGS

Annual Congress on Medical Education and Licensure Chicago Feb 15-16  
Dr H. G. Weiskotten 535 North Dearborn St. Secretary

American Society of Anesthetists New York Feb 4 Dr Paul M. Wood  
745 Fifth Avenue New York Secretary  
Conference of State and Provincial Health Authorities of North America  
Washington D. C. March 22-25 Dr A. J. Chesley 469 State Office  
Bldg St. Paul Secretary  
Western Section American Laryngological Rhinological and Otolaryngological  
Society Portland Ore Jan 31 Dr Irving M. Lupton 1020 S.W.  
Taylor St. Portland Ore. Chairman



## Current Medical Literature

### AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1932 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (\*) are abstracted below.

### American Heart Journal, St. Louis

24 579-718 (Nov.) 1942

- Interrelation of Disease of Coronary Arteries and Gallbladder  
H. R. Miller, New York—p. 579
- Auricular Flutter Associated with Bizarre QRST Complexes  
J. S. Butterworth and C. A. Pounder, New York—p. 588
- Influence of Posture on Electrocardiogram  
H. S. Myer on and W. D. Davis Jr., New Orleans—p. 593
- Auricular Complex in Coronary Thrombosis  
A. Bloom and D. Gilbert, Richmond, Va.—p. 602
- \*Weltmann Serocoagulation Band in Myocardial Infarction  
J. H. Delaney, Columbia, Mo., and J. W. Keyes, Detroit—p. 607
- \*Diagnostic Value of Electrocardiogram Based on Analysis of 149 Autopsy Cases  
L. A. Katz, A. M. Goldman, R. Langendorf, L. G. Kaplan and S. T. Killian, Chicago—p. 627
- Dissecting Aneurysm of Aorta  
N. Flaxman, Chicago—p. 634
- Electrocardiographic Changes Following Electrically Induced Convulsions  
E. M. Kline and J. I. Fetterman, Cleveland—p. 663
- Studies on Coronary Occlusion. III. Effect of Digitalis on RST Segment of Electrocardiogram After Coronary Ligation  
M. G. Mulinos and A. Leslie, New York—p. 671
- Id. IV. Vasodilators and Coronary Circulation. Experimental Observations  
A. Leslie and M. G. Mulinos, New York—p. 679

**Weltmann Serocoagulation Band**—The interest of Delaney and Keyes in the application of the Weltmann serocoagulation test in coronary artery occlusion was aroused by the parallelism between this test and the sedimentation rate and leukocyte count in other conditions characterized by tissue necrosis. The coagulation band of the Weltmann serocoagulation test was considerably shortened in 24 cases of coronary artery occlusion. The coagulation band became progressively shortened during the early acute stages of infarction beginning on the second or the third day, and reached its minimum by the fifth to the seventh day. This "shift to the left" afforded some index of the extent of myocardial necrosis. An abrupt, extreme or persistent left shift would indicate either a large infarction or slow healing and therefore a more serious prognosis. Conversely a coagulation band which is only moderately shortened or promptly returns to normal was associated with satisfactory healing and a good prognosis. As repair proceeds by fibrosis the coagulation band lengthens again to normal. Large areas of fibrosis old or recent, result in a shift to the right, beyond normal. The Weltmann reaction may serve as a manifestation of the actual pathologic course of the disease. In coronary artery insufficiency, which produces myocardial ischemia without actual infarction, the coagulation band is unchanged. Therefore the Weltmann test is useful in differentiating between the two conditions. The conditions (pregnancy, the ingestion of food and destructive changes in the body) that cause variations in the sedimentation rate are not observed to do so in the Weltmann test, which more closely reflects the true nature of the pathologic change and the clinical course of the patient. There was a close parallelism between the Weltmann coagulation band and the nonfilament count. The two complicating factors which must be considered in interpreting the coagulation band are the presence of old or new fibrotic processes of cardiac or extracardiac origin and myocardial insufficiency. The data obtained from a frequent charting of the Weltmann serocoagulation reaction are superior to those obtained with any other single procedure.

**Diagnostic Value of Electrocardiogram**—The electrocardiographic and the necropsy observations of 149 consecutive cases were compared by Katz and his co-workers. In cases of combined hypertrophy of the right and left ventricles the electrocardiogram usually reflected only the predominant ventricular

strain. Right ventricular preponderance was more often correctly diagnosed and less often overlooked than left ventricular preponderance. However, decided hypertrophy, especially if both ventricles are involved, may be present without electrocardiographic evidence of ventricular strain. Old healed infarction of the anterior wall may be indistinguishable from left ventricular hypertrophy without myocardial infarction. Conversely, left ventricular hypertrophy may give rise to an electrocardiographic pattern suggestive of recent infarction of the anterior wall. The electrocardiographic pattern of congenital heart disease was diagnostic. The patterns associated with recent myocardial infarction were significant although errors did occur, but errors were less likely when chest leads and serial curves were obtained. Old healed myocardial infarction, coronary sclerosis and myocardial fibrosis commonly failed to produce any characteristic electrocardiographic pattern. The electrocardiographic localization of myocardial infarction was correct in all but 1 case of old healed infarction. In the 2 cases of infarction of the lateral wall there were anterior wall patterns in the limb leads. Recent diffuse pericarditis was recognized in the electrocardiogram in the presence of associated masking conditions. The patterns of acute cor pulmonale were diagnostic, but extensive massive pulmonary embolism may occur without these patterns. Chronic cor pulmonale may produce a diagnostic pattern. The mitral P wave pattern is indicative of left auricular involvement, and in the present series it constituted electrocardiographic evidence of rheumatic heart disease.

### American Journal of Physiology, Baltimore

137 641-798 (Nov.) 1942 Partial Index

- Effects of Heightened Negative Pressure in Chest Together with Further Experiments on Anoxia in Increasing Flow of Lung Lymph  
Madelaine F. Warren, Delores K. Peterson and C. K. Drinker, Boston—p. 641
- Volume of Air Moved by Artificial Respiration in Anesthetized Men  
D. R. Hooker, W. B. Kouwenhoven and J. A. York, Baltimore—p. 649
- Role of Adrenal Cortex in Preventing Hypoglycemic Convulsions  
A. Arnett, M. Kessler and E. Cellhorn, Chicago—p. 653
- Control of Clonic Responses of Cerebral Cortex  
A. Roenblueth, D. D. Bond and W. B. Cannon, Boston—p. 681
- Effect of Peripheral Vasoconstriction on Vasoconstriction Determinations Made on Basis of Blood Pressure of Normal Subjects  
Grace M. Roth and C. Sheard, Rochester, Minn.—p. 693
- Production of Experimental Polycythemia by Daily Administration of Epinephrine or Posterior Pituitary Solution  
J. E. Davis, Little Rock, Ark.—p. 699
- Distribution of Sucrose in Body Fluids Following Intravenous Injections  
R. S. Hubbard and R. K. Under, Buffalo—p. 722
- \*Effects of Diet Deficient in Vitamin B Complex on Sedentary Men  
E. Egan, R. E. Johnson, R. Bloomfield, I. Broucha, A. P. Meiklejohn, J. Whittenberger, R. C. Darling, C. Heath, A. Graybiel and F. Consolazio, Boston—p. 731
- Acid Base Equilibrium of Blood in Exercise  
E. S. Turrell and S. Robin, in Bloomington, Ind.—p. 742
- Relationship Between Monochromatic Light and Pupil Diameter. Low Intensity Visibility Curve as Measured by Pupillary Measurements  
I. H. Wagman and J. E. Gullberg, Berkeley, Calif.—p. 769
- Effect of Injured Area on Electrical Field of Heart Based on Experiments with Models  
L. A. Katz, K. Jochim and A. Goldman, Chicago—p. 779

**Vitamin B Complex Deficiency in Sedentary Men**—Egana and his collaborators show that a diet grossly deficient in the vitamin B complex causes subjects to become deficient (as determined by urinary excretion) within three or four weeks, that there is measurable physical deterioration in this time and that brewers yeast is a complete and adequate supplement to the deficient diet. The subjects used were 7 healthy physicians. The symptoms of physical deterioration were mild and vague, the most constant being easy fatigue, loss of ambition and loss of efficiency in daily work. Physical fitness for exhausting exercise and particularly recuperation between repeated periods of exhausting exercise were moderately deteriorated. The changes were reversed by adding brewers yeast to the diet. All other metabolic measurements showed slight or no abnormal changes. These measurements were oxygen consumption, carbon dioxide excretion, blood lactate, blood pyruvate, blood sugar, urine lactate and urine pyruvate. Cardiovascular changes were inconstant; there never was a tachycardia on exertion. On the contrary, abnormally slow heart rates in moderate exercise and in exhausting exercise were the rule. Blood pressure did not change. The electrocardiogram of only 1 subject showed significant changes.



## Annals of Surgery, Philadelphia

116 641-800 (Nov.) 1942

- Practical Concept for Treatment of Major and Minor Burns Importance of Timing Therein F B Gurd D Ackman J W Gerrie and J E Pritchard Montreal Canada—p 641
- \*Study of Shock Delaying Action of Barbiturates with Consideration of Failure of Oxygen Rich Atmospheres to Delay Onset of Experimental Shock During Anesthesia H K Beecher Jane D McCarrell and E I Evans Boston—p 658
- Chest Injuries F S Dolley and L A Brewer 3d Los Angeles—p 668
- Pilonidal Cysts and Sinuses Method of Wound Closure Review of 230 Cases W F MacFee New York—p 687
- Successful Closure of Arteriovenous Aneurysm Involving Left Innominate Vein and Left Common Carotid Artery H Tarnower B Irttin, Scarsdale N Y and G C Adie New Rochelle N Y—p 700
- Complicated Case of Aneurysm Involving Iliac and Femoral Arteries L N Atlas Cleveland—p 708
- Comparison of Results of Roentgen Rays Sulfanilamide and Serum Therapy in Experimental Gas Gangrene in Pigeon W H Erb and P J Hodess Philadelphia—p 713
- \*Noninfective Gangrene Following Fractures of Lower Leg C G Child 3d New York—p 721
- Recurrent Ulceration Following Subtotal Gastrectomy in Treatment of Gastrointestinal Ulcer S Mage New York—p 729
- \*Primary Carcinoma of Duodenum L Berger and H Koppelman Brooklyn—p 738
- Solitary Nonparasitic Cyst of Liver H S Munroe Jr Charlotte N C—p 751
- Studies on Use of Metals in Surgery II Experiments on Use of Titanium in Cranial Repair F Campbell A Metrowsky and A Tompkins Albany N Y—p 763
- Use of Lamp to Warm Moist Compresses H E Pearse Rochester N Y—p 776
- Anatomic Approach to Pulmonary Resection E M Kent and B Blades St Louis—p 782

**"Shock Delaying" Action of Barbiturates**—According to Beecher and his co workers the observation of Seeley, Essex and Mann that shock produced in dogs by exposure and manipulation of the intestine is slower to appear when barbiturate (sodium amytal) anesthesia than when ether anesthesia is used has been confirmed. There was no significant delay in the onset of shock produced by hemorrhage when barbiturate (sodium amytal) or ether anesthesia was used. This observation indicates that the barbiturates as compared with ether anesthesia are not useful in delaying all types of shock. The barbiturates appear to delay shock in comparison with ether only when the trauma is associated with loss of plasma from wound surfaces. The recommendation that barbiturates be administered to all wounded men if shock is anticipated involves two major assumptions, both of which, on the basis of the available information, are untenable. First, the recommendation that barbiturates be given all seriously wounded men assumes that the barbiturates will be of value in all types of shock which is not the case. The assumption that such administration of barbiturates will not be dangerous is contradicted by abundant evidence. Second direct application as a shock delaying or preventive requires the assumption that comparison of the barbiturate data with the ether data is the same as a comparison of barbiturate data with a condition of no anesthesia. No data are available to indicate that the onset of shock is slower under barbiturates than in the unanesthetized subjects. In experiments the administration of approximately 100 per cent oxygen did not significantly delay, in comparison with room air, shock due to bleeding under a barbiturate or ether anesthesia.

**Gangrene Following Fractures**—Child reports the fifteenth case of noninfective gangrene following fracture of the lower leg. In his patient who was 23, a careful analysis of the complication reveals two features of significance. 1 The nerve supply of the lower leg and foot, which was intact on admission, failed during the next two or three days. 2 The blood supply of the foot, which also was normal on admission showed early signs of embarrassment followed, however, by ultimate survival of the member. With these facts in mind it is possible to reconstruct the course of events that led to the complication. As a result of the severe crushing nature of the injury the anterior tibial artery probably was torn sufficiently to damage its intima, and a thrombus began to form at the site of the injury. During the next few days the thrombus became so large that it occluded the lumen of this vessel. Dependent on the progressive nature of this lesion were the clinical phenomena, namely the intact nerve and blood supply on admission their eventual

failure as the integrity of the blood supply became compromised and finally gangrene and complete loss of sensation. The ultimate viability of the foot may in all probability be ascribed to the rich collateral circulation about the ankle joint and between the distal branches of the anterior and posterior tibial arteries in the foot, but although this was abundant it was inadequate to supply in retrograde fashion the proximal portion of the anterior tibial arteries. To establish the validity of these assumptions the 14 cases of this complication appearing in the literature from 1850 to the present time are reviewed. Analysis reveals that the average age for the 15 was 26 years, and therefore degenerative diseases of the arterial wall as predisposing factors can be discounted. With two exceptions the fractures were extensive and involved both bones of the lower leg. The sites of fracture were about evenly distributed between the upper, middle and lower thirds of the lower leg, some were compound, some oblique, some transverse and many were comminuted. Apparently no particular site or type of fracture was especially predisposing. The gangrene in 9 involved the lower leg and foot, in 5 the foot alone and in 1 only the lateral muscles of the calf. The condition in all but 2 required that amputation be carried out. The site of the occlusive process in the other 13 was located, in 4 it was the popliteal, in 8 the anterior and posterior and in 1 the posterior tibial arteries. The complication in all probability does not appear to be related to the method of immobilization employed. Of the 2 patients on whom amputation was not done, the 1 who refused amputation was left with a useless leg and 1, the author's patient, is left with a foot which functions only partially even when supplemented by a brace. There were no deaths.

**Carcinoma of Duodenum**—A proved case of primary carcinoma of the infrapapillary portion of the duodenum is presented by Berger and Koppelman who discuss the roentgen, operative and necropsy observations from a clinical point of view. In the literature on all types of primary duodenal carcinoma 386 proved cases are reported to date, of which 199 per cent were suprapapillary, 65 per cent peripapillary and 15 per cent infrapapillary. Earlier diagnosis depends on the clinician's awareness that the diagnosis of duodenal carcinoma is possible though rare (from 0.03 to 0.003 per cent of all necropsies). Roentgen examination is especially helpful if the lesion is looked for consciously. While the results of radical surgery in duodenal carcinoma have been discouraging (52 per cent five year cures), with earlier diagnosis and with the present improved methods of preoperative and postoperative care the prospect for the future looks brighter, since a rational surgical technique is available for each type of case and since metastasis at the time of exploration is low.

## Archives of Pathology, Chicago

34 937-1096 (Dec.) 1942

- Experimental Cholesterol Atheromatosis in Omnivorous Animal the Chick D V Dauber and I N Katz Chicago—p 937
- Localized Pleural Mesothelioma Investigation of Its Characteristics and Histogenesis by Method of Tissue Culture A P Stout and Margaret R Murray New York—p 951
- Heterotopic Unrecognized Mechanical Principle Effective in Aortic Sclerosis J Kravka Jr Augusta Ga—p 965
- Elastic Tissue II Study of Elasticity and Tensile Strength of Elastic Tissue Isolated from Human Aorta G M Hays New York—p 971
- Atrophy Degeneration and Metaplasia in Denervated Skeletal Muscle R Altschul Saskatoon Sask Canada—p 982
- Arteriosclerosis Obliterans Study of Lesion in Occluding Peripheral Sclerosis with Note on Monckeberg's Sclerosis S W Sappington and H R Fisher Philadelphia—p 989
- Heterotopic Brain Tissue in Unions of Two Anencephalic Monsters Edith I Potter and R L Young Chicago—p 1009
- Transposition of Aorta and Pulmonary Artery Embryologic Study of Its Cause J L Bremer Boston—p 1016
- Adrenal Cortex in Essential Hypertension W S Dempsey Montreal Canada—p 1031
- Production of Cirrhosis of Liver in Rats by Feeding Low Protein High Fat Diets H Blumberg Baltimore and H G Crady Darby Pa—p 1035
- Parathyroid Gland in Infancy E Kaplan Boston—p 1042
- Equine Encephalomyelitis (Western) in Man Histologic and Anatomic Study J H Peers Bethesda Md—p 1050
- Effects of Radiation on Normal Tissues IV Effects of Radiation on Cardiovascular System S Warren Boston—p 1070
- Id VII Effects of Radiation on Urinary System S Warren Boston—p 1079

## Archives of Physical Therapy, Chicago

23 641-704 (Nov) 1942

Poliomyelitis and Public Health D W Gudakunst New York —p 645  
Treatment of Infantile Paralysis in Acute Stage J A Toomey Cleveland —p 650

\*Basis for Transitions in Physical Treatment of Poliomyelitis Jessie Wright Pittsburgh —p 662

\*Kenny Treatment for Infantile Paralysis M E Knapp Minneapolis —p 668

## Transitions in Physical Treatment of Poliomyelitis —

A comparison of observations in cases of poliomyelitis treated by early immobilization and by the Kenny method suggests Wright states, that early judicious use of fomentations and physiologic movements as pain and tenderness subside tend to absorb products of effusion, relieve muscular spasm and limit scar tissue which may ensnare normal neuromuscular units. Thus residual paralysis may be confined to the neuromuscular units which have been primarily and permanently injured by the virus. The rationale of making a transition from the early rigid rest and splinting to starting physical treatment immediately after diagnosis is confirmed. Wright believes that Miss Kenny's most important contribution to the treatment of infantile paralysis is in arousing the medical profession to use her method early in the acute stage of the disease and thus prevent much impaired circulation, fibrosis, loss of muscle sense and restriction of joint action so common when early treatment consisted of rigid rest and extensive splinting. Much of the residual damage to patients so treated was probably due to muscular spasm that was never relieved by immobilization.

**Kenny Treatment for Infantile Paralysis**—Knapp discusses muscle spasm, mental alienation and incoordination, the three basic ideas which differentiate the Kenny conception of the symptomatology of infantile paralysis. Paralysis is common to the two concepts. Muscle spasm is one of the basic symptoms—it is an involuntary and uncontrollable shortening of muscle fibers. This spasm is not to be confused with the spasticity of an upper motor neuron lesion which will relax under steady tension. Some of the possible local mechanisms responsible for the spasm are inflammatory or toxic changes and circulatory changes resulting in localized anoxia. However, the local condition may also be due to changes in the central nervous system. The so called irritative cord lesions may account for spasm. As denervated muscle is hypersensitive to acetylcholine, local spasm could be caused by a pathologic change in the cord. It is probable that fibrosis and contractures may be due to anoxia caused by spasm. It also seems reasonable that permanent pathologic changes may thus be produced by the spasm itself, even without extensive loss of motor cells. Consideration of these factors lends weight to the argument that muscle spasm should be treated and relieved as soon as the diagnosis has been made and that splinting, which favors spasm, should be avoided. Mental alienation is probably a physiologic block in conduction as contrasted with an anatomic block caused by destruction of anterior horn cells. Under this term may be included temporary paralysis produced by nonlethal damage to the nerve cells which recover spontaneously after the infection has subsided. Kabat has suggested the term "reversible paralysis" instead of "mental alienation." The conception of "mental alienation" is a valuable one if for no other reason than to suggest a possible effective treatment. Incoordination means that, because of disturbances in the normal motor patterns as a result of paralysis, alienation or spasm new motor patterns are developed which must become normal before normal action can occur. Evidence for the support of this idea is supplied by numerous patients who have been treated by the Kenny method months or years after unsuccessful treatment by conventional methods and who have been able to walk without support or have been able to use parts which previously were useless. The increase in useful function is due not to increase in power but to increase in coordination and decrease in limitation of motion from muscle shortening so that the efficiency of the muscle is greater.

## Bulletin of Johns Hopkins Hospital, Baltimore

71 253-314 (Nov) 1942

Factors Influencing Level of Vitamin A in Blood of Rats H W Josephs Baltimore —p 253

Studies in Vitamin A Influence of Vitamin A on Serum Lipids of Normal and Deficient Rats H W Josephs Baltimore —p 265

Evaluation of Progesterone Therapy in Treatment of Endometrial Hyperplasia G E S Jones and R W Te Linde Baltimore —p 282

Spirochetal Survival in Frozen Plasma M M Rutch and J W Chambers Baltimore —p 299

\*Sulfonamide Film for Use as Surgical Dressing Preliminary Report K L Pickrell Baltimore —p 304

**Sulfonamide Film as Surgical Dressing**—While studying various drying agents and plastic substances it occurred to Pickrell that a preformed sulfonamide film might serve a useful purpose in surgery. The film is made in the following manner: An emulsion is prepared containing 3 per cent of sulfadiazine or sulfanilamide, 25 per cent of methyl cellulose, 3 per cent of triethanolamine and 0.5 per cent of sorbitol with 50 per cent alcohol or acetone added to make 100 cc. The resulting emulsion is sprayed with a pressure gun or paint spray on a smooth horizontal glass surface. This is allowed to dry if acetone is used drying is extremely rapid but if 50 per cent alcohol is used several hours at 75°C are required before the film can be removed in a single sheet. The films are stable and can be sterilized by dry heat. Composition studies reveal that the film ordinarily contains 35 to 50 per cent of the sulfonamide compound. When a segment of the film is placed beneath the skin of a rabbit the sulfonamide can be detected in the blood within several hours. At the end of twenty-four hours disintegration of the film is almost complete. The author has used these sulfonamide films for 50 patients with burns in whom a surgical detergent was used to clean the burned surface and the surrounding skin if it was grossly contaminated. The area was then washed with saline solution, sulfadiazine or azochloramid solution. While the surface was still moist the sulfonamide film was placed to overlap the burned surface. A smooth, firm pressure dressing of gauze was then applied. This film remains in place for three to five days, at which time epithelialization will be taking place in second degree burns. Since the film is translucent, the injured area may be inspected without removing it. In third degree burns and in exudative lesions the film may be renewed as desired. The film has also been used to cover recent incisions, lacerations and abrasions to prepare granulating areas for grafting to cover the recipient and donor graft areas at the time of grafting to cover abraded and ulcerated areas and as a framework to hasten closure and regeneration of perforated eardrums. If low concentrations of the sulfonamides were used in the films infection was likely. Sulfadiazine films appeared to offer greater local protection against infection than did the sulfanilamide films. Pickrell feels that these preformed films may find a definite place in surgery for the hospitalized and ambulatory patient and in cases in which infection is imminent and surface drying is desired or when moisture, coincident with the use of ointments and its resulting maceration, is to be discouraged.

## California and Western Medicine, San Francisco

57 283-340 (Nov) 1942

Hydatidiform Mole and Chorionepithelioma M Schulze San Francisco —p 292

War Dermatology Some General Aspects S Ayres Jr Los Angeles —p 294

California State Board of Medical Examiners How Funds Received from Physicians Are Expended D W Stephenson Sacramento —p 297

War Gas Injuries of Eye E D Godwin Long Beach —p 299

New Adrenalin-like Compounds Their Action and Therapeutic Application M H Nathanson Los Angeles —p 301

Thyroid in Pregnancy C J Baumgartner Los Angeles —p 307

Tumors of Rectum K E Smiley Los Angeles —p 310

## Canadian Public Health Journal, Toronto

33 471-516 (Oct) 1942

Scarlet Fever Immunization in Windsor Ont J Howie Windsor, Ont —p 471

Food Consumption and Preferences of Families with Low Incomes in Halifax N S E G Young Halifax N S —p 480

New Venereal Diseases Prevention Act of Ontario as It Affects the Medical Officer of Health W H Avery Toronto —p 486

Interest of the Public in Health D W Gudakunst, New York —p 490

Plans for Vital Statistics J T Marshall Ottawa Ont —p 495

## Endocrinology, Springfield, Ill

31 573-702 (Dec) 1942 Partial Index

- Effect of Synthetic Desoxycorticosterone Acetate Therapy on Plasma Volume and Electrolyte Balance in Normal Dogs M Clinton Jr C W Thorn H Eisenberg and Kay E Stein Baltimore—p 578
- Chemical Study of Tissue Changes in Adrenal Insufficiency and Traumatic Shock A P W Clarke and R A Cleghorn Toronto Canada—p 597
- Effects of Hormones on Erythropoiesis in Hypophysectomized Rat E P Vollmer A S Gordon and H A Charipper New York—p 619
- Comparison of Thermostability of Growth and Ketogenic Activities of Anterior Pituitary Extract R A Shipley Cleveland—p 629
- Ultratiltration of Anterior Pituitary Ketogenic and Growth Principles R A Shipley and W B Seymour Cleveland—p 634
- Action of Gynecogenic and Androgenic Hormones on Gonads and Pituitary Gland of Mature Male Rats C A Jol Basle Switzerland—p 644
- Cardiotoxic Coiter Distinct Entity Preliminary Report C R Schmidt and A E Hertzler Halstead Kan—p 684

## Florida Medical Association Journal, Jacksonville

29 199-246 (Nov) 1942

- Some Medical Problems of Flight N S Rubin Pensacola—p 213
- Shock W O Arnold West Palm Beach—p 219
- \*The Sulfonamide Group in Surgery F J Warr and E Campelli Jacksonville—p 223
- Isoptartum Hemorrhage R K O'Brien St Petersburg—p 226

**Sulfonamides and Surgery**—In 100 consecutive surgical cases in which infection was established in 79 at operation and potential in 21 Warr and Campelli applied the sulfonamide compounds locally whenever possible and also systemically by the oral or the parenteral route. The results in traumatic wounds and in intestinal anastomosis were extremely gratifying. In large, extensive surface wounds, exemplified by the radical mastectomy, there was a striking increase in bleeding and serum formation. The use of these drugs in such wounds has been discontinued. Primary closure and healing of infected wounds with the use of the drugs was most gratifying. Sodium sulfathiazole may be administered in a 0.5 per cent solution in isotonic solution of sodium chloride by hypodermoclysis. A stronger solution cannot be used beneath the skin. No severe or permanent adverse reactions were encountered.

## Hawaii Medical Journal, Honolulu

2 1-52 (Sept-Oct) 1942

- Disposition of War Casualties War Wounds A W Spittler Honolulu—p 17
- Id Shock C T Young Honolulu—p 22
- Id Abdominal War Wounds L D Heaton—p 26
- Id Chest Wounds J E Strode Honolulu—p 29
- Id Head Injuries R B Cloward Honolulu—p 32
- Id Orthopedic Wounds J D MacPherson Pearl Harbor—p 37
- Id Burns Treatment Plan for Large Numbers P C Sprangler—p 40
- Id Blast Injury of Lungs with Comment on Immersion Blast Injury J Palma Pearl Harbor—p 42

## Journal of Experimental Medicine, New York

76 497-598 (Dec) 1942

- Specific Polysaccharide Content of Pneumonic Sputums J T Tripp A W Frisch Detroit C D Barrett Jr Mason Mich and B E Pidgeon—p 497
- Specific Polysaccharide Content of Pneumonic Lungs A W Frisch Detroit J T Tripp C D Barrett Jr Mason Mich and B E Pidgeon—p 505
- Hypoproteinemia as Protection Against Mercuric Chloride Injury in Dogs R L Holman Chapel Hill N C and G I Donnelly Durham N C—p 511
- Low Protein Diet Augments Hyperproteinemia Produced by Repeated Injections of Homologous Plasma Evidence for Dynamic Equilibrium Between Food Plasma and Tissue Proteins R L Holman Chapel Hill N C—p 519
- Coagulation and Liquefaction of Semen Protolytic Enzymes and Citrate in Prostatic Fluid C Huggins and W Neal Chicago—p 527
- Natural Antibody That Reacts in Vitro with Sedimentable Constituent of Normal Tissue Cells I Demonstration of Phenomenon J G Kidd and W I Friedewald New York—p 543
- Id II Specificity of Phenomenon General Discussion J G Kidd and W F Friedewald New York—p 557
- Metabolism of Central Nervous System in Experimental Poliomyelitis F Rucker and H Kabat Minneapolis—p 579

## Journal of Lab and Clinical Medicine, St Louis

28 127-254 (Nov) 1942

- Antibody Production and Anamnestic Reaction P R Cannon Chicago—p 127
- Sarcoidosis (Boeck-Pemmer-Schramm Disease) as Cause of Pituitary Syndrome F J Kraus Peoria Ill—p 140
- Treatment of Congestive Heart Failure in Ambulatory Patients with Orally Administered Mercurial Diuretic J Burstein G Brown and C Klein New York—p 147
- Adenylic Acid and Bacterial Growth S Cipe and A G Osler New York—p 150
- Fatal Salmonella Intracranial Infection in Infant Report of Case W I Bray and J M Meredith University Ark—p 152
- Effect of Injection of Tissue Extract on Number of Blood Platelets A Uhlen Rochester Minn—p 157
- \*Preliminary Report on Treatment of Bacillary Dysentery with Succinyl Sulfathiazole I J Poth B M Chenoweth Jr and F L Knotts Baltimore—p 162
- New Hypothesis of Production of T Wave in Electrocardiogram Based on Electrokinetic Phenomena J R Miller and R F Dent Chicago—p 168
- Significance of Urinary Ammonia A P Briggs Augusta Ga—p 174
- \*Promsulfaphen Retention in Low Grade Chronic Illness M H Stiles M T Stiles and A M Kolb Philadelphia—p 180
- Solubility and pKa Data of Some Commonly Used Sulfonamides W C Clark F A Strickland and A J Levitan Minneapolis—p 188
- \*Fat Metabolism in Acne Vulgaris F B LeWinn and I Zugerman Philadelphia—p 190

**Treatment of Bacillary Dysentery**—The general regimen that Poth and his collaborators carried out in treating patients with bacillary dysentery included the administration of adequate parenteral fluids and electrolytes to combat dehydration when this was indicated, no transfusions of whole blood or plasma for the dysentery and succinyl sulfathiazole by mouth in a daily dose that varied from 0.25 to 1 Gm per kilogram of body weight. The total daily dose was given in six equal portions. The length of treatment varied from two to seven teen days. There were no failures and no deaths. The ages of the patients ranged from 8 weeks to 83 years. The response of children and infants was prompt whether treatment was begun early or late in the disease. The response was equally good with small as well as with large doses. The temperature returned to normal in twenty-four hours or less in 9 of 10 instances. In the exception the time was thirty six hours. The response of 10 adults to therapy was also prompt regardless of the duration of the disease. Bacteriologic studies showed that *Shigella paradyseriae* was especially susceptible to the antibacterial action of succinyl sulfathiazole. The dysentery organisms ordinarily disappeared from the stools within forty eight hours whereas significant lowering of the coliform bacteria required two to three days of additional therapy. The drug was equally effective in the acute and the more chronic forms of the disease. No untoward toxic manifestations ensued.

**Bromsulphalein in Low Grade Chronic Illness**—The hepatic function of 112 ambulant patients with low grade chronic illness probably secondary to chronic infection was determined by the Stiles and Kolb. The bromsulphalein test was used for the determination. MacDonald's normal criterion of complete elimination in twenty five minutes of a dose of bromsulphalein equal to 5 mg per kilogram of body weight was adopted. In all but 16 evidence of hepatic dysfunction was obtained. Of the remaining 96, more than 20 units of bromsulphalein was retained by 33. The mean retention of patients between 21 and 40 was less than the general average and that of patients more than 60 was greater, but the actual significance is uncertain. When the mean bromsulphalein retention of patients with mild general symptoms was compared with the mean retention of patients with moderately severe and severe symptoms, the differences were statistically significant, the respective values being 10.189 and 44.7 units. While the bromsulphalein retention by patients with high sedimentation rates tended to be high, there were some with high rates whose retention was low and some with low rates whose retention was considerable.

**Fat Metabolism in Acne Vulgaris**—LeWinn and Zugerman state that a study of the fat tolerance, indicated by blood cholesterol changes following the ingestion of fat, of 20 patients with acne vulgaris failed to reveal any difference from that of patients without acne.

**Journal of Neurophysiology, Springfield, Ill**

5 417-520 (Nov.) 1942

- Absence of Local Sign in Visceral Responses to Pain D G Sattler New York—p 417
- Potentials Recorded from Nerve Trunk and Dorsal Root by Micro Electrodes H O Parruck Boston—p 423
- Mediation of Descending Long Spinal Reflex Activity D P C Lloyd New York—p 435
- Intersegmental Inhibition in Spinal Cord of Frog H Winterstein and M Terzioğlu Istanbul Turkey—p 459
- Oscillographic Studies on Spinal Tract of Fifth Cranial Nerve F Harrison and K B Corbin Memphis Tenn—p 465
- Effects of Intensity and Wavelength on Driving Cortical Activity in Monkeys W C Halstead G W Knox J I Woolf and A E Walker Chicago—p 483
- Reflex Discharges in Branches of Crural Nerve B Renshaw New York—p 487
- Action Potential and Enzyme Activity in Electric Organ of Electrophorus Electricus (Linnaeus) I Choline Esterase and Respiration D Nachmansohn New Haven Conn R T Cox C W Cortes New York and A L Machado Rio de Janeiro Brazil—p 499

**Journal of Nutrition, Philadelphia**

24 405-502 (Nov.) 1942

- Influence of Thiamine Riboflavin Pyridoxine and Pantothenic Acid Deficiencies on Nitrogen Metabolism B Sure and Z W Ford Jr Fayetteville Ark—p 405
- Inhibition of Symbiotic Synthesis of B Complex Factors by Sulfonamides R F Light L J Crucas C T Olcott and C N Frev New York—p 427
- Potassium Sodium and Chlorine Balances of Preschool Children Receiving Medium and High Protein Diets Jean E Hawks Merle M Bray Sylvia Hartt Margaret Barry Whittemore and Marie Dye East Lansing Mich—p 437
- Riboflavin Requirement of Dog R L Potter A E Axelrod and C A Elvehjem Madison Wis—p 449
- Metabolism and Growth Rate of Rats H H Kibler and S Brody Columbia Mo—p 461
- Effects of Prolonged Daily Treatment of Normal Rats with Saline Anterior Pituitary Extract I Sexual Differences in Appetite Growth and Organ Weights L Voris M Kriss L F Marcy and R S Bowman Philadelphia—p 469
- Id II Protein and Energy Metabolism L Voris M Kriss L F Marcy and R S Bowman Philadelphia—p 481
- Effect of Vitamin B Deficiency on Intestinal Absorption of Galactose in Rat A H Free and J R Leonards Cleveland—p 495

**Journal of Urology, Baltimore**

48 459-562 (Nov.) 1942

- Urology in the Changing World O S Lowsley New York—p 459
- Large Bone Metastasis from Carcinoma of Ureter Complicated by Congenital Giant Hydronephrosis Case H R Sauer Buffalo—p 467
- Ureterointestinal Anastomosis Implantation of Double Ureter Technique End Result L R Wharton Baltimore—p 474
- \*New Method of Ureteral Transplantation for Cancer of Bladder Report of Fifteen Clinical Cases H J Jewett Baltimore—p 489
- Lymphosarcoma of Testis Report of Four New Cases M B Dockerty and J T Priestley, Rochester Minn—p 514
- Humor of Spermatic Cord Report of Case V F Marshall New York—p 524
- Lipomyoma of Spermatic Cord Case Report and Review of Literature G H Strong Baltimore—p 527
- Primary Malignant Tumor of Epididymis (Rhabdomyosarcoma) G B Strong Baltimore—p 533
- Urinary Stress Incontinence Its Relation to Cystocele and Lacerations of Pelvic Floor J W Davies New York—p 536
- Variation in Daily Urinary Excretion of Androgens in Relation to Benign Hypertrophy of Prostate Mary L Miller and R A Moore St Louis—p 544
- Properties of Organic Acid Solutions Which Determine Their Irritability to Bladder Mucous Membrane and Effect of Magnesium Ions in Overcoming This Irritability H I Suby R M Suby and F Albright Boston—p 549

**Ureteral Transplantation for Bladder Cancer**—Jewett designed a special electrode for establishing an adequate and permanent ureterointestinal ostium and then a simple two stage method of implanting two intact ureters simultaneously into the sigmoid in cancer of the bladder. He has completed both stages of the ureterointestinal implantation in 15 instances. Thirteen of the patients had extensive vesical carcinoma and 2 did not have cancer, so they consequently did not have cystectomy but they fell in the same age group and were totally incapacitated by a deep seated infection of the bladder. Nine of the 15 patients are now living, the longest postoperative interval has been one and a half years. Of the 6 who died 3 did so during convalescence and 3 after discharge from the hospital. In one of the hospital deaths the cause was attributable to an error in technic

An early model of the electrode did not work satisfactorily and extensive sloughing followed. The second patient died of sudden cardiac failure and the third of a volvulus of the lower ileum which was not related to the ureterosigmoidostomy. Of the 3 who died after discharge, 1 died in nine months from metastasis, 1 in six months from local recurrence of the carcinoma in the pelvis, probably with metastasis, and 1 died two months after operation, three weeks before death this patient's postoperative condition was excellent and there was no obstruction of the urinary tract. The attending physician thought that death was due to ascending renal infection. Necropsy was not obtained. The condition of most of the 15 patients was considered hopeless and every form of therapy had been tried elsewhere before transplantation of the ureters was done. The author believes that the mortality among patients of better surgical risk could be reduced considerably.

**Western J Surg, Obst & Gynecology, Portland, Ore**

50 543-596 (Nov.) 1942

- New Surgical Technique for Resection of Skull Introduction of Rotary Precision Cranial Saw M A Glaser Los Angeles—p 543
- Problem of Pulmonary Embolism A R Barnes Rochester Minn—p 551
- \*Use of African Clawed Frog (*Xenopus laevis* Daudin) as Rapid Diagnostic Test for Pregnancy A I Weisman A F Snyder and C W Coates New York—p 557
- Technic for Hofmeister Anticolic Gastric Resection D Metheny Seattle—p 562
- Retrodisplacements of Uterus L C Sheffey Philadelphia—p 564
- Prevention of Obstetric Infection by Use of Vaginal Antiseptics H W Mayes Brooklyn—p 568
- Transnatal Asphyxia and Anoxia C J Lund Madison Wis—p 575
- \*Local Anesthesia in Obstetrics and Gynecology J P Greenhill Chicago—p 579
- Treatment of Prolonged Labor Due to Uterine Inertia R S Siddall Detroit—p 581
- Economics of Obstetric Care from Standpoint of Obstetrician H H Cummings Ann Arbor Mich—p 588

**Frog Pregnancy Test**—Weisman and his colleagues have used the African clawed frog (*Xenopus laevis*, Daudin) in determining pregnancy in 267 women. In 154 the frog test was run parallel with the rabbit test and in 113 the tests were subsequently checked by physical observation and roentgenograms. The frog test was made with the urines of women who had missed not more than one menstrual period and who thought that pregnancy was possible. None could be diagnosed as pregnant or nonpregnant by physical examination. Of the 154 tested by both the rabbit and the clawed frog test, 148 were correctly diagnosed by both methods. The six discrepancies on further testing revealed the rabbit test to be in error in each instance. Of the 113 tested with the frog alone, 112 were diagnosed correctly and 1 incorrectly. The error was made on a woman who was seven days overdue in her menses, frog tests one week later showed a strong oviposition. The test has a number of advantages over other tests used for the diagnosis of pregnancy. It takes only six to twelve hours, it is 99.6 per cent accurate, it is simple to perform, the frogs are easy to maintain, the test is inexpensive as the animals can be used repeatedly, and the reading of the reaction is simply the gross observation of eggs in the water.

**Local Anesthesia in Obstetrics**—Some of the advantages of local anesthesia in obstetrics and gynecology that Greenhill mentions are that there are practically no pulmonary, local or general complications, the mortality is negligible, there are no ill effects to the liver, lungs, heart, circulatory apparatus and central nervous system, bleeding in the field of operation is decidedly reduced, there is no asphyxia of the child, haste in operating is unnecessary and wound infection is decreased. Local anesthesia, the author states, should be used more widely by obstetricians and gynecologists, as it definitely decreases the mortality and morbidity. The obstetric indications are, in part, dilation and curettage for incomplete missed and therapeutic abortion, hydatidiform mole, spontaneous delivery, episiotomy and repair, low forceps delivery, cesarean section and Porro operation. The gynecologic indications are dilation and curettage, plastic operations on the vagina, Manchester operation, Le Fort operation, vaginal hysterectomy, salpingectomy, oophorectomy and hysterectomy.

## FOREIGN

An asterisk (\*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

## British Journal of Dermatology and Syphilis, London

54 255-282 (Oct) 1942

- Lichen Simplex Chronicus (Neurodermatitis) of Palms and Soles Mary S. Smith—p. 255  
 Dermatomyositis Case Muriel J. L. Frazer—p. 265  
 Acne Vulgaris in Infants R. Aitken—p. 272

## British Journal of Surgery, Bristol

30 1-88 (July) 1942

- Hemangiomas Arising in Bones of Skull G. F. Rowbotham—p. 1  
 \*Fatigue Fracture of Tibia J. B. Hartley—p. 9  
 Ileogastric Syndrome L. R. Braithwaite—p. 15  
 Ectopia Vesicae Complicated by Adenocarcinoma with Review of Literature W. H. Graham—p. 23  
 Morbid Anatomy of Case of Recurrent Dislocation of Shoulder A. L. Eyre Brook—p. 32  
 \*Blast Effects in Warfare E. R. P. Williams—p. 38  
 \*Pathologic Changes Produced in Animals by Depth Charges G. R. Cameron, R. H. D. Short and C. P. G. Wakeley—p. 49  
 Fibrous Stricture of Small Intestine Following Strangulated Hernia H. C. Barry—p. 64  
 Traumatic Rupture of Urethra M. Silverstone—p. 70

**Fatigue Fracture of Tibia**—Since 1931 Hartley has seen 14 patients complaining of pain in the calf or near the upper end of a tibia, and generally to the inner side. There is little to see or feel and roentgen study reveals changes which, in an early case, suggest an incomplete tibial fracture from  $2\frac{1}{2}$  to 3 inches below the knee joint. A small knuckle of callus is usually visible at the inner or posterior aspect of this level. In 3 patients the condition was bilateral, which observation can lead only to the diagnosis of fatigue fracture in a person between 7 and 20 years of age. The most recent case has demonstrated the need for recognizing this condition during war, for in this instance an erroneous diagnosis led to severe fracture of the tibia and fibula in an active recruit, and consequently to prolonged immobilization. Now that adolescent groups are liable for war service, the incidence is likely to be greater, since fatigue fracture is more common in adolescence. Generally there is no history of injury or of violence. Nine of the author's 14 patients had no history of injury, 4 had a history of a recent fall or blow and 1 thought he had fallen. The only constant symptom is pain on standing, on walking or after walking. This may be either behind the knee, in the calf or over the inner aspect of the upper third of the tibia. There is no pain when the leg is at rest. So far no patient with bilateral involvement has complained of pain in both legs. Slight swelling on the inner aspect of the upper end of the shaft of the tibia was present in only 5 cases and tenderness in 3. Spontaneous cure results from nothing more than rest from weight bearing for several weeks. The condition may be due to faulty crystal structure of bone at this area of maximal strain and/or to abnormal strain at an already considerably weak site. It is essentially a fatigue dystrophy. Its roentgen appearance and healing are similar to march fracture of the metatarsals. It is not due to infection, bone tumor, Looser's umbauzonien, syphilis or tuberculosis.

**Blast Effect in Warfare**—Williams believes that it is important to determine which of the three components in the compound blast wave in air is the traumatic factor and how it affects the body. The effect of the negative air suction wave cannot be neglected. This wave has a great amplitude, as it starts at the peak of the positive pressure and descends slowly to below atmospheric pressure. Sudden decreases in air pressure, the negative phase of the blast wave, is certainly likely to be injurious to human lungs already damaged by the positive phase. The third blast component of mass movement of air or gas is capable of inflicting injury and is responsible for the shattering effects produced in the immediate vicinity of an explosion. In water, where mass movement is of a small degree even in close proximity to an explosion, these shattering effects are not observed. Contusional effects can be produced by the rush of gas from an explosion irrespective of any damage which the pure pressure wave may have caused. The lesions caused in water are due to a single high pressure wave, and there is no question of a wave descending the trachea or an after suction

wave. The effects on the body of explosions, both in air and in water, are primarily due to the externally applied pressure wave, but in air both the windage factor and the after suction waves play their part. Internal injury due to blast without external marks of violence is rare. Only 4 such cases were encountered among 1,500 casualties—in practically every instance a coexisting wound due to crushing, asphyxia and the like will be evident.

**Depth Charges and Pathologic Changes**—Should a depth charge, mine or torpedo explode in the vicinity of where a ship's company is in the water after the sinking of their ship there is grave danger of most of the men losing their lives. The clinical manifestations of patients who have suffered from water blast vary from slight spinal concussion accompanied by bloody diarrhea to laceration of the abdominal organs and lungs. The mortality from water blast is high and it is conceivable that many war casualties are due to this factor alone. With the object of finding out the real causation and mechanism of the thoracic and abdominal lesions and also to see if any form of simple protection could be devised, Cameron and his collaborators carried out a series of animal experiments. Microscopic examination has confirmed naked eye observation that the most important structural changes produced by a depth charge are in the respiratory system. There is a striking similarity in the nature of these effects, the main variation being in their intensity and distribution. The pulmonary changes are hemorrhage and emphysema with rupture of air spaces. Study of the pulmonary changes leads to an elucidation of the mechanism of depth charge effects. The most severe injury was seen in animals which were within a radius of 40 yards from the depth charge. Eleven of 13 animals within this radius were killed instantly, 10 showed extensive pulmonary hemorrhage and 5 moderate to severe interstitial emphysema. Hemorrhage may, however, develop in animals as far away as 100 yards. Severe pulmonary hemorrhage may occur without immediate death while animals may be killed at once and not show definite pulmonary lesions. Hemorrhage is present more frequently in the right than in the left lung, the upper lobes and margins of the lung are the most common sites involved. Bronchi may become filled with large blood clots, while small hemorrhages sometimes develop in the walls of the trachea and bronchi. Acute vesicular and interstitial emphysema are practically constant in animals within 40 yards of the depth charge. Emphysema affects the upper lobes of both lungs most often being least frequent in the lower lobes. Pneumo thorax and hemothorax are sometimes concomitant. Little damage is produced in the soft structures of the wall of the body and the bones. There is no special tendency for certain hollow viscera containing fluid, such as the gallbladder and urinary bladder, to be involved.

## British Medical Journal, London

2 505-534 (Oct 31) 1942

- \*Nutritional Iron Deficiency Anemia in Wartime I. Hemoglobin Levels of 831 Infants and Children L. S. P. Davidson, G. M. M. Donaldson, M. J. Dyer, S. T. Lindsay and J. G. McSorley—p. 505  
 \*Plasma Protein Storage J. Bettie and H. B. Collard—p. 507  
 Tonsillectomy by Guillotine and Dissection T. B. Johnson—p. 517  
 Atypical Influenza Pneumonia at a School H. G. J. Herxheimer and A. J. McMillan—p. 513

**Nutritional Iron Deficiency Anemia**—Davidson and his colleagues assessed the iron deficiency of 442 infants and pre-school children from 2 to 4 years of age and of 389 children from 5 to 12 years of age attending two primary day schools in Edinburgh. A comparison of the hemoglobin levels of children 2 to 23 months of age in the present Edinburgh series with the figures for an Aberdeen series indicates that the incidence of severe anemia (less than 61 per cent of hemoglobin) in the 1935 Aberdeen series is three times as great as in the 1942 Edinburgh series but the proportion of moderately anemic infants (61 to 70 per cent of hemoglobin) has risen by 10 per cent in Edinburgh as compared with the Aberdeen figure. Eighty-three per cent of the Edinburgh infants and 87 per cent of the Aberdeen infants have a hemoglobin level of less than 80 per cent. After three years of war there has been no deterioration in hemoglobin levels, but anemia is still common. Any advantage which the Edinburgh has over the Aberdeen series in infancy appears to be lost during the preschool or the 2 to 5 year period. Thus on

entering school at 5 years the Edinburgh children had an average hemoglobin of 81 per cent compared with an average figure of 87 per cent for the Aberdeen series. Only 9 per cent of 197 school children had hemoglobin levels of 90 per cent. The hemoglobin levels of children reaching school age were slightly lower in the Edinburgh series than in the prewar Aberdeen series. More than half of the children in the Edinburgh series had hemoglobin concentrations below 80 per cent. The frequency and degree of anemia in these school children call for the most careful consideration by both local and national authorities. During the period of active growth and mental development the incidence of anemia should be reduced to the lowest possible level. This can be achieved by the provision of school meals which are appetizing, well balanced and rich in foodstuffs with a high iron content and/or by supplying iron to the children in the form of a tablet or a mixture or incorporating it in some universally eaten food, such as bread.

**Plasma Protein Storage.**—To determine plasma protein storage Beattie and Collard studied the effects of plasma transfusions on hepatectomized and anesthetized cats and of varying protein concentrations in the perfusing fluid in perfused isolated liver. After repeated transfusions with plasma of a protein content lower than that of the animal's blood, the plasma protein rose significantly in 4 of the 5 animals, and the rise in 1 was of doubtful significance. Four animals lost the major portion of the transfused fluid from the circulation. One animal lost about half the transfused fluid. The plasma protein added to the blood was retained in the circulation in 2 animals and considerable fractions of it left the circulation in the others. Presumably the greater part of this "lost" protein entered the protein stores. Retention of plasma protein in the circulation may be accomplished by increasing the concentration to a much higher level and by expanding the blood volume. The isolated liver experiments show clearly that the liver can mobilize and throw into the perfusing fluid quantities of plasma protein. The stimulus for this production is obviously the low plasma protein concentration of the perfusing fluid. There was also a correlation between the degree of "hypoproteinemia" and the rate of plasma protein production. When plasma was added to the perfusing fluid about one hour after the experiment had begun the results obtained seemed to depend partly on the state of the reserves and partly on the concentration of protein in the perfusing fluid. There can be no doubt that the liver is a "store" for plasma protein, but to determine if it was the only store hepatectomized animals were prepared and after variable periods given plasma. Two animals showed no change in total plasma proteins before they were given a transfusion, seventy minutes after the transfusion 1 showed an appreciable loss of protein out of the circulation 1 lost a greater amount in forty minutes and 1 had lost some protein before transfusion and continued to lose an even greater quantity afterward. This may suggest a movement of protein into other stores, but they are not as convincing as evidence of movement from such stores into the blood. Such evidence is provided by 2 cats, in 1 over a period of thirty minutes while blood dilution was proceeding, the total plasma protein was raised by a small but significant amount, and in 1 over a period of forty-five minutes while blood dilution was proceeding, the total plasma protein was raised by 11 per cent over the expected value. In the first animal the addition of protein to the circulation continued after a plasma transfusion at about the same rate as before transfusion. The evidence suggests that plasma protein leaves the blood stream in hepatectomized animals in quantities greater than might reasonably be required for normal metabolism and, conversely, these animals seem to possess some source of plasma protein other than the liver. Whether all body cells can contribute protein to the blood stream with the facility with which they can apparently withdraw it has yet to be decided.

### Edinburgh Medical Journal

49 593-656 (Oct.) 1942

- The Medical Preliminary and After S McDonald—p 593  
Problem of Air Borne Infection T J Mackie—p 607  
Treatment of Cerebrospinal Fever with Sulfapyridine. A Joe—p 628  
Payments by Patients in Eighteenth Century D Robertson—p 643

### Schweizerische medizinische Wochenschrift, Basel

72 661-684 (June 20) 1942 Partial Index

- Relation Between Muscular Fatigue and Adrenals with Theory of Muscular Contraction F Verzar—p 661  
Prophylactic Inoculations E Berger—p 668  
\*Pathogenesis of Hypochromic Anemia Following Gastric Resection G Hemmeler—p 670  
Determination Distribution and Elimination of Acetyl-sulfanilamide in Man E Deutsch—p 672

**Pathogenesis of Hypochromic Anemia Following Gastric Resection.**—Attention has frequently been called to the frequent occurrence of anemia particularly hypochromic anemia following resection of the stomach for gastroduodenal ulcer. It was assumed that iron deficiency was the cause. According to Hemmeler anemia due to iron deficiency following gastric resection can arise (1) from a deficiency of hydrochloric acid in the stomach. Study of the gastric juice of patients who had stomach resection revealed achylia in from 80 to 95 per cent of the cases reported by various authors. Anemia due to iron deficiency may also be due (2) to too rapid gastric passage of the alimentary mass so that the alimentary iron has not sufficient time to become transformed into an absorbable ionized form. It may be due (3) to the fact that the alimentary mass no longer passes into the duodenum, the site of the assimilation of iron. The author studied these factors with the aid of absorption curves for iron. His investigations reveal that the anacidity or hypoacidity of the gastric juice diminishes the ionization of the alimentary iron which is indispensable for iron absorption. The accelerated gastric passage of the alimentary mass likewise plays a part, because the iron, even in the presence of hydrochloric acid does not have the time to become ionized. The fact that the food does not pass the duodenum, the usual site of iron resorption, is of no importance in the pathogenesis of anemia following gastric resection because ionized iron can be absorbed below the duodenum. Occurrence of hypochromic anemia after gastric resection can be prevented by administration of iron as soon as the serum content of iron shows diminution.

72 685-728 (June 27) 1942 Partial Index

- Epidemiology of Tuberculosis in Denmark T Madsen—p 685  
\*Late Primary Tuberculous Infection and Its Development W Löffler—p 686  
\*Late Primary Tuberculous Infection and Its Early Evolution E Lehinger—p 701  
\*Late Primary Tuberculous Infection and Its Development S J Leitner—p 711  
Severe Tuberculous Familial Infection A Wernli Hassig—p 713  
Prognosis of Pulmonary Tuberculosis Weltmann Reaction Carried Out with Citrated Blood J Stephani—p 716  
Reduction of Temperature by Sulfanilamide as Differential Diagnostic Characteristic Particularly Against Tuberculosis J L Burchhardt—p 717

**Late Primary Tuberculous Infection.**—According to Löffler the less rapid spread of tuberculosis in the population has delayed the primary infection of many persons into adulthood. In Switzerland the primary infection of adults follows the same course as in children. It presents no sharply outlined symptomatology but rather a heterogeneous picture. Many primary infections run their course unobserved, only a small number cause clinical manifestations. Some cases exhibit only roentgenologic changes, others appear as febrile conditions with many possible diagnostic explanations. In the presence of an obscure febrile condition a primary infection should be thought of. The clinical symptoms of erythema nodosum (with or without Poncet's rheumatism and phlyctenae) and of exudative pleurisy of adults, particularly of young adults, are often a typical expression of a primary infection. Tuberculous infiltrates of adults represent particularly typical manifestations of primary infection rather than of secondary infiltrations or of early infiltrates. They are of exogenic origin and call for isolation and examination of persons in their environment. Today it is necessary to prove secondary infiltrations, whereas until recently it was necessary to prove primary infiltration. The demonstration of tuberculous exposure supports a suspected diagnosis. Intestinal primary infection must be considered in some cases, although it is rare. The frequent observation of primary infection in military service involves no decisive changes in insurance compensation because when acute extensive dissemina-



tion, pleurisy and erythema nodosum occurred during service or shortly thereafter compensation was granted on the basis of the principle of contemporaneity

**Late Primary Tuberculosis and Its Early Evolution**—Uehlinger points out that the gradual increase in late primary infections is a result of the gradual decrease in the tuberculous involvement in children. On the basis of postmortem observations in the army, evidence of tuberculous infection can be expected in approximately 50 per cent of the age groups between 20 and 55 years. The importance of late primary tuberculous infection is proved by the fact that, of 72 fatal cases of miliary and meningeal tuberculosis observed from 1939 to 1941, 60 could be traced to a late primary infection. In contradistinction to postmortem studies, the clinical diagnosis of a late primary tuberculous infection is extremely difficult. The majority (about two thirds) of late primary infections pursue a silent course. Only the postprimary hematogenic and canalicular dissemination of the infection generally leads to clinical manifestations. The most frequent forms of benign, hematogenic early evolution are erythema nodosum and exudative pleurisy, the most frequent malignant form is the progressive protracted dissemination with terminal tuberculous meningitis and miliary tuberculosis. The source of dissemination is frequently the cavernous breakdown of the primary infiltrate or of a tracheobronchial lymph node perforating into a bronchus. Early malignant evolution of a late primary pulmonary infection must be suspected in the presence of progressive loss of weight, prolonged acceleration of the sedimentation rate, progressive leukopenia with lymphopenia, tachycardia, persistence or greatly retarded absorption of the primary infiltrate, and recurrent febrile bacillemia. Primary infection during adolescence has a comparatively high mortality, because at this time of life there is a predisposition to hematogenous dissemination. High mortality rates are to be expected if late primary infection becomes frequent among a population with a low index of infection. Late primary infections require careful supervision. They suggest the presence of persons with open tuberculosis in the environment.

**Late Primary Tuberculosis and Its Development**—Of Leitner's 48 patients with late primary infection, 37 complained of fatigue, 16 had cough, 2 expectoration and 33 fever. Sensitivity to tuberculin was pronounced in all. Erythema nodosum was observed in almost one third. While erythema nodosum is not a specific tuberculous lesion, it is seen in the majority of cases. The frequency of erythema nodosum during the primary infection and the pronounced tuberculin sensitivity indicate early development of an intense allergy. Erythema nodosum is probably to be regarded as an allergic reaction. The author differentiates primary infection into (1) a clinically, as well as roentgenologically, latent type recognizable only by the fact that the tuberculin reaction becomes positive, (2) a type clinically latent but with a positive roentgen picture, (3) a type with clinical and roentgenologic manifestations resembling an acute infectious disease and (4) a type with clinical signs but atypical roentgen picture. This last type can be recognized only by the positive tuberculin reaction. The author gained the impression that allergy is usually most pronounced shortly after primary infection. As regards immunity he believes that there is practically no superinfection during the biologic activity of tuberculosis recognizable by the positive tuberculin reaction. The author stresses the advantages of tuberculin tests in large groups (universities, armed forces, occupational schools and factories). It is simple, reveals sources of infection and makes possible early treatment.

### Anais Brasileiros de Ginecologia, Rio de Janeiro

14 1-80 (July) 1942 Partial Index

Hyperplasia of the Endometrium T. S. Cullen—p. 1

\*Chorea in Pregnancy Vitamin B<sub>6</sub> Therapy S. Rabin and H. Duek—p. 12

**Chorea in Pregnancy**—Rabin and Duek direct attention to the therapeutic value of vitamin B<sub>6</sub> in chorea of pregnancy. They believe that chorea of pregnancy and chorea minor have a common etiology, namely avitaminosis B<sub>6</sub>, and that the etiologic therapy in either type consists of administration of vitamin B<sub>6</sub>. A primipara aged 19 reported to the hospital during the second month of pregnancy complaining of vomiting.

Emesis was controlled by endocrine therapy. Shortly afterward chorea developed. The treatment consisted in intramuscular injections of 50 mg of pyridoxine given daily for a week and every other day for another week. The total number of injections was ten. The patient was given a diet rich in vitamins. Chorea was rapidly and permanently controlled. The appetite of the patient and her general condition rapidly improved.

### Revista Clínica Española, Madrid

5 161-226 (May 15) 1942

Physiopathologic Studies of Thymus and Its Hormone P. Farreras

Valenti—p. 161

Investigations on Lathyrism C. Jimenez Diaz, E. Roda, E. Ortiz de

Landuzuri, C. Marini and I. Lorente—p. 168

Roentgenologic Study of Ulcers of Pyloric Passage L. de Lara—

p. 177

\*Arteriography in Osseous Lesions F. Lopez Areal—p. 182

Dietic Insufficiency as Cause of Extrapyramidal Symptoms J. Calvo

Melendro—p. 185

\*Study of Disturbances in Aviators During Acrobatic Flight Cerebral

Factor L. Pescador—p. 190

Nicotinic Acid in Cerebral Thrombosis D. Furtado—p. 193

Sulfonamide Therapy in Streptococcal Meningitis of Orogenic Origin

R. Alvarez Perez—p. 195

**Arteriography in Bone Lesions**—Lopez Areal advocates injection of from 10 to 20 cc. of a 35 per cent solution of sodium iodide. This substance produces no changes in the vascular endothelium as demonstrated by surgical interventions. Arteriography is of diagnostic value in all bone lesions. To facilitate the exact diagnosis it is important to study the collateral circulation. In benign bone tumors the collateral circulation shows no alteration either in caliber, direction or form of the main vessel, although occasionally the vessel becomes slightly displaced by the tumor. In malignant tumors, particularly sarcomas, the collateral circulation always shows abnormal increase, the vascular net is complicated, branches cross aimlessly without any arrangement, newly formed vessels of irregular distribution course in all directions and there are vessels which supply the tumor. Veritable pools of blood exist in telangiectatic tumors and make the roentgenogram appear cloudy. The appearance and extent of the collateral circulation are the chief guide in the differential diagnosis between neoplastic and non-neoplastic bone lesions and between benign and malignant bone tumors. Arteriography is also a valuable aid in the control of the roentgen irradiation of bone tumors.

**Cerebral Disturbances in Aviators During Acrobatic Flights**—Pescador mentions the various aspects of acceleration disease and emphasizes that a cerebellar component exists in the disturbances that develop during acrobatic flights. This cerebellar component is manifested by static changes, by mild disturbances in walking and in coordination, by tremor and by hypermetria. In animal experiments changes become evident which indicate disturbances in the inferior nuclei demonstrated by the abolishment of certain statokinetic reflexes. It is suggested that the blood perfusion of the dentate nucleus, which is the weakest point in the cerebellar economy, assumes a decisive role in the pathogenesis.

### Revista de la Facultad de Medicina, Bogota

10 435-498 (April) 1942 Partial Index

\*Transmission of Leprosy by Fleas Some Observations G. Muñoz Rivas—p. 635

Dementia Paralytica, Tabes and Diabetes Insipidus A. Hernandez—p. 680

**Transmission of Leprosy by Fleas**—Muñoz Rivas found that when fleas of the type *Pulex irritans* and *Pulex canis* bite patients with leprosy they suck up lepra bacilli which will survive for more than twenty-six hours in the digestive tract of these insects. The stomach of larvae fed on dejecta of adult fleas biting patients with leprosy contain acid alcohol resistant bacilli in 21 per cent of the cases. The stomach of larvae fed on infected leprosy food contain lepra bacilli in 100 per cent of the cases. The stomach of larvae from fleas captured in the rooms of patients with leprosy or which were left in contact with earth from the rooms of these patients contain acid alcohol resistant bacteria morphologically identical with lepra bacilli in 75 per cent of the cases. The author concludes that fleas transmit leprosy. Extermination of fleas should be a part of the campaign against leprosy.



## Book Notices

**Sulfanilamide and Related Compounds in General Practice.** By Wesley W. Spink, M.D., F.A.C.P., Associate Professor of Medicine, University of Minnesota Medical School, Minneapolis. Second edition. Cloth. Price \$3. Pp. 374 with illustrations. Chicago: Year Book Publishers, Inc. 1942.

A subject of the greatest interest to all practitioners of medicine is the use of the various sulfonamide compounds in the treatment of infections. Indeed, no aspect of medicine has attracted wider attention during the past few years. In this edition of Dr. Spink's monograph there is presented in a simple, direct and clear style a summary of sulfonamide therapy which should be read by every student of the subject and every practitioner of medicine who uses these important therapeutic agents. The text shows a sense of critical method which is invaluable to the reader, and many of the case reports which are based on the author's personal experience are illustrated by good charts. Dr. Spink has done a splendid piece of work and the medical profession is indeed fortunate to have such an authoritative and up to date monograph on the sulfonamides available as a guide to treatment.

**How to Be Fit.** By Robert Kipling, Director of the Gymnasium, Associate Professor of Physical Education, Yale University, New Haven. Foreword by John Kieran. Cloth. Price \$2. Pp. 131 with illustrations. New Haven: Yale University Press, 1942.

The book is a well written, well edited collection of exercises directed toward physical development. The purpose of the exercises is to work all muscles of the body including some that are little used. The exercises do not call for sudden strain nor do they tax the body unduly. There are two sets of lessons. Each lesson is composed of eight exercises, with excellent illustrations of each. The first set of lessons numbers fifteen and is designed for general use of old and young. Any one who plays golf or tennis or does gardening can do them. The second set of five lessons is a sort of "postgraduate" course, to be used on completion of the first set and only by the young and strenuous who wish further development. The book is well worth while for use in gymnasiums, schools, Y. M. C. A.'s and colleges. The author is an authority on the subject, having been the director of gymnasiums and swimming coach at Yale for twenty-five years. The book is the result of his experience.

**Manual of Dermatology.** By Donald M. Pillsbury, M.D., Marlon B. Sulzberger, M.D., and Clarence S. Livingood, M.D., Military Medical Manuals. Issued under the Auspices of the Committee on Medicine of the Division of Medical Sciences of the National Research Council. Cloth. Price \$2. Pp. 421 with 109 illustrations. Philadelphia & London: W. B. Saunders Company, 1942.

As the material in this manual is designed for the use of medical officers, the text concerns itself only with the management of the dermatoses commonly encountered in the armed forces. Consideration is not given to rare or obscure dermatoses or to those affecting particularly women, children or the aged.

The authors have designed a textbook which will be most useful for the diagnosis and treatment of the vast majority of the cutaneous disorders encountered. The early chapters cover the general considerations of diagnosis, with due emphasis on the history and the clinical findings with regard to primary and secondary lesions and the distribution of the lesions. Then follows a chapter which deals with the sites commonly involved in a number of dermatoses. This material is presented chiefly by means of fourteen full page illustrations which demonstrate graphically the topographic tendencies of some sixteen dermatoses and twenty-seven types of involvement of the mucous membranes.

The common disorders are then considered individually from the standpoints of clinical findings, differential diagnosis and treatment. These descriptions are concise but contain a maximum of information. A particularly valuable feature in this section is the use of numerous inserts which emphasize important fundamental features in the various diseases and which furnish guideposts designed to avoid common errors in diagnosis and treatment.

The material dealing with treatment includes a chapter on the general principles of local treatment and consideration of simplified and of extended therapy, the latter for use in hospital or sick bay. In addition an appendix furnishes a formulary of eighty-two prescriptions of tested merit.

All the clinical illustrations are grouped in one section of seventy-eight pages; these have been well selected, and salient diagnostic features are pointed out in the legends.

The authors have used their material in so ingenious a manner that a vast amount of information has been compiled in a small space, and the manual should have a great appeal for physicians both in military and in civil practice of medicine.

**Blenorragia y sulfamidas. Blenorragia. Nociones generales de diagnóstico, tratamiento actual. Sulfamidas. Estudio clínico experimental. Sulfamidoterapia en la blenorragia.** Por Guillermo Jacaprazo, profesor adjunto de la facultad de ciencias médicas de Buenos Aires. Tests de profesorado. Paper. Pp. 562 with illustrations. Buenos Aires: Imprenta Ferrari Hnos. 1941.

The subject matter consists chiefly of the diagnosis and modern treatment of gonorrhea, with clinical and experimental data. Of great interest are those sulfonamide compounds not generally used in the United States such as uliron, neo uliron, albucid and rodillone. With uliron Scherber and independently, Lohe and his co-workers are quoted as claiming 75 per cent cures in 75 and 98 cases respectively. But the author obtained in 54 cases only 19 cures. In 11 per cent of these prostatitis and epididymitis developed during treatment. With albucid the author quotes von Kennell as curing 86.5 per cent of 200 cases and St. Wolfran of Vienna as curing 98 per cent of 81 cases treated. The author himself, however, finds this drug less effective than sulfapyridine, even though better tolerated. Rodillone has been considered of value by Heitz-Boyer. Durel, however, obtained only 20 per cent cures and felt that the compound's greatest value was in subacute cases. Saby stressed the early use of rodillone. If there was no response in a week the drug was discontinued.

Illustrations showing the gross and microscopic lesions in intoxication with these compounds are excellent. Experiments were carried out on a series of 55 rats to demonstrate lesions of the gastrointestinal tract and other organs. The changes in the stomach varied from simple erosion to ulcerative necrosis. Chronic intoxication was manifested as chronic inflammation. No lesions were found in the control animals or in animals receiving subtoxic dosage. Sulfapyridine brought about the severest reaction. In decreasing severity red prontosil, uliron and white prontosil produced superficial lesions. No lesions occurred with albucid, septazine, sulfathiazole and neo uliron. The author concludes that sulfapyridine is contraindicated for patients with inflammatory and ulcerative gastric lesions.

Normal and pathologic tissue cultures containing a 1 per cent concentration of the various sulfonamide compounds were studied. The sulfonamides did not produce definite cytotoxicity or inhibit the growth of either the normal or the pathologic (fascicular sarcoma of the rat) tissue in this concentration. The monograph is a complete treatment of the subject up to and including the introduction of sulfathiazole.

**This Is My Life.** By Agnes Hunt, D.B.E., R.R.C. Foreword by Morris Bishop. Cloth. Price \$2.00. 1 p. 27 with drawings by Georg T. Hartmann. New York: G. P. Putnam's Sons, 1942.

Agnes Hunt in 1900 founded the first open air orthopedic hospital. The Boschurch Home was then an old farm house in a village in England. In less than forty years the home had become a hospital of more than 300 beds with orthopedic clinics stretching out over eight counties, a staff of after care nurses and a training college for cripples. By 1901 the stable about the old home had become the plaster room, the coach house the splint shop, the saddle room a bathroom, the cow houses a laundry, and the pigsty, after many vicissitudes, was turned into a sitting room. Nevertheless the home had an attraction for cripples. The author who was a cripple, was advised to consult Mr. Robert Jones, the great orthopedic surgeon of Liverpool. This day in 1903, she says, was the greatest day of her life, even though it was followed by three months in a "Jones abduction frame." Robert Jones later came to the countryside in consultation and on his way paid a visit to the Boschurch Home.

When no one descended from the train at the stop, the great specialist was found comfortably asleep in the train. Thus Robert Jones became interested in the home and for nearly thirty years thereafter "worked for us and loved us even as we well-migh worshipped him." It was his genius and great spirit which developed this home into a vast hospital, which shortly after Sir Robert's death was named the Robert Jones and Agnes Hunt Orthopedic Hospital. Sir Robert died on Jan. 18, 1933. Agnes Hunt wrote this book to amuse him in his last illness. No doubt Sir Robert was amused by Agnes Hunt's tales of her remarkable mother, whose size, it is said, was equaled only by her iron whims and determinations and who with whirlwind energy "managed family perils, domestics, animals, storms and continents." Mamma Hunt transported her large family to Australia to raise angora goats, only to learn on arrival that no one there had ever seen an angora goat. After difficult years in Australia the family returned to England by way of the United States and decided to start a convalescent home. This book should interest nurses particularly. The dean of Durham, the Rev. C. A. Allington, author of "Poets at Play," offered to refund the purchase price of the book to any one who did not feel happier and better for reading it.

**Personal and Community Health** By C. E. Turner, A.M., Sc.D., Dr. P.H. Professor of Biology and Public Health in the Massachusetts Institute of Technology. Cambridge. Sixth edition. Cloth. Price \$3.50. Pp. 652 with 131 illustrations. St. Louis: C. V. Mosby Company, 1942.

This edition of Turner's standard textbook is satisfactory. It follows the conventional textbook arrangement with part one devoted to personal health, part two to community health, appendix A to communicable diseases and appendix B to an evaluation of disinfection methods and materials. The material is sound, well selected and clearly presented. Professor Turner gives perhaps more anatomic basis than most writers on personal and community health. The book covers fully the important questions of health values, nutrition, digestion, oral hygiene, respiration, circulation, excretion, endocrines, special senses, mental hygiene, exercise, body mechanics, foot hygiene, reproduction, heredity, narcotics and stimulants, and responsibility for health maintenance as factors in the individual health. Under community health will be found discussions of disease prevention, communicable diseases, immunity, specific diseases, food control, water supply, waste disposal, ventilation, heat and light, public health administration, maternal and child health, and school and industrial hygiene. There are 127 illustrations in black and white and 4 color plates. There is a good glossary and an adequate index. The book can be recommended for its thoroughness, reliability and clearness.

**Her Star in Sight** Mary Carstens in Medical School. By Mildred Foulke Meese. Cloth. Price \$2. 1 p. 331 with illustrations by Sandra James. Indianapolis and New York: Bobbs-Merrill Company, 1942.

This is a romantic story of Mary Carstens, who decided while still in high school that she wanted to be a doctor. Mary had lived for many years in an orphanage. Now we see her in medical school, in the sorority house, in the hospital wards as a student and through her internship, graduation in medicine and state board examinations. Mary was in love with young Dr. Peter Kirkland, who after the attack on Pearl Harbor was commissioned a major in the medical corps with the Marines. Fortunately Peter was able to attend Mary's graduation in his uniform before leaving for military duty and they became engaged. Before writing this novel the author visited hospitals, laboratories and classes in medical schools and studied medical records. It has, therefore, some medical background and should interest girls who have an ambition to study medicine.

**His Sword: A Tale of the Vikings** By Alfred C. Muller, M.D. Cloth. Price \$2. Pp. 246. Boston: Meador Publishing Company, 1942.

Years ago a sunken ship was discovered near Oeseberg, Norway, which was the grave of King Harold's daughter, Queen Asa of Viken, and her favorite handmaiden, who had been killed in order that she might serve her mistress in Valhalla, as was the custom of those times. This ship is now in a museum in Oslo. The author, a country doctor now 76 years of age, began to write a historical novel based on this discovery, but as he

delted into history it appeared that Queen Asa had done away with her husband and therefore did not deserve the service of a lovely handmaiden in Valhalla or the sacrifice of her life in order to serve the queen. The author then abandoned the strictly historical outline and wrote a fanciful story in which he makes the queen a heroine and spares the life of her handmaiden. The book takes its title from the great sword Sunderer, with which it was believed no brave king could ever lose a battle. When King Erling died he bequeathed the great sword to his young son Ottar, who swore to forge the Northland into a united kingdom. At the same time the tender youth laid the foundation for a psychic inhibition which ardent love for his queen could not overcome. The author shows an insight into human nature throughout the book. His style and choice of words are well adapted to a story of the hardy vikings.

**The Making of a Surgeon** A *Midwestern Chronicle*. By Ernest V. Smith, M.D., D.Sc., F.A.C.S. Cloth. Price \$3. Pp. 344 with illustrations. Fond du Lac, Wis.: Berndt Printing Company, 1942.

At 23 the author decided to study medicine even though it was necessary to work his way through medical school. After graduating in 1907 at the University of Minnesota and without having an internship, he married the girl he had been courting for many years and went into practice in a small town. Four years later he accompanied a patient to the Mayo Clinic, where his former instructor Dr. Louis B. Wilson suggested that he come to the clinic to work for three years, one in pathology, one in internal medicine and one in surgery. "Then," Dr. Wilson said, "you will be a real doctor." The author followed this advice. He established a clinic in Fond du Lac, Wis., in 1916 in partnership with other physicians, three of whom are still there after more than twenty-five years, a period, the author says, longer than any other three doctors have worked together in the same capacity in the history of medicine and surgery. These men are Dr. Oliver M. Layton, Dr. William J. Waldschmidt and the author, also working with them throughout this period as a surgical nurse has been Sister M. Agneta and during the last seven years the author's son, Dr. Ernest V. Smith, Jr. This book is the story of the author's boyhood and of his work later in the profession of medicine. His opinions on medical education and medical practice are sound.

**Outline of Histology** Part I. General Histology. Part II. Dental Histology and Embryology. By Margaret M. Hoskins, I.H.D., and Gerrit Bevelander, I.H.D. Departments of Anatomy, College of Dentistry and the Graduate School of Arts and Science, New York University, New York. Paper. Price \$2.00. 1 p. 174 with 80 illustrations. 112 with 56 illustrations. St. Louis: C. V. Mosby Company, 1942.

This outline of histology is apparently meant as a student aid. Such student aids have, in our opinion, no pedagogical value unless made by the students themselves. A prepared outline does not offer the student an opportunity to train himself in scientific thinking and cannot replace a textbook. But some teachers do not agree with this idea and approve of read-made outlines. They demand, however, that they be short and clear. Both of these qualities are lacking in this book. The text is often inaccurate, and the efforts to explain too much in too brief a span are confusing. The diagrammatic illustrations will not help to give the student much histologic insight. The extensive section on dental histology is somewhat better than the rest of the book. This, however, does not justify the superficial treatment of the outline. It is inferior to other textbooks of dental histology which are available. There is no index.

**Fundamentals of Psychiatry** By Edward A. Strecker, M.D., Sc.D., F.A.C.P. Professor of Psychiatry and Chairman of the Department Undergraduate School of Medicine, University of Pennsylvania, Philadelphia. Cloth. Price \$3. Pp. 201 with 15 illustrations. Philadelphia: Montreal & London: J. B. Lippincott Company, 1942.

This little manual is a useful and accurate summary of psychiatry as it is seen through the eyes of a leading specialist. The chapter headings are the usual ones, on etiology, classification of mental diseases, methods of examination and the various types of psychoses. Part of a chapter is devoted to the psychoneuroses, and there is a short chapter devoted to defective problems of war. The book is systematic and has a number of good illustrative case histories. It is remarkably complete for its small size.

## Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS BUT THESE WILL BE OMITTED ON REQUEST.

### AIR EMBOLISM

**To the Editor**—A discussion arose as to what consequences might commonly be expected to follow accidental injection of air into the venous circulation, incident to intravenous therapy. Are there any records as to the approximate amount that has been introduced without developing important reaction?

Captain M C, A U S

**ANSWER**—The danger of air embolism during an intravenous drip must be minimal, since 5 to 10 cc of air has been injected rapidly in man without producing clinical symptoms. The entrance of sufficient amounts of air to produce clinical symptoms requires a gaping of the injured vein and a definite sucking action toward the heart. These factors are present at the large veins of the neck and at the root of the arm (internal and external jugular, subclavian and axillary veins). These veins are fixed by fascial coverings and cannot readily collapse. The placental veins following childbirth and the pulmonary veins, when surrounded by scar tissue, which prevents collapse, are particularly predisposed to permit the entrance and transport of air.

In the case of venous air embolism, a characteristic hissing sound is heard followed by a peculiar churning of the heart. This sound may hardly be heard with the stethoscope but occasionally can be heard at a considerable distance from the patient. When air enters the right side of the heart it is pressed, in the shape of foam or large bubbles, into the pulmonary artery. Death may occur through asphyxia just as in thromboembolism or dyspnea, cyanosis and tightness of the chest develops, all of which may disappear if the air bubbles are not too obstructive. If the entrance of air is through the pulmonary veins following pleural punctures, pneumothorax or operations on the lung, the air embolus obstructs segments of the arterial tree. The tongue may show pallor, air bubbles can be seen in the retina. Petechial hemorrhages in the skin occur. Blindness, dizziness and convulsions may be present. The administration of 100 per cent of oxygen with a Boothby mask may save life or minimize permanent damage by absorbing the nitrogen bubbles from the vascular tree.

### HISTIDINE AND MUCOUS SECRETION IN PEPTIC ULCER

**To the Editor**—On page 345 of your book *Selected Questions and Answers* it is stated that Lenormand (*Presse med* 41:1141 [July 19] 1933) expressed his belief that the beneficial effect of histidine therapy in ulcer was due to its action on the vagus autonomic system causing an increased secretion of mucus. Is there available any therapeutic agent with an antihistidine effect preferably one that specifically neutralizes a supposed (?) excess production of histidine thus causing a decreased secretion of mucus?

H D Coles MD Chicago

**ANSWER**—There is no evidence to support the view of Lenormand that histidine exerts an effect on the vagus-anatomic system, thereby causing an increased secretion of gastric mucus. Mucus is secreted by the epithelium of the entire surface of the stomach, by the mucoid neck cells of the fundus and by the cardiac and pyloric gland cells. Little is known about the regulation of its secretion, although it is known that mucus is secreted by the resting stomach and that the production of mucus is relatively greatly decreased during the active secretion of hydrochloric acid. In animal experiments, stimulation of the vagus and sympathetic nerves has been shown to result in an increased output of mucus. The injection of epinephrine is followed by secretion of mucus, this secretion is not abolished, however, by the administration of atropine (Portis, S A *Diseases of Digestive System*, Philadelphia, Lea & Febiger, 1941, p 100).

There have not been any reports to suggest the existence of any therapeutic agent which diminishes the secretion of gastric mucus. Nor does there appear to exist a substance which may presumably neutralize histidine. Indeed, it has been demonstrated fairly conclusively that histidine does not exert any effect on the volume and acidity of gastric secretion (Chang, Hsiao-Ch'ien *Proc Soc Exper Biol & Med* 37:155 [Oct.] 1937; Goodman, L S, and Bearg, P A. The Action of Histidine on

the Gastrointestinal Tract, *Am J Digest Dis* 5:117 [April] 1938; Atkinson A J, and Ivy, A C. Further Attempts at Achlorhydria, *ibid* 5:30 [March] 1938).

It may be stated also that the supposed beneficial effect of histidine in the treatment of gastroduodenal ulcer has not been observed in numerous well controlled experimental and clinical studies. Stalker, Bollman and Mann (*Am J Digest Dis & Nutrition* 3:822 [Jan] 1937) and Sandweiss, Saltzstein and Glazer (*ibid* 4:20 [March] 1937), among others, were unable to prevent the development of ulcers in "Mann-Williamson" dogs by the intramuscular injection of histidine. Sandweiss (*THE JOURNAL*, April 25, 1936 p 1452) in a careful clinical study of the problem concluded that the transient symptomatic effects of histidine could be explained entirely on the basis of a psychotherapeutic response to hypodermic medication given enthusiastically. Finally, no condition is known in which the secretion of mucus is excessive or in which its inhibition would be desirable.

### PROBABLE OVARIAN NEOPLASM

**To the Editor**—A housewife aged 55 complains of intermittent and increasing menorrhagia of one year's duration. Previous to that time she went two to three months without menses on several occasions since the age of 51. She has noticed an increasing size and hardness of the lower part of the abdomen for the past year. Her temperature, pulse and respiration were normal, the blood pressure 230 systolic and 110 diastolic, the weight 149 pounds (68 Kg). She lost about 40 pounds (18 Kg) in the past one and one half years partly through diet. Pelvic examination reveals a protrusion of the cervix about 1½ inches beyond the vaginal introitus without straining. There is some cornification of the mucous membrane but no ulceration or erosion. The cervical canal is about ½ inch in diameter and a pale, reddish mass about ¼ inch in diameter can be seen attached within the canal to the anterior lip. The uterine isthmus is about 1 inch in diameter and about 2½ inches long. In the right side of the pelvis is a mass about 5 inches in diameter extending into the abdomen to about 1 inch inferior to the umbilicus. The mass is firm, smooth, freely movable and not tender and lies immediately deep to the abdominal wall. It is either a part of the uterine body or is attached to it. In the left side there is another mass which entirely fills this side of the pelvis and extends into the abdomen about 2 inches superior to the left pubic ramus. This mass can be moved but gives the impression of being wedged in the left side of the pelvis. It is firm and rather tender. On its inferior aspect it presents two nodules each about 1 inch in diameter. My diagnoses are hypertension—possibly essential, multiple fibromyomas of the uterus (larger than a four month pregnancy), descensus uteri, cystocele, rectocele and slight urethrocele. However, there are no symptoms suggesting the latter. I should appreciate recommendations as to the handling of this case.

M D Washington

**ANSWER**—One of the first things to think of in a woman 55 years old who bleeds profusely is a granulosa cell tumor of the ovary. The patient may have this condition even if she has uterine fibroids or other neoplasms. Regardless of whether or not a granulosa cell tumor is present, tumors of the size mentioned, especially in a woman of 55, require prompt treatment. In spite of the patient's hypertension it is not advisable to apply radiation therapy, chiefly because it is highly important to make a correct diagnosis. This can be done only by a laparotomy.

The patient should be put to bed for at least a week, preferably longer, with a view to reducing the blood pressure and building up her resistance as much as possible. All the necessary laboratory tests should be made and she should be given repeated small doses of a sedative such as phenobarbital to help reduce the blood pressure. She may also be given large amounts of vitamin C in addition to a well rounded diet. If the red blood cell count is below normal it should be increased, by transfusion if necessary. Consultation should be had with a physician anesthetist concerning preoperative medication and also the safest anesthetic to use. If possible an internist should be present at the operation, and certainly all paraphernalia and medication should be at hand for the treatment of shock or any other complication. The physician assistants and nurse should be familiar with the surgeon's technic so that there will be a minimum of motions, confusion and delay. It is essential to remove the neoplasm as speedily as possible and with the least amount of trauma. No effort should be made to repair the relaxed vagina. At the time of suturing the cervical stump (if a supravaginal hysterectomy is performed) or closing the vaginal vault (if a total hysterectomy is done) the bladder can be advanced so as to take up part of the vaginal relaxation. A much better procedure is to sew the cervical stump or the vaginal vault to the fascia of the rectus muscles. Anchoring the vaginal vault to the abdominal vault should correct the prolapse. In nearly all cases in which such a suspension is performed, a perineorrhaphy must also be carried out, but in this

case only the abdominal operation should be done and not the vaginal. The shorter the operation and the period of anesthesia, the safer it will be for the patient.

In a case like this it is best to remove the entire uterus and both tubes and ovaries not only because of the strong likelihood of a malignant growth in the ovaries or uterus but also because there is a large polyp or pedunculated, submucous fibroid in the cervical canal.

If the surgeon is not capable of performing a total hysterectomy with ease and rapidity, he should ask some one else, preferably an experienced gynecologist, to do the operation. The patient's life will depend in large measure on the skill of the operation, and she should have the best possible care.

If the vaginal prolapse is present after the abdominal operation, a pessary may be inserted in the vagina or a plastic operation may easily be done under direct infiltration anesthesia a few months after the laparotomy, provided of course the patient's general condition will permit the operation.

#### PERSISTENT ULNAR NERVE PAIN AFTER CONTUSION

*To the Editor*—A patient injured his elbow as a result of a fall. He is a carpenter and the handle of the hammer is supposed to have struck the elbow in the course of the fall. About two months ago the ulnar nerve was moved from its original position behind the internal condyle and deposited in a new bed in front of the condyle. This operation was done because of a diagnosis of chromatic neuritis. The patient has continued to have more pain than he had previous to it even after a period of two months. At operation the sheath of the nerve was also dissected free for a space of approximately 1½ inches. The surgeon evidently thought that the trauma had injured the nerve sheath and that there was some constriction that accounted for the pain. The problem which I have to decide is whether or not I have to operate again and transfer the nerve to its original bed. I think it is possible that the new position of the nerve causes it to be stretched unduly and may have something to do with the continuation of the pain. Diathermy and other forms of heat application have not given good results nor has massage.

P H Owens M D Kansas City Mo

*ANSWER*—On the basis of the information submitted, the only explanation which can be suggested for the pain in the ulnar distribution is that the nerve was contused and the neuralgia is at the point of contusion, although the nerve was probably not divided. There would be nothing gained or lost by restoring the nerve to its original position. If a neuroma cannot be found on exposing the nerve it would probably be better to divide the nerve, on condition that the pain is bad enough to warrant this procedure. If a neuroma can be found, it should be resected and the nerve resutured.

#### IDENTIFICATION OF RETAINED PLACENTAL TISSUE

*To the Editor*—Given a case of spontaneous subacute inversion of the uterus a curettage was done to determine the possible retention of placental tissue. Is an obstetrician justified in stating that he can recognize with certainty with the naked eye placental tissue in the form of uterine curettings or must it always be confirmed by microscopic findings of chorionic villi?

M D New York

*ANSWER*—Placental tissue can usually be determined with the naked eye particularly in the early weeks of pregnancy. A simple way to verify the presence of placental villi is to immerse a portion of the tissue in water. If villi are present they will stand out prominently. At or near term a firm blood clot removed by curet may be mistaken for placental tissue, but by breaking up the clot one may easily determine the true condition. Occasionally a piece of thick decidua is mistaken for a piece of placenta containing villi. In such a case, if the water immersion test does not help, a hand lens almost certainly will. When a curettage is not performed until days or weeks after a miscarriage or full term labor, a hard hemorrhagic piece of tissue is often removed, the contents of which can be determined only by microscopic examination.

#### INTRANASAL INSULIN ADMINISTRATION

*To the Editor*—In August 1936 there was an article in The Journal regarding the experiments of Ralph H Major M D in the use of intranasal applications of insulin. Please advise me if this experiment was carried further and with what results.

R W Holley M D Appalachia Va

*ANSWER*—Some 25 patients with diabetes of moderate severity have been treated by intranasal application of insulin and there is no doubt that they can be controlled by this method. It has been abandoned for two reasons. First, it proved to be an expensive method of administration because the doses were necessarily larger than those effective with hypodermic medication. Second, most of the patients after a time grew tired of the frequent nasal spray and prefer to return to subcutaneous administration.

#### ULTRAVIOLET LAMPS IN SCHOOLS FOR PREVENTION OF INFECTIONS

*To the Editor*—I should like to ask about the advisability of installing special ultraviolet ray lamps in our centralized school for the prevention of air borne infections. The literature on this subject seems promising but questions have arisen as to whether there would be any harmful effects from the ultraviolet rays such as injury to the eyes or skin cancer.

M D New York

*ANSWER*—There is not sufficient evidence to sponsor unservedly the use of ultraviolet lamps in schools for the prevention of air borne infections. Nevertheless it is well known that ultraviolet emanations of selected ray lengths are bactericidal at short distances. In the application of this knowledge to school buildings, the installations should be such as to rule out any likelihood of injury to the eyes, skin burns or like hazards.

#### DISPOSITION OF RADIUM SUPPLY WHILE IN MILITARY SERVICE

*To the Editor*—If I enter military service I must put away for the duration about 100 mg of radium. I do not wish to keep it around my small home for I have learned that lead or no lead, it darkens film within a few days and I don't wish it near my children. What do you suggest as a means of disposing of it safely for an unpredictable length of time until I return to practice?

M D Missouri

*ANSWER*—The best disposal of radium during the war is to keep it in use in treatment of the sick. There should be an attempt to make arrangements with a responsible man to store and use the radium in his own practice at the same time getting authority to do so from your insurance company. Caution must be used in choosing a physician who already uses radium and is skilled in its use and care. Someone may be found who needs an extra supply and who would be willing to pay something for its use, at least the insurance premium.

#### BIOPSY OF PROSTATE THROUGH RECTAL WALL

*To the Editor*—At a recent meeting of our tumor board we discussed a case in which a suggestive nodule in the prostate was easily accessible to palpation on rectal examination. One physician of some years of experience advised taking a biopsy through the rectal wall stating that the idea that one should not go through the rectal wall was nonsense and an idea which physicians have handed down without foundation. If this is true some of us who expose the prostate through a perineal incision to take such biopsies are making rather hard work out of what could be an easy and minor procedure. I would appreciate an opinion on this subject.

J Robert Rinker M D Fort Worth Texas

*ANSWER*—A biopsy made through the rectum into the prostate is not good surgery. Such penetration of the bowel can result in infections.

#### STABILITY OF SOLUTION OF SODIUM SULFATHIAZOLE

*To the Editor*—Please advise how long solution of sulfathiazole is stable and potent.

J J Johnson Jr M D Las Vegas N M

*ANSWER*—The solution of sulfathiazole must mean a solution of the sodium salt. Although it is not known how long such a solution will be stable, it is advisable to use only freshly prepared solutions for injection. In alkaline solution the sulfonamides are readily oxidized and may yield toxic products.

#### ENDOCRINES AND CARCINOMA

*To the Editor*—Has orchectomy or diethylstilbestrol proved to be of any value in the treatment of neoplasms other than carcinoma of the prostate?

L A Crowell Jr M D Lincoln N C

*ANSWER*—The employment of either orchectomy or diethylstilbestrol in the treatment of carcinoma of the prostate is still on an experimental basis. There is no reason to believe that these procedures are of any use for other types of neoplasms.

#### VITAMIN A AND COLOR BLINDNESS

*To the Editor*—In Queries and Minor Notes in The Journal Nov 28 1942, page 1080, the answer to M D New Mexico relative to color blindness does not mention the two reports of Dunlap and Loken concerning the possible value of vitamin A in treating color blindness (Science 95 554 [May 29], 96 251 [Sept 11] 1942). Granted that this is not a completely studied problem perhaps the inquirer would like to know of the references. It seems too bad that the soldier spoken of should lose his chances for advancement if there is any type of treatment available that might possibly be of benefit even though experimental in character. The doses of vitamin A recommended by Dunlap and Loken do not appear to be sufficiently high to fall within a toxic range.

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## PROGNOSIS IN HYPERTENSION

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While the cause of hypertension remains obscure and the treatment unsatisfactory, and its importance as a prime cause of mortality in adult life looms increasingly great there is nevertheless reason for optimism in the near future and even at the present time. Clinical studies have contributed greatly to an increasing understanding of the course of the disease. These have indicated, as has been aptly stated by Riesman,<sup>1</sup> that while hypertension is not conducive to longevity it is compatible with longevity, and it is, therefore, pertinent to inquire into the various factors which determine the outlook in subjects with hypertension. Until now prognosis has been concerned chiefly with estimation of the life expectancy and the eventuality of various serious complications which tend to occur over a period of years in the majority of subjects with persistent elevation of the arterial pressure. Recent investigations have offered new concepts which clarify the physiologic mechanisms in hypertension and which may point the way to therapeutic advances. The advent of several new therapeutic approaches offers real promise that hypertension may be brought under some measure of control and therefore prognosis becomes of great practical importance both as a standard by which to evaluate new therapeutic procedures and also to indicate the proper selection of cases amenable to various forms of therapy.

### THE SIGNIFICANCE OF HYPERTENSION

Broadly, hypertension is important for two reasons as an indication of an underlying disease and because of the deleterious effects of the elevated blood pressure itself. It is well recognized today that elevation of the arterial pressure can result from a great variety of causes. These may be classified into five major groups: renal, endocrine and vascular lesions, disease of the central nervous system, and essential hypertension of unknown origin.<sup>2</sup> The cases of hypertension in which the etiology is known and can be ascribed to renal, endocrine or other organic disease constitute but

a very small fraction of the total number of cases presenting elevated arterial pressure. Nevertheless, careful search should always be made for any condition which may be associated with and contribute to the hypertension, since occasionally spectacular "cures" may attend therapy of an associated disease, as in nephrectomy in certain cases of unilateral renal disease associated with hypertension. Most frequently when hypertension is secondary to some known cause the prognosis is determined largely by the underlying disease and the hypertension plays a secondary role. Hypertension of whatever etiology, however, may occasionally progress to rapidly fatal malignant nephrosclerosis.<sup>3</sup>

The injurious effects on the vascular system and vital organs have been considered by some to be due at least in part, directly to the hypothetical noxious substance which causes hypertension, the hypertension itself being merely a manifestation of the effect on the arterioles, and it has even been questioned whether hypertension per se has any influence on the development of arteriosclerosis.<sup>4</sup> However, all the pathologic changes in hypertension can be reasonably explained in accord with present knowledge as resulting directly from the mechanical effects of persistent elevated arterial tension acting on a vulnerable vascular system. Persistent elevation of the arterial pressure produces two important types of vascular lesions which are distinct in their pathogenesis, characteristics and consequences. These two lesions, arteriolar sclerosis and large artery atherosclerosis, are responsible for most of the serious lesions in hypertension. Hypertrophy of the heart likewise may be ascribed directly to the elevated arterial pressure which results in the performance of greatly increased work by the left ventricle in order to maintain its normal output. Even here, however, the development of heart failure most often is due in part to coronary artery disease, which is usually present and which aggravates a relative inadequacy of coronary supply resulting from hypertrophy itself.<sup>5</sup>

Several classifications for the prognostic grading of hypertension have been proposed based on blood pressure levels and reactivity, on biopsy study of the arterioles and on retinal examination.<sup>6</sup> These studies have helped greatly to clarify many aspects of the course of hypertension. These groupings are based on arteri-

3 Derow H A and Altschule M D. The Nature of Malignant Hypertension. *Ann Int Med* 14: 1768 (April) 1941.

4 Davis David and Klainer M J. Studies in Hypertensive Heart Disease. II. The Role of Hypertension Per Se in the Development of Coronary Sclerosis. *Am Heart J* 19: 193 (Feb) 1940.

5 Averbuch S H. Heart Failure in Hypertension. *Am Heart J* 11: 99 (Jan) 1936.

6 Wagener H P and Keith N M. Diffuse Arteriolar Disease with Hypertension and the Associated Retinal Lesions. *Medicine* 18: 317 (Sept) 1939. Keith N M, Wagener H P and Barker N W. Some Different Types of Essential Hypertension. Their Course and Prognosis. *Am J Med Sci* 197: 332 (March) 1939.

From the Medical Department of the Equitable Life Assurance Society of the United States.

Read before the Section on Experimental Medicine and Therapeutics at the Ninety Third Annual Session of the American Medical Association, Atlantic City, N. J., June 10, 1942.

1 Riesman David. High Blood Pressure and Longevity. *J A M A* 96: 1105 (April 4) 1931.

2 Schroeder H A and Steele J M. Studies on 'Essential' Hypertension. I. Classification. *Arch Int Med* 64: 927 (Nov) 1939.

olar changes which depend on the degree of hypertension, in contrast to changes in the large arteries which are quite distinct in pathogenesis from arteriolar disease, being related to the duration rather than to the degree of hypertension. In a very general way there is some parallel in the development of arteriolar sclerosis and arterial atherosclerosis, but this is not regularly the case. Arteriolar disease has important consequences of serious nature, such as malignant nephrosclerosis and cerebral hemorrhage, which may occur quite unpredictably at any time in the course of hypertension owing to rapid and extreme rises in the level of the blood pressure. Ordinarily, however, essential hypertension has a characteristic evolution over a long period, which may vary from ten to fifteen years or longer, with the ultimate development of heart failure, coronary thrombosis or other vascular complications. The mortality from heart failure and degenerative atherosclerotic changes of the large vessels such as the coronary arteries, which result from long-standing duration of hypertension without regard to its degree, is far greater than the mortality from such causes as malignant nephrosclerosis and apoplexy, which can be attributed more directly to a decided elevation of the blood pressure.

It is evident therefore, that an important consideration in prognosis is the proper evaluation of the duration of the hypertension apart from its degree. Since the degenerative atherosclerotic changes may occur in the absence of advanced arteriolar disease, it appears that the grading of hypertension solely by arteriolar changes which indicate the degree and not necessarily the duration of hypertension has certain shortcomings. It is our object to emphasize the duration as a prognostic guide and to consider the methods for evaluating the stage of the disease.

#### THE BLOOD PRESSURE

If blood pressure studies have certain limitations which should be appreciated, nevertheless in addition to being the means for recognizing that a state of hypertension exists, determination of the blood pressure is of great prognostic value. There has been considerable diversity of opinion regarding the precise level of arterial pressure that constitutes a state of hypertension. In general, more recent opinion has tended to place the upper limit of normal at lower levels, and whereas thirty years ago Janeway and others regarded that values above 160 systolic and 100 diastolic constituted hypertension, today arterial pressure of 140 systolic and 90 diastolic is usually considered the dividing line. The supposed physiologic increase in average blood pressure with age is due largely to the inclusion of cases of hypertension, the prevalence of which increases greatly with advancing age. If cases of obvious hypertension are excluded in computing average blood pressure, it is found that the level of the average blood pressure rises very little with advancing age,<sup>7</sup> so that old rules of the thumb, such as 100 plus age for systolic level become grossly inaccurate. The arbitrary exclusion of cases with hypertension in computing

average blood pressure is open to criticism, however, on the grounds of the method of selecting the sample. Instead of attempting to determine average values for blood pressure, it might be preferable to ascertain the modal or most frequently observed level of the blood pressure at various ages and establish limits of normal based on significant deviations from the modal value. Probably the best criterion of abnormal blood pressure is that level at which mortality experience exceeds the predicted average mortality of the population.

The comprehensive study made in 1939 by the Joint Committee of the Association of Life Insurance Medical Directors and Actuarial Society of America<sup>9</sup> demonstrated conclusively that levels of blood pressure above 140 systolic and 90 diastolic are definitely abnormal at any age and that the actual exceeds the expected mortality in rapidly rising ratios for systolic or diastolic values above this level. A finding of extreme interest, which has been noted previously in actuarial studies,<sup>10</sup> is that the mortality varies with the level of the blood pressure at lower levels too, i. e., that the life expectancy in subjects with blood pressure below average values is decidedly better than the life expectancy of the average population and that fewer deaths from cardiovascular disease occur in this group. This was brought out even more strikingly in the recent study of Hunter,<sup>11</sup> which showed that with the systolic pressure 22 to 18 mm less than average the ratio of actual to expected number of deaths was only 71 per cent. Each small increment in the blood pressure above this was associated with a progressive increase in the ratio of actual to expected deaths (i. e., decreased life expectancy). These findings suggest that hypertension should not properly be defined by departures from the average pressure but that the lowest arterial pressure compatible with normal physiologic function is the optimal one. Values in excess of the low optimal level impose an increasing strain on the cardiovascular system, even in the range which has always been regarded as "normal," simply because these are the most common levels. Actually, then, hypertension merges imperceptibly with "normal" values of the blood pressure and, except for the distinctive changes in the arterioles consequent to extreme elevation of the blood pressure in the malignant phase, hypertension is not a disease entity but merely a condition which places somewhat greater strain on the cardiovascular system than exists in the average person, producing identical but accelerated and accentuated effects. The atherosclerotic changes in the large arteries are in no way qualitatively different in hypertension from the atherosclerosis in the coronary arteries and aorta which develop in the absence of hypertension but the elevated blood pressure accentuates the development of these lesions. Arteriolar sclerosis similar to that observed in hypertension likewise develops in subjects with normal blood pressure, particularly the renal arterioles, but the changes are definitely accentuated in hypertension in relation to its degree.

Apart from the problem as to just what level of arterial pressure constitutes a state of hypertension is

7 Fahr G. Hypertension Heart Am J M Sc 175:453 (April) 1928. Bell E T. Primary Hypertension Proc A Life Insur M Dir America 26:269 1939.

8 Symonds B. The Blood Pressure of Healthy Men and Women Proc A Life Insur M Dir America 9:22 1922. Robinson S C and Brucer Marshall. Range of Normal Blood Pressure Statistical and Clinical Study of 11 383 Persons Arch Int Med 64:409 (Sept.) 1939.

9 Blood Pressure Study Actuarial Society of America and Association of Life Insurance Medical Directors 1939.

10 Blood Pressure Report of the Joint Committee on Mortality of the Association of Life Insurance Medical Directors and the Actuarial Society of America 1925.

11 Hunter A. Blood Pressure Among Standard Lives J Inst Actuaries 70:60 1939.



the question of determining the true level of the blood pressure in any one person. The level of the blood pressure fluctuates greatly both in normal subjects and in those with hypertension,<sup>12</sup> and there is an element of sophistry in the mechanical averaging of a number of readings which has little physiologic significance. It is becoming increasingly recognized that subjects whose blood pressure rises to abnormal levels under any circumstances are predisposed to subsequent hypertension,<sup>13</sup> and several tests employing various pressor stimuli have been devised to measure the reactivity of the blood pressure as an index of potential hypertension. These tests must be employed judiciously, for, while some of the procedures are simple, such as breath holding or immersion of the hand in cold water, meticulous attention to details is required<sup>14</sup> and a basal level must first be attained. In effect the initial blood pressure reading on physical examination may be regarded as a psychic pressor test and has been recognized as having the same significance.<sup>15</sup>

The extreme variability in the level of the blood pressure, diastolic as well as systolic, dictates reserve in drawing conclusions from casual blood pressure readings. The variability of the blood pressure when studied by frequent determinations throughout the day,<sup>16</sup> and its lability under the influence of various drugs, has been employed as a prognostic guide and as an index of the suitability of various therapeutic procedures.<sup>17</sup> In the initial stages of hypertension there is a decided variability of hypertension, but, as the initial variable arteriolar spasticity is gradually succeeded by organic changes in the arterioles in the form of hypertrophy of the media and arteriolar sclerosis, arteriolar relaxation becomes less frequent and less complete and the level of the blood pressure tends to become fixed at higher levels. Diurnal variation becomes less pronounced and there is only an incomplete fall in blood pressure toward normal during sleep or after intravenous injection of barbiturates which remove the tonic sympathetic influence and indicate the degree of residual arteriolar spasticity. The fall in blood pressure following inhalation of amyl nitrite has been proposed as a prognostic test of arteriolar reactivity,<sup>18</sup> the pressure falling less in cases of hypertension with organic arteriolar lesions than in those with earlier arteriolar spastic changes. It has been our experience, however, that a transitory sharp fall in the blood pressure may occur even in the cases of advanced hypertension, and we have observed

a drop in pressure to normal levels under the influence of this potent vasodilator in cases of malignant hypertension, and severe hypertension with apoplexy.

Sodium nitrite and carotid sinus pressure may be employed as depressor tests. Overbreathing for a period of two or three minutes with decrease in the blood carbon dioxide content may also be employed as a depressor test and a fall in blood pressure to normal may occur in the earlier stages of hypertension the response being less extreme than with amyl nitrite. Spontaneous falls to normal levels occur very frequently in hypertension and, to quote Ayman<sup>19</sup> "This occurs even in patients with widespread vascular changes. Fifty-six per cent of 76 unselected, untreated cases exhibited this finding."

The level of the blood pressure and its lability is of undoubted value in interpreting the degree of hypertension and the extent of the arteriolar changes, but it does not give accurate information concerning the duration of the hypertension and the equally important atherosclerotic vascular changes which as already mentioned, are largely responsible for the mortality in hypertension. The progressive increase in mortality with each increment of blood pressure which has shown up consistently in mortality studies is attributable largely to the fact that in a very general way the blood pressure tends to become more elevated with increasing duration of the hypertension. This is by no means the rule, however, and, as stated by Fishberg,<sup>20</sup> "In some instances the blood pressure rises rapidly or more often slowly but progressively as the patient is watched for years. On the other hand in very many patients the height of the pressure does not change notably from that found at the first examination even though it is followed for years." The mortality from heart failure and degenerative vascular changes resulting from long-standing hypertension occurs without any necessary relation to its degree. The limitations of blood pressure levels and tests of reactivity, which measure the degree of hypertension and its effect on the arterioles, are therefore evident.

#### MUSCLE BIOPSY AND RETINAL EXAMINATION

Direct studies of arteriolar involvement are possible by means of pectoral muscle biopsy and retinal examination. Extensive and valuable contributions have been made by Wagener, Keith, Kernohan and their associates at the Mayo Clinic<sup>6</sup> as well as by others. The classification of hypertension into four prognostic grades, as suggested by Wagener and Keith, based on blood pressure levels and reactivity, pectoral muscle biopsy and particularly retinal findings is well known and has been generally adopted for the prognostic grading of patients with hypertension. It is with no intent to detract from the value of these studies that we reiterate that these criteria establish the degree of arteriolar involvement and that these procedures do not necessarily indicate the degree of equally significant atherosclerotic vascular disease. As stated by Wagener and Keith themselves,<sup>6</sup> the cases presenting group 1 hypertension in which the findings of retinal examination and pectoral biopsy are minimal "constitute the great majority of the cases with hypertension." It is apparent

12 Ayman David. Essential Hypertension. The Diastolic Blood Pressure Its Variability. *Arch Int Med* 48: 89 (July) 1931. Ayman David and Goldshine A. D. Blood Pressure Determinations by Patients with Essential Hypertension. I. The Difference Between Clinic and Home Readings Before Treatment. *Am J M Sc* 200: 465 (Oct) 1940. Ayman<sup>10</sup>

13 Frost H. M. Hypertension and Longevity in Life Insurance Medicine. Boston: New England Mutual Life Insurance Co. 1926. vol 1, p. 178. Palmer R. S. The Significance of Essential Hypertension in Young Male Adults. *J A M A* 94: 694 (March 8) 1930. Stueglitz E. J. Emotional Hypertension. *Am J M Sc* 179: 775 (June) 1930. Hines E. A. Jr. Range of Normal Blood Pressure and Subsequent Development of Hypertension. A Follow Up of 1 522 Patients. *J A M A* 115: 271 (July 27) 1940.

14 Hines E. A. Jr. Technique of the Cold Pressor Test. *Proc Staff Meet Mayo Clin* 14: 185 (March 22) 1939.

15 Ayman David and Goldshine A. D. Blood Pressure Determinations by Patients with Essential Hypertension. II. The Difference Between Home and Clinic Readings During and After Treatment. *Am J M Sc* 201: 157 (Feb) 1941.

16 Mueller S. C. and Brown G. E. Hourly Rhythm in Blood Pressure in Persons with Normal and Elevated Pressure. *Ann Int Med* 3: 1190 (June) 1930.

17 Allen E. V. Lundy J. S. and Adson A. W. Preoperative Prediction of Effects on Blood Pressure of Neurosurgical Treatment of Hypertension. *Proc Staff Meet Mayo Clin* 11: 401 (June 24) 1936.

18 Stueglitz E. J. Arterial Hypertension. Evaluation of the Prognois. *Arch Int Med* 46: 227 (Aug) 1930.

19 Ayman David. Normal Blood Pressure in Essential Hypertension. *J A M A* 94: 1214 (April 19) 1930.

20 Fishberg A. M. Hypertension and Nephritis. ed 4. Philadelphia: Lea & Febiger. 1939. p. 622.



again, therefore, that blood pressure studies, retinal examination and other procedures which reflect the degree of arteriolar disease do not serve equally well as criteria of the duration of hypertension and those complications which depend largely on the duration rather than the degree of hypertension, such as cardiac hypertrophy and coronary sclerosis<sup>21</sup>

#### CARDIAC HYPERTROPHY

Two changes occur regularly with increasing duration of hypertension which can be evaluated objectively and which are serviceable as prognostic guides. Left ventricular hypertrophy and eventually atherosclerotic changes, particularly in the coronary vessels and the aorta, are invariable accompaniments of elevated arterial pressure of long standing. Hypertrophy is related to the degree as well as the duration of hypertension and usually antecedes significant arteriosclerotic changes somewhat.

Hypertrophy of the left ventricle can be determined by means of x-ray study and electrocardiography, which also serve to reveal arteriosclerotic changes in the aorta and coronary arteries. Roentgen examination is of limited value in the early stages of left ventricular hypertrophy for, since hypertrophy is a matter of an increase in thickness of the left ventricular myocardium of a few millimeters, this cannot be discerned even by the most refined x-ray measurements until in a later stage associated enlargement of the left ventricular cavity supervenes. Concentric hypertrophy of the left ventricle may, however, be suggested by an altered shape of the cardiac silhouette with an increased convexity and rounding of the left ventricular curve even though the dimensions of the cardiac shadow may not be measurably increased. Electrocardiographic changes due to coronary disease are well known, but less attention has been paid to the use of the electrocardiogram than the x-ray examinations in detecting hypertrophy. While the association of a characteristic pattern of electrocardiographic changes with hypertrophy of the left ventricle has been noted by many investigators beginning with Einthoven's early observations, specific criteria have not been established. A study was therefore made of a large group of subjects who had been examined in the Equitable Home office with the object of establishing what electrocardiographic changes in conjunction with left axis deviation could be considered indicative of left ventricular hypertrophy. The findings, reported in detail elsewhere,<sup>22</sup> indicate that left ventricular hypertrophy may be considered present when left axis deviation is present in association with any of the following abnormalities in the ventricular complex.

- 1 Increase in amplitude of the QRS complex when the sum of the R wave in lead 1 and the S wave in lead 3 is more than 25 mm (25 millivolts), or when the height of the R wave in lead 1 or the S wave in lead 3 individually exceeds 16 mm (16 millivolts)

- 2 Depression of the ST segment in lead 1, even of as slight a degree as 0.5 mm

- 3 Flattening of the T wave below 1 mm amplitude, or other T wave abnormalities in lead 1

<sup>21</sup> Roesler Hugo Gibson G G and Hussey Raymond A Correlation Study Between Retinal Vascular Changes Electrocardiographic Alterations and Radiological Heart Size in Essential Hypertension *Ann Int Med* 13 1814 (April) 1940

<sup>22</sup> Gubner R S and Ungerleider H E Electrocardiographic Criteria of Left Ventricular Hypertrophy Factors Determining the Evolution of the Electrocardiographic Pattern read before the eighteenth scientific session of the American Heart Association June 5 1942

Applying these electrocardiographic criteria, as well as x-ray evidence of left ventricular hypertrophy and aortic widening, to 100 cases of advanced hypertensive heart disease, it was found that 90 per cent showed some evidence of left ventricular hypertrophy or arteriosclerosis of the aorta or coronary vessels in the electrocardiogram or the roentgenogram. The electrocardiogram was found to provide the most sensitive single criterion for detecting left ventricular hypertrophy, being more valuable than roentgen findings.

In order to test the thesis that mortality is higher with increasing duration of the hypertensive disease, as revealed by electrocardiographic abnormalities indicative of hypertrophy, a mortality study according to electrocardiographic findings was carried out on 424 insurance applicants with hypertension.<sup>23</sup> The cases were divided into 4 groups: (1) normal electrocardiogram, (2) borderline electrocardiographic changes, (3) pattern of left ventricular hypertrophy, (4) electrocardiographic changes indicative of myocardial disease with or without a pattern of hypertrophy.

It was found that there was a distinct increase in mortality with progression in the electrocardiogram toward an abnormal pattern, the ratio of actual to expected mortality in the respective groups being 186 per cent, 269 per cent, 344 per cent and 375 per cent, as compared with a normal ratio of 100 per cent. This increase was only in slight part attributable to differences in blood pressure, since there was little variation in the different groups. Adjustment for slight increase in the blood pressure still left a considerable increase in the mortality ratios in the successive groups. There was a relative homogeneity of body build and age also in the different groups, so that the increment in mortality must be considered as correlated with the electrocardiographic findings used as a basis for the classification of the groups.

The results of this study indicate that the stage of the hypertensive disease as determined by electrocardiographic evidence of left ventricular hypertrophy, employing criteria established, is an important consideration in the evaluation of prognosis. Since the electrocardiogram was normal in only 44 per cent of all subjects with hypertension, it would appear desirable to take electrocardiograms routinely in cases of hypertension. The group consisted of insurance applicants, most of whom had no symptoms and were unaware of the presence of elevated blood pressure. Among patients with symptoms undoubtedly even a greater number would show electrocardiographic abnormalities.

#### ARTERIAL ATHEROSCLEROSIS

The electrocardiogram is of value not only in revealing the presence of hypertrophy but also as an indication of coronary artery sclerosis. Roentgen examination too is useful in demonstrating sclerotic changes of the aorta. Atherosclerosis of the aorta is of greater significance than arteriosclerosis of the peripheral arteries, since it is more closely associated with coronary artery disease. The roentgen findings in arteriosclerosis of the aorta are quite characteristic, consisting of elongation, tortuosity, increased density and calcification, most often in the transverse and descending aortic arch, with diminished pulsation in this region. The ascending aorta is not so regularly involved by arterio-

<sup>23</sup> Daley R M Ungerleider H E and Gubner R S Prognosis and Insurability of Hypertension with Particular Reference to the Electrocardiogram *Proc A Life Insur M Dir America* 28 18, 1941

sclerosis, although it may become somewhat dilated, perhaps to act as a larger reservoir in consequence of the diminished elasticity of the remainder of the aorta. The systolic murmur over the aortic area which is frequently present in subjects with hypertension and arteriosclerosis is not necessarily due to sclerotic changes in the aortic valve or ascending aorta but may be due to dilatation of the ascending arch, which often accompanies arteriosclerosis of the aorta. Another finding occasionally observed on physical examination is a prominent pulsation of the right carotid artery due to buckling and kinking as a result of elongation of the aorta. This may be mistaken for an aneurysm. Widening of the pulse pressure with an elevated systolic and relatively normal diastolic pressure is also indicative of arteriosclerosis of the aorta, and this is not infrequently observed in cases of advanced hypertensive heart disease, the diastolic level falling as aortic elasticity diminishes. Arterial pulse wave velocity, as determined by simultaneous carotid and femoral sphygmograms, is characteristically increased.

One of the simplest and most useful criteria to evaluate abnormalities of the aorta is the measurement recently proposed by Sheridan,<sup>24</sup> i.e., the transverse diameter of the frontal aortic silhouette (vascular pedicle) in relation to standards of height and weight as employed in predicting the transverse diameter of the heart, a small correction being necessary for age. This does not distinguish dilatation from arteriosclerosis since increase in the diameter of the vascular pedicle can result from dilatation or tortuosity of the aortic arch, but it does indicate whether the aorta is normal or abnormal.

Analysis of teleroentgenograms in 100 cases with advanced hypertensive heart disease showed a significant increase in the aortic arch transverse diameter, i.e., values exceeding 10 per cent above the predicted, in 54 per cent of cases. Evidence of arteriosclerosis of the aorta was present as frequently as enlargement of the cardiac shadow. Definite arteriosclerotic changes may be present in the absence of any evidence of left ventricular enlargement, and in the series studied the roentgenogram indicated arteriosclerosis and/or cardiac enlargement in 78 per cent of cases. Roentgen examination, therefore, just as electrocardiography is a valuable prognostic guide in adducing evidence regarding the state of the cardiovascular system. It may be mentioned again that definite cardiac enlargement and atherosclerosis of the aorta and coronary arteries may exist in the presence of an arterial pressure which is only moderately elevated and labile and which indeed at times may fall spontaneously to normal values, even though hypertension may be of long-standing duration. The state of the arterioles as revealed by blood pressure levels and reactivity and retinal examination is, therefore, only part of the picture, and investigation for cardiac enlargement and significant atherosclerotic changes by means of physical examination, electrocardiography and roentgen study are essential for evaluating prognosis.

#### RENAL INVOLVEMENT IN HYPERTENSION

Examination of the urine is of little value as an adjuvant in interpreting high blood pressure, except to distinguish those cases due to glomerulonephritis

or other renal disease. Albuminuria occurs in a comparatively small proportion of cases of hypertension and, while severe albuminuria is often a poor prognostic omen, there is no correlation between albuminuria and the course of hypertensive disease. Impairment in renal function does not occur until relatively late when severe arteriolar sclerosis has led to widespread atrophy of the renal parenchyma. Impairment of the concentrating power, which is a sensitive test of renal tubular function, occurs earlier than a decrease in the urea clearance which tends to be maintained by a relative increase in the glomerular filtration fraction resulting from efferent glomerular arteriolar constriction.<sup>25</sup> In malignant nephrosclerosis the severe arteriolar necrotic lesions in the kidneys cause rapid deterioration of renal structural integrity and function, and uremia is usually a prominent part of the clinical picture. In uncomplicated essential hypertension, however, only a small fraction of cases, varying in different studies from 1 to 7 per cent, progress to renal insufficiency.<sup>26</sup>

In the past few years there has been an attempt to identify essential hypertension with experimental hypertension produced by renal ischemia.<sup>2</sup> The renal blood flow is usually reduced in hypertension, but there is no proof that this is the cause rather than the effect of the circulatory changes. Investigation of the kidneys should always be made in the presence of hypertension for many cases have been reported with spectacular cures following nephrectomy in cases of unilateral renal disease, such as atrophic pyelonephritis.<sup>28</sup> Enthusiasm should be tempered, however, by Allen's estimate that a renal lesion responsible for hypertension can be demonstrated less than once in 300 cases,<sup>29</sup> and by the careful study made by Chasis and Redish<sup>30</sup> which failed to disclose evidence of unilateral renal ischemia or correlation between structural abnormalities and renal function in a series of 21 unselected cases with hypertension.

It has been observed that hypertension seldom develops in cases with unilateral renal disease unless there previously exists a predisposition to hypertension.<sup>1</sup> In the frequent cases in which unilateral renal disease or hypertension secondary to glomerulonephritis or any cause progresses to the malignant phase of arteriolar necrosis, it may be assumed that there is a high constitutional predisposition to hypertension, with increased arteriolar reactivity which reacts excessively to the pressor substance leading to extreme hypertension with accelerated arteriolar changes.

25 Corcoran A C and Page I H. Quantitative Formulation of Maximum Urinary Specific Gravity. *J Mount Sinai Hosp* 8: 459 (Jan-Feb) 1942.

26 Christian H C in discussion on Paullin J E. Ultimate Results of Essential Hypertension. *J A M A* 87: 931 (Sept 18) 1926. Bell E T and Clawson B J. Primary (Essential) Hypertension. Study of Four Hundred and Twenty Cases. *Arch Path* 5: 939 (June) 1928.

27 Goldblatt Harry. Experimental Hypertension Induced by Renal Ischemia in Harvey Lectures 1937-1938. Baltimore: Williams and Wilkins Company, 1938.

28 Weiss Soma and Parker Frederic. Pyelonephritis: Its Relation to Vascular Lesions and to Arterial Hypertension. *Medicine* 18: 221 (Sept.) 1939. Abeshouse B S. Hypertension and Unilateral Renal Disease. Review of Literature and Report of Sixteen Cases. *Surgery* 9: 942 (June) 10: 147 (July) 1941. Nesbit R M and Ratliff R K. Hypertension Associated with Unilateral Renal Disease. *J A M A* 116: 194 (Jan 18) 1941.

29 Allen E V. Medical Aspects of Arterial Hypertension. *Bull New York Acad Med* 17: 174 (March) 1941.

30 Chasis Herbert and Redish Jules. Unilateral Renal Function in Essential Hypertension. *J Clin Investigation* 20: 442 (July) 1941. *Arch Int Med* 70: 738 (Nov.) 1942.

31 Hines E A Jr and Lander H H. Factors Contributing to Development of Hypertension in Patients Suffering from Renal Disease. *J A M A* 116: 1050 (March 15) 1941.

24 Sheridan J T. The Transverse Diameter of the Frontal Aortic Arch Silhouette. *Proc A Life Insur M Dir America* 28: 49 1941.

## OTHER FACTORS IN PROGNOSIS

An imposing array of studies all attest a strong hereditary tendency in hypertension,<sup>32</sup> and it has been suggested that hypertension is transmitted as a mendelian characteristic. Among young subjects with a family history of hypertension a high incidence of potential hypertension has been demonstrated employing the cold pressor test.<sup>33</sup> It has been observed that succeeding generations in hypertensive families tend to have more severe grades of hypertension and at earlier ages than the previous generation.<sup>34</sup>

The age at which hypertension develops appears to influence its course. Just as with diabetes hypertension developing in middle and older ages is less often severe and progresses slowly, with the development of atherosclerotic vascular changes. In earlier life hypertension tends to run a more rapid course, often terminating in malignant nephrosclerosis, whereas this occurs less frequently beyond the fifth decade. Apparently the strong constitutional predisposition to hypertension which causes it to develop earlier in life carries with it a greatly increased arteriolar reactivity producing an exaggerated reaction to the as yet unknown pressor agent.

The increased incidence of hypertension in the white race has frequently been noted particularly in comparison to the relative freedom from hypertension among groups leading a more primitive existence and many have therefore regarded hypertension as a consequence in large measure of civilized life. Of interest in this regard is the very low incidence of hypertension among native African Negroes,<sup>35</sup> whereas in urban areas in the United States the incidence of hypertension among Negroes greatly exceeds that among the white population and runs a more rapid and severe course.<sup>36</sup>

The constitutional type of the hypertensive subject is usually described as of hypersthenic habitus with a tendency to obesity. Hypertension occurs frequently in persons of normal or even slender build, but it is true that it is more frequently associated with obesity and the mortality experience when hypertension and obesity are associated is greater than the additive mortality of the two impairments individually.<sup>37</sup> A question of some practical importance is whether the obesity and hypertension are both the result of a constitutional tendency or whether elevation of the blood pressure can be more directly ascribed, at least in part, to overweight. There is some evidence for the latter view, and loss of excess weight is a rational therapeutic procedure in hypertension.

While hypertension occurs with somewhat greater frequency in females, the course, as has been repeatedly observed in clinical studies, is more benign.<sup>38</sup> Malig-

nant hypertension develops much more frequently among males, atherosclerotic complications too, such as coronary occlusion, are likewise relatively less frequent among females. Atherosclerosis, as is well known, is observed less frequently in females than males in the absence of hypertension as well. It is remarkable how well some women tolerate severe hypertension for many years without serious complications and indeed frequently with few symptoms. The specific type of hypertension occurring in toxemia of pregnancy has been exhaustively studied and need be referred to only briefly. Attempts have been made to explain the hypertension of pregnancy on a renal basis, but evidence for a renal origin is lacking even more than in the case of essential hypertension, since renal blood flow is increased rather than decreased in preeclamptic toxemia.<sup>39</sup>

Whatever the etiology may be, preeclamptic toxemia occurs with greater frequency among those predisposed to hypertension, and pregnancy aggravates hypertension leading to toxemia in approximately 50 per cent of cases with preexisting hypertension.<sup>40</sup> In a relatively high proportion of cases the hypertension initiated or aggravated during pregnancy persists permanently, so that in general it may be stated that pregnancy has a definitely deleterious effect on hypertension.

The association of hypertension with diabetes, which in itself leads to arterial atherosclerosis probably due to the associated hypercholesterolemia, accentuates the development of atherosclerotic lesions. Advanced sclerotic changes in the aorta and coronary arteries are frequently observed at necropsy when the two diseases have been present together and the retinal lesions are likewise severe. Renal lesions, first described by Kimmelstiel,<sup>41</sup> consisting of intracapillary glomerulosclerosis,<sup>42</sup> renal tubular changes and a nephrotic syndrome due to severe albuminuria, occur in a considerable proportion of cases.

## THE EFFECT OF TREATMENT ON PROGNOSIS

Of the innumerable therapeutic measures that have been advocated for hypertension only two have been found effective, potassium thiocyanate<sup>43</sup> and surgical procedures on the abdominal sympathetic nervous system.<sup>44</sup> Very recently an active depressor principle has been isolated from the kidney which is effective in lowering blood pressure in experimental hypertension.

32 Ayman David. Heredity in Hypertension in Medical Papers Dedicated to Henry Asbury Christian. Baltimore: Waverly Press, 1936.  
Williams G D. Hereditary Aspects of Arterial Hypertension in Relation to Arteriosclerosis in Cowdry C V. Arteriosclerosis. New York: Macmillan Company, 1933.  
Fishberg A M. Hypertension and Nephritis. p. 574. Hines.<sup>33</sup>

33 Hines E A Jr. The Hereditary Factor in Essential Hypertension. Ann Int Med 11: 593 (Oct) 1937.

34 Adson A W. The Surgical Consideration of Essential Hypertension. University of Pennsylvania Bicentennial Conference, 1941. p. 21.

35 Donnison C P. Blood Pressure in African Native. Its Bearing on Etiology of Hypertension and Arteriosclerosis. Lancet 1: 6 (Jan) 5) 1929.

36 Kaselman Morris. Incidence of Hypertension in White and Negro Males. M Rec 154: 16 (July 2) 1941.  
Weiss W M and Prusmack J J. Essential Hypertension in the Negro. Am J M Sc 195: 510 (April) 1938.

37 Mills J. Assistant Superintendent. Statistical Bureau. Equitable Life Assurance Society of the United States. Personal communication to the authors.

38 Paulin J E. Ultimate Results of Essential Hypertension. J A M A 97: 924 (Sept 18) 1926.  
Blackford J M, Bowers J M and Baker J W. Follow Up Study of Hypertension. ibid 94: 328 (Feb 1) 1930.  
King R L, Carlisle T and Blackford J M. A Follow Up Study of Four Hundred Cases with Hypertension. Am Heart J to be published.

39 Chesley I C and Chesley E R. Diuretic Clearance and Renal Blood Flow in Toxemia of Pregnancy. J Clin Investigation 19: 219 (Jan) 1940.  
Wellen Irwin, Welsh Catherine A, Taylor H C Jr and Rosenthal A. Filtration Rate Effective Renal Blood Flow, Tubular Excretory Mass and Phenol Red Clearance in Specific Toxemia of Pregnancy. ibid 21: 63 (Jan) 1942.

40 Dexter Lewis Weiss Soma and others. Preeclamptic and Eclamptic Toxemia of Pregnancy. Boston: Little Brown & Company, 1941.  
41 Kimmelstiel Paul and Wilson Clifford. Inter-capillary Lesions in the Glomeruli of the Kidney. Am J Path 12: 83 (Jan) 1936.

42 Allen A C. So Called Inter-capillary Glomerulosclerosis Lesion Associated with Diabetes Mellitus. Morphogenesis and Significance. Arch Path 32: 33 (July) 1941.

43 Barker M H, Lindberg H A and Wald M H. Further Experiences with Thiocyanates. Clinical and Experimental Observations. J A M A 117: 1591 (Nov 8) 1941.  
Kurtz C M, Shapiro H A, and Mills, C S. Therapy with Sulfocyanate. Results. Am J M Sc 202: 378 (Sept) 1941.  
Massie Edward. Therapy with Thiocyanate. Internat Clin 3: 198 (Sept) 1941.  
Robinson R W and O'Hare, J P. Potassium Sulfocyanate Therapy. New England J Med 221: 964 (Dec 21) 1939.

44 Adson A W. The Surgical Consideration of Essential Hypertension read before the University of Pennsylvania Bicentennial Conference, 1941.  
Allen E V and Adson A W. The Treatment of Hypertension. Medical or Surgical. Ann Int Med 14: 288 (Aug) 1940.  
Peet M M, Woods W W and Braden Spencer. Surgical Treatment of Hypertension. Results in Three Hundred and Fifty Consecutive Cases. J A M A 115: 1875 (Nov 30) 1940.  
Crile George. Indications for Operation and End Results of Treatment of Hypertension by Precordial Ganglionectomy. Proc A Life Insur M Dir America 26: 17 1939.

and which has been found promising in a few clinical cases<sup>45</sup>. This work is still in the experimental stage.

The careful observations made by Wagener, Keith and Barker<sup>6</sup> on a large series followed over many years have been suggested by these authors as a control for other studies. Many of the claims made for various drugs and other measures, subsequently disproved, have been due to a failure to control the study adequately. As previously mentioned, casual readings of the blood pressure are valueless because of the spontaneous fluctuations in the blood pressure. Relief of symptoms is not an accurate guide, since there is a large psychic element and symptoms may be controlled by a large variety of nonspecific measures including placebos<sup>46</sup>. A substantial fall in blood pressure, which may persist for some time, does not always indicate that the improvement is specifically due to the therapy. Thus the claims recently made for tyrosinase<sup>47</sup> have been shown to be due largely to a nonspecific pyrogenic effect,<sup>48</sup> the same being true for implantation of renal tissue in which the depressor effect is due to abscess formation<sup>49</sup>. Even though the lowering of the blood pressure is accomplished in a nonspecific manner by these agents, investigation along this line may prove fruitful if high blood pressure can be satisfactorily reduced and maintained at a lower level without injurious effects. The fall in blood pressure following sympathectomy is usually prompt and striking, but a similar fall occurs frequently after any nonspecific abdominal or other operation<sup>50</sup>. The fall in blood pressure following sympathectomy is rarely sustained for more than several months. Nevertheless, carefully controlled studies have shown that in cases presenting severe hypertension and even malignant nephrosclerosis the outlook for life is definitely improved. Recession of severe retinal changes, such as papilledema, hemorrhages and exudates, and improvement in the cardiac status and electrocardiogram, associated with a fall in blood pressure, have been observed in certain cases treated by sympathectomy, thiocyanates and renal extracts. In some instances the employment of two procedures, such as thiocyanates following sympathectomy, has seemed to augment the beneficial effect<sup>51</sup>. The outlook, therefore, while as yet grave, offers definite promise.

One cannot expect that any form of therapy, however effective in reducing blood pressure, can beneficially influence organic and irreversible vascular changes. Since the great majority of cases with hypertension are observed rather late in the course of the disease when cardiac and vascular complications have supervened, no specific therapy can hold out much hope at

this stage. The situation is similar to that in diabetes mellitus in which insulin corrects the metabolic derangement but cannot erase the damage that has been done by long years of an unrecognized and untreated condition. As in the case of diabetes concurrently with the development of therapeutic procedures which will effectively lower the blood pressure, and this has not yet been achieved, it will be necessary to educate the public to frequent examinations so that early hypertension and even a predisposition to hypertension will be recognized. It is axiomatic that any treatment is more effective the earlier it is applied, and while no improvement can be expected in a case in which advanced coronary disease with cardiac failure has occurred, or little and temporary response in cases of extreme hypertension with severe arteriolar lesions, the efficacy of any measure will be much greater in earlier stages in which the blood pressure may more readily be reduced to moderate levels and so retard the development of the cardiovascular and other lesions.

#### CONCLUSIONS

Numerous factors all of which must be considered, determine the prognosis in hypertension. The more important questions to be answered are

- 1 Does a state of hypertension exist and if so what is its degree?
- 2 Can a known cause for the hypertension be found?
- 3 What is the extent of the organic changes in the heart, arteries, arterioles and kidneys?

These among other considerations, including sex, age and the presence of associated conditions, such as diabetes and obesity, are important in estimating the life expectancy and the benefit which may be expected from therapeutic procedures available at the present time.

#### ABSTRACT OF DISCUSSION

DR BENJAMIN JABLON, New York. Without definite information regarding life expectancy in individuals affected with hypertension or even the average duration of the disease, one cannot be certain that treatment is of any real value. I have attempted for the past ten years to get such information. By comparing the results obtained with renal extract and other therapies with those furnished by Dr Daley and his co-workers, one may know which of these treatments are of real value. I have attempted to use heart change as an index of prognosis. I have also used it at one time as a basis for the selection of cases to be treated with renal extract. I have found, however, that these changes were not dependable guides. Many patients without any apparent heart changes die early, whereas others with extensive changes survive for long periods. One patient suffering from malignant hypertension with extensive cardiac and retinal changes is still alive and doing well four and one-half years later. He has been treated with renal extract during the greater part of this period, and there has been definite improvement in the heart and eyegrounds, but only statistical studies of untreated cases can properly control such observations. Others have suggested retinal changes as an index of prognosis, but many have heard Dr Scott report improvement in retinopathy with boiled milk injections. One criterion found of great value as an index to prognosis is the urea clearance test. I have also based selection of cases for treatment on this test. If the urea clearance is below 15 per cent of normal I have not attempted to use renal extract, since many such cases may even react unfavorably to this treatment. If the urea clearance, already low progressively, decreases, the outlook is exceedingly grave. Such cases do not respond well to any treatment medical or surgical.

45 Page, I. H. and others. Reduction of Arterial Pressure of Hypertensive Patients and Animals with Extracts of Kidneys, *J. Exper. Med.* 73: 7 (Jan.) 1941. Wakerlin, G. E. and others. Reduction in Pressure of Renal Hypertensive Dogs with Hog Renin, *Science* 93: 332 (April 4) 1941. Grollman, Arthur, Williams, J. R. Jr. and Harrison, T. R. Reduction of Elevated Blood Pressure by Administration of Renal Extracts, *J. A. M. A.* 115: 1169 (Oct. 5) 1940.

46 Ayman, David. An Evaluation of Therapeutic Results in Essential Hypertension. I. The Interpretation of Symptomatic Relief, *J. A. M. A.* 95: 246 (July 26) 1930.

47 Schroeder, H. A. and Adams, M. H. Effect of Tyrosinase on Experimental Hypertension, *J. Exper. Med.* 75: 531 (April) 1941.

48 Chasis, Herbert, Goldring, William and Smith, H. W. The Reduction of Blood Pressure Associated with the Pyrogenic Reaction in Hypertensive Subjects, *J. Clin. Investigation* 21: 369 (July) 1942.

49 Friedman, Ben, Jarman, Julian and Marrus, Joseph. Therapeutic Agents and Renal Implantation in Experimental Hypertension, *J. Mount Sinai Hosp.* 8: 534 (Jan. Feb.) 1942.

50 Volini, I. F. and Flaxman, Nathan. The Effects of Nonspecific Operations on Essential Hypertension, *J. A. M. A.* 112: 2126 (May 27) 1939.

51 Davis, Loyal and Barker, M. H. Clinical and Experimental Experiences in the Surgical Treatment of Hypertension, *Ann. Surg.* 110: 1016 (Dec.) 1939.

## HERNIATED INTERVERTEBRAL DISK

## A STUDY OF THE IODIZED OIL COLUMN

THE PROCAINE TEST IN DIFFERENTIAL DIAGNOSIS  
FROM REFLECTED SCIATIC PAIN

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Herniated intervertebral disk, or herniation of the nucleus pulposus, has become a well established syndrome. The lesion is clearly a causal factor for low back pain associated with radiating pain in the sciatic distribution. While the incidence of herniated disks in "sciatic cases" appears to be growing ever larger, there is nevertheless a group of cases in which the back pain and sciatic radiation is related to soft tissue or myofascial injury. Out of the fog of ignorance which has hung for so long over the subject of low back pain these two lights of knowledge have appeared. Each of these two causal factors is productive of definite syndromes and lends itself by the use of proper methods to a high percentage of accurate diagnoses. They indicate prescribed methods of treatment which are rewarded by almost uniformly excellent results. Since in any case of low back pain with sciatic radiation one of these two causal factors is likely to prevail, it is paramount that their respective syndromes and their differentiation be clearly understood.

Herniated disk provokes a syndrome of spinal nerve root compression, and the radiating pain is referred pain associated with the signs and symptoms that attend direct root involvement. We do not believe that herniated disk is the only cause of referred sciatic pain, but it is the most common cause. For example we have seen cases that present a perfect syndrome for a single nerve root compression and in which a diagnosis of herniated disk was mandatory. A herniated disk (concealed or otherwise) was not found to be present, but a decompression of the intervertebral canals of appropriate roots was followed by excellent results. This has been consistent. The causal factor in these cases is not yet so well understood but the pertinent point is that the diagnostician might think more broadly in terms of nerve root compression rather than specifically of herniated disk.

The myofascial syndrome is associated with or provokes a strictly reflex sciatic radiation and hence can be differentiated from referred sciatic radiation.

This paper is a presentation of our experience with these cases, and for convenience it is divided into two parts. Part I is devoted to the cases in which a diagnosis of root compression with radiating pain was made. Herniated disk was the predominant cause and we have elected this as the title of the paper. Special emphasis is placed on the interpretation of the iodized oil film. Having become thoroughly acquainted with the important features of the iodized oil column, we now use the method only in the occasional case in which such a precise confirmation is desired. In addition to the 63 cases reported in this paper we have since done 26 additional laminectomies for herniated intervertebral disk. Of these, 17 were done without confirmation by

iodized poppy seed oil. In only 1 case was the lesion not found. Iodized oil was used in 9 cases. The iodized oil films were positive in 6 of these and disks were found. They were negative in 2 cases in which herniated disks were found to be absent. The iodized oil was considered negative in 1 case in which a small disk was found.

Part II is devoted to the diagnosis and management of reflex sciatic pain.

PART I ROOT COMPRESSION WITH  
RADIATING PAIN

Although herniated intervertebral disks were witnessed by Virchow and cases have been sporadically reported since his time,<sup>1</sup> and although Goldthwait described their pathology in 1911,<sup>2</sup> it was not until 1934 that Mixer and Barr<sup>3</sup> correlated the pathology with the sciatic syndrome as we know it today. Interest was excited and as is true for any syndrome of definite



Fig 1—An example of a complete filling defect in the iodized oil column due to a herniated disk between the fourth and fifth lumbar vertebrae. The herniation was large and extended all the way across the spinal canal. Note however that iodized oil passed by the lesion freely and was not completely blocked as might be the case with tumor. When the patient is lying on his back the defect (D) appears complete. This type occurred three times in 46 cases.

understandable cause, it required only a few years to become established and its various aspects generally agreed on by the profession. We are reporting the results of our experience with 63 laminectomies with reference chiefly to a method of differential diagnosis and to the interpretation of the iodized oil column.

## ANALYSIS OF CASES

Sixty-three laminectomies were done, with iodized oil studies in all cases. Herniated disks were found in 50 cases.

1 Dandy, Walter E. Loose Cartilage from Intervertebral Disk Simulating Tumor of the Spinal Cord. *Arch Surg* 19 660 (Oct) 1929.  
2 Goldthwait, J. E. The Lumbosacral Articulation. *Boston M & S J* 164 365 (March 16) 1911.

3 An excellent recent account of the pathology is given by Saunders, John B. de C. M. and Inman, Verne L. Pathology of the Intervertebral Disk. *Arch Surg* 40 389 416 (March) 1940.

4 Mixer, W. J. and Barr, J. S. Rupture of the Intervertebral Disk with Involvement of Spinal Canal. *New England J Med* 211 210 215 (Aug 2) 1934.

**Proved Herniated Disks** (50 cases) —There were 38 males and 12 females

The incidence of cases by decades was first 0, second, 3, third, 7, fourth, 13, fifth, 16, sixth, 10, seventh, 1, eighth, 0

**Segmental Location** —The disk was below the fourth or fifth lumbar vertebra in 46 cases (92 per cent) It was below the seventh cervical in 1 case below the ninth dorsal in 1 case and below the third lumbar in 2 cases

The patient with the cervical disk complained of pain in the ulnar distribution of the right upper extremity. An iodized oil study proved the presence of the herniated disk.

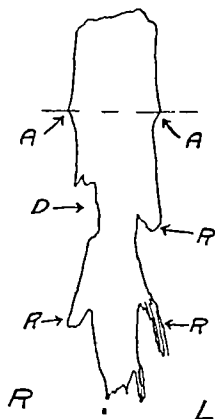
The patient with a disk at the ninth dorsal vertebra presented a tumor syndrome (transverse myelitis at the ninth dorsal vertebra)

One patient with a disk at the third lumbar vertebra complained of pain radiating to the left knee and related the onset to a back injury. The knee jerk on the same side as the laterally placed disk was absent. The other patient with a disk at the third lumbar complained of pain radiating to the foot only on the right. His legs and ankles were decidedly weakened and both knee jerks and ankle jerks lost. The herniated disk was large, ruptured and extended completely across the spinal canal.

**Analysis of Disks at the Fourth or Fifth Lumbar** (46 cases) —History. The onset of low back pain was sudden and related to a definite injury in 36 cases (78 per cent), there was no relation to injury in 7 cases (15 per cent) and the history was questionable in 3 cases (7 per cent). The shortest period given



Fig 2—Definite unilateral defect due to a herniated disk below the fourth lumbar vertebra on the right. Such defects usually have a ragged outline. Note that the defect involves the position of the axillary pouch of the fifth lumbar nerve on the right. This type of defect occurred in 18 cases out of 46. One of these cases presented the defect at the fourth and fifth lumbar vertebrae as the result of a herniated disk at each location. *A*, typical axillary pouches below the third lumbar vertebra; *R*, arachnoid root sleeves containing iodized oil; *D*, defect due to the herniated disk.



Of the 36 cases with a history of injury the onset of pain radiating down a lower extremity occurred sometime after the low back pain in 27 cases (75 per cent) and was given as concomitant with the back injury in 9 cases (25 per cent).

Of the 27 cases the shortest period between the onset of radiating pain and low back pain was two days, the



Fig 3—Mild defect due to a herniated disk between the fifth lumbar and the first sacral vertebra on the right. The apparent bilateral defect at *F* is not due to a disk. All iodized oil contained within the outer arrows at *F* is within the dural canal. The oil streaming down at the lateral aspects of this region is enveloping the intradural roots destined to emerge at *A*, (the fifth lumbar roots). The filling defect caused by the roots can be seen (*R*). The axillary pouches below the fourth lumbar vertebra and designated as *A5* are intact. The fusiform column of iodized oil between the inner arrows at *F* is sometimes all that is seen between two pairs of axillary pouches. Such a constriction has no pathologic meaning and a study of this film clearly shows how it is formed. See figure 7 under false defects. The true defect is a mild notch at *D* which obliterates the axillary pouch between the fifth lumbar and first sacral vertebrae on the right. *S1* is the corresponding pouch on the left. Six instances of this mild type of defect occurred among 46 cases. One case showed the defect at the fourth and fifth lumbar vertebrae.

longest period, fifteen years. The usual period varied greatly from weeks to years.

All 46 patients described radiating pain down the posterior aspect of the thigh and at least to and involving the leg—usually the lateral aspect or calf of the leg. Thirteen of these patients said there was no pain in the foot. Thirty-three (72 per cent) described pain radiating to the foot—usually the ankle dorsum or ball of the foot. In these two groups (radiation to leg or to foot) no definite correlation could be made between the type of radiation described and the fact that the disk was below the fourth or fifth lumbar vertebra. There was about an equal distribution of the two locations in each group. Hence we feel that a specific localization of the disk at the fourth or fifth lumbar based on the patient's localization of the radiating pain is faulty and should not be entirely depended on at the time of operation.

Some form of paresthesia was definitely described in 39 cases (85 per cent). Paresthesia strongly indicates organic involvement of the nerve root in question as opposed to reflex pain and is a dependable symptom. There was apparently no paresthesia experienced in 7 cases (15 per cent).

between the onset of low back pain and removal of the herniated disk was two months, the longest twenty-five years. The usual was two or three years.

3 The segment of iodized oil column between two pairs of axillary pouches may present a waistlike or fusiform constriction of varying degree. This is shown particularly well in figure 7. We feel that even though this constriction is pronounced it has no pathologic significance. It is probably occasioned by the fact that the oil does not fill out the subarachnoid space laterally, owing to the presence of the nerve roots which are destined to emerge from the next lower exits from the cul-de-sac. This is brought out especially well in the analysis of figure 3.

In respect to the iodized oil studies of the low lumbar region the cases fall into the following groups:

- A Positive iodized oil and herniated disk found, 46 cases
- B Positive iodized oil, the herniated disk is thought to have been missed, a group of 5 earlier cases
- C Negative iodized oil, herniated disk found, 1 case
- D Negative iodized oil, no herniated disk found, 3 cases
- E False iodized oil defects, no herniated disk found 5 cases

**GROUP A—*Iodized Oil Positive and Herniated Disk Found* (46 cases)**—In analyzing the iodized oil films we have classed the defects according to the following types: 1 Complete, in which a filling defect extends completely across the iodized oil column. 2 Definite unilateral defect, in which a definite notch is cut out of the iodized oil column on one side. 3 Definite bilateral defect, in which a definite notch is cut out of the iodized oil column on both sides at the same segment. 4 Mild defect, in which there is a mild filling defect at an axillary pouch. 5 Root sign, in which there is no filling defect in the iodized oil column proper but there is some displacement of the root from its normal course or a blunt cessation of the passage of iodized oil down the root sheath. The latter interpretation is aided by the visualization of a normal root opposite to the defective one.

The incidence of these types of defects in the 46 cases of disks at the fourth and fifth lumbar vertebrae is as follows:

- 1 Complete defect, 3 cases
- 2 Definite unilateral defect 18 cases (1 case showed this defect at the fourth and fifth lumbar vertebrae)
- 3 Definite bilateral defect, 6 cases (2 cases each showed two bilateral defects)
- 4 Mild defect 6 cases (in 1 case this defect was present at the fourth and fifth lumbar vertebrae)
- 5 Root sign, 13 cases

Diagnoses were made from all of the aforementioned defects previous to operation and found to be correct at operation.

Instances of each type of defect are given in the illustrations as follows:

- Complete defect, figure 1
- Definite unilateral defect, figure 2
- Mild defect, figure 3
- Root sign, figures 4, 5 and 6

**GROUP B—*Positive Iodized Oil, Herniated Disk Thought to Have Been Missed***—There were 5 cases in this group. They were earlier cases and we were not so keenly aware of the necessity of exploring far laterally in the spinal canal. At this time we were using the transdural approach in some cases and obviously might overlook a small laterally placed herniation. When no disk was found, an appropriate sensory root

was cut or intervertebral canals were unroofed. The results were good and all 5 patients were relieved of pain. On reexamining the iodized oil films we are convinced that herniated disks are present in these cases. Unilateral definite defects were present in all cases.

When operating on small or medium lateral disks we have often had the feeling that the decompression alone, effected by removal of a laminal arch and ligamentum flavum, would be followed by relaxation of the involved root and relief of pain, although the underlying disk herniation still remains.

**GROUP C—*Negative Iodized Oil, Herniated Disk Found* (1 case)**—There has been only 1 case in which we felt that the iodized oil roentgenogram was entirely negative and yet at exploration a herniated disk (small and laterally placed below the fifth lumbar vertebra) was found. The clinical history and examination were sufficiently typical to warrant exploration. Even in this case when the facts were known, we felt that a root sign was demonstrable on reexamining the films. We feel that it is significant that only 1 case falls in this group, because it attests the reliability of the iodized oil study. It is equally significant that 8 cases (3 in group D and 5 in group E) were classed as negative iodized oil and false iodized oil defects respectively and, when exploration was done, no herniated disk was found.

**GROUP D—*Negative Iodized Oil, No Herniated Disk Found* (3 cases)**—These 3 cases showed clinical syndromes that warranted exploration in spite of a negative iodized oil study. Herniated disks were carefully searched for but none were found. Appropriate sensory roots were sectioned, based on the distribution of pain and the results were good.

When the sensory portion of the fifth lumbar or first sacral root is cut, the patients are conscious of numbness in the distribution of the cut root. They appear to become accustomed to it however and much prefer it to the former pain. In fact the same type of numbness at times follows the removal of a herniated disk and is probably due to a little too vigorous retraction of the dural sheath of the root while removing the pathologic tissue. The subjective numbness in this instance is greater than the demonstrable hypesthesia but is not cause for great complaint.

It has often been stated that involvement of a single sensory root is not sufficient to cause a demonstrable hypesthesia. Recently, however, we have been encouraged to find that, if we test comparable loci on the legs and feet with equal stimuli of light touch and pin prick so that the patient may compare the normal with the pathologic side, a definite hypesthesia can be demonstrated. This is true in the event of a single herniated disk below the fourth or fifth lumbar vertebra and appears to be more consistent on the lateral aspect of the calf or the lateral aspect of the ankle or medial side of the foot.

**GROUP E—*False Iodized Oil Defects, No Herniated Disk Found* (5 cases)**—Five patients were submitted to exploration for herniated disks because the history and examination, though equivocal in some ways, warranted an investigation. No evidence of herniated disk was found. Two of the iodized oil roentgenograms are analyzed in figures 7 and 8. We have classified the filling defects as false or artefacts and we feel that their



character serves to strengthen the dicta which we have proposed concerning the significant defects

It will be noted that all the patients in this group as well as those in Group D were relieved of pain following exploration. In these cases when a herniated disk was not disclosed either the intervertebral canals were par-

tive iodized oil findings and in whom we believe we failed to expose the pathologic condition are considered in the section devoted to that group (B)

CASE 1—E M, a man aged 65, had sciatic pain on the right side for three months. There were no history of injury and no back pain. The pain radiated to the right calf and lateral aspect of the foot. The calf was 15 cm smaller than that on the left. The ankle jerk was lost on the right side.

The column of iodized oil showed symmetrical hour glass constrictions between the axillary pouches of the third and fourth and between the fourth and fifth lumbar vertebrae. There was no defect at the location of any axillary pouch.

The regions of the fourth and fifth lumbar and first sacral roots were carefully inspected and no evidence of a pathologic condition of the disks was found. The ligamenta flava appeared normal. The fourth and fifth intervertebral canals on the right were partially decompressed. The result was good and the patient was relieved of his pain.

CASE 2—W A, a man aged 56, had pain in the back for eight years following a back injury. Sciatic radiation involved the leg and the foot in the left first sacral distribution. There was paresthesia and an absent ankle jerk on the left. The laminae arches of the fourth and fifth lumbar vertebrae were removed and careful inspection of the usual regions revealed no evidence of a herniated disk. The sensory portion of the left first sacral root was sectioned. A good result was obtained and the patient was relieved of his pain.

The iodized oil roentgenogram is shown in figure 7.

CASE 3—W S, aged 51, experienced gradual loss of strength in the lower extremities for four months accompanied by pain and numbness in both feet and legs and pain along the sciatic course in both thighs. The spinal fluid protein was 130 mg per hundred cubic centimeters. An iodized oil study showed the defect seen in figure 8. A later study also showed a defect at the eleventh dorsal vertebra which was felt to

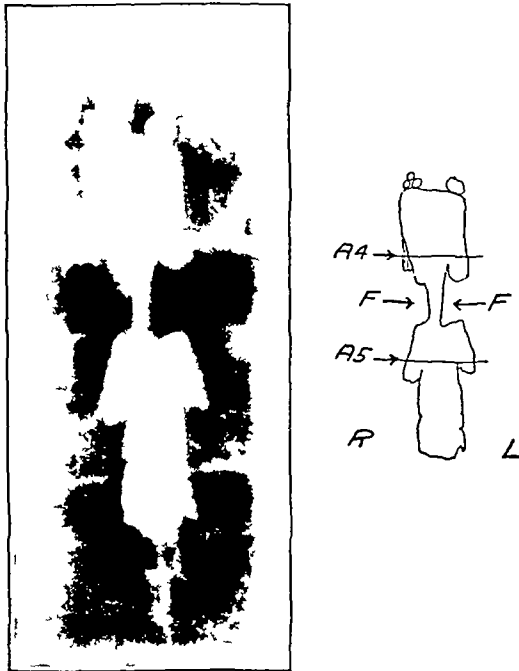


Fig 7—False defect. A good example of a constriction between two pairs of axillary pouches without pathologic significance. *A<sub>4</sub>* and *A<sub>5</sub>* region of axillary pouches at the fourth and the fifth lumbar vertebra respectively. *F* false defect the formation of which is clarified by an analysis of figure 3.

tially opened or a sensory root sectioned in a location that was thought to be in keeping with the distribution of the pain.<sup>11</sup> This relief of symptoms was not only fortunate for the patients but raises some interesting speculations. In group D and also in this group of false iodized oil defects, except for the patient who proved to have an aneurysmal varix of the cord one might deduce that causes other than herniated disk may occasionally be responsible for root pain at the fourth and fifth lumbar vertebrae and the question of constriction of the nerve in the intervertebral canal following injury to the spine again intrudes itself. Two of these patients presented an absent ankle jerk. It may be recalled in this connection that a traumatic neuralgia of an intercostal nerve following an injury of the dorsal spine occasionally occurs. At any rate when a patient gives a fair or good history for herniated disk and exploration proves negative the question of management becomes acute. We feel that a partial unroofing of the intervertebral canal of the root or roots in question is indicated. The results have been as favorable as when a herniated disk is found and removed.

A brief account of the cases in this group is given. We feel that this type of case will be encountered from time to time and deserves further consideration because it constitutes a more puzzling problem than a straight forward herniated disk.

The speculations aroused concerning the relief of symptoms in those earlier patients who presented posi-

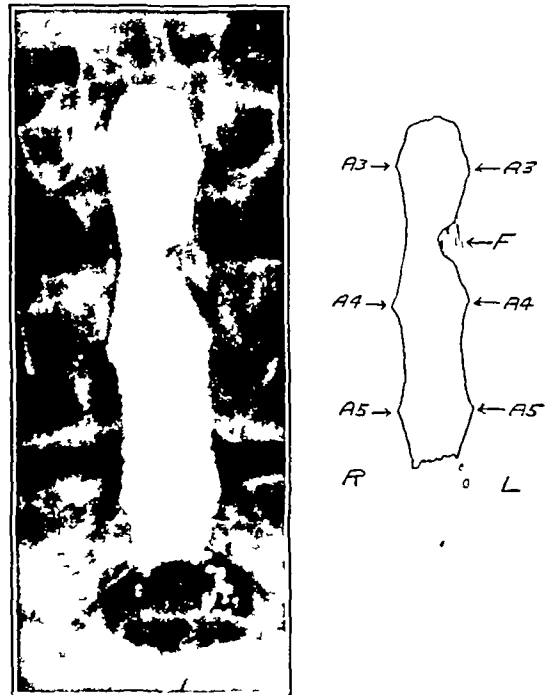


Fig 8—False defect. This artefact between the axillary pouches *A<sub>3</sub>* and *A<sub>4</sub>* on the left might easily be misinterpreted but its location contraindicates herniated disk and illustrates the importance of the axillary pouches as landmarks.

be a tumor. The canal from the second lumbar to the sacrum was examined and no evidence of herniated disk found. At the eleventh dorsal vertebra an aneurysmal varix was disclosed.

The iodized oil roentgenogram showing an artefact between the third and fourth lumbar roots on the left is shown in figure 8.

11 We have now for some time abandoned the practice of cutting sensory roots because decompression of only appropriate roots in these cases has been followed by good results.

CASE 4—D J, aged 42, had low back pain for a year and a half following a back injury. There was sciatic radiation on the left side involving the leg, ankle and foot. There was no exaggeration of pain on coughing and sneezing and no diminution of ankle jerk but there was a mild hypesthesia over the entire left leg.

The column of iodized oil showed a large unilateral defect between the axillary pouches of the second and third and an hour glass constriction between the pouches of the third and fourth lumbar vertebrae. There was no defect at any axillary pouch.

The usual regions were carefully examined from the second lumbar to the first sacral vertebrae and no pathologic condition of the disks was found. There were some unusually large extradural veins on the left from the second to the fifth lumbar vertebrae which, judging from their proximity to the emerging roots, may possibly have had some significance. The intervertebral canals on the left side were partially decompressed. The result was nevertheless good and the patient was relieved of pain.

CASE 5—B J, aged 55, had pain in the right hip radiating to the right knee and ankle of five and a half months' duration. The pain was accentuated by heavy lifting but not on coughing or sneezing. The ankle jerk was not lost. On the whole the history and examination were equivocal for herniated disk.

The column of iodized oil showed what appeared to be a definite unilateral defect on the right and above the axillary pouch below the fourth lumbar. The pouch was not directly involved. Applying what we had learned about iodized oil indications, it was our feeling that the defect was an artefact. The laminae arches of the third, fourth and fifth lumbar vertebrae were removed and the usual regions carefully inspected without disclosing any pathologic condition of the disks. The intervertebral canals on the right side were partially decompressed. The result was good and the patient was relieved of pain.

#### COMMENT

*Etiology*—Trauma to the spine undoubtedly plays an important role. The trauma usually manifests itself as a sudden severe pain or "catch" in the lower part of the back at a time when the patient is lifting a weight less often from a twist or fall. The mechanism is one in which a great compressive force is exerted on the intervertebral disks by compression and flexion of the spine. The mechanism is probably responsible for the overwhelming incidence of the pathologic condition at the disks below the fourth and fifth lumbar vertebrae. The leverage is greatest at these points and the articulating planes of the facets are in the sagittal plane. Spurling and Bradford<sup>12</sup> report that 90 per cent of the herniated disks in their series occurred below the fourth or fifth lumbar vertebrae. Spurling and Grantham<sup>13</sup> later reported 99 per cent. Robinson<sup>10</sup> reported 95 per cent of 75 cases. The incidence at the fourth or fifth lumbar vertebra comprised 92 per cent of our 50 cases.

We feel that the initial event in the development of a herniated disk is a severe compression of the nucleus pulposus between the cartilaginous disk plates. This may occur with or without a rotary shearing of the articular facets. If the latter injury occurs, the patient is struck with a severe pain in the lower part of the back that may occasion his stay in bed for a few days or weeks. In any case the injury to the nucleus pulposus causes a loss of its integrity followed by sequestration and desiccation. The resulting material under ordinary stresses and strains is subject to gradual herniation through the annulus fibrosus and through

the weakest place in the posterior longitudinal spinal ligaments, which is at their lateral margins. Hence we feel that the herniated disk with its attending root signs and symptoms is a by-product of a back injury and requires time to develop after the injury. Most of our patients have clearly differentiated between the injury associated with low back pain and the subsequent development of radiating root pain. Even in the minority of patients who describe the root pain as being coincident with the back injury we are inclined to feel that there has been a preceding back injury. Indeed, some patients describe repeated "catches" in the back while lifting and which ultimately come to be associated with pain radiating to the leg and foot. The repeated strains serve to enhance the herniation of an already disintegrated nucleus pulposus. Mixer and Barr<sup>14</sup> reported that back pain preceded the leg pain in 48 per cent of 123 cases.

Ultimately the nuclear material may actually rupture the posterior longitudinal spinal ligament in the line of its fibers and extrude itself into the spinal canal. So completely has the nucleus become sequestered in some cases that one of us (O. H.) by grasping the exposed portion with forceps has been able to extricate the mass in toto from its bed between the cartilage plates, leaving a cavity lined by smooth glistening walls.<sup>15</sup> There appears to be some confusion in the use of the terms herniation and rupture. We choose to refer to any pathologic protrusion of the disk as a herniated disk. It may be ruptured or unruptured depending on whether or not it has in part or entirely extruded itself through the posterior longitudinal spinal ligament.

A history of back injury is given by various authors as occurring in the following percentage of cases: Mixer<sup>16</sup> 60 per cent, Love<sup>17</sup> 58 per cent of 500 cases, Mixer and Barr<sup>14</sup> 49 per cent of 123 cases and in our series 78 per cent of our cases.

*Ligamentum Flavum*—We have not encountered a case in which we felt that a hypertrophied ligamentum flavum was an entity or responsible in itself for root pain. It is an unyielding bulwark against which the herniated disk pinches an emerging root, and after carefully dissecting and studying the ligament in a number of cases we are not convinced that it plays any other pathologic role. Even if it should be hypertrophied, in the absence of a herniated disk we do not believe that it could be responsible for root pain.

Horwitz<sup>18</sup> in an anatomic study of 75 human cadavers found no instance in which the ligamentum flavum exerted undue pressure on the caudal nerve roots. Apparent forward bulging of the ligament which constricted the intervertebral foramen was found between the fifth lumbar and the first sacral vertebra in 4 specimens and between the fourth and fifth lumbar vertebrae in 2 specimens. The bulge was found to be due to advanced proliferation of the articular facets of the apophyseal joints and not to be hypertrophy of the overlying ligamentum flavum. Love says "The important point to remember about the ligamentum flavum is that although it may be of sufficient size to compress

14 Mixer William J and Barr Joseph S. Protrusion of the Lower Lumbar Intervertebral Disks. New England J Med 223 523 529 (Oct 3) 1940.

15 We refer to this in operating room parlance as a ripe disk.

16 Mixer William J. Rupture of the Lumbar Intervertebral Disk. An Etiologic Factor for So Called Sciatic Pain. Ann Surg 106 777 787 (Oct) 1937.

17 Love J. G. and Walsh M. N. Intraspinal Protrusion of Intervertebral Disks. Arch Surg 40 454 484 (March) 1940.

18 Horwitz Thomas. Lesions of the Intervertebral Disk and Ligamentum Flavum of the Lumbar Vertebrae. An Anatomic Study of Seventy Five Human Cadavers. Surgery 6 410 424 (Sept) 1939.

12 Spurling R. Glen and Bradford F. Keith. Neurologic Aspects of Herniated Nucleus Pulposus at the Fourth and Fifth Lumbar Interspaces. J A M A 113 2019 2024 (Dec 2) 1939.

13 Spurling R. Glen and Grantham E. G. Neurologic Picture of Herniations of the Nucleus Pulposus in the Lower Part of the Lumbar Region. Arch Surg 40 375 388 (March) 1940.

the nerve roots, causing intractable pain, this phenomenon without an associated protrusion of the disk is rare."

**Clinical Symptoms and Signs**—The typical unequivocal case may be described as follows. The patient tells of an injury to his back some months or years before. The suddenly acquired low back pain may have been severe enough to require a few days in bed and has never completely subsided. There may have been subsequent sharp pains in the lower part of the back associated with heavy lifting but in any case some time later he experiences a new type of pain which he describes as radiating down the back of the thigh and then to the calf and some part of the foot or ankle. The pain is toothache-like in character and may be augmented by sharp jabs when certain positions are assumed. Paresthesias are experienced in the leg or foot in the form of numbness or "pins and needles." Coughing and sneezing exaggerate the pain.

The patient walks with a stiffened back, obviously uncomfortable and with a slight list usually toward the painful side. The list may be away from the painful side. He sits down slowly on the opposite buttock favoring the painful leg. On examination movements of the back are limited in all directions and the erector spinae muscles are spastic, particularly on the painful side. The straight leg raising test is positive, especially on the same side and accompanied by pain. The region of the sciatic nerve and the calf muscles are tender. Motor strength of the lower extremities is usually unimpaired. Sensation is unimpaired but a mild hypesthesia to light touch may be discerned over the lateral aspect of the leg or at some place on the foot or ankle. The knee reflexes are equal, but the achilles tendon reflex on the painful side is absent or diminished. Under such circumstances one can make a diagnosis of herniated disk below the fourth or fifth lumbar vertebra. Good clinical descriptions of herniated disk are given by Macey,<sup>19</sup> by Spurling and Grantham<sup>13</sup> and by Mixer.<sup>16</sup> The last mentioned gives an account of the earlier literature.

Many cases will not be typical, however, but will present only some of the elements of the syndrome. The syndrome may be considered as that resulting usually from a compression of the motor and sensory fibers of a single nerve root. The severity of the pain and motor signs depends on the severity of the compression. Of all the symptoms and signs we feel that the location and character of the radiating pain particularly when accompanied by paresthesia is the most important and should lead to the diagnosis of small laterally placed disk herniations.

Spurling and Grantham<sup>13</sup> and Spurling and Bradford<sup>12</sup> feel that the ankle jerk is uninvolved if the disk is below the fourth lumbar and that it is diminished or absent if the disk is below the fifth lumbar vertebra. Our experience does not agree with this statement (as shown in the analysis of cases). We feel that the ankle jerk may or may not be involved in the event that a disk is at either the fourth or the fifth lumbar vertebra and that involvement depends on how severely the motor root is compressed. Pain undoubtedly precedes any involvement of the ankle jerk.

Although the radiating pain involved the leg or foot in all our cases, Mixer and Barr<sup>14</sup> report pain in the thigh in only 13 per cent of their cases. It involved the calf in 66 per cent and the foot in 21 per cent.

**Lumbar Puncture**—A herniated disk at the fourth or the fifth lumbar vertebra will be caudal to the usual lumbar puncture and hence even if it should be a large herniation it would not impair the measurable dynamics of the spinal fluid. Even though the protein content of the fluid is higher than 45 mg per hundred cubic centimeters in 17 per cent of our cases we do not feel that this fact has been particularly helpful. In a series of protein determinations on what we believe to be normal spinal fluids the fluctuation in values was very similar to that in our disk cases. Barr, Hampton and Mixer<sup>9</sup> state that increased protein may result from irritation of nerve roots without necessarily having a block. Hence an examination of the first fraction of fluid withdrawn may show more protein than the second fraction.

#### THE OPERATION

Cases have been reported by Love<sup>20</sup> and by Hambly<sup>21</sup> in which the disk herniation was removed without removal of any bone. Removal of the ligamentum flavum provided sufficient exposure. At most in many cases they make only a partial removal of the lateral half of a laminal arch. Such minimal exposures are commendable and at times have proved satisfactory in our hands also. We prefer, however, to chip away a portion of an entire laminal arch. If the disk is between the fifth lumbar and the first sacral the lower margin of the laminal arch of the fifth lumbar vertebra is chipped away and the ligamentum flavum on both sides removed widely. If the disk is between the fourth and fifth lumbar vertebrae the lower margin of the fourth and the upper margin of the fifth are rongueured away. In our experience the herniation usually lies in part under a laminal arch, and in some cases it has rested entirely under it so that it was not exposed until the arch was entirely removed. This has been especially true of herniated disks that have rested under the laminal arch of the fifth lumbar vertebra. Recently in searching for a disk we rongueured away the lower third of the fifth arch and then its upper third leaving only the middle third as a rim. Finally and not until this was removed could a small laterally placed disk be disclosed. Furthermore the apparently thorough decompression which had been made would not have been effective in relieving the involved fifth lumbar root had the further exploration not been made. Although the relation of the herniated disk to a nerve root is constant its relation to the laminal arches is not always exactly the same. The total removal of the fourth and fifth lumbar laminal arches has in no way incapacitated our patients if the articular facets have been left intact. We would sound a note of caution against too great stress on minimal exposures, particularly when the exploration is made on the basis of clinical findings only and without the aid of visualization with iodized oil. While we begin the operation with a minimal exposure we do not hesitate to enlarge it in the interest of a thorough exploration even to the removal of three laminal arches if warranted by the history and clinical findings.

Often the herniated portion of the disk is quite laterally situated and unless the exploration is carried far laterally clear to the intervertebral canal such a lesion may be overlooked. Palpation of these locations with the index finger will ordinarily betray small herniations but if one is in doubt it is well to retract the

20 Love J G. Removal of Protruded Intervertebral Disks Without Laminectomy. Proc Staff Meet Mayo Clin 14:800 (Nov 8) 1939. Love and Walsh.<sup>1</sup>

21 Hambly W B. The Interlaminal Disk at the Fourth and Fifth Lumbar Interspaces. Surg Gynec & Obst 71:344-346 (Sept.) 1940.

19 Macey Harry B. Clinical Aspects of Protruded Intervertebral Disk Arch Surg 40:433-443 (March) 1940.

root in question and explore the disk up to the point where the nerve enters the intervertebral canal. After the ligamentum flavum between the fifth lumbar and the first sacral arches has been thoroughly removed one can usually palpate a hump with the finger tip just under the first sacral arch. This is a normal configuration of the body of the first sacral vertebra and should arouse no concern.

While there will be the occasional case in which the lesion is best exposed between a root and the dural cul-de-sac, the most effective maneuver is retraction of the nerve root mesially. There are three reasons for this. The maneuver usually provides greater exposure of the herniated disk, small disks are often quite laterally situated and there is often a rich plexus of veins in the "axilla" which the root makes with the cul-de-sac and which gives troublesome bleeding when disturbed.

If the posterior longitudinal ligament is not already ruptured it is incised or the dome of the protrusion uncapped and all available sequestered disk material curetted away. When a herniated disk is found on one side, the ligamentum flavum on the opposite side is removed and that side carefully explored also. Such an exploration has in some cases revealed an early herniation which, though symptomless at the time, may well have produced symptoms later on.

If iodized oil has been injected, a small incision is made in the dura at the conclusion of the operation and the oil is allowed to escape, being aided by elevating the head of the operating table upward.

The average patient is kept in bed two weeks and then allowed up as tolerated. He is cautioned not to lift heavy objects or strain his back for two months.

We have not felt that spinal fusions are indicated after removal of an uncomplicated herniated disk, but in view of our premise of initial back injury we should not become oblivious to its consideration. At present an evaluation of the role played by a back sprain and that played by a herniated disk in the causation of low back pain is difficult. Perhaps more follow-up studies will be helpful. In any case it is probably well to solicit the judgment of the orthopedist in this particular matter.

#### RESULTS

The results following extradural removal of herniated disk have been excellent. The patient usually realizes that he is free from what was a very agonizing and incapacitating pain as soon as he recovers from the anesthetic. The relief of this type of root pain is in many ways comparable to and as spectacular as the relief of the pain of *tic douloureux* following a partial section of the sensory root of the fifth cranial nerve and marks a decided advance and achievement in the neurologic surgery of pain syndromes.

One patient in our series extending over a period of three years returned complaining of a recrudescence of his former pain. A herniated disk below the fifth lumbar vertebra on the right side had been removed three months previously. Reexploration revealed that the region from which the pathologic material had been removed was in excellent order. There was no recurrence of the herniation. The intervertebral canal at that location was then partially unroofed. The patient has again been free from pain to the time of writing (three months).<sup>22</sup> It was interesting to find that healing of the wound was exceptionally good and the scar tissue formation over the spinal canal very dense. The

scar tissue was not especially adherent to the dura, however, and the plane of cleavage could be easily effected.

#### PART II THE REFLECTED SCIATIC PAIN, THE DIFFERENTIAL DIAGNOSIS BY THE PROCAINE TEST

The phenomenon of referred sciatic pain is most strikingly represented in the clinical syndrome of the herniated intervertebral disk. In our series the percentage of correct diagnosis of this condition, as proved by biopsy, was high (90 per cent), but this high average can be attained only by insisting strictly on certain diagnostic prerequisites over and above the radiating sciatic pain, these are the traumatic pathogenesis, the neurologic signs and the visualization of the disk by x-ray examination. In other words, the diagnosis must be positive and confirmed by the presence of pertinent symptoms rather than by exclusion.

Sciatic pain due to pressure of the disk on the sensory spinal root is of mechanistic origin. So also is sciatic pain from certain other causes for instance in arthritis or in congenital anomalies of the spine, in which it results from narrowing of the intervertebral foramina and encroachment on the spinal nerves. There is, however, this difference between the two situations. We have little or no anatomic proof of the compression of nerve roots by the intervertebral foramina in arthritis, except in solitary instances in which the anatomic distribution motor and sensory, of a single nerve root absolutely identifies the condition, whereas in the case of the protruded disk not only is there a definitely established anatomic entity but the relief which follows the removal of the disk proves that it actually is the pain producing agent.

Thus the student is in the fortunate position to develop a very definite clinical pathologic picture based on authenticated cases. We notice particularly that the sciatic radiation is by no means all that is necessary to make the diagnosis of a ruptured disk, the mode of onset, the distribution of any paralysis, the type of pain and the presence of concrete disturbances (paresthesias, reflexes, touch and so on), indicating compression of a peripheral nerve, and finally the visualization of the disk in the roentgenogram, are all essential diagnostic features.

It is this careful reservation that the diagnosis of compression or referred pain must be contingent on more concrete evidence than mere radiation which has opened the way for a real discrimination in interpreting sciatica. For one thing it has done away with the one time cherished mechanistic concept that all sciatica is the result of mechanical pressure and that there is no other possibility of its origin.

There is, indeed, another possible source of the pain phenomenon, namely that it is of reflex origin. By this is meant that the pain impulse travels from a peripheral point, in this case the strained soft structures of the back, centripetally to the spinal cord, and makes then synaptic contact with other sensory units at different levels and with different anatomic distribution, with the result that pain sensation is recorded in the territory of the second unit.

If such a type of reflected sciatic pain is found to exist, it must be carefully differentiated from that kind of referred sciatic pain which is due to direct pressure acting on the posterior roots or on any other point of the peripheral nerve.

<sup>22</sup> See discussion under Group E False Iodized Oil Defects

The reflex character of such a sciatic pain can be proved only if the reflex arc can be interrupted at the point of the primary local irritation, in this case the soft tissue lesion in the back, and if such an interruption immediately and absolutely abolishes the radiation along the sciatic nerve.

In the case of the low back pain this is facilitated by the fact that many patients show so-called trigger points, that is, small, strictly localized and distinctive areas of pain on pressure (fig 9). These are most frequently the lumbosacral junction, the posterior superior iliac spine, the gluteal insertion at the outer posterior rim of the ilium and the posterior border of the tensor fasciae.

Anatomy teaches us that all these structures as well as all ligamentous, tendinous and aponeurotic structures of the lower part of the back receive their sensory innervation from the posterior primary division of the lower lumbar and of the sacral nerves. The sciatic trunk, on the other hand, composed of the last two lumbar and first three sacral roots, is entirely constituted by the anterior primary divisions of the spinal nerves. There is no communication between the two territories of the anterior and the posterior primary division, and any synaptic connection between these two systems must occur not lower than in the spinal ganglions or, more likely, in the spinal cord itself through the lateral horns and the spinothalamic pain conducting tract.

For the past five years we have been able to prove that some sciatic radiations associated with low back pain are of this purely reflex character. This proof is furnished by producing or intensifying sciatic radiation by simple stimulation of the circumscribed painful area in the back and, furthermore, by the fact that infiltration with 5 to 10 cc of a 1 per cent solution of procaine hydrochloride into this area at once abolishes the sciatic radiation. It thus has become established that among cases of sciatic radiation there are some which have nothing to do with mechanical irritation of the posterior roots but are caused by local pain centers at the back, which excite by reflex routes other pain centers in the cord, situated at different levels, and the stimulation of which is recorded as sciatic neuralgia.

Clinically there is a difference between this type of neuralgic sciatic pain and the radiation due to direct posterior root irritation such as exists in herniated disks. First and foremost of all, the reflex sciatic pain is purely neuralgic and there are no signs of disturbances of other sensory qualities: no paresthesias, anesthesias or changes in the deep reflexes.

Second, the radiating pain follows the local back pain, often only after later attack, as a sort of cumulative effect of afferent pain impulses, and, third, there is no strict anatomic distribution of the radiation such as is seen in herniated disk and the pain does not reach into the sole or heel of the foot.

In none of the cases of purely reflex sciatica, so proved by a positive procaine test, was there paresthesia, anesthesia, loss of reflexes or anatomic extension of radiation to the outer side of foot or heel.

#### HOW THE PROCAINE TEST IS TO BE CARRIED OUT AND HOW IT IS TO BE INTERPRETED

The test is to prove the connection between local back pain radiation. Hence no patient is eligible for it unless there is a distinct trigger point present and he does show definite radiation. We use 1 per cent solution of procaine hydrochloride without epinephrine and inquire of the patient if he has any idiosyncrasy to procaine.

Since most of them have had teeth extracted at some time or other, they are able to give this information.

While the patient is on the table in the prone position, the trigger point is marked with mercuric iodine and the field is swabbed with half strength iodine benzene solution. The skin is anesthetized with a few drops of procaine hydrochloride solution and a long lumbar puncture needle is then inserted through the soft tissues to the periosteum. The fascia and sheath are then poked through in several places until the patient volunteers the information that he feels not only pain at the trigger point at the back but also a definite radiation down his leg.

After injection of 6 to 10 cc the trigger point must have disappeared and the patient states that the radiating pain down his leg likewise has vanished. The patient is then told to turn over and to lift the affected limb, knee extended. He is surprised to find that he can lift it without pain as well as he can the other limb. He is then told to get off the table and to walk. He now finds that he can walk with ease, can bend forward though he still may retain his lateral list.

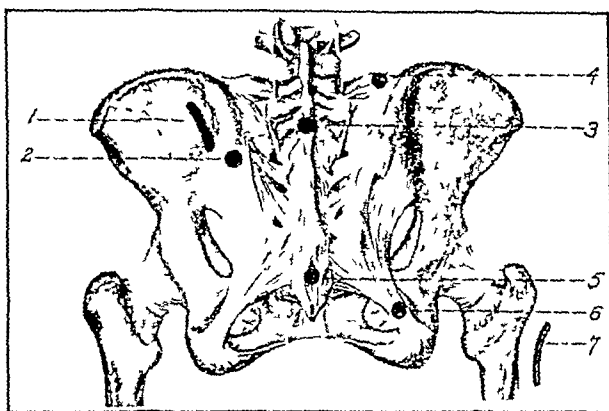


Fig 9—Pressure points of lumbosacral syndromes: 1 Gluteus maximus syndrome 2 Sacrospinous syndrome 3 Sacrolumbar syndrome 4 Transversosacral syndrome 5 Sacrococcygeal syndrome 6 Sacrotuberous syndrome 7 Tensor fasciae

We place a good deal of emphasis on avoiding any suggestions and on having the patient himself volunteer his expression of relief. Every possible chance of auto-suggestion should be eliminated and the patient should not know beforehand what relief to expect. The surprise element is a valuable sign of good faith. The patient is then told that he may expect the relief to last pending the action of procaine and no longer, and this may be a matter of hours or of days.

We are particularly anxious to see that the relief both local and of the radiation, is complete. There is no such thing as a partially positive procaine test. It is either strikingly positive or negative or noncommittal. We lay emphasis on the point that the patient is genuinely surprised, really taken aback, over the fact that he can raise his leg as high as the other, that back and sciatic pain have completely disappeared, that he bends over without trouble and that he can walk without discomfort.

The patient then is warned that with the wearing off of the procaine effect the pain, both local and radiating, will return. The free interval may last from several hours to several days. After this time the patients complain that the pain has returned "worse than ever." There is no reason for the returning pain being more intense than the original one. But the patient having enjoyed a brief spell of complete relief, keenly resents

the return of his complaint, against which he has to build up his tolerance a second time

As soon as the pain is under control by virtue of the procaine injection it seems best to start treatment without delay. Traction in bed in a direction corresponding to the position the patient assumes in standing (usually with the hip slightly flexed), together with hot packs and massage for the contracted back muscles, cathartics and acetylsalicylic acid is the standard treatment

The patient should remain in bed until the spontaneous sciatic pain has disappeared and until he is able to roll over in bed without any discomfort. He is then ready to be up, but on crutches only, and after he has been fitted with a proper support

In all cases of sacrolumbar strain and in cases of recurrent sacrospinalis strain we prefer the brace. A type which reaches just below the shoulder blades and has a pelvic and suprailiac cross band and a snug leather apron in front has served us best

In cases of complicating spinal arthritis a brace should be used which reaches higher up and is provided with shoulder straps

In cases of more acute sacrospinalis sprains, gluteal sprain and sprain of the fascia lata we prefer a corset supplied with a sacroiliac pad and reaching far enough downward to cover the gluteal region and the upper part of the thigh

In some cases in which hospitalization was impossible or inadvisable we have applied hip spicas reaching from the mamillary line over the affected side to the ankle, but no attempt is made to correct the asymmetrical position, either the forward flexion deformity or the lateral deviation. The cast is applied to the patient "as is"

Weight bearing on the affected leg is started very carefully and slowly, with the patient still on crutches, and the latter are discarded only when the patient himself is sure of the weight tolerance of the affected leg and then only for guardedly increased periods

We practice the treatment of the contracted muscle masses from the beginning. While the patient is in bed the muscles are relaxed by hot packs and light massage, while the patient is up on crutches vigorous massage and later graded exercises are instituted

#### REPORT OF CASES

(a) *Sacrospinalis Syndrome*—CASE 1—P H, aged 17 years, had pain and stiffness of the back with radiation to the right thigh following occupational strain of two months' duration and sciatic scoliosis. A trigger point was present in the right posterior superior spine. Reflexes were normal. Kernig's sign was present. Procaine into the trigger point gave a positive test. Conservative treatment (as described), traction, corset and physical therapy, was employed. Complete relief was obtained. Observation has been continued for three years

CASE 2—L McC, aged 58, had low back pain with sciatic radiation on the left side to the foot for seven months. A trigger point was present in the left posterior superior spine. Kernig's sign was present. Reflexes were normal. Procaine into the trigger point gave a positive test. Conservative treatment (traction, support and physical therapy) effected complete relief. The patient has been under observation for two and one-half years

CASE 3—E B, aged 49, had low back pain with right sciatic radiation to the leg from strain. A trigger point was present in the right posterior superior spine. Kernig's sign was present on the right. Reflexes were normal. Procaine into the trigger point gave a positive test. Conservative treatment (corset and physical therapy) led to considerable improvement with only occasional pain. The patient has been under observation for two years and nine months

CASE 4—E M, aged 31, had low back pain with sciatic radiation on the left side to the leg for three months. A trigger point was present in the left posterior superior spine. Kernig's sign was present. Reflexes were normal. Procaine into the trigger point gave a positive test. Conservative treatment (corset and physical therapy) gave complete relief. The observation time has been one year

(b) *Lumbosacral Syndrome*—CASE 5—C R C, aged 25, had pain in the back and radiation in both thighs for eleven months following strain. A trigger point was present in the sacrolumbar junction. Kernig's sign was present. Reflexes were normal. Procaine into the trigger point gave a positive test. Conservative treatment (braces and physical therapy) gave complete relief. The observation time was one year and eight months

(c) *Combined Lumbosacral and Sacrospinalis Sprain*—CASE 6—I A K, aged 32, had low back pain and gluteal radiation with numerous recurrences for eleven years following a fall. A trigger point was present in the sacrolumbar region and right posterior superior spine. A bilateral Kernig's sign was present. Reflexes were normal. Procaine into the trigger point gave a positive test. Conservative treatment (corset and physical therapy) gave complete relief. Observation time was two years

(d) *Combined Sacrolumbar and Tensor Fasciae Strain*—CASE 7—B M, aged 33, had recurrent low back pain with left sciatic radiation to the ankle for five years following strain. A trigger point was present in the left posterior superior spine, tensor fasciae. Left Ober and Trendelenburg tests were positive. Reflexes were normal. Procaine into the trigger point gave positive tests with disappearance of the Ober and Kernig signs. Conservative treatment (corset and physical therapy) gave complete relief. Observation time was three years

(e) *Sacrobuterous Syndrome*—CASE 8—C J S, aged 49, had low back pain, bilateral sciatic radiation, following a fall, for eight months. A trigger point was present in the sacrotuberous ligament. Kernig and bilateral reflexes were normal. Procaine into the trigger point gave a positive test. Conservative treatment (corset and physical therapy) resulted in considerable improvement

(f) *Sacrospinalis Syndrome in Osteoarthritis*—CASE 9—M L A, aged 38, had recurrent low back pain with left sciatic radiation to the knee for seven years. A trigger point was present in the left posterior superior spine. Kernig's sign was present. Reflexes were normal. Procaine into the trigger point gave a positive test. Conservative treatment (brace and physical therapy) resulted in improvement. Observation time was thirteen months

(g) *Gluteal Syndrome*—CASE 10—E D, aged 45, had low back pain with left sciatic radiation to the calf for two years. A trigger point was present in the left gluteal region. Kernig's sign was present. Reflexes were normal. Procaine into the trigger point gave a positive test. Conservative treatment (corset and physical therapy) gave complete relief. Observation time was three months

CASE 11—M F, had low back pain with left sciatic radiation for one year following strain. A trigger point was present in the left gluteal region (posterior superior spine). Kernig's sign was present. Reflexes were normal. Procaine into the trigger point gave a positive test. Conservative treatment (traction, brace and physical therapy) gave complete relief. Observation time was four months

#### STATISTICAL REVIEW

One hundred and seventeen cases of low back pain with radiation and a positive procaine test were observed

*End Results*—Criterion. Continuous relief from immobilization by traction, casts, braces or operative fusion

Complete relief, 95 cases (85 per cent)  
Partial relief, 18 cases (12 per cent)  
No relief, 4 cases (3 per cent)



## SUMMARY

1 Conditions of a positive procaine test are as follows

(a) The case must be suitable for the test by showing a definite trigger point at the back and sciatic radiation

(b) Insertion of the needle must increase the local pain as well as the radiation (voluntary information)

(c) Injection of procaine must abolish the local trigger point as well as the radiation and the Kernig sign must disappear (voluntary information)

(d) Precautions should be taken against any auto-suggestion by the patient

(e) The procaine test should not be accepted as proof unless it is strikingly positive

## 2 As to Treatment

(a) A positive procaine test promises the success of immobilization

(b) In most cases conservative immobilizing measures suffice (traction, plaster, brace, cast)

(c) In some cases operative fixation (fusion) is necessary

(d) In cases of strain of the fascia lata (positive Ober sign and tender point at fascia) the Ober operation is successful

(e) Physical therapy in the form of hot packs massage and graded exercises is an essential adjunct to the treatment

## CONCLUSIONS

1 Low back pain accompanied by sciatic radiation may be due to

(a) Lumbosacral root compression A herniated intervertebral disk is the commonest causal factor The pain is referred and is ordinarily accompanied by other symptoms and signs of nerve root compression that are of diagnostic significance If a tender locus is present over the lower part of the back, sacrum or buttocks, local anesthetization of the locus will not abolish the symptoms or signs

(b) Myofascial trauma The radiating pain in this case is reflected and unaccompanied by symptoms and signs of spinal root compression If a tender locus (trigger point) over the lower part of the back, sacrum or buttocks is present, local anesthetization (procaine test) will abolish the pain temporarily and thus indicate the causal factor

Hence the procaine test is an additional valuable test in the differentiation of referred and reflex "sciatica"

2 Herniated intervertebral disk below the fourth or fifth lumbar vertebrae ordinarily invokes such a definite syndrome that myelography is seldom necessary to establish the diagnosis In the occasional equivocal case in which myelography is desired, iodized poppy seed oil is the medium of choice If 5 cc of the oil is used, the smallest, laterally placed herniations will be indicated in the roentgenogram in a very high percentage of cases

3 In a small percentage of patients who present definite symptoms and signs of root compression, including an absent achilles tendon reflex, no herniated disk, concealed or otherwise, is found In this type of patient we advise complete removal of the fourth and fifth lumbar lamina arches and their accompanying ligamenta flava and partial unroofing of the intervertebral canals of the fifth lumbar and first sacral roots The results in this type of patient following such a decompression have been very encouraging

## DECOMPRESSION OF PROTRUDED INTERVERTEBRAL DISKS

WITH A NOTE ON SPINAL EXPLORATION

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Exploration of the cauda equina in the region of the fifth lumbar vertebra for intractable low back and sciatic pain is now frequently performed by neurologic surgeons<sup>1</sup> For properly selected patients operation usually yields prompt and persistent relief from severe pain<sup>2</sup>

However, further refinement in technic is suggested by the appreciable percentage of patients who suffer persistent or recurrent minor discomfort in the back As emphasized previously,<sup>2</sup> exploration should be adequate and usually should include the anterior aspect of the spinal canal both above and below the fifth lumbar vertebra not only in the midline but also far laterally near the intervertebral foramen on each side At the same time the less laminar bone removed the more prompt will be convalescence and the less likely subsequent minor backache Furthermore while operation should be extensive enough to yield relief from pain, it should at the same time minimize the risk of recurrent symptoms In this paper I present two suggestions which have proved helpful, namely, the interlaminar approach to the spinal canal after bilateral stripping of the sacrospinalis muscle from the spinous processes and laminae and decompression of small intraspinal protrusions of intervertebral disks without removal of any of the disk structure

## INTERLAMINAR EXTRADURAL EXPLORATION OF THE SPINAL CANAL AFTER BILATERAL STRIPPING OF THE SACROSPINALIS MUSCLES

Interlaminar exploration of the spinal canal was apparently first recorded by Love<sup>3</sup> and by Hamby,<sup>4</sup> who recommended unilateral stripping of the sacrospinalis muscle However, in most cases unilateral exposure of the spinous processes and laminae leads to certain technical difficulties In the first place there is considerable awkwardness in retracting the sacrospinalis group of muscles on just one side If a self-retaining laminectomy retractor of the Adson-Beckman type is used and the medial prongs are placed in the deep fascia, the retractor becomes rotated on its long axis and is awkward to manage, if the medial prongs are placed at the base of the spinous process the amount of exposure is appreciably diminished by the retractor itself If a retractor of the Hibbs type is used, the assistant's arm is in the way and there is a tendency for the patient to be pulled out of position on the operating table Because the exposure is so limited there is a considerable tendency for the surgeon to remove laminar structure in the region of the articular facets Naturally, if the facets are entered there is greater likelihood of instability of the vertebral structure at this level and, by the same token, greater risk of persistent backache Another important dis-

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<sup>1</sup> Love and Walsh<sup>6</sup> Dandy<sup>10</sup> Bradford and Spurling Barr and Mixer<sup>7</sup>

<sup>2</sup> Ecker Arthur Intraspinal Operations in Compensation Case J A M A **119** 128 130 (May 9) 1942

<sup>3</sup> Love J G Protruded Intervertebral Disks with a Note Regarding Hypertrophy of Ligamenta Flava J A M A **112** 2029 2034 (Dec 2) 1939

<sup>4</sup> Hamby W B The Interlaminar Removal of Protrusions of the Intervertebral Disk at the Fourth and Fifth Lumbar Interspaces Surg Gynec & Obst **71** 344 346 (Sept) 1940



advantage of the unilateral approach to the spinal canal is the unilateral exposure of the spinal surface of the disk. Many neurosurgeons of experience have had patients with protruded intervertebral disks who have been relieved of sciatic pain on one side and who have had recurrence of symptoms on the opposite side.

Although I had been Dr Love's first assistant when he did his first 6 cases of interlaminar approach to the spinal canal with the unilateral stripping of the muscles, in my own practice I had felt satisfied with this method in only 3 cases out of the first forty-five operations of this type which I performed. Furthermore, I had hesitated to strip the muscles on both sides because of the possibility of increasing postoperative discomfort. However, Bradford and Spurling<sup>5</sup> have clearly recommended that "even when a strictly unilateral laminectomy is performed or when the removal of no bone is contemplated, it is advisable to strip the erector spinae muscles bilaterally in order that a self-retaining retractor can be placed to best advantage." As a matter of fact, the bilateral stripping of the muscles causes no more postoperative discomfort than unilateral stripping. Ordinarily after the muscles have been stripped on both sides it is advisable to remove the interspinous ligament and perhaps a minute amount of adjacent spinous process. This method permits finger exploration of the anterior portion of the spinal canal, at least at the lumbosacral level, in most cases. Naturally the laminae can be nibbled with rongeurs as far as seems indicated.

Since carrying out bilateral stripping of the muscles routinely in cases of suspected protrusion of the intervertebral disk, I have been able to perform adequate exploration of the spinal canal without removal of any portion of the lamina in 5 out of 9 successive cases. In the other cases of this series there was only minimal removal of bone, and in no instance of this group were the articular facets exposed or a neural arch interrupted. This method permits the use of a self-retaining retractor and of the ordinary overhead operating room light. It permits thorough study of the intraspinal structures and especially the relationship of the disk to the nerve roots and laminae.

The importance of not opening the dura in these cases can hardly be overemphasized. In the first place, leaving the dural sac intact provides a fluid buffer against trauma to the affected nerve root<sup>6</sup> as well as to the rest of the roots of the cauda equina. In the second place, the pressure in the normally distended dural sac is invaluable in stopping bleeding from the epidural veins and may easily be supplemented by a small free muscle graft. Furthermore, it is highly desirable to avoid the introduction of blood in the subarachnoid space in avoiding not only immediate meningeal irritation but also the later development of adhesive arachnoiditis of the cauda equina. In addition, leaving the dura intact minimizes the risk of meningitis from an unsuspected tuberculous spondylitis or a possible postoperative infection of the wound. Finally the remote risk of postoperative development of extradural cyst (arachnoidal evagination) is obviated by leaving the dura intact. It may be asked whether midline protrusions of the intervertebral disks require transdural removal. It will be indicated later that midline protrusions of the disk rarely cause symptoms and in most

cases the disk structure should be left alone, especially if there is a bony ledge of vertebra above or below the protrusion. Naturally, the nerve roots should be adequately decompressed on each side.

When bilateral stripping of muscles and interlaminar exploration of the spinal canal are performed with or without removal of intraspinal protrusion of the intervertebral disk, patients have as little discomfort postoperatively as when the muscles are stripped from only one side. For example, they can turn themselves on a firm bed with little pain. Furthermore, if unable to empty the bladder when lying in bed, male patients may stand at the bedside, and female patients may sit on a bed pan twelve hours after operation. Convalescence is shorter than after laminectomy, and complaints of minor postoperative discomfort are appreciably fewer. A secondary operation could be performed fairly safely because the laminae are intact, and the periosteal elevator can slide along the bone with less danger of tearing the dura than if the bone has been removed.

#### DECOMPRESSION FOR SMALL OR MODERATE INTRASPINAL PROTRUSIONS OF INTERVERTEBRAL DISKS

When is a disk protruded? There is no question about massive protrusions of intervertebral disks which represent an intraspinal mass a centimeter or more in diameter. But these large tumors which are so gratifying to excise represent the minority of lesions disclosed at operation. Ordinarily the surgeon finds a disk which bulges more or less. Love<sup>7</sup> judges whether the disk is protruded or not by its resilience or consistency as well as by the associated changes in the nerve root—edema, inflammation and possible adhesions. Since the intervertebral disk normally has a certain amount of intraspinal bulge, I consider a disk protruded only if it bulges more when the lumbar spine is extended as a result of the anesthetist's lifting the shoulders of the patient. This increase of protrusion on extension of the lumbar spine may seem paradoxical when compared with the fact that most protrusions begin when the lumbar spine is in flexion. However, the original protrusion is caused by a tear in the annulus fibrosus. The additional protrusion, when the lumbar spine is extended, is caused by a tendency of the posterior portions of the bodies of the vertebrae to act as pincers.

It is not the protrusion of the intervertebral disk itself which causes sciatic pain but rather the compression of the nerve root between the disk and the posterior wall of the intervertebral foramen. As Barr and Mixer<sup>8</sup> state, "the lesion is laterally placed, usually directly beneath the articular facet." The problem, therefore, is to relieve the pressure from the nerve (or nerve root). In most cases pain produced by small and moderate protrusions of the intervertebral disk can be adequately relieved by removing the structure against which the nerve root is being displaced, namely the ligamentum flavum at its lateral extremity. Occasionally, in order to decompress the nerve root adequately, it is advisable to remove some of the articular capsule to which the lateral portion of the ligament is attached,<sup>9</sup> and adjacent portions of the laminae.

5 Bradford F K and Spurling R G The Intravertebral Disk Charles C Thomas Publisher Springfield Ill 1941  
6 Love J G and Walsh M N Intraspinal Protrusion of Intervertebral Disks Arch Surg 40 454-484 (March) 1940

7 Love J G Personal communication to the author June 1942  
8 Barr J S and Mixer W J Posterior Protrusion of the Lumbar Intervertebral Disk J Bone & Joint Surg 23 444-456 (April) 1941  
9 Naffziger H C Inman Verne and Saunders J B deC M Lesions of the Intervertebral Disk and Ligamenta Flava Surg Gynec & Obst 66 288-299 (Feb 15 no 21) 1938

The results in my complete series of 14 cases of definite protrusions in which this decompressive procedure has been carried out have been at least as favorable as in those cases in which the protruded portion of the intervertebral disk has been removed. In the immediate postoperative course there is less sciatic pain and tenderness because it has not been necessary to exert so much traction on the nerve root. When laminectomy is performed, I believe it best to require three weeks of postoperative hospitalization and three additional months before the patient returns to regular work. When an interlaminar excision is performed without removal of any portion of the intervertebral disk which may be more or less protruded, I have found just as good results by shortening each of these periods of time by one third. The late results in cases of protruded disk (which have been only decompressed) seem entirely satisfactory and there has been no recurrence of symptoms so far. One such patient underwent operation on Nov 20 1939 and has been working regularly as a truck mechanic without any discomfort ever since (twenty-nine months postoperatively at the latest report). The others have been followed for periods ranging from seventeen to two months. I hope that this method will minimize the incidence of recurrence of protruded intervertebral disk which is known to be at least 1 per cent<sup>6</sup> and is likely to be higher with the further passage of time. In 1 additional case there was intraspinal protrusion of the intervertebral disks both above and below the fifth lumbar vertebra. I removed the larger protrusion but not the smaller. The postoperative result both in terms of relief from pain and in restitution to work was excellent at the time of the latest report twenty-six months after operation.

Leaving a stretched annulus fibrosus and posterior longitudinal ligament seems more reasonable than tearing through them completely and opening the way for additional fragments of intervertebral disk to protrude into the spinal canal later. After all, the major portion of the disk itself is undisturbed, no matter how large the fragment removed at operation. Naturally, large intraspinal protrusions or fragments which have torn loose from their attachments should be excised.

Furthermore, at operation for suspected protrusion there is found occasionally a perfectly normal disk which does not bulge into the spinal canal even when the lumbar spine is extended by elevation of the shoulders. It has been suggested<sup>10</sup> that these "flat disks" are "concealed ruptured intervertebral disks." In some cases there is definite thickening of the ligamentum flavum. In others there may be compression of the nerve by dilatation of the veins<sup>11</sup> or by narrowing of the intervertebral foramen due to vertebral subluxation or proliferative bone changes.<sup>12</sup> In most such cases which are carefully selected and exploration done for protruded intervertebral disks and in which no protrusion is found there is relief following intra-

spinal exploration and decompression of the nerve root. There is no justification for excising a portion of intervertebral disk in any of these cases.

#### SUMMARY

The routine exploration of the spinal canal in the region of the fifth lumbar vertebra should be performed between the laminae after the erector spinae muscles have been retracted on both sides. This procedure has minimized postoperative discomfort and shortened the period of convalescence. Questionable slight and moderate protrusions of the intervertebral disk should be left alone and the overlying nerve root adequately decompressed. This procedure has yielded results as satisfactory as removal of the protruded portions of such disks and it may minimize the incidence of recurrence of symptoms.

Physicians Building

### TREATMENT OF IMPETIGO CONTAGIOSA WITH A NEW PHYSICAL FORM OF SULFATHIAZOLE

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The treatment of impetigo contagiosa presents a problem of considerable importance. The danger to the patient is by no means negligible, even after infancy and the great infectiousness and rapid spread of the lesions have always caused concern.

Until quite recently the therapy of impetigo was rarely considered in the medical literature. The two methods in general use were the application of solution of methylrosaniline and that of ammoniated mercury several times a day, with removal of crusts as they formed. Since the outbreak of the present war, however, there has been a sharp increase in the frequency of such investigations, and many studies of new methods of treatment of impetigo have been reported in the British literature. This is quite in keeping with the natural history of the disease, since its spread is favored by a deterioration in sanitation and by crowding. The heightened importance of the problem of impetigo in the army, as well as in civilian life, is pointed out by Downie.<sup>1</sup>

It is apparent also that the greater need for prompt healing and for checking the spread of impetigo in these years has evoked general dissatisfaction with older methods, since many of the recent papers deal with new ones. Moreover the number of forms of treatment suggested in these studies implies that an entirely satisfactory one has not been found. Within the years 1940 to 1942, more than ten different methods of treatment for impetigo have been offered and results of clinical investigation given in support of each one.

In addition to the sulfonamide studies, and concurrently with them, the following forms of therapy have been studied and suggested: copper sulfate-zinc sulfate lotion,<sup>2</sup> solution of ferric chloride,<sup>3</sup> boric acid-zinc oint-

Aided by a grant from the Smith Kline & French Laboratories, Philadelphia.

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<sup>1</sup> Downie V. J. The Silver Nitrate Treatment of Impetigo Contagiosa. *J. Roy. Army Med. Corps* 77: 97 (Aug.) 1941.

<sup>2</sup> Forman L. Impetigo. *British Encyclopedia of Medical Practice* 7: 81 1938. Packer M. E. J. Treatment of Impetigo. *Brit. M. J.* 2: 364 (Sept. 6) 1941.

<sup>3</sup> Smith J. H. Liq. Ferri Perchlor. Fortis for Impetigo and Syphilis. *Barbier Brit. M. J.* 2: 640 (Nov. 1) 1941.

<sup>10</sup> Dandy, W. E. Concealed Ruptured Intervertebral Disks. *J. A. M. A.* 117: 821-823 (Sept. 6) 1941.

<sup>11</sup> Cohen, Ira. Extradural Varix Simulating Herniated Nucleus Pulposus. *J. Mount Sinai Hosp.* 8: 136-138 (Sept. Oct.) 1941. Redler, Irving, and Anderson, G. C. Anomalous Vein Encroaching on the Fifth Lumbar Root as a Cause of Sciatic Pain. *New Orleans M. & S. J.* 94: 190-192 (Oct.) 1941. VanWagenen, W. P. Lumbar Spinal Nerve Root Compression by Extradural Veins. *Neurosurgical Ward Rounds* 3: 18 (Nov. Jan.) 1941-1942.

<sup>12</sup> Hadley, L. A. Apophysal Subluxation Disturbances In and About the Intervertebral Foramen Causing Back Pain. *J. Bone & Joint Surg.* 18: 428-433 (April) 1936. Subluxation of the Apophysal Articulations with Bone Impingement as a Cause of Back Pain. *Am. J. Roent. genol.* 33: 209-213 (Feb.) 1935.

ment,<sup>4</sup> hydroxyquinoline,<sup>5</sup> staphylococcus toxoid,<sup>6</sup> silver nitrate cautery<sup>1</sup> and mechanical occlusion by adhesive plaster. In addition to these, there have been reports by protagonists of the classic treatment by ammoniated mercury.

These studies report the percentage of cure ranging from 80 to 100 per cent, and the number of days required for the cure ranges from a few days to almost a month, usually ten to fourteen days. During this period treatments must be administered often and removal of crusts requires frequent attention.

The investigations of sulfonamide treatment have included several modes of administration. Studies have appeared on the use of peroral sulfonamides, sulfonamide ointments in various bases, and locally applied powdered sulfonamides. These investigations have yielded results which are more uniform than are those of the methods not employing the sulfonamides. A

The method devised by them yielded a stable suspension of fine crystals of sulfonamide. This suspension is presumably of natural crystals of the drug. It resembles magnesia magma in physical appearance and remains stable in pure water for at least many months. This last property presents an important contrast to the behavior of a crushed ordinary sulfonamide compound, which settles and cakes when suspended in water. Finally, when allowed to dry, the suspension becomes a fine, friable powder. These physical properties have extended the range of usefulness of the sulfonamides in local application. Studies of such uses have been reported.<sup>7</sup>

This new physical form of the sulfonamides has been named "microcrystalline" by Chambers, and a number of the commonly used sulfonamides have been prepared in this form.<sup>8a</sup> In the present study a 20 per cent suspension of microcrystalline sulfathiazole was used.

*Some Data Reported in Studies on the Use of Sulfonamides in the Treatment of Impetigo*

Authors	Method	Times per Day	Average of Days Required for Cure	Comment
Bainbauer Knoll and Perrin Arch Dermat & Syph 4, (2) 1941	Oral		4.5	Small doses 2 Gm a day for adults
Burckhardt Schweiz med Wchnschr 71 663 1941	Oral		6	
Schlesinger and Martin Lancet 1 527 1942	Oral		8	Some drug complications
Winer and Strakosch J A M A 118 921 1942	Oral		9.5	Small doses
Culleret Bull Soc franc de dermat et syph 44 517 1937	Ointment	1	3	Chrysoidin base
Culleret ibid 44 1178 1937	Ointment	2	Several	
Culleret Pellerat and Peissel ibid 46 501 1939	Ointment		0.8	
Girard Delbos and Taubert ibid 46 604 1939	Ointment		6	
Carlsaw and Swenarton Brit M J 2 225 1941	Ointment or paste		15	Sulfonamide for first 2 days only
Keeney Pembroke Chatard and Ziegler J A M A 117 1415 1941	Ointment or paste	2	7	
Robinson and Robin on South M J 34 1099 1941	Ointment or paste		7	
Sams and Capland Arch Dermat & Syph 44 227 1941	Ointment or paste	2	4.10	
Schneiper Schweiz med Wchnschr 71 222 1941	Ointment or paste		4.10	
Cohen Brit M J 1 350 1942	Ointment or paste		10	
Snell ibid 2 178 1941	Ointment or paste		17	
Steigman ibid 1 12 1942	Ointment or paste	1	4.5	
Winer and Strakosch J A M A 118 221 1942	Ointment or paste	2	6	
Winer and Strakosch J A M A 118 291 1942	Ointment or paste	2.5	5	With cod liver oil
Glicklich New England J Med 226 981 1942	Ointment	8	4.6	
Merz Schweiz med Wchnschr 67 349 1936	Powder		few	
McKenna Brit M J 2 99 1940	Powder		few	
Marshall ibid 2 544 1941	Powder		7	
Schlesinger and Martin Lancet 1 527 1942	Powder		7.5	

summary of results of sulfonamide studies appears in the accompanying table.

The ointments were in almost all cases made up to 5 per cent of the drug. Application twice or three times a day was recommended in most of the papers dealing with ointments, as was the removal of crusts when necessary.

#### EXPERIMENTAL

The basis for a rational improvement in the treatment of impetigo by local application of the sulfonamides was provided by Chambers and his associates.<sup>8</sup> These workers were interested for other reasons in preparing a neutral aqueous preparation of sulfonamides of much higher concentration than any available at the time.

4 Jay J W W Treatment of Impetigo Brit M J 2 526 (Oct 11) 1941

5 Ebner M T Treatment of Impetigo Contagiosa Ohio State M J 38 35 (Jan) 1942 Desmarais M H L Treatment of Impetigo Contagiosa Brit M J 2 356 (Sept 6) 1941 Seldowitz Morton Treatment of Impetigo with Rubber Containing 8 Hydroxyquinoline Am J Dis Child 59 67 (Jan) 1940 Roxburgh A C Etiology and Treatment of Impetigo Practitioner 146 289 (May) 1941 Carpenter C C Treatment of Impetigo Contagiosa with Compound Chlorhydroxyquinoline Ointment Arch Dermat & Syph 37 307 (Feb) 1938

6 Hahn T F Staphylococcus Toxoid in Impetigo J Florida M A 27 549 (May) 1941

7 Schuler F Die Behandlung der Impetigo Contagiosa mit Leukoplast Kinderarzt Praxis 11 354 1940 Ball F I The Occlusive Dressing in the Treatment of Impetigo Contagiosa California & West Med 44 402 (May) 1936

8 Chambers L A Harris T N Schumann Francis and Ferguson L K The Use of Microcrystals of Sulfathiazole in Surgery J A M A 119 324 (May 23) 1942

#### TECHNIC OF APPLICATION

In treating impetigo locally with this preparation I employed the following technic. A drop or two of the suspension was poured onto a small gauze dressing. It was found that the water would seep into the few layers of gauze to a greater extent than did the crystals. This would concentrate the sulfonamide crystals on the surface of the dressing leaving a small white collection of pure sulfathiazole in water of the consistency of fresh mud. The actual treatment consisted simply in applying the dressing thus prepared to the skin, the bit of sulfathiazole paste being placed in contact with the lesion. The only preparation of the area was washing with ordinary soap and water, with removal of all the crusts. When necessary, the area was also shaved. One small dressing was applied to each lesion.

On removal of the dressing twenty-four hours later, the lesion was always found to be healed. As the dried dressing was removed the residual drug would come off the site of the lesion in a dust or a very friable powder.

9 Silcox L E and Schenck H P Use in Otolaryngology of Microcrystals of Drugs of the Sulfonamide Group Arch Otolaryng 36 171 (Aug) 1942 Harris T N Sommer H E and Chapple C C The Administration of Sulfonamide Microcrystals by Inhalation Am J M Sc to be published Hawking Frank Effect of Sulfonamide Preparations on Experimental Infected Wounds Lancet 2 507 (Oct 31) 1942 Chambers Harris Schumann and Ferguson

8a These microcrystals of the sulfonamides are prepared by the Smith Kline & French Laboratories Philadelphia who supplied the material for this investigation.

Hardly ever was there any adhesion of the dressing to the site of the lesion, and in each of three lesions in which this did occur the lesion was found to be healed. There was no attempt to compare results with those of older methods of treatment in the series, since the pattern of development of impetiginous lesions is so constant under those methods.

#### RESULTS

Fifteen children from institutional and private practice were treated in this manner, with a total of 293 lesions. The ages of the children ranged from 1 week to 11 years. There were 2 spreading outbreaks each involving 3 children in close institutional contact with others and one pair of cases occurring in a family. The other cases, institutional or private, were single.

The observations made when the dressing was removed a day later were identical in 290 of the 293 lesions treated. Fine dry white powder would come off the skin, leaving a dry pink area corresponding to the lesion of the day before. This area would, of course, be surrounded by the usual flare. Thereafter, no further treatment or care would be given to the site of the lesion. Within a few days the epidermis would begin to grow in and the color of the flare would lighten.

In the case of the 3 lesions previously mentioned the dressing was found on the following day to adhere to the skin by a caked crust, but the base of the lesion resembled those of all the others after treatment. The area was then covered with an unmedicated dressing for another day or two to see whether the treatment had been successful. In none of these cases did the original lesion reappear or new ones develop, and the reepithelization progressed normally. It was concluded that the therapeutic result had preceded the caking and was not affected by it.

In no instance did any additional lesions develop or appear from the time of treatment of the original ones, either on the subjects or their institutional neighbors. In the case of the two outbreaks the spread ceased as of the time of the single treatment.

#### COMMENT

The improved results in the treatment of impetigo reported here are due only to the physical form of the agent and its chemical simplicity. Ordinary sulfonamide powders cake on lesions of impetigo for the same reason that they cake in pure aqueous suspension, presumably because the grains of powder are not naturally crystalline in shape. The microcrystalline drug maintains the separation of the crystals, assuring a much greater surface for solution into local tissue fluids and a continued distribution over the lesion.

In the case of ointments, caking is not a source of difficulty, but the serous exudate on meeting the ointment layer collects and coagulates, forming a crust which might well separate the lesion from the therapeutic agent. This would account for the necessity of frequent treatment and periodic crust removal during even the four or five day period required. The microcrystalline suspension, however, contains nothing but the drug and water, so that no barrier meets the exuding lymph or serum at the body surface. Any such exudate is directly miscible with the water of the suspension and is actually diluted by it. In fact it is planned to add a small amount of citrate solution as an anticoagulant to the water base of the sulfathiazole microsuspension if clotting should occur more frequently in the future.

Of some interest is the minimum amount of time required by the treatment. Although most of the lesions were observed twenty-four hours after treatment there is no evidence that that length of time is required. The last patient of the series, originally exhibiting 23 lesions, had the dressings removed in about sixteen hours, with the usual results. If, as would appear to be the case, we have considerably improved the physicochemical environment of the interaction of sulfathiazole and cocci, then the actual time of treatment may be considerably reduced, approaching ideally the time of ordinary serum-coccus-sulfonamide mixtures. It is planned to determine this time threshold in the next series of cases.

Finally, the complete halting of the spread of the disease from the time of treatment which has been observed thus far, is of considerable practical importance. Taken in conjunction with the single treatment required, this means that the checking and treatment of an epidemic of impetigo, even in a crowded group, is completed within an hour or so of the time treatment is begun. Under conditions of crowding the thorough washing with soap and water of close contacts and then examination of these a day later is, of course, assumed.

The importance of a more rapid cure and check of spread of impetigo from the point of view of public health need hardly be pointed out here. There are other aspects of the disease, however, which call for the most rapid control of epidemics whenever they appear. Impetigo neonatorum is admittedly important to the health of the patient, but in children past infancy the disease is generally regarded as of negligible significance to the patient's health. In view of this prevalent attitude it is worth pointing out that in each of five series of cases of glomerulonephritis<sup>10</sup> impetigo was identified as the precursor in percentages ranging from 10 to 15. These series include a total of 650 cases in Australia, Germany and the United States, and the percentages were of the total number of cases in each series rather than of those cases in which the precursor could be identified. Two other authors who review the subject, Vollhard<sup>11</sup> and Silvers,<sup>12</sup> bring out additional evidence of this association. Since the length of incubation of the bacteria in the skin must affect the degree of sensitization to bacterial antigens, there can be no doubt of the importance of aborting cases of impetigo as quickly as possible.

Sulfathiazole was used in these studies because of its availability and its effectiveness on both streptococci and staphylococci. Microcrystals of other sulfonamide compounds have been produced and would presumably be as effective against susceptible bacteria.

#### SUMMARY

A single application of a new physical form of the sulfonamides in the treatment of impetigo in my experience with the method thus far has been found to cure the lesions within a day and to stop the spread of the disease.

2222 North Fifty-Third Street

10 Southby R and Stanton B L. Acute Nephritis in Children with Special Reference to Renal Tests. *M J Australia* 1 127 (Jan 30) 1926.  
Hill, L W. Studies in the Nephritis of Children. *Am J Dis Child* 17 270 (April) 1919.  
Lichtwitz L. Die Praxis der Nierenkrankheiten. Berlin Julius Springer 1934 p 291.  
Kaumheimer, L. Ueber akute Nephritis bei Kindern nach impetiginosen Hauterkrankungen, *Monatschr f Kinderh* 10 139 1912.  
Rapaport M. Personal communication to the author.

11 Vollhard F. *Handbuch der inneren Medizin*. Berlin 6 1245 1931.  
12 Silvers S H. Impetigo Contagiosa Complicated by Acute Nephritis. *New York State J Med* 39 1093 (June 1) 1939.

## SULFATHIAZOLE IN ECZEMATOUS PYODERMA

SENSITIZATION REACTION TO SUCCESSIVE LOCAL  
AND ORAL THERAPY REPORT OF  
TWELVE CASES

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The induction of sensitivity to various sulfonamide compounds and the possible physiologic mechanisms responsible are subjects of increasing interest and importance. This paper is a report of a reaction which we have observed in 12 patients, in whom a sensitivity to sulfathiazole was apparently induced by local application of it to diseased skin, and in whom the evidence of sensitivity appeared when the drug was later administered by mouth. These patients all suffered from various forms of eczematous dermatitis complicated by some degree of low grade secondary pyococcic infection and were treated for more than five days with 5 per cent sulfathiazole emulsion type ointment and later given sulfathiazole by mouth. A characteristic explosive type of systemic and dermatologic reaction occurred. These patients were part of a series of more than 1,000 patients suffering from various dermatoses whom we have treated with the sulfonamide compounds applied locally.

The several reports regarding the use of sulfathiazole ointment in the treatment of cutaneous pyogenic infections will not be completely summarized here.<sup>1</sup> In three reports some local reaction to sulfathiazole ointment was reported. Sams and Capland<sup>2</sup> observed a patient in whom the local application of sulfathiazole powder for chronic otitis externa produced an acute exacerbation. Later administration of sulfathiazole by mouth to this patient was followed by massive edema of the face and ears and a generalized erythematous macular and pustular eruption. Recently Miller<sup>3</sup> reported that a patient with sycosis vulgaris had been given applications of 50 per cent and 25 per cent sulfathiazole ointment for a total of two weeks. Two months later the patient was given 1 Gm of sulfathiazole by mouth and within two hours the eyelids became swollen shut and an eruption appeared on the face, forearms, back, abdomen and thighs. In another study we<sup>4</sup> reported on the treatment of 190 patients with sulfathiazole incorporated in bases of various types. In this paper we stated that "in a few patients with chronic eczematoid eruptions, flare-ups have been noted in conjunction with the use of sulfathiazole ointment

but no exacerbation has been noted in a patient with a dermatosis primarily due to infection." None of the patients in this series had been given sulfathiazole by mouth after local application of the drug. It was demonstrated that sulfathiazole ointment (particularly when the ointment base is of the emulsion water soluble type) is an extremely effective therapeutic agent in the treatment of impetigo, ecthyma and acute impetiginous dermatitis uncomplicated by other etiologic factors. However, it was emphasized that sulfathiazole ointment has a much less striking effect on eczematous lesions complicated by chronic bacterial infection than on acute pyodermas due solely to pyococci. Our subsequent experience in a large series of patients is in accord with this. In addition, certain limitations and contraindications to sulfathiazole ointment therapy have become apparent, and it is with these that the present paper is concerned.

The following case summaries are representative of a type of reaction which we have encountered.

CASE 1—J T, a Negro aged 22, had had dermatitis repens on the inner surface of his right ankle, anterior to the malleolus for ten months.

Physical examination was negative except for the cutaneous lesion and moderate chronic prostatitis which was possibly a focus of infection.

There had been no illnesses except the cutaneous lesion, which had increased in size slowly and which had partially regressed on two or three occasions following various types of local treatment. Sulfonamide compounds had not been administered either locally or orally.

Bacterial culture of material taken from the lesion yielded hemolytic *Staphylococcus aureus*.

From Aug 10 to Aug 25 1941 a total of fifteen days, 5 per cent sulfathiazole cream was rubbed into the lesion three times a day, followed by the application of a bandage. About 50 per cent improvement was noted after seven days, following this initial change the condition of the lesion remained stationary.

From August 25 to October 20 he was given 5 per cent ammoniated mercury ointment, azochloramid ointment sulfurated potash soaks and superficial roentgen therapy (total of 300 roentgens in divided doses). Temporary improvement occurred but was not sustained, and the patient was admitted to the hospital.

October 21 sulfathiazole was administered by mouth (1 Gm four times a day). Three hours after the first dose the patient complained of pruritus of the palms and soles, malaise and chilliness, and his temperature became elevated to 100.2 F. In a few more hours a vesicular and bullous eruption appeared which in the course of twenty-four hours, involved the hands and feet (especially the palms and soles), the face including the forehead and ears and the trunk, associated with a very definite exacerbation of the original lesion on the ankle. Administration of the drug was discontinued after the first dose. The patient's temperature fluctuated between 99 and 100.5 F for the next four days and then became normal. An interesting feature was the occurrence of an extremely pruritic erythematous, edematous vesicular patch at the site of injection of an intradermal *Staphylococcus ambatoxoid* test (0.025 cc.) which had been done two weeks before. This test had previously been negative. Gradual improvement occurred with symptomatic treatment and within four weeks the skin was well including the original lesion on the ankle. The patient remained well until four months later, after which he disappeared from observation.

CASE 2—M G, a white man aged 43, had had localized eczema with secondary pyogenic infection on the outer surface of the legs—two patches on the right leg and one on the left leg—for five months.

Physical examination was negative except for the cutaneous lesions and moderate chronic prostatitis.

Onset of the three eczematoid patches was preceded by chigger bites which had become secondarily infected. The

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Some of the cases here cited were seen in the Dermatology and Syphilology Service, Station Hospital, Indiantown Gap Military Reservation, Pennsylvania.

Released for publication by the War Department Manuscript Board which assumes no responsibility other than censorship for the contents of this article.

1. Keeney E. L., Pembroke R. H., Chatard F. E. and Ziegler J. M. Sulfathiazole Ointment in the Treatment of Cutaneous Infections. *J. A. M. A.* 117: 1415 (Oct 25) 1941. Robinson H. M. and Robinson H. M., Jr. Local Use of Sulfathiazole in Dermatoses. *South. M. J.* 34: 1093 (Nov.) 1941. Sams and Capland. Pillsbury, Wammock, Livingood and Nichols.<sup>4</sup> Miller.<sup>3</sup>

2. Sams, Wiley M. and Capland, Lewis. Topical Treatment with Sulfathiazole. *Arch. Dermat. & Syph.* 44: 226 (Aug.) 1942.

3. Miller J. Lowry. Use of Sulfanilamide and Its Derivatives in Ointment Form. *Arch. Dermat. & Syph.* 46: 379 (Sept.) 1942.

4. Pillsbury D. M., Wammock V. S., Livingood C. S. and Nichols A. C. The Local Treatment of Pyogenic Cutaneous Infections with Sulfathiazole in an Emulsion Base. *Am. J. M. Sc.* 202: 808 (Dec.) 1941.

lesions persisted despite various types of local treatment including applications of 5 per cent sulfathiazole ointment for a period of about fourteen days two months before he had come under our observation, with moderate improvement. Definite exacerbation was noted when the patient changed from cotton to long woolen underwear. He stated that he had never taken any sulfonamide compounds by mouth.

Bacterial culture of material taken from the lesions yielded hemolytic *Streptococcus* and hemolytic *Staphylococcus aureus*.

From Jan 25 to Feb 8, 1942, a total of thirteen days, 5 per cent sulfathiazole ointment was applied three times a day, followed by application of a light bandage to hold the ointment in place. Only slight improvement was noted and the patient was admitted to the hospital.

From February 8 to 20 treatment consisted of bed rest, potassium permanganate compresses, Burow's solution (1/16) compresses, 2 per cent ammoniated mercury ointment and superficial roentgen therapy (total of 100 roentgens divided into two treatments). There was slight improvement.

February 20 0.5 Gm of sulfathiazole was given by mouth. Eight hours later the patient had a chill accompanied by elevation of temperature to 102.4 F, edema of the face and eyelids and severe generalized pruritus. Within twenty-four hours there was a severe flare-up of the initial lesions on the legs, and onset of a macular and vesicular eruption involving the face, sides of the neck, buttocks, lateral surface of the thighs, backs of the hands and the thorax occurred. The temperature returned to normal after three days and within ten days the generalized eruption had disappeared entirely. At this time the initial lesions on the legs had regressed about 50 per cent.

March 2 the patient was given 0.1 Gm of sulfathiazole by mouth. The course of events just described recurred with onset about four hours after administration of the drug. This reaction was not as severe as the first and it subsided in four days. It was followed by further improvement of the initial lesions on the legs.

From March 10 to 12 he was given sulfadiazine 0.5 Gm four times a day by mouth. After a total of 4 Gm, there was a slight exacerbation of the lesions on the legs and an elevation of the temperature to 99.2 F. Therefore the drug was discontinued.

From March 12 to 24 slow improvement of all lesions occurred with symptomatic treatment. At the time of the patient's discharge, March 24, the skin was clear except for residual erythema, scaling and hyperpigmentation at the site of the original lesions on the legs. The patient was instructed to wear long cotton underwear to prevent contact of woolen clothing with the skin, and during a period of one month's observation there was no exacerbation. Although a patch test with wool was negative, it was quite clear that a low grade sensitivity to wool was an important contributory causative factor.

CASE 3—J. Z., a white man aged 30, had had chronic impetiginous dermatitis of the hands and feet (most of the involvement on the palms and soles) for two months.

Physical examination was negative except for the cutaneous lesions, hyperhidrosis, moderate chronic prostatitis and chronic tonsillitis.

Onset occurred with a vesicopustular and patchy eczematoid eruption on the soles, the sides of the feet and the dorsal surface of the right great toe two months before admission to the hospital. This was followed one month later by scattered vesicles on the palms (id?) which was succeeded by deep pustules and eczematoid patches along the sides of the fingers. It is probable that sulfathiazole ointment had been used as local treatment about six weeks before he had come under our observation. He stated that he had never taken any sulfonamide compound by mouth.

Bacterial culture of material taken from the lesions yielded hemolytic *Streptococcus* and hemolytic *Staphylococcus aureus*.

From Dec 10 to Dec 26, 1941 5 per cent sulfathiazole cream was applied four times a day. Slight improvement occurred.

December 26 treatment with sulfathiazole by mouth was started (1 Gm four times a day). Four hours after the second dose the patient was awakened by severe pruritus of the palms and soles. His temperature became elevated to 101 F and this

was accompanied by malaise and chilliness. Within the next twelve hours an erythematous macular and vesicular eruption appeared on the face, the posterior portion of the ears, the backs of the hands and feet and the buttocks. This eruption later became eczematous, with oozing in intertriginous sites and scaling on the face, buttocks and backs of the hands and feet. There was a decided exacerbation of the lesions on the hands and feet. The elevation of temperature and the constitutional symptoms subsided in four days and the generalized eruption disappeared entirely at the end of fourteen days with about 50 per cent improvement of the primary dermatosis on the hands and feet.

Jan 8 1942 0.5 Gm of sulfathiazole was given by mouth. The course of events described was repeated except that the reaction was not as severe and the symptoms subsided within five days.

From January 18 to 21 sulfadiazine (1 Gm four times a day) was given by mouth. No reaction of any kind occurred. There was no improvement (the drug was not continued for a time sufficient for a therapeutic trial).

From January 21 to March 2 the lesions on the palms and soles slowly disappeared. At least part of the improvement was due to a tonsillectomy and a course of prostatic massage, and the patient remained well for a period of one month, after which he was lost from observation.

#### COMMENT

As our experience with this sensitization reaction increased, it became apparent that there were certain factors common in all of our cases.

1. Thus far the reaction has occurred only in those persons who have had a localized eczema with a secondary pyogenic element or a chronic impetiginous dermatitis which was predominantly eczematous. In all such patients one of the etiologic factors in the dermatosis, as far as could be determined, was sensitization to insect bites (chiggers), wool, shoe leather, soap, weeds or to the allergenic products of bacteria. We have not observed the reaction in impetigo, in ecthyma or in acute pyogenic complications of fungous infections or of acute dermatitis venenata. Provided the dermatitis did not become chronically eczematous.

2. The reaction is probably induced by rather prolonged application of the sulfathiazole ointment (more than five days) and becomes manifest when sulfathiazole is given by mouth. The symptoms occur following administration of a very small amount of sulfathiazole and within a period of a few hours. We do not know whether or not the local application of the drug leads to an increased sensitization of the skin as compared with the sensitization which frequently occurs following the administration of sulfathiazole by mouth. It is possible that the oral administration of sulfathiazole followed by an interval of time and subsequent use of the drug by mouth would result in the same chain of symptoms in a patient with a dermatosis of the type described.

3. The course of events was very similar in all cases: (a) the prompt development of constitutional symptoms including malaise, chilliness and elevation of temperature, (b) the local exacerbation of the lesions under treatment and (c) the generalized hematogenous "id"-like eruption, which was always pruritic and "explosive" in its onset. In many respects, the symptoms are not unlike those described by Lyons and Balberor<sup>6</sup> in a recent paper (also discussed in an editorial in *THE JOURNAL*).<sup>5</sup> They described a so-called sulfonamide shock representing an acquired sensitivity to the sulfonamide as the result of oral administration.

<sup>5</sup> Sulfonamide Sensitivity, editorial, *J. A. M. A.* 119:1202 (Aug 8) 1942.

<sup>6</sup> Lyons R. H. and Balberor, Harry. *Univ. Hosp. Bull. Ann Arbor Mich.* 7:19 (March) 1941.



of the drug, manifested on subsequent oral administration (after a five to fourteen day interval) of the same sulfonamide compound. Their evidence indicated "that approximately one third of all patients treated with sulfonamide drugs develop a sensitivity to these drugs sufficient to interfere with their subsequent use on these patients." The symptoms which they observed included elevation of temperature, chilliness, erythema, pruritus and conjunctival injection. It is probable that there are similarities in the mechanism of the reaction which they have described and the reaction which we have observed. However, it is to be pointed out that the absorption of sulfathiazole during the local treatment of the cutaneous lesions which we describe is extremely small compared to that occurring during administration by mouth. (None of our patients had a history of oral sulfathiazole therapy previous to the treatment of their cutaneous disease.) It is our opinion that when sensitization occurs on local application of sulfathiazole it does so more frequently in certain types of cutaneous disease in which pyogenic infection is a partial causative factor but not the chief one. Cutaneous tests with the chemically pure sulfonamide compound in an effort to predict reactivity are almost valueless.

4 The symptoms recur when sulfathiazole by mouth is resumed for a second and third time. It is possible that such patients might tolerate the drug eventually, that is, that "hyposensitization" could be accomplished, because in many of our cases the reactions have decreased in severity. It is not known how long the sensitivity to sulfathiazole persists, we have not had an opportunity to determine this in any of our patients.

5 We are not certain whether these patients can take other sulfonamides by mouth without reaction. Of 4 of our patients who had one reaction and were given sulfadiazine after the first reaction had subsided, 3 had no symptoms and the other one had a slight elevation of temperature and a local exacerbation of his cutaneous lesions (case 2). Recently, we have been using 5 per cent sulfadiazine ointment in the treatment of cutaneous infections, but we have not had sufficient experience to form any conclusions regarding the occurrence of this sensitization reaction in a group of patients similar to the reaction in those cases in which sulfathiazole was used. On the basis of a limited experience, it is our belief that sulfadiazine ointment probably is as effective as sulfathiazole ointment as a therapeutic agent in cutaneous infections primarily due to pyococci.

6 We have noted that, in most instances the reaction described has been followed by improvement of the primary dermatosis under treatment. We do not think that this can be attributed to the elevation of temperature, the reason is not clear, but possibly it is due to an increase in local and general immunity to the bacterial organism.

7 There have been no changes in the blood count and no evidence of liver or kidney damage in connection with this reaction.

8 It is our feeling that sulfathiazole ointment should not be used indiscriminately in the treatment of eczematous lesions complicated by chronic pyogenic infection or of chronic impetiginous dermatitis which becomes eczematous. If improvement occurs with local sulfonamide therapy, it does so in a relatively short period of time and prolonged local application is neither advisable nor necessary. It seems imperative to administer sulfathiazole by mouth cautiously to patients with the types of cutaneous disease described here if local sulfathiazole therapy has been used previously.

## SUMMARY

The type of sulfathiazole reaction described here is apparently a result of sensitization to the drug induced by local application and becomes manifest after oral administration of sulfathiazole. This reaction is characteristic and has been noted only in patients who have been treated for localized eczema plus a chronic complicating infection or for impetiginous dermatitis with eczematous tendencies. The reaction has been observed in 12 patients. On the basis of an experience with more than 1,000 patients in whom local sulfathiazole therapy to the skin has been used, it is considered that (1) such therapy should not be employed for prolonged periods (more than five days), since the danger of sensitization is apparently increased thereby, (2) the indications for such therapy should be carefully considered, (3) local sulfathiazole therapy is highly effective when properly applied in frank superficial pyoderms (impetigo, ecthyma and acute pyococcal infections of superficial fungous disease dermatitis or eczema) but is decidedly less effective and productive of possible later reactions in cases of chronic eczematous processes in which sensitization to various substances, including bacteria has occurred.

HYPERSENSITIVITY PRODUCED BY THE  
TOPICAL APPLICATION OF  
SULFATHIAZOLE

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The use of sulfonamides locally has progressed rapidly during the last several years. In the treatment of various pyogenic infections of the skin sulfathiazole ointment has been described in several series of cases with satisfactory results and no toxic manifestations. Sams and Capland<sup>1</sup> had favorable results with sulfathiazole ointment in 53 cases of cutaneous infections with no detrimental local or systemic effects. Beinbauer, Knoll and Perrin<sup>2</sup> treated 19 patients with infectious eczematoid dermatitis, with 13 instances of clinical cure and 5 of decided improvement. Winer and Strakosch<sup>3</sup> stress the value of sulfathiazole ointment in the treatment of impetigo contagiosa and even reported excellent results with only the oral use of the drug. The Robinsons<sup>4</sup> reported excellent results with the local treatment of the dermatosis of 94 patients. Strakosch and Olsen<sup>5</sup> stated that topical administration of sulfathiazole is advantageous because local tissue concentration will be reached with smaller amounts and unpleasant toxic reactions are minimized.

While the profession is learning to respect the untoward reactions of this group of drugs when used by mouth or by needle, there has been no description

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<sup>1</sup> Sams, W. M. and Capland, Lewis. Topical Treatment with Sulfathiazole. *Arch. Dermat. & Syph.* 44: 226-230 (Aug.) 1941.

<sup>2</sup> Beinbauer, L. G., Knoll, A. E. and Perrin, S. R. Clinical Response of Certain Dermatologic Diseases to Sulfathiazole. *Arch. Dermat. & Syph.* 43: 621-627 (April) 1941.

<sup>3</sup> Winer, L. H. and Strakosch, E. A. The Value of Sulfathiazole Ointment in the Treatment of Pyogenic Infections of the Skin. *J. A. M. A.* 118: 221 (Jan. 17) 1942.

<sup>4</sup> Robinson, H. M. and Robinson, H. M., Jr. Local Use of Sulfathiazole in Dermatoses. *South. M. J.* 34: 1093-1095 (Nov.) 1941.

<sup>5</sup> Strakosch, E. A. and Olsen, U. M. Bacteriostatic Effect of Sulfathiazole in Various Ointment Bases. *Arch. Dermat. & Syph.* 46: 44-53 (July) 1942.



of reactions to the drugs when applied locally for various cutaneous disorders. The reason for the absence of reports of toxic manifestations in cutaneous disease may be that the ointment was not applied over relatively large areas of denuded surface permitting sensitization by the drug. We have recently seen 2 cases of varicose eczema of the legs with large denuded areas to which sulfathiazole ointment was applied for a short time, and in each case fever and a generalized toxic rash promptly developed which subsided on cessation of the drug. Furthermore, in both cases the rash was reproduced by ingestion of small amounts of sulfathiazole, in the second case a full-blown cutaneous reaction developed six hours after ingestion of only 8 mg ( $\frac{1}{8}$  grain) of sulfathiazole.

#### REPORT OF CASES

**CASE 1**—Mrs H P, aged 58, a farmer's wife, first seen on June 15, 1942, since December 1941 had suffered from a sharply margined ulcer about the size of a quarter (24 mm) over the inner malleolus of her right leg. In April 1942 the leg became swollen and the area around the ulcer became red and weepy. The inflammation extended to the midportion of her leg, and large varicose veins were present. The left leg also showed varicosities but no ulceration or inflammation. Owing to the edema and inflammation, injection therapy of the veins was not considered, but she was advised to rest the limb and apply wet compresses. Since she was unable to follow this suggestion 5 per cent sulfathiazole ointment was applied on gauze to the inflamed area, the limb was bandaged to the knee and a supportive elastoplast bandage was applied. Four days later an erythematous patchy eruption appeared on

powders were used for the extensive generalized eruption. In a few days the rash assumed the appearance of an erythroderma, the fever subsided and after ten days a branny desquamation occurred with moderate exfoliation of the skin of her hands and feet. The Wassermann reaction of her blood was negative and other laboratory examinations were negative. Physical examination was essentially negative with the exception of the dermatologic disorder.

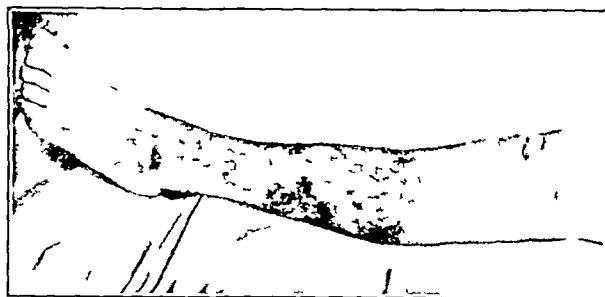


Fig 2 (case 2)—Varicose eczema after removal of sulfathiazole ointment

She was discharged from the hospital July 1. The leg ulcer had practically healed and the eruption was slightly scaling and receding. On July 6 she returned for observation, and it was then noted that small crusted pustular lesions were present on both buttocks. The generalized eruption had disappeared and she was comfortable except for these small pyogenic areas. The smear from these lesions showed the presence of streptococci and a few staphylococci and she was advised to take sulfathiazole by mouth. She ingested 1 Gm of the drug and within three hours, before she had a chance to take the second dose, her skin began to burn and tingle, an erythematous rash appeared almost universally and her temperature was elevated to 102 F. The drug was stopped and the eruption progressed through the stages of erythema, papules in patchy formation, desquamation and exfoliation exactly similar to the events that followed the application of the sulfathiazole paste boot. She remained in bed at home under expectant therapy and in two weeks, after considerable desquamation the dermatitis subsided leaving a somewhat thickened indurated dermis.

**CASE 2**—Mrs R S, aged 64, admitted to the York Hospital July 3, 1942, complained chiefly of a generalized rash. She had suffered with varicose veins in both legs for more than twenty years and obtained relief with elastic stockings. In 1939 ulcers developed on the lower left leg and healed with difficulty under indifferent therapy. On June 15, 1942 the skin of the lower left leg became red and inflamed associated with severe itching but no ulceration. She continued her occupation as a cook but consulted her physician who applied a 5 per cent sulfathiazole ointment to the inflamed area. Within twenty-four hours a well defined weeping reaction occurred, but she continued the use of the ointment reapplying a fresh amount after cleansing the affected parts with a bland oil. After three days of such treatment a generalized eruption appeared over her whole body which did not subside after she discontinued the sulfathiazole ointment and she was referred to the York Hospital.

The eruption at the time of admission consisted of raised patchy papules with surrounding erythema. Moderate desquamation was present in the antecubital spaces, forearms and palms of the hands. Large varicose veins were observed on both legs. On the lower left leg an indurated eczematoid area was present which was crusted and moist. With mild lotions and wet compresses to the varicose eczema the generalized eruption subsided, a branny desquamation occurred and the intensity of her itching lessened. Her temperature on admission was 100 F, which subsided in forty-eight hours. On July 10, one week after her admission she was given 8 mg ( $\frac{1}{8}$  grain) of sulfathiazole powder by mouth to determine whether this drug was an etiologic factor. Within six hours an intense red itching, raised papuloerythematous eruption appeared on her face, arms, neck, back and chest. The rash



Fig 1 (case 2)—Generalized eruption resulting from topical application of sulfathiazole.

her arms, chest, back, face and both legs. Her temperature rose to 101 F and she suffered chills and malaise. She was admitted to the York Hospital on June 21. The elastoplast bandage was removed and the raw, inflamed area appeared red, glistening and clean. A little of the sulfathiazole ointment was still retained in the ulcer and surrounding skin. Wet continuous compresses of potassium permanganate (1:2,000) were applied to the left leg and soothing mild lotions and

was patchy with arcuate configuration the primary lesions being papules with an erythematous halo. There was no elevation of temperature with this reaction. On the back small crusted lesions occurred with necrotic and pustular centers. The whole picture resembled exactly what was seen on her admission and under mild expectant therapy subsided in the same manner. Two weeks after this outbreak the skin was still somewhat reddened and thick following an exfoliative process.

Serologic reaction of her blood was negative and her blood count was normal. Sulfathiazole determination of the blood twenty-four hours after the ingestion of the  $\frac{1}{2}$  grain of sulfathiazole was negative. Examination of her urine also gave negative results. Physical examination was inconsequential except for the varicose veins, varicose eczema and eruption. Patch tests with 5 per cent sulfathiazole ointment, powdered sulfathiazole, petrolatum, hydrous wool fat and powdered sulfanilamide were negative. There is no personal or family history of hay fever, asthma, urticaria or other cutaneous lesions. She is the mother of 9 children, none of whom have ever shown any allergic manifestations.

#### COMMENT

In an analysis of the events that occurred in these 2 cases many problems of drug sensitivity and toxicity are aroused that so far are not clearly understood. Sulfathiazole and its allied compounds have been in general use for too short a time for all its manifestations and its dangerous possibilities to be clearly and scientifically appraised.

In our first case the possibility of sulfathiazole sensitization was not recognized until after the drug was readministered by mouth. After the use of an occlusive bandage and a four day interval, a generalized erythroderma developed which resembled a type of eruption already described as resulting from the ingestion of sulfathiazole.<sup>6</sup> Two weeks later, after the ingestion of 1 Gm, the former eruption quickly reappeared in an aggravated form. In the second case sulfathiazole ointment was applied and in three days a generalized eruption occurred, after an interval of ten days 8 mg ( $\frac{1}{2}$  grain) of sulfathiazole was administered orally and an eruption appeared within six hours which resembled in every respect the characteristics of the original rash and was identical with the one seen in case 1. The whole sequence of events in these 2 similar cases must be the result of cause and effect, and coincidence can probably be eliminated.

The danger of arousing a latent sensitivity by the ingestion of sulfathiazole has received considerable comment by many investigators. Lyons and Balheror<sup>7</sup> comment that the high incidence of fever associated with the readministration of sulfathiazole strongly suggests that the use of the drug is accompanied by more danger than was formerly considered. They believe that sulfathiazole when introduced into the body may develop antigenic properties which in certain instances produce a state of hypersensitivity that is manifested by a fever response. They suggest that the relative specificity of the reaction points toward the antigenic nature of the drug in spite of the fact that sensitivity to any drug cannot be demonstrated by scratch, patch or passive transfer studies. They furthermore stress that the incidence of the reaction is enhanced by an

interval between the courses in contrast to the continuous administration of the drug. Stiles<sup>8</sup> reports 4 cases in which apparently hypersensitivity developed even after small doses of sulfathiazole. In each case after sulfathiazole had been discontinued the administration of a single 0.5 Gm tablet was followed by nervousness, chills, malaise and fever. Shavin,<sup>9</sup> Davidson and Bullowa<sup>10</sup> and Winsor and Burch<sup>11</sup> all emphasize the allergic potentialities of sulfathiazole and warn against careless administration after a lapse of treatment. Our experience has been somewhat unique, for in our cases sensitization of the skin was aroused by the topical administration of the drug and was reactivated after an interval by the ingestion of 1 Gm in 1 case and only 8 mg in the second case.

One can only speculate how many patients use the sulfonamides either locally or generally for a short time or in small quantities and do not progress to clinical evidence of toxicity. At some later date when large doses are necessary they will probably show the classic symptoms of an untoward reaction and will not be able to benefit from the remarkable bacteriostatic properties of these drugs.

Combes and Cañizares<sup>6</sup> quote the Suttons as advising the use of sulfanilamide in cases of "eczema" of the legs which they believe is due to a remote focus of streptococcal infection. They also state that the drug is of value in stopping the spread of acute or subacute infectious eczematoid dermatitis. However, in both of our cases the varicose eczema had been present for a long time and a great variety of local treatments had been applied without the production of an infectious eczematoid dermatitis and no generalized eruption had appeared until sulfathiazole had been applied locally and ingested internally. We therefore feel that the generalized eruption was not an eczematoid dermatitis but a sensitization process caused by the local application of sulfathiazole.

Richter<sup>12</sup> studied 79 cases of generalized exfoliating erythrodermas of which 38 were associated with eczema. He divided his cases into three main groups: (1) those caused by internal disturbances, (2) those due to advanced age and (3) those presenting demonstrable external noncutaneous idiosyncrasy from contact with various chemical substances. From our experience sulfathiazole ointment can be considered a noxious chemical substance which can give rise to cutaneous idiosyncrasy.

In view of the absorption with the possibility of toxic reactions, it is urged that the profession refrain from using sulfathiazole ointment in those minor conditions in which less harmful drugs are completely adequate. This form of the drug should probably never be used over areas of moderate to large size in which there is danger of arousing sensitization of the dermis. It is well recognized by all authorities that sensitization to the sulfonamides may be permanent. This property makes the use of the drug either locally or generally for minor or self-limited conditions a dangerous practice because it may forever prohibit its administration when serious bacterial disease occurs at some future date.

6 Combes F C and Cañizares Orlando. Sulfanilamide and Allied Compounds. Arch. Dermat. & Syph. 44: 236-247 (Aug) 1941. Greenwood A M. Skin Manifestations Due to Sulfanilamide and Its Derivatives. New England J Med 224: 237 (Feb 6) 1941. Volini I F, Levitt S O and O'Neil H B. Cutaneous and Conjunctival Manifestations of Sulfathiazole Intoxication. J A M A 116: 938-940 (March 8) 1941.  
7 Lyons R H and Balheror Harry. Febrile Reactions Accompanying the Readministration of Sulfathiazole. J A M A 118: 955-958 (March 21) 1942.

8 Stiles M H. Hypersensitivity to Small Doses of Sulfathiazole. Pennsylvania M J 44: 823-824 (April) 1941.  
9 Shavin S J. Complications from Sulfanilamide and Its Related Compounds. Tri State M J 12: 2490-2495 (May) 1940.  
10 Davidson Arnold and Bullowa J M G. Acquired Hypersensitivity to Sulfapyridine and Sulfamethylthiazole. New England J Med 223: 811-813 (Nov 14) 1940.  
11 Winsor Travis and Burch G E. Renal Complications Following Sulfathiazole Therapy. J A M A 118: 1346-1353 (April 18) 1942.  
12 Richter Richard. Generalized Exfoliating Erythrodermas with Special Consideration of the Secondary Erythrodermas. Arch f Dermat u Syph 179: 611-638 1939.

## CONCLUSIONS

1 Two patients with varicose eczema were treated locally with 5 per cent sulfathiazole ointment with the production of a generalized eruption that was reproduced after the administration of small doses of sulfathiazole by mouth

2 We believe that the topical application of sulfathiazole can arouse a hypersensitivity resembling an allergic phenomenon and that this hypersensitivity can be affected by continuing the use of the drug either locally or by ingestion

3 We feel that sulfathiazole is potentially too dangerous a drug to use indiscriminately in mild ailments, and it is very possible that the intermittent use of this drug may produce dangerous reactions

4 If sulfathiazole is continued after an interval of cessation, only minute doses need be given to ascertain whether sensitization has occurred

5 The older methods of treatment of varicose eczema and varicose ulcer—vein injection, gelatin boot, rest and wet compresses, roentgen therapy and the like—should always be tried before sulfathiazole therapy is instituted

## CUTANEOUS HYPERSENSITIVITY TO TOPICAL APPLICATION OF SULFATHIAZOLE

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Local application of the sulfonamide drugs in the management of various dermatologic and surgical conditions has by this time attained a deserved popularity. Sulfathiazole and its sodium salt, chiefly in crystalline or ointment form, have proved to be the most widely used and perhaps the most efficacious in this respect. Numerous reports attest both the popularity and the effectiveness of these medications when employed in the therapy of such diverse conditions as impetigo, ecthyma, pyoderma, furunculosis, certain cases of acne vulgaris, sycosis barbae, infectious eczematoid dermatitis and in secondarily infected cutaneous lesions of many other types.<sup>1</sup> Certain ophthalmologic diseases have also been successfully treated by this method.<sup>2</sup>

Hypersensitivity to direct application of sulfathiazole to the skin has been encountered in isolated instances. The resultant reaction has been in the form of chemical, vesicular or vesiculopapular dermatitis at the onset. A systemic reaction has seldom been observed in this regard (the blood levels are not significantly affected), but this may occur provided a sufficiently large area of the surface has been treated and especially if the treated areas have been denuded of surface epithelium, as in extensive burns for example.

The incidence of sensitization of sulfathiazole applied locally is probably low. Keeney, Pembroke, Chatard and Ziegler,<sup>3</sup> Pillsbury, Wammock, Livingood and

Nichols,<sup>4</sup> Winer and Strakosch,<sup>5</sup> and Glicklich<sup>6</sup> failed to observe this phenomenon in relatively large numbers of patients treated with sulfathiazole ointment. Sams and Capland, however, noted 1 example of clinical hypersensitivity in their report. The patient experienced an exacerbation of dermatitis about the ears following the use of sulfathiazole powder on two separate occasions. Patch tests with sulfathiazole crystals were negative, but the authors concluded nevertheless that the patient was hypersensitive.

Miller<sup>7</sup> observed 2 instances of cutaneous reactions to 50 per cent sulfathiazole ointment. In one of these the eruption occurred when the drug was given orally. He also observed mild vesicular eruptions following the application of 10 per cent sulfathiazole with recurrences when the ointment was later reapplied. Although patch tests with sulfathiazole were not performed



Fig. 1 (case 1)—Vesicular and papular dermatitis of the neck resulting from hypersensitivity to sulfathiazole ointment

Miller implied that the reactions were the result of absorption and warned against the possible danger of sensitizing the patient by the local application of sulfathiazole and thus precluding future oral administration for systemic infections.

Instances of sensitization to sulfathiazole applied topically (wherein the diagnosis has been established by patch testing), apparently have not been recorded in the literature. The complex nature of the ointment bases used in some commercial sulfathiazole preparations has added to the problem of accurately determin-

The photographic illustrations in this report were made by Dr. Daniel J. Kandel.  
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1 Spink, W. W. and Paine, F. R. Local Use of Sulfathiazole in Treatment of Staphylococcal Infections. *Minnesota Med.* 23: 615 (Sept.) 1940. Sams, W. M. and Capland, Lewis. Topical Treatment with Sulfathiazole. *Arch. Dermat. & Syph.* 44: 226 (Aug.) 1941.

2 Thygesen, Phillips and Stone, William Jr. The Treatment of Inclusion Conjunctivitis with Sulfathiazole Ointment. *J. A. M. A.* 119: 407 (May 30) 1942.

3 Keeney, E. L., Pembroke, R. H., Chatard, E. E. and Ziegler, I. M. Sulfathiazole Ointment in the Treatment of Cutaneous Infections. *J. A. M. A.* 117: 1415 (Oct. 25) 1941.

4 Pillsbury, D. M., Wammock, V. S., Livingood, C. S. and Nichols, H. C. Local Treatment of Pyogenic Cutaneous Infections with Sulfathiazole in Emulsion Base. *Am. J. M. Sc.* 212: 781 (Dec.) 1941.

5 Winer, L. H. and Strakosch, E. V. Sulfathiazole Ointment in the Treatment of Pyogenic Infections of the Skin. *J. A. M. A.* 118: 221 (Jan. 17) 1942.

6 Glicklich, E. A. Sulfathiazole Ointment in Treatment of Pyogenic Dermatoses. *New England J. Med.* 226: 981 (June 18) 1942.

7 Miller, J. L. Use of Sulfanilamide and Its Derivatives in Ointment Form. Local Treatment of Cutaneous Diseases. *Arch. Dermat. & Syph.* 46: 379 (Sept.) 1942.

ing such reactions. It seems probable, however, that cutaneous hypersensitivity to sulfathiazole powder and ointments will appear with increasing frequency as these therapeutic agents gain even more general acceptance. In view of these circumstances the following experiences should be of interest.



Fig. 2 (case 2)—Positive reaction with sulfathiazole crystals

#### REPORT OF CASES

**CASE 1**—J. E., a white man aged 55, was referred to me by Dr. Aaron Kanter for the treatment of a basal cell carcinoma affecting the back of the neck. Following confirmation of the diagnosis microscopically, the lesion was treated by means of the administration of roentgen radiation with a total of 6 erythema doses (2,100 roentgens) given. Erythema was effected within ten days and rapid sloughing of the carcinoma took place. Healing began about three and one-half weeks after the beginning of treatment and a proprietary ointment containing 5 per cent sulfathiazole was prescribed to prevent the occurrence of secondary infection. About twenty-four hours after the initial application the patient experienced burning and pruritus, and the next day a severe papular and vesicular eruption was observed in the areas of the healing carcinoma and surrounding skin (fig. 1).

The sulfathiazole ointment was discontinued and the dermatitis treated by means of bland moist compresses and lotions. Recovery was prompt and uneventful. Patch tests were then performed with the results shown in the first part of table 1. Several control tests with the substances employed in the preliminary tests were negative. The manufacturers of the sulfathiazole ointment<sup>8</sup> were consulted and the various ingredients contained in the preparation were given as follows: sulfathiazole 5 per cent, duponol PC 1 per cent, steryl alcohol 10 per cent, cetyl alcohol 3 per cent, spermaceti 10 per cent, glycerin 10 per cent, sodium ethyl mercurothiosalicylate (merthiolate) 0.005 per cent and sufficient water.

The final patch tests were then performed with results shown in the last part of table 1.

From the clinical course and the results of the patch testing, it was concluded that the patient was hypersensitive to sulfathiazole and sodium sulfathiazole in crystalline, solution or ointment form. An interval of about twenty-four hours occurred between the time of the first application of the ointment and the appearance of the patient's dermatitis. Since neither the patient nor his physician were aware of previous applications of sulfathiazole to the skin, it appeared that a period of twenty-four hours was necessary for the development of hypersensitivity (sensitization period?) in the patient.

**CASE 2**—Mrs. M. S., aged 42, white, a housewife, was referred to me through Dr. Francis X. Siegel because of the presence of an erythematous papulovesicular eruption of the eyelids. The dermatosis had been present for four weeks. For six months previously the patient had been treated by several ophthalmologists for corneal ulcers. A variety of solutions and ointments including 1 per cent yellow oxide of mercury, sulfathiazole ointment, zinc-boric acid drops and an ointment containing zinc oxide and ichthammol had been employed. Only the sulfathiazole ointment had been employed during the six weeks preceding the onset of the dermatitis.

In view of the characteristics and localization of the eruption, dermatitis resulting from sensitivity to nail lacquer was suggested. On inquiry it was learned that the patient had used this cosmetic over a period of several years. Various other substances were considered as possible causative agents, but except for the nail lacquer and eye medications these seemed unlikely.

Treatment consisted of removal of the patient's nail lacquer, elimination of all previous local therapy and administration of fractional doses of roentgen radiation. Dilute Burow's solution compresses and zinc oxide paste were applied locally. In response to this treatment the lesions about the eyelids subsided in about two weeks. Patch tests were then performed, the results of which are given in table 2.

The patient was then advised to reapply her nail lacquer to exclude clinical hypersensitivity in the presence of negative patch tests.<sup>9</sup> No recurrence of the dermatitis took place. Several weeks later when sulfathiazole ointment was again applied to the eyelids a definite flare-up of the eruption occurred. The conclusions drawn from the patch testing and clinical course were that the patient was hypersensitive to sulfathiazole and to sodium sulfathiazole in crystalline, solution and ointment form.

**CASE 3**—Mrs. P. M., aged 28, white, was referred for the treatment of a generalized dermatosis by Dr. Abbott Y. Wilcox. The eruption began following the application of adhesive plaster.

TABLE 1—Results of Patch Tests in Case 1

Substance	Result	Substance	Result
Preliminary Tests			
Sodium sulfathiazole crystals	2 plus	Sodium sulfathiazole solution (5%)	2 plus
Sulfathiazole ointment (5%)	2 plus	Toilet soap used by patient	Negative
Final Tests			
Steryl alcohol	Negative	Glycerin	Negative
Cetyl alcohol	Negative	Spermaceti	Negative
Duponol	Negative	Sulfathiazole ointment	2 plus
Merthiolate	Negative	Sulfathiazole crystals	3 plus
Sodium sulfathiazole crystals	3 plus		

TABLE 2—Results of Patch Tests in Case 2

Substance	Result
Sodium sulfathiazole crystals	3 plus
Sulfathiazole ointment (5%)	2 plus
Sulfathiazole crystals	3 plus
Sodium sulfathiazole solution (5%)	3 plus
	(delayed reaction)
Nail lacquers	Negative
Zinc boric acid eye drops	Negative
Zinc oxide ichthammol ointment	Negative
Murine	Negative
Eye drops (unidentified)	Negative

for the immobilization of a sprained ankle, as a characteristic erythematous, papulovesicular adhesive plaster dermatitis, about this member. Despite removal of the plaster, the lesions spread rapidly to the upper part of the leg. A secondary infection supervened and a commercial 5 per cent sulfathiazole ointment<sup>10</sup>

<sup>9</sup> Hollander, Lester. Nail Lacquer Dermatitis. J. A. M. A. 116: 1714 (Nov. 16) 1940.

<sup>10</sup> Sulfathiazole ointment prepared by Eli Lilly & Co., Indianapolis, was used in this instance. The ingredients of this preparation were listed as follows by the manufacturer: White beeswax, white petrolatum, anhydrous lanolin and sulfathiazole.

<sup>8</sup> The preparation used was Pragmasul, manufactured by the Smith Kline & French Laboratories, Philadelphia.

had then been applied. After several days the dermatitis appeared on all the extremities, and there were patches on the trunk and neck.

The diagnosis of contact dermatitis from sulfathiazole beginning as an irritant (adhesive plaster) dermatitis was made. Treatment consisting of superficial roentgen radiation, dilute boric acid compresses and a bland "shake" lotion was instituted. The use of the sulfathiazole preparation was discontinued.

TABLE 3—Results of Patch Tests in Case 3

Substance	Result
Sulfathiazole crystals	3 plus
Sodium sulfathiazole crystals	3 plus
Sulfathiazole ointment (5%)	3 plus
Ingredients of ointment base	Negative
Nylon	Negative

TABLE 4—Results of Patch Tests in Case 4

Substance	Result
Sulfathiazole crystals	4 plus
Sodium sulfathiazole crystals	3 plus
Sulfathiazole ointment (5%)	3 plus
Sulfathiazole solution (5%)	2 plus
Sulfanilamide crystals	Negative
Sulfadiazine crystals	Negative
Ingredients of sulfathiazole ointment base	Negative
Sulfapyridine crystals	Negative

The patient recovered from the dermatosis within three weeks without sequelae, and patch tests were then performed, with the results given in table 3.

A severe irritant dermatitis was observed in the areas in which adhesive plaster had been applied to hold the patch tests in place. Conclusions were that the patient was unduly sensitive to the adhesive plaster and hypersensitive to sulfathiazole and sodium sulfathiazole crystals and to sulfathiazole ointment.

Determination of group as opposed to specific hypersensitivity was investigated by means of patch tests with various other sulfonamide drugs. The reactions to powdered sulfanilamide, sulfapyridine and sulfadiazine were repeatedly negative, whereas those to sulfathiazole and sodium sulfathiazole were persistently positive.

CASE 4—Miss M. B., aged 39, white, referred by Dr. Cyril E. Schrimpf, had had a chronic recurrent eczematous eruption affecting the external ears for the past several years. Recently some roentgen therapy had been given in combination with applications of sulfathiazole powder. At first the results of treatment were good. After several weeks, however, the external ears became edematous, reddened and oozing. A papular and vesicular eruption appeared in the surrounding areas with subsequent spread to the neck, face, antecubital fossae, anterior part of the chest, abdomen and back. The severity of the dermatitis necessitated hospitalization.

Treatment was initiated by removing the sulfathiazole powder and the application of soothing compresses and lotions. Recovery was prompt and complete within two weeks.

Patch tests were performed, and the reactions recorded in table 4 were observed.

The obvious conclusions were that the patient was hypersensitive to sulfathiazole and sodium sulfathiazole in crystalline and ointment form and that the reactions were specific.

## COMMENT

The cases described herein presented cutaneous eruptions associated with the use of sulfathiazole ointments and characteristic of contact dermatitis in every respect. The lesions began as papules or vesicles and proceeded to eczematization with oozing, erythema, crust formation, desquamation and healing without scarification. The diagnosis was established in each instance from the history and by patch testing and in 1 instance by means of a flare-up test. Control patch tests were performed on nonsensitive persons to exclude the possibility of primary irritant rather than a sensi-

tization effect for sulfathiazole and sodium sulfathiazole crystals. Attempts to discover allergenic tendencies among the various ingredients of the bases for the sulfathiazole ointments in cases 1, 3 and 4 were unsuccessful. In 3 cases repeated applications of the drug were apparently necessary before sensitization occurred. In case 1 the reaction was noted within twenty-four hours, so that the ointment had been used only a few times. Investigation in cases 3 and 4 disclosed that the hypersensitivity was specific for sulfathiazole and its sodium salt, since patch tests with other sulfonamide drugs failed to elicit reactions. The lesions subsided promptly in each case when applications of the sulfathiazole were discontinued.

## SUMMARY AND CONCLUSIONS

1 The diagnosis in 4 cases of cutaneous hypersensitivity to sulfathiazole and sodium sulfathiazole and ointments containing these substances was established in each instance by means of patch testing. From these procedures, the ingredients of the ointment bases of two commercial sulfathiazole preparations were not implicated as causative allergens.

2 The dermatitis occurred in each case as a characteristic contact dermatitis which disappeared when the sulfathiazole preparations were no longer applied.

3 In view of the popularity of therapy with topical applications of sulfathiazole and the relatively few recorded instances of cutaneous hypersensitivity, it is probable that the incidence of this phenomenon is low.

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## CUTANEOUS MELANOMAS

## A CLINICAL STUDY OF SIXTY CASES

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AND

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This report is based on a clinical study of 60 cases of cutaneous melanoma. Thirty-five were seen in private practice and 25 are from records of the departments of dermatology and syphilology and of surgery of the University Hospitals and represents all of the patients between the years 1921 and 1941, a period of twenty years.

In the treatment of few pathologic conditions is there such pessimism and divergence of opinion as in that of cutaneous melanoma. This is due to the generally confused ideas of the average physician concerning pigmented moles and their relation to malignant growths, the highly malignant nature of melanomas, their tendency to metastasize early and the generally unsatisfactory results obtained from various treatment procedures. Nevertheless it is true that lack of diagnostic skill and delay in the institution of adequate treatment have many times contributed to the poor results.

## PRECURSOR LESIONS

The great majority of cutaneous melanomas arise from pigmented junction type nevi in the skin. In color these nevi vary from slate blue to bluish black or various shades of brown to jet black with lighter

Prof. C. A. Tenhart permitted the authors to review and use the records of the surgical department.

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and darker shades often present in the same lesion. These precursor lesions are usually smooth and flat but occasionally may be raised with a verrucous or wrinkled surface and are nearly always soft. There is scarcely any person who does not have several of them on his body, yet the number which become malig-

In 48, or 80 per cent, of the cases there was a history of a previously existing pigmented lesion. In 25, or 41.7 per cent, a history was obtained of a pigmented mole being present since birth, while in 23, or 38.3 per cent, a pigmented lesion had developed later in life and had been present from eight months to thirty-two years prior to evidence of malignant change.

The nevi present since birth were brown, brown-black, slate blue, bluish black or black. Most of them were smooth, soft, flat macular or plaque-like. Those which developed later in life were more likely to be flat macular lesions, principally black or bluish black. It is our impression that the soft flat slate blue, bluish black and black moles are the most dangerous. Also those developing later in life are more apt to become malignant and, as has been pointed out by Traub and Keil,<sup>1</sup> show a tendency to metastasize earlier.

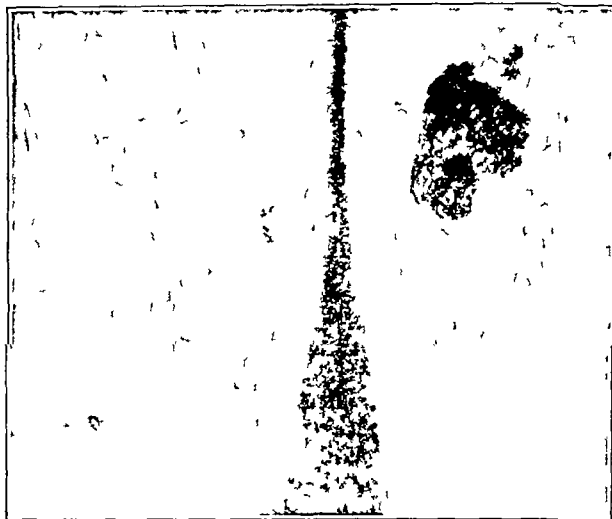


Fig. 1—Melanoma of eighteen months duration on the anterior surface of the left leg of a man aged 48. Developed in a black mole present since birth and irritated by garter. A mid thigh amputation was performed. Regional lymph nodes were not clinically involved and dissection was refused. He has remained clinically free from metastases for fourteen months. Note daughter lesions in surrounding skin and black pigmented nevi on other leg.

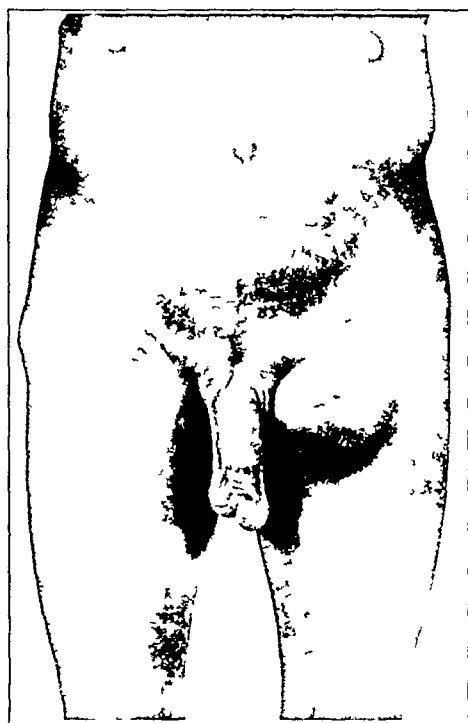


Fig. 2—Melanoma in a Negro aged 54 with metastasis to the regional lymph nodes in the groin and general dissemination as revealed by roentgenograms of the lungs.

nant is extremely small. They should not be confused either with the soft elevated smooth or warty and sometimes hairy pigmented intradermal nevus ("common mole") or with the raised, hard, pigmented intra-epidermal nevus (fibrous nevus).



Fig. 3—Developed from a flat slate blue nevus on the sole of the foot. No change in the nevus was noted before metastasis occurred. The patient gave a history of irritation by a nail in his shoe eight months previously. No treatment was given. He died within two years.

#### LOCATION OF LESIONS

Melanomas may occur on any part of the body, but statistics generally reveal that they predominate on the lower extremities and on the face. In this series 22, or 36.7 per cent, were on the lower extremities. Of these 10, or 16.7 per cent, were on the soles of the feet, 4 were on the dorsum of the feet or on the toes, 6 were on the legs and 2 were on the thighs. In 25 cases, or 41.7 per cent, the lesions were on the head, 19 of these being on the face, 5 on the ears and 1 on the scalp. There were 7, or 11.7 per cent, on the upper extremities. There were 2 cases presenting involvement of the nail bed—the melanotic whitlow of Hutchinson—and in 2 others the site of the lesions was the skin of the fingers. The arms were involved in 3 instances.

In only 6 cases, or 10 per cent, were the lesions on the trunk.

1. Traub, E. F. and Keil, Harry. Common Mole. Its Clinical Pathologic Relations and Question of Malignant Degeneration. Arch. Dermat. & Syph. 41: 214-252 (Feb.) 1940.

## ROLE OF TRAUMA

The role of trauma as a causative factor in the transition from a benign pigmented nevus to a malignant melanoma has been emphasized by many writers. The location of the majority of melanomas on the feet, face and ears, where trauma is most likely to occur is strongly suggestive. In 35, or 58.3 per cent of the cases, there was a history of previous trauma. The following causes were the most frequently encountered: bruises, cuts from shaving, scratches, picking of lesions, a bruise from a nail in a shoe, the wearing of shoes in the presence of a pigmented mole, incomplete removal of a pigmented nevus, the application of various caustics, previous roentgen treatment and electrolysis.

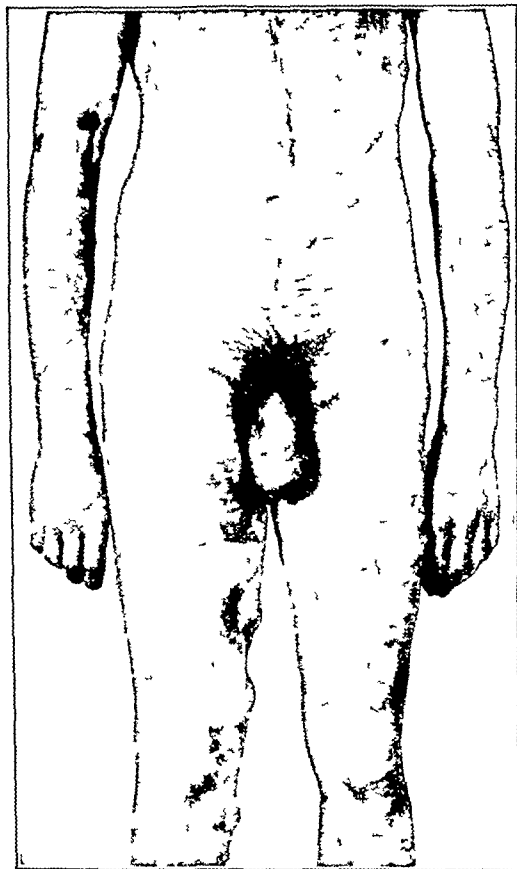


Fig 4—Melanoma showing generalized metastases in a man aged 49. Ten months previously he stubbed his right great toe. A bluish discoloration developed under the nail followed by extension into the skin of the toe. Amputation of the toe was followed by the appearance of nodules along the course of the saphenous vein.

There was no significant difference in the sex incidence, there being 33 males and 27 females. The youngest patient was 3 years of age and the oldest 78. Two thirds of the patients were over 40 years of age. Nine of the 60 patients were over 70 years of age. There were 2 Negroes in the series.

## SYMPTOMS OF MELANOMA

Melanomas include tumors called malignant melanoma, melanocarcinoma, melanoepithelioma, nevocarcinoma, melanoblastoma and melanosarcoma. As to whether nevus cells and melanoblasts are ectodermal or mesodermal in origin is not important from the clinical standpoint, for there appears to be no particular difference in the degree of malignancy of the various types. However, it is well known that the well

differentiated tumors are the most dangerous because of the tendency to early metastasis.

The first change in the transition from a benign pigmented melanotic nevus to a melanoma is most likely to be an increase in the size of the lesion by peripheral extension and by an increase in pigmentation. A flat



Fig 5—Metastatic nodules in the kidney revealed at autopsy.

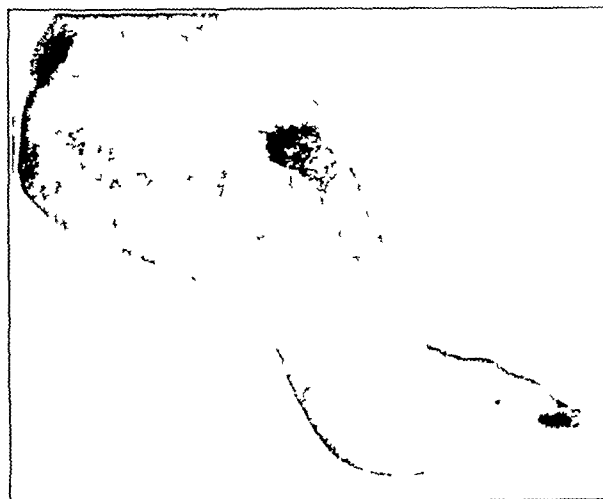


Fig 6—Melanoma on the foot of a man aged 25 developed in a flat brown mole of five years duration. The tumor appeared in six months following application of acid to remove the mole.

lesion may become raised and indurated, and this is followed by bleeding, ulceration and the development of fungoid tumor masses. Radiating projections of pigment may be seen in the surrounding normal skin and indicate local dissemination. Sometimes the first



evidence of malignancy is the development of a single nodule in the center or at the edge of the nevus, or the appearance of nearby daughter lesions. An increase in pigmentation is an early warning sign and may precede the development of a nodule or infiltration of the base by many months.

Metastasis occurs comparatively early. Rarely it may even occur before any change in the primary lesion is detected. Pack and Adair<sup>2</sup> found that in two thirds of the cases of melanoma of the skin in which the regional nodes were dissected, but were not palpable prior to operation, minute foci of metastatic melanoma were discovered.

Dissemination may occur by way of the superficial lymphatics of the skin, in which case nodules or pigmented areas develop in the neighboring skin. If spread is by the deep lymphatics, the regional lymph nodes become enlarged, discrete and hard. More frequently than in any other type of malignant condition, dissemination may be through the blood stream with metastatic growths appearing in any part of the body. Obviously, such conditions are hopeless. Melanin can be demonstrated in the urine in many cases in which metastases have developed.

#### PROPHYLACTIC TREATMENT OF PIGMENTED MOLES

Concerning the treatment of pigmented moles, opinions vary from the removal of no moles to the removal of all of them. However there is general agreement

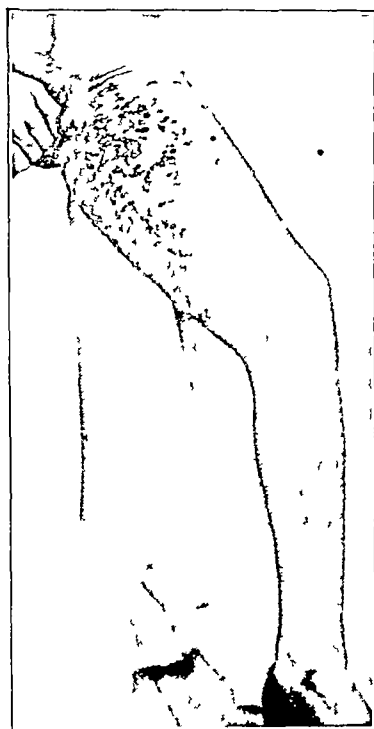


Fig 7—Excision of the lesion and heavy radium irradiation to the site of operation in addition to dissection of the regional lymph nodes did not prevent generalized metastasis.

among authors that if pigmented nevi are to be treated at all they should be thoroughly destroyed or excised, with a liberal margin of healthy tissue.

De Cholnoy<sup>3</sup> advises surgical removal of pigmented moles on the feet and irritated areas. Adair<sup>4</sup> believes that the best treatment for these lesions in the quiescent state is by simple careful excision with the scalpel, caution being taken in going wide of the lesion in every direction, even going down to fascia in most instances. He considers this procedure good prophylactic cancer surgery and makes

the statement "I have not witnessed any recurrences of the quiescent melanomas when this procedure is carried out."

Traub,<sup>5</sup> in discussing the junction type of melanotic nevus, states "Thus far, none of the marks I have removed for diagnostic study, regardless of the size of the excision, have later given rise to a tumor of malignant character or metastasis to nodes or other



Fig. 8—Extensive metastasis to the left lung

tissue. This proves that the junction nevus is a benign lesion. However, it is the one lesion that should not, in my opinion, be treated by repeated solid carbon dioxide applications or frequently repeated desiccation."

Butterworth and Klauder<sup>6</sup> believe that it is not practical to remove all pigmented lesions of the skin but advise prophylactic removal of those on the head and feet. Klauder<sup>7</sup> states that "Thorough destruction, including healthy tissue surrounding the lesion and beneath it, by means of the electrocautery, electrodesiccation or surgical excision, affords the safest means of removing pigmented nevi. The nevus should be thoroughly destroyed in one operation. To treat these lesions by painting with acids, by applying carbon dioxide snow, by electrolysis, stryngulation by applying a string around a pedunculated lesion or any treatment given at short intervals are dangerous procedures which constitute irritation which affords opportunity for malignant change."

Baxter<sup>8</sup> advised surgical excision with a liberal margin of healthy tissue, and if histologic examination shows that the lesion is malignant the regional lymph nodes should be removed and a capsule of radium left in the wound. Becker<sup>9</sup> recommends excision for biopsy

<sup>2</sup> Pack, G. R. and Adair, F. E. Subungual Melanoma. Surgery 5: 47-72 (Jan.) 1939.

<sup>3</sup> de Cholnoy, Tibor. Malignant Melanoma. A Clinical Study of 117 Cases. Ann. Surg. 113: 392-410 (March) 1941.

<sup>4</sup> Adair, F. E. Treatment of Melanoma. Report of 400 Cases. Surg. Gynec. & Obst. 62: 406-409 (Feb.) 1936.

<sup>5</sup> Traub, E. F. Congenital Anomalies (Nevi) and Their Relationship to Cancer and Melanoma. Pennsylvania M. J. 44: 1103-1110 (June) 1941.

<sup>6</sup> Butterworth, Thomas and Klauder, J. V. Malignant Melanomas Arising in Moles. J. A. M. A. 102: 739-745 (March 10) 1934.

<sup>7</sup> Klauder, J. V. Treatment of Nevi. The Hazard of Insufficient Destruction of Pigmented Nevi. Pennsylvania M. J. 33: 472 (April) 1930.

<sup>8</sup> Baxter, S. H. Melanoma. Minnesota Med. 18: 409-412 (June) 1935.

<sup>9</sup> Becker, S. W. Melanotic Neoplasms of the Skin. Am. J. Cancer 22: 17-40 (Sept.) 1934.

study of suspicious pigmented lesions and believes that metastases are not caused by this procedure. Biopsies result in early diagnosis and treatment and thus improve the prognosis. Farrell<sup>10</sup> believes that early radical surgical removal of any type of nevus subjected to trauma, including about 4 cm of normal skin and the subcutaneous tissue, is the only means of reducing the high mortality rate of melanomas.

Taussig and Torrey<sup>11</sup> state that the impression that it is dangerous to remove, by almost any method the warty or hairy type of pigmented nevus is erroneous. If the nevus is of the smooth blue-black type, they recommend that it be removed by wide surgical excision or by electrodesiccation. Or one may elect to leave it alone with a warning to the patient that it should be removed immediately if it increases in size.

Anderson and Simpson<sup>12</sup> advise the removal of pigmented moles if located on areas likely to be chronically irritated. Their methods consist of wide surgical excision alone, roentgen rays or radium in a massive dose alone or in combination with surgical excision and the careful thorough destruction of such lesions by electrodesiccation. In an experience of over twenty years they have not seen a malignant condition develop as a result of their procedures.

Adair,<sup>3</sup> in discussing the treatment of pigmented moles, says that one group of physicians advise leaving them all alone. He further states that "The second

of our 400 cases that the electric needle applied with good intent but without sufficient accuracy, is the one trauma responsible for as much wild growth as any other form of injury." He recommends simply careful scalpel dissection, caution being taken in going wide



Fig 10—Melanoma on the breast of a man aged 48 showing the development of nodules in a flat pigmented black nevus present since birth. An increase in pigmentation was the first symptom. The lymph nodes were not clinically enlarged. Wide scalpel excision of the lesion including the deep fascia and block dissection of the axillary lymph node were performed. Generalized dissemination resulted in death two years later.



Fig. 9—Metastasis to the mesentery. Autopsy also revealed metastasis to the heart, brain, kidneys and other organs.

group is composed of men some of whom are dermatologists. They attack the black mole with the electric needle. For this type of therapy I have less than merger regard. In fact, I am convinced from a study

of the tumor in every direction, even going down to fascia in most instances in cases of quiescent melanomas.

Dermatologists have also been blamed by others for the use of electrolysis and the application of solid carbon dioxide on melanotic nevi, but it is our belief that, as a group, the dermatologists are by training and experience better qualified than any other group to distinguish between benign and potentially malignant nevi. Moreover, if they are to be treated, they recognize the importance of their thorough destruction either by the actual cautery, electrodesiccation or complete scalpel excision.

Our practice has been to remove pigmented junction type nevi for prophylactic and diagnostic purposes if located on areas subjected to chronic irritation. This has been done by scalpel excision with a margin of approximately one-half inch of healthy tissue, including the subcutaneous tissues. In some instances thorough destruction by the electrocauter or electrodesiccation has been employed. Recurrences or dissemination of quiescent pigmented nevi have not been seen by us following these methods. We agree with Ewing<sup>13</sup> that if recurrence occurs following the excision of a mole the lesion was already malignant before it was excised.

In our opinion, these lesions should not be treated by irradiation by the application of caustics or solid carbon dioxide, by electrolysis or by any method requiring repeated treatments. Experienced clinical judgment is of the utmost importance.

#### TREATMENT OF MELANOMA

It is common knowledge that unless melanomas are adequately treated before metastasis has occurred the prognosis is extremely grave. What constitutes ade-

10 Farrell N I. Cutaneous Melanomas. *Arch Dermat & Syph* 26: 110-124 (July) 1932.

11 Taussig L R and Torrey F A. Malignant Melanoma. A Statistical and Pathological Review. *California & West Med* 52: 15-18 (Jan) 1940.

12 Anderson H F and Simpson C A. Pigmented Moles and Their Treatment. *Am J Roentgenol* 33: 54-58 (Jan) 1935.

13 Ewing James. *Neoplastic Diseases*, ed 4. Philadelphia: W B Saunders Company, 1940. pp 948-970.

quate treatment has resulted in much controversy. Should radiation therapy be employed alone? Should radiation be combined with surgical measures or should surgery alone be used? Is electrodesiccation the method of choice in treating the primary lesion? Should the regional lymph nodes be treated when there is no clin-



Fig. 11—Melanoma in a woman aged 73. A flat brown mole had been present all her life. Six months before she was seen black pigment appeared in the lesion followed by elevation and bleeding. Surrounding pigmentation had always been present. The lesion and surrounding pigmentation was destroyed by the electrocautery followed by irradiation with roentgen rays in a dosage of 6 000 roentgens. She has remained well for more than five years.

ical evidence of their involvement? These are all questions that require sound and experienced clinical judgment to answer.

Butterworth and Klauder<sup>6</sup> recommend excision of the primary lesion by means of electrosurgery, including about 3 cm. of skin beyond the margin of the lesion. This is followed by heavily filtered high voltage roentgen therapy to the field of operation, as well as to the lymphatics draining the area and to the regional lymph nodes. Of 40 patients traced, 14 were living at the time the report was made. In 8 of them it was for less than three years, while 6 were alive from forty-one months to one hundred and one months.

De Cholnoky<sup>3</sup> advises wide surgical excision of the primary lesion with the underlying fascia and the surrounding subcutaneous tissue followed by dissection of the regional lymph nodes. He recommends amputation in melanomas of the fingers, toes and feet followed by dissection of the lymph nodes.

Adair<sup>4</sup> reported a series of 400 cases from the Memorial Hospital in New York. In only 105, or about 25 per cent, of the patients was there a possible chance of cure. Of these, 70 had been treated more than five years, and 23, or 33 per cent, had survived. All 70 patients had been treated by surgery alone or by a combination of surgery and irradiation. In a group of 245 patients showing recurrences at the time of treatment, only 7, or 2.8 per cent, were presumably cured. He states that the results of irradiation alone were disappointing, that it nearly always fails and is indicated only for palliation in cases of hopeless involvement. On the other hand, Anderson and Simpson<sup>12</sup> believe that massive roentgen therapy by improved methods is superior to other forms of therapy.

More than twenty-five years ago Broders and McCarty<sup>14</sup> advised radical surgical excision of the primary growth and dissection of the regional lymph nodes.

Taussig and Torrey,<sup>11</sup> in a review of 35 cases, concluded that melanomas can be cured if they are removed early enough by radical surgical excision or thorough destruction by electrothermic means.

When the growth is believed to be local, MacKee and Cipollaro<sup>15</sup> prefer wide, deep surgical excision to the muscle, including the aponeurosis. The width of the excision should be greatest at the bottom in order to include malignant cells that may extend down and out. They state that it may be wise to apply a lethal dose of roentgen rays or radium before excision but that irradiation is of no help after metastasis has occurred.

In the period of twenty years covered by this report, various treatment methods have been employed. For the primary lesions, these have included electrothermic destructive procedures, scalpel excision and amputation in some cases in which the lesions were on the extremities. Irradiation, with roentgen rays and radium, was applied to the operative field in some instances. Irradiation of metastatic involvement of the



Fig. 12—A man aged 52 when first seen had generalized blood borne metastasis resulting from a melanoma on the left ankle. A flat brown black nevus had been present since birth. No treatment was given. He died three months later.

nodes failed to prevent further dissemination and death in every instance in which it was used including those in which surgical dissection was also done.

14 Broders A. C. and McCarty W. C. Melanoepithelioma. A Report of 70 Cases. *Surg. Gynec. & Obst.* 23, 28-32 (July) 1916.  
15 MacKee G. M. and Cipollaro A. C. Cutaneous Cancer and Pre-cancer. New York. American Journal of Cancer 1937 pp. 147-153.

As a rule, dissection of lymph nodes was not performed unless there was clinical evidence of their involvement. Criticism of this procedure may be justified, but we would like to point out that in the practice of the dermatologist a larger proportion of the lesions are earlier types of melanomas than those seen by the surgeon or radiologist. In fact in many instances lesions that were proved microscopically to be melanomas were clinically only suspicious. For this reason the cures obtained by experienced dermatologists are in general better than those of the surgeon whose patients usually have a far advanced condition when he is called on to treat them. In our series of 60 patients, out of the group of 25 from the surgical records at the University Hospitals, only 2 were known to be living more than five years. Twelve of these 25 had regional or general metastases when first seen. In 6 instances, metastases, while not clinically present when first seen, developed in from seven to sixteen months. All 18 patients are known to have died of their disease. Seven had no nodes clinically present. Two have been well for seven and eight years respectively, 2 were clinically free from disease when last seen one and one-half years after treatment, and 1 is living with metastases. Two have since died of metastasis and 1 could not be followed.

By comparison, it is found in the other group of 35 cases seen in dermatologic practice that 31 patients had no clinical evidence of metastasis when first seen. Of these, 3 had metastases later and died in less than two years. Nine are living but have been treated less than five years, and 17, or 56.7 per cent, of this group without clinical metastasis when first seen have lived from seven to eighteen years without recurrences. In 2 instances follow-up was not possible. Four patients showing metastases when first seen have all died of their disease.

In the latter group we find a high percentage of cures because early treatment was instituted before metastases had occurred. Our experience has shown that the method of treatment is not so important as long as the melanoma is completely surgically excised or thoroughly destroyed. Wide scalpel excision was performed in the majority of instances, while electrodesiccation or the electrocautery was employed chiefly in early clinically suspicious lesions that were small in size. Follow-up irradiation to the operative field with filtered roentgen rays, with Coutard technic in doses of 5,000 to 8,000 roentgens, was employed in 6 cases in this group. As to whether irradiation in this manner should be used is a question of clinical judgment to be decided individually in each case.

The diagnosis of melanoma was made by histologic examination in 58 of the cases. In 2 that presented widespread general metastases the diagnosis was made clinically.

#### SUMMARY AND CONCLUSIONS

Of a series of 60 patients with melanomas, a group of 25 patients seen in hospital surgical practice presented themselves for treatment, comparatively late with relatively advanced malignant growths and a large percentage showing metastatic involvement. Only 2 patients are known to be alive more than five years later. The mortality rate was 92 per cent.

Of the other group of 35 patients seen in dermatologic practice 17, or 48.6 per cent, survived from seven to eighteen years. As a group these patients were seen comparatively early in their disease and the great

majority were free of metastatic dissemination when they were first treated.

The results obtained indicate that the only hope of reducing the high mortality rate in cutaneous melanoma lies in early diagnosis and thorough destruction of the primary lesion before dissemination takes place, either by electrocauterization (not electrolysis) or by radical scalpel excision.

Experienced clinical judgment is necessary in deciding in what cases dissection of regional lymph nodes should be done. If the lymph nodes are clinically involved the chances of cure by any therapeutic method are practically nil. Melanomas on the fingers, hands, arms, feet and legs should be treated by amputation followed by surgical dissection of the regional lymph nodes in every case.

The complete scalpel excision or thorough destruction of flat, nonhairly pigmented nevi (junction type nevi) from areas subject to chronic irritation such as the face, ears, extremities and particularly the feet is the best form of prophylaxis for cutaneous melanomas.

Euclid at Fourteenth Street

#### ABSTRACT OF DISCUSSION

DR H. FORD ANDERSON, Washington, D. C. The handling of melanomalignancy is one of the most serious problems that faces the dermatologist, who by training is best adapted to meet the problem from the diagnostic angle. The differential diagnosis and classification of pigmented lesions is practically a daily chore for all of us. Publications by men of other groups are on record in which seborrheic keratoses and keratomas easily identified from both their photographs and biopsies are included under the heading of melanotic tumors. From the standpoint of nomenclature to me the word melanoma from its literal translation means merely a tumor containing melanin and may be either benign or malignant. The authors clearly state here that when they use the term melanoma they mean melanomalignancy and thereby avoid any confusion as to site of origin which would be of no practical value in this type of discussion of the problem. Many other physicians have also developed skill in the diagnosis and treatment of melanotic tumors. This is particularly true of the better plastic surgeons. The time was when surgeons would criticize the dermatologist when the opportunity arose and, when a recurrent melanotic malignant growth came into the dermatologic clinic after surgery had been performed on the original lesion, students were told about the inadequacy of surgery and that if the blood vessels and lymphatics had been sealed by electrical methods this calamity would not have happened. In both instances both men were wrong. Provided that in both instances there was no recurrence at the site of the previous lesion which always is the best criterion of adequate therapy. All this was wrong. There are men in both fields capable of handling any possible situation that has not already advanced beyond the point of all hope and today most of the better men in both fields recognize this fact. Unfortunately this point of all hope in melanotic malignant growths often comes early and insidiously. The prophylaxis in removal of premalignant lesions especially those subject to irritation whether by sun, by clothing or by electrolysis is again properly emphasized as well as the type of lesion most apt to cause trouble. The next most important problem is recognition and treatment of the malignant lesion, which can be summed up as total destruction and must be adequate. Adequacy can be obtained by surgery, electrical destruction or combinations of these. The importance of the biopsy cannot be overemphasized. Without it adequate therapy and prognosis would be impossible in many instances.

DR EUGENE F. TRAUB, New York (Flushing, N. Y.) In the case of melanomas I believe our only hope of reducing the mortality rate is through prophylactic treatment. Fortunately while pigmented nevi and pigmented marks on the skin of

various types are common, the development of melanoma is exceedingly rare. The disease has such a bad reputation solely because when malignant melanoma has actually developed the prognosis has always been exceedingly poor. For this reason I have attempted to tackle the problem by trying to get a line in the type of pigmented mark which is liable to become a malignant melanoma, the idea being that once we have ascertained correctly what types of pigmented marks are dangerous we can then intelligently discuss the feasibility of their prophylactic removal. Since it is of the greatest importance to learn as much as possible about the type of lesion from which malignant melanomas arise, I suggest that extreme care be taken in describing the exact type of lesion from which this has apparently occurred when reporting such cases. The exact duration of the original mark, prior to the time malignant change apparently occurred, is also valuable information to record. With regard to the matter of biopsy for diagnostic purposes, most pigmented lesions in which the question of malignant melanoma arises are fortunately usually small. While not particularly opposed to the diagnostic biopsy, I believe it is far better to excise the entire lesion completely and submit it for study than first to remove a small portion, which might give false information and which usually must be followed by a complete excision within a short space of time in any event. Where the marks are extremely large, which is rare, of course this might not apply. Concerning the diagnosis of malignant melanoma, in late cases this presents relatively little if any difficulty, but in early lesions great differences of opinion may arise, both clinically and, I believe particularly, histopathologically. I have frequently found that the best skin pathologists will differ widely in their opinions as to the innocence or the malignancy of a lesion on examination of microscopic sections. It becomes imperative to balance such opinions carefully against the clinical appearance of the lesion and its course or development while under observation. The most important part of this entire subject is the earliest destruction of those lesions which might be looked on as dangerous.

DR LOUIS A. BRUNSTING, Rochester, Minn. There is no treatment other than excision for melanomas. If the patient is elderly, operative measures may be postponed unless the lesion is at a site which is subject to irritation. Not all melanomas are pigmented nor, on the contrary, are all pigmented lesions melanomas. It is desirable to have microscopic examination of all suggestive lesions. Those who advise conservative treatment and who do not have microscopic examinations of tissue to back up their findings may include such lesions as foreign body reactions, deposits of hemosiderin, verruca senile or blue nevus. Once melanomas show signs of growth or ulceration, the outlook is grave regardless of the type of treatment. Even though the lesion is excised widely it is doubtful whether the use of x-rays or radium is of additional benefit, and such procedures as amputation of the extremities or even excision of the regional lymph nodes are probably useless.

DR S. W. BECKER, Chicago. On the basis of studies of pigmentation, starting with normal pigmentation and extending to the nonmalignant and to the malignant conditions, I have gained certain ideas which I believe will withstand scientific scrutiny. In what clinical work I have had the opportunity to carry out, certainly these have been borne out. In the first place melanomas do not metastasize early. That idea has been gained because the melanoma has not been appreciated at the earliest stage. One patient whose picture the authors presented had a brown lesion appearing five years previously. In my opinion that brown lesion at the time of appearance was a lentigo maligna, which is not a nevus but is already a malignant melanoma, and I do not believe that a melanoma arises from nevi as often as it does from the so-called lentigo maligna. The junction type nevus is a sort of misnomer. Some lesions which have been presented as junction type nevi are already lentigo maligna. These malignant changes can be readily appreciated by the fact that groups of cells are working their way through to the cutaneous surface. In ordinary nevus, a flat nevus, such as the one Dr Traub presented, the patient with the thigh and leg covered with nevi, you may find almost the same picture. You will find groups of nevus cells all attached to the epidermis,

but you do not find them working their way through the epidermis to the cutaneous surface. If melanoma does arrive from a nevus, it is the smooth brown type and not the blue black variety. Patients admit that the lesion when it started was brown and over a period of many years it changed and became darker in color and blue black, and at that time it was already a malignant melanoma and not a nevus. Malignant melanomas arise at the junction of the epidermis and dermis, and, if you are confronted with a quiescent nevus, all that you have to do is to destroy enough of the lesion to destroy melanoblasts at the junction. You do not have to worry about the nevus cells deeper down. The first thing, of course, is to be sure of the diagnosis. The early recognition, of course, is extremely important. Any brown lesion which has appeared recently and is enlarging, and any preexisting brown lesion which is enlarging or becoming darker, should be submitted to biopsy to eliminate lentigo maligna. Pathologists and even dermatologists have a great deal of difficulty with the diagnosis of doubtful cases.

DR ALFRED HOLLANDER, Springfield, Mass. The authors have given us an instructive paper on melanomas. If we are dealing with the common cutaneous melanomas we have nothing to add. There is another angle to this problem, however. We see frequently nonpigmented tumors, especially warts located on the scalp. When we see those lesions we should be careful in regard to the treatment. I should say that not too rarely when we do a biopsy on those tumors we see a melanotic stage developed within the tumor which cannot be seen clinically. I should recommend that in all these tumors, especially when they have a tendency to be injured by mechanical friction, you do a biopsy and find out whether or not there is already a so-called nonpigmented melanoma. Regarding therapy, I have done electrocutting for the last eleven years, and I should say that if we are able to remove the tumor with the scalpel we should do that, because I have never seen wounds set by the electrocutting method heal as nicely and as quickly as they will when removed by the scalpel.

DR FRANCIS A. ELLIS, Baltimore. The question of melanomas provokes discussion because they are one of the common dermatologic lesions and occasionally they are either clinically or histologically malignant. According to several standard text books and dictionaries, a melanoma is a tumor composed of cells which form melanin pigment (melanoblasts), and they may be either benign or malignant. The classification of these tumors may be difficult with patients below the age of puberty. Recently I was consulted by several surgeons concerning melanomas of the face removed from 2 patients, 1 a child 1 year and a half old and the other a boy 10 years old. Both of the growths were smooth and brown. Microscopically they showed clear cells in the junction between the basal layer and the cutis, but there were nevus cells penetrating deeply into the cutis without forming nests. From the microscopic appearance they were malignant. Until some one can advance some better diagnostic criteria, one will have to wait and see what happens. It is my opinion that many of these melanomas in infants and children are frequently histologically malignant but are usually clinically benign. The tumors are in the formative stage and therefore show the malignant histologic picture.

DR JAMES R. DRIVER, Cleveland. I thank the discussers for their valuable remarks. The prognosis of melanoma is not so bad as is generally supposed if one keeps in mind the importance of its early diagnosis and adequate treatment. The removal of suggestive pigmented lesions from areas likely to be subjected to chronic irritation is the best type of cancer prophylaxis.

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**Early Work on Coronary Disease**—To the English physicians must be given the credit for the earliest productive work on the coronary artery in its relation to angina pectoris. Heberden was the pioneer clinician of angina. Jenner and Parry, by necropsy and logical reasoning, showed the relation of the syndrome to disease of the coronary artery. Allan Burns was the first to try to prove the correctness of the myocardial ischemia theory by a purposeful planned experiment—Herrick, James B. A Short History of Cardiology, Springfield, Ill., Charles C. Thomas, 1942.

## Clinical Notes, Suggestions and New Instruments

### ALLERGY TO ARGYROL

LEO H. CRIEP, M.D. PITTSBURGH

A case of acquired allergy to argyrol<sup>1</sup> is reported because it is an instance of sensitivity which must be a great deal more common than is recognized and because it offers an opportunity for the study of the possible mechanism involved in drug allergy.

A thorough search of the medical literature fails to reveal more than a single reported instance of allergy to argyrol.<sup>2</sup> In the one referred to a young woman received nasal treatments with argyrol for several years twice a week for a suppurative sinusitis. From the description given, it is also likely that she had some allergic nasal manifestations. The treatments were discontinued for several months and on being resumed the patient had an immediate reaction. This consisted of massive swellings of the face, generalized urticaria and symptoms of collapse. On several occasions subsequent treatments evoked similar, severe, immediate reactions. Scratch tests with 10 per cent argyrol were positive.

#### REPORT OF CASE

M. S., a man aged 26, has had seasonal hay fever for four years. Asthmatic breathing first developed at the end of the 1941 hay fever season. It further appears that the ingestion of even a very small quantity of milk gives rise to violent cramps and diarrhea. He presents evidence of considerable infection in the paranasal sinuses. Considerable sneezing, nasal blockage, rhinorrhea and even wheezing would develop during the course of local treatments with the drug, necessitating the administration of epinephrine on one occasion. Some time later severe asthma followed spraying of the throat with argyrol for pharyngitis. It finally became obvious that the patient's discomfort was more than that usually experienced from the mechanical irritation of the nasal tampons, hence local treatments with argyrol were discontinued.

Scratch (skin) tests performed with a weak (1 per cent) solution of argyrol produced a definite local reaction while a control test with the drug on another person was negative. Similarly, an intradermal test with a 1 per cent argyrol solution yielded a very severe local and a mild constitutional reaction. The ophthalmic test was positive with argyrol. Controls were uniformly negative.

As an aid in determining the specificity of these reactions, passive transfer tests were done. One-tenth cc of the patient's serum was injected intradermally into the arm of a normal person and twenty-four hours later 0.05 cc of 1 per cent solution of argyrol was injected into the sensitized site. A definite local reaction resulted, indicating the presence in the patient's serum of specific antibodies (reagents) against argyrol. Controls were negative. It would therefore appear that the patient is specifically sensitive to argyrol—first because of the presence of demonstrable antibodies (reagents) in his serum and second because of the development of a constitutional reaction on exposure.

#### COMMENT

This instance of allergy to argyrol is of interest because unlike most instances of drug allergy it is associated with demonstrable specific antibodies. There are persons who as a result of sensitivity to drugs such as acetylsalicylic acid may have a severe and even a fatal attack of asthma following the ingestion of even small doses of the drug. However, because of the nonprotein nature of the drug specific anti-

bodies are not demonstrable in the serum of such patients. Skin testing to acetylsalicylic acid and similar drugs is usually not of any value. It is thought that in these instances the allergy is to a combined protein, a combination of the drug with protein body molecules. My patient did not have any cutaneous reactions to solutions of silver nitrate. It is obvious then, that the allergy must be either to the protein vehicle of argyrol or to the combination of argyrol with this protein vehicle. In contrast to the type of allergy to acetylsalicylic acid, positive reactions were obtained in this case to colloidal protein solutions of the drug.

According to the Council on Pharmacy and Chemistry of the American Medical Association<sup>3</sup> argyrol is a silver preparation consisting of a colloidal solution of silver or silver oxide in alkali-proteins. I was interested in determining the nature of the protein vehicle of argyrol in order to test the patient's sensitivity to this protein alone as well as to argyrol. Repeated attempts to obtain either this information or the protein vehicle itself for separate testing were unsuccessful. The A. C. Barnes Company,<sup>4</sup> proprietors of argyrol, refused to cooperate in this investigation, claiming that 'to furnish the solution without the silver would be impractical because it would deteriorate and become mildewed'. Nor is the nature of this protein known to the Food and Drug Administration<sup>5</sup> or to the Council on Pharmacy and Chemistry. According to the U. S. Dispensatory argyrol "is said to be a combination of silver with a protein produced by the electrolysis of serum albumin, while one synonym given for argyrol by this source is 'silver vitellin,' and vitellin is a commercial variety of lecithin derived from eggs.

There are various essentially similar colloidal silver preparations on the market. They are all grouped in the U. S. Pharmacopeia under the common name of 'mild protein silver.' The protein vehicle in some of these such as solargentum (Squibb), is known to be gelatin. Formerly argyrol was included in New and Nonofficial Remedies in 1928 it was omitted<sup>3</sup> because of 'unsubstantiated and misleading statements in regard to its therapeutic actions and chemical individuality' and because of a disregard of the pharmacopeial title.

The A. C. Barnes Company throughout the controversy which led to the omission of argyrol from N. N. R. consistently maintained that its product was different in composition from that of other products included under the 'mild protein silver' in the U. S. Pharmacopeia. In 1928 the American Medical Association Chemical Laboratory reporting on argyrol for the Council on Pharmacy and Chemistry stated 'In our opinion tests do not indicate that argyrol is essentially different from the other preparations in reference to the therapeutic component, i. e. the concentration of silver ions as indicated by the yeast test. On the other hand, according to the Council on Pharmacy and Chemistry, the yeast test showed that argyrol agrees with the other preparations of mild protein silver in the proportion of its ionized silver.

In view of this information the patient was tested intradermally with similar dilutions of Solargentum (Squibb) and Heyden's U. S. P. mild protein silver. Negative cutaneous reactions and negative passive transfer tests were obtained with both of these products indicating that the protein vehicle must be different. Local nasal tampons with both of these preparations failed to give rise to local symptoms or asthma.

It would appear that in both instances referred to this allergy occurred in otherwise allergic persons who acquired a sensitivity to argyrol following sufficient exposure to this substance. There is still another interesting feature to both of these instances namely that the constitutional reaction occurred following resumption of treatment with argyrol after the patient

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1. Argyrol is a preparation of mild protein silver manufactured by the A. C. Barnes Company, Philadelphia.

2. Howard, R. C. Allergy to Argyrol in a Patient with Chronic Purulent Otitis Media. *Laryngoscope* 40: 215-218 (March) 1930.

3. Council on Pharmacy and Chemistry, American Medical Association. Personal communication. Reports of the Council. Argyrol Omitted from N. N. R. J. A. M. A. 90: 849 (March 17) 1928.

4. A. C. Barnes Company. Personal communications to the author.

5. United States Food and Drug Administration. Personal communications to the author.

had discontinued this therapy for a few months. This is in accord with my own experience in cases of acquired allergy to biologic products such as liver extract and pancreatic extract.<sup>6</sup> These allergic patients seem to develop constitutional reactions, usually after they have taken repeated treatments, then discontinued treatments for a while and finally resumed them. The reaction occurs as a rule after the first of the last series of such treatments.

One wonders whether the supposed rarity of the occurrence of allergy to argyrol in nose and throat practice may not be due to a failure to recognize its presence. Patients receiving such treatments frequently protest about the discomfort it causes them, and in many instances it is not easy to recognize this discomfort as an allergic manifestation because the primary symptoms from which the patient seeks relief are so similar to those which develop coincident to treatment. In other instances the reaction may be too mild to be recognized. It is therefore thought likely that rhinologists who suspect a possible allergic reaction following the use of argyrol may do well to change to some other mild protein silver preparation and avoid these allergic reactions without depriving the patient of the desired therapeutic effect. It is generally agreed that the therapeutic effect of all mild protein silver preparations is about the same. In view of this, it may be advisable to change from one preparation to another at stated intervals in the treatment of patients who receive regularly local applications of such preparations and thus avoid the development of allergic manifestations.

Several workers<sup>7</sup> noticed the occurrence of anaphylactic shock in guinea pigs and rabbits exposed on successive injections with collargol (a colloidal silver preparation) during the course of animal experimentation. Undoubtedly this shock was due to anaphylactic sensitization to the protein vehicle in collargol, which is a product of mild protein silver similar to argyrol.

1001 May Building

## CONTACT DERMATITIS FROM RUBBER SERVICE MASK

CAPTAIN IRVING A LEWE  
MEDICAL CORPS ARMY OF THE UNITED STATES

Rubber respirator dermatitis has been brought to the attention of the medical profession by a recent report of 16 cases observed at one of the Royal Navy depots by Petro.<sup>1</sup> The following case is reported because I have found no reference of respirator dermatitis in the United States military service.

### REPORT OF CASE

W H V, a white soldier aged 42, admitted to the Station Hospital, Camp Roberts, California, Sept 1, 1942, complained of an itching cutaneous eruption on the face of less than twenty-four hours' duration.

The patient stated that on August 26 he had gone through the gas chamber for the first time, wearing his service mask which was brand new. A few hours later an itching cutaneous rash developed on the face which persisted until the following day. The mask was worn again for five minutes at a gas drill on August 31. Three hours later a similar eruption of greater severity appeared. He was hospitalized the following morning.

6 Crippe L H. Allergy to Liver Extract. J A M A **110** 506 1938. Allergy to Pancreatic Tissue Extract with Report of Two Cases. J Allergy **12** 154 163 (Jan) 1941.

7 Stewart F W and Parker F Jr. So called Endothelial Blockade with Collargol. Am J Path **2** 381 389 1926. Bottner A. Ueber Kollargolanaphylaxie und ihre Bedeutung für die menschlichen Anaphylaxie, Deutsches Arch f klin Med **125** 122 1918.

Released for publication by the War Department Manuscript Board which assumes no responsibility other than censorship for the contents of this article.

1 Petro John. Respirator Dermatitis. Brit M J **1** 631 (May 23) 1942.

A review of his past history revealed that he had had eruptions on the scalp, both axillae and crural regions on and off since puberty, the eruption would be mild and relatively asymptomatic. There was a history of contact dermatitis from leather watch bands and from an elastic abdominal binder worn after an appendectomy many years before. The family history was negative for allergy.

On admission, the patient presented a bright red erythematous vesicular cutaneous eruption confined to the peripheral portion of the face corresponding to the area in close contact with the gas mask. The central portion of the face was spared, giving the appearance of an oval band of dermatitis. There was a coincidental mild chronic seborrheic dermatitis of the scalp, axillae and crural regions. No other physical abnormalities were found. A blood count was normal and urinalysis was negative.

The facial dermatitis was treated with Burow's solution compresses and calamine lotion, resulting in complete clearing of the eruption in one week. The seborrheic dermatitis responded to treatment with a sulfur-resorcinol lotion.

September 9 the patient was allowed to wear his gas mask in the ward for ten minutes. Three hours later he was aware of itching at the site of contact with the mask. Within an hour this was followed by an erythematovesicular cutaneous eruption which became progressively more severe. This time there was pronounced edema of the eyelids. When seen the following morning the eyelids were reddened and swollen shut, and there was a greatly edematous erythematovesicular cutaneous eruption of the periphery of the face most severe on the forehead and frontal scalp, here there was considerable oozing and crusting. By the next day the edema was even more pronounced with boggy tissue of all the loose tissue under the chin, and itching was intense.

The eruption gradually subsided with compressing and application of bland antipruritic lotions and ointments. Patch tests were placed on the patient's back on September 21, a sample of unprocessed rubber and small samples of rubber from the three service masks in current use at Camp Roberts being used. The patches were removed in forty-eight hours. A positive reaction was elicited with the samples from service mask M2-A1, the type that the patient had been wearing, and service mask M-3, a diaphragm mask made of the same type of rubber.

The tests with unprocessed rubber and service mask M1-A2 were negative. The positive reactions were manifested by erythema and small papules and vesicles confined to the site of the patch test. Another reading taken at seventy-two hours showed a much more pronounced reaction of the positive tests with slight peripheral spread.

By September 26 the dermatitis had entirely subsided and the patient was permitted to wear mask M1-A2 in the ward for ten minutes. No reaction resulted. This test was repeated in the ward the following day for twenty minutes without reaction. The patient was discharged from the hospital on September 28 and provisions were made for him to exchange his mask for one of the M1-A2 type.

### COMMENT

It is interesting to note that the face pieces on the two masks to which the patient demonstrated sensitivity were made of the same type of rubber. His present mask is of an older type, the rubber of which is processed in a different manner. This is in accordance with previous reports<sup>2</sup> in which it has been shown that most cases of rubber dermatitis are due not to the rubber itself but to the antioxidants and accelerators used in the manufacturing process. No attempt was made to determine the offending substance in this case. If further cases are found it would be wise to investigate the manufacturing processes.

2 Schwartz Louis and Tulipan Louis. A Textbook of Occupational Diseases of the Skin. Philadelphia Lea & Febiger 1939. Petro<sup>1</sup>



## Special Article

### HANDBOOK OF NUTRITION VIII

#### IODINE IN NUTRITION

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*These special articles on foods and nutrition have been prepared under the auspices of the Council on Foods and Nutrition. The opinions expressed are those of the authors and do not necessarily reflect the opinion of the Council. These articles will be published later as a Handbook of Nutrition.—Ed*

In the struggle for survival in this world conflict, in which both physical and emotional demands on the body's resources are rapidly mounting, the problems of nutrition assume an even greater significance. And thus iodine, a nutritional necessity, essential in the normal regulation of the energy output of the human body comes to take its place in any all inclusive war effort.

#### DISTRIBUTION OF IODINE AND GOITER

Iodine is widely distributed throughout all nature. It occurs in many forms, both organic and inorganic. It is found in nearly all living things as well as in the air, water, soil and rocks. Not the sea, as is popularly believed, but the earth's crust is the major storehouse of iodine.<sup>1</sup>

Iodine is not uniformly distributed but varies with the local geologic conditions of the soil and water. Inversely related to the distribution of iodine is the incidence of endemic goiter. The highest incidence of goiter is found among the Alps, Pyrenees and Himalayas, the Thames Valley in England, certain inhabited districts of New Zealand, the region of the Great Lakes and the Pacific Northwest.<sup>2</sup>

Throughout the United States there are similarly varying degrees of iodine deficiency. A low occurrence of iodine together with a high incidence of goiter are especially prominent in the Central Plain of North America, in contrast to the low incidence of goiter on the sea coasts, where large amounts of high iodine containing sea foods are consumed. On the other hand, the district of Salt Lake City has a high incidence of goiter even though the water of Great Salt Lake has a higher iodine concentration than the ocean. However, neither vegetation nor fish for human consumption comes from the nearly lifeless waters of the Great Salt Lake.<sup>3</sup>

The incidence of goiter can be correlated with the iodine intake of a given region. This in turn is largely dependent on the soil iodine. Intake iodine is derived essentially from the food and to a lesser degree from unsupplemented salt or from water.<sup>4</sup> About 14 micrograms daily was formerly said to represent the difference in iodine intake between goitrous and nongoitrous

regions.<sup>4</sup> However the estimation of regional differences in iodine consumption becomes less pronounced as the interstate transportation of foods, drinks, vegetables, fruits and fertilizers increases.

The amount of iodine in the local drinking water may be regarded as a measure of the iodine content of the soil and, consequently, of the fruits, grains, grasses and vegetables grown in the region. It is not, however, important as a source of nutritional iodine save in unusual circumstances.<sup>5</sup> McClendon has divided the United States into sections according to the iodine content of the waters. In a section extending from Oregon to the western part of Maine and in another from Nevada to the western part of Virginia the water iodine is low and the incidence of goiter high.<sup>2</sup> The Michigan studies revealed that the incidence of goiter in a given locality is inversely proportional to the amount of iodine found in its waters.<sup>6</sup>

The food iodine is the most important factor determining the goiter incidence in a given region. Japan presents an outstanding example of a goiter free area. Yet Formosa, which like Japan is geologically low in iodine, has a high incidence of goiter. The absence of goiter in Japan is a consequence of the extensive importation and consumption of seaweed which is rich in iodine.<sup>2</sup>

In South Carolina, where the incidence of goiter is low, the amount of iodine in the vegetables is considerably higher than in the more goitrous Northern and Western states.<sup>6</sup> Yet the cotton and tobacco growing South as a whole comprising a great part of the goiter free United States<sup>7</sup> fails to produce sufficient food and feed crops for its own needs.<sup>8</sup> Thus, most of the canned foods and other food products in the United States come from sections of the country poor in iodine.<sup>9</sup>

The regional incidence of goiter is also correlated with the milk iodine of the area.<sup>9</sup> This follows since the iodine content of the soil and vegetation determines the iodine intake of the lactating mammal.<sup>10</sup> Consequently, the milk iodine depends on the soil of the locality from which it is obtained provided supplemental iodine is not being consumed.<sup>11</sup> This is also true of eggs and other food products.<sup>1</sup>

In the Chinese province of Yunnan there is a high incidence of goiter and considerable cretinism. Men and women working on the Burma Road show an incidence of thyroid enlargement as high as 80 per cent with an average well over 50 per cent. Residence in a Yunnan goitrous district for six months appears sufficient to produce thyroid enlargement in susceptible individuals. Iodine deficiency in the provincial salt and vegetation appears responsible. As the result of military occupation by the Japanese, the hinterland of China is now cut off from its former coastal supply of

4 Hercus, C. E. and Roberts, K. C. The Iodine Content of Food, Manures and Animal Products in Relation to the Prophylaxis of Endemic Goiter in New Zealand. *J. Hyg.* 26: 49, 1927.

5 Reports cited in footnotes 63 and 66.

6 Weston, W. Foods in the Solution of the Goiter Problem. *South M. J.* 23: 479, 1930.

7 McClendon, R. Olesen.<sup>6</sup>

8 Olesen, R. Endemic Goiter. *U. S. Pub. Health Bulletin* 192: 27, 1929. Opportunity or Calamity, editorial. *Food Industries*, November 1931, pp. 467-469.

9 Orr and Leitch.<sup>3</sup> Shore and Andrew.<sup>12</sup>

10 Meyer, J. H. The Iodine Content of Milk. Thesis for M.S. Dept. Surg. Res., Ohio State University, 1940.

11 Shore and Andrew.<sup>12</sup> Meyer.<sup>10</sup>

12 Shore, R. A. and Andrew, R. L. Goiter in School Children. The Incidence of Goiter in School Children in Relation to the Amount of Iodine in Soil and Water in Certain Districts of the North Island in New Zealand. *Dept. Health & Sc. & Ind. Research*, Wellington, 1929. *Bull. Hyg.* 5: 94, 2, 1930.

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Aided by a grant from the Conely Fund for Research of the Ohio State University.

1 Orr and Leitch.<sup>3</sup> McClendon.<sup>7</sup> von Fellenberg.<sup>4</sup>

2 McClendon, J. F. Iodine and the Incidence of Goiter. *Minneapolis University of Minnesota Press*, 1939.

3 Orr, J. B. and Leitch, I. Iodine in Nutrition. *Medical Research Council Special Series Report No. 23*, London, 1929.

high iodine-containing salt. Consequently large areas of free China must now depend on Yunnan salt, which is deficient in iodine.<sup>13</sup>

#### IODINE AND THE NORMAL THYROID GLAND

The human thyroid gland is a principal storehouse for iodine. Weighing ordinarily about 25 Gm and containing about 10 mg of iodine, it normally maintains an iodine concentration of around 40 mg per hundred grams. It was shown long ago by Marine and Lenhart that, when this concentration falls below 10 mg per hundred grams, hyperplasia ensues and goiter may consequently develop.<sup>14</sup>

No other organ of the body has the power of iodine concentration possessed by the thyroid gland. The whole blood iodine averages less than 1 part in 25 million while the thyroid gland normally contains approximately 1 part in 25 hundred. This indicates that the thyroid gland can concentrate the iodine it obtains from the blood by a factor of at least 10,000.

Within the colloid in the alveoli of the thyroid gland iodine is stored in the form of the amino acids diiodotyrosine and thyroxine containing respectively 59 and 65 per cent iodine. King suggests that the thyroid hormone has undergone a process of evolutionary development in complexity, from a simpler physiologically active iodine compound produced in the tissues.<sup>15</sup>

The accepted facts of thyroid physiology indicate that iodine is selectively absorbed by the active thyroid gland. Furthermore in some measure the glandular function is regulated by its iodine content. Studies with radioactive iodine have shown that iodine is quickly brought to the gland by the blood stream and rapidly converted by the thyroid cells into organic compounds, moreover, that within a matter of a few hours these organic iodine compounds may return to the circulation.<sup>16</sup>

The total thyroid iodine content varies directly with the weight of the gland, while the relative iodine content is inversely proportional to its weight.<sup>15</sup> This inverse relationship between the size of the thyroid and its iodine concentration was noted as early as 1896 by Baumann<sup>17</sup> and was later confirmed by Marine and Lenhart in 1909.<sup>14</sup> The thyroid iodine content varies inversely with the incidence of nodule formation, the percentage of epithelial proliferation, the height of the follicular epithelium, the incidence of lymphocytic infiltration and the occurrence of degenerative changes.<sup>18</sup>

Iodine intake is the principal factor which determines the iodine content of the thyroid and overshadows other differences due to species, age or sex. Small differences in the supply of iodine are reflected in the iodine content of the gland. The thyroid fixes a relatively higher

percentage of iodine from smaller doses of administered iodine than from larger.<sup>18</sup>

Since iodine intake is so largely dependent on the soil and consequently on plant iodine, the gland concentration varies with the geographic distribution of iodine. Thus, in nongoitrous Texas the fat free thyroid contains 6 mg of iodine per gram, whereas in goitrous North Dakota it contains only 3.2 mg per gram.<sup>19</sup>

King found the total thyroid iodine higher from May through October than from November through April, although the gland concentration remained fairly constant.<sup>1</sup> The iodine content of the ruminant thyroid was found to be maximum in late summer and early fall and at a minimum in winter and early spring.<sup>6</sup> This variation in thyroid iodine may be attributed to fluctuation in the amount of iodine available from the pastures.<sup>21</sup> Perhaps more fundamental than the seasonal per se is variation in the foodstuffs available during each season.<sup>22</sup> Orr and Leitch analyzed various plants grown in Scottish pastures and collected during different months of the grazing seasons. They demonstrated an increase in the autumn iodine content.<sup>7</sup>

Age as well as sex differences in thyroid iodine have also been reported.<sup>3</sup>

#### IODINE AND THE PATHOLOGIC THYROID GLAND

Endemic goiter and its sequelae are fundamentally a result of iodine deficiency.<sup>3</sup> The ultimate cause of endemic goiter however is not clear. The immediate cause is a deficiency of iodine necessary in the production of the high iodine containing thyroid hormone. This deficiency may be absolute as in areas of subnormal iodine intake, or it may be relative, subsequent to various demands on the body which increase the needs for thyroid secretion.<sup>24</sup> Such factors include puberty, pregnancy, lactation, the incidence of infectious diseases, ingestion of toxic substances and high calcium intake, as well as those conditions which interfere with the gastrointestinal absorption of iodine.

The microscopic changes in the thyroid closely parallel the chemical findings.<sup>1</sup> Brumann and Roos<sup>5</sup> and also Oswald<sup>25</sup> were the first to observe that, if iodine is withheld, compensatory hypertrophy of the thyroid occurs. They noted that the iodine content of the thyroid is proportional to the amount of colloid present and that in colloid goiter the concentration of iodine is definitely below that found in the normal gland.

When normal or goitrous thyroid glands obtained from goitrous regions are compared with other normal

13 Robertson R Cecil. The Problem of Endemic Goiter in Yunnan Province. *J Clin Endocrinol* 1: 285 1941

14 Marine David and Lenhart C H. Further Observations of the Relation of Iodine to the Structure of the Thyroid Gland in the Sheep Dog Hog and Ox. *Arch Int Med* 3: 66 (Feb) 1909

15 King J D. The Iodine Content of the Normal Thyroid Gland Correlated with Its Histology and the Iodine Content of Other Normal Body Tissues in Central Ohio. Dissertation for Ph.D. Dept Surg, Res. Ohio State University 1940

16 Perlman I, Chaikoff I D and Morton M E. Radioactive Iodine as an Indicator of the Metabolism of Iodine. I. The Turnover of Iodine in the Tissues of the Normal Animal with Particular Reference to the Thyroid. *J Biol Chem* 139: 433 (May) 1941. Perlman I, Morton M E and Chaikoff I L. Radioactive Iodine as an Indicator of the Metabolism of Iodine. II. The Rates of Formation of Thyroxine and Diiodotyrosine by the Intact Normal Thyroid Gland. *ibid* 139: 449 (May) 1941. Curtis G M and Davison R A. Unpublished data

17 Baumann E. Ueber den Jodgehalt der Schilddrüsen von Menschen und Thieren. *Ztschr f physiol Chem* 22: 1 1896

18 Leblond C P and Sue I. Iodine Fixation in the Thyroid as Influenced by the Hypophysis and Other Factors. *Am J Physiol* 134: 549 (Oct) 1941

19 Fenger F, Andrew R H and Vollerston J J. Geographic Location and the Iodine Content of the Thyroid Gland. *J Am Chem Soc* 53: 237 1931

20 Seidell A and Fenger F. Seasonal Variation in the Iodine Content of the Thyroid Gland. *J Biol Chem* 1: 517 1913. Kendall E C and Simonsen D G. Seasonal Variations in the Iodine and Thyroxine Content of the Thyroid Gland. *ibid* 90: 357 1928

21 Matthews N L, Curtis G M and Meyer J H. The Effect of Increased Iodine Feeding on the Iodine Content of Cows Milk. *J Dairy Res* 10: 395 1939. Meyer J H, Matthews N L and Curtis G M. A Study of the Effects of Increased Iodine Feeding to a Herd of Sixty Dairy Cows. *Ohio J Sc* 40: 9 1940. Orr and Leitch<sup>7</sup>

22 Shore and Andrew<sup>1</sup>, Matthews, Curtis and Meyer<sup>21</sup>, Meyer, Matthews and Curtis<sup>1</sup>

23 King<sup>1</sup>, Marine<sup>14</sup>, Elmer<sup>1</sup>

24 Elmer A W. Iodine Metabolism and Thyroid Function. London Oxford University Press 1938

25 Baumann E and Roos L. Ueber das normale Vorkommen des Jods in Thierkörper. II. Mitt. *Ztschr f physiol Chem* 21: 481 1896

26 Oswald A. Ueber den Jodgehalt der Schilddrüsen. *Ztschr f physiol Chem* 23: 265 1897

or goitrous glands, it is found that the glands from the goitrous regions are the largest and have the highest incidence of nodule formation, the smallest follicular size and the lowest iodine content<sup>15</sup>

If iodine is administered to a person with a normal thyroid gland or with a colloid goiter there is a subsequent increase in the iodine content of the gland, with no notable change in its structure and with no hyperplasia of the remaining lobe after single lobectomy. If iodine is withheld, however, the iodine content of the gland gradually decreases, and hyperplasia will ensue if one lobe is removed<sup>14</sup>

Remington and his associates have shown that it is possible to produce enlarged and hyperplastic thyroid glands in young rats fed for five weeks on a diet extremely low in iodine<sup>27</sup>. The addition of iodide to the diet prevented the development of goiter, nevertheless, increased iodine intake by newborn rats during the first four weeks of life did not permit sufficient storage of iodine to prevent the development of goiter when iodine was later withdrawn. Varying the calcium content of the ration or its calcium-phosphorus ratio or the presence or absence of vitamin D did not significantly affect the degree of goiter produced<sup>27</sup>

The blood iodine is increased during pregnancy<sup>28</sup>. There is also an increased loss of iodine in the urine<sup>29</sup>. Thyroid hyperplasia may be demonstrated in from 70 to 80 per cent of the patients<sup>24</sup> and may also occur during lactation, since considerable iodine is lost in the milk<sup>24</sup>. It has been noted that feeding iodine to pregnant animals prevents microscopic pathologic changes in the thyroid<sup>30</sup>

#### IODINE AND THE EXTRATHYROID TISSUES

The total iodine content of the human body is variable and depends on divers factors. A normal man weighing 70 Kg may be estimated reasonably to contain about 50 mg of iodine, which is equivalent to about 1 part in 1,400,000 of body substance. Iodine thus forms less than 0.00008 of 1 per cent of the body weight. Every cell in the body is said to contain some iodine,<sup>31</sup> however, of the total body iodine, about one half can be assigned to the muscles, one fifth to the thyroid, one tenth to the skin and one seventeenth to the bones<sup>32</sup>

Several investigators maintain that the iodine concentration of the endocrine glands, exclusive of the thyroid and parathyroids, exceeds that of the nonendocrine tissues<sup>33</sup>. King, investigating mammalian tissue iodine,<sup>15</sup> and Libecap, determining the iodine content of normal

human tissues,<sup>34</sup> were unable to confirm this relatively high iodine content attributed to the nonthyroid endocrines. Moreover, they both found that the iodine content of the pituitary as well as of the central nervous system, was unusually low.

The importance of the liver in the physiology of iodine is emphasized by Elmer<sup>34</sup>. This is further supported by the consistently high iodine content found in the bile<sup>35</sup>. With the exception of the thyroid gland and the hair, bile contains the highest iodine concentration in the human body<sup>34</sup>

Von Fellenberg found that the lungs retain more injected iodine than other organs, however they may also lose it more rapidly. Since the administration of iodide did not increase the amount of iodine in the expired air, he concluded that the lungs lose iodine in some other manner<sup>36</sup>. Ariel and his co-workers<sup>3</sup> and Lein,<sup>38</sup> independently using radioactive iodine found that next to the thyroid gland the lungs collect most of the iodine injected. Lein was unable to correlate the large quantity of iodine held in the lungs with the iodine expired in the air.

#### IODINE AND THE BODY FLUIDS

Human blood normally contains a fairly constant concentration of iodine. Fractionation studies reveal that about a fourth of this appears to form part of the circulating thyroid hormone<sup>39</sup>. The other three fourths, consequently, would represent the iodine of nutrition together with products of the breakdown of the high iodine containing thyroid hormone.

Various values, ranging from 3 to 20 micrograms per hundred cubic centimeters, have been ascribed by different investigators to the normal blood iodine level<sup>40</sup>. These vary with the method of iodine determination, the geographic area and divers other factors. The average blood iodine of 29 normal individuals in central Ohio was found to be 4.2 plus or minus 1.2 micrograms per hundred cubic centimeters<sup>28</sup>. The blood iodine is significantly increased during pregnancy, during parturition, in unmedicated toxic nodular as well as in exophthalmic goiter (chart 3) and in certain non-thyroid diseases<sup>41</sup>. The higher blood iodine observed in certain patients with treated toxic nodular or with exophthalmic goiter may be due to the iodine medication of these patients,<sup>42</sup> since the administration of iodine in all forms thus investigated increases the circulating blood iodine<sup>43</sup> (chart 1).

In hypothyroidism the average total blood iodine does not differ as significantly as might be expected

27 Remington R R and Levine H. Studies on the Relation of Diet to Goiter. III. Further Observations on a Goitrogenic Diet. *J Nutrition* 11: 343 1936

28 Curtis G M and Fertman M B. The Blood Iodine in Health and Disease. unpublished data

29 Enright Lena Cole Versa V and Hitchcock F A. Basal Metabolism and Iodine Excretion During Pregnancy. *Am J Physiol* 113: 221 (Sept.) 1935. Puppel I D and Curtis G M. Iodine Balance in Exophthalmic Goiter. *Arch Path* 26: 1093 (Dec.) 1938. The Iodine Balance in Nodular Goiter. *J Clin Investigation* 17: 729 (Nov.) 1938

30 Schmelling J W. Over de normale en vergroote Schildklier geduren de embryonale ontwikkeling bij den pasgeborene en pasgeborene en bij het jonge kind in Nederland. Dissertation Utrecht 1934

31 Justus J. Ueber den physiologischen Jodgehalt der Zelle. *Virchows Arch f path Anat* 170: 500 1902

32 Sturm A and Buchholz B. Beitrage zur Kenntnis des Jodstoffwechsels. Jodverteilung im menschlichen und tierischen Organismus in ihrer Beziehung zur Schilddruse. *Deutsches Arch f klin Med* 161: 227 1928

33 Bourcet M P. Sur l'iodine normal de l'organisme et son elimination. *Compt rend Acad d sc* 131: 392 1900. Maurer E. Ducure H and Palasoff W. Untersuchungen uber das Vorkommen von Jod im menschlichen und tierischen Organismus. *Munchen med Wechschr* 74: 271 1927. Maurer E and Ducure H. Zur Kenntnis des Jods als biogenes Element der Jodgehalt im normalen tierischen Organismus. *Biochem Ztschr* 217: 227 1930. Sturm and Buchholz von Fellenberg

34 Libecap I L. The Iodine Content of Normal Human Tissues. Thesis for M. M. Sc. Department of Surgical Research. Ohio State University 1942

35 King L. Libecap I L.

36 von Fellenberg T. Versuche uber die Jodspeicherung in den einzelnen Organen. *Biochem Ztschr* 174: 355 1926

37 Ariel Irving Bale W F. Downing Vincent Hodge H C. Mann Walter Van Voorhis Stanley Warren S L and Wilson Helen J. The Distribution of Radioactive Isotopes of Iodine in Normal Rabbits. *Am J Physiol* 132: 346 (March) 1941

38 Lein A. Studies on the Rate of Certain Iodine Reactions in the Thyroid Gland. unpublished data

39 Davison R A and Curtis G M. Acetone Fractionation of Blood and Urinary Iodine. *Proc Soc Exper Biol & Med* 41: 637 1939. Davison R A, Zollinger R W and Curtis G M. The Fractionation of the Blood Iodine. I. Findings in Patients with Normal Thyroid Function and with Hypothyroidism. *J Lab & Clin Med* 27: 643 1942

40 Davis C B, Curtis G M and Cole V V. The Normal Iodine Content of Human Blood. *J Lab & Clin Med* 19: 818 1934

41 Curtis G M, Cole V V and Phillips F J. Blood Iodine in Thyroid Disease. *West J Surg* 42: 435 1934

42 Curtis G M. The Iodine Relationships of Thyroid Disease. *Surg Gynec & Obst* 62: 365 1936

43 Curtis G M. Iodine Metabolism in Toxic Goiter. *J Med* 15: 148 1934. Orr and Leitch, Elmer, Salter

from the normal<sup>28</sup> However, the acetone insoluble fraction, which presumably contains the circulating thyroid hormone, has an average value of about one-half normal and a range which barely overlaps the lower normal<sup>29</sup>

Blood iodine levels vary, as does the concentration of the thyroid iodine, however, the range is narrower<sup>24</sup> Some find a variation of the blood iodine with age,<sup>44</sup> others maintain that there is a seasonal variation,<sup>45</sup> while some note sex differences in the blood iodine level<sup>46</sup> We were unable to substantiate either a significant sex difference or any seasonal difference in a study of hundreds of patients with various diseases<sup>28</sup>

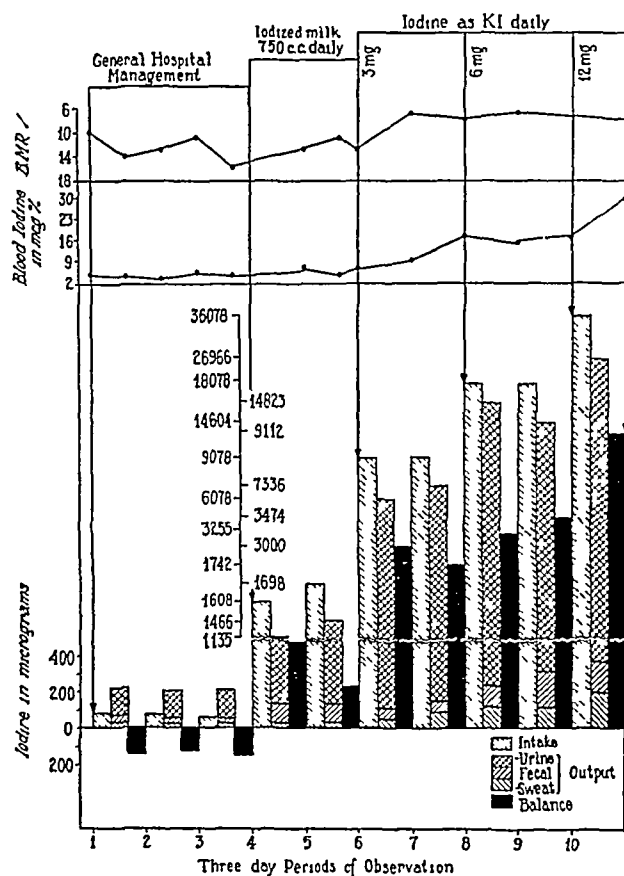


Chart 1—A thirty day iodine balance of a normal person (J R a man aged 56 Oct 10 Nov 13 1936) On the original low iodine intake the balance is negative and the principal iodine loss is in the urine Iodine storage occurs after giving milk with an increased iodine content obtained from a dairy herd receiving supplemental iodine and further increases when small amounts of iodine are administered daily Note the consequent rise in the blood iodine Reproduced from a chart that appeared originally in the *Annals of Surgery* October 1938 p 579

In certain diseases the blood iodine varies independently of the basal metabolic rate, in others the two are similarly affected We have found the blood iodine significantly correlated with the basal metabolic rate in 70 patients with toxic diffuse goiter, in 29 with toxic nodular goiter and in 80 with nontoxic nodular

goiter<sup>28</sup> (chart 3) Mobius and Nolte have noted correlation between the basal metabolic rate and increased blood iodine<sup>47</sup>

Thyroidectomy, either for thyroid disease or experimentally, exerts an important effect on the blood iodine Immediately following total thyroidectomy there ensues a transient increase in the blood iodine, which persists for about thirty-six hours After varying periods following total thyroidectomy the blood iodine decreases to about one-third normal<sup>48</sup>

Under maintained basal conditions the normal adult excretes a surprisingly constant amount of iodine in the urine<sup>49</sup> (chart 1) The urinary iodine varies geographically It is higher in sea coast regions than in those inland<sup>24</sup> and is higher in nongoitrous than in goitrous regions In five nongoitrous regions from 72 to 343 micrograms a day, averaging 165 micrograms, was excreted, in contrast to a range of from 27 to 64 a day, averaging 42 micrograms, in five goitrous regions<sup>49</sup> The average amount of urinary iodine excreted during twenty-four hours by normal adults in central Ohio, a moderately goitrous region, is 51 micrograms<sup>50</sup>

Several factors increase the loss of iodine in the urine, such as hyperthyroidism<sup>51</sup> (chart 3), menstruation,<sup>52</sup> pregnancy,<sup>29</sup> surgery<sup>53</sup> and the administration of iodine in nearly all forms<sup>54</sup> (chart 1) Milk with an increased iodine content, obtained from dairy herds fed supplemental iodine and given to patients with varying types of thyroid disease as well as to other hospital patients, consistently increased the urinary output of iodine The patients were thus maintained in a positive iodine balance<sup>55</sup> (chart 1) On the other hand, fasting decreases the urinary excretion of iodine<sup>55</sup> (chart 2) However, the decrease is less if the fasting is preceded by an iodine rich diet<sup>56</sup>

Iodine has been demonstrated in lymph,<sup>57</sup> cerebrospinal fluid,<sup>58</sup> perspiration<sup>59</sup> (chart 3), chyle, ascitic fluid pleural exudates and milk In milk it plays an important role in supplying needed iodine to the growing infant with a resultant depletion of the mother<sup>10</sup> If iodine feeding is essential to health, it is even more

47 Mobius W and Nolte I A Verhalten von Grundumsatz und Blutjod bei Thyreotoxikosen *Ztschr f Klin Med* 129 1/4 1935

48 Curtis G M Barron L E and Phillips I J The Blood Iodine After Total Thyroidectomy in Man *J Lab & Clin Med* 20 813 1935

49 Curtis G M Puppel I D Cole V V and Matthews N L The Normal Urinary Iodine of Man *J Lab & Clin Med* 22 1014 1937

50 Curtis G M and Puppel I D Urinary Iodine in Thyroid Disease *West J Surg Obst & Gynec* 45 417 1937 Curtis Puppel Cole and Matthews<sup>49</sup>

51 Curtis G M and Puppel I D Increased Urinary Excretion of Iodine in Hyperthyroidism *Arch Int Med* 60 498 (Sept) 1937

52 Cole V V and Curtis G M Cyclic Variations in Urinary Excretion of Iodine in Women *Proc Soc Exper Biol & Med* 31 29 1933

53 James A G The Postoperative Loss of Iodine in the Urine Thesis for M A degree Department of Surgical Research Ohio State University 1937 Curtis and Puppel<sup>50</sup>

54 Curtis Puppel Cole and Matthews<sup>49</sup> Curtis and Puppel foot notes 50 and 55

55 Curtis G M and Puppel I D The Iodine Metabolism in Thyroid Disease Tr Third International Goiter Conference Washington D C 1938 p 367 The Iodine Metabolism in Exophthalmic Goiter *Ann Surg* 108 574 (Oct) 1938

56 Salter W T The Endocrine Function of Iodine Cambridge Mass Harvard University Press 1940

57 Schneider E and Widmann E Klinische und experimentelle Untersuchungen zum Problem des Kropfes und der Basedowschen Krankheit I Untersuchungen zur Frage des Blutjodgehaltes *Deutsche Ztschr f Chir* 231 305 1931

58 Klassen K P Bierbaum R L and Curtis G M The Comparative Iodine Content of the Blood and Cerebrospinal Fluid *J Lab & Clin Med* 25 383 1940

59 Cole Versa V Curtis G M and Bone Mary L The Iodine Content of Hospital Foods *J Am Dietet A* 10 200 (Sept) 1934 Cole Versa V and Curtis G M Human Iodine Balance *J Nutrition* 10 493 (Nov) 1935

44 Burger M and Mobius W Der Jod und Cholesteringehalt des Blutes in seinen Beziehungen zur essentiellen Hypertonie *Klin Wchnschr* 13 1349 1934

45 Veil W H and Sturm A Beitrage zur Kenntnis des Jod stoffwechsels *Deutsches Arch f Klin Med* 147 166 1925 Kato S Ueber die Verteilung des in der Korper eingefuhrten Jods auf verschiedene Organe *Tokuoku J Exper Med* 29 442 1936 Ito<sup>46</sup>

46 Ito Nakao Iodine Metabolism of Patients Suffering Endemic Goiter in Jehol I Blood Iodine Content of a Healthy Person *J Orient Med* 28 529 1938 Baumann E J and Metzger N On the Amount of Iodine in the Blood *J Biol Chem* 121 231 1937

necessary to the lactating as well as to the pregnant mammal. The loss of iodine in the milk results in depletion of the mother's iodine reserve with an ensuing negative iodine balance. This loss should be compensated by a sufficiently large, previously built up

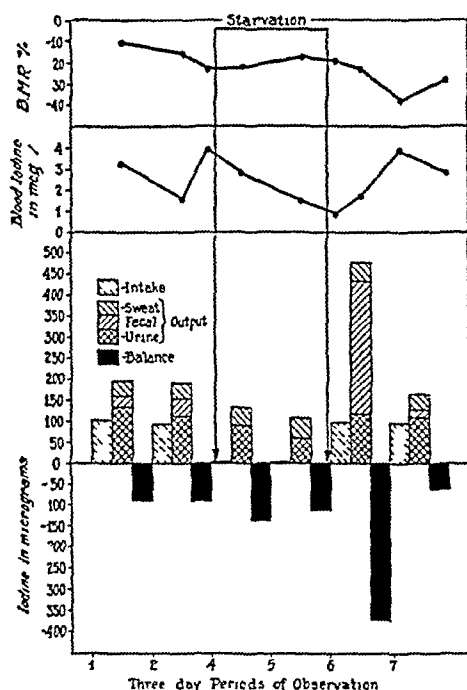


Chart 2—Effect of starvation on the normal iodine balance (R. B. a youth aged 19 normal constant regimen and starvation Nov. 17 Dec. 8 1936). Note the negative balance on the original low iodine intake. Loss of iodine in the urine and sweat continues during starvation. Reproduced from a chart that appeared originally in the *Annals of Surgery*, October 1938, p. 580.

iodine reserve or by an increased intake. Otherwise iodine deficiency goiter may develop.<sup>60</sup> Administration of iodine to animals increases the milk iodine.<sup>61</sup>

#### GOITER PROPHYLAXIS BY IODINE

'The results of iodine treatment of goiter have been so successful and so well recognized by the lay public that they constitute a chapter unique in the history of nutrition.'<sup>62</sup>

Fortunate was the empiricism which led the ancients to use burnt sponge or seaweed in the treatment of goiter. Iodine was then unknown. It was not until the year 1811 that iodine was accidentally discovered by Courtois as a by-product resulting from the use of seaweed in preparing war materials for Napoleon. Within a few years Sir Humphry Davy had isolated iodine from sponges, seaweed and other forms of marine life. Thence followed a fruitful century of clinical investigation extending from Straub of Berne to Plummer of Rochester, and of fundamental experimental researches dating from Boussingault of Paris through Chatin, Baumann, Kendall, Marine, von Fellenberg and others to Harington of London.

<sup>60</sup> Marine, David. Studies on the Etiology of Goiter Including Graves Disease. *Ann. Int. Med.* 4: 423, 1930. The Importance of Relative Iodine Deficiencies in Certain Forms of Goiter. *J. Am. Dietet. A.* 3: 1, 1933. Elmer.

<sup>61</sup> Scharrer, K. and Schwarbold, J. Zur Kenntnis des Jods als biogenes Element. Ueber den Chemismus des tierischen Jodstoffwechsels. *Biochem. Ztschr.* 150: 307, 334, 1927. Scharrer, K. and Schropp, W. Zur Kenntnis des Jods als biogenes Element. VIII. Futterungsversuch mit steigenden Jodgeben an Milchkühen. *ibid.* 213, 18, 1929. von Fellenberg, Meyer, Matthews, Curtis and Meyer. Matthews and Curtis.

<sup>62</sup> White House Conference on Child Health and Protection. Nutrition. Iodine in Nutrition. Section 1, p. 260. Medical Service, 1932.

Today iodine prophylaxis against goiter is most widely recognized, while iodized salt is used throughout the entire United States, even on Nantucket Island and in the Philippines.<sup>63</sup> The extensive and increasing popularity of the use of iodized salt obtained an original impetus from the experiments of Marine and his co-workers in Akron, Ohio.

Marine's significant studies on the prevention of goiter were made on a large group of schoolgirls. Approximately one half voluntarily received sodium iodide daily in a 0.2 Gm. dose distributed over a period of two weeks each spring and fall. The results of two and one-half years of observation showed that of the girls who had no goiter at the beginning of the test 0.2 per cent of the 2,190 receiving iodine developed enlarged thyroid glands, while 21.5 per cent of the 2,305 who did not receive supplemental iodine developed goiter. Of the girls with an initial thyroid enlargement 65.4 per cent of 1,182 who received iodine showed a reduction in the size of the thyroid gland at the end of the year, in contrast to the 13.8 per cent of the untreated 1,048 who showed some diminution in the size of the goiter.<sup>64</sup> In this same study Marine and Kimball point out that goiter is most apt to develop during tetraline puberty or pregnancy.

The character and results of the Ohio demonstration stimulated other similar efforts throughout the world, particularly in Switzerland, Austria and Germany. Iodine prophylaxis in Switzerland brought with it the steady decline year by year of cretinism, such an important economic factor to the Swiss. The institution of iodized salt in the canton of Appenzell in 1922 reduced enlarged thyroid glands in newborn infants from an

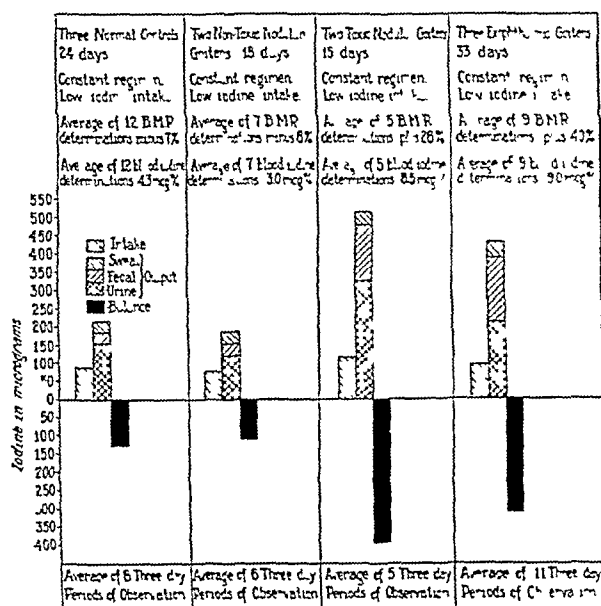


Chart 3—A comparison of the average iodine balance of three normal persons with that of 4 patients with nodular goiter and 3 with exophthalmic goiter. All were maintained on a low iodine intake. Reproduced from a chart that appeared originally in the *Journal of Clinical Investigation*, November 1938, p. 734.

incidence of 50 per cent to almost nothing. The consumption of iodized salt in the canton of Vaud as a result of the efforts of the Swiss goiter commission,

<sup>63</sup> Report of the Initial Meeting of the Study Committee on Endemic Goiter of the American Public Health Association, Detroit, June 14-15, 1941.

<sup>64</sup> Marine, David and Kimball, O. P. Prevention of Goiter in Man. *J. A. M. A.* 77: 1068 (Oct. 1) 1921.

brought about in fifteen years a decline of goiter incidence from 77 to 21 per cent<sup>65</sup>

The Iodized Salt Committee of the Michigan State Medical Society was organized in 1922. Common salt, iodized to contain 0.02 per cent of sodium iodide, was subsequently introduced by that committee in cooperation with the state board of health in 1924. The results of its consumption were convincing. From 1924 to 1935 there ensued a 75 to 90 per cent decrease in the incidence of goiter in those counties using the iodized salt.<sup>66</sup> The incidence of goiter operations in seven large hospitals in southern Michigan dropped from 1,452 in 1927 to 591 in 1933. There was a 60 per cent decrease in goiter operations as compared with a 17 per cent all operation decrease during the corresponding depression years.<sup>67</sup>

Iodine supplementally administered in the form of iodized salt, when thus extensively used, has repeatedly proved beneficial in the prevention of goiter. Its curative effect, however, depends on the character of the goiter as well as on the patient's age at the time of institution of iodine treatment. While it is of value to patients with colloid goiters,<sup>3</sup> little beneficial change may be expected in older patients with goiters of long standing in which there are extensive pathologic alterations such as hemorrhage with resultant cyst formation, calcification, vascular degenerative changes and old nodular formations.<sup>68</sup> The efficacy of iodine prophylaxis is greater the earlier it is applied and decreases after puberty.<sup>3</sup> Consequently it would seem wisest to commence prophylaxis even before the time of conception and to maintain it throughout the pregnancy. It should be continued as well during childhood and particularly through the menarche in young girls. This can be adequately accomplished in iodine deficient goitrous regions by the continued use of iodized salt. Subsequent to the nearly worldwide preventive use of iodine a general decrease in the incidence of goiter has ensued, particularly in Switzerland, Austria, Germany, northern Italy, the United States, England, New Zealand, Poland, Rumania, Latvia and more recently in other countries.<sup>24</sup>

Evident microscopic changes ordinarily occur in hyperplastic thyroids subsequent to the administration of supplemental iodine. Rapid involution of an existing hyperplasia may be induced, moreover glandular hyperplasia of the residual tissue even after extirpation of as much as three fourths of the thyroid can be prevented by the administration of sufficient iodine. Marine and Lenhart even maintain that a hyperplastic gland cannot revert to the colloid state without the presence of a necessary minimum of iodine.<sup>14</sup>

Despite almost worldwide favorable results thus empirically substantiating the basic theory behind iodine prophylaxis, objections have been repeatedly raised in the earlier years abroad and more recently in the United States to the preventive use of supplemental iodine. Principal among these objections has been the harm which iodine might cause to persons with overactive thyroid glands as well as the excitation of a simple or

nodular thyroid enlargement into a toxic or hyperfunctioning type. The basis of this fear of "jodbasedow," or *iodine induced hyperthyroidism*, arose as early as 1820 when Comdet treated his patients with excessive amounts of iodine.<sup>69</sup> The resultant idea has developed along with the subsequent progress of iodine prophylaxis. It has been a natural reaction to dangers inherent in pioneering a drug whose action was not fully understood. More recent exponents of the basic theory behind "jodbasedow" were Theodore Kocher and his successor Fritz de Quervain. In 1904 Kocher reported that patients with nodular forms of goiter may develop thyrotoxicosis when treated with iodine, in 1910 he wrote of the untoward effects of iodine in toxic diffuse goiter.<sup>70</sup> In 1933 de Quervain listed 33 cases of "jodbasedow" observed during a period of nine years.<sup>71</sup>

Convincing proof that iodine induced hyperthyroidism ordinarily or even commonly results from the administration of increased amounts of iodine to patients with goiter is lacking. On the other hand there is extensive evidence that supplemental iodine is ordinarily beneficial in the preventive treatment of endemic goiter. Kimball found that only 4 per cent of patients with goitrous "adenomas" later developed hyperthyroidism after the use of iodized salt, whereas 56 per cent of those with goitrous "adenomas" who used no iodized salt or any other form of iodine medication later manifested evidence of increased thyroid activity.<sup>72</sup>

In current medical practice there is ordinarily but little hesitancy in prescribing relatively large amounts of iodide on specific indications for example in the therapy of syphilis without any special regard to the thyroid and its activity. Demonstrably harmful effects as a result of increased thyroid function are not expected and are rarely encountered, especially if patients with thyroid abnormalities are excluded.<sup>6</sup> However symptoms of iodism ranging from a mild corvza or a moderate acne to a severe dermatitis even with high fever are known to occur subsequent to the administration of iodides.<sup>73</sup>

No ill results should be anticipated from the widespread use of iodides in the minute concentrations in which they occur in iodized salt. The development of iodism subsequent to the continued use of iodized salt alone has even been questioned.<sup>74</sup> Nor is iodism subsequent to the consumption of diets rich in iodine-containing foods recorded in the literature.<sup>74</sup>

#### IODINE PROPHYLAXIS IN ANIMALS

Breeding difficulties among domestic animals long existed in varying degrees throughout the goiter areas of the United States.<sup>75</sup> A practical solution of this

69 Comdet J. R. Decouverte d'un nouveau remede contre le goitre. *Ann. de chim. et phys.* 15: 49, 1820.

70 Kocher T. Die Therapie des Kropfes. *Deutsche Klinik* 8: 111, 1904. Ueber Jodbasedow. *Arch. f. klin. Chir.* 96: 403, 1910.

71 de Quervain Fritz. Report of the Second International Goiter Conference. Berne, 1933, pp. 10, 12.

72 Kimball O. P. The Efficiency and Safety of the Prevention of Goiter. *J. A. M. A.* 91: 44 (Aug. 18), 1928. The Prevention of Goiter in Michigan and Ohio. *ibid.* 108: 860 (March 13), 1937.

73 Campbell W. R. Iodine in Normal Nutrition. *Canad. M. A. J.* 40: 77, 1939.

74 Weston W. Iodine in Nutrition. *Am. J. Pub. Health* 21: 715, 1931.

75 Smith G. E. Iodine Requirement in the Pregnant Sow (Fetal Athyrosis). *J. Biol. Chem.* 29: 215, 1917. Hart E. B. and Steenbock Harry. Thyroid Hyperplasia and the Relation of Iodine to the Hairless Pig. *Malady* *ibid.* 33: 313, 1918. Kalkus J. W. A Study of Goiter and Associated Conditions in Domestic Animals. *Bull.* 136, Washington State Expt. Sta., July, 1920. Marine G. Welch Shepperd.

65 Eggenberger H. Kropf und Kretinismus. *Hirch Handbuch der Inneren Sekretion* 3, numbers 3 and 4. Leipzig. Kabitsch, 1927.

66 First Official Report of the Goiter Survey of Michigan. Study of the Effect of the Use of Iodized Salt on the Incidence of Goiter. *J. Michigan M. Soc.* 36: 647, 1937.

67 McClure R. D. Thyroid Surgery in Southern Michigan as Affected by the Generalized Use of Iodized Salt. *J. Michigan M. Soc.* 33: 58, 1934. The Incidence of Operations for Goiter in Southern Michigan. Effect of Iodized Salt After Twelve Years General Use. *J. A. M. A.* 109: 782 (Sept. 4), 1937.

68 Orr and Leitch. *Elmer*.



threat to the health of our country's live stock was found in the administration of iodine. As early as 1907 iodine-containing salts were fed to Michigan sheep in order to prevent the high death rate ordinarily occurring among the newborn.<sup>60</sup> In 1916 Montana, faced with a high mortality among its live stock, as well as with the development of goiter and underfunctioning thyroids, instituted similar therapy with considerable success.<sup>61</sup> At the University of Wisconsin Farms, since the introduction of iodized salt in 1920, there has not been an instance of goiter among the domestic animals, including sheep, swine, colts or calves.<sup>62</sup>

Iodine prophylaxis of iodine deficiency disease among animals, or "fetal athyrosis," as it is designated, has spread to various other states and provinces. Minnesota, North and South Dakota, Wyoming, Washington, Idaho, southern Alberta and British Columbia have similarly used iodine preventively.<sup>63</sup>

#### IODINE AND THE GENERAL HEALTH

Sufficient iodine is requisite for normal growth.<sup>3</sup> As early as 1895 it was demonstrated that growth may be induced even in certain cretins by the administration of dried thyroid. A similar effect may be demonstrated in certain children, living in iodine deficient areas and not receiving supplemental iodine, who have failed to grow normally because of lesser degrees of hypothyroidism. These children may also manifest various other symptoms subsequent to varying severity of the hypothyroidism.<sup>70</sup>

Topper and Cohen record that the administration of desiccated thyroid to normal children, as well as to children presenting evidence of hypothyroidism, resulted in definite growth acceleration in both groups.<sup>80</sup> Swiss statistics show that boys receiving iodine grew on the average 7 mm more than untreated boys and put on 200 Gm more of weight. The mean weight at birth of infants whose mothers were receiving iodized salt was 100 Gm greater than that of control infants.<sup>3</sup>

Hunziker reported that the average height of Swiss recruits was significantly greater from 1908 to 1912 than during the period from 1884 to 1891. He concluded that supplemental iodine was partly responsible for this increase in stature. Moreover, he found the average height inversely proportional to the incidence of goiter in the sections from which the recruits came.<sup>81</sup>

Feeding milk with an increased iodine content to children living in a region of high goiter incidence resulted in more rapid and regular growth and development. Children with debility or those who revealed slow development, failure to gain weight or retarded growth showed subsequent steady improvement.<sup>82</sup> Administration of optimal amounts of iodine to nursing animals

accelerated the rate of growth and weight of their young.<sup>83</sup> Direct iodine administration to the young was likewise beneficial.<sup>84</sup>

The favorable effect of iodine on the growth of vertebrates may be direct or indirect. It appears more likely that iodine acts indirectly by supplying the necessary constituent for normal thyroid secretion and thus permitting the gland to exert its usual function. Excessive thyroid secretion limits growth and may result in abnormal development.<sup>3</sup>

#### THE HUMAN REQUIREMENT OF IODINE

The human organism thus has a definite nutritive requirement for iodine. The supply necessary to answer this demand should be sufficient to meet the daily losses by excretion and to maintain within the body such a reserve as may be needed in the manufacture and distribution to the body of sufficient thyroid hormone. The amount of iodine intake, however, is not always equal to the physiologic needs. Elmer points out the contrast with the organism's chlorine requirement which is associated with the sensation of taste.<sup>4</sup> The fundamental question consequently arises: how much supplemental iodine should be supplied in goitrous areas to protect the people and live stock from the effects of iodine deficiency? Thus far, three methods have been devised in attempts to answer this question.

By the geographic method the iodine intake of the inhabitants of goiter free areas is determined and compared with that of goitrous areas of varying degrees. The difference in the amount of iodine intake is then regarded as the amount of supplemental iodine required. According to von Fellenberg's estimate the annual iodine intake in one goitrous and one practically goiter free area in Switzerland was 47 and 114 mg respectively.<sup>85</sup> Calculating from this the iodine requirement is less than 20 micrograms daily, a figure now regarded as unusually low. Calculated on a survey of the average daily urinary loss of iodine which is an unusually accurate barometer of the iodine intake of a given area, the daily iodine requirement would lie somewhere between 100 and 200 micrograms.<sup>40</sup>

The principle of thyroxin formation and decay was originally outlined by Plummer and Boothby<sup>86</sup> and subsequently developed by W. O. Thompson and his associates.<sup>8</sup> Plummer and Boothby found that the daily rate of thyroxin decay ranged between 0.2 and 0.4 mg. Thus, this daily supply of thyroxin maintained a normal basal metabolic rate in a totally myxedematous patient. Thompson and his group concluded that from 0.3 to 0.4 mg of thyroxin was necessary to

76 Marine David. On the Occurrence and Physiological Nature of Glandular Hyperplasia of the Thyroid (Dog and Sheep). Together with Remarks on Important Clinical (Human) Problems. *Bull. Johns Hopkins Hosp.* 18: 359, 1907.

77 Welch H. Hurlessness and Goiter in Newborn Domestic Animals. *Bull.* 119. Montana Agr. Expt. Sta. September 1917.

78 Sheppard J. H. The Northern Pig: Its Habits, Breeding and Management. *Bull.* 230. North Dakota Agr. Expt. Sta. 1929. Keith W. D. Goiter from the Standpoint of Prevention. *Canad. M. A. J.* 16: 1171, 1926. Meyer<sup>10</sup> Smith. *Kalkus*.

79 Moore M. C. and Moseley H. W. Iodine and Its Relation to Health. A Review. New Orleans M. & S. J. 86: 449, 1934.

80 Topper Anne and Cohen Philip. Effect of Thyroid Therapy on Children. *Am. J. Dis. Child.* 35: 205 (Feb.) 1928.

81 Hunziker H. Kropf und Längenwachstum. *Schweizer med. Wchnschr.* 50: 209, 1920.

82 Weston W. Specially Produced Milk in the Solution of the Goiter Problem. *South. M. J.* 27: 249, 1914.

83 Maurer E. and Diez S. Zur Kenntnis des Jods als biologisches Element. Ueber Wachstumsbeschleunigung an jungen Ratten bei Verfütterung jodangereicherter Kost an das laktierende Muttertier. *Biochem. Ztschr.* 182: 291, 1927. Weiser S. and Zwick A. Zur Biochemie des Jods. *ibid.* 187: 377, 1927. Orr and Fitch.<sup>2</sup>

84 Hunziker P. J. Talbot C. P. and Gibson E. F. Continued Administration of Iodide and Other Salts. Comparative Effect on Weight and Growth of Body. *Arch. Int. Med.* 42: 579 (Oct.) 1926.

85 von Fellenberg T. Das Vorkommen der Kreislauf- und der Stoffwechsel des Jods. *Ergebn. d. Physiol.* 25: 176, 1926.

86 Plummer H. S. and Boothby W. M. Specific Dynamic Action of Thyroxin. *Am. J. Physiol.* 55: 295, 1921. Plummer H. S. The Interrelationship of Function of the Thyroid Gland and of Its Active Agent Thyroxin in the Tissues of the Body. *J. A. M. A.* 77: 243 (July 23) 1921.

87 Thompson W. O. McEllan I. L. Thompson Phebe K. and Dickie L. F. N. The Rates of Utilization of Thyroxine and of Desiccated Thyroid in Man. The Relation Between the Iodine in Desiccated Thyroid and Thyroxin. *J. Clin. Investigation* 12: 235, 1933. Thompson W. O. Thompson, Phebe K. Taylor S. C. Nutter S. B. and Dickie Lois F. N. The Pharmacology of the Thyroid in Man. *J. A. M. A.* 104: 972 (March 21) 1935.



maintain a normal basal metabolic rate in myxedematous patients at bed rest. On the basis of these results the amount of thyroxin supplied daily by the thyroid to the circulation in order to maintain normal metabolic activity is equivalent to from 130 to 260 micrograms of iodine. The uncertain factor here, however, is that iodine-containing end products of thyroxin decay may be retained and eventually reutilized by the thyroid gland in the further synthesis of thyroid hormone.

Total iodine balance studies constitute the third principle which has been employed. The iodine balance represents the daily amount of iodine lost or retained by the body, as ascertained by the difference in the amount of iodine intake and excretion. Pioneer iodine balance determinations were accomplished by von Fellenberg, who reported low values and consequently a low daily requirement.<sup>87</sup> The balance studies of Scheffer made in Pecs, Hungary, revealed that 54 micrograms of daily iodine intake was sufficient to maintain a normal individual in iodine balance.<sup>88</sup>

Ohio State University studies were made on normal individuals maintained at bed rest on a monotonous diet under controlled hospital conditions (charts 1, 2 and 3). Under these circumstances the basal human adult iodine requirement was found to range from 44 to 75 micrograms daily and to average 67 micrograms, or approximately 1 microgram per kilogram of body weight.<sup>89</sup> This average daily requirement is comparable to that determined by Scheffer. However, it should be emphasized that it applies to adults maintained under controlled basal conditions. Moreover, to arrive at an optimal iodine requirement, it is necessary to take into account individual activity as well as the varied stress and strain of existence.

After consideration of the difference in iodine intake between goitrous and nongoitrous regions, as well as the amount estimated as necessary to maintain normal metabolic activity, 2 micrograms daily per kilogram of body weight, together with the daily basal requirement of 1 microgram, can be reasonably justified as an amount sufficient to account for basal needs, those of ordinary activities and also some for reserve. The optimal daily requirement would thus be somewhere near 200 micrograms for the 70 Kg. adult, a value compatible with Elmer's deduction from various investigations that the human optimal requirement ranges between 100 and 200 micrograms daily.<sup>90</sup> The pregnant woman should receive additional iodine.<sup>90</sup>

Various methods of supplying supplemental iodine to the inhabitants of iodine deficient areas have been advanced. These include the use of foods known to be rich in iodine, iodination of water supplies, administration of iodine at regular intervals in the form of solutions or tablets, the general use of iodized salt and the consumption of iodized milk.

The use of iodized salt has thus far proved the most widely adopted method. The nearly universal employment of common salt for seasoning and cooking as well as the ready preparation and low cost of iodized salt makes this a popular method. The use of milk with an

increased iodine content has also been suggested as suitable, especially for children who ordinarily consume relatively large quantities.<sup>91</sup> Effective iodine prophylaxis, however, should also conform to local conditions, since no single method will reach all those individuals who need iodine.<sup>92</sup>

On June 14, 1941 the National Study Committee on Endemic Goiter, meeting in Detroit, resolved that

On the basis of past experience in Michigan and taking into consideration more recent laboratory research, the committee recommends that for the prevention of endemic goiter the content of potassium iodide in table salt and salt for domestic animals should be 0.01 of 1 per cent, provided that an effective stabilizer be used.<sup>93</sup>

The iodized salt originally recommended in 1924 by the Michigan State Medical Society in conjunction with the state board of health, and since employed in Michigan with such outstanding results, originally contained 0.02 per cent of sodium iodide, or more than twice the amount of iodine recently recommended by the National Study Committee on Endemic Goiter. However, after careful consideration the committee reached the conclusion that the addition of 0.01 per cent of potassium iodide plus a stabilizer should be sufficient. The importance of a stabilizer was emphasized in view of previous experience that iodine may be lost from iodized salt and thus impart a yellow color and halogen odor due to the liberation of elemental iodine.

It has been estimated that the average adult ingests about 6.2 Gm. of salt daily. Calculated on this basis, the approximate amount of potassium iodide intake would be 620 micrograms, which is equivalent to about 474 micrograms of iodine. This is more than twice the amount we have suggested as optimal and would amply provide a person with a sufficient reserve.

The widespread prevention of endemic goiter and its sequelae will depend not only on the preparation and consumption of an adequate iodized salt but also on the persistent education of the public to its necessity.

I am sure you are aware that in spite of the notable contributions of Michigan and the organization of similar practices in a few other states there are still a good many states in the country where goiter is a problem with a portion of the population, where no thought is given to it where there is no state health policy and no professional medical attitude and where endemic goiter prevails, and in a severe form. Our interest in the American Public Health Association is to get the facts so authoritatively expressed and accepted that there can be no escape from the responsibility of the health officers to make effective all useful methods of goiter prevention. (Dr. Haven Emerson)<sup>93</sup>

Under ever increasing demands of wartime effort and production each individual should have, to thrive and function at his best, among other important elements an adequate supply of iodine. For iodine, not only a nutritional necessity in the prevention of goiter, plays an important role in the general well-being of all mammals. The increased physical activity and emotional stress occurring in our struggle for survival put greatly increased demands on the human body. Thus the optimal activity essential for any all inclusive war effort cannot be maintained without a sufficient supply of iodine.

<sup>88</sup> Scheffer, L. Ueber die Jodbilanz normaler Menschen. *Biochem. Ztschr.* **259**, 11, 1933.

<sup>89</sup> Flickinger, F. M. The Iodine Requirement of Man. Thesis for M.S. degree. Department of Surgical Research, Ohio State University, 1941. Puppel and Curtis.<sup>29</sup> Cole, Curtis and Bone.<sup>9</sup> Cole and Curtis.<sup>9</sup>

<sup>90</sup> Enright, Cole and Hitchcock.<sup>79</sup> Marine and Kimball.<sup>61</sup>

<sup>91</sup> Meyer.<sup>10</sup> Weston.<sup>14</sup>

## Council on Pharmacy and Chemistry

THE COUNCIL HAS AUTHORIZED PUBLICATION OF THE FOLLOWING  
REPORT  
AUSTIN E. SMITH, M.D., Secretary

### AMPULS OF CAMPHOR AND ACCEPTED BRANDS OMITTED FROM N. N. R.

The following manufacturers' brands of Ampuls of Camphor have been included in New and Nonofficial Remedies: George A. Breon & Co., Inc., Drug Products Company, Inc., and Endo Products, Inc.

At the October 1941 meeting of the Council the question of the present usefulness of ampuls of camphor was discussed but definite action was postponed in order that a status report could be prepared.

On the basis of a subsequent report the manufacturers of accepted camphor preparations were informed that the therapeutic usefulness of camphor had been questioned and that they were therefore invited to present any available evidence which would justify its further retention in New and Nonofficial Remedies. A letter was also directed to authorities on agents used to combat circulatory collapse asking for an opinion on the usefulness of this drug.

Reply was received from only one manufacturer, who stated "this product is not used as extensively as heretofore and we have no defense to offer for its retention in the N. N. R."

Of the authorities consulted on this problem, eleven replied:

**DR. JOHN MARTIN ASKEY, Los Angeles:** My only experience with camphor parenterally was during my hospital years from 1923 to 1925 and a year or so after that. I was unable to convince myself that there was any beneficial effect from the camphor and consequently I have not used it for the last twelve or thirteen years.

**DR. M. A. BLANKENHORN, Cincinnati:** It has been so many years since any one on my service has used camphor oil for intramuscular use that I am obliged to look elsewhere for an answer to your question. I cannot find that any one in the Cincinnati General Hospital has used enough camphor oil within the past ten years to have any opinion about its value. The pharmacist has a canny way of telling what the vogue in therapy has been in this hospital for a long period. He is very sure that no one has used any within the past two years, and in the past ten years so little has been used that it would be impossible to give an opinion about its value. I should tell you that in this hospital the resident staff is given a great deal of authority in selecting remedies and the visiting staff, many and varied, is likewise given to try everything. My conclusions are that camphor oil has been abandoned.

**DR. HERRMAN L. BLUMGART, Boston:** I have not utilized camphor for many years, since I have never been able to convince myself that the administration of this substance parenterally was really useful. Particularly in recent years, other substances have become available which have more definite therapeutic usefulness.

**DR. HENRY A. CHRISTIAN, Brookline, Mass.:** I consider camphor as of very little value in circulatory and respiratory collapse, however it is given. Commencing in 1907, after seeing it used extensively in Germany, I used camphor in a mixture of oil and ether subcutaneously and intramuscularly both in postoperative and postinfectious circulatory respiratory collapse or failure. Results were disappointing and I substituted caffeine in large doses, often intravenously, with more satisfactory results. I do not advise continued acceptance in New and Nonofficial Remedies.

**DR. HAROLD FEIL, Cleveland:** I have never had any very definite feeling about the merits of camphor and do not use it. Certainly there are more effective ways of stimulating the myocardium and I feel that camphor is not an important drug in heart therapy.

**DR. HARRY GOLD, New York:** I am of the opinion that camphor has no value for systemic use, either by injection or by any other mode of administration, in the treatment of circulatory collapse or heart failure. Some years ago I made a study at the hospital on a select group of patients with circulatory failure and heart failure with congestion. I recorded the blood pressure, heart rate, urine output and symptoms that would indicate improvement. Camphor in oil was injected intramuscularly in doses of 10 grains every hour. The highest total amount was 106 grains. There were no signs of improvement by any of the foregoing criteria. The largest dose caused extreme nervousness with a panic state and diarrhea. These patients responded in the customary way to subsequent digitalization. In some of these patients, peripheral circulatory failure was outstanding and, in these as well, camphor was without therapeutic effect. The literature on the beneficial effects of camphor on the circulation is notoriously uncritical.

**DR. E. E. IRONS, Chicago:** For many years camphor was one of the drugs that was used in emergencies as a cardiac stimulant. Some men used it in alleged cardiac failure in pneumonia. I always felt it was used chiefly because there was nothing much else to do. I have not used a dose of camphor as a cardiac stimulant for twenty years.

**DR. LOUIS N. KATZ, Chicago:** I see no need for continuing camphor in New and Nonofficial Remedies. This drug is now used but seldom, and at no time did it seem to have any universally expected action. While it has been used as a heroic procedure to resuscitate persons by so-called respiratory and circulatory stimulation these effects if present were fleeting and probably produced by reflexes set up by the irritation of the drug locally. As a stimulant it has been largely replaced by nikethamide, by metrazol and by caffeine. I have inquired among my clinical colleagues and have been informed that they rarely or never use it. Not one has considered it important that it be retained in the N. N. R. Our drug room has had a supply on hand which is seldom called on. There was a vogue amongst pediatricians for its use many years ago, but this too has died out. I therefore see no reason for retaining this drug. The most that can be said for it is that it is harmless, but even this carries with it the possibility that a physician in using this drug may overlook the use of something potent.

**DR. ROBERT L. LEVY, New York:** There is no evidence that camphor, no matter how given, is of value in circulatory collapse or heart failure. Such action as it has is of very short duration. There are numerous other drugs and therapeutic measures which are more effective in treating these conditions. In my opinion ampuls of camphor should be dropped from the forthcoming edition of "New and Nonofficial Remedies."

**DR. EUGENE A. STEAD, JR., Atlanta, Ga.:** As far as I know, there is no satisfactory evidence that camphor is useful in the treatment of collapse. My own reaction would be not to include it in New and Nonofficial Remedies. I am not familiar with any recent literature on this problem.

**DR. HAROLD J. STEWART, New York:** In the last twenty years of my practice in internal medicine with special emphasis on cardiology and diseases of the cardiovascular system I have not had occasion to use camphor in any form and from my own experience see no place for its use.

Since none of the manufacturers or the specialists who would ordinarily be familiar with an agent widely used in their field have offered evidence to justify retention in New and Nonofficial Remedies, it was believed that the chapter on camphor preparations should be omitted immediately without waiting to give the matter further consideration in 1943, which is the expiration date of the products now accepted.

In view of the foregoing, the Council voted to omit the chapter "Ampuls of Camphor" and the accepted brands from New and Nonofficial Remedies in view of the absence of evidence to justify retention.

# THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY FEBRUARY 6 1943

## COOLING IN SHOCK

The use of external heat to treat or prevent shock is a time honored remedy like the treatment of fever with cold applications. These measures once seemed wholly logical. Means of lowering body temperature in febrile states are now generally used only when the temperature rising over 104 F, causes delirium and threatens life. Fever is recognized as part of the "wisdom of the body." The concept of the possible protective role of reduced temperature of the body or the extremities in shock has not been given sufficient consideration. Warnings about the dangers of overheating are appearing with increasing frequency in current writings.<sup>1</sup> Many thoughtful surgeons long ago abandoned the "postoperative sweat" treatment or "shock bed" which was introduced primarily in the hope of preventing shock and pneumonia.

The patient who is going into shock may feel uncomfortably warm, just as does the one who is about to faint. This may be considered the converse of the "chill" that accompanies the rise in temperature at the onset of fever. A chill obviously is a mechanism for raising body temperature rapidly, the feeling of warmth, like the sweat after a chill, is part of the bodily mechanism for rapidly lowering body temperature. No one has proved that a patient's sensation and behavior when he has a chill or a sweat are harmful and not a part of a complex adaptive mechanism. Many of us have had the unfortunate experience of finding 'well trained' people working hard to warm up a patient with cold, clammy skin when the rectal temperature was found to be 105 or 106 F, much to the consternation of all concerned except the patient who by this time had ceased trying to remove the covers.

Patients in shock look better when heated, just as febrile patients may feel better after the use of antipyretics. In animals shocked by various procedures a temporary improvement in appearance is produced by warming, but this may be followed by rather sudden

collapse. The warmed animals show a higher death rate than the unheated or cooled controls.<sup>2</sup> Analogies between shocked animals and the complex types of shock seen in modern war cannot be too closely drawn, work on higher apes is needed to round out the observations on rodents and dogs. However, it is certainly true that when blood volume is reduced the oxygenation of the tissues is restricted. When the oxygen supply is thus reduced, survival depends partially at least on the temperature. The cooler the tissues the less the oxygen requirement. The fall in metabolism amounts to about 13 per cent for each degree centigrade.

Much harm is attributed to tissue anoxia in shock. Subnormal temperature tends to prevent relative anoxia by diminishing the speed of the vital use of oxygen. Thus a fall in temperature is not the result of the anoxia but rather seems to be a well developed and useful protective mechanism which the traditional treatment combats. In this connection it is interesting to note that many have been surprised at the recovery of casualties who did not have the "benefit" of prompt professional care.

The safe range of body temperature deviates far more below than above normal, temperatures down to 90 F can be tolerated for many hours and may actually be life saving when the circulation is feeble. Experimental and clinical studies have resulted in abandonment of the old enthusiasm for warmth in the treatment of an extremity with impaired circulation and threatened gangrene. We have agreed not to fight nature's cooling of the foot that is suffering from anoxia but we are still training first aid workers to fight nature's cooling of the person who has a general inadequacy of circulation. Traditional views about the relation of external heat to shock have retarded acceptance of refrigeration (crimo-) anesthesia in traumatic lesions of the extremities. Those who have used it are impressed by the fact that the method seems to reduce rather than increase the dangers of shock.

Investigators are still at work analyzing the mechanism and the nature of heat exhaustion. All recognize that it has the characteristics of shock—cold, clammy skin, oligemia and hemoconcentration. One form of shock is therefore produced by heating the body, and heat prostration is not treated with hot packs. A large incidence of heat prostration often comes with sudden onset of hot weather, when the existing blood volume is insufficient for the increased demands imposed by vasodilatation and sweating. Heating the postoperative or post-traumatic patient makes the environment comparable to the beginning of hot weather and thus adds to the danger of insufficient blood volume, shock or heat prostration.

Warming the shock patient has been practiced for centuries without convincing evidence of value. Cooling has not apparently been given a fair trial. Many

<sup>1</sup> Blalock, Alfred and Maon, M. F. A Comparison of the Effects of Heat and Thaw of Cold in the Prevention and Treatment of Shock. Arch. Surgery 42: 1054 (June) 1941.

<sup>2</sup> William, John R. Winston-Salem, N. C. Personal communication.

experimental studies are still unpublished because of laudable caution. The time is now ripe for a presentation of the side of this complicated and controversial subject which favors cold. Certainly external warmth should not be used in treating cases of shock when only the skin is cold but rectal temperature is normal or even above normal.

The following points deserve emphasis, particularly in teaching outlines for first aid workers, which incidentally should be modernized at once by eliminating those portions dealing with external heat for the alleged prevention or treatment of shock. Aiding the cooling process during certain phases of shock by cold applications seems theoretically sound, but the use of such procedures should await further knowledge. External heat makes the shock patient appear better but probably lessens his chances of recovery. A conscious patient should be warmed or cooled in accordance with his own desires. An unconscious postoperative or post-traumatic patient needs no more external warming than a recumbent normal person. Hot water bottles, hot pads and hot blankets are usually not indicated unless they are necessary also for normal persons in the same environment. External heat should never be applied when the rectal temperature is above 96 F. Coldness of the skin often conceals a rise in body temperature. In the long and bloody war that lies ahead, shocked soldiers have a better chance of recovery than ever before because of the use of plasma and other means of restoring blood volume. It will probably be still better if therapists abandon the fight against the wisdom of the body in lowering the oxygen needs by cooling. Instead of warming the shocked patient, allow him to maintain the lowest safe level of temperature.

### INFLUENZA EPIDEMICS

An influenza epidemic, once well under way, is spread by droplets. What happens at the beginning of an outbreak? Why do epidemics occur only at intervals? In his recent presidential address before the Section of Pathology of the Royal Society of Medicine, Andrewes<sup>1</sup> reviewed the present knowledge of this subject and presented theoretical considerations which he believes may explain some of the obscurities.

There is a tendency, Andrewes says, to interpret recent observations as meaning that epidemics are caused by numerous different viruses, only two of which have yet been recognized. However, there may be more unity in influenza than such a view would suggest. In epidemics of meningitis, he points out, the different serologic types are spread simultaneously. Indeed, in time of war and famine, wholly distinct diseases such as typhus fever, relapsing fever and dysentery may rage at the same time. Thus the yet unknown

subtle factors which determine an influenza epidemic may similarly favor the spread of 'influenza A' virus and at the same time of B and perhaps of C and of others.

Swine influenza breaks out in herds of pigs in the Middle West every winter, but the virus apparently disappears every summer. A clue to the mysterious sudden occurrence of swine influenza may be afforded by Shope's<sup>2</sup> observations on the survival of swine influenza virus in lungworms, which are almost universally present in pigs' lungs in the Middle West. In a pig with swine influenza, the lungworms in its lung take up the virus. This is present in the embryonated ova, which duly pass out through the pig's alimentary canal. The intermediate host of the lungworm is the earthworm. The earthworm consumes the lungworm ova which have been passed in the pig's feces and the lungworms go through further phases of their life cycle within the earthworms. In due course pigs eat these infected earthworms. Then the lungworms find their way through the pig's intestinal wall to the lungs—still carrying the influenza virus throughout their travels. The infected pig does not at once get swine influenza, some provoking stimulus is necessary to activate the disease. In Shope's experiments the most regular way of activating the infection was to give repeated intramuscular injections of live or killed *Hemophilus influenzae*. However, intrapulmonary injections of calcium chloride and other apparently unrelated but similar "insults" to the pig have provoked the disease. Andrewes concludes that the natural epizootic occurring simultaneously in every one of a herd of pigs can be explained by the action of a provoking stimulus—just what is not exactly clear—to animals already harboring the virus infected worms in their lungs. As far as human epidemics are concerned, a helminth reservoir of virus is not inconceivable but does not seem likely. However, the story of the swine virus does emphasize the possibility that an influenza virus can exist in a masked or occult form.

Another puzzling question is the relationship between active immunity to influenza and the titer of circulating antibodies. What are the difficulties? First there are periodic outbreaks of influenza, the major ones are apparently due chiefly to "influenza A", others may be due wholly or partly to "influenza B", still others may produce cases which fail to show signs of the presence of the influenza virus as at present known, although the illnesses are clinically like those of known 'influenza A and B' virus infections and occur simultaneously. Second, "influenza A" viruses vary from one outbreak to another, antigenically, in their rapidity of spread in the human population and in the ease with which they can be established in ferrets. Third it has been shown

<sup>1</sup> Andrewes, C. H. Thoughts on the Origin of Influenza Epidemic. *Proc Roy Soc Med* 36: 1 (Nov.) 1942.

<sup>2</sup> Shope, R. E. Swine Lungworm as Reservoir and Intermediate Host for Swine Influenza Virus. Transmission of Swine Influenza Virus by Swine Lungworm. *J. Exper. Med.* 74: 49 (July) 1941.

that "influenza A" virus lies quiescent for twenty-one months out of twenty-four. Fourth, some relationship is shown to exist between the immunity of an individual and the level of neutralizing antibodies in his serum, yet protein antibodies diminish only to a limited extent his liability to infection. As a possible solution, Andrewes pictures a "basic influenza virus," stripped of a number of its properties including all or most of the A antigen, which makes it recognizable serologically as "A influenza" virus. It would then resemble the degraded forms of many bacteria which exist in a form lacking a familiar antigen. This basic virus may then, according to Andrewes' theory, be presented as a latent virus, persisting harmlessly in cells of human carriers, although the possibility that it hides in some other host between epidemics cannot be ruled out.

How, then, may this basic virus acquire the virulence to produce the influenza epidemic or pandemic? In winter when other respiratory pathogens pass from host to host more easily, this "basic virus" is helped to travel too, by chance passage through several successive hosts with low A antibody or otherwise poor resistance its virulence and power to make an antigen may increase. Following this line, Andrewes postulates different gradations of virus: grade 1, a basic virus which probably spreads little but remains between epidemics in a small number of human carriers; grade 2, the hypothetical agent causing a large number of those crises of influenza which occur mixed with "influenza A or B" but get labeled "influenza Y" because no evidence of the workings of A or B can be detected; grade 3, the agent which has developed the ability to infect ferrets and to make much A antigen; grade 4 (resting on firmer ground), the agent from which patients develop readily obtainable A antibodies during their illness; and grade 5, viruses which caused widespread epidemics in Great Britain in 1933 and 1937 and which infect ferrets and mice with relative ease. There is not yet enough information, Andrewes says, to guess what grade of virulence must be obtained before amniotic inoculations, as described by Burnet,<sup>3</sup> can be successful. What relationship exists between the viruses involved in the pandemics of influenza of 1918-1919 and the epidemics of the last decade is likewise speculative.

As Andrewes himself says, this outline of a gradation in properties of influenza viruses from basic virus to pandemic virus may prove to be far from a true picture. If true, however, it would afford a feasible explanation of many difficulties—of the failure to find A virus between epidemics, of the occurrence in many outbreaks of mixtures A and Y, of the variations in biologic properties of viruses isolated at different times and of the anomalies in the relation between antibody titer and active immunity. If this sequence of events is

essentially correct, it might result in possibilities of interrupting the cycle at several different points. Most important, it could be attacked at its beginnings when virus of low grade is being given an opportunity to spread widely. Moreover, this conception may affect the possibilities of improving aerial hygiene in the future by better ventilation, ultraviolet radiation and antiseptic mists and may offer a clue to the more effective utilization of biologic methods of active immunization.

## Current Comment

### THE NATIONAL QUININE POOL

This week to every druggist in the United States went from the War Production Board an appeal for quinine, supplemented with statements by Ross T. McIntire, Surgeon General of the Navy, Donald M. Nelson of the War Production Board and Jesse H. Jones, Secretary of Commerce. The Army and Navy need every gram of quinine that can be secured. "Even though atabrine and other synthetic antimalarials are being used in tremendous quantities," says the statement, "quinine is vitally needed for our soldiers abroad because this drug has a faster action, brings the malaria under control more quickly, and thus shortens the length of time the soldier is incapacitated. Quinine is also necessary for use in cases which cannot tolerate atabrine and other synthetic drugs." The needs of our civilian population for antimalarial drugs will be cared for by the development of totaquine, which is a mixture of cinchona alkaloid prepared from the low grade barks in South America. Totaquine, while excellent for domestic use, is not as stable as is quinine and therefore not as suitable for shipment into areas of varying climatic conditions. To the pharmacists of the country the appeal has been made that they send all supplies of quinine, alkaloids, salts and other cinchona derivatives, whether in open or in closed packages, to the National Quinine Board, which is in the headquarters of the American Pharmaceutical Association, 2215 Constitution Avenue Northwest, Washington, D. C. These materials, when collected, will be processed and thus made available to our armed forces. Each druggist who makes a contribution will be privileged to display in the window of his store a card indicating that he has contributed to the National Quinine Board and thus has rendered an important service to the armed forces. At the same time as this arrangement was being put into effect in this country, an announcement came from Great Britain that drastic restrictions have been placed on quinine, making it illegal to prescribe, dispense or supply quinine except in the treatment of malaria or in the case of quinidine in the treatment of cardiac arrhythmia. So important is the control of malaria to the health of our troops in many of the combat zones that the supply or lack of quinine might well be the determining factor in the winning of the war.

<sup>3</sup> Burnet, F. M. Influenza Virus Infection of Chick Embryo Lung. *Brit. J. Exper. Path.* 21: 147 (June) 1940.

AMERICAN PHARMACEUTICAL MANUFACTURERS' ASSOCIATION AWARDS  
SCROLL OF DISTINCTION  
TO DR DOISY

Since 1939 the American Pharmaceutical Manufacturers' Association has recognized annually the achievement of a scientist who has distinguished himself in the field of therapy. The award is made on the recommendation of an advisory committee which includes Dr George R. Cowgill of Yale University School of Medicine and Dr Howard B. Lewis of the College of Pharmacy of the University of Michigan. Those who have received awards since 1939 include

1939 Drs Nathan B. Eddy and Lyndon F. Small, United States Public Health Service, for studies of chemistry, pharmacology and therapeutics of morphine derivatives

1940 Dr Perrin H. Long, Johns Hopkins University School of Medicine, for studies of sulfanilamide, sulfapyridine and related pharmaceuticals

1941 Dr Tom D. Spies, University of Cincinnati School of Medicine, for contribution to our knowledge of the B complex vitamins as pharmaceuticals important in the treatment of disease

1942 Dr Edward A. Doisy, St. Louis University School of Medicine, for fundamental scientific contributions in the field of hormones

Each year the scroll which memorializes the contribution to science is presented by a distinguished physician in the presence of an audience composed of leaders in the scientific and industrial field and is accompanied by a symposium devoted to the phase of medical science in which the recipient of the award has achieved distinction. Awards such as this, which represent recognition of distinguished service to humanity, have a special place in the field of medicine, and the American Pharmaceutical Manufacturers' Association deserves commendation for the high plane on which the selection of the recipient and the manner of the presentation have been maintained.

VIRAL CHEMOPROPHYLAXIS

In the course of experiments to determine what dietary factors are essential to multiplication of virus, Sprunt<sup>1</sup> of Duke University found that subcutaneous injection of methionine in rabbits increased their dermal resistance to experimental inoculation with vaccinia virus. Measurements of skin susceptibility were made by use of serial dilutions of the virus, the 50 per cent point being selected in calculations of the immunity ratio.<sup>2</sup> In a typical experiment 5 rabbits each received a daily dose of 300 mg of methionine for two days preceding and five days following dermal injection with the virus, 5 normal rabbits of the same age and weight being used as controls. In this series the calculated dermal resistance was increased fourteenfold as a result of methionine therapy. If the first methionine dose was delayed till immediately after the skin test, the calculated increase in resistance was tenfold. If delayed till forty-eight hours after the skin test, the increase was but fivefold. In all cases the lesions in the treated animals were smaller in size and disappeared twenty-

four hours earlier than in the controls. Equally striking results were obtained with choline, given in 300 mg doses at eight hour intervals two days before and continued for five days after the skin test the calculated dermal resistance in the choline series being increased nineteenfold. Betaine caused a similar but less pronounced increase in skin resistance the calculated ratio here being fivefold. The chemical characteristic common to these three successful prophylactic agents is the "biologically labile methyl group." Whether or not exposed mucous surfaces share in this therapeutically increased viral resistance has not yet been determined. Viruses other than poliomyelitis virus have not yet been tested.

FRANCIS X. DERCUM

The name of Dercum is probably best known to the medical profession for his description of a neurologic entity, *adiposis dolorosa*. Dr Throckmorton,<sup>1</sup> who studied under Dercum, gave a vivid picture of him in his chairman's address before the Section on Nervous and Mental Diseases of the American Medical Association at the Cleveland session in 1941. Francis X. Dercum was born in Philadelphia, Aug. 10, 1856. On his graduation in 1877 from the University of Pennsylvania he engaged in the general practice of medicine in his native city. From the beginning his interests were wide, as is evident from the fact that he taught histology and physiology in his alma mater, while paying more and more attention to the diseases of the nervous system. In 1884 he was appointed consultant pathologist to the State Hospital for the Insane at Norristown. Somewhat later he succeeded Dr Charles K. Mills as chief of the Nervous Disease Clinic in the Hospital of the University of Pennsylvania and instructor in nervous diseases at the university. In 1885 he became one of the founders of the Philadelphia Neurological Society, whose first president was S. Weir Mitchell. In 1887 he was appointed neurologist to the Philadelphia General Hospital, the famous Old Blockley. Here he was actively engaged in teaching and clinical work for a quarter of a century. In 1892 he was elected to the newly created chair of clinical professor of neurology in the Jefferson Medical College, where he taught nervous and mental diseases until 1925. In 1892 he published a paper in which he described a new entity to which he gave the name *adiposis dolorosa*. This became known as Dercum's disease. Dercum was a talented clinical investigator, an inspiring teacher and a philosopher. His philosophic tendency is best reflected in the last two books written by him, "The Physiology of Mind" and "The Biology of the Internal Secretions." The government of France made him a chevalier of the Legion of Honor, and the American Philosophical Society elected him president. His last contributions were "On The Nature of Thought and Its Limitation" and "Nonliving and Living Matter." Death came to him suddenly, April 23, 1931, while he sat in the presidential chair of the American Philosophical Society.

<sup>1</sup> Sprunt, D. H. *Proc. Soc. Exper. Biol. & Med.* 51: 226 (Nov.) 1942

<sup>2</sup> Sprunt, D. H. *J. Exper. Med.* 75: 297 (March) 1942

<sup>1</sup> Throckmorton, T. B. *Francis X. Dercum—Physician, Teacher and Philosopher*. *J. Nerv. & Ment. Dis.* 96: 229 (Nov.) 1942

# MEDICINE AND THE WAR

*In this section of The Journal each week will appear official notices by the Committee on War Participation of the American Medical Association announcements by the Surgeon Generals of the Army, Navy and Public Health Service, and other governmental agencies dealing with medicine and the war and such other information and announcements as will be useful to the medical profession*

## EXPERIMENTAL MEDICINE IN RUSSIA IN THE WAR

PROFESSOR LAVRENTIEV

(Supplied by the Russian Embassy)

The All Union Institute of Experimental Medicine (V IEM) is the greatest medical research institute in the Soviet Union. Recently it celebrated its fiftieth anniversary. Besides I. Pavlov and Svirich many conspicuous scientists are associated with the institute, including Bikov and Speranski.

Shortly before the outbreak of war against Germany, the institute had two leading scientific centers, located in Moscow and in Leningrad and a special biologic station with a monkey nursery at Sukhumi in the Caucasus.

Of particular interest in the studies carried out by I. P. Pavlov and his school is the production of the nervous diseases and neuroses in animals. Evidence from extensive investigations undertaken in the department of pathology, headed by academician Speranski, showed the leading role of the nervous system in human conditions of disease.

Among the clinical studies are those by Prof. A. V. Vishnevsky in local analgesia.

The invasion by Germany set before the institute two great problems which had to be solved as promptly as possible to alter the character of the problems pursued in the institute and to secure the productive research work in wartime. Decentralization of the institute was carried out and a number of its laboratories were transported far to the rear. In July 1942 a session of the institute was held in Novosibirsk to summarize its achievements during the first year of war.

A. Smorodintzev has developed a method of prompt diagnosis of typhus. This method enables one to diagnose typhus on the second or third day of the disease and thereby to prevent its dissemination. Dr. Levkovich prepared vaccines against typhus following all existing methods (Weigel, Duran-Sparrow, Cox). These were tested on laboratory animals, as well as in clinics of the institute. Professor Petrisheva developed prescriptions of diverse extracts, preparations and ointments protecting man against lice. The chemical laboratories of the institute have found important diagnostic symptoms for identifying typhus. This concerns a peculiar chloride crisis undergone by the patient on the seventh day of the disease, chlorides disappearing from the urine to reappear again toward the end of the disease.

The bacteriophage laboratory headed by Professor Eimoliev has produced active phages against dysentery, pus-forming cocci and cholera. Some interesting combinations of phage with modern chemotherapeutic substance (sulfapyridine and sulfathiazole) are proposed by this laboratory.

Application of chronometric methods to the injured and uninjured nerve was proposed by Prof. A. Magmitsky as a means for ascertaining the lesion of the nerve stem without recourse to an operation. This method is now used in hospitals. In the laboratories of Professor Anokhin and Kharitonov, the causes of pain accompanying lesions of the nervous system have been ascertained and the methods of eliminating them proposed. Combating pains, acceleration of the nerve regeneration and the prevention of irregular growth of the nerves are at present the most important problems of neurosurgery. So far hospitals and physicians have been very pessimistic regarding the replacement of defects of the nervous system. Dr. A. Anokhin suggested a method of replacing defects of the nerve stems by transplanting human and animal nerves preliminarily treated with formaldehyde. Many clinical cases have already been treated by using this method.

A special study of regeneration of the nerve and of the methods which may prevent its irregular growth and accelerate regeneration were carried out in the laboratory of Professor Lavrentiev. The method was devised of observing the regeneration of nerves in a live animal by means of vertical microscopic illumination. The great role of blood vessels was ascertained which were shown to change and develop within the damaged area of the nerve stem.

Injuries of the brain were studied in the clinics of V IEM headed by Professor N. Geraschenkov. The work of the nerve clinic in V IEM was organized in such a way that observations on the wounded were begun at a dressing point at the front and completed in the rear at a hospital. This offered the possibility to follow both the healing process of the wound and the results of the preventive and curative treatment. In treating cerebral wounds surgical methods were combined with intravenous and administration by mouth of modern chemotherapeutic substances such as streptocide, sulfidin and sulfithiazole which led to a great decrease in the mortality rate. The successful treatment of dangerous complications of skull wounds, as caused by microbes of gas gangrene was devised. Professor Kaplinsky and Professor Braunstein showed that long lasting pains elicit appreciable metabolic changes, closely resembling those associated in the human and animal organism with vitamin B deficiency and the deficiency of this vitamin causes in its turn an inflammatory process in the nerve. This treatment, with large doses of vitamin B proved effective.

Besides the common methods of treatment with heat, the electric current and light the V IEM clinic inaugurated occupational therapy. A wounded fighter gets



gradually accustomed to movements associated with labor processes, such as sewing, hammering and planing. In this way the nervous system and limb are gradually reorganized and begin to perform movements which were impossible prior to the treatment.

The treatment of wounds of the suppurative processes of the joint and bone inflammations was taken up by

the surgical clinic in V.I.E.M. Prior to the war Prot A. Vishnevsky suggested treating the wounds by means of plugs soaked in an emulsion of balsam tar and similar substances with an admixture of verotorm. This method proved exceptionally effective in treating large wounds—those of the chest and abdominal cavity included.

## ARMY

### CIVILIAN PHYSICIANS TO BE EMPLOYED BY ARMY FOR SERVICE IN WAR PLANTS

Civilian physicians with civil service status will be employed by service commands for medical service in industrial plants operated by the Army to relieve medical officers for troop duty. The War Department announced on January 26. Expert medical supervision is provided to insure industrial hygiene in army-operated arsenals and depots. In establishments where the work involves occupational health hazards, periodic physical check-ups of the workers are conducted. Women physicians may be employed at army plants at the discretion of the commanding officer. This practice has been recommended for plants employing a high percentage of women. A civil service examination announcement for physicians and civil service forms 57 and 2398 to be used in making application may be obtained at any first or second class post office.

### THE McCLOSKEY GENERAL HOSPITAL

The U. S. Army General Hospital at Temple, Texas, has been named in honor of Major James A. McCloskey, M. C., the first regular army medical officer to lose his life in the present war with Japan during the battle of Bataan, Philippine Islands, in March 1942. Major McCloskey graduated from the St. Louis University School of Medicine in 1933, became a first lieutenant of the U. S. Army medical reserve corps on June 6, 1933 and was on active duty from Jan. 22, 1935 to Jan. 29, 1936, he was commissioned a first lieutenant in the medical corps of the U. S. Army on Jan. 30, 1936, a captain on Jan. 22, 1938 and major on Dec. 29, 1941.

The McCloskey General Hospital has a capacity at present of 1,500 beds, and a second unit is now under construction for an additional 1,500 beds. The following doctors serve as chiefs of services: surgical, Lieut. Col. Foy Roberson; medical, Major Sloan G. Stewart, M. C.; laboratory, Major David M. Earl; laboratory, Major Paul G. F. Schmitt; dental, Lieut. Col. Leslie D. Maurer; nurses, Capt. Zita Callaghan. The hospital buildings are all two-story red brick with green composition roofs. The hospital has many buildings which are joined by covered passageways, so that patients may be moved without exposure to the weather. There are ramps connecting the first and second floors. The hospital has its own laundry, guard house, hospital exchange, post office, commissary, fire department, railroad station and Red Cross building with an auditorium. The McCloskey General Hospital, which admitted its first patient on Oct. 20, 1942, is equipped to handle all types of cases.

### ONE THOUSAND MEDICAL ADMINISTRATIVE OFFICERS A MONTH AT CAMP BARKELEY

The first of the new semimonthly groups to complete the medical administrative officer training at the Medical Replacement Training Center Officer Candidate School, Camp Barkeley, Texas, graduated on January 13, and following a ten-day leave the members of the graduating class reported to their station assignments. The medical administrative officers are selected mostly from the medical department and after their graduation and commissioning take over the duties of supply, training, personnel and other administrative work, thus releasing doctors of medicine for medical and surgical work.

The Surgeon General of the Army recently announced that 7,000 soldiers will be commissioned at Camp Barkeley each month during 1943. The faculty of this officer candidate

school at this large medical replacement training center consists of Brig. Gen. Roy C. Heflebower, commandant; Col. George E. Armstrong, assistant commandant; Lieut. Col. Charles I. Driscoll, executive officer; and Lieut. Clement A. Studebaker, secretary. And the following directors of departments: Capt. Miles G. Bull, administration; First Lieut. James A. Kennedy, logistics; Major Francis B. Elder, sanitation; Major Wayne A. Starkey, tactics; Major August H. Groe, chief, training; Major Joseph J. Wimberly, chemical warfare liaison officer; and Lieut. Col. Harold C. Washburn, infantry liaison officer.

The officers and enlisted men at this medical replacement training center to date have purchased war bonds with a maturity value of \$1,938,800. According to the public relations officer, these soldiers are making doubly sure that when it comes their turn to enter the combat zones they will have enough equipment to do the job.

### MICHIGAN TO TRAIN SPECIALISTS FOR THE ARMY

The War Department, Washington, D. C., has selected the University of Michigan as one of twelve universities in the country to present a special series of intensive courses in the medical and surgical specialties for the training of army medical and dental officers. According to the *Detroit Free Press*, the special courses at Ann Arbor will vary from six to twelve weeks and succeeding courses will be given at least until June 30, each course being given to from two hundred to four hundred officers, none of whom will be over 50 years of age. Special emphasis will be placed on courses in tropical medicine. Only those will be selected to enter the special courses in surgery who have had a minimum of twelve months' full-time practical training in general surgery.

### BRIGADIER GENERAL GRANT VISITS AFRICA

Brig. Gen. David W. Grant, air surgeon, U. S. Army, recently returned from the front theater of operations in Africa where he visited the medical installations of the Army Air Corps. General Grant gave an address at the Medical Field Service School at Carlisle Barracks, January 9, based on his African experience, pointing out the difficulties surmounted by the air corps in establishing medical installations for air evacuation and emphasizing the efforts of the U. S. Army in Africa in preventive medicine and sanitation.

### BRITAIN TURNS OVER FIVE HOSPITALS TO UNITED STATES FORCES

Five new hospitals, fully equipped by Great Britain, have been turned over to the United States forces, according to an announcement by the minister of health, Ernest Brown, on Dec. 17, 1942, who at the same time announced that the Canadian forces had been given the use of eight hospitals.

### ARMY PERSONAL

Major E. A. Zimmermann, M. C., has been promoted to lieutenant colonel. Colonel Zimmermann was in practice in Dayton, Ohio, before entering the army and since November 1941 has been assigned to the Medical Replacement Training Center at Camp Barkeley, Texas. He is a graduate of St. Louis University Medical School and entered the army two years ago as a first lieutenant.

## CIVILIAN DEFENSE

CARE AND DISTRIBUTION OF  
GAS MASKS

The Office of Civilian Defense, Washington, D C, issued on January 20 Operations Letter 106, for the special attention of states and communities to which gas masks have been allocated

Noncombatant masks are now being shipped from manufacturers and U S Office of Civilian Defense supply depots to communities which have received allocations of masks and have returned properly executed, OCD form No 501 These will be in assorted sizes

Valuable and critical materials are used in the manufacture of gas masks Hence care must be exercised in their handling, distribution and storage in order that the usefulness of the present limited supply may be preserved

It is recommended that 5 per cent of the masks other than those designated for training purposes be held in reserve by the local property officer, that defective masks and those with exhausted canisters be replaced from this reserve and that the remainder, other than those designated for training purposes, be distributed to the protective services in communities in accordance with 'Regulations No 1 Governing Loans of Equipment and Supplies to Civil Authorities' (paragraph 7c)

It is recommended that about 20 per cent of the number allocated to each service be stored by that service in places readily available, as for example police stations, fire stations, sector wardens' posts, hospital and casualty stations serving as assembly points for medical teams rescue depots, public works and public utilities warehouses Storage must be in a cool dry place, and masks should be kept from contact with sunlight, oils or corrosive liquids and vapors This increment of masks should be held as a reserve and should not be assigned to individuals It is important that this reserve be decentralized as a safeguard against fire or bombing and also to permit rapid distribution in case of an emergency

The remaining 80 per cent allocated to the services may be issued to individuals in the services but should not be carried by them during their daily activities These masks should be

kept at the posts where the individuals will assemble during drills or enemy action Under no circumstances should masks be assigned to individuals before they have received training in their use and care, including proper storage

The commander of the local U S Citizens Defense Corps, through his senior gas officer, should immediately arrange a gas mask training program for those to whom masks are to be issued If no senior gas officer has been appointed, steps should be taken to appoint one in accordance with Operations Letters 42 and 91

In the training program the commander and senior gas officer of the local U S Citizens Defense Corps should utilize the services of individuals in the community who have attended the War Department civilian protection schools If there are no qualified individuals, assistance should be sought from the state gas consultant, who may request aid from the regional director of the U S Office of Civilian Defense

Repair of masks is not to be attempted locally except in case of extreme necessity Defective masks or those with exhausted canisters should be collected by the local property officer and returned, preferably in lots of twenty or more, to the nearest U S Office of Civilian Defense supply depot for repair and replacement

Salt Lake City 341 Pierpont Avenue.  
Chicago 1750 Wrightwood Avenue  
Fitchburg Mass Willow Street  
Hartford Pa  
Birmingham Ala 503 South Twenty Second Street (Long Furniture Manufacturing Company)

When a local property officer has masks which he wishes to return, he should so notify the nearest depot commander, who will then send shipping instructions and a government bill of lading which will authorize the transportation of the damaged masks without expense to the locality

After use, masks should not be worn by another individual without proper sterilization Instructions for sterilization are given in Office of Civilian Defense publication "Protection Against Gas"

## MISCELLANEOUS

## COMMITTEES ON WAR PARTICIPATION

In a recent conference of the War Participation Committee of the American Medical Association it was urgently suggested that all state associations create similar committees, so that these committees may supplement the existing committees on medical preparedness, even without any change in their personnel In this connection the chairman of the committee, Dr Walter F Donaldson, Pittsburgh, points out that the functions of this committee described by the House of Delegates of the American Medical Association which met in 1942 are as follows

'It should feel free to express comments and criticism of policies relating to the participation of the medical profession in the war effort

"Without authority to act, only to advise, it becomes a committee to express the views of the medical profession on such proposals as are made which may have a direct bearing on the principles which the American Medical Association regards as fundamental in the provision of good medical service"

## RUSSIA EXPRESSES GRATITUDE FOR AID

Soviet Ambassador Maxim Litvinov said at the annual meeting of the board of directors of Russian War Relief, Inc, in Washington, D C, 'I am authorized and greatly privileged to express on behalf of the Soviet Government the Red Army and all Soviet people their deep gratitude to Russian War Relief, to its board, to all working in the organization and to all contributors It is hardly possible to put into words the gratitude to America felt by wounded Red Army men receiving anesthetics during surgical operations, by those who, thanks to other medicaments from this country, have received alleviation from pain or a cure of their ills or by those who have kept them-

selves warm in American clothes on the field of battle and in the trenches during freezing winter days and nights The evacuated citizen too has been warmed, body and soul, by the receipt of winter clothing Thanks to timely medical aid, many Red Army men have had their time in the hospital shortened and been enabled to return to the front, so that Russian War Relief may be said to have influenced the numerical strength of our forces and thus to a certain extent to have done its bit for the victories of the Red Army"

Litvinov especially stressed the value to international friendship of the work of Russian War Relief He concluded by expressing confidence "that the friends of Russian War Relief will not weary of well doing and that the next report will rejoice our hearts with no less satisfactory, if not with still greater, results"

Edward C Carter, president of Russian War Relief, Inc, announced that since its inception in the fall of 1941 it had raised by Dec 31, 1942 in contributions in cash, in kind and in collectible pledges a total of \$9,342,204 The total of relief goods shipped and in purchase commitments as of December 31 was \$5,244,000, of which 78 per cent was for medical and surgical supplies, 15 per cent for clothing, knitgoods and blankets, 6 per cent for foodstuffs and seeds, and 1 per cent for miscellaneous items Carter said that relief needs in Russia during 1943 are expected to be far greater than in 1942 Success of the 1942 campaign, Carter said, was due to the wide support given Russian War Relief by labor, nationality, fraternal, youth and religious groups

Among others who attended the luncheon, in addition to board members, were Mrs Ivy Litvinov, English born wife of the Soviet ambassador, and Mrs J Borden Harriman, former U S minister to Norway

**DIVISION OF MEDICAL SCIENCE OF THE  
NATIONAL RESEARCH COUNCIL  
APPOINTS CONSULTANT  
GROUP ON MALARIA**

The Division of Medical Sciences of the National Research Council has established a special Subcommittee on Coordination of Malarial Studies including

DR FREDERICK M HANES, Chairman  
DR W M CLARK  
DR E K MARSHALL JR  
DR JAMES A SHANNON  
DR HENRY MELENEY  
DR O H PERRY PEPPER (ex officio)  
DR CHESTER S KEEFER (ex officio)

Under this committee there are panels concerned with chemistry of antimalarials, clinical testing of antimalarials, pharmacology of antimalarials and a special group which is concerned with new investigations on atabrine. The groups established include

*Chemistry of Antimalarials (under Division of Chemistry)*

DR W M CLARK, Chairman  
DR N L DRAKE  
DR ROBERT ELDERFIELD  
DR E K MARSHALL JR  
DR RALPH L SHRINER  
DR LYNDON SMALL  
DR FREDERICK Y WISELOGLE

*Clinical Testing of Antimalarials*

DR JAMES A SHANNON, Chairman  
DR FRANCIS G BLAKE  
DR MARK F BOYD  
DR ROBERT B WATSON  
DR W BARRY WOOD JR  
DR FREDERICK M HANES (ex officio)  
DR CHESTER S KEEFER (ex officio)  
DR O H PERRY PEPPER (ex officio)

*Pharmacology of Antimalarials*

DR E K MARSHALL JR, Chairman  
DR L T COGGESHALL  
DR E M K GEILING  
DR HANS MOLITOR  
DR W H TALIAFERRO

*Conference Committee on Atabrine*

DR JAMES A SHANNON, Chairman  
DR W M CLARK  
DR E K MARSHALL JR  
DR HANS MOLITOR  
DR L F SMALL, liaison (from U S P H S)

**FURTHER CONSERVATION OF  
CINCHONA BARK**

The Office of War Information announced on January 9 that cinchona bark, the source of quinine, and its derivatives are to be further conserved for direct antimalarial use by order M-131 as amended by the director general for operations. The order also limits the use of quinine itself to antimalarials and eliminates the provision in the original order which allowed the use of quinine in the manufacture of quinine and urea hydrochloride and in quinine hydrochloride and urethane. It can be used only for the manufacture of totaquine and certain quinine salts—the sulfate, hydrochloride and dihydrochloride. The dihydrochloride is for intravenous use, and the three quinine salts allowed are needed by the United States Army and Navy.

In addition to the requirement that quinine be used only as an antimalarial, the order requires that it be used only in ampule form uncombined with ingredients other than the necessary solvent and preservative or in powder, 5 grain tablet or 5 grain capsule form, uncombined with ingredients other than necessary fillers and excipients. However, licensed pharmacists may compound quinine in any form on individual prescriptions written by licensed physicians for quinine as an antimalarial agent. Existing stocks of quinine and urea hydrochloride and

of quinine and urethane may be used under the provisions of the order.

Quinine is defined as meaning quinine alkaloid extracted from cinchona bark and the quinine salts derived from quinine alkaloid. Totaquine is defined as a mixture of alkaloids extracted from the bark of cinchona trees the mixture to conform to the standards of the United States Pharmacopeia.

Totaquine, which is considered as valuable as quinine in the treatment of malaria, came into use as a result of experiences gained in India and the Philippines where low grade barks less rich in quinine were found to yield a combination of alkaloids satisfactory for the treatment of malaria.

Certificates are to be filed with the seller or supplier that quinine or totaquine is to be used as an antimalarial agent and that the cinchona bark is to be used for the primary manufacture of quinine or totaquine. This order M 131 as amended in no way changes the restrictions of order M 131-A applying to cinchonine, cinchonidine and quinidine.

**LOS ANGELES TO ISSUE FOOD ON PRESCRIPTION FOR SPECIAL DIETS**

In accordance with plans made on January 4 at a meeting of the Los Angeles City and County defense council, and the necessity for helping thousands of persons who for reasons of health are on strict diets, it was agreed, in view of the rationing of foods, that certain foods would be provided to such persons on physicians' prescriptions. The city health officer, Dr George Uhl, said that the health authorities have been besieged with pleas from persons who have been unable to obtain the foods needed in their special diets. Under the plan agreed on, a doctor will be able to write a prescription for example for a pound of butter or a dozen eggs or anything else that may be included in the special diet. The plan will operate on a voluntary basis for the present and is expected in view of the cooperative spirit of the merchants and jobbers to have widespread acceptance.

**MEDICAL AND SURGICAL RELIEF  
COMMITTEE**

At the annual meeting of the Medical and Surgical Relief Committee of America at its headquarters 420 Lexington Avenue, New York City, in January the executive chairman, Mrs Huttleston Rogers, announced that more than \$30,000 worth of supplies has been furnished during the last year to army air stations, to civil air patrol stations and to the coast guard and amphibious forces of the U S Navy, bringing the total value of the shipments of the Medical and Surgical Relief Committee up to nearly \$500,000. In addition to America's armed forces, supplies were sent also to German prison camps through the International Red Cross, to hospitals and welfare groups in the United States and Alaska and to African missions. Among the supplies sent out in the last year were two hundred and forty-eight complete physician's emergency medical field sets and large quantities of instruments, surgical dressings, sulfonamide compounds, concentrated foods and vitamins.

**REHABILITATION OF SELECTEES**

Ninety-nine patients with hernia referred to the Illinois State Department of Public Welfare by the Selective Service System were cured and made fit for military service in the last six months, according to a report by the Illinois State Welfare Director submitted to Governor Green. Twenty-five were treated by local or staff physicians and 74 submitted to an operation by the chief surgeon of the Department of Public Welfare, Dr Frederick Gruneck of Chicago. All these men were rehabilitated without charge in state hospitals.

**OATH TAKEN BY ALIENS**

The director of civilian defense, James M Landis, Washington, D C, on January 7 issued Amendment No 5 to Regulations No 3 of the Office of Civilian Defense, effective immediately. The amendment adds to section 9 (a) the following: "The oath taken by each alien appointed to membership in the Defense Corps may omit the first two clauses of the form hereinbefore set forth."

# ORGANIZATION SECTION

## MEDICAL LEGISLATION

### DISTRICT OF COLUMBIA

*Bills Introduced*—S 454, introduced by Senator Langer, North Dakota, proposes to prohibit experiments on living dogs in the District of Columbia. H R 1457, introduced by Representative Randolph West Virginia, proposes to amend the healing arts practice act of the District of Columbia so as to provide for the issuance of temporary permits to practice the healing art

### MEDICAL BILLS IN CONGRESS

*Bills Introduced*—S 227 introduced by Senator Clark, Missouri proposes to amend paragraph IX of Veterans' Regulation No. 10 so as to define misconduct for compensation and pension purposes as limited to felonious misconduct. S 400, introduced by Senator Thomas, Utah, provides for the organization and functions of the United States Public Health Service. S 450 introduced by Senator Pepper, Florida provides benefits for the injury, death, disability or enemy detention of civilians and for the prevention and relief of civilian distress arising out of the present war. S Res 74 submitted by Senator Pepper, Florida, proposes to authorize the Committee on Education and Labor or any subcommittee thereof to make a full and complete study and investigation of the manpower resources of the United States with particular reference to housing, health, education, technical training and civilian mobilization and morale. S Con Res 4 submitted by Senator Wiley, Wisconsin, proposes to create a joint committee on social security, composed of designated members of the Committee on Finance of the Senate and of the House Committee on Ways and Means. This joint committee will be authorized to investigate with respect to the need for and advisability of modification or enlargement of the present social security program and to consider any proposals submitted to the Congress in connection therewith. S 345 introduced by Senator Murdock, Utah, for himself and Senator Gillette, Iowa, proposes to authorize chiropractors to treat beneficiaries of the United States Employees' Compensation Act. S 463, introduced by Senator Downey, California proposes to confer on certain persons who served in a civilian capacity under the jurisdiction of the Quartermaster General during the war with Spain, the Philippine Insurrection or the China Relief Expedition the benefits of hospitalization and the privileges of the soldiers' homes. H R 1286, introduced by Representative Izac, California, proposes to amend the Social Security Act so as to provide benefits to persons permanently crippled to a degree such that they are not able to engage in a gainful occupation. H R 1297, introduced by Representative Mott, Oregon, proposes to authorize the Director of the Census to issue certifications of birth records. H R 1298, introduced by Representative Noriell, Arkansas provides for identification buttons for persons deferred or discharged from or rejected for military or naval service on account of physical defects not due to personal misconduct. H R 1352, introduced by Representative Dielstein, New York, proposes to make it a federal offense to alter the inner surface of the hand for the purpose of preventing identification by the use of fingerprints. H R 1368 introduced by Representative Price, Florida, proposes to authorize an appropriation of \$1,500,000 to construct a 500 bed veterans hospital in Alachua County, Florida. H R 1391, introduced by Representative Lane, Massachusetts, proposes to recognize the high public service rendered by soldiers who volunteered and served in trench fever experiments in the American Expeditionary Forces. H R 1402, introduced by Representative Sparkman, Alabama, and H R 1458, introduced

by Representative Cannon, Florida, propose to direct the Veterans' Administration to provide vocational rehabilitation and assistance in securing suitable employment for service connected disabled veterans in need thereof. H R 1451, introduced by Representative Walter, Pennsylvania, proposes to establish uniform procedure relative to the proof of age, place of birth or proof of death. H R 1453, introduced by Representative Case, South Dakota, provides that veterans of the present war suffering with tuberculous or neuropsychiatric ailments shall receive the same domiciliary or hospital care as veterans of the World War. H R 1259, introduced by Representative Bradley, Michigan, proposes to authorize a federal appropriation of \$700,000 to construct a veterans hospital in or near Gladstone, Mich., with a capacity of 150 beds. H J Res 12, introduced by Representative Keogh, New York, proposes to authorize the President to issue a proclamation designating the week of November 7 as the "National War on Cancer Week" in honor of the birthday of Madame Sklodowska Curie. H J Res 13, introduced by Representative Voorhis, California, proposes to establish the third week of September as National Employ the Physically Handicapped Week. H R 980, introduced by Representative Bates, Kentucky, provides that the Veterans' Administration shall not, in the absence of fraud or clear and unmistakable error, reduce any permanent disability rating. H R 994, introduced by Representative Cunningham, Iowa, provides that in the administration of benefits for veterans the permanent loss of the use of both feet, or both hands, or both eyes, or of one foot and one hand, or one foot and one eye, or one hand and one eye, or the loss of hearing of both ears, or the organic loss of speech, or becoming permanently helpless or permanently bedridden, shall be deemed total permanent disability for insurance purposes. H R 997, introduced by Representative Durham, North Carolina, proposes to amend the National Defense Act of June 3, 1916 by eliminating the Medical Administrative Corps in the Medical Department of the Regular Army and substituting therefor a Pharmacy Corps. H R 1013, introduced (by request) by Representative Lesinski, Michigan proposes to grant permanent and total disability ratings to disabled men of the Army, Navy, Marine Corps and the Coast Guard suffering from severe industrial inadaptability as a result of active service in the Army, Navy, Marine Corps or the Coast Guard. H R 1029, introduced by Representative Rogers, Massachusetts, provides that notwithstanding any provision of law or veterans' regulation, any World War ex-serviceman shown to have active pulmonary tuberculosis of compensable degree shall be deemed to be totally disabled for purposes of compensation when hospitalized. H R 1108, introduced by Representative Harness, Indiana, provides for the issuance of a certificate of citizenship to any person claiming to be a citizen of the United States at birth in whose case no official record of birth is available. H R 1189, introduced by Representative Rogers, Massachusetts, proposes to direct the Veterans' Administration to provide vocational rehabilitation and assistance in securing suitable employment for service connected disabled veterans in need thereof.

### STATE MEDICAL LEGISLATION

#### Arizona

*Bills Introduced*—S 30 and H 25 propose the enactment of an occupational disease law and contain a list of thirty five diseases which shall be deemed to be occupational in nature, among which are asbestosis and silicosis. H 4 to amend the pharmacy practice act, proposes to redefine the words "chemicals" and

"medicines" so as not to include "patent" or proprietary medicines in the original package or container and to prohibit the board of pharmacy from issuing permits for the sale of proprietary and "patent" medicines

### California

*Bills Introduced*—S 279, to amend the law relating to the sales tax, proposes to exempt therefrom medicines sold as dietary supplements or adjuncts. S 282 to amend the vehicle code relating to ambulances, proposes that the driver of the ambulance that first arrives at the place where an accident has occurred and who neglects or refuses to care for any injured person or to transport such person to a hospital shall be guilty of a misdemeanor. A 508 to amend the law relating to aid to the aged, proposes that necessary medical or surgical services shall be rendered by the physician or surgeon selected by the aged person. A 528 proposes the creation of a state board of massage to examine and license practitioners of that art. The practice of massage is defined as the use or employment of any method, art or science of administering to the human body for hygienic or therapeutic purposes exclusively, by rubbing, stroking, kneading, tapping or rolling the same manually or the external application of water either natural or mineral, to the human body for the purpose of relieving or alleviating affected parts thereof. Furthermore massage is declared to be distinct from the practice of medicine, surgery, osteopathy, drugless physicians, chiropody or chiropractic, physiotherapy, and persons duly licensed to practice those professions are excluded from the provision of the proposal. A 530, to amend the labor code relating to the management of hospitals, proposes that any employer who furnishes hospital service shall permit its employees contributing to the maintenance of the service to choose at least a majority of the board of directors or officers in charge of such hospital service. A 573, to amend the business and professions code, proposes to eliminate the issuing of a drugless practitioner's certificate.

### Colorado

*Bills Introduced*—S 135 proposes the enactment of a new public health law.

### Connecticut

*Bills Introduced*—S 253 proposes to authorize the state board of examiners for nursing to issue temporary licenses to properly qualified persons. S 257 to amend the medical practice act, proposes to require applicants for license to show that they have received the degree of doctor of medicine rather than merely a diploma of graduation, from an approved school. S 261, to amend the premarital examination law, proposes to authorize the required certificate to be signed by a physician licensed to practice medicine in the state of Connecticut or any state or territory of the United States or the District of Columbia. S 262 proposes to authorize persons formerly licensed to practice physiotherapy who had retired from active practice or were living outside the state to resume practice in the state by merely notifying the state department of health and paying the required registration fee. S 264 proposes to require physiotherapists to renew their licenses annually. H 470 to amend the uniform state narcotic law, proposes to remove opium, morphine and heroin from the exemption thereof and to make other changes.

### Georgia

*Bill Introduced*—H 29, to amend the law relating to the liens of inn keepers, proposes to include hospitals within such law and to secure by such liens the payment of all sums due for treatment, hospitalization and other accommodations.

### Idaho

*Bills Introduced*—S 14 proposes to exempt all persons serving in the armed forces of the United States from the law requiring persons to procure licenses as a prerequisite to engaging in a trade, occupation or profession and proposes further that such persons shall be in good standing without renewing their licenses during the continuance of such service. S 27 proposes to exempt from the payment of any professional or

occupational license or renewal fee all persons engaged in the military services of the United States and provides that their existing licenses shall remain in good standing for six months following the person's discharge from military service without the necessity of renewal. S 30 proposes to require any physician knowing that a patient treated or examined by him has cancer, carcinoma, lymphoma, sarcoma, leukemia or any form of malignant growth to report the same promptly to the state department of public health. The fine for failing to do this would be \$100 for each offense. H 43 proposes that each applicant for a marriage license shall produce a certificate signed by a licensed physician certifying that the applicant has been thoroughly examined and that he is not infected with syphilis in a communicable stage. The serologic test for syphilis required by the proposal could be made in the laboratory of the department of public health or in a laboratory approved by said department.

### Indiana

*Bills Introduced*—S 69 proposes to authorize any reputable physician duly licensed to practice medicine and surgery or obstetrics in the state of Indiana to practice in any public or private hospital without being required to become a member of the staff of physicians of such hospital subject only to reasonable rules and regulations which shall be the same to all physicians. H 192 proposes to exempt nonprofit corporations formed by hospitals for the purpose of issuing contracts to furnish hospital care to individuals or groups of individuals from the state insurance laws.

### Iowa

*Bills Introduced*—S 36 proposes to prohibit certain types of advertising by persons engaged in prescribing or supplying eyeglasses. S 67 proposes that when a town accepts a gift and the same is used to establish a hospital it shall on direction of the county supervisors furnish care to indigent persons committed to it by the county board at the expense of the county. S 82 and H 126, to amend the income tax law propose to authorize taxpayers to deduct expenses for the medical care of the taxpayer his spouse or a dependent and the term medical care is defined as amounts paid for the diagnosis, cure, mitigation, treatment or prevention of disease or for the purpose of affecting any structure or function of the body.

### Kansas

*Bills Introduced*—S 53 proposes to prohibit children from attending school unless they have been vaccinated against smallpox and immunized against diphtheria. H 91 proposes to authorize the board of medical registration and examination to issue temporary certificates to physicians licensed as such outside the state if they are found qualified to practice in the state during the present war emergency. The holder of such temporary certificate would be privileged, during the term specified, to practice his profession within the state subject to all laws of the state generally applicable to the practice of such profession and subject to such rules, regulations, restrictions and area limitations as the state board of medical registration and examination may impose. H 92 proposes the creation of a state board of consulting psychologists to determine the qualifications of persons desiring to practice such profession and to issue licenses therefor. The term consulting psychologist is not defined by the proposed bill.

### Massachusetts

*Bill Introduced*—H 450 to amend the unemployment security law proposes to authorize payment to persons who leave their employment temporarily or permanently because of illness, disease or state of health requiring or justifying such leaving provided that in case of such illness, disease or state of health the director shall establish rules and regulations for registering and giving notice etc.

### Michigan

*Bills Introduced*—H 59 proposes to prohibit the sale of barbituric acid or any of its derivatives, sulfamylamide and any of its derivatives, chloral hydrate or paraldehyde, except under certain conditions. PROHIBIT PHYSICIANS' IDENTITIES AND VETERI-

narians could make sales of such substances provided certain record requirements are fulfilled and druggists and pharmacists would be proscribed from selling such substances except on prescription of a licensed physician, dentist or veterinarian. H 62 proposes to require school boards to provide for the annual physical examination of all pupils in said districts.

#### Minnesota

*Bills Introduced*—S 108 and H 160, to amend the law relating to the reporting of births occurring in maternity hospitals, propose to require such hospitals to file a written report with the director of social welfare of the birth of any child known or believed to be illegitimate within twenty-four hours after the birth occurs.

#### Missouri

*Bill Introduced*—H 85, to amend the Missouri laws relating to the construction of statutes, proposes that the words "physician" and "surgeon" shall be construed to include the practice of any school of medicine recognized by the laws of Missouri, including a practitioner of any osteopathic school of medicine recognized by the laws of Missouri, as being endowed with definite privileges, rights and duties, such as the right to practice as doctors their respective arts of healing by giving physical examinations and by prescribing remedies and treating diseases of the human body and mind and thereby endeavoring to alleviate diseases and pain of any patient, including the privilege, right and duty to practice their respective healing arts in all hospitals or institutions built or maintained by revenue derived from public taxes, to practice as doctors their respective healing arts by rendering public health, public safety and public sanitation services and public precautionary measures sanctioned by any act of congress or sanctioned by any Missouri statute.

#### Montana

*Bill Introduced*—S 17 proposes the enactment of a new vital statistics law.

#### Nebraska

*Bills Introduced*—Bill No 124, to amend the laws regulating the practice of osteopathy, proposes, among other things, to increase the scope of practice authorized to osteopathic licentiates to include operative surgery with instruments and obstetrics, and the use of antiseptics, anesthetics, narcotics, biologics, analgesics, anodynes, antidotes, serums and vaccines. Bill No 139, to amend the laws regulating the practice of medicine and surgery, proposes, among other things, that (1) persons serving an internship in an accredited hospital shall be exempt from the provisions of the law, (2) osteopathic licentiates shall be exempt from the law unless they represent themselves to be physicians and surgeons or profess or hold themselves out to administer or prescribe drugs in any form or perform operative surgery with instruments or practice obstetrics, (3) chiropractic licentiates shall be exempt from the provisions of the law so long as they confine their practice to the treatment of human ailments by the adjustment by hand of any articulations of the spine, (4) any limited licentiate shall be exempt from the law so long as he confines himself strictly to the field for which he is licensed and does not hold himself out as administering or prescribing drugs in any form or performing operative surgery or practicing obstetrics and (5) an approved medical school may now give the required four courses of lectures of eight months each without the limitation that no two of such courses may be held in one year. The proposed amendment provides merely that no two such courses shall be held concurrently. Bill No 149 to amend the pharmacy law, proposes to exempt pharmacists actively engaged in the military service from payment of the annual renewal license fee.

#### New Hampshire

*Bill Introduced*—H 32 proposes enabling legislation for the incorporation of non profit sharing organizations formed for the purpose of establishing, maintaining and operating a nonprofit medical service plan whereby medical service may be provided at the expense of said corporation by physicians to subscribers to said plan under contract entitling such subscribers to certain

medical service. The bill sets forth the form of contract method of having rates and contracts approved, method of financing such plans and certain restrictions, among which is the provision that no medical service corporation shall impose any restrictions on physicians who administer to its subscribers as to methods of diagnosis or treatment. The bill also proposes that no person shall become a participating physician unless he shall be a physician holding a full license to practice medicine in the state of New Hampshire.

#### New York

*Bills Introduced*—S 9 proposes the creation of a state board of examiners in optical dispensing and sets forth the qualifications to be required of persons desiring to practice optical dispensing. Provisions are made for the granting of licenses, the annual registration of licenses and the revocation of licenses. Optical dispensing is defined as the filling of prescriptions for lenses and the fitting of the glasses but not to include the right to hold oneself out as being able to examine eyes or to diagnose, treat, correct, relieve, operate or prescribe for any human ailment, deficiency, deformity, disease, injury, pain or physical condition. Furthermore, the bill would provide that nothing in its terms should be construed as a limitation or restriction in any respect on the practice of medicine by duly licensed physicians. Finally, the bill proposes that a legally incorporated optical corporation may operate through duly licensed and registered dispensing opticians while conforming to the provisions of the bill. S 34 and A 58 propose a law for the establishment and administration of a system of health insurance. Among other things the bills propose that every general medical and dental practitioner, duly licensed to practice in the state (with out discrimination against any school or mode of practice which is lawful in the state), shall have the right to be included in the list of those furnishing the medical benefits provided. Furthermore, every person entitled to the medical benefits provided by the bill shall have the right to select the general medical practitioner by whom he wishes to be attended and treated. S 72 proposes the enactment of a consumers' protection act regulating the registration, standards, sale and labeling of proprietary products, defined as a food, drug, cosmetic or device in which the distinctive name, formula or composition, and in addition the method of manufacture for a device, is the exclusive property of a proprietor, by reason of a patent, copyright, registration or first general use or otherwise and is not dedicated to free public use. S 206 and A 279 to amend the education law relating to physiotherapists, propose to require physiotherapists to treat only quarantinable diseases under the supervision of a duly licensed physician. Under the present law they may not treat any disease except under the supervision of a duly licensed physician.

#### North Carolina

*Bill Introduced*—H 110 proposes to authorize state institutions for the care of the sick, feeble-minded or insane to have performed on persons dying in such institutions a postmortem examination in the laboratories of incorporated medical schools, after securing the written consent of the deceased person's husband or wife or next of kin.

#### North Dakota

*Bill Introduced*—S 43, to create a state commission for the survey and control of feeble-minded, proposes, among other things, to prohibit the issuance of marriage licenses to any person whose name appears on the official list of feeble-minded persons.

#### Ohio

*Bill Introduced*—H 44 to amend the law relating to sales tax, proposes to exempt therefrom the sale of drugs or medicine, compounded, prepared or sold in accordance with or under a prescription issued by a licensed practitioner of medicine.

#### Oklahoma

*Bills Introduced*—H 14 proposes the enactment of a premarital examination law. Persons desiring to be married must obtain a certificate from a duly licensed physician, licensed to practice in Oklahoma, that they have undergone a standard

serologic examination and that in the opinion of the physician they are not infected with syphilis in a communicable stage H 37 proposes that state and local officers, or their authorized deputies who are physicians, be empowered to detain and examine persons suspected of being infected with a venereal disease and authorizes the detention of such persons until the results of an examination are known. The examination must be made by a health officer or, at the option of the person to be examined, by an approved licensed physician. H 38 proposes to amend the law dealing with the duties and powers of the commissioner of health and providing that the terms contagious disease and infectious disease shall include venereal disease. The present law now concerns contagious, infectious and malarial diseases. S 56 proposes to create a separate board of examiners for naturopaths and defines naturopathy as the physiologic and mechanical sciences, such as mechanotherapy, articular manipulation, corrective orthopedic gymnastics, neurotherapy, psychotherapy, hydrotherapy and mineral baths, electrotherapy, thermotherapy, phototherapy, chromotherapy, vibrotherapy, thalamotherapy and dietetics which shall include the use of foods of such biochemical tissue building products and cell salts as are found in the normal body, and the use of vegetable oils and dehydrated and pulverized fruits, flowers, seeds, barks, roots and vegetables uncombined and in their natural state, and, added to the foregoing definition, would include all methods now in use, as physiotherapy, Indian herb, herb and simple remedy doctoring, physical culture, gynecology [sic], autiochemistry, colonic therapy and scientific massage and such methods as are taught in standard schools of naturopathy. The proposal would further constitute a finding that this definition of naturopathy has been approved by an act of Congress dated Feb 7, 1931. Naturopaths would be required to observe and be subject to all state, county and municipal regulations in regard to the control of contagious and infectious diseases, the reporting of deaths and to all other matters pertaining to the public health, in the same manner as is required of other practitioners.

#### Oregon

*Bills Introduced*—S 30 proposes that any person otherwise qualified who is graduated in medicine or surgery from the University of Oregon Medical School and who shall have served at least six months in the armed forces of the United States during the present war and been honorably discharged therefrom shall be granted a license to practice the profession in which he graduated without the necessity of taking an examination. S 31, to amend the medical practice act, proposes to authorize persons whose licenses have been revoked or suspended to practice medicine and surgery pending an appeal from such revocation or suspension order. S 35 to amend the workmen's compensation law, proposes to redefine the phrase "personal injury" so as to mean accidental injury or death arising out of and in the course of employment, and such occupational disease or infection as arises naturally out of such employment or as naturally or unavoidable results from such accidental injury. H 101, to amend the law relating to cosmetic therapy, proposes to proscribe the removal of warts, moles or other blemishes by any electrologist. H 103, to amend the law relating to the examination of handicapped children proposes to authorize examinations of the eyes to be made and that the findings be certified to by qualified and licensed optometrists.

#### Rhode Island

*Bill Passed*—S 42 passed the senate on January 28. To amend the basic science law, it proposes to exempt from the operation of the act all persons who had on April 27, 1940 already satisfactorily completed one or more full school years at an approved school.

#### South Dakota

*Bill Introduced*—S 10 proposes the repeal of two paragraphs in the existing law relating to the use tax. One of these paragraphs exempts tangible personal property not readily obtainable in South Dakota which is to become a capital asset of any trade, business or profession and the other exempts industrial

materials and equipment which are not readily obtainable in South Dakota.

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#### Tennessee

*Bills Introduced*—S 77 proposes to amend the law prohibiting the hiring of food handlers suffering from venereal diseases by providing that all persons so employed must procure a health certificate, including a Wassermann test signed by a physician licensed to practice in the state of Tennessee, which certificate must be renewed annually. Amendment No 1 to S 85 proposes the enactment of a basic science law requiring persons desiring to be examined for the purpose of obtaining licensure to practice the healing art or any branch thereof to pass an examination in anatomy, physiology, chemistry, bacteriology and pathology. Among other things, the proposal would exempt from the operation of its terms dentists, osteopaths, chiropractors, naturopaths, nurses, midwives, optometrists, chiropodists, barbers, cosmeticians or Christian scientists practicing within the limits of their respective callings and persons specifically permitted by any law to practice any form of the healing art in restricted areas without license, except that chiropractors and osteopaths shall be covered by the law if they possess, prescribe or administer drugs in any form. H 39 proposes that hospitals, clinics, sanitariums, doctors, physicians, surgeons, nurses, pharmacists, undertakers, embalmers or other persons called on to render aid to persons suffering from any wound or other injury inflicted by means of a knife, pistol, gun or other deadly weapon or by other means of violence, or suffering from the effects of poison or suffocation, shall report the same immediately to the chief of police. H 48 proposes to amend the law relating to the release of patients from hospitals for the insane by providing that no person shall be discharged or temporarily released from such hospital without the approval of the court committing such person. The existing law authorizes persons to be released when the superintendent of the institution deems it best and advisable. H 187 proposes to amend the law relating to the control of venereal diseases by requiring physicians who make a diagnosis of, treat or prescribe for a case of venereal disease to report such case immediately to the full time municipal district or county health officer. The bill further proposes to authorize state, district county and municipal health officers to detain and examine persons reasonably suspected of being infected with a venereal disease and to require infected persons to report to a reputable physician or clinic for treatment. H 410 proposes the enactment of a permanent registration and identification law. H 420 proposes to prohibit the sale or advertisement of articles used for the prevention of conception without a license issued by the state board of pharmacy except that this proposal would not apply to physicians and medical practitioners regularly licensed to practice medicine or osteopathy in the state of Tennessee. H 460 to amend the premarital examination law, proposes to authorize the required serologic examination to be on forms prepared, approved and distributed by the departments of public health of other states or by the United States Army, Navy, Marine Corps and Public Health Service. The present law restricts such examinations to approved laboratories in the state.

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*Bills Passed*—H 129 passed the House on January 20. The bill proposes the creation of a state board of naturopathic examiners who will be authorized to issue themselves licenses as naturopathic physicians. Naturopathy means, according to this proposal, nature cure or health by natural methods and is further defined as the prevention, diagnosis and treatment of human injuries, ailments and diseases by means of any one or more of the psychologic, physical or mechanical, chemical or material forces or agencies of nature. Such naturopathic licentiates, however, are proscribed from performing any surgical work other than minor matters.

**Texas**

*Bill Introduced*—H 20 proposes the creation of a separate state board of examiners for chiropractors and defines chiropractic to be the science of analyzing and adjusting the articulations of the human spinal column and its connecting tissues without the use of drugs or surgery.

**Washington**

*Bills Introduced*—S 63 proposes the creation of a separate examining board for sanopractic physicians sanopractic being defined as the art and science of applied prophylactic and therapeutic sanitation which enables the physician to direct advise, prescribe or apply food water, roots herbs light, heat exercises active and passive manipulation adjusting tissue vital organs or anatomic structure by manual mechanical or electrical instruments or appliances or other natural agency to assist nature restore a psychologic and physiologic interfunction for the purpose of maintaining a normal state of health in mind and body. Apparently sanopractors would be authorized to practice surgery and obstetrics and to use anesthesia. H 41 proposes to authorize the establishment of emergency health and sanitation areas and sets forth certain regulations applicable to the state board of health in connection therewith.

**West Virginia**

*Bill Introduced*—C. C. H. House Bill No 1 (official number not yet received) proposes the enactment of legislation providing for the organization incorporation licensing and operation of nonprofit medical service corporations and hospital service corporations under the supervision and jurisdiction of the insurance commissioner.

**Wyoming**

*Bills Introduced*—H 9 to amend the law relating to the practice of chiropractic proposes to require chiropractors at the time of the annual renewal of their license to present evidence that they have attended at least one day of the educational courses given during the prior year by the Wyoming chiropractic association. H 22 to amend the pharmacy laws proposes that a hospital shall not be prohibited from keeping on hand and using professionally drugs medicine or narcotics under the direction of physicians dentists or veterinarians, even though there be no registered pharmacist present.

## MEDICAL LEGISLATION PASSED BY THE SEVENTY-SEVENTH CONGRESS

The Seventy-Seventh Congress adjourned on Dec 16, 1942. Numerous proposals of medical interest had been introduced though perhaps not as many as in preceding congresses. Few measures of major importance in the field of health were enacted other than those associated with the general war effort.

*Purity of Insulin*—The protection of diabetic patients from impure insulin was assured by the enactment of legislation providing for the distribution of the drug under supervision of the Federal Security Agency. This legislation was necessary because of the expiration of the insulin patent under which the purity and potency of insulin had been regulated.

*The May Bill to Control Prostitution*—Congress completed action on the May bill prohibiting prostitution within such reasonable distance of military or naval establishments as the Secretaries of War and Navy may determine to be needful to the efficiency, health and welfare of the Army and Navy.

*Student Loans*—Federal funds to the extent of \$5,000,000 were made available for loans to students pursuing accelerated medical courses and certain other designated technical courses. Likewise additional funds were made available to the United States Public Health Service for the training of nurses to augment the supply of nurses depleted by the demands of the military program.

Osteopaths were persistent in their demands for recognition at the hands of Congress and were successful to the extent that the Surgeon General of the Army was authorized to

appoint osteopaths as interns in army hospitals and to the extent that authorization was included in a bill providing an appropriation for the Navy Department for the use of funds "for the pay of commissioned medical officers who are graduates of reputable schools of osteopathy." Thus far osteopaths have not been appointed as interns in army hospitals nor are osteopaths eligible for commissions in the Medical Corps of the Navy.

The Lanham bill became a law and made considerable federal funds available for the construction in distressed areas of needed public works, including hospitals health facilities and clinics. Under this legislation, hospital clinic and other health facilities were augmented in many states in areas where existing facilities had proved totally inadequate to serve the influx of population due to defense activities. Additional funds \$4,557,000 too were made available to the Veterans Administration for major reconditioning replacements and new construction of hospitals and domiciliary facilities for veterans.

During the closing days of the Congress legislative action was completed on a Treasury Department initiated measure to regulate the growing of the opium poppy in the United States and to provide for the manufacture of opium from the plants. The growing of the opium poppy particularly in certain Western states has created a distinct problem to prevent the diversion of opium obtainable therefrom into illicit channels. The war too has greatly diminished the sources of supply for opium. The law that was enacted provides a method by which both problems may be handled by the government. Another measure enacted during the last days of the Congress increases the pay and allowances of the Army and Navy Nurse Corps and authorizes the employment by the military establishment of and accords a military status to female dietetic and female physical therapy personnel. This law also authorizes the employment of other technical and professional female personnel in categories required for duty outside the continental United States.

The Congress took one more step looking toward the provision of adequate housing for the Army Medical Library when it authorized an additional appropriation for the purchase of a site for the building. Apparently however this urgent project will not be carried to completion until more peaceful times.

As has been previously reported in *THE JOURNAL* the Soldiers and Sailors Civil Relief Act was variously amended to provide additional relief for persons in military service. Of particular interest to the medical profession is a provision in the amendatory law under which leases for office space entered into by physicians who thereafter enter military service may be canceled.

The new Revenue Act will greatly increase the tax burden of physicians as it will other federal income taxpayers. It does not effect any changes in the deductions that a physician may claim on account of professional activities. It does impose an obligation on physicians who have in their employ persons receiving wages in excess of \$12 a week a duty of withholding the victory tax as explained in detail recently in *THE JOURNAL*. The new act eliminates an injustice that has obtained for a number of years in the manner in which outstanding accounts on the books of a taxpayer at the time of his death have been treated for income tax purposes. Hereafter such unpaid accounts will not be considered as part of the income of the decedent for the year of death, as has heretofore been the case but will be taxable when paid as a part of the income of the person who receives the money. A provision in the new law also authorizes a taxpayer to deduct amounts expended for medical dental and hospital care to the extent that such expenses exceed 5 per cent of the net income of the taxpayer but not in excess of \$2,500 in case of the head of a family, or \$1,250 in case of other individual taxpayers.

Additional funds were made available to the United States Public Health Service for a continuation of a program to provide reserves of blood plasma in hospitals the reserves being established to meet any wartime contingency caused by enemy action which may necessitate blood transfusion to civilians.

## MEDICAL ECONOMIC ABSTRACTS

DISTRIBUTION AND MOVEMENT  
OF PHYSICIANS

The directories of the American Medical Association from 1923 to 1938 have been analyzed by the United States Public Health Service<sup>1</sup> to determine the changes in the distribution of physicians within the United States during that period. It was found that 52,000 physicians had left the medical profession and 75,000 had entered it. Nearly 6,000 had both entered and departed from the profession without being included in the totals for either initial or terminal year. Of 94,000 physicians who remained in the directory for the fifteen year period, 13,000 made one or more changes from one state to another.

For an average group of 100 physicians in the 1923 directory, 56 were listed in the same state, 36 had left the profession and 8 had moved to another state by 1938; meanwhile 8 had moved to this state and 51 new registrants had entered the profession. The net effect of these changes reflected an increase of 15.9 per cent in the total number of physicians over the period, an increase almost exactly proportional to the corresponding population increase.

The number of physicians per hundred thousand of population did not change greatly as a whole, nor did the migration of physicians already within the profession greatly change the proportion. The greatest change was due to the number of new physicians settling in the different states. According to the degree of increase or decrease of physicians, the states are divided into three basic groups as follows:

Group A: Arizona, California, Connecticut, Delaware, Florida, Maryland, Massachusetts, Michigan, Minnesota, New Jersey, New York, North Carolina, Rhode Island, Washington, and Wisconsin. Group B: Colorado, District of Columbia, Illinois, Louisiana, Nevada, New Mexico, Ohio, Oregon, Pennsylvania, Texas, Utah, Virginia, and West Virginia. Group C: Alabama, Arkansas, Georgia, Idaho, Indiana, Iowa, Kansas, Kentucky, Maine, Mississippi, Missouri, Montana, Nebraska, New Hampshire, North Dakota, Oklahoma, South Carolina, South Dakota, Tennessee, Vermont, and Wyoming.

1. Mountain, J. W., Pennell, E. H., and Nicolay, Virginia. Location and Movement of Physicians, 1923 and 1938—Turnover as a Factor Affecting State Totals. *Pub. Health Rep.* 57: 1752 (Nov. 20) 1942.

In group A the number of physicians per hundred thousand increased from 132 to 150. In group B there was a slight decrease from 135 to 131, but in group C there was a significant decrease from 126 to 104. This was brought about by the fact that, of the 100 physicians in group A in 1923, 70 were newly registered physicians while only 40 out of 100 in group B were newly registered physicians and only 31 out of 100 in the states where the largest percentage decrease occurred since 1923.

This difference in the number of physicians newly registered is reflected in existing age differences.

Where the largest gains occurred the median was forty-three years, where physicians increased to a lesser extent the median was forty-nine years, and in states where net losses in physician totals occurred the median was fifty-three years. Accordingly, it is evident that there was a spread of ten years between the median ages for the three groups of states. Such a spread would indicate that those states in which the recruitment of new physicians was proportionately small are faced with important recruitment problems in the future if the level which even now exists is to be maintained.

While the number of newly registered as well as the total ratio of physicians in the states can be shown to be greatly affected by the ability to purchase medical care, there were nevertheless a number of poorer states and relatively rich ones in each group to indicate that there were other influences at work in determining the distribution of physicians. On the whole, states with high per capita incomes realized much more generous provisions for medical care than did those with low incomes.

It is suggested that the recruitment of new physicians is "related to the extent of physician training facilities in states." A comparison of the opportunities for internships as shown in the hospital number of *THE JOURNAL* clearly demonstrates that in both wealthy and poor states relatively extensive training opportunities were associated with increased physician totals over the period, whereas states showing decreasing physician totals provided more limited accommodations for the training of interns.

## WOMAN'S AUXILIARY

## Colorado

The Woman's Auxiliary to the Otero County Medical Society was organized Nov. 13, 1942. Mrs. George W. Miel of Denver, publicity chairman of the Colorado woman's auxiliary, and Mrs. Virgil Sells, chairman of the yearbook for the state auxiliary, assisted with the organization. Mrs. R. S. Johnston gave a luncheon to the doctors' wives of La Junta, Air Base, Fort Lyon, and neighboring towns of the valley. Mrs. Johnston was elected president of the Otero County auxiliary. Mrs. J. A. Lawson, Rocky Ford, vice president, and Mrs. A. P. Cash, La Junta, secretary and treasurer. Dr. Johnston, president of the Colorado State Medical Society, attended the meeting.

## Illinois

The Woman's Auxiliary to the Chicago Medical Society visited the American Medical Association headquarters Oct. 22, 1942, and made a tour of the building. An extensive program has been carried on by the defense chairman, Mrs. Harry J. Dooley, and her committee. The booth at 30 North Michigan Avenue has been open daily from 10 a. m. until 4 p. m. with auxiliary members in charge. One hundred and sixty-four women have served in this capacity. From February to October more than \$25,000 worth of bonds and stamps were sold.

## Mississippi

Thirty members of the auxiliary to the Northeast Mississippi Thirteen Counties Medical Society met at the Tupelo Methodist Church Annex in Tupelo for the December meeting, the president, Mrs. Stanley Hill of Corinth, presiding. Dr. David E. Givton of Blue Mountain College gave an excellent commentary on the war.

## New York

Forty members of the Woman's Auxiliary to the Onondaga County Medical Society were luncheon guests of Mrs. Maxwell C. Montgomery at the Rome State School. Miss Inez Stibbind, supervisor of the school colony, traced the growth of the school. Mrs. Andrew Sloan, chairman of the blood plasma bank, gave a report of the clinic which is operating daily at the Utica General Hospital under the direction of Dr. Roscoe C. Borst. The blood plasma bank is a project of the War Council Emergency Committee of which Dr. Fred T. Owens is chairman. The auxiliary began the project in September, 1941, by calling for volunteer donors, and since that time nearly a thousand persons have responded. Committee members are serving daily as registrants at the War Council headquarters and others are making surgical dressings for the blood plasma clinic.

The Oswego County auxiliary members have been busy sponsoring a Navy Relief Horse Show. Mrs. Grove C. Elder was general chairman. The horse show cleared \$1411.99 which was turned over to the Oswego County Navy Relief Society.

## West Virginia

Mrs. John P. Helmick of Fairmont, president elect of the Woman's Auxiliary to the West Virginia State Medical Association, was elected to the same office in the Auxiliary to the Southern Medical Association at the annual meeting recently held in Richmond. At the same session Mrs. Welch England of Parkersburg, immediate past president of the Auxiliary to the West Virginia State Medical Association, was elected a member of the council.

## Medical News

(PHYSICIANS WILL CONFERR A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS OF GENERAL INTEREST SUCH AS RELATE TO SOCIETY ACTIVITIES NEW HOSPITALS EDUCATION AND PUBLIC HEALTH)

### CALIFORNIA

**Personal**—Dr Andrew M Harvey has been appointed assistant city health officer of Long Beach. He succeeds Dr Frederick G Hall who had been acting assistant health officer under Dr Frank W Stewart but who has retired.

**State Meeting to Be in Los Angeles**—The annual session of the California Medical Association will be held at the Biltmore Hotel, Los Angeles, May 23. The Hotel Del Monte at Del Monte, where the meeting was to be held, has been taken over by the U S Navy as a preflight school.

**Dr Soley Appointed Head of Pharmacology Division at California**—Dr Mayo H Soley, associate professor of medicine and lecturer in pharmacology, has been appointed chairman of the division of pharmacology at the University of California Medical School, San Francisco. Dr Soley fills the vacancy left when Chauncy D Lerke, Ph.D., resigned to accept the deanship of the University of Texas Medical Branch at Galveston. Dr Soley graduated at Harvard Medical School, Boston, in 1933.

**Physician Awarded Distinguished Flying Cross**—Lieut John H Stark, Los Angeles, a member of the medical corps of the air force since June 1942 has been awarded the Distinguished Flying Cross by General Douglas MacArthur. The *Bulletin* of the Los Angeles County Medical Association reports that Lieutenant Stark somewhere in the southwestern Pacific, entered the smoldering wreckage of an airplane which had crashed and which contained fused bombs likely to explode and removed injured members of the crew to give them medical treatment.

**Dr Tresidder Chosen to Head Stanford University**—Dr Donald B Tresidder has been elected president of Stanford University by action of the board of trustees. He succeeds Dr Ray Lyman Wilbur, who in 1941 reached the retirement age and was appointed chancellor and who since then has been serving as acting president. The appointment will be effective September 1. Dr Tresidder was born in Tipton, Ind., April 7, 1894. He graduated from Stanford University in 1919 and the school of medicine in 1927. He was elected to the board of trustees in December 1939 and became president of the board in May 1942. His father, mother and uncle all were practicing physicians. Dr Tresidder is now president of the Yosemite Park and Curry Company, a position he has held since 1925. He has resigned as president of the board of trustees of Stanford to accept the university presidency. Dr Wilbur, when Dr Tresidder assumes the presidency, will carry on as chancellor, to which position he was elected for life.

### GEORGIA

**Society News**—The Fulton County Medical Society will be addressed February 15, by Drs Roy R Kraelc, Emory University, on 'Highlights of Hematology for 1942' and Paul B Beeson, Atlanta, "Review of Acute Respiratory Diseases."

**The Fischer Awards**—The L C Fischer award of \$100 for the best written paper given before the Fulton County Medical Society during the past year was presented by Dr Allen H Bunce, January 4 during the society's thirty-eighth annual meeting to Drs Joseph Yampolsky and Charles C Powell for their work on 'Syphilitic Aortitis in a Nine Year Old Child'. A similar prize for the best research work went to Dr John Ross McCum for his paper on 'Acute Pancreatitis'. All are of Atlanta.

**Doctors Day**—On March 30 Doctors Day was observed in Georgia in accordance with a resolution that was adopted by the Woman's Auxiliary to the Medical Association of Georgia in 1934. A similar resolution was adopted by the National Auxiliary in 1935 and a recommendation made that each state select a day which would celebrate an outstanding medical achievement in that state. Several states have chosen March 30 as their Doctors Days in honor of Georgia which commemorates the day on which Dr Crawford W Long 'first used ether anesthesia in surgery'. The Georgia auxiliary published a special tribute by Mrs Leonard Rush Massengale, Lumpkin chairman of Doctors Day in Georgia.

### ILLINOIS

**Laboratory Closed**—The branch laboratory of the Illinois Department of Public Health at Galesburg was closed on January 30. Calvin Corey, bacteriologist formerly in charge of the Galesburg Laboratory, entered military service on January 14 and has not been replaced. A release from the state department indicated that the present state health budget limitations prevent the department from recruiting civilian bacteriologists qualified to fill highly responsible supervisory positions. Physicians in the Galesburg area wishing to make use of state laboratory services for the examination of various specimens are asked to send such specimens through to the Chicago laboratory of the state health department at 1800 West Illinois Street or to the Springfield Laboratory at 126 North Fifth Street.

### Chicago

**Kretschmer Memorial Lecture**—Dr Eugene L Opie, director of the department of pathology, Cornell University Medical College, New York, will deliver the second Edwin R Kretschmer Memorial Lecture of the Institute of Medicine of Chicago at the Palmer House February 26. His subject will be 'The Experimental Production of Leukemia and Its Significance in Relation to the Human Disease'.

**Supreme Court Upholds Sentence of Physician Accused of Abortion**—On January 19 the Illinois Supreme Court affirmed the criminal court conviction of Dr Nathaniel H Schaffner, who had been charged and found guilty of performing an abortion, newspapers reported. The physician was sentenced to fourteen years in prison. The woman in the case died on July 7, 1942 in Dr Schaffner's office, it was stated.

**Electron Microscope Installed at Institute of Technology**—The Illinois Institute of Technology has installed an electron microscope which is said to be the first in the Chicago area. The microscope is in the physics building at the institute. Research work will be carried out under the supervision of James S Thompson, Ph.D., director of the department of physics. One of the first subjects to be studied will be cancer, which has heretofore occupied the attention of Dr Thompson.

### MAINE

**Society News**—Dr Forrest C Tyson, Augusta spoke on "Dementia Precox" before the Kennebec County Medical Association at a meeting in Augusta recently. The Penobscot County Medical Association was addressed in Bangor recently by Dr B Earl Clarke, Providence R I on 'The History of the Microscope and Early Microscopy'. At a meeting of the Piscataquis County Medical Association in Milo recently Lieut Allan J Stinchfield Skowhegan, M C U S Army, spoke on "Chemical Warfare". Dr Howard M Clute, Boston addressed a recent meeting of the Oxford County Medical Society in Rumford on 'The Problems of Acute Cholecystitis'.

### MARYLAND

**Industrial Hygiene Laboratory at Johns Hopkins**—Announcement is made of the establishment of the army industrial hygiene laboratory at the Johns Hopkins University School of Hygiene and Public Health, Baltimore. The laboratory will operate under the direction of the occupational hygiene branch of the preventive medicine division of the Office of the Surgeon General of the Army. Its function will be to conduct surveys and investigations concerning occupational health hazards in army owned and operated industrial plants, arsenals and depots, making reports on examinations of such gases, fumes, dusts, toxic substances or chemicals as may be collected in army plants.

### MASSACHUSETTS

**Tufts Alumni Lecture**—Comdr A Warren Stearns, M C, U S Naval Reserve on leave of absence as dean of Tufts College Medical School, Boston will deliver the annual Tufts Alumni Association Lecture at the medical school February 19. His subject will be "Social Equilibrium".

**Dr Carpenter Made Director of Nutrition Laboratory at Carnegie Institute**—Thorne M Carpenter, Ph.D., since 1937 acting director of the Nutrition Laboratory of the Carnegie Institution of Washington, Boston, has been appointed director of the laboratory. Dr Carpenter received his degree of doctor of philosophy at Harvard University in 1915. For a time early in his career Dr Carpenter was assistant chemist at the Hatch Experimental Station, Massachusetts Agricultural College, and at the Pennsylvania State College Experimental Station. Later he was expert in animal nutrition at the Bureau of Animal Industry, U S Department of Agriculture. From 1905 to 1907 he was research chemist of the Carnegie Institute.

tion of Washington, stationed at Wesleyan University, Middletown Conn., and scientific assistant in nutrition investigations for the U S Department of Agriculture. He was also instructor in chemistry at Wesleyan in 1907, when he went to the Nutrition Laboratory, Carnegie Institution, Boston as research chemist. He was president of the American Institute of Nutrition from 1940 to 1941.

**Symposium on Aviation Medicine**—The department of ophthalmology of Boston City Hospital sponsored a symposium on aviation medicine in compliance with requests from representatives of the medical corps of the United States Army and Navy for the training of future medical officers for services with aviation units. Ross A. McFarland, Ph.D., assistant professor of industrial research in the Fatigue Laboratory, Harvard University, Boston, spoke January 17 on "The Whole of the Medical Program in Civil Aviation" and January 24 on "The Effects of High Altitude in Aviation." On January 31 the speakers were Comdr. A. Warren Stearns, M.C., U.S. Naval Reserve, on "The Application of Psychiatry to the Military Needs" and Lieut. Edward J. Galway, U.S. Naval Reserve, "The Application of Psychology to the Selection and Maintenance of Aircraft Pilots." Others in the series will be Capt. John C. Adams, M.C., U.S. Navy, on "Naval Aviation," Lieut. Comdr. Frank R. Philbrook, M.C., U.S. Naval Reserve "Demonstration of a Naval Flight Physical Examination," Dr. Varaztad H. Kazanjian, Boston, "Early Treatment of Traumatic Injuries of the Face and Jaw," and Dr. Donald Munro, Boston, "Head and Spinal Injuries."

### NEW JERSEY

**Dr. Franz C. Schmelkes Dies**—Franz C. Schmelkes, Ph.D., assistant director of the research department of Wallace and Tiernan Products, Newark, since 1927, died Dec. 11, 1942, aged 43, of angina pectoris. Dr. Schmelkes was born in Prague, Czechoslovakia. He had done considerable research in organic chemistry, sterilization of water and pharmacology.

**Personal**—William T. Anderson, Jr., Ph.D., since 1923 director of the radiation research laboratory of the Hanovia Chemical and Manufacturing Company, Newark, has been granted a leave of absence to accept a commission as lieutenant in the U.S. Naval Reserve.—Dr. Wells P. Eagleton, Newark, recently received an honorary degree of doctor of science from the University of Newark.

**Kenny Treatment Center Opened in Jersey City**—The establishment of a school for training physicians, technicians and nurses in the Kenny method for the treatment of infantile paralysis at the Jersey City Medical Center has been announced. The school will open in February under the co-sponsorship of the New York University and the state chapter of the National Foundation for Infantile Paralysis.

**Alcoholic Consultation Bureau**—The establishment of the Alcoholic Consultation Bureau, Inc., with headquarters at 744 Broad Street, Newark, is announced in the December *Quarterly Journal of Studies on Alcohol*. The bureau is described as an organization specializing in prevention and cure of alcoholism to which a person who cannot control his drinking can go. The staff consists of a psychiatrist, a social worker-psychologist and a lawyer. A nominal fee is charged with no charge to needy persons. The advisory council of the bureau consists of members of committees of the Research Council on Problems of Alcohol and includes Drs. Robert E. Fleming, Boston, Norman H. Jolliffe, New York, Lawrence Kolb, Washington, D.C., Edward A. Strecker, Philadelphia, Leonard V. Harrison, LL.D., Bronxville, N.Y., and Major Merrill Moore, medical corps of the Army.

### NEW MEXICO

**Public Health Conference**—A medical and public health conference was held at Albuquerque on January 18 for the staffs of the local U.S. Indian Medical Service, New Mexico's Third Health District and the New Mexico Department of Public Health with Dr. Ralph B. Snively, Albuquerque, medical director, district number 3 of the U.S. Indian Service presiding. Dr. John W. Elder, Albuquerque, acting district health officer, opened the meeting and other speakers included Dr. Snively on "Immunization Procedures," Miss Easter Flynn, R.N., Bernalillo, and Miss Gladys Anderson, R.N., Tron, "Sulfaguanidine in Treatment of Dysentery—Nursing Considerations," Dr. Michel Puyon, Albuquerque, "Practical Application of Nutrition Research," and Dr. Sophie B. D. Aberle, Albuquerque, "Nutritional and Vitamin Content of Native Plants." A group of motion pictures on various topics was shown.

### NEW YORK

**Utica Hospital Observes Hundredth Anniversary**—On January 16 appropriate ceremonies marked the hundredth anniversary of the Utica State Hospital, Utica. The hospital was opened as the New York Lunatic Asylum on Jan. 16, 1842. Among the speakers at the recent celebration were Drs. William J. Tiffany, Albany, commissioner of the New York State Department of Mental Hygiene, Arthur H. Ruggles, Providence, R.I., president of the American Psychiatric Association, Willis E. Merriman, Utica, superintendent of the hospital, Richard H. Hutchings, Utica, former superintendent of the hospital, Samuel W. Hamilton, Washington, D.C., mental hospital adviser of the U.S. Public Health Service, and Mr. Homer Folks, New York, secretary of the State Charities Aid Association and chairman of the state's temporary commission on state hospital problems. A short history of the hospital was compiled as a booklet to mark the occasion.

### New York City

**Dr. Bela Schick Honored**—A dinner was held at the Hotel Astor, Dec. 11, 1942, in honor of Dr. Bela Schick and for the Russian War Relief. The speakers at the dinner included Dr. Henry E. Sigerist, director of the Institute of the History of Medicine at Johns Hopkins University, Baltimore, and Major George Fielding Eliot, author and military critic.

**The Biggs Memorial Lecture**—Lieut. Col. Paul F. Russell, Army of the United States, chief of the Tropical Disease and Malaria Control Section, Division of Preventive Medicine, Office of the Surgeon General, Washington, D.C., will deliver the annual Hermann M. Biggs Memorial Lecture on April 1 at the New York Academy of Medicine. His subject will be "Malaria and Its Influence on World Health."

**Information and Counseling Service**—On January 25 the mayor's committee on wartime care of children held a special program to open the first information and counseling service in the Harlem Health Center. The service will be available to working mothers six days and two evenings a week. Among the speakers were Mayor La Guardia and acting welfare commissioner Leo Arnstein, chairman of the committee. Special tribute was paid to the late William Hodson, who was killed in an airplane crash, January 15, while on a leave of absence from his position as commissioner of public welfare to carry out a special mission for Herbert H. Lehman, federal director of foreign relief and rehabilitation.

### NORTH CAROLINA

**Physician Chosen as Raleigh's Outstanding Citizen**—Dr. Alexander Webb, Jr., on January 22 was presented with a gold key by the Junior Chamber of Commerce of Raleigh for his selection as "Raleigh's outstanding young citizen of 1942." The presentation of the key was made at a banquet at the Hotel Carolina. Dr. Webb was selected by the award committee in recognition of his leadership and contributions of service in organization of the local medical unit of civilian defense and other activities in civilian defense and civic life. Dr. Webb is a native of Raleigh. He graduated at the University of North Carolina and in 1937 at Harvard Medical School, Boston. He has been associate chairman of the emergency medical unit of the Raleigh Citizens Defense Corps since 1941.

### OHIO

**Personal**—Dr. Virginia B. Hickerson has been appointed pediatrics coordinator for the Anti-Tuberculosis League of Cincinnati and Hamilton County, succeeding Dr. Barbara A. Hewell.—Dr. Joseph B. Stocklen, Cleveland, medical director of the Cuyahoga County Tuberculosis Dispensary, has been appointed controller of tuberculosis for Cuyahoga County. With the appointment the case finding program, nursing activities, clinics, admissions, hospitalization, record keeping and rehabilitation services in the entire county have been placed under one administrative officer.

**Chemical Warfare Course**—Western Reserve University School of Medicine, Cleveland, and the Office of Civilian Defense cooperated in January in a chemical warfare course for physicians, hospital administrators and nurse executives. Instructors were:

Dr. Joseph Seifter, assistant professor of pharmacology  
Dr. Harold D. Crean, associate professor of physiology  
Dr. Walter H. Pritchard, instructor in medicine  
Dr. John A. S. Gammel, assistant clinical professor of dermatology and syphilology  
Dr. John W. Holloway, assistant clinical professor of surgery  
Dr. Robert M. Stecher, assistant clinical professor of medicine

Two programs were offered, one for the east side of Cuyahoga County, Lake Ashabula and Geauga counties and the other for the western section of Cuyahoga County, Lorain and Erie counties.



## OREGON

"Be Kind to Doctors Week"—Portland observed "Be Kind to Doctors Week" Dec 13-19, 1942, according to *Northwest Medicine*. Newspaper and radio publicity was used which urged the public to cooperate by calling physicians early in illness to avoid night calls and by going to the office when possible. The public was also asked to help the hospitals by making shorter visiting hours, taking fewer bouquets to patients and helping feed or wait on patients to relieve the nurses.

## PENNSYLVANIA

**Smallpox in Pennsylvania**—On January 16 the *Science News Letter* reported that 52 smallpox cases were recorded in latest returns to the U S Public Health Service for the entire state of Pennsylvania. Seventeen cases were recorded for the rest of the nation, the group being scattered over five different states.

## Philadelphia

**Annual Postgraduate Institute**—"Management of Emergencies" will be the theme of the annual postgraduate institute of the Philadelphia County Medical Society to be held at the Benjamin Franklin Hotel, May 11-14.

**Dr Opie Temporary Director of Phipps Laboratories**—Dr Eugene L. Opie, New York has been acting as temporary director of the laboratories of Henry Phipps Institute since Dr Esmond R. Long entered the army medical corps as chief of the division of tuberculosis. Dr Opie has spent at least one day each week at the Phipps Institute as consultant and supervisor of research. Dr Opie has also been directing the work of the department of pathology at Cornell University Medical College N Y from which he once retired during the absence of Dr William Dock who entered the army.

## Pittsburgh

**Society News**—Dr Robert C. Grauer addressed the Allegheny County Medical Society January 19, on "The Evaluation and Management of the Endocrine Patient" and Dr Ernest P. McCullagh, Cleveland, "Male Sex Hormone". Drs Wendell B. Gordon and Floyd H. Bragdon discussed "The Basis of Electrocardiographic Diagnosis" and "Low Back Pain from Neurosurgical Viewpoint" respectively, before the Pittsburgh Academy of Medicine, January 12.

## WASHINGTON

**Changes in Health Officers**—Dr Elizabeth Gunn McCann Omak has been appointed health officer of Okanogan County to continue the unexpired term of Dr Glenn L. Stevens. Okanogan, who has entered military service. Dr Frederick M. Petrie has been appointed health officer of Tappanish, succeeding Dr Angus Meagher, who has gone into military service.

**Dr Kahl Named Assistant Director of Health**—Dr John A. Kahl, district health officer with headquarters at Walla Walla, has resigned to become assistant director of health of Washington, newspapers reported on December 29. The district of which he has been head includes Walla Walla, Benton and Franklin counties. At one time Dr Kahl had served as director of local health for the state department of health and as health officer of Clark County.

**Society News**—Dr William K. Livingston, Portland, Ore. addressed the Walla Walla Valley Medical Society in Walla Walla recently on "Vascular Diseases". The society has also been addressed recently by Dr Lester J. Palmer, Seattle, on "The Significance of Glycosuria" and Dr Paul G. Hothow, Seattle, on "Herniation of the Intervertebral Disk versus Spinal Injury and Low Back Pains". The King County Medical Society was addressed in Seattle, February 1, by Dr Byron F. Francis, Seattle, on "Influenza Pneumonia" and Lieut. Comdr. Winfred H. Bucemann, M C U S Navy, Bremerton, "Treatment of Air Raid Casualties at Site of Incident".

**Largest Indian Hospital Completed**—The newly completed Cushman Hospital adjacent to the city of Tacoma is the largest Indian institution in the country according to *Northwest Medicine*. Built by the U S Department of the Interior as an enlargement of the old hospital, the new unit is six stories high and contains 350 beds with all facilities for surgical, medical, obstetric and tuberculous patients and with x-ray equipment. Patients will be received from Indian tribes from Washington, Oregon, Idaho, Montana, northern California and Alaska. Formerly the institution was a combination hospital and Indian school for reservations covering the major part of Pierce and King counties. The Cushman Hospital now covers 38 acres and fulfills terms of Indian treaty rights dating back to 1855. Dr Jesse H. Hendry, Tacoma, is the staff superintendent.

## GENERAL

**Board Examinations in Otolaryngology**—The American Board of Otolaryngology will hold its next examination in New York at the Waldorf-Astoria Hotel and the New York Eye and Ear Infirmary June 3-5. Dr Dean M. Lierle, University Hospitals, Iowa City, is the secretary-treasurer of the board.

**Pathologists Postpone Meeting**—The American Association of Pathologists and Bacteriologists has canceled its annual meeting scheduled to be held at the University of Chicago, April 1-2. The council of the association will meet early in April to transact the necessary business of the association. Nominations for membership, together with supporting data and not less than two letters of recommendation, should be in the secretary's office not later than April 1. Dr Howard T. Karsner, 2085 Adelbert Road, Cleveland is the secretary.

**Annual Dinner of Planned Parenthood Federation**—The annual meeting of the Planned Parenthood Federation of America was held at the Waldorf-Astoria, New York, January 28-29. Various work shop conferences for state leagues made up the program for the first day. One session of the second day was devoted to a panel discussion on "Planned Parenthood in Wartime". At the annual dinner "Family Health in America" was discussed by Ernest Albert Hooton, Ph.D., professor of anthropology, Harvard University, Boston, and Charles P. Taft, LL.D., assistant federal director of Defense Health and Welfare Services, Washington, D.C. Albert D. Lasker, New York, retired head of the former Lord & Thomas Advertising Agency, gave \$50,000 to the federation. It was announced on January 20.

**American Orthopsychiatric Association**—The twentieth annual meeting of the American Orthopsychiatric Association will be held at the Hotel Pennsylvania, New York, February 22-24. A general session on "Problems of a Wartime Society" will open the session with Dr Franz G. Alexander, Chicago, Gardner Murphy, Ph.D., New York, and G. Howard Shaw, assistant secretary of state, Washington, D.C., as the speakers. This theme will also close the program. There will be a special section meeting on "The Military Scene and the Individual" and one on the "Psychology of Preadolescent Children in Wartime". Round table discussions will be held on "Treatment of Aggression", "Learning: Psychoanalytic and Gestalt Interpretations" and "Rorschach's Test: Current Progress with This Instrument as an Aid in Diagnosis and Therapy".

**National Conference on Medical Service**—The seventh annual meeting of the National Conference on Medical Service will be held at the Palmer House, Chicago, February 14 under the presidency of Dr Joseph D. McCarthy, Omaha. "Analysis of Current Trends in the Control of Medicine" will be the theme of the morning session with the following speakers:

Dr John J. Carey, Milwaukee: Effect on Medical Education  
Dr Roy B. Harris, New Orleans: Significance to Medical Licensure  
Dr B. Robinson, D.D.S., Baltimore: Outlook for Dentistry  
Dr Claude W. Munger, New York: Hospital Problems  
Dr Alfred W. Aldson, Rochester, Minn.: The Doctor of Medicine and His Responsibility

The noonday dinner will be addressed by the Hon. Harold H. Burton, LL.D., Washington, D.C., United States Senator from Ohio on "America Looks Ahead". Dr McCarthy will also deliver his presidential address at this session. In the afternoon the following will speak on "Medicine in the Postwar Era":

Dr Rollo K. Packard, Chicago: Return of the Medical Officer to Private Practice  
Dr Carl H. McCiskey, Indianapolis: Responsibility to the War Veteran  
Dr Carl F. Vohs, St. Louis: Extension of the Social Security Program  
Dr Ransom D. Bernard, Clinton, Iowa: Expansion of Public Health

**Obstetrics Prize**—The American Association of Obstetricians, Gynecologists and Abdominal Surgeons announces that all manuscripts in its foundation prize award contest must be received by the secretary before June 1. The award shall consist of \$150 and eligible contestants include interns, residents, graduate students in obstetrics, gynecology, abdominal surgery and physicians with an M.D. degree who are actively practicing or teaching obstetrics, gynecology and abdominal surgery. Manuscripts must be presented under a nom de plume together with a sealed envelop bearing the nom de plume and containing a card showing the name and address of the contestant. Manuscripts must be limited to five thousand words and must be typewritten in double space on one side of the sheet. Illustrations should be limited to such as are required for a clear exposition of the thesis. The successful thesis shall become the property of the association but this provision shall in no way interfere with the publication of the communication in the journal of the author's choice. Free copies of all manuscripts and illustrations must be submitted. The award



will be made at the annual meeting of the association at which time the successful contestant must appear in person to present his paper as a part of the regular scientific program. The contestant must meet all expenses incident to the presentation. Dr. James R. Bloss, 418 Eleventh Street, Huntington, W. Va., is the secretary of the association.

**Tropical Medicine Study Begins at Tulane**—On January 4 twenty-nine persons began classes in the study of tropical medicine at Tulane University of Louisiana School of Medicine, New Orleans. After completing their training, all will return to their own medical schools to teach. The group includes:

Dr. Gilbert D. Curtis, College of Medical Evangelists, Los Angeles, Loma Linda.  
Dr. Morris Tager, Yale University, New Haven, Conn.  
Dr. William Platt Emory University, Atlanta, Ga.  
Dr. Carroll L. Birch, University of Illinois, Chicago.  
James A. Kennedy, Ph.D., University of Louisville, Ky.  
Dr. Walter A. Stryker, University of Michigan, Ann Arbor.  
Dr. William J. Pyles, Columbia University College of Physicians and Surgeons, New York.  
Dr. Roger D. Baker, Duke University, Durham, N. C.  
Dr. Arnold G. Wedum, University of Cincinnati.  
Dr. Matthew C. Riddle, University of Oregon, Portland.  
Dr. Hunter S. Cook, Hahnemann Medical College and Hospital of Philadelphia.  
Dr. Eleanor H. Valentine, Woman's Medical College of Pennsylvania, Philadelphia.  
Dr. Francis D. Smith, University of Virginia, Charlottesville.  
Dr. Gerald R. Collier, University of Western Ontario, London, Canada.  
Dr. James Z. Davis, University of Utah, Salt Lake City.  
Leslie G. Saunders, Ph.D., University of Saskatchewan, Saskatoon, Canada.  
Dr. Lloyd J. Florio, University of Colorado, Denver.  
Lois C. Lillick, Ph.D., New York Medical College.  
Justus F. Mueller, Ph.D., Syracuse University, Syracuse, N. Y.  
Thomas J. Brooks, Jr., Ph.D., Wake Forest College, Winston-Salem, N. C.  
Angus M. Griffin, Ph.D., George Washington University, Washington, D. C.  
Dr. Albert H. Meier, Northwestern University, Chicago.  
Dr. Jacob Furth, Cornell University, New York.  
Dr. Robert M. Shaw, University of Alberta, Edmonton, Canada.  
Anna D. Dulaney, Ph.D., University of Tennessee, Memphis.  
Dr. William Kaufmann, Albany Medical College, Albany, N. Y.  
Dr. Richard C. Porter, University of Buffalo.  
James Fred Denton, Jr., Ph.D., University of Georgia, Augusta.  
Millard F. Gunderson, Ph.D., University of Nebraska, Omaha.

The project was described in *THE JOURNAL*, Dec. 19, 1942, page 1329. It was made possible by a grant of \$25,000 through the Association of American Medical Colleges by the John and Mary R. Markle Foundation.

**Report of Industrial Hygiene Foundation**—With war industries losing manpower at the rate of one hundred and thirty-six million workdays per year, or an average of more than two and one half million workdays weekly, through illness alone, special studies are now going forward to help reduce sick absenteeism in the industries by the Industrial Hygiene Foundation, Pittsburgh, and a group of its member companies in collaboration with the U. S. Public Health Service according to the annual report of the managing director of the foundation. Statistics are now complete for fourteen of the participating companies for the year 1941 covering absences of eight days or over. In 1942 eleven more companies and associations affiliated with the foundation in an effort to promote healthful working conditions, bringing the total to 246 company and association members in the foundation. These organizations, practically all of them engaged in war production employ between two and three million war workers. More plant hygiene surveys were conducted in 1942 than in any previous year. The introduction of unfamiliar and new chemicals in manufacturing processes, some with little known toxic effect is demanding even greater attention to hygiene measures. Meanwhile, it was stated the dermatoses continue to be the most common of all occupational diseases. Continued support was noted for medical and engineering research in industrial health with grants to the Saranac Laboratory, N. Y., the University of Pennsylvania, Philadelphia and Harvard School of Public Health, Boston. A study in toxicology is under way for a member company at Mellon Institute, Pittsburgh. Two medical and two engineering bulletins were issued to members during the year. Comparison of Stereoscopic Miniature Chest Films, Single Roentgenograms on Paper and Single Roentgenograms on Large Films. Effects of Exposure to Welding Fumes and Gases Upon Normal and Tuberculous Animals, Air Flow Measurement by the Dilution Method and Measuring Air Flow in Industrial Ventilation. More than one thousand abstracts of articles, legal decisions and news items relating to industrial health have been carried in the foundation's *Monthly Hygiene Digest* during the past year. As a wartime measure the foundation's board of trustees has authorized the extension of service to nonmember companies on a cost plus basis which includes plant hygiene surveys now being conducted in all types of manufacturing.

**Annual Report of Foundation for Infantile Paralysis**—The National Foundation for Infantile Paralysis disbursed \$1,142,009.35 in seventy-seven grants and appropriations during the fiscal year ended Sept. 30, 1942. The money went to medical schools, hospitals, research laboratories, health institutes and foundations from funds raised by the March of Dimes' and celebrations of President Roosevelt's birthday. During the year 450 county chapters of the foundation were formed so that now 2,900 of America's 3,070 counties are serviced by about 40,000 volunteer workers. The foundation reports that its achievements during the year were the teaching of the Kenny method of treating after-effects which entailed establishment of special training programs to provide physicians, nurses and physical therapists to apply and carry on the method, broadening of study in search of a prevention and real cure, addition not only to knowledge of the nature of the virus but also the method of spread of the infection and emphasis of the little appreciated role of spasms and other temporary symptoms which if untreated result in permanent damage and correlation of the study of infantile paralysis with studies of related encephalitis infections. For virus research the foundation made twenty-three grants to twenty-one institutions for a total of \$543,749.46. Of the grants, seven were to men or institutions whose work had not been previously supported by the foundation. Among the grants were \$59,244 to Johns Hopkins University School of Hygiene and Public Health, Baltimore (the term of this grant is five years and the total approved for that period is \$300,000), \$40,000 to the University of Michigan School of Public Health, Ann Arbor, \$21,526 to George Williams Hooper Foundation of the University of California, San Francisco, two grants totaling \$21,510 to the Michigan Department of Health, Lansing, \$16,000 to Yale University School of Medicine, New Haven, Conn., two grants totaling \$13,255.25 to the University of Minnesota Medical School, Minneapolis, \$12,400 to the Children's Hospital Research Foundation of the University of Cincinnati College of Medicine, \$10,860 to the University of Toronto Connaught Laboratories, Canada, \$10,000 to Stanford University School of Medicine, San Francisco, and \$10,000 to the University of Southern California School of Medicine, Los Angeles. To carry on after effects work the foundation made twenty-three grants to sixteen institutions in twelve states and Canada among them being ten new grants. The total including one appropriation was \$88,286.35. Among the grants were three grants totaling \$11,893.38 to the State University of Iowa College of Medicine, Iowa City, \$9,200 to the University of Rochester School of Medicine and Dentistry, New York, two grants totaling \$7,975 to the Massachusetts General Hospital, Boston, \$7,050 to the University of Minnesota Medical School, two grants totaling \$7,000 to the University of Colorado School of Medicine, Denver, and \$5,900 to the Columbia University College of Physicians and Surgeons, New York. For educational purposes there were three appropriations and twelve grants to ten institutions in seven states, the total amount being \$227,540.80. Principal grants were \$6,000 to Teachers College of Columbia University, New York, three grants totaling \$34,280 to the National Organization for Public Health Nursing, Inc., New York, \$50,120 to the Georgia Warm Springs Foundation, \$16,695 to the University of Minnesota Medical School, \$10,400 to Northwestern University Medical School, Chicago, \$10,000 to the Harvard Infantile Paralysis Commission, Boston, \$9,520 to Stanford University School of Health (Women), Palo Alto, Calif., \$5,000 to the American Physiotherapy Association, Palo Alto, and \$4,500 to the D. T. Watson School of Physiotherapy, Leetsdale, Pa. For epidemics and public health work there were five grants and eight appropriations totaling \$27,432.76. The grants were \$8,950 to the Illinois Committee on Infantile Paralysis in joint cooperation with the Cook County Public Health Unit and Illinois Department of Public Health, Chicago, \$3,600 to the New York State Department of Health, Albany, \$1,080 to the Children's Hospital, Winnipeg, Canada, \$940.72 to Vanderbilt University School of Medicine, Nashville, Tenn., and \$500 to the Louisiana State University School of Medicine, New Orleans. Among the miscellaneous appropriations was \$30,000 for operation of the infantile paralysis center at Tuskegee Institute, Alabama, which provides after care for Negro orthopedic cases, also \$225,000 to the Georgia Warm Springs Foundation to conduct its work and research studies. To make the Kenny method of treatment available to patients in all parts of the country the National Foundation enlarged its training course at the University of Minnesota, added six courses at different centers throughout the country and set up scholarships for training physicians, nurses and physical therapists in this method.

## Foreign Letters

### BUENOS AIRES

(From Our Regular Correspondent)

Dec 18, 1942

#### Epidemic of Acute Anterior Poliomyelitis

The number of cases of acute anterior poliomyelitis in Argentina since last November has been larger than those of previous epidemics. The acute course of the disease is similar to that of the 1936 epidemics. About 400 cases have been reported in two months in the epidemic area, in which more than 700 cases were observed during the whole epidemic period of five months in 1936. A permanent committee for the crusade against the disease has been recently organized. Separate wards and 600 beds in various hospitals have been reserved for patients with the disease. The proper measures for controlling the epidemics as well as negotiations which aim at the creation of a scientific institute for researches on the disease as it develops in Argentina are in course. Dr Enrique Claveaux, the director of the Instituto de las Enfermedades Infecciosas y de Higiene of Montevideo Uruguay recently reported good results from the administration of tetanus toxin to patients with the disease. The treatment is said to be reliable and harmless provided the toxin is administered in the proper dose.

#### New Hospital Center

Dr Juan M. Obarrio, a psychiatrist, recently presented a plan for the creation of a hospital for the diagnosis and treatment of psychoneuro endocrine diseases which will be called the Hospital Intermedio. The hospital will function as a center for the diagnosis and therapy of diseases of the nervous system and of the endocrine glands. The patients will be treated as ambulatory before hospitalization whenever this treatment is indicated. All the necessary services and facilities for the treatment of special diseases will be included. There will be a department for social work. Dr Gonzalo Bosch, a psychiatrist and the director of an important hospital for the insane in Buenos Aires, said that the number of beds in municipal asylums is insufficient and that the creation of a hospital in accordance with Dr Obarrio's plans is of paramount importance.

The municipal council voted unanimously for the creation of the Hospital Intermedio. The money for the construction, equipment and maintenance of the hospital is already provided for. There is a municipal fund in Buenos Aires, which is collected during the year in the form of a 5 per cent tax on theater tickets. Up to now the fund has been used for the building and maintenance of hospitals for the insane and homes for old people. This fund is now available for the Hospital Intermedio. The total amount of the tax in 1942 was about 1,200,000 Argentine pesos (\$300,000).

#### Epidemic Encephalomyelitis

Dr Rene Crouchet of the Faculty of Medicine of Bordeaux recently gave a lecture in the Hospital de Clínicos in Buenos Aires. He discussed epidemic encephalomyelitis (Crouchet's disease). He concluded that epidemic encephalomyelitis is a polymorphous disease with a variety of clinical forms. In the typical clinical form of the disease the symptoms are somnolence, moderate fever and visual disorders (diplopia). The diagnosis is difficult, as the symptoms are those of common grip. It is easier in epidemic seasons during which the prognosis is grave with an approximate mortality of 10 per cent. Sequels especially postencephalitic parkinsonism, appear late after apparent cures. The lesions of the nervous tissues from localization of a filtrable virus are similar to those caused by rabies or poliomyelitis virus. The disease was recognized as such for the first time in 1915 and 1916 in the war zones of the French army (regions of Commercy and Verdun). From

these regions the disease extended to France, the colonies and several foreign countries. The intravenous injections of dextrose and sodium salicylate is the therapy of choice in acute forms of the disease.

#### Medical and Surgical Meetings

The fourteenth Argentine Congress of Surgery, which was organized by the Argentine Association of Surgery, was recently held in Buenos Aires. Dr Carlos Roberto Lavalle is the president. The speakers were Drs Rafael J. Babbina, Oscar Vaccarezza, Wenceslao Tejerina Rotheringham and Alejandro Pavlovsky who discussed "Nontraumatic Medullary Compression," "Thoracic Trauma" and "Etiology, Pathogenesis, Diagnosis and Therapy of Acute Pancreatitis" respectively. The topics to be discussed in the next Argentine Congress of Surgery are "Preoperative and Postoperative Periods in Surgery of the Liver and Bile Ducts," "Treatment of Genital Prolapse and Its Results" and "Trauma of Carpal Bones." —The first Inter American Congress of Surgery was held at Santiago, Chile, on November 14, on the occasion of the centennial anniversary of the foundation of the University of Chile. Delegations from the United States and Canada and other Pan American countries were present. —The second Latin American Congress of Plastic Surgery was recently held in Buenos Aires. Dr Lelio Zeno, surgeon, of Buenos Aires, is the president. There were several important official topics discussed, including "Labio-platine Fissure." The next Latin American Congress of Plastic Surgery will be held in Chile. The official topics will include "Plastic Surgery of the Hand" and "Treatment of Scars." —The third Pan American Congress of Endocrinology, which was to meet in Buenos Aires in the course of 1943, has been postponed on account of the war. The exact date will be decided later on. —The Pan American Neuropsychiatric Week, which was to take place in Buenos Aires early in the course of 1943, has been postponed till November 1943. —The first National Conference of Normal and Pathologic Anatomy, Histology and Embryology was recently held in Cordoba. Dr Humberto Fracassi was the president. Brazil, Chile, the United States, Paraguay and Uruguay accepted the invitations extended to them and sent delegations. —The first Argentine Congress on Endemic and Epidemic Diseases was held in Buenos Aires in November 1942. Dr Carlos Gonso Gandolfo, professor of epidemiology in the Faculty of Medicine of Buenos Aires, is the president. The official topics were diphtheria, exanthematic typhus, infections in Latin America not previously recognized, acute anterior poliomyelitis (Heine-Medin disease), brucellosis, diseases of the respiratory tract caused by viruses and miscellaneous topics on endemic diseases and infections. The next congress will be a Pan American Congress on Endemic and Epidemic Diseases. It will be held in Montevideo in November.

#### Sanitary Conference

The government of Argentina recently appointed a committee to organize a sanitary conference. Dr Juan Jacobo Sprangenberg, the president of the Departamento Nacional de Higiene, was appointed president of the organizing committee. The sanitary conference will be held in Buenos Aires at a later date. The aim of the conference is to organize national centers of social care and public health in such a manner as to have a coordinated system throughout the country.

#### New Scholarships

The Academia Nacional de Medicina of Buenos Aires recently established the Hirsch Medical Scholarships with a fund of 500,000 pesos (about \$125,000), which was donated by Mr Alfredo Hirsch of Buenos Aires. The medical studies with these scholarships will be made in the United States or in England for two years beginning by the middle of 1943. For the first ten years the scholarships will be given for studies on cancer, leprosy and infantile paralysis.

## Deaths

**Elmer Burkitt Freeman** \* Baltimore, Baltimore Medical College, 1900 specialist certified by the American Board of Internal Medicine, member of the American Gastroenterological Association and the National Gastroenterological Association, fellow of the American College of Physicians member of the Southern Medical Association and secretary of its section on gastroenterology in 1930 and 1931 and chairman in 1932, fellow of the Premier Congres international de gastroenterologie, formerly clinical professor of gastroenterology at the University of Maryland School of Medicine and College of Physicians and Surgeons associate in clinical medicine at the Johns Hopkins University School of Medicine since 1929, formerly lecturer on medicine at his alma mater gastroenterologist St Agnes' Hospital since 1910 dispensary physician gastrointestinal department, Johns Hopkins Hospital, since 1912 and assistant visiting physician at the hospital since 1929 visiting physician at the Bon Secours Hospital from 1917 to 1938 and attending gastroenterologist since 1938 visiting physician to the Church Home and Infirmary since 1929 member of the associate staff, Union Memorial Hospital, from 1936 to 1938 and since 1938 a member of the active staff, since 1917 physician in chief, Maryland General Hospital, where he died December 23, of myocardial infarction with cerebral embolus, aged 67

**John Rathbone Oliver**, Baltimore Leopold Franzens-Universität Medizinische Fakultät Innsbruck, Austria 1912 served as priest at the Protestant Episcopal Church in 1900 and as curate at St Mark's Church Philadelphia 1900-1903, when he resigned was restored to the orders in 1927 member of the Medical and Chirurgical Faculty of Maryland the American Psychiatric Association the Royal Society of Medicine the Phi Beta Kappa and the Association for Research in Nervous and Mental Disease professor of the history of medicine at the University of Maryland School of Medicine and College of Physicians and Surgeons from 1927 to 1930 and associate in the history of medicine at Johns Hopkins University School of Medicine from 1930 to 1939 surgeon in the Austrian Army, 1914-1915, psychiatrist, Johns Hopkins Hospital, from 1915 to 1917, chief medical officer to the Supreme Bench of Baltimore from 1917 to 1930 member of the Medical Officers' Reserve Corps received the degree of doctor of philosophy from Johns Hopkins University in 1927, author of many books including "The Good Shepherd," "Fear," "Psychiatry and Mental Health" "Tomorrow's Faith," "Priest or Pagan" and "Spontaneous Combustion", aged 71, died, January 21, in the McLean Hospital, Belmont of bronchopneumonia

**Leslie Lawson Bigelow** \* Columbus, Ohio Harvard Medical School, Boston 1906 acting dean and clinical professor of surgery at the Ohio State University College of Medicine, where he had been a member of the faculty since 1914, past president of the Ohio State Medical Association and the Columbus Academy of Medicine, fellow of the American College of Surgeons acting director of the Starling-Loving University Hospital surgeon and chief of staff of the Children's Hospital, surgeon to the Grant and St Francis hospitals at one time served as a delegate to the British Medical Association and the Institute of Public Health in Zurich Switzerland, formerly chief surgeon for the old Hocking Valley Railroad, president of the Harvard Medical Alumni Association 1940-1941 aged 62, died January 15 of embolism following an operation

**Louis Joseph Seibert**, Toronto Ont Canada, University of Toronto Faculty of Medicine 1912 specialist certified by the American Board of Ophthalmology member of the American Academy of Ophthalmology and Otolaryngology head of the department of ophthalmology at St Michael's Hospital for many years on the staff of the Hospital for Sick Children consultant at St Joseph's Hospital since it was founded in 1921 served as a captain in the medical corps of the Canadian Army during World War I for many years a member of the athletic board of the University of Toronto in 1928 was elected to the board of education of Toronto representing the separate schools in 1908 represented Canada at the Olympic games at London, England aged 56 died December 2

**Henry H Foringer**, Elizabethtown Pa, Western Reserve University Medical Department, Cleveland, 1883 member of the Medical Society of the State of Pennsylvania, at one time a member of the staff of St Vincent's Hospital and resident physician at the Pennsylvania Soldiers and Sailors Home Erie in 1936 in honor of his fifty years in the prac-

tice of medicine a testimonial dinner was given him by the Erie County Medical Society, aged 88 died December 9 in the Philadelphia Freemasons Memorial Hospital, Masonic Homes of carcinoma of the stomach and prostate

**Francis Joseph Carr**, Buffalo, Niagara University Medical Department, Buffalo 1894 member of the Medical Society of the State of New York fellow of the American College of Surgeons attending surgeon Emergency Hospital consulting surgeon Mercy and Millard Fillmore hospitals and Buffalo Hospital of the Sisters of Charity Buffalo St Mary's Hospital, Niagara Falls J N Adam Memorial Hospital Perrysburg St Francis Asylum, Buffalo and Gardenville and Our Lady of the Angels Home, Williamsville, aged 79 died December 10 of cerebral hemorrhage

**William David Barry** \* Smethport Pa, Jefferson Medical College of Philadelphia 1909 served as a first lieutenant in the medical corps of the U S Army during World War I served as a member of the county war price and rationing board number 1 and as chairman of the board at Smethport formerly a member of the staff of the Wills Eye Hospital Philadelphia aged 60 died December 5 in Bradford of coronary thrombosis

**Archibald Bee**, Florence Colo Starling Medical College, Columbus 1890 member of the Colorado State Medical Society served during World War I aged 77 died December 5 in the Camden Clark Memorial Hospital Parkersburg W Va of carcinoma of the lung

**Samuel Dey Bennett**, Millville N J Jefferson Medical College of Philadelphia 1896, member of the Medical Society of New Jersey, served several years as school physician for the board of education of Millville, aged 70 died December 3 of carcinoma of the throat

**J W Edward Bitter** \* Quincy Ill, Quincy College of Medicine, 1887 served as president of the Adams County Medical Society in 1929 and in 1933 and as secretary 1922-1923 in 1936 was honored by the society on the occasion of his fiftieth anniversary in the practice of medicine on the staff of St Mary Hospital aged 80, died December 17 of cerebral hemorrhage

**Volney T Boaz**, Manson Wash Baltimore Medical College 1895 also a pharmacist veteran of the Spanish-American War, surgeon for the Santa Fe and Frisco Railroad served as a member of the board of education and as county coroner, aged 81, died, November 19, of cerebral hemorrhage

**John Erskine Burns**, New Dennison Ill St Louis College of Physicians and Surgeons 1902 member of the Illinois State Medical Society aged 65 died December 2, in the Herrin (Ill) Hospital of heart disease

**Alan Duncan Calhoun** \* Richmond Heights Mo Washington University School of Medicine St Louis 1935 instructor in clinical ophthalmology at his alma mater assistant ophthalmologist Barnes and St Louis Children's hospitals assistant ophthalmologist to outpatients University Clinics specialist certified by the American Board of Ophthalmology aged 35 died, December 15 of subarachnoid hemorrhage and rupture of a cerebral aneurysm

**Samuel Handly Caraway**, Indianapolis Medical College of Ohio Cincinnati 1893 served as a captain in the medical corps of the U S Army during World War I aged 76 died, December 14, in the Veterans Administration Facility, Marion, of lobar pneumonia

**Booton Stover Compton**, Atlanta, Ga University of Maryland School of Medicine Baltimore 1910 on the staff of the Veterans Administration Facility aged 59 died, December 26 of a fracture received in a fall in his home

**Daniel Newman Cone**, White Springs Fla University of Virginia Department of Medicine, Charlottesville, 1899 member of the Florida Medical Association, formerly served as state senator and as director of the bureau of epidemiology state board of health, at one time surgeon in the U S Public Health Service Reserve, aged 67, died, December 1, of lympho sarcomatosis

**J Arthur Cormier**, Rochester, N Y Laval University Medical Faculty, Montreal Que Canada 1883, for many years physician at St Joseph's Orphanage aged 82 on the staff of St Mary's Hospital, where he died, December 11, of coronary thrombosis

**Linn M Cudworth**, Perry Mich Baltimore University School of Medicine, 1896 in 1940 was selected from a group of nominees in a popular radio program as the typical American small town doctor aged 72, died, December 9, of pernicious anemia

**William Leslie Davenport**, Amelia C. H., Vt. College of Physicians and Surgeons, Baltimore, 1893, member of the Medical Society of Virginia, aged 81, died, December 22, of coronary thrombosis.

**Robert Brewer Dixon** \* Boston Harvard Medical School, Boston, 1879, aged 86, died, December 16, of bronchopneumonia.

**James M. Goldman**, Vincennes Ind., Eclectic Medical Institute, Cincinnati 1896, served as county physician for many years and as deputy county coroner, aged 74, died December 20, in the Good Samaritan Hospital of angina pectoris.

**Channing Hall** \* Oakland Calif., Cooper Medical College, San Francisco 1911, fellow of the American College of Surgeons, served overseas as a captain in the medical corps of the U. S. Army during World War I, recently chairman of the Selective Service Board number 63, aged 57, on the staffs of the Samuel Merritt Hospital, the Peralta Hospital and the Alameda (Calif.) Hospital, where he died, December 14, of pneumonia.

**Alva Curtis Hamblin**, Valrico, Fla., Chattanooga (Tenn.) Medical College, 1892, past president of the Hillsborough County Medical Society, port physician during the Spanish-American War, formerly county physician for Hillsborough County for many years, district health officer for the state board of health, at one time health officer for Tampa, aged 83, died, December 6, of chronic prostatic hypertrophy and uremia.

**Charles A. Handley**, Brocton, Ill., Louisville (Ky.) Medical College, 1894, aged 74, died, December 13, of cerebral hemorrhage.

**Grove Harkness**, Minocqua Wis., Rush Medical College, Chicago, 1890, aged 82, died, December 12, in a hospital at Milwaukee of heart disease.

**Allan Harris**, Greenwich N. J., Baltimore Medical College 1902, member of the Medical Society of New Jersey, aged 69, died November 2, of coronary embolus, arteriosclerosis and hemiplegia.

**Hazel May Hatfield**, Woodcliff Lake N. J., Cornell University Medical College, New York 1907, for many years associated with the department of health of New York City, aged 59, died, December 4, in the Hackensack (N. J.) Hospital.

**Robert Hessler**, Indianapolis, Medical College of Indiana, Indianapolis, 1891, aged 81, died, December 17, of cerebral sclerosis.

**Amon S. Hill**, Panama City, Fla., Atlanta (Ga.) Medical College 1891, served on the staff of the Panama City Hospital, for many years president of the First National Bank, aged 81, died December 9, of nephritis.

**George Arthur Holliday**, Traverse City, Mich., Detroit College of Medicine, 1904, member of the Michigan State Medical Society, formerly a dentist, served in the U. S. Navy during World War I and later was transferred to the medical corps of the U. S. Army with rank of major, served as a transport surgeon until eighteen months after the Armistice, major in the medical reserve corps, U. S. Army, not on active duty, for many years health officer of Traverse City, aged 75, died October 30, of cerebral hemorrhage.

**Isaac H. Hornsby**, Whiteville, Tenn., Memphis Hospital Medical College 1885, formerly chairman of the board of education, aged 93, died December 15, of coronary occlusion.

**W. J. Hutto**, Bee Branch, Ark. (licensed in Arkansas in 1903), aged 71, died December 12, of arteriosclerosis.

**Robert S. Kirk**, Baltimore, Baltimore Medical College, 1896, on the staff of the Church Home and Infirmary, aged 71, died, December 1, of pneumonia.

**Henry Clay Knapp** \* Huntingburg Ind., Indiana Medical College, School of Medicine of Purdue University, Indianapolis, 1906, aged 76, died December 4, of angina pectoris.

**Isidore Harry Kugel**, Brooklyn, Long Island College Hospital, Brooklyn 1917, member of the Medical Society of the State of New York, aged 50, died, December 23, of heart disease.

**Oliver Morton Layton**, Fond du Lac, Wis., Rush Medical College, Chicago, 1895, member of the State Medical Society of Wisconsin, fellow of the American College of Physicians on the staff of the St. Agnes Hospital, aged 71, died, December 27, of heart disease.

**Mason B. Light** \* Indianapolis, Indiana University School of Medicine, Indianapolis 1910, served as a captain in the medical corps of the U. S. Army during World War I, aged 53, on the staffs of the Indianapolis City Hospital, St. Francis Hospital, Methodist Hospital and St. Vincent's Hospital, where he died December 19, of carcinoma.

**Frank G. Lightner**, Sabina, Ohio, Medical College of Ohio, Cincinnati 1890, aged 75, died, December 13, in Washington C. H. of arteriosclerosis.

**Bert Duane Longe**, Newport, Vt., University of Vermont College of Medicine, Burlington 1896, at one time secretary and treasurer of the Orleans County Medical Society, aged 73, died December 14, of diabetes mellitus and myocardial degeneration.

**Charles Reese Longworth**, San Diego Calif., Ohio Medical University, Columbus, 1904, aged 73, died, December 2.

**Bertha Goba Macbeth**, Fort Wayne, Ind., Fort Wayne College of Medicine 1905, member of the Indiana State Medical Association, aged 68, died December 15, in the Methodist Hospital of aortic obstruction.

**Ralph Heminway Marsh**, Guilford, Maine, Medical School of Maine, Portland 1893, member and past president of the Maine Medical Association, past president of the Piscataquis County Medical Society, had served as county medical examiner and special pension examiner, was on the medical advisory board of his district during World War I, at the June 1942 annual session of the Maine Medical Association was presented with the association's gold medal in recognition of fifty years in the practice of medicine, aged 79, died, October 27.

**Leon Matassarini** \* Leavenworth, Kan., Universitatea din Bucuresti Facultate de Medicina Rumania, 1901, past president and secretary of the Leavenworth County Medical Society, served in France and as a lieutenant colonel in the medical corps of the U. S. Army during World War I, colonel in the medical reserve corps not on active duty, for several years served as a member of the board of education of Leavenworth, on the staffs of the Cushing Memorial and St. John's hospitals, aged 64, died December 6, of coronary occlusion.

**William Markle Miller**, Caryville Ill., Rush Medical College, Chicago 1894, had served as mayor of Caryville, village trustee, school director and a member of the board of education in 1942 was presented with a gold medal by the Illinois Central Railroad in award in recognition of fifty years of service as a railroad surgeon, aged 83, died, December 14, of heart disease.

**George Lone Monson** \* Denver, Denver and Gross College of Medicine, 1905, formerly clinical instructor of obstetrics at his alma mater, aged 60, died December 7, of poison self administered.

**James E. New**, Dexter, Ga., University of Georgia Medical Department, Augusta 1900, member of the Medical Association of Georgia, chairman of the Laurens County Welfare Board, past president of the Laurens County Medical Society, served several terms as mayor of Dexter, was chairman of the board of education of Dexter and a director in the Citizens and Southern Bank of Dublin, aged 65, died, December 11, in a hospital at Dublin of pneumonia.

**William Drummond Radcliffe** \* Belen N. M., Cleveland Medical College, Homeopathic 1894, for many years a member of the state board of health, health officer of District number 8, consisting of Catron, Socorro, Torrance and Valencia counties, aged 77, died December 12, of coronary thrombosis.

**Frederick King Rogers**, Lawrence, Kan., College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1912, aged 55, died, December 3, of coronary sclerosis.

**Wilfred Sefton**, Auburn N. Y., Harvard Medical School, Boston 1918, member of the Medical Society of the State of New York, aged 50, on the staff of the Mercy Hospital and Auburn City Hospital, where he died, November 4, of pneumonia (virus).

**John William Shaffer** \* Youngstown, Ohio, Ohio Medical University, Columbus 1898, senior surgeon for many years on the staff of St. Elizabeth's Hospital, aged 69, died, December 3, of sarcoma of the nasopharynx.

**Frank Pulliam Smith**, Fort Worth, Texas, University of Louisville (Ky.) Medical Department 1911, member of the State Medical Association of Texas, formerly served as health officer of Tarrant County, aged 59, died, December 1, of heart disease.

**Ernest Hampton Updike**, Mill Creek, W. Va., Bennett Medical College, Chicago, 1915, aged 65, died, December 4, of cerebral thrombosis.

**Harry W. Watts**, Pembroke, Ky., Louisville (Ky.) Medical College, 1894, member of the Kentucky State Medical Association, director of the Peoples' Bank and member of the school board of Pembroke, aged 70, died, December 9, of bulbar paralysis and pneumonia.

## Bureau of Investigation

### DANGEROUS TO HEALTH

#### Because of Inadequate Warnings on Labels

[EDITORIAL NOTE—These abstracts differ from other abstracts of Notices of Judgment issued by the Food and Drug Administration of the Federal Security Agency which have appeared in these pages in that they deal with nostrums which were misbranded because their labels failed to carry adequate warnings against giving them to children or using them in those pathologic conditions in which they might be dangerous to health, or caution against unsafe dosages or methods or duration of administration or application, for the protection of the user. The abstracts that follow are given in the briefest possible form: (1) the name of the product, (2) the name of the manufacturer, shipper or consigner, (3) the date of shipment, (4) the composition, (5) the type of nostrum, (6) the reason for the charge of misbranding, and (7) the date of issuance of the Notice of Judgment—which is considerably later than the date of the seizure of the product and somewhat later than the conclusion of the case by the Food and Drug Administration.]

**Aesculus Pile Cerate**—C F Breitenbach (Mucine Company) Chicago Composition essentially ichthammol tar oil and extractives of plant drugs and petrolatum. Misbranded because designation Pile Cerate and statement relieves bleeding itching blind protruding ulcerated piles on carton were false and misleading. Further misbranded because label failed to bear name and place of business of manufacturer packer or distributor since reference to 'Ainsworth Specialty Co Kansas City Mo' did not make clear this concern's connection with the product and because label did not give the common or usual name of each active ingredient or its quantity. Also misbranded because labeling failed to warn against use of the product by children or in those pathologic conditions in which its employment might be dangerous to health or caution against unsafe dosage or methods or duration of administration for protection of user.—[D D N J F D C 436 September 1942]

**Argosine**—C F Breitenbach (Mucine Company) Chicago Composition a silver substance such as argyrol an extract of a plant drug and water. Misbranded because label failed to bear the common or usual names of the active ingredients as well as name and place of business of manufacturer packer or distributor since the name and address Ainsworth Specialty Company Kansas City Mo appearing on the carton were not those of the manufacturer and did not reveal any connection of this firm with the product. Further misbranded because unlabeled portion of Argosine failed to bear required statement as to quantity of contents and because of false and misleading statements made regarding the therapeutic properties of the product which alleged properties were not named in the government's abstract of the case. Also misbranded because label did not contain adequate directions for taking or sufficient warnings against use by children or in those pathologic conditions in which it might be dangerous to health or caution against unsafe dosages or methods or duration of administration or application for protection of user.—[D D N J F D C 436 September 1942]

**Cascarin Compound Tablets**—Boyce Pharmacal Company Los Angeles Shipped July 10 1940 Composition in each tablet alkaloidal material including about 0.024 grain of strychnine sulfate  $\frac{1}{8}$  grain of podophyllin and  $\frac{1}{4}$  grain of aloin and an emodinbearing drug such as cascara sagrada. Misbranded because label failed to warn adequately against use by children or in those pathologic conditions in which it might be dangerous to health or caution against unsafe dosage or duration of administration, since label did not warn purchaser that the product should not be taken when symptoms of appendicitis are present and that its use by children and elderly persons was particularly dangerous or caution against frequent or continued use which might cause dependence on laxatives to move the bowels. Further misbranded because name Cascarin Compound falsely suggested that the essential ingredient of the product was derived from a species of cascara whereas its principal active ingredients were aloin podophyllin and strychnine because designation Dr Hinkle No 3 gave the false impression that the mixture had the essential composition designated for Hinkle's pills in the National Formulary whereas the composition differed therefrom and because the label failed to list the common or usual name of each of the active ingredients since the word Cascarin was coined and hence was not the common or usual name of any drug.—[D D N J F D C 440 September 1942]

**Coldlax**—Smith Brothers Drug Company Greensboro N C Shipped Dec. 10 1940 Composition essentially water alcohol sodium salicylate and an unnamed laxative plant drug with menthol camphor and traces of alkaloids. Misbranded because the product name and the statement on carton and bottle label for the relief of colds and the designation for colds in the directions were false and misleading since the product was not an adequate treatment for colds also misbranded because the unmodified statement for coughs in the directions was false and misleading since the article was not an adequate treatment for coughs from all causes further misbranded because claim Coldlax contains

no habit forming drugs was false and misleading since the product did contain aromatic fluid extract of cascara sagrada the frequent or continued use of which might cause dependence on laxative. The branded again in that the article failed to bear the common or usual name of each active ingredient since alkaloids is not the common or usual name of any constituent of this preparation and the name of other ingredients were given in abbreviated form. Further misbranded because labeling directions for its use were inadequate since they did not limit the period of time over which it might properly be taken. Finally misbranded because label did not adequately warn against use in those conditions wherein it might be dangerous to health or caution the user that it should not be taken when symptoms of appendicitis such as nausea vomiting or abdominal pain were present or that frequent or continued use might result in dependence on laxatives.—[D D N J F D C 440 September 1942]

**Crawford's Sa Lax**—Crawford Food Inc Los Angeles Shipped July 26 1940 Composition tablets containing the laxative drugs rhubarb root and senna leaf with Irish moss okra and leafy plant material such as parsley. Misbranded because package failed to bear adequate directions for use and stated that the dosage must be determined by the severity of the case merely suggesting a general dosage which did not constitute suitable directions for the use of a laxative preparation. Misbranded also because label failed to caution adequately against use in certain pathologic conditions or methods or duration of administration for protection of users in that it did not inform the purchaser that the product would be dangerous to a person suffering from appendicitis or that its frequent or continued use might result in dependence on laxatives. Further misbranded because label falsely represented the active ingredients to be parsley and asparagus intended to maintain a higher alkalinity through the intestine and into the colon than do other vegetables of higher initial alkaline content.—[D D N J F D C 441 September 1942]

**Gleet Specific**—C F Breitenbach (Mucine Company) Chicago Shipped between Jan 22 and Nov 11 1940 Composition a mercury compound calculated as mercury oxymercide (0.2 per cent or 1500) eucalyptus oil and a plant drug extract all incorporated in wool wax (lanum). Misbranded because name Gleet Specific was false and misleading and because label failed to declare proportion derivative or preparation of mercury present since the label statement Mercury Oxymercide 1500 was not accurate. Further misbranded because label failed to bear name and place of business of manufacturer packer or distributor since designation Ainsworth Specialty Co Kansas City Mo did not make clear this concern's connection with the product nor did label correctly declare quantity of contents or the common or usual names of the active ingredients neither did label bear adequate directions for taking or sufficient warnings against use by children or in those pathologic conditions in which it might be dangerous to health or caution against unsafe dosages or methods or duration of administration or application for protection of user.—[D D N J F D C 446 September 1942]

**Graham's Pills**—Kells Company Newburgh N Y Shipped between Nov 29 1940 and Jan 25 1941 Composition essentially laxative plant drugs. Misbranded because label directions for use were inadequate in that they provided for [recommended?—Ed.] excessive dosage and label bore false and misleading claims as to product's efficacy in treating biliousness for which according to the government the pills would not be efficacious. Further misbranded because label did not carry an accurate statement of the quantity of the contents or sufficient caution against use in those pathologic conditions wherein the product might be dangerous to health or warn against unsafe dosage for the protection of users.—[D D N J F D C 445 September 1942]

**Grover Graham Remedy**—Kells Company Newburgh N Y Shipped between Nov 29 1940 and Jan 25 1941 Composition essentially magnesium sodium bicarbonate sodium bromide alcohol water and small amounts of chloroform ginger and peppermint oil. Misbranded because label did not give adequate directions for use chiefly in that no limitation was put on the amount of bromide that might be administered daily also misbranded because of false and misleading label claims such as that the product offered instant relief for severe attacks of indigestion and all stomach ills and was a remedy for dyspepsia gastritis and bloating further misbranded because label did not give adequate warning against use in those pathologic conditions wherein it might be dangerous to health or caution against unsafe dosage or methods of administration.—[D D N J F D C 445 September 1942]

**Prostatic Deplient**—C F Breitenbach (Mucine Company) Chicago Composition about 12 per cent of glycerin and 6 per cent of epsom salt with water emulsified. Misbranded because of false and misleading label claims. Highly deplient and cleansing with immediate relief of congestion of the rectal area. Used as a primary treatment on prostatic disorders (nonoperative). Further misbranded because label failed to bear name and place of business of manufacturer packer or distributor since designation Ainsworth Specialty Co Kansas City Mo did not make clear this concern's connection with the product nor did label clearly declare the quantity of contents or give the common or usual name of each active ingredient neither did label contain adequate directions for taking or sufficient warnings against use by children or in those pathologic conditions in which it might be dangerous to health or caution against unsafe dosages or methods or duration of administration or application for protection of user.—[D D N J F D C 446 September 1942]

**Sterile Uteroids**—C F Breitenbach (Mucine Company) Chicago Shipped between Jan 22 and Nov 11 1940 Composition essentially ichthammol menthol an iodine compound and extracts of plant drugs the whole mixture incorporated in wool wax (lanum). Misbranded because

label failed to bear name and place of business of manufacturer packer or distributor since reference to 'Ainsworth Specialty Co Kansas City Mo' did not make clear this concern's connection with the product nor did label correctly declare quantity of contents neither did label bear adequate directions for taking or sufficient warnings against use by children or in those pathologic conditions in which it might be dangerous to health or caution against unsafe dosages or methods or duration of administration or application for protection of user Further misbranded because of false statement on label that the mixture contained 10 per cent of powdered alum and 1 per cent of zinc sulfate whereas these substances were not present and because label falsely implied that this product was effective for intrauterine treatment and endometritis Adult terated because its strength differed from and its quality fell below that which it purported to possess —[D D N J F D C 436 September 1942]

## Correspondence

### SURGICAL TREATMENT OF DUODENAL ULCER

*To the Editor* —The generally accepted treatment of duodenal ulcer is subtotal gastric resection with the main object of reducing the secretion of hydrochloric acid, one of the causes of duodenal ulcer Many recently published articles on the subject include some such statements as are quoted from Dr Kiefer by Dr Nissen and the following "The basic prerequisites of the operation are the removal of the pylorus, a radical resection of all antral tissue and the excision of the ulcer" (Mage, Sigmund *Ann Surg* 116 729 [Nov.] 1942)

It would seem that 1 Excision of the ulcer is not always necessary If the ulcer is nonresectable, inaccessible on the posterior wall, in the distal duodenum, because of adhesions, or on account of the patient's general condition, the ulcer has many times been allowed to remain, with sometimes satisfactory results Excision of the ulcer, if convenient, is a supplement to attempts to remove or to minimize a cause is, of course, rational and advisable, though one may reasonably doubt that scar tissue remaining after excision will be more resistant to irritating acid stomach contents than was the mucosa at the site of the ulcer Removal of a cause may make removal of the ulcer unnecessary As an analogy, varicose ulcer need not always be removed, if the cause is corrected

2 Removal of the ulcer, as one author states, "to eliminate pylorospasm," seems to be rather heroic treatment Removal or minimizing of a cause, presumably hyperchlorhydria, might be successful Sacrifice of the pylorus with the substitution of an artificial, nonphysiologic, nonsphincteric, gastrojejunal communication calls for many physiologic readjustments and adaptations in the digestive processes that cause symptoms and therefore should be avoided Disturbances with or destruction of other sphincters e g pharyngeal, esophageal, cardiac, biliary, urinary or anal, disturb normal function and produce distressing symptoms Loss of control of the sphincter at the upper extremity of the intestinal tract (the pylorus) may be followed by serious disturbances despite the fact that they are not as apparent as those at the lower extremity

3 Resection of all antral tissue is a mutilating operation, based essentially on Edkins theory that the antral mucosa secretes a hormone (gastrin) that is carried to the fundus and there stimulates the secretion of hydrochloric acid This theory was presented in 1906 and has not been substantiated by experimental or clinical evidence Whether gastrin is, or is not, histamine has not been definitely settled

In 1941 I discussed Edkin's theory and its relation to peptic ulcer (*Am J Surg* 53 255 [Aug.] 1941) Objections to the sacrifice of the antrum are that the antral secretion is chiefly alkaline mucus, one of nature's buffers against excess gastric acidity and that the irritating gastric contents come in contact with the more susceptible jejunal, instead of the more tolerant duodenal, mucosa The latter fact may explain the recurrent jejunal ulcers after the Finsterer operation rather than the preservation of the antrum

Other objections to distal gastrectomy are that the antral, Brunner's and duodenal glands may have a hemopoietic function and that the antrum takes an active and important part in the physiologic, antropyloroduodenoneuromuscular mechanism that controls the opening and the closing of the gastrointestinal communication, which influences gastric tonicity, mobility, retention, evacuation, secretion and absorption Such an important structure certainly should not be sacrificed unless the necessity has been definitely proved

Granting, for argument's sake, the development of gastrin, which stimulates fundal secretion of hydrochloric acid, its obliteration by antral resection would reduce such secretion by but a fraction, as at least two other important stimuli remain intact These are psychic and hormones formed in the lower duodenum and upper jejunum are carried to the fundus by the circulation

Therefore it would seem logical from a phylogenic, embryologic, physiologic, anatomic, experimental point of view and from a small clinical experience to utilize the direct minimizing of the acid secreting fundus of the operation of subtotal gastrectomy but at the same time modifying it by preserving the important distal stomach, i e, partial fundusectomy

If this less formidable nonmutilating procedure with proper so-called medical management does not prove satisfactory, the distal stomach may then be removed for its possible indirect effect on acid secretion

GREGORY CONNELL, Oshkosh, Wis

### TOTAL COLLAPSE ASSOCIATED WITH PHYSICAL EXERTION

*To the Editor* —I should like to comment on the two references to the paper by Colonel Suzman and myself (Mechanisms Involved in Acute Fatal Nontraumatic Collapse Associated with Exertion, *Am Heart J* 23 761 [June] 1942) made by Dr A M Master (Total Collapse Associated with Physical Exertion) in THE JOURNAL, Oct 3, 1942, page 392

We have not concluded "that severe physical exertion or trauma can produce coronary occlusion" In fact we have clearly stated that "normally no conceivable functional strain can cause fatal collapse" Regarding Master's second point, I enclose a reprint of a paper by Colonel Melzer and myself (Acute Fatal Nontraumatic Collapse During Work and Sport, *South African J M Sc* 5 4 [March] 1940) which contains the necropsy findings in 64 of the 66 cases of death associated with physical exertion on which our paper is based Of the two further observations, one has in the meantime been published in the *American Heart Journal* (Cluver, E. H., and Jokl, Ernst Sudden Death of a Rugby International After a Test Game, 24 405 [Sept.] 1942)

As the result of a regrettable oversight, the paper by Jokl and Melzer was not quoted in the list of references given by Jokl and Suzman, although complete reference to it has been made in the paper by Cluver and Jokl If Dr Master will study the pathologic material presented by Jokl and Melzer and by Cluver and Jokl he will, I trust, be satisfied that the necessary data and necropsy reports have been made available In conclusion I wish to say that our findings, far from contradicting the findings of the valuable researches by Master and his associates, on the contrary rather serve to corroborate them

As I do not know Dr Master's address, I shall appreciate it if you will let him have the enclosed reprint containing the bulk of the evidence to which you have referred in your editorial comment in the August 22 issue of THE JOURNAL, page 1431

ERNST JOKL, M D  
Johannesburg South Africa

Medical Consultant in Physical Education  
to South African Defense Force



**Medical Examinations and Licensure****COMING EXAMINATIONS AND MEETINGS**

**ANNUAL CONGRESS ON MEDICAL EDUCATION AND LICENSURE**  
CHICAGO Feb 15-16 Sec Council on Medical Education and Hospitals Dr H G Weiskotten 535 North Dearborn Street Chicago

**NATIONAL BOARD OF MEDICAL EXAMINERS  
EXAMINING BOARDS IN SPECIALTIES**

Examinations of the National Board of Medical Examiners and Examining Boards in Specialties were published in THE JOURNAL Jan 30 page 369

**BOARDS OF MEDICAL EXAMINERS**

**ALABAMA** Montgomery June 15-16 Sec Dr B F Austin 519 Dexter Ave Montgomery

**ARKANSAS** \* Medical Little Rock June 3-4 Sec Dr D L Owens Harrison *Eclectic* Little Rock June 3-4 Sec Dr C H Young 1415 Main St Little Rock

**CALIFORNIA** Los Angeles March 8-11 Sec Dr C B Pinkham 1020 N St Sacramento

**CONNECTICUT** \* Hartford March 9-10 *Endorsement* Hartford March 23 Sec to the Board Dr Creighton Barker 258 Church St New Haven

**DELAWARE** Dover July 13-15 Sec Medical Council of Delaware Dr Joseph S McDaniel 229 S State St Dover

**DISTRICT OF COLUMBIA** \* Washington May 10-11 Sec Commission on Licensure Dr George C Rubland 6150 E Municipal Bldg Washington

**FLORIDA** \* Jacksonville June 21-22 Sec Dr William M Rowlett Box 786 Tampa

**GEORGIA** March Sec State Examining Boards Mr R C Coleman 111 State Capitol Atlanta

**ILLINOIS** Chicago April 6-8 Superintendent of Registration Department of Registration and Education Mr Philip M Harman Springfield

**IOWA** \* Iowa City Feb 22-24 Dir Division of Licensure and Registration, Mr H W Grefe Capitol Bldg Des Moines

**KANSAS** Kansas City May 19-20 Sec Board of Medical Registration and Examination Dr J F Hassig 905 N Seventh St Kansas City

**KENTUCKY** Louisville March 2-4 Sec State Board of Health Dr A T McCormack 620 S Third St Louisville

**MAINE** Portland March 9-10 Sec Board of Registration of Medicine Dr Adam P Leighton 192 State St Portland

**MARYLAND** Medical Baltimore March 23-26 Sec Dr J T O'Mara 1215 Cathedral St Baltimore *Homeopathic* Baltimore June 15-16 Sec Dr J A Evans 612 W 40th St Baltimore

**MASSACHUSETTS** Boston March 9-12 Sec Board of Registration in Medicine Dr H Q Gallupe 413 F State House Boston

**MICHIGAN** \* Ann Arbor and Detroit June 11-13 Sec Board of Registration in Medicine Dr J Earl McIntyre 100 W Allegan St Lansing

**MISSOURI** St Louis Feb 16-18 and March 23-25 Sec State Board of Health Dr James Stewart State Capitol Bldg Jefferson City

**MONTANA** Helena April 6-7 Sec Dr Otto G Klein First National Bank Bldg Helena

**NEW HAMPSHIRE** Concord March 11-12 Sec Board of Registration in Medicine Dr Deering G Smith State House Concord

**NEW MEXICO** \* Santa Fe April 12-13 Sec Dr Le Grand Ward 135 Sena Plaza Santa Fe

**OHIO** Columbus March 16-19 *Endorsement* Columbus April 6 Sec Dr H M Platter 21 W Broad St Columbus

**UTAH** Salt Lake City June Dir Department of Registration Mr G V Billings 324 State Capitol Bldg Salt Lake City

**VERMONT** Burlington March 25-27 Sec Dr F J Lawliss Richford Franklin Rd

**VIRGINIA** Richmond March 24-27 Sec Dr J W Preston 307 Franklin Rd Roanoke

**WEST VIRGINIA** Charleston March 1-3 Commissioner Public Health Council Dr C F McClintic State Capitol Charleston

\* Basic Science Certificate required

**BOARDS OF EXAMINERS IN THE BASIC SCIENCES**

**ARIZONA** Tucson March 16 Sec Dr R L Nugent Science Hall University of Arizona Tucson

**COLORADO** Denver March 10-11 Sec Dr E B Starks 1459 Ogden St Denver

**CONNECTICUT** Feb 13 Address State Board of Healing Arts 1945 Yale Station New Haven

**DISTRICT OF COLUMBIA** Washington April 19-20 Sec Commission on Licensure Dr George C Rubland 6150 E Municipal Bldg Washington

**FLORIDA** DeLand June 9 Sec Dr J T Conn John B Stetson University DeLand

**MICHIGAN** Ann Arbor and Detroit Feb 12-13 Sec Miss Eloise LeBeau 101 N Walnut St Lansing

**OKLAHOMA** Oklahoma City May Sec Dr Oscar C Newman Shattuck

**OREGON** Portland Feb 13 Sec Board of Higher Education Mr Charles D Byrne University of Oregon Eugene

**RHODE ISLAND** Providence Feb 17 Chief Division of Examiners Mr Thomas B Casey 366 State Office Bldg Providence

**SOUTH DAKOTA** Aberdeen June 4-5 Sec Dr G M Evans Yankton

**WISCONSIN** Madison April 3 Prof Robert N Bauer 152 W Wisconsin Ave Milwaukee

**Minnesota October Report**

The Minnesota State Board of Medical Examiners report the oral written and practical examination for medical licensure held at Minneapolis Oct 20-22, 1942. The examination covered 12 subjects and included 60 questions. Fifty candidates were examined all of whom passed. Five physicians were licensed to practice medicine by reciprocity and 7 physicians so licensed on endorsement of credentials of the National Board of Medical Examiners. The following schools were represented:

School	PASSED	Year Grad	Number Passed
Stanford University School of Medicine	(1940)	(1940)	1
University of Colorado School of Medicine	(1940)	(1940)	1
Loyola University School of Medicine	(1940)	(1940)	1
Northwestern University Medical School	(1942)	(1942)*	2
Rush Medical College	(1939)	(1940-3)	2
University of Illinois College of Medicine	(1932)	(1938)	2
Indiana University School of Medicine	(1929)	(1929)	1
Harvard Medical School	(1940)	(1941)	2
University of Minnesota Medical School	(1937)	(1939)	20
(1941-3) (1941-3)* (1942-3) (1942-9)*			
Creighton University School of Medicine	(1937)	(1937)	1
University of Nebraska College of Medicine	(1941)	(1942)	2
University of Cincinnati College of Medicine	(1940)	(1941)	2
Jefferson Medical College of Pennsylvania	(1937)	(1938)	3
(1941)			
Temple University School of Medicine	(1935)	(1941)	1
Baylor University College of Medicine	(1941)	(1941)	1
Marquette University School of Medicine	(1941)	(1942)	2
University of Wisconsin Medical School	(1938)	(1940)	2
University of Western Ontario Medical School	(1941)	(1941)	1

School	LICENSED BY RECIPROCITY	Year Grad	Reciprocity with
State University of Iowa College of Medicine	(1941)	(1941)	Iowa
University of Nebraska College of Medicine	(1931)	(1941)	Nebraska
Ohio State University College of Medicine	(1931)	(1941)	Ohio
University of Virginia Department of Medicine	(1930)	(1941)	Virginia

School	LICENSED BY ENDORSEMENT	Year Grad
Yale University School of Medicine	(1941)	(1941)
George Washington University School of Medicine	(1941)	(1941)
Northwestern University Medical School	(1941)	(1941)
Harvard Medical School	(1939)	(1940)
University of Minnesota Medical School	(1940)	(1940)
University of Buffalo School of Medicine	(1940)	(1940)
University of Pennsylvania School of Medicine	(1941)	(1941)

\* These applicants received the M.B. degree and will receive the M.D. degree on completion of a year's internship

**Missouri October Report**

The Missouri State Board of Health reports the written examination for medical licensure held at Kansas City, Oct 15-17, 1942. The examination covered 15 subjects. An average of 75 per cent was required to pass. Thirteen candidates were examined, 12 of whom passed and 1 failed. The following schools were represented:

School	PASSED	Year Grad	Number Passed
Howard University College of Medicine	(1938)	(1942)	2
Rush Medical College	(1907)	(1942)	2
St Louis University School of Medicine	(1942)	(1942)	1
New York University College of Medicine	(1942-2)	(1942)	2
University of Tennessee College of Medicine	(1942)	(1942)	1
Baylor University College of Medicine	(1939)	(1942)	1
Marquette University School of Medicine	(1942)	(1942)	1
University of Wisconsin Medical School	(1942)	(1942)	1
Universidad Nacional Facultad de Medicina Mexico	(1941)	(1941)	1

School	FAILED	Year Grad	Number Failed
St Louis College of Physicians and Surgeons	(1922)	(1922)	1

On Nov 16, 1942, 8 physicians were licensed to practice medicine by reciprocity and 2 physicians so licensed on endorsement of credentials of the National Board of Medical Examiners. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad	Reciprocity with
Georgetown University School of Medicine	(1891)	(1891)	Penna
Northwestern University School of Medicine	(1942)	(1942)	Kansas
University of Chicago The School of Medicine	(1937)	(1937)	New York
Johns Hopkins University School of Medicine	(1936)	(1936)	Maryland
University of Michigan Medical School	(1940)	(1940)	Michigan
New York University College of Medicine	(1940)	(1940)	New York
University of Tennessee College of Medicine	(1941)	(1941)	Mississippi
Medical College of Virginia	(1937)	(1937)	N Carolina

School	LICENSED BY ENDORSEMENT	Year Grad
Yale University School of Medicine	(1936)	(1936)
Harvard Medical School	(1924)	(1924)



## Bureau of Legal Medicine and Legislation

### MEDICOLEGAL ABSTRACTS

**Workmen's Compensation Acts Amebic Dysentery Allegedly Contracted Through Negligence of Employer in Furnishing Drinking Water**—In the course of his employment, Parkhurst was exposed to *Endameba histolytica* through the drinking water furnished on the job by the employer, a subcontractor on the project at which Parkhurst worked, and contracted amebic dysentery. He instituted proceedings for compensation under the workmen's compensation act of California, seeking an increase of 50 per cent on the applicable normal compensation allegedly because his disability was due to the serious and wilful misconduct of his employer, which additional compensation is permissible under the California act if the disability can be so attributed. The industrial accident commission found that the injury was not caused by the employer's serious and wilful misconduct and awarded normal compensation only. The workman appealed eventually to the Supreme Court of California.

Medical testimony adduced apparently before the commission disclosed that amebic dysentery is usually contracted by drinking contaminated water, that water can be contaminated by contact with fecal matter or contaminated hands and that a single person who is a carrier of the disease can infect the water supply and cause an epidemic among persons drinking the water. Apparently the water line at the project at which Parkhurst worked was attached to a pipe connecting an irrigation pump and a neighboring uncovered reservoir. When adjoining land was irrigated water from the reservoir would siphon into the water line and outlets on the job. There was evidence that the reservoir was used as a swimming pool and that tests made by county health authorities about eight months after the workman contracted the disease revealed that the water although still classified by them as good was contaminated with fecal matter. The drinking water was drawn from faucets used by the men in washing their hands on their way to and from the toilets, which were near some of the faucets. The drinking water in turn, after being drawn from the faucets, was supplied to the men on the job by an open bucket and common dipper, in violation of a California statute requiring closed containers and individual drinking cups. It further appeared that the employer commenced work as a subcontractor after the construction was under way on this particular building project and accepted the facilities furnished by the general contractor. The employer knew how the water was distributed but made no inquiry as to its source. At no time did he attempt to furnish his employees with pure, fresh drinking water. It further appeared that numerous employees had complained at various times to the superintendent on the project that the drinking water had a foul taste and odor and gave them diarrhea and cramps. While the superintendent admitted to the complaining employees that the water was bad, he excused the practice on the ground that no other water was available and that all water in that particular neighborhood had a somewhat unpleasant taste and odor. There was further evidence that a public health authority inspected the premises on the job two or three weeks prior to the onset of the dysentery in the workman and ordered the employer to desist from distributing water in open containers and common dippers.

The workman contended that in view of the foregoing evidence there was no evidence to support the commission's finding that his injury was not caused by the serious and wilful misconduct of the employer and that that misconduct is proved by the violation of the statute referred to and by the complaints by the men as to the foul condition of the water. Serious and wilful misconduct of an employer within the meaning of the workmen's compensation act, said the Supreme Court, is conduct that the employer knew, or should have known, was likely to cause serious injury, or conduct that evinces a reckless disregard for the safety of his employees. The employment of workmen under dangerous conditions that can be guarded against constitutes a reckless disregard for their safety. In this case, the

employer by knowingly violating its statutory duty to supply its employees with pure drinking water in closed containers and individual cups set the conditions for the transmission of various communicable diseases and exposed the employees to the hazard of serious injury therefrom. It is true that not every violation of a statute is serious and wilful misconduct. On the other hand, communicable diseases are readily transmitted by common drinking cups, and the statutes in the present case were designed to safeguard employees against that hazard. Violation of these statutes is particularly serious when hundreds of men are employed on the same project at the same time as here, and do not have access to other drinking water. The employer is charged with knowledge of the statute and was found by the commission to know that the water was distributed in violation of the statutory requirements. Violation of the statutes in question was not mere negligence but criminal conduct punishable as a misdemeanor.

It remains to be determined, continued the court, whether there is any evidence in the record from which the commission could find that there was no serious and wilful misconduct by the employer despite the violation of the statutes. Whether the serious and wilful misconduct of the employer caused the workman's injury is essentially a question of fact, and if there is any substantial evidence to support the findings of the commission its award will not be disturbed. On the other hand, the award of the commission will be set aside if there is no evidence to support its findings. The employer placed some emphasis on evidence in the record that the county health authorities considered the water in the reservoir safe for drinking. From that fact the employer sought to draw an inference that it could not be charged with knowledge that the water was unfit for human consumption. Actually, continued the court, the opinion of the health authorities referred only to water in the reservoir about eight months after the injury. They made no tests of the water before or at the time of the injury. While there was evidence that the president, general manager and sole stockholder of the employer corporation had on the job drunk the water from the common dipper, the most favorable inference that can be drawn from that fact is that one person did not consider the means of distribution dangerous. It has been held, however, that an employer's mistake in judgment does not relieve him from liability for serious and wilful misconduct.

Neither, in the opinion of the court, would the evidence that the drinking facilities on the job were installed by the general contractor and were used by its employees with no ill effects support the commission's finding. In fact, said the court, the commission's finding regarding the numerous complaints registered by the men destroys the pertinence of the alleged effect of the water on previous users. The testimony of the employer that it customarily accepted the facilities furnished by the general contractor and that the latter was under a contractual obligation to it with respect to such facilities indicates a misconception of its duties and liabilities with regard to the safety of its employees. The employer was aware of the general contractor's breach of contract. Its own statutory duty to furnish its employees with pure drinking water in closed containers and in individual drinking cups could not be delegated.

In the light of the findings of the commission and in the absence of substantial evidence to support its conclusion that the injury was not caused by the serious and wilful misconduct of the employer, the Supreme Court annulled the order of the commission denying additional compensation.—*Parkhurst Industrial Accident Commission* 129 P. (2d) 113 (Calif. 1942)

## Society Proceedings

### COMING MEETINGS

Annual Congress on Medical Education and Licensure Chicago Feb. 15-16  
Dr. H. C. Weiskotten, 535 North Dearborn St., Chicago, Secretary

American Association of Pathologists and Bacteriologists Chicago April 12  
Dr. Howard T. Karsner, 2085 Adelbert Rd., Cleveland, Secretary  
Conference of State and Provincial Health Authorities of North America  
Washington, D. C. March 22-25 Dr. A. J. Chesley, 469 State Office Bldg., St. Paul, Secretary  
Society of University Surgeons Chicago Feb. 11-13 Dr. Alexander Braunschwig, 950 East 59th St., Chicago, Chairman, Program Committee

## Current Medical Literature

### AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1932 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (\*) are abstracted below.

#### American Journal of Ophthalmology, Cincinnati

25 1409-1530 (Dec) 1942

- Fibroblastic Overgrowth of Persistent Tunica Vascuosa Lentis in Infants Born Prematurely. III. Studies in Development and Regression of Hyaloid Artery and Tunica Vascuosa Lentis. T. L. Terry. Boston —p 1409.
- Focal Infection. A. C. Woods. Baltimore —p 1423.
- Ophthalmoscopic Observation of Microfilariis in Vitreous of Patients Infected with Onchocerciasis. A. T. Estrada. Mexico. D. F. Mexico —p 1445.
- Eye Surgery in Wartime. E. Hartmann. New York —p 1448.
- Great Usefulness of Bicyclic Combinations in Exploration of Astigmatism. M. Marquez. Mexico. D. F. Mexico —p 1458.
- Effect of Undercorrection and Base In Prism on Myopic Refractive State. J. Chance. E. Ogden and K. B. Stoddard. Berkeley. Calif —p 1471.
- Evaluation of Glaucoma Operations. B. F. Payne. New York —p 1474.
- Changes in Vernal Composition of Rat Lenses with Glactose Cataract. P. W. Slicht. K. C. Swan and W. D. Paul. Iowa City —p 1482.
- \*Chemotherapy in Acute Gonococcal Conjunctivitis. L. K. Sweet. Washington. D. C. —p 1487.

#### Chemotherapy in Acute Gonococcal Conjunctivitis—

Sweet emphasizes the value of the sulfonamide compounds in acute gonococcal conjunctivitis, reports the use of sulfadiazine and compares the relative efficacy of sulfanilamide, sulfapyridine, sulfathiazole and sulfadiazine in treating this condition among 102 such patients admitted to the pediatric or contagious disease wards of the Gallinger Municipal Hospital from July 1938 to April 1942. The condition of almost all the patients who responded to the sulfonamide drugs improved, the acute inflammatory reaction subsiding rapidly, the redness and edema disappearing within two or three days and the discharge stopping in four or five days. Six of the 32 patients who received sulfanilamide were resistant to the drug and 26, or 81.2 per cent, responded favorably. Only 12, or 37.5 per cent, of these patients gave negative smears within three days of treatment. Only 2 of 50 patients treated with sulfapyridine were resistant to the therapy, the 48 responding favorably. Four of the patients who received sulfapyridine had failed to respond to sulfanilamide. 1 of them was resistant to and 3 responded to sulfapyridine. Of the 50 patients 32 showed negative smears within three days of treatment. Eight patients were treated with sulfathiazole, all responded to treatment and 6 had negative smears within three days. Sixteen patients received sulfadiazine, all responded favorably and 12 had negative smears within three days. Thus on the basis of frequency and rapidity of cure, sulfapyridine, sulfadiazine and sulfathiazole are approximately equal, and all are superior to sulfanilamide. There were no recurrences, and only one corneal ulcer occurred in the whole series. The toxic symptoms have not been striking. Slight cyanosis, nausea and anemia were encountered frequently but have not been serious. Of the more severe symptoms hematuria, drug dermatitis and hyperpyrexia occurred once among the patients treated with sulfapyridine. There were no severe reactions to sulfanilamide and sulfadiazine, and only 1 patient responded unfavorably (severe conjunctival reaction) to sulfathiazole. Therefore sulfathiazole should be used in ocular infections only when other equally efficacious chemotherapeutic agents are not available for use.

#### American Journal of Pathology, Ann Arbor, Mich

18 969-1184 (Nov) 1942

- Benign Chondroblastoma of Bone. Reinterpretation of So-Called Calcifying or Chondromatous Giant Cell Tumor. H. L. Jaffe and L. Lichtenstein. New York —p 969.
- Carcinoid Tumors of Rectum Derived from Esparmer's Preenterochromic Cells. A. P. Stout. New York —p 993.
- Renal Tubule (Nephron) as Affected by Mercury. J. G. Edwards. Buffalo —p 1011.
- Origin of Colloid and Lipid Droplets in Epithelial Cells of Renal Tubules. H. Smetana and F. R. Johnson. New York —p 1029.
- Effects of Centrifugation on Intracellular Inclusions Produced by Subcutaneous Injections of Aluminum Oxide. F. M. Birch and A. M. Lucas. Ames. Iowa —p 1031.
- Pathologic Alterations in Surface Relationships and Morphology at Human Synapse. J. Minckler. St. Louis —p 1061.
- \*Hyperplasia of Megakaryocytes in Pneumonia and Its Relationship to Leukoblastic Hyperplasia of Bone Marrow. R. J. Williams. Providence. R. I. —p 1105.
- Studies on Fowl Leukosis. Transfer to Chick Embryo. M. L. Pierce. Chicago —p 1127.
- Effects of Growth Hormone of Anterior Hypophysis (Antustrin G) on Skeleton of Mice and Guinea Pigs. M. Silberberg and Ruth Silberberg. New York —p 1141.
- Fibrosis of Pancreas in Meat Fed Ducks. I. A. Mirsky, S. Elgart and N. Nelson and P. Wasserman. Cincinnati —p 1159.

**Megakaryocytes in Pneumonia**—By inspecting the vertebral marrow and comparing it with controls Williams demonstrated megakaryocytic hyperplasia in 26 of 306 unselected patients. For controls 16 patients dying within twelve hours of a traumatic injury were used. Primary pneumonia had occurred in 39, or 12 per cent, of the unselected patients whereas it had occurred in 17, or 65 per cent, of those with megakaryocytic hyperplasia. Counts of the megakaryocytes in the 39 with primary pneumonia revealed more than 5,000 cells per cubic millimeter of vertebral marrow in 19. There was no significant variation from the normal in the relative numbers of the types of megakaryocytes. In pneumonia there was a striking parallelism between hyperplasia of megakaryocytes and of leukoplasmic cells. This megakaryocytic and leukoblastic hyperplasia occurred in infectious diseases other than primary pneumonia and is to be regarded as a type reaction. The hyperplasia begins first in the marrow of the lumbar vertebrae and only later in the diaphysis of the humerus. The study and comparison of the marrow of the vertebrae with that of other long bones are necessary to detect and classify the reactions of the marrow.

#### Am J Roentgenol & Rad Therapy, Springfield, Ill

48 571-714 (Nov) 1942

- Some Considerations Concerning Roentgen Diagnosis of Pneumoconiosis and Silicosis. E. P. Pendergrass. Philadelphia —p 571.
- Anatomic Roentgenologic Analysis of Normal Hilar Shadow. G. Herrnhaiser. Tel Aviv. Palestine —p 595.
- \*Respiratory Function of Digestive Tract as Basis of Roentgenographic Life Test. J. G. Dillon. Moscow. Soviet Union —p 613.
- Laminography of Sphenoid Bone. B. S. Epstein. Brooklyn —p 625.
- Substitute for Fatty Meal in Cholecystography. Max Ritvo and Meyer Ritvo. Boston —p 632.
- Roentgenographic Soft Tissue Study in Orthopedic Hospital. R. W. Lewis. New York —p 634.
- North American Cutaneous Blastomycosis Treated with Superficial Roentgen Therapy. Report of Four Cases. J. E. Hemphill and R. O. Noojin. Durham. N. C. —p 643.
- \*Total Body Irradiation with Review of Cases. F. G. Medinger and L. F. Craver. New York —p 651.
- Radiotherapy of Cancer of Antrum. E. Valencia and L. M. Rosenthal. Chicago —p 672.
- Cancer of Cervix Uteri Associated with Pregnancy. S. Richman and M. J. Goodfriend. New York —p 677.
- New Design for Increasing Heat Dissipating Capacity of Rotating Anode Tubes. R. R. Machlett and T. H. Rogers. Springdale. Conn —p 685.

**Respiratory Function of Digestive Tract**—The conclusions of Dillon on the problem of the respiratory function of the digestive tract are as follows. 1 The only place of obstruction of the lower end of the esophagus is the looplike paraesophageal muscle of the diaphragm functioning synchronously with the respiratory movements of the diaphragm. 2 The term "aerophagy" does not correspond to the mechanism of accumulation of air in the stomach and therefore it should be replaced by the more correct term "gastro-pyry". 3 The air enters the stomach and intestine of the newborn and adults during the inspiratory movements of the thorax. Swallowed air has no substantial significance. 4 In addition to pulmonary respiration, gastric respiration exists in every human being. The latter is

subsidiary but may become prevailing for example, in a person whose larynx has been extirpated because of a malignant growth. 5 The presence of air in the digestive tract of the newborn serves as proof of extrauterine respiration and that the infant was born alive. 6 The roentgen examination of a stillborn fetus in utero never reveals air in the digestive tract. 7 Correctly made roentgenograms of dead fetuses who were breathing even for a short time disclose air in the stomach or intestine. Therefore such a roentgenogram serves as a test of life. 8 A roentgenographic test of life is the most reliable and sensitive of all such available tests.

**Total Body Irradiation**—Irradiation of the whole body was used by Medinger and Craver for 94 patients with Hodgkin's disease, 30 with lymphosarcoma, 76 with lymphatic leukemia, 12 with myelogenous leukemia, 5 with polycythemia vera, 6 with mycosis fungoides, 11 with multiple myeloma and 35 with miscellaneous advanced carcinoma or sarcoma with generalized metastasis. The results of treating the 270 patients demonstrate that total body irradiation produces the greatest palliation in lymphomatoid disease and therefore its usefulness is largely restricted to this group of radiosensitive tumors. The greatest benefit was obtained in chronic lymphatic and myelogenous leukemia, Hodgkin's disease, lymphosarcoma and polycythemia vera. The improvement was less striking in mycosis fungoides and multiple myeloma, and there was no appreciable improvement in the 35 with generalized metastatic carcinoma or sarcoma. The survival period and the period of active useful life were prolonged in patients with Hodgkin's disease, lymphosarcoma and chronic lymphatic leukemia. Favorable palliation followed total body irradiation of patients with chronic myelogenous leukemia, polycythemia vera, mycosis fungoides and multiple myeloma. Acute lymphatic and myelogenous leukemia were not benefited. The most favorable results were obtained when local roentgen irradiation or surgery preceded total body irradiation. The aim of therapy is to obtain maximal improvement with minimal unfavorable reactions. In the determination of the dosage the guiding factors are (1) age and general resistance of the patient, (2) the disease and its extent, (3) the amount of previous irradiation, (4) the blood cell levels previous to therapy and (5) the response of the patient during treatment.

## Archives of Dermatology and Syphilology, Chicago

46 783-974 (Dec.) 1942

- \*Intensive Treatment of Syphilis with Multiple Injections of Mapharsen. Concentration of Arsenic in Blood. J. Siegel, D. H. Goldstein and L. J. Goldwater. New York—p. 783.
- Clinical Evaluation of Lepromin Test. C. S. Pin. Shanghai, China—p. 792.
- Orthostatic Hypotension Accompanying the Tabetic Form of Dementia Paralytica. Malaria Treatment. Report of Case. H. E. Freeman and J. E. Robertson. Cleveland—p. 796.
- Pemphigus. Historical Study. W. F. Lever and J. H. Talbot. Boston—p. 800.
- Neurotic Excoriations. F. E. Senevir and H. Shellow. Chicago—p. 824.
- Edema of Genitalia Complicating Resin Contact Dermatitis Due to Underwear. B. B. Alperstein, I. Sherman and B. K. Sherman. Brooklyn—p. 829.
- Dermatitis from Seed and Oil of Bertholletia Excelsa (Brazil Nut). L. S. Markson. Milwaukee—p. 831.
- Calcium, Potassium and Sodium Metabolism and the Skin. Use of Potassium Chloride in Certain Allergic Dermatoses. T. Cornbleet, R. C. Ingraham and H. C. Schorr. Chicago—p. 833.
- Herpes Gestationis. Successful Treatment with Sulfathiazole. Report of Case. G. M. Lewis. New York—p. 841.
- Quantitative Studies on Atypical Syphilitic Serums. Bettina B. Carter. Louisville, Ky.—p. 843.
- Tests for Mildness of Soap. D. J. Kosman and F. H. Snyder. Ivorydale, Ohio—p. 846.
- \*Reaction to Sodium Diphenyl Hydantoinate (Dilantin Sodium). Hemorrhagic Erythema Multiforme. Perminating Fatally. E. B. Ritchie and W. Kolb. Galveston, Texas—p. 846.
- Syroid and Tuberculosis. Report of Case with Autopsy. F. Ronchese, Providence, R. I.—p. 860.
- Osteomatosis Cutis. Report of Case. H. A. Lilga and D. C. Burns. Petoskey, Mich.—p. 872.
- Pemphigus. Conjunctivae with Scarring of Skin. Report of Three Cases. W. F. Lever. Boston—p. 875.

**Syphilis**—Siegel and his associates determined the arsenic content of the blood of patients with early syphilis receiving intensive mapharsen therapy. Characteristic and essentially similar curves were obtained for 15 patients who received mapharsen alone and 16 patients who received fever therapy with typhoid vaccine in addition to mapharsen. The daily average

of the morning low point values of arsenic in the blood of the patients who received mapharsen alone showed a progressive rise up to 16 micrograms of arsenic per hundred cubic centimeters of whole blood in the course of the first five days of treatment. The daily average of the morning low point values of the patients receiving mapharsen and fever therapy showed a prompt rise to a level of about 10 micrograms after one day of treatment, remained unchanged for three days and then rose to a level of 17 micrograms in the next three days. Comparison of results obtained by the multiple syringe method with results obtained by other observers who used the continuous drip method revealed a close parallel in the morning low point concentrations of arsenic in the blood.

**Reaction to Phenytoin Sodium**—Ritchie and Kolb report a fatal case of hemorrhagic erythema multiforme following the use of phenytoin sodium. Necropsy showed extensive hemorrhagic changes in the skin, mouth and gastrointestinal tract and edema of the lungs and brain. There were small pericapillary hemorrhages in the region of the third ventricle. The primary cause of death was respiratory paralysis.

## Archives of Neurology and Psychiatry, Chicago

48 865-1048 (Dec.) 1942

- Relief of Pain by Mesencephalic Tractotomy. A. E. Walker, Chicago—p. 865.
- Somatotopic Localization of Spinothalamic and Secondary Trigeminal Tracts in Mesencephalon. A. I. Walker. Chicago—p. 884.
- Problem of Imperception of Distance and of Impaired Body Territories with Organic Lesions. Relation to Body Scheme and Its Disorders. J. Gerstmann. New York—p. 890.
- Studies on Corpus Callosum. VI. Orientation (Temporal Spatial Cnosis) Following Section of Corpus Callosum. A. J. Akelaitis, Rochester, N. Y.—p. 914.
- \*Removal of Malignant Thymoma in Case of Myasthenia Gravis. J. Turnbull, Vancouver. B. C. Canada—p. 938.
- Convulsions in Nonepileptic Patients on Withdrawal of Barbiturates, Alcohol and Other Drugs. L. B. Kohnowski, Brentwood, N. Y.—p. 946.
- Electroencephalogram Accompanying Hyperactive Carotid Sinus Reflex and Orthostatic Syncope. F. M. Forster, E. Roeman and F. A. Gibbs. Boston—p. 957.
- Effect of Hyperventilation on Electroencephalogram of Schizophrenic and Nonpsychotic Subjects. M. A. Rubin. Worcester, Mass., with assistance of Eleanor Turner—p. 968.
- Ligation and Resection of Superior Longitudinal Sinus. J. R. Jeger, Denver—p. 977.
- True Fatty Degeneration in Sensory Neurons of the Aged. R. C. Truex and K. L. Zwemer. New York—p. 988.

**Mesencephalic Tractotomy for Pain**—Three further cases in which Walker performed mesencephalic tractotomy through an incision in the rostral portion of the pons are reported. This level seems more favorable for the section because its approach is easier and the surface markings of the pain tracts in the mesencephalon are clearer. Two reports have been published previously. Immediately after section, superficial or deep pain in the contralateral half of the body was relieved. Abdominal pain on the involved side, such as might be produced by deep palpation, was absent. The side of the body contralateral to the lesion feels "numb," "dazed" or "funny" after the operation. After a time this sensation becomes less pronounced but does not disappear. Immediately after section, painful stimuli on the contralateral side are not appreciated. After approximately two weeks painful stimuli (pinprick, cold and heat) give rise to a peculiar disagreeable feeling in the part stimulated. The sensation is not painful but annoying, as it is more unpleasant than pinprick on the normal side. Localization of touch, two point discrimination, vibratory sensibility, position sense and joint sense are practically normal. One or two days after operation hemianopsia contralateral to the lesion is usually demonstrated. Within a week the visual acuity usually returns to normal. Subjectively there were no auditory abnormalities, but audiometer tests revealed impaired appreciation of high tones by the ear contralateral to the lesion. For about a month after operation the leg contralateral to the lesion is not as strong or agile as the ipsilateral leg. The strength of the other extremities is normal. No ataxia has been demonstrated. Disturbances of bladder function were not observed. Incontinence of the bladder occurred in 1 patient who was confused and stuporous from cerebral softening precipitated by manipulation of the brain, renal failure and infection of the bladder. No statement regarding libido can be made as yet.

**Thymoma Removal in Myasthenia Gravis**—Judging from available reports, Turnbull believes that the results of thymectomy appear more promising than those of removing a thymic tumor. To arrive at any conclusions regarding the treatment of myasthenia gravis it is necessary to distinguish sharply between these operations. When more cases of the successful removal of a thymic tumor are recorded, the pathologic type of tumor will probably be found to be important. Of the 5 recorded cases in which the removal of a thymic tumor was successful (including the author's case) dramatic and immediate cure resulted only in the case in which a carcinoma was present. In 2 the tumor was a lymphosarcoma, and in both it is questionable whether operation caused improvement or prolonged a remission, in 1 the operation probably had no effect on the disease, as the tumor that was removed was devoid of anything but debris and fibrous tissue, and in the author's case removal of a lymphosarcoma had no appreciable effect on the myasthenia gravis.

### Archives of Surgery, Chicago

45 863-1052 (Dec) 1942

- Experimental Freezing Shock Changes in Body Fluids and Tissues E E Murrhead C T Ashworth L A Kregel and J M Hill, Dallas Texas—p 863
- \*Experimental Gas Gangrene W R Sandusky and F L Meleney, New York—p 890
- Interpelvian Abdominal Amputation Report of Three Cases W E Leighton St Louis—p 913
- Importance and Distribution of Transversalis Fascia from the View point of the Surgeon S A Ziemann Chicago—p 926
- Chemical Cauterization of Mucosa of Gallbladder W S Carpenter and C F Vale Detroit—p 935
- Lymphosarcoma of Intestine Report of Two Cases F R Menne D G Mason and R Johnston Portland Ore—p 945
- Stab Wound of Pulmonary Artery with Suture and Recovery Report of Case with Brief Review of Traumatic Cardiac Surgery H M Schriebl Durham N C—p 957
- Arterial Blood Flow in Extremities with Varicose Veins D I Abramson and S M Fierst Cincinnati—p 964
- Progress in Orthopedic Surgery for 1941 Review Prepared by Editorial Board of American Academy of Orthopaedic Surgeons—p 969
- Review of Urologic Surgery (to be concluded) A J Scholl Los Angeles, F Hinman, San Francisco, A von Lichtenberg Mexico D F, Mexico A B Hepler Seattle R Gutierrez New York G J Thompson J T Priestley, Rochester Minn E Wildbolz Berne, Switzerland and V J O'Connor, Chicago—p 1022

**Experimental Gas Gangrene**—Sandusky and Meleney produced wounds in anesthetized guinea pigs and contaminated them with certain of the clostridia associated with gas gangrene in human beings. Subsequently the wounds were treated locally with sulfanilamide, sulfadiazine, sulfathiazole, sodium sulfadiazine, sodium sulfathiazole, gramicidin and zinc peroxide. When used in wounds within two hours of production and contamination with *Clostridium welchii* or *Clostridium septicum*, sulfanilamide, sulfadiazine, sulfathiazole and the sodium salts of the latter two were effective in preventing the death of animals from gas gangrene. The effectiveness of zinc peroxide in such wounds was not convincing. Zinc peroxide was effective in producing a slight but statistically significant reduction in mortality from gas gangrene in animals whose wounds were contaminated with *Clostridium novyi*. Sodium sulfathiazole approached zinc peroxide in effectiveness, but the reduction in mortality was not statistically significant. The other sulfonamide compounds failed completely in *Cl novyi* contaminated wounds. None of the agents were effective in preventing death from gas gangrene in animals whose wounds were contaminated with *Clostridium ordalii*. Yet sulfadiazine, sulfathiazole and their sodium salts significantly delayed death. In animals with *Cl welchii* contaminated wounds debridement, irrigation of the wounds and chemotherapy were of significantly greater value than chemotherapy alone. Debridement and irrigation without chemotherapy gave results similar to those obtained in untreated controls. In general sulfadiazine, sulfathiazole and their sodium salts were more effective in preventing experimental gas gangrene than was sulfanilamide. Since the results have a direct clinical application there should be a consensus among investigators in this field so that the experimental methods, the contaminating organisms (their dosage and method of administration) and the treatment to be instituted could be standardized. The discrepancies in the results so far obtained in experimental gas gangrene indicate that further studies are imperative before the newer chemotherapeutic agents can be evaluated properly.

### Bulletin New York Academy of Medicine, New York

18 773-848 (Dec.) 1942

- Neuropsychiatry in Wartime C A Blakelee New York—p 775
- \*Prefrontal Lobotomy: Surgical Relief of Mental Pain W Freeman and J W Watts New York—p 794
- Brain Abscess J E I King New York—p 813
- Brain Lesion Constantly Found in Head Injuries J Arce Buenos Aires Argentina—p 831

**Prefrontal Lobotomy**—Freeman and Watts state that now the problems in prefrontal lobotomy are beyond their first stage of the hit or miss production of destructive lesions of the frontal lobes and then waiting to see what the effect will be. With continued study for six years they have developed an operative technique that has certain merits of precision. They have followed all their 136 patients with periodic surveys so that they can now give the following conclusions: 1 Prefrontal lobotomy interrupts the connection between the frontal lobe and the thalamus, thereby reducing the subjective emotional reactions of the patient. This loss of painful self-consciousness in the psychotic patient is followed by reintegration of the personality with the ideational activities directed outward. 2 Intelligence is unharmed but its application subjectively to the interpretation of social and personal influences is diminished and in some patients results in indolence and lack of tact. 3 Many patients are able to reach their pre-psychotic level of occupational adjustment, some even exceed it. 4 Failures are due to (1) inadequate operation which may be corrected by a secondary more complete lobotomy, (2) a too extensive operation, (3) inadequate evaluation of the aggressive traits of the patient previous to the development of his psychosis and (4) emotional deterioration. 5 Old people whose lives are a burden to themselves by reason of psychosis are particularly good subjects for prefrontal lobotomy because of the serenity of disposition that follows the operation. 6 Best results are obtained in obsessive tension states, good results in involutional depression, fair results in schizophrenia and poor results in alcoholism. Prefrontal lobotomy is comparable in its effects with the neurosurgical operations for relief of pain only in these cases it is mental pain that is relieved.

### Canadian Medical Association Journal, Montreal

47 505-610 (Dec) 1942

- \*Local Treatment of Burns with Sulfadiazine Spray C J Colovaris Montreal W T West St Hubert Que and J C Armour Montreal—p 505
- Production of Nephrosclerosis by Overdosage with Desoxycorticosterone Acetate H Selye Montreal—p 515
- \*Successful Removal of Sacral Parasitic Fetus Jessie Gray Toronto—p 520
- Health Insurance and Medical Education W Pinfield Montreal—p 523
- \*Modern Conception and Treatment of Frostbite Survey and Discussion of Literature W G Bigelow Toronto—p 529
- \*Conception of Neuralgic Chest Pain T G Heston Toronto—p 535
- Abscess of Lung R M Janes Toronto—p 540
- Chronic Infective Arthritis Caused by *Pseudomonas Pseudomallei* P E Fiset Quebec—p 545
- Treatment of Perianal Abscess and Fistula W F Gillespie Edmonton, Alta—p 547
- Chronic Idiopathic Hypoparathyroidism M M Cantor and J W Scott Edmonton Alta—p 551
- Distribution of Thrombi in Veins of Pelvis and Legs in Relation to Possible Value of Ligation of Femoral Vein E S Ingraham Jr, Montreal—p 553
- Oxygen Therapy and Resuscitation M D Leigh and Frances M Richardson Montreal—p 555
- Sulfonamides and Blood Sedimentation Rate R A Palmer, Vancouver, B C—p 561
- Aleukemic Lymphatic Leukemia or Lymphosarcoma J W Auld Calgary Alta—p 563
- Gallbladder Disease and X-Ray D MacDonald St Catharines Ont—p 564

**Treatment of Burns with Sulfadiazine Spray**—Colovaris and his co-workers have treated the burns of 8 patients with a spray of sulfadiazine in triethanolamine and plasma and other supportive measures. This method, reported by Pickrell in 1941, possesses several advantages over previous methods. The resulting eschar allows the patient to be out of bed much more quickly than do those of other methods, because cracking is considerably decreased as the eschar is soft and pliable yet strong enough to withstand the strain of movement. It does not bind granulating surfaces tightly if at all, causing constriction as do other eschars because it fits more loosely on the

wounded surface being a hardening of the vehicle rather than a precipitation of surface proteins. The spray is of definite value in combating gram positive and gram negative organisms commonly infecting burned surfaces without damaging tissues. Burns of the face can be managed with this treatment. Pain was relieved within fifteen minutes of treatment. The eschar can be adjusted to any depth by varying the amount of spray applied. The disadvantages of the method are that the eschar is formed relatively slowly, toxic reactions with the use of the spray on large areas of the body are possible and grafting is impeded.

**Removal of Sacral Parasitic Fetus**—The successful removal of a large parasitic fetus from a 7 month boy is reported by Gray. The mass, attached to the coccygeal region by a wide pedicle which seemed to displace the anus anteriorly from the coccyx, was removed twenty-four hours after birth. Prior to operation a roentgenogram revealed that there was no skeletal connection between the baby and the parasitic fetus. When the tumor was completely removed and hemostasis secured, it became apparent that closure would have to be transverse in order to push the rectum up into the hollow of the sacrum and to approximate the anus closer to the coccyx in the normal relationship. When interrupted plain catgut sutures of the subcutaneous and fascial tissues of the upper and lower margins of the wound, after a gram of sulfathiazole powder was sprinkled into the large raw area were tied it was found that the coccyx had to be removed so that the cutaneous margins could be approximated without tension. Another 0.5 Gm of sulfathiazole was sprinkled in the wound and the skin was closed with interrupted silk sutures. Seventy five cc of compatible whole blood was given intravenously during operation. The wound healed by first intention and the sutures were removed in eight days. The baby's general condition was excellent and he was discharged three weeks after operation. The child undoubtedly owes his life to the fact that labor was induced at seven months because of the mother's toxemia, and to the fact that the tumor did not communicate with any vital structure of the infant. The tumor, hardened in formaldehyde for a week on section revealed cerebral tissue, well developed convolutions of an almost perfect hemisphericum, a ventricle, choroid plexus within the hemisphere, bronchi pulmonary tissue, ciliated epithelium underlain by submucous glands, vascular structures, high columnar epithelium tending to form papillary infoldings simulating gastrointestinal tract, skeletal development, marrow and cartilage. Other microscopic sections showed cerebral cortex and subcortical white matter together with choroid plexus structure and dura mater, fat, voluntary and involuntary muscular fibers, lung, renal tubules, typical lymph nodes vascular structures and one ganglion composed of typical ganglion cells and neurons surrounded by a fibrous tissue capsule in well differentiated form. The skin covering the tumor was typical epidermis including coil glands, hair shafts and sebaceous glands. The maternal grandmother of the baby was a twin and had sisters who were twins. Also the paternal grandmother had maternal and paternal twin cousins.

**Modern Conception and Treatment of Frostbite**—Bigelow states that rubbing or massaging in frostbite and trench foot damages the skin and increases tissue reaction. Some means to increase the blood flow to the affected part before secondary reactions of thrombosis and arterial change set in may reverse the process of stasis and supply oxygen to meet the demands of a locally increased metabolism. A slow rate of thawing minimizes the metabolic demands of the tissue. The use of heparin for preventing thrombosis suggests itself. Sympathetic nerve anesthesia or extirpation of sympathetic ganglions would counteract spasm and also supply the required increase in blood flow. From the personal account of a North Greenland explorer, downward massage of the limb above the frozen limbs of 3 members of this party, carried out in a cold room, resulted in slow but complete recovery. If such massage relieves arterial spasm and forces arterial blood into the extremity, its rationale as a first aid measure is good. To insure slow thawing, Kreyberg suggests keeping a small ward cooled to between room temperature and freezing. A more beneficial type of treatment may be local refrigeration of the elevated extremity with

heat to the remainder of the body. This would aid in counteracting shock and would produce a reflex vasodilatation in the affected limb. Refrigeration should be continued for one to several days, depending on the severity of the lesion. Controlled thawing may be accompanied by "the application of cold water at 10 to 15 C." Cooling relieves some of the pain that accompanies thawing.

**Conception of Neuralgic Chest Pain**—Among 341 consecutive cases referred to an army medical consulting clinic 100 men complained of chest pain. In 53 the pain was the major if not the chief, complaint. The conception that Heaton has of these pains is that they are pains of essentially similar nature, sharing a common mechanism of production, though this mechanism may be operated by different factors in different cases. The pain is more deserving of a name than are its initiating factors which determine its occurrence and location, since these factors are multiple and not necessarily themselves of the nature of progressive organic disease. Two names in use are sufficiently inclusive "neuralgia" and "causalgia." The first term is preferred, as the latter has a rather limited connotation at present. If an explanation of this chest pain is attempted it must explain its increased frequency in emotionally unstable persons, in whom it may be provoked by excitement alone, its association with organic thoracic disease, its occasional occurrence without evident emotional instability and without evident intrathoracic disease (intercostal neuralgia) and the effect of movement in provoking pain. The same pain may occur in the apparent absence of all these conditions and any of these conditions may be present without the chest pain. The pain in "chronic pleuritis," "effort syndrome" and some cases of organic disease of the heart and lungs cannot be differentiated in character from neuralgic pain. Such pain is commonly misdiagnosed as 'pleurisy' or 'heart disease,' and when the same type of pain occurs in the abdomen as 'appendicitis' or 'kidney trouble.' The prognosis varies greatly, being worst among the chronically psychoneurotic. The pain on rare occasions is moderately disabling.

### Canadian Public Health Journal, Toronto

33 517-564 (Nov.) 1942

- State of Health of the People of Canada in 1941 J. J. Hergert, Ottawa, Ont.—p. 517
- Air Raid Precautions in Montreal and the Health Officer A. Croulx, Montreal—p. 532
- Epidemic of Typhoid Fever Due to Infected Cheese Manitoba December 1939 March 1940 M. Bowman, Winnipeg, Man.—p. 541
- Epidemic of Mumps in Peterborough, Ont. D. B. Avison, Peterborough, Ont.—p. 548
- Utilizing Service Clubs, Women's Organizations and Other Local Organizations in Public Health Education D. A. Currey, St. Catherine, Ont.—p. 552

**Typhoid Due to Infected Cheese**—From December 1939 to March 1940 three outbreaks of typhoid apparently due to cheese occurred in the province of Manitoba. Although typhoid bacilli were not recovered from the cheese, Bowman presents epidemiologic evidence which suggests that the three outbreaks were probably caused by infected cheese. The evidence submitted suggests that cheese made from raw milk may constitute a serious hazard in transmitting typhoid unless such cheese is aged for an adequate period. (The Army will not buy cheese until it has been aged for at least three months.) Milk produced for cheese making should be supervised and controlled as rigidly as that for liquid consumption. Either pasteurization of milk or adequate aging of cheese should be insisted on. As carriers with no history of illness may be common, all reasonable precautions must be taken to avert the transmission of typhoid bacilli.

### Iowa State Medical Society Journal, Des Moines

32 533-588 (Dec.) 1942

- Management of Strabismus O. B. August, Chicago—p. 533
- Theology of Intoxication and Phonation C. F. Harkness, Davenport—p. 537
- Intensive Gastrointestinal Hemorrhage J. I. Kestel, Waterloo—p. 54
- Gunshot Wound of Spinal Cord W. D. Abbott and R. T. Smith—p. 544
- Use of Steel Wire Sutures in Repair of Hernia J. W. Agnew and J. W. Dulin, Iowa City—p. 546

## Journal of Infectious Diseases, Chicago

71 97-192 (Sept-Oct) 1942

- Identification of Two Strains of Virus Isolated from Cases of Atypical Pneumonia M Dorothy Beck and M D Eaton Berkeley Calif —p 97
- Egg Mediums for Isolation of All Three Types of Tubercle Bacilli Janet R McCarter and Elizabeth M Kanne Madison Wis —p 102
- Oxidation Reduction Potentials in Salmonella Cultures IV Note on the Relation of Observed Potentials to  $pH$  W Burrows Chicago —p 106
- Nucleic Acid of Rabbit Papilloma Virus Protein A R Taylor Dorothy Beard, D G Sharp and J W Beard Durham N C —p 110
- Isolation and Properties of Macromolecular Component of Normal Chick Embryo Tissue A R Taylor D G Sharp Dorothy Beard and J W Beard Durham N C —p 115
- \*Experimental Human Vaginal Trichomoniasis H C Hesselstine S L Wolters and Alice Campbell Chicago —p 127
- Genetic Constitutions of Host and Pathogen in Mouse Typhoid M R Zelle, Ames Iowa —p 131
- Studies on Staphylococci I Occurrence of Bacteriophage Carriers Among Strains of Staphylococcus Aureus R T Fisk Los Angeles —p 153
- Id Identification of Staphylococcus Aureus Strains by Means of Bacteriophage R T Fisk Los Angeles —p 161
- Toxic Effects of Tyrothricin Gramicidin and Tyrocidine C H Rammelkamp and L Weinstein Boston —p 166
- An 'Infection Prevention' Test for Evaluation of Skin Disinfectants W J Nungester and Alice H Kempf Ann Arbor Mich —p 174
- Relationship of St Louis and Western Encephalitic Viruses to Fowl and Mammals in California Beatrice F Howitt and W Van Herick San Francisco —p 179

**Experimental Human Vaginal Trichomoniasis**—The cooperation of 80 pregnant patients made it possible for Hesselstine, Wolters and Campbell to study the effect of inoculating the Trussell-Plass strain of trichomonads. Seventy received the unaltered culture, while 10 received only the filtrate portion of the culture. The twenty-four to forty-eight hour cultures were implanted in the vagina. Fifty-three patients had vaginal smear controls, while the remaining 17 had only clinical observation. No positive reaction for vaginal trichomoniasis developed in the latter group. Seven of the former group had positive reactions and in 2 others trichomoniasis developed after delivery, yet the smears of these 2 were negative prior to parturition. The general trend was for the trichomonads to disappear in the course of a few to several days. Only 3 of the 7 patients had symptoms, while 6 of the 7 had a typical discharge on examination. Only 2 received treatment, the rest improved without it. Six of the 7 had a bacterial flora (judged by smear) which is supposed to be more favorable for the growth of the vaginal trichomonads than the theoretical normal. The literature on the vaginal tetratrichomonads and the present data are deficient to prove the presence or absence of immunity in those women who did not become experimentally infected. Special studies must be made to solve this problem.

## Journal Neuropath and Exper Neurology, Baltimore

1 351-454 (Oct) 1942

- Amiotonia (Myatonia) Congenita Oppenheim's Disease Clinicopathologic Report of Case G B Hassin Chicago —p 351
- \*Scarlatinal Encephalomyelitis N W Winkelman Philadelphia —p 363
- Vascularization of Cerebral Neoplasms Studied with Fuchsin Staining Method of Eros S Arieti New York —p 375
- \*Central Nervous System in Tetanus A B Baker Minneapolis —p 394
- Multiple Tumors of Brain of Diverse Origin P G Myerson New York —p 406
- Postvaccinal Encephalitis in Adults Report of Two Cases One with Autopsy R M Mulligan and K T Neuburger Denver —p 416
- Cortical Origin and Distribution of Corpus Callosum and Anterior Commissure in Cat III H W Garol New Haven Conn —p 422
- Histologic Observations on Nervous System of Monkeys Experimentally Deprived of Vitamin E I S Wechsler and J H Globus New York —p 430
- Rapid Method for Combined Staining of Myelin Sheaths and Lipid Products of Degeneration L Roizin New York —p 438

**Scarlatinal Encephalomyelitis**—Because of the rarity of diffuse encephalomyelitis in the course of scarlet fever Winkelman reports such an occurrence in a Negro girl of 9. The diffuse inflammation involved the brain and the cord and showed no special predilection for either the gray or the white matter. The cerebral symptoms developed seven days after the onset of scarlatina. There was clinical evidence of widespread involvement of the entire brain stem and spinal cord. At necropsy a type of perivenous encephalomyelitis resembling that seen in measles, after vaccination and the other known virus infections

was observed. The conclusion is reached that the complications of the central nervous system were not the result of the 'scarlatinal organism itself' but developed from the release by the streptococcus of a virus lying dormant within the system. Clinically the condition was different from the usual mild neurologic complications seen infrequently in scarlet fever. The changes within the central nervous system were so intense and widespread that recovery was precluded.

**Central Nervous System in Tetanus**—Baker studied tissues from 12 cases of human tetanus and gives a composite description of the changes in the central nervous system in such cases. The study reveals that the tetanus toxin does have an affinity for the central nervous system and that if the illness is sufficiently prolonged it will produce structural damage to its tissues. Functional impairment of the nervous elements occurs in almost every case regardless of the duration of the disease but in the more rapidly fatal ones the affliction is not of sufficient duration for such changes to become anatomically apparent. If death occurs before the fifth day of the illness few alterations are visible. The nerve cells are first to become involved, the damage is irregular and a swelling and perinuclear chromatolysis are present. The anterior horn cells are rarely severely involved and certainly much less affected than the nerve cells of the cerebral cortex or the cells of the cranial nerve nuclei. Even in the presence of severe cortical damage the anterior horn cells usually appear intact. If the illness lasts more than five days perivascular areas of demyelination and gliosis occur. These lesions are widely disseminated within the cerebral hemispheres. In prolonged disease they often result in large confluent areas of tissue destruction. Death is generally believed to result from exhaustion, circulatory failure and asphyxia due to spasm of the glottis, diaphragm and intercostal muscles during the convulsions. Extensive pathologic alterations may occur within the medulla. Therefore certain cases of tetanus must terminate fatally because of structural damage to the medullary centers with secondary cardiac or respiratory failure. The possibility of such cerebral involvement in tetanus must force one to a guarded prognosis in every case. The consistent perivascular distribution of the lesions strengthens the view of a hematogenous spread of the tetanus toxin. This widespread scattering of the lesions also adds weight to the belief that the toxin is disseminated through the blood stream.

## Journal of Pharmacology &amp; Exper Therap, Baltimore

76 97-188 (Oct) 1942 Partial Index

- Influence of Bile on Gastric Motility J M Winfield and J Kauller z Detroit —p 97
- Effects of Some Nitrate Esters of Xanthine Derivatives C Lehmann A M Ambrose and P K Knoefel Louisville Ky —p 126
- Morphogenetic Actions of Various Steroids in Castrate Male Rat H Selve and S Albert Montreal Canada —p 137
- Ascorbic Acid Dehydroascorbic Acid System in Synthesis and Inactivation of Sympathomimetic Amine K H Beyer Madison Wis —p 149
- In Vitro Studies of Sulfonamide Action on Organisms of Brucella Group and Counteracting Effect of Para Aminobenzoic Acid B Wise Durham N C —p 156
- Effect of Various Sulfonamides Sulfones and Other Compounds Against Experimental Influenza and Poliomyelitis Infection in White Mice L T Coggeshall and J Maier New York —p 161
- Percutaneous Absorption of Ammonium Hydrogen Sulfide and Hydrogen Sulfide E P Luig and J H Draize Washington D C —p 179

## Kansas Medical Society Journal, Topeka

43 441-476 (Nov) 1942

- Fundamentals of Psychiatry H W C Menninger Topeka —p 441
- Appendicitis in St John's Hospital J C Mitchell Salina —p 446
- The Relation of the Radiologist to the Hospital C H Warfield Wichita —p 450
- Treatment of Nail Puncture Wounds of Feet M A Waller, Kansas City —p 453

## Kentucky Medical Journal, Bowling Green

40 427-466 (Nov) 1942

- Local Use of Sulfonamides in Wounds G Y Graves Bowling Green —p 430
- Interdependence of Curative and Preventive Medicine P E Blackerly Louisville —p 433



**Laryngoscope, St. Louis**

52 835-922 (Nov.) 1942

- \*Otitic Meningitis: Review of Literature and Report of Results Five Years Before and Since Introduction of Chemotherapy. H. L. Williams, W. E. Herrell, A. E. Brown, J. W. Kernohan and H. P. Wagener. Rochester, Minn.—p. 835.
- Experimental Observations on Auditory Masking. H. G. Kobrak, J. R. Lindsay and H. B. Perlman. Chicago—p. 870.
- Review of Methods Used for Estimating Percentage Loss of Hearing. H. A. Carter. Chicago—p. 879.
- Review of Available Literature on Pharyngeal and Pharyngeal Surgery for 1941. F. E. LeJeune and P. J. Bayon. New Orleans—p. 891.

**Otitic Meningitis**—To evaluate the results of treating otitic meningitis with the sulfonamide drugs, Williams and his co-workers analyzed the 46 cases that they observed during the five years before their advent and the 24 encountered since. In 10 of the first group, fulminating meningitis was associated with acute otitis media, no specific treatment was attempted other than spinal drainage. These 10 patients died. The 7 in whom otitic meningitis occurred subsequent to mastoidectomy for acute or chronic disease of the temporal bone also died. Two of the 9 patients in whom otitic meningitis was diagnosed before mastoidectomy recovered. Hemolytic streptococci were cultured from the spinal fluid of 6, type III pneumococci from 2 and type I pneumococci from 1. In the last case antipneumococcus serum was without demonstrable benefit. In the remaining 20, examination disclosed increased pressure of the cerebrospinal fluid, leukocytosis and neurologic signs of meningitis, microorganisms could not be demonstrated. In 12 of the 20 there was evidence of petrositis. The leukocyte count of the cerebrospinal fluid in 5 of the 12 ranged from 200 to 6,000 per cubic millimeter. These 5 patients recovered. The cerebrospinal fluid of 7 contained less than 100 polymorphonuclear leukocytes, 5 recovered and 2 died. In the remaining 8 mastoidectomy was performed, 4 recovered and 1 died of a cerebellar abscess, 2 of postoperative thrombosis of the cavernous sinus and 1 of a subdural abscess over the anterior surface of the cerebellum. The 24 patients treated during the last five years represent a 48 per cent reduction in the number encountered over the previous five years. This reduction becomes even more striking as the number of patients hospitalized during this time for diseases of the middle ear and sinuses was actually increased. The most likely explanation for the change is that the routine use of sulfonamides has prevented the development of meningitis. Fulminating meningitis occurred in 6 of the 24, 4 died and 2 recovered. These patients were seen soon after the advent of sulfonamide therapy and illustrate the danger of inadequate doses. In 3 of the 24 otitic meningitis, with petrositis in 2, developed after mastoidectomy, 2 died. The 1 who recovered did so after a prolonged use of sulfapyridine without operation in spite of the petrositis and a severe diabetes. In 11, otitic meningitis was diagnosed preoperatively, and treatment consisted of chemotherapy and surgical drainage of the focus of infection in the temporal bone. Two of 4 patients suffering from the pneumococcal infections recovered, only 4 of the 6 with meningitis due to hemolytic streptococci recovered after adequate chemotherapy and surgical treatment, and 1 patient with green producing streptococci died in spite of high concentrations of sulfapyridine and surgical treatment of an apical petrositis associated with epidural abscesses. The remaining 4 patients had definite meningitis but culture of the cerebrospinal fluid was negative. Two of these patients died, 1 of thrombophlebitis of the cavernous sinus and 1 of cerebrospinal meningitis. The other 2 recovered after intracapsular exploration and drainage of the petrous apex combined with adequate chemotherapy before and after operation. Among these 24 patients of the second group there were 4 for whom chemotherapy was used entirely too late and to 4 others the amounts given were inadequate. Therefore, as only 16 of the 24 patients received adequate chemotherapy the recovery rate for these 16 is 69 per cent as compared to 35 per cent for the 46 in the first group. Therefore, with chemotherapy and drainage, the recovery rate of adequately treated patients has been doubled during the last five years.

**Maine Medical Association Journal, Portland**

33 263-288 (Dec.) 1942

- Newer Knowledge Concerning Arterial Hypertension. L. B. Ellis. Boston—p. 263.
- Freudian Theories. Section I. Definitions. I. Newman. Augusta—p. 271.

**Michigan State Medical Society Journal, Lansing**

41 893-1012 (Nov.) 1942

- Toxemias of Pregnancy. Certain Criteria in Differential Diagnosis. P. E. Sutton. Royal Oak—p. 923.
- Acute Suppuration in Spaces of Neck. S. Ishler. Cincinnati—p. 936.
- \*Problems in Differential Diagnosis of Coronary Sclerosis. A. R. Barnes and R. D. Pruitt. Rochester, Minn.—p. 943.

**Coronary Sclerosis**—Barnes and Pruitt believe that specialization in heart disease, particularly in the diagnosis of coronary sclerosis, without an extensive general knowledge of internal medicine is fallacious. Coronary disease may infringe on and have to be distinguished from diseases affecting numerous adjacent organs. A discriminating history is indispensable in differential diagnosis, failure of which may lead to unwarranted and extremely hazardous surgical intervention when the pain of coronary thrombosis is situated in the upper portion of the abdomen, or the patient may be deprived of a much needed operation if lesions of the upper portion of the abdomen producing pain referred to the thorax are regarded as of cardiac origin. The diagnosis of angina pectoris is based on the history of symptoms and not on physical and/or laboratory data.

**Military Surgeon, Washington, D. C.**

91 499-618 (Nov.) 1942 Partial Index

- Primary Atypical Pneumonia. Report of Twenty Five Cases. J. H. Whiteley, A. Bernstein and M. Goldman—p. 499.
- Id. Etiology Unknown. D. M. Green and F. G. Eldridge—p. 503.
- Epidemic Meningitis. Report of Fifteen Cases at Fort Eustis. W. B. Borden and P. S. Strong—p. 517.
- Nasal Accessory Sinuses and Aviation Medicine. H. G. Bullwinkel—p. 522.
- Hypertensive Cardiovascular Disease in Panamanians and West Indians Residing in Panama and the Canal Zone. H. P. Marvin and E. R. Smith—p. 529.
- Cellulitis of Masticatory Structures. M. D. Gruber—p. 531.
- Dermatology and the War. M. H. Saffron—p. 559.
- Therapy of External Diseases of Eye. E. P. Burch, H. G. Rubin and W. W. Singer—p. 564.
- Method of Managing Shock. Jitters in Army Hospital of Cantonment. Type A. J. Surber—p. 574.
- Military Qualifications of Egotistic Type. M. E. Segal—p. 577.
- Vaccinia Autoinoculation. R. C. Green and J. M. Michener—p. 579.
- Regulated Group Exercise for Convalescent Patients. H. M. Childress—p. 581.

**Minnesota Medicine, St. Paul**

25 953-1030 (Dec.) 1942

- Wartime Problems in Industrial Health. C. M. Peterson. Chicago—p. 967.
- Minnesota's Industrial Health Program. L. W. Foker. Minneapolis—p. 970.
- Prevention and Treatment of Heat Collapse Among Industrial Workers. F. J. Elias. Duluth—p. 972.
- Diet and Muscular Fatigue. A. F. Henschel. Minneapolis—p. 974.
- First Aid to Injured Workman. R. F. McGandy. Minneapolis—p. 977.
- What the Medical Profession Can Do to Increase Safety and Health in War Industries. A. N. Wold. St. Paul—p. 979.
- Carcinoma of Gallbladder. Study of Sixty Cases. H. Mattson. Minneapolis—p. 985.
- Use and Abuse of Chemotherapy. W. W. Spink. Minneapolis—p. 988.
- Use and Abuse of Digitalis. M. Barron. Minneapolis—p. 990.

**Missouri State Medical Assn. Journal, St. Louis**

39 359-394 (Dec.) 1942

- Anatomic Considerations of the Heart. J. D. Guyot. Jefferson City—p. 359.
- Physiologic Considerations of Heart Disease. J. Jensen. St. Louis—p. 360.
- Proper Nomenclature. Its Value in the Matter of Statistics. H. W. Carle, St. Joseph—p. 362.
- Correct Method of Examination of the Cardiac Case. R. E. Myers. Joplin—p. 363.
- Rheumatic Heart. Common and Uncommon Manifestations of Rheumatic State in Childhood. W. M. Ketchum. Kansas City—p. 366.
- Clinical Considerations of Pericarditis. J. R. Smith. St. Louis—p. 369.



## Nebraska State Medical Journal, Lincoln

27 401-428 (Dec) 1942

- Present Day Problem in Tuberculosis B Goldberg Chicago—p 401  
Chemotherapy in Diseases of Genitourinary Tract W H Schmitz Omaha—p 405  
Management of Labor in Contracted Pelvis R Luikart Omaha—p 411  
Hemorrhage Complication of Labor W C Kenner Nebraska City—p 413

## New England Journal of Medicine, Boston

227 691-726 (Nov 5) 1942

- Tetanus Toxoid Immunization of Adolescents Skin Reactivity Allergy and Unfavorable Reactions J R Gallagher Constance D Gallagher and G G Kaufmann Andover Mass—p 691  
Adequate Clinical Records Professional Responsibility J H Pratt Boston—p 695  
Drug Therapy of Migraine Headache L S Trowbridge T J C von Sorch and M Moore Boston—p 699  
Intrinsic Diseases of Liver Simulating Acute Cholecystitis K B Lawrence and H M Clute Boston—p 701  
Primary Carcinoma of Appendix Associated with Acute Appendicitis Report of Case E L Young and S Wiman Boston—p 703  
Bile Pigments (concluded) C J Watson Minneapolis—p 705

227 857-892 (Dec 3) 1942

- \*Hemolytic Transfusion Reactions Due to Rh Factor A Preventable Danger L K Diamond Boston—p 857  
\*Treatment of Cancer of Prostate with Castration and Administration of Estrogen Preliminary Report R Chute and A T Willetts Boston—p 863  
Care of Patients Requiring Thyroidectomy O Cope and C E Welch Boston—p 870  
Digitalis Edema and Diuretics A S Freedberg and H L Blumgart Boston—p 874

### Hemolytic Transfusion Reactions Due to Rh Factor

—Diamond discusses the transfusion reactions that occurred in 10 recipients who were given blood compatible for blood groups but incompatible as to the Rh factor that is the donor's blood was Rh positive and the recipient's blood lacked the Rh factor and had a means of isosensitization previously, leading to the development of an anti Rh agglutinin. In another patient an anti Rh agglutinin was demonstrated early and a transfusion reaction was avoided. Isosensitization occurred in some patients as the result of previous transfusions with Rh positive blood, in others because of a fetus having Rh positive blood cells. In still another patient an anti Rh agglutinin of natural origin seemed to be present. Mixtures of the recipient's Rh negative cells and the donor's Rh positive cells were observed in the blood of 3 patients soon after the hemolytic transfusion reaction. This necessitated care in interpreting the test for Rh positive cell agglutination. In 2 women of childbearing age isosensitization to the Rh factor developed through the use of Rh positive blood for transfusion, and it seemed to have been the direct cause of the severe fetal erythroblastosis in the infant of a subsequent pregnancy. Following the hemolytic reaction, the use of Rh negative blood for subsequent transfusions caused no further difficulties.

**Cancer of Prostate**—The results that Chute and Willetts obtained in 37 patients with carcinoma of the prostate treated by castration and/or estrogen are reported. In 33, carcinoma of the prostate was proved by microscopic study and in 4 there was convincing clinical evidence. Two patients were treated with castration only, 8 with stilbestrol (diethylstilbestrol or diethylstilbestrol dipropionate) only and 27 with castration and stilbestrol. The effect of stilbestrol was equal to that of castration and stilbestrol, but the effect of stilbestrol alone lasted only during its administration. The general results were extremely satisfactory, and only 1 patient seemed to obtain no benefit. Three patients died during the year of the study. The effect, consisting in effective and lasting relief from the pain of metastasis, improvement in appetite, weight and strength a feeling of well being and decrease in the size and softening of the prostate, was rapid. In 9 of 13 with urinary retention treated with orchiectomy and stilbestrol, the size of the obstructing prostate was so reduced that the ability to void was reestablished. If the preoperative level of the acid phosphatase

was above normal it fell rapidly after castration and was still further reduced by stilbestrol. The alkaline phosphatase usually rose soon following castration whether or not stilbestrol was used. The 17-ketosteroids were lowered in most cases after orchiectomy. In 5 patients with bony metastasis demonstrable roentgenologically, followed for more than six months the metastasis was apparently progressing as usual. After castration libido and the power of erection disappeared but there were no other harmful effects. No dangerous or harmful effects followed stilbestrol therapy, but there were minor unpleasant effects which disappeared if the drug was discontinued or the dose decreased.

## New Jersey Medical Society Journal, Trenton

39 567-614 (Nov) 1942

- Correlation of Roentgen Ray Diagnosis of Lesions of Stomach and Duodenum with Operative Findings Selected Case Reports W J Marquis and C F Baker Newark—p 575  
Neurosyphilis in Relation to Ophthalmology I Levy Trenton—p 581  
Effect of Amphetamine (Benzedrine) Sulfate Propadrine Hydrochloride and Propadrine Hydrochloride in Combination with Sodium Delivinal on Appetite of Obese Patients S W Kalb Newark—p 584

## New Orleans Medical and Surgical Journal

95 211-258 (Nov) 1942

- X Ray Consultation T I St Martin Houma La—p 211  
Spread and Metastasis in Carcinoma of Cervix Uteri Their Significance in Planning Treatment B Pearson and M Garcia New Orleans—p 215  
Chemotherapy of Digestive Tract J A Bergen Rocher Minn—p 219  
Feeding Infants C A Stewart New Orleans—p 225  
Epidemiology of Endemic Typhus Fever in Southern United States W R Whitehouse New Orleans—p 227  
\*Clinicopathologic Study of Rheumatic Fever and Rheumatic Heart Disease in White and Negro Races F E Bruno and H T Engelhardt New Orleans—p 234  
Comments on Medical History of Louisiana as Taught in Public Schools R Matas New Orleans—p 238  
Experience in Selective Service Work T A Watters and W Thompson New Orleans—p 241

95 259-304 (Dec) 1942

- Clinical Applications of Recent Knowledge Concerning Blood Substitutes U Maes and H A Davis New Orleans—p 259  
Pharmacologic Basis of Selection of Anesthesia J Adriani New Orleans—p 266  
Anesthesia in Heart Disease W R Wirth New Orleans—p 273  
Anesthesia in Obstetrics M C Beck New Orleans—p 278  
Modern Management of Food Allergy M Shushan New Orleans—p 286

**Clinicopathologic Study of Rheumatic Fever**—An analysis by Bruno and Engelhardt of the discharge diagnosis of 187,987 patients from January 1939 through 1941 revealed 150 cases of acute rheumatic fever, an incidence of 0.08 per cent. Sixty six patients were Negroes and 86 were white persons. During the three years of the study there were 725 instances of rheumatic heart disease, 51 per cent of the patients were white and 49 per cent Negroes. There was no appreciable racial difference in active and inactive rheumatic heart disease. The data obtained from 16,121 necropsies revealed 102 cases of rheumatic heart disease, 46 of the patients were white and 56 were Negroes. The study suggests that Negro patients suffering from rheumatic heart disease tend to die at an earlier age than do white patients.

## North Carolina Medical Journal, Winston-Salem

3 579 622 (Nov) 1942

- Osteomyelitis of Frontal Bone E A Thacker Goldsboro—p 579  
Recognition of Visceral Transposition D deF Bauer Winston-Salem—p 584  
Use of Slowly Absorbable Morphine in Treatment of Addiction J F Merritt Greensboro—p 588  
Duodenal Diverticula D Cayer and G Baylin Durham—p 589  
Essential Drugs for the Physician's Bag G T Harrell Jr Winston-Salem—p 591  
Injection Treatment of Certain Conditions in General Practice W J Lackey Fallston—p 593  
Bromide Therapy and Intoxication R L Garrard Greensboro—p 597  
Proper Function and Highest Usefulness of Certain Medical Specialists J M Worthington Charlotte—p 599  
Pediatrics Changing Medical Specialty J S Hunt Charlotte—p 602

**Oklahoma State Medical Assn Jour, Oklahoma City**

35 453-498 (Nov) 1942

- Delivery of Sick Woman At or Near Term E P Allen Oklahoma City—p 453  
 Causes of Blindness in Oklahoma Analysis of Blindness of Recipients of Aid to the Blind from the Oklahoma Department of Public Welfare T O Coston Oklahoma City—p 454  
 Medicine and Pharmacy in War O L Prather Tulsa—p 460  
 Recent Advances in Treatment of Acute and Chronic Sinus Infection M D Henley Tulsa—p 463

**Pennsylvania Medical Journal, Harrisburg**

46 81-176 (Nov) 1942

- Maternal Mortality in Pennsylvania P Titus Pittsburgh—p 97  
 Low Back Pain of Industrial Workers W H Means Lebanon—p 103  
 Practical Problems in Diabetes H B Thomas York—p 108  
 Management of Squint in Children J van D Quereau Reading—p 112  
 Responsibilities of the District Maternal and Child Health Physician C H Phillips Wilkes Barre—p 117  
 \*Noncarcinomatous Postirradiation Ulcerations of Cervix H W Jacob J R Johnston and P Gross Pittsburgh—p 119

**Noncarcinomatous Ulcerations of Cervix**—The postirradiation complications involving the bladder and rectum, which are now recognized and frequently anticipated that were observed in 4 of the 99 patients with carcinoma of the cervix that Jacob, Johnston and Gross treated, occurred months or years after the radiation therapy and were caused by occlusive vascular changes. Difficulty is sometimes experienced in differentiating the postirradiation necrosis or ulceration from a recurrence or an extension of the malignant growth. A similar postirradiation ulceration in the cervix itself caused by vascular occlusion also would cause considerable diagnostic difficulty. The lesions of each of the 4 patients developed at or near the site of the original carcinoma suggesting a recurrence. In 1 this impression was so strong that, pending the biopsy report, a hopeless prognosis was considered and in 2 roentgen treatments were begun and then discontinued when microscopic study failed to reveal carcinoma. The classic vascular occlusive changes secondary to radiation were demonstrable in sections of the lesions from each of the patients. The vascular changes caused infarction with the associated necrosis and ulceration. Only microscopic examination of the tissues will disclose the true nature of the suspected lesions.

**Psychoanalytic Quarterly, Albany, N Y**

11 459-636 (Oct) 1942

- Psychopathic Characters on Stage S Freud—p 459  
 Reminiscences of Professor Sigmund Freud M Graf—p 465  
 Emotional Memories and Acting Out F Weiss Chicago—p 477  
 Defense Reactions in Anxiety States of Central Origin J Kasanin San Francisco—p 493  
 Freudian Mechanisms and Frustration Experiments D Rapaport Topeka Kan—p 503  
 Amazons in Ancient Greece Bernice Schultz Engle Omaha—p 512

**Rhode Island Medical Journal, Providence**

25 225-240 (Nov) 1942

- New Phases of Cancer Research H C Pitts Providence—p 225  
 Experiment in Sickness Insurance J E Farrell Providence—p 229

**Rocky Mountain Medical Journal, Denver**

39 821-884 (Dec) 1942

- Relation of Growth and Development to Pediatric Surgery H E Coe Seattle—p 838  
 Actual Disturbances of Endocrine Glands E H Ryncarson Rochester Minn—p 840  
 Review of Surgical Treatment of High Blood Pressure R M Stuck Denver—p 847

**South Carolina Medical Assn Journal, Florence**

38 279-306 (Nov) 1942

- Sciatica Justification for Conservative Treatment J W White Greenville—p 279  
 Work of the Duke Endowment with South Carolina Hospitals G P Harris Charlotte N C—p 282  
 Failures in Use of Miller Abbott Tube in Intestinal Obstruction A Hinson Rock Hill—p 284  
 Chronic Prostatitis A C Bradham Anderson—p 288

**Surgery, Gynecology and Obstetrics, Chicago**

75 675-800 (Dec) 1942

- New Operative Techniques in Management of Bowel Obstruction (1) Aseptic Decompressive Suction Enterotomy (2) Aseptic Enterotomy for Removal of Obstructing Gallstone and (3) Operative Correction of Nonrotation O H Wengenstein Minneapolis—p 675  
 Repair of Severed Tendons of Hand and Wrist Statistical Analysis of 300 Cases H Miller Detroit—p 693  
 Absorption of Sulfonamides During Labor H Speert Baltimore—p 699  
 Diagnosis and Treatment of Tuberculosis of Kidney H L Kretschmer Chicago—p 704  
 \*Tuberculosis of Female Genital Organs O Auerbach Staten Island N Y—p 712  
 Surgical Stabilization of Dislocated Paralytic Hips End Result Study H Hallock New York—p 721  
 \*Two Needle Oxygen Myelography New Technique for Visualization of Spinal Subarachnoid Space D Munro and C W Elkins Boston—p 729  
 Treatment of Pilonidal Sinus J E Dunphy and D D Watson Boston—p 737  
 Anatomy of Pelvic Autonomic Nerves in Relation to Gynecology A H Curtis B J Anson F I Ashley and T Jones Chicago—p 743  
 \*Left Sulphuric Abscess H Neuhof and N C Schlossmann New York—p 751  
 Management of Abnormal Vaginal Bleeding H J Stander C T Javert and K Kuder New York—p 759  
 Zinc Peroxide Dressing for Postoperative Anorectal Wounds C A V Burt and E J Pulaski New York—p 765  
 Basal Body Temperature in Disorders of Ovarian Function and Pregnancy A Palmer San Francisco—p 768  
 Technique of Skin Grafting E J Poth Galveston Texas—p 779  
 Essential Points in Operative Technique of Gastrectomy J L De Courcy Cincinnati—p 785  
 Hypermotility of Upper Lip C M Dorrance and P E Loudenslager Philadelphia—p 790  
 Technique for Transplanting Ulnar Nerve J R Ferintosh Edinburgh Scotland—p 792  
 Study of Tendon Implantations into Bone G A Kernwein Chicago—p 794

**Tuberculosis of Female Genitalia**—Auerbach states that from January 1933 to July 1941 52 cases of tuberculosis involving one or more organs of the female genital tract were revealed at the postmortem examination of 571 females with tuberculosis whose ages varied from 2 to 56 years. The fallopian tubes of 49 were involved the uterus of 29 the ovaries of 15 and the vagina of 2. Tubal tuberculosis was bilateral in 46, the abdominal ends were first and most extensively involved. The tubal tuberculosis was the result of a hematogenous tuberculosis, the hematogenous seedings occurred during a fresh primary complex from a tuberculous extrapulmonary organ or a chronic pulmonary tuberculosis. The size, shape and form of the tubes were not altered in the early stage of the disease, as the process progressed they became thicker and softer and on cross section were almost caseous. Tuberculous peritonitis developed in the 26 with the more extensive involvement. This caused a matting together of the tubes and the surrounding structures. The tuberculous process in the tubes began with the development of foci in the wall which, on perforation into the lumen, spread to the remainder of the tube. The tubes of 3 healed, in 2 with calcification and in 1 with beginning scar formation. In 26 of the 29 the uterine tuberculosis was the result of an intracavitary extension from the tubes, the uterus showed decreasing intensity of the process from the fundus toward the cervix. The cervix was infrequently tuberculous. The size and shape of the uterus were rarely altered even in extensive disease. The tuberculous process was usually limited to the endometrium but sometimes extended into the myometrium. In 3 the tuberculous process was part of a hematogenous dissemination, the foci were present in the wall and were unrelated to a tubal tuberculosis. In ovarian tuberculosis both ovaries were involved as the result of extension from the surrounding structures (perioophoritis). The vagina was infected from the tubes and uterus and contained ulcers and nodules which decreased in intensity from above downward. Primary tuberculosis was not encountered and the author doubts its occurrence.

**Two Needle Oxygen Myelography**—A method which uses oxygen and employs two needles for the roentgen visualization of the spinal subarachnoid space is described by Munro and Elkins. The method can be used to fill any or all of the space without distortion and as frequently as necessary without affecting later observations. The technique is based on the hydrodynamic laws that govern the substitution of gas for liquid in a closed container. The evening before the patient is given 1 ounce (30 cc) of castor oil by mouth and a soap-suds enema.

The following day he is placed in the lateral position on a tilt top x-ray table with a Bucky-Potter diaphragm. An adjustable webbing sling attached by its free ends to the table and looped about the patient's shoulders keeps him in place when the table is tilted. A low lumbar puncture is performed, followed by puncture at the cephalad level to be filled. If the entire canal is to be visualized, the cephalad needle is placed in the cisterna magna. If the thoracic and lumbar region is to be visualized the cephalad needle is placed at the desired level in the thoracic region. If the lumbar area alone is to be visualized the cephalad needle is placed between the twelfth thoracic and the first lumbar vertebra. Number 18 gage Fremont-Smith needles with three way stopcocks are used for the punctures. After spinal fluid is removed from each needle for protein determinations and cell counts the patient's head is lowered to 25 degrees below horizontal and both needles are opened. Fluid will flow from the cephalad needle and as this occurs, oxygen is slowly injected into the caudal needle. The injection is made from a sterile 50 cc syringe which has been filled from a small oxygen tank. The oxygen must not be injected under pressure. When spinal fluid ceases to flow from the cephalad needle and oxygen appears, both needles are closed. Stereoscopic lateral roentgenograms are now taken of the lumbar and thoracic levels. Oblique views satisfactorily replace the lateral and anteroposterior views in the cervical level. To fill the lumbar area 20 to 30 cc of oxygen has been found sufficient, 40 to 50 cc for the mid-thoracic and lumbar areas and 75 to 100 cc for the entire spinal canal. In the eleven months to January 1942, sixty-nine myelograms have been done by the two needle method on 60 patients. Thirty-seven of the 60 patients did not need surgical intervention. In 9 patients a diagnosis of protrusion of the nucleus pulposus following rupture of an intervertebral disk was made on the evidence of the myelogram and other data. The protruded nucleus was found at operation exactly as visualized on the myelogram. Laminectomy confirmed the two needle myelographic visualization of 1 case each of congenital absence of the sacrum, congenital duplication of the lumbosacral spine and traumatic distorting adhesions and scar formation between the dura and the cervical cord. An exploratory procedure for a ruptured intervertebral disk was carried out on 7 patients in spite of negative two needle myelograms, pathologic changes were not found. The operative observations disagreed with the myelogram in only 2 of the 23 patients operated on. 1 was a patient with a metastatic tumor of the sixth dorsal vertebra and a dynamic block with myelographic evidence of involvement of the spinal meninges at the same level and in 1 the myelogram was interpreted as positive for an extruded nucleus by one and negative by another surgeon. Exploration demonstrated a thin layer of unidentified abnormally placed tissue on the anterior aspect of the low lumbar dura. In 1 case a protruded nucleus was diagnosed and removed at operation without any previous visualization of the subarachnoid space. Thus, in 23 cases the method accurately depicted the spinal subarachnoid space in 20 was useful but not accurate in 2 and was not used in 1.

**Left Subphrenic Abscess**—The disparity between the mortality of right (35 per cent) and of left (75 per cent) subphrenic abscess at the Mount Sinai Hospital prompts Neuhoef and Schlossmann to consider 33 adequately documented consecutive cases of left subphrenic abscess observed at the hospital since 1928. During the same time 51 cases of right subphrenic abscess were observed. The authors say that the various organs bordering the left subphrenic space, and their mobility, render more complex the problem of diagnosis and treatment of left subphrenic abscess. Left subphrenic abscesses only followed antecedent intra abdominal infections. The almost invariable pathway of spread was by direct extension, and lymphatic dissemination hardly played a role. Rightsided gastroduodenal perforation was an unexpected cause of left subphrenic abscess. Clinical manifestations of left subphrenic abscess usually vague and sparse, often appeared relatively late in the disease. Indirect signs of thoracoabdominal involvement were usually more significant than direct signs of a subphrenic abscess. Conclusive evidence was a raised parietic left diaphragm but this was only occasionally present. Roentgen study of the diaphragm particularly lateral and oblique views is of importance in revealing the position of the diaphragm and the subphrenic shadow of the inflammatory process or abscess. Exploratory aspiration is

often imperative to establish the diagnosis. The study of the roentgenogram should be the chief guide to the site of aspiration. A subphrenic abscess may exist despite repeated negative aspiration, and then an exploratory operation is desirable. A subpleural approach is advocated for abscesses of the 'abdominal' type and a transpleural transdiaphragmatic approach for the 'thoracic' type. A two stage transpleural transdiaphragmatic operation was attended with poor results. A satisfactory one stage operation featuring a double sealing of the free pleura by two tiers of diaphragmatic sutures is described. The inclusion of right and left subphrenic abscess under subphrenic abscess is not desirable because of the difference in etiology, pathogenesis and mortality.

### Surgery, St. Louis

12 685-840 (Nov.) 1942

- Flow of Lymph from Burned Tissue with Particular Reference to Effects of Fibrin Formation on Lymph Drainage and Composition W. W. L. Glenn, Delores K. Peterson and C. K. Drinker Boston —p 685
- \*Experimental Pulmonary Edema Following Lobectomy and Plasma Infusion J. H. Gibbon Jr. and Mary H. Gibbon Philadelphia —p 694
- Renal Response to Hypertonic Sucrose Solutions C. Feher, S. Rodbard and L. N. Katz Chicago —p 705
- Aneurysm of Temporal Artery Spontaneous Case Cured by Operation R. K. Brown and R. H. Mehnert Buffalo —p 711
- End to End Ileocolostomy Indications for and Evaluation of Resection of Right Portion of Colon in One Stage for Malignant Lesions C. W. Mayo and C. P. Schlicke Rochester Minn. —p 716
- Double Loop Rectal Resector and Biopsy Forceps R. Turrell New York —p 729
- Method of Closing Pyloroantral Pouch in Antral Exclusion Operation O. H. Wangenstein Minneapolis —p 731
- Operative Technique for Intrathoracic Gutter with Special Reference to Maintenance of Airway W. H. Prioleau Charleston S. C. —p 742
- \*New Theory Concerning Etiology of Riedel's Struma J. L. De Courcy Cincinnati —p 754
- Fractures of Neck of Femur V. L. Hart Minneapolis —p 763
- Equalizing Lower Extremities Clinical Consideration of Leg Lengthening versus Leg Shortening G. S. Phalen Rochester Minn. and C. C. Chatterton St. Paul —p 768
- Surgical Treatment of Filarioid Cysts with Description of Author's Method of Demarcation and Closure G. S. Van Alstine Chicago —p 782
- \*Antibacterial Action of Certain Disinfectants A. Hoyt, R. T. Fisk and G. Burde Los Angeles —p 786
- Use of Tantalum Clips for Hemostasis in Neurosurgery R. H. Pudenz Montreal Canada —p 791

**Pulmonary Edema**—On the basis of their results with cats in trying to determine why there is pulmonary edema in some patients after thoracic surgery the Gibbons conclude that the edema occurs because of increased capillary blood pressure because of decreased colloid osmotic pressure of the blood plasma or because of an increased permeability of the capillary endothelium. They say that the use of plasma and blood transfusions in thoracic surgery must not be indiscriminate. When the cardiorespiratory function following or during a thoracic operation, has been impaired in any way it seems that when fluids, which tend to remain in the blood stream are given intravenously a certain degree of caution should be exercised and signs of pulmonary edema should be watched for.

**Etiology of Riedel's Struma**—De Courcy thinks that the true cause of Riedel's struma is a perithyroiditis and that the fibrous growth begins outside rather than inside the thyroid itself. It has always seemed to him that Riedel's struma is a vascular rather than a glandular disease that is, a disease which begins with a perithyroiditis resulting in secondary changes in the gland. The fibrous whorls found about the blood vessels are similar to those described by Goldblatt and his associates which follow partial occlusion of the renal blood vessels. The perithyroiditis with the adherent muscles probably causes a constriction of the thyroid vessels and their superficial tributaries and thus the fibrous changes of Riedel's disease ensue. Two recent case histories and microscopic observations are presented which the author believes, help to clarify his theory.

**Antibacterial Action of Disinfectants**—The relative bacteriostatic and bactericidal powers of six mercurial disinfectants commonly used for preparing the skin and for the cold "sterilization" of instruments against *Staphylococcus aureus* and *Escherichia coli* were tested by Hoyt, Fisk and Burde. All the mercurials had a relatively high bacteriostatic power but their bactericidal effect was low. Aqueous iodine and zephiran (an antiseptic containing oil of coconut), on the other hand appeared to be highly bactericidal and bacteriostatic.

## FOREIGN

An asterisk (\*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

## Journal of Mental Science, London

88 485-670 (Oct) 1942

- Psychopathic States D K Henderson—p 485  
Types of Psychopathic Personality A A W Petrie—p 491  
Some Experiences Among Naval Personnel D Curran—p 494  
Pentothal Sodium Narcosis W Blyth—p 504  
Psychometric Study of Dementia M B Brody—p 512  
\*Prefrontal Leukotomy J S McGregor and J R Crumlie—p 534  
Occurrence of Grasping Reflex in Postconvulsive Stage of Electrically Induced Seizures and Its Behavior in Various Mental Disease I F Kuno and F T Thorpe—p 541  
Psychosis of Association L G M Page—p 545  
Hormone Treatment of Acromegaly E L Hutton and M Reiss—p 550  
Changes in Output of 17 Ketosteroids After Shock Treatment Prefrontal Leukotomy and Other Procedures R E Hemphill L D MacLeod and M Reiss—p 554  
Corticotrophic Hormone in Treatment of Involutional Melancholia with Hypopituitarism and Pituitary Cachexia R E Hemphill and M Reiss—p 559  
Blood Barbiturate During Prolonged Narcois R F Chatfield and D N Parrott—p 566  
Study of Pathologic Drunkenness N P Moore—p 570  
Ammonium Chloride Treatment of Schizophrenia K A H Rizvi—p 575  
Thiocyanate Compounds in Urine of Schizophrenics T D Zurehkevich and R M Shulgan—p 578  
Predictability of Suicide F Reitman—p 580

**Prefrontal Leukotomy**—McGregor and Crumlie performed prefrontal leukotomy on 6 patients suffering from melancholia, 12 from schizophrenia and 2 from non-systematized delusional insanity. Of these, 3 with melancholia and 2 with schizophrenia have made a complete adjustment and have resumed their former activities. The mortality for the series was 10 per cent: the first death, that of a man aged 53 with melancholia, was caused by bronchopneumonia following secondary cerebral hemorrhage, and the second death, that of a woman aged 32 with schizophrenia, resulted from cerebral softening following ligation of the left internal carotid artery for deep seated cerebral hemorrhage. The bleeding must have occurred at the time of operation, but this was not apparent when the wounds were sutured. The operation offered hope for a return to a more or less normal life in certain selected cases.

## Lancet, London

2 503-530 (Oct 31) 1942

- Some Aids to Operative Surgery W A Cochrane—p 503  
\*Postvaccinal Eruptions E Bloch—p 504  
\*Effect of Sulfonamide Preparations on Experimental Infected Wounds F Hawking—p 507  
Plasma Viscosity in Pulmonary Tuberculosis A K Miller and R B Whittington—p 510

**Postvaccinal Eruptions**—Bloch states that toward the end of May 1942 a patient with unrecognized oriental smallpox arrived in Glasgow on board ship and was removed to a hospital. During the following two months there ensued in and around Glasgow 9 cases directly connected with the ship, 20 shore cases apparently unconnected with the ship or with each other and 4 cases secondary to the latter group. Two of the patients connected with the ship and 6 of the others died. Wide measures of surveillance and vaccination of contacts had been practiced from the outset. Thanks to the enlightened response of the public and to the cooperation of the doctors and the press, about half a million vaccinations were performed during July. Many instances of regional or generalized vaccinal rashes appeared among children and adults. Many of milder and sparse eruptions must have eluded medical observation. However, records are available of 123 regional or generalized postvaccinal eruptions. One of the 123 patients died. Most of the postvaccinal eruptions appeared within seven to eleven days after a well defined positive primary vaccination of children. A regional papular eczema erupted seven weeks after vaccination of an infant. Etiologic observations were negative. Of 98 who had erythematous or urticarial eruptions 37 had papular urticaria and 20 pleomorphic types of erythema multiforme. Though regarded as impetigo bullosa the eruption of a group of patients simulated multiple autoinoculations. No instance was classified as generalized vaccinia. A previously healthy breast fed boy

whose vaccination at 8 weeks was positive died ten days later of exfoliative dermatitis, that is, on the sixth day of illness or the fifth day of the complicating eruption, the complicating disease was regarded as staphylococcal.

**Sulfonamides and Experimental Wounds**—Hawking describes the therapeutic activity in experimental wounds filled with a sulfonamide paste without more than superficial cleansing and covered by an occlusive dressing for several days. This is the treatment that has been suggested by Gardham in a communication to the War Wounds Committee of the Medical Research Council for the treatment of wounds under the battle conditions of modern warfare. The persistence of the sulfonamide in a wound can be prolonged by incorporating sulfanilamide in an oily medium or by using a less soluble sulfonamide, such as sulfathiazole or sulfapyridine. Therapeutically (i.e., prevention of streptococcal septicemia) the best results were obtained with a preparation of sulfathiazole consisting of microcrystals suspended in saline solution, with sulfanilamide, which is more soluble and more rapidly absorbed better results were obtained with oily than with aqueous preparations. Microscopically the presence of an oil in the wounds caused undesirable tissue reactions. Of the oils tested, cod liver oil was especially injurious in this respect and liquid petrolatum was moderately deleterious, while cottonseed oil was the least harmful. The best preparation was the microcrystalline preparation of sulfathiazole, which was also the most effective therapeutically. Judging by reports from forces in the Middle East, the sulfonamide dressing of a wound is inferior to excision, but since many exigencies of war render surgical operations impracticable, dressing the wounds with a semifluid sulfonamide preparation is advantageous in restraining bacterial growth until more adequate treatment is feasible in these circumstances the best preparation to use is the microcrystalline suspension of sulfathiazole or, failing that, an aqueous preparation of sulfanilamide.

## Medical Journal of Australia, Sydney

2 283-312 (Sept 26) 1942

- Aspects of the Life of a Colonial Surgeon The Honorable W L Crowther I R C S C M / S Sometime Premier of Tasmania W E I H Crowther—p 283  
Control of Venereal Disease in the Army N M Gibson—p 290  
Trophoblasts and Treatment of Venereal Disease at Public Clinic J C Booth—p 292  
Urethritis in the Male V A B Willis—p 294  
\*Gastric and Duodenal Ulcers in South Australia J B Cleland—p 295

2 313-334 (Oct 3) 1942

- Injuries and Diseases in Australia Attributable to Animals (Insects Excepted) V Mammals Fish Spiders Vites Ticks et Cetera Shell fish Sponges Protozoa J B Cleland—p 313  
Some Aspects of Medical Disease Confronting Us in Our War with Japan C Fortune—p 320

**Gastric and Duodenal Ulcers in South Australia**—The data from 5,000 South Australian postmortem examinations that Cleland presents reveal that gastric ulcers greatly preponderated over duodenal ulcers, whether only actual ulcers found at necropsy or scars of healed ulcers were considered. There were 110 gastric to 70 duodenal ulcers, or, if the scars are added, 123 gastric to 84 duodenal ulcers. For each five year period during the twenty-two years during which these necropsies were performed the number of gastric ulcers exceeded that of duodenal ulcers. There has been no change in the relative incidence over these years. In persons less than 50 years of age the incidence of gastric and duodenal ulcers was about equal, but after this age there was a rapid increase in the incidence of gastric ulcers. There was a preponderance of peptic ulcers in men: 150 open ulcers in men to only 30 in women. The sex ratio of gastric ulcers is about 4 men to 1 woman and that of duodenal ulcers is about 7 men to 1 woman. The tabulated results show that the death of 58 of the 110 subjects with gastric ulcer was the result of the condition, in 23 death was directly or indirectly due to hemorrhage, in 20 to the more immediate effects of rupture, 4 died from subphrenic or other peritoneal abscesses, 6 after gastrectomy or gastroenterostomy, 1 from massive pulmonary embolism, and in 4 instances death was due to the ulcer but the exact cause was not tabulated. Forty-two of the 70 with duodenal ulcer died as a result of the condition, 12 from hemorrhage or its effects, 22 from the more

immediate effects of rupture, 4 from subphrenic or peritoneal abscesses, death followed gastroenterostomy in 3 and in 1 the exact cause was not tabulated. No pathologic lesion occurred in other parts of the body, with the doubtful exception of hydatid cysts with sufficient frequency to be likely to be connected with the etiology of peptic ulcers. Any possible connection of the hydatid cysts, apart from anaphylactic reactions, would probably consist in injury to the mucosa during the passage through it of the hexacanth embryo.

### Ophthalmologica, Basel

104 1-64 (July) 1942

Mode of Action of Antiglaucomatous Operations Especially Diathermization of the Ciliary Body. L. Weekers and R. Weekers—p. 1

Direct Measurement of Total Refraction Power of Living Human Eye. H. Goldmann and R. Hagen—p. 15

\*Use of Prostigmine in Treatment of Glaucoma. Jenny Kull—p. 23

**Prostigmine in Treatment of Glaucoma**—Kull demonstrates that prostigmine causes in the normal rabbit eye a rise in pressure followed by a decrease. In patients with glaucoma prostigmine produces a decrease in intraocular pressure. Decrease in pressure can be effected in some patients who previously were treated without success with pilocarpine. The most definite effect was observed with prostigmine in simple chronic glaucoma. Prostigmine is administered to human subjects in solutions from 1 to 3 per cent, in exceptional cases in 5 per cent solutions. The 3 per cent solution is generally well tolerated, whereas the 5 per cent solution frequently causes irritation.

### Schweizerische medizinische Wochenschrift, Basel

72 753-780 (July 11) 1942 Partial Index

Fatigue and Disease. R. Stachelin—p. 753

\*Mode of Transmission of Typhus. Observations on Laboratory Infections. W. Löffler and H. Mooser—p. 755

\*Neurotoxic Action of Sulfonamide Derivatives. L. Puhr—p. 761

Modification of Bacterial Respiration by Sulfathiazole. W. Frei—p. 763

Treatment of Pneumococcal Peritonitis with Sulfathiazole. H. Kaelin—p. 765

Action of Roentgen Rays on Testes of Rats. H. von Wattenwyl—p. 765

**Transmission of Typhus, Laboratory Infections**—Löffler and Mooser review the early literature on typhus and its dissemination, giving particular attention to the question of whether it is the bite or the feces of lice which transmit the disease. They consider the following possibilities: (1) scratching, in the course of which feces and intestinal contents of crushed lice are rubbed into the wound, (2) inoculations by the bite of lice by means of the suction apparatus which has been contaminated with feces, (3) introduction of feces into the conjunctiva after the crushing of lice with the fingers (persons infested with lice are in the habit of crushing the lice between the finger nails), (4) inhalation of scattered feces of lice. The authors made their observations on 6 cases of laboratory infection with murine typhus. A percutaneous infection by injury could be excluded in all of them. Droplet infection by virus disseminated in the room must be considered responsible for the infection, so that the respiratory tract is without doubt the port of entry. This was the only possible way in which one of the patients could have been infected, she had never had direct contact with infectious material, she had only once entered the room in which, immediately before, nasal infections of animals had been carried out. The authors suggest that the catarrhal symptoms on the part of the air passages at the onset of the disease is a specific symptom that directs attention to the port of entry. As is usually the fact, the patients required considerable nursing care, but in spite of this there were no further infections. A droplet infection from man to man is not likely. This corresponds to all former observations on the noninfectiousness of deloused patients. Prophylactic vaccination against typhus does not confer complete protection against the disease but probably explains the mild course in 1 of the cases. A survived attack of typhus apparently confers a high resistance even against massive laboratory infections. In view of the fact that many persons who have been vaccinated against typhus contract the disease and that immunized animals can be infected by the nasal route, it is recommended that the personnel of delousing stations be immunized and equipped not only with protective clothing but also with gas masks.

**Neurotoxic Action of Sulfonamide Derivatives**—Although numerically the nervous disturbances are comparatively small among the secondary effects of the sulfonamide derivatives, they deserve attention because they persist for some time after cessation of the medication. Puhr describes his studies on four groups of 8 leghorn chicks. The tests were made with sulfanilamide, sulfapyridine, sulfamidomethylsulfanilamide and sulfamethylthiazole which were administered by means of an esophageal tube in the form of a 10 per cent suspension that had been stabilized with tragacanth. The daily dose was 0.33 Gm per kilogram of body weight. The treatment was continued for seventy days. The results of these tests are recorded in a table, which reveals that 7 birds died during the treatment and 2 others were sick at the end of the treatment. Sulfanilamide and sulfapyridine had the highest and sulfamethylthiazole the lowest morbidity rates. In the development of the surviving chicks a similar tendency was evident. The neurotoxic manifestations were identical in character but not in degree, first there was contracture of the toes, later a spastic atactic walk and finally the gait was reeling and required the use of the wings. There was considerable emaciation. The birds stopped movements and died within a few days. Necropsies disclosed no gross organic changes. One bird of each group was examined for microscopic changes in the nervous system, particularly the sciatic nerve, with negative results. The spinal cords of 2 chicks were examined and changes were detected so that the author concludes that the anatomic basis of the neurologic symptoms is not a peripheral neuritis but rather a funicular lesion of the spinal cord. He admits, however, that his material was too small to justify conclusions. He failed to produce polyneuritis in pigeons by the administration of sulfamethylthiazole. He emphasizes that the doses he used for the chickens were large and that comparative amounts are never used for human subjects. It is also surprising that the neuritis occasionally seen in human subjects was never developed in chicks or pigeons, in spite of high doses. Thus the animal experiments permit no explanation of the fortunately rare neurotoxic secondary effects, which always seem to have the character of peripheral lesions. The observation of the relatively slight neurotoxic action of sulfamethylthiazole in comparison to other sulfonamide derivatives is in agreement with numerous clinical reports.

### Arquivos da Assistencia a Psicopatas do São Paulo

7 5 289 (March-June) 1942 Partial Index

\*Neurologic Aspects of Insulin Coma. P. Pinto Pupo—p. 5

Diagnosis of Cerebral Cysticercosis During Life of Patients. Cases. D. Lioba Silva—p. 223

**Neurologic Aspects of Insulin Coma**—Pinto Pupo made observations on 64 patients with schizophrenia in the course of insulin coma. He found that high doses of insulin cause the appearance of neurologic signs that occur with a definite regularity in definite sequence. Neurologic manifestations of insulin shock are uniform, showing differences in intensity but not in quality. In 56 out of 64 cases a type of symptomatology was observed that could be called "classic." Here phenomena of liberation of lower mechanisms were striking. In 5 cases there were observed hypotonia and akinesia. In 2 cases shock did not progress to coma in spite of high doses. In 1 case the clinical picture was dominated by phenomena of hypertonia of the parkinsonian type. Insulin shock permits observation of progressive "dissolution" of nervous functions, thus offering an excellent means of studying nervous physiopathology. The neurologic signs of the insulin shock begin with cortical phenomena followed by those of liberation of the pyramidal tract functions and preceding the extrapyramidal signs. Phenomena of automatic functioning of the brain stem systems, characterized by decerebrate rigidity and ocular disturbances as well as by circulatory, respiratory and thermic symptoms, appear late. Among the most striking phenomena observed is the decerebrate rigidity with its semeiologic characteristics. Decerebrate rigidity takes place in quadriextension of extremities, but the types of flexion of the upper extremities as well as those of extension of the lower extremities are incomplete. Hypertonia of decerebration is an entirely reflex phenomenon. The gradual passage from

the pyramidal to the decerebrate type of rigidity allows their complete separation because of their peculiar semeiologic characteristics. The order of the appearance of pyramidal phenomena of liberation and the lack of correlation among them during insulin shock present a strong argument in favor of the interpretation of these manifestations as depending on different systems. Hyperreflexia, Babinski and similar signs, as well as hypertonia are manifestations of liberation of different systems from their subordination to the pyramidal system. Hypothalamic nervous mechanisms, modifiers of arterial pressure, can work reflexly in consequence of external stimulation when liberated from the subordination to higher centers. This fact may explain the arterial hypertension observed in the first phase of the convulsive, epileptic or metrazol crisis.

### Medicina, Madrid

10 165-251 (Sept) 1942

- Spectroscopy in Medicine. II. Basis of Spectroscopic Analysis of Absorption and Laws Governing It. F. Enriquez de Salamanca. F. Poggio Morana and P. de Agustín Giménez—p. 165  
Traumatic Factor in Detachment of Retina. B. Carreras—p. 177  
Amebiasis. J. Covaleta Ortega—p. 188  
Hypophyseal Cachexia. J. Leon Cañero—p. 206  
\*Study of Lung in Whooping Cough. D. M. Parra—p. 223  
Diagnosis of Persistence of Ductus Arteriosus. M. Ruiz Rivas—p. 232  
Estrogenic Activity of Some Aromatic Ketones and Carbons. J. Monguio and J. Monche—p. 243  
\*Four Cases of Poisoning with Hemlock Roots. E. Montañes del Olmo—p. 249

**Lung in Whooping Cough.**—Among pathognomonic auscultatory signs of whooping cough Pospischill considers fine and moderately coarse rales at the bases during the early stage of the disease and coarse rales which can be heard in larger areas of both lungs as the lesions become diffuse. In the advanced cases only coarse rales are heard. Parra reports his observations on 240 cases, which he classifies into two groups. The first group comprises 103 cases all of which present some deviation from the usual course of the disease such as elevation of temperature, alteration in the usual blood picture of whooping cough, change in the respiratory rhythm and appearance of areas of dulness. This group also included patients with a positive tuberculin test although an active tuberculous process had not been established. There were patients in this group with roentgenologic and clinical signs of bronchopneumonia or pneumonia. Many other cases, particularly those with a protracted course and mild fever, presented diagnostic problems. The second group comprised 137 cases in which the course of the disease was typical and the tuberculin test was negative. This group was carefully studied, roentgenograms being made every eighth day. Attempt was made to verify Gottche's observations on the lungs of infants with whooping cough and on his necropsies in which he had observed perivascular, interstitial and peribronchial inflammation. Gottche concluded that whooping cough should not be considered as a catarrh of the upper air passages but rather as a chronic interstitial pulmonary inflammation. On the basis of his own studies Parra reaches the following conclusions: 1. The clinical signs described by Pospischill as characteristic for the whooping cough lung were observed in 50 per cent of the cases particularly in the mild cases. 2. The picture described by Gottche was encountered in only 3. 3. Hilitis and cord shaped shadows were observed in 30 per cent. 4. In 67 per cent the roentgen appearance was extremely difficult to differentiate. 5. The roentgenograms were not indicative of the intensity of the disease process. 6. Roentgenologic appearances may persist for some time after the disease has run its course.

**Hemlock Poisoning in Four Children.**—Montañes del Olmo reports observations on 4 children of the ages between 5 and 9 years who had eaten roots of poison hemlock (*Conium maculatum*) because they resembled carrots. When seen eight hours later the children were delirious and their pupils showed maximal dilatation and failure to react to light. The pulse was extremely rapid. Aspiration and washing of the stomach yielded clean fluid. Treatment consisted in administration of a solution of sodium sulfate, Hayem's serum and camphor liniment. All children recovered.

### Revista Chilena de Pediatría Santiago

13 701-783 (August) 1942

- \*Sulfonamide Therapy in Infants. M. J. Del Carril, G. Foley, A. Iarcuna and E. Sojo—p. 701  
Artificial Feeding of Healthy Infants. P. Araya Ch—p. 716  
Hypertrophic Cervical Meningitis of Tuberculous Origin. R. Matte—p. 768

**Sulfonamide Therapy in Infants.**—Del Carril and his collaborators stress that in order to obtain best results with sulfonamides the treatment must be early, intense and limited. Among 52 cases of bronchopulmonary disease the authors record thirty successes and twenty-two failures. They regard these figures as encouraging, particularly because this group included a number of cases of bronchopneumonia in which sulfonamides are of little value. They call particular attention to the frequency of relapses when the sulfonamide medication is discontinued a few hours after the fall in temperature. They insist that medication should be continued for from thirty-six to forty-eight hours longer in order to provide time for the absorption of the pulmonary focus and the stimulation of the defense powers. In pulmonary abscess sulfathiazole proved unsatisfactory. Surgical treatment is here irreplaceable. Sulfonamide treatment has reduced the high mortality of purulent meningitis in infants. In pneumococcal meningitis the mortality was 100 per cent before the sulfonamide era but of the 23 patients with this type treated by the authors with sulfapyridine 7 survived. Of 5 patients with meningococcal meningitis 3 were cured and 2 died but all 3 with influenza meningitis died. In erysipelas of infants sulfanilamide proved highly successful. Of the 20 patients, some of whom were gravely ill, only 2 died, 1 of these had bronchopneumonia as a complication and the other was a weak prematurely born infant. In 11 cases of acute enterocolitis in which the authors employed sulfaguanidine the results were more prompt the earlier the treatment was instituted.

### Revista Clínica Española, Madrid

5 227-298 (May 30) 1942 Partial Index

- Diabetes Mellitus and Male Sex Hormones. M. Schachter—p. 277  
Roentgenologic Exploration with Barium Paste as Determining Cause of Acute Perforation of Gastrointestinal Ulcers. A. G. Brion—p. 231  
Studies on Lathyrism. C. Jimenez Diaz and F. Vivanco—p. 234  
Studies on Cardiorespiratory Insufficiency. C. Jimenez Diaz, A. Alemany and J. Quintero—p. 241  
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**Glycogenosis in Child of Twenty Months.**—Ortiz Ramos and Pérez Martínez present the history of a child aged 20 months with symptoms of glycogenosis (von Gierke's disease). The liver was enormously enlarged. The child had convulsions early in the morning and hypoglycemia before breakfast. The child was extremely sensitive to insulin. Injection of epinephrine did not affect the blood sugar. The urine contained sugar and acetone and the blood sugar curve was of diabetoid type. The authors agree with Jimenez Diaz that glycogenosis is caused by an insufficiency in the secretory functions of the anterior pituitary, the growth hormone and the insulin antagonistic hormone being chiefly concerned. It is assumed that an embryonal condition of the liver exists and that a hereditary predisposition plays a part.

**Growth Promoting Nonthiamine Factor in Liver Extract.**—In the course of studies on the biologic value of various legumes, particularly chick peas (*Lathyrus sativus*), Jimenez Diaz and Vivanco observed that rats fed exclusively on chick peas exhibited retarded growth. The addition of an animal protein, even of low biologic value, such as gelatin, was found to normalize the growth curve. The authors experimented with the addition of liver extracts and of various vitamins to an exclusive chick pea diet. They found that deproteinized liver contains a thermolabile factor which differs from vitamin B<sub>1</sub> and is capable of normalizing the growth of rats fed with chick peas. Since the same growth stimulus can be produced with animal proteins (gelatin or casein) this factor is assumed to promote the utilization of vegetable proteins in the intestine of rats.



## Book Notices

**Changes in the Knee Joint at Various Ages With Particular Reference to the Nature and Development of Degenerative Joint Disease** By Granville A. Bennett M.D. Associate Professor of Pathology Harvard Medical School Boston Hans Walne M.D. Research Fellow in Medicine Harvard Medical School and Walter Bauer M.D. Associate Professor in Medicine Harvard Medical School Cloth Price \$2.50 Pp 97, with 9 illustrations and 31 plates New York Commonwealth Fund London Oxford University Press 1942

The authors report a study of knee joints of 63 persons ranging in age from 1 month to 90 years, removed post mortem or by amputation. The investigation was made on material taken only from patients without a record or physical findings of joint disease and was undertaken primarily to establish a norm for degenerative changes seen in these joints with advancing age. Other factors, such as excessive trauma and associated specific joint disease were thus ruled out as possible agents in the pathogenesis of the lesions described.

Complete macroscopic, microscopic and x-ray studies were made of all joints. Detailed microscopic examination of weight bearing, non-weight bearing, contacting and noncontacting, as well as the marginal areas of the joint surfaces with reference to osteophyte formation were made. Changes in the menisci, synovia and blood vessels were correlated with the changes noted in the cartilaginous and bony components of the joints.

The material is arbitrarily divided according to decades of life, and the changes are recorded for each ten year period from the first to the tenth. Macroscopic and microscopic changes in the articular surfaces and menisci were first noted in the second decade and became progressively more apparent after maturity. After 15 years of age and subsidence of growth activity, increased prominence of the articular margin at the synovial junction was first noted, although obvious x-ray evidence of marginal proliferation and osteophyte formation was not noted until the seventh and eighth decades.

The minimal changes demonstrable by x-ray examination in all cases were never consistent with the pronounced degree of macroscopic and microscopic degeneration seen in each respective decade. Degenerative changes in the menisci followed closely those of the articular cartilage, whereas the synovia remained relatively unaltered throughout. No evidence of any but incidental association between arteriosclerotic changes in the vessels and joint degeneration was noted.

The section of descriptive morphology is followed by an analytical interpretation of the authors' findings in the light of work of others, and a subsequent section on various concepts of the genesis of the joint changes is likewise approached from a historical point of view. With regard to the pathogenesis of osteophyte formation, the authors suggest that the result of loss of articular cartilage substance and elasticity leads to increased traction on the peripheral joint margins with weight bearing. The resulting functional stress plus other nonmechanical factors lead to hypertrophy and hyperplasia of the tissues in these regions.

The final chapter reviews critically the theories of etiology of degenerative joint disease and suggests possibilities as to future lines of investigation. The authors conclude not only that the problem deals with processes of tissue aging in general but that articular surfaces are subject to mechanical and biologic handicaps quite distinct from other tissues which predispose these structures to early and progressive senescence.

The monograph furnishes a comprehensive, critical review of the literature and current thought regarding degenerative or hypertrophic arthritis and provides a valuable working volume for those interested in the fundamental problems and pathology of joint disease.

**The Modern Treatment of Venereal Diseases** By E. T. Burke D.S.O. M.B. Ch.B. Cloth Price 12s 6d Pp 105 with 6 illustrations London John Bale Medical Publications Limited [1942]

As indicated in the foreword by Dr W. Allen Daley, this was the last manuscript completed by Dr Burke before his death. In such a small volume it is almost impossible to do more than touch the most salient points in the treatment of syphilis. In fact the author constantly refers the reader to his larger volume "Venereal Diseases" (London, H. K. Lewis & Co., Ltd., 1940).

He still believes in the use of Zittmann's decoction in certain cases of malignant syphilis "in refractory, relapsing and drug inert patients." He thinks the effects are due to the presence of two saponins in the sarsaparilla root in the compound. He prefers liposoluble bismuth and likes no oral bismuth compounds. He thinks there is a place for acetarsol (acetarsone) for adults (sailors and travelers, long distance lorry drivers and others). He considers mapharside (mapharsen) inferior and causative of disquietingly high incidence of toxic effects. This certainly is not true of our American product. He is fearful of sulfarsphenamine and bismarsen because of a tendency to blood dyscrasias and exfoliative dermatitis; he prefers neoarsphenamine.

His criteria of cure are as follows: 1. Negative Wassermann and Kahn tests at intervals of thirteen weeks for two years after treatment. 2. Absence of clinical and radiologic evidence of syphilis. 3. Negative cerebrospinal fluid at the beginning during and at the end of the observation period.

Burke evaluates treatment in terms of therapeutic units for various arsenicals and bismuth compounds and considers that an efficiency index of more than 60 assures the patient with an early syphilis of a cure. This is assured by the formula  $E = \frac{\text{Therapeutic units} \times 100}{\text{Weeks}}$ . To be sure this method of evaluation

of therapy may be worth while, but it is rather cumbersome. His data with it are quite similar in end results to those in American clinics. He is a firm believer in the use of continuous therapy for early syphilis, using alternating courses of arsenicals and bismuth compounds. In fact, he was the first man in England to accept this method of therapy. In chronic syphilis he is not so sure of the value of his efficiency index. Certainly it shows that a patient receiving less than an index of 60 could not hope for a cure. He is a firm believer in the use of intravenous iodides in late syphilis and central nervous system syphilis—here along with fever therapy, tryparsamide and liposoluble bismuth. In congenital syphilis we are surprised to note that he advises intravenous iodides for interstitial keratitis. The Cooperative Group, Klauder and others have called attention to the irritating effects of this agent in such a situation. No mention is made of fever therapy for it.

The remainder of the book is devoted to gonorrhea and so on. Only a few paragraphs are devoted to chancroids and only a single paragraph to venereal lymphogranuloma which is even more important and far more crippling.

It is doubted that this small book would be of much value to American readers. It is too compressed. Moreover the English names for antisyphilitic agents would be confusing for the average physician.

It is to be regretted that Dr Burke, a great leader in the fight against venereal diseases in England, is no longer with us.

**La digital. Estudio clínico. Técnica del tratamiento. Resultados.** Por el Doctor Alejandro Garretón Silva, profesor titular de la Facultad de medicina de la Universidad de Chile. Santiago. Cloth Pp 143 with one illustration. Santiago. Empresa editora Zig Zag S. A. 1942.

The author attempts in this small volume to present to his countrymen a fairly complete discussion of the various aspects of digitalis which in his opinion are essential to its intelligent and adequate therapeutic use. After a brief historical introduction he points out that cardiac cases are numerous in Argentina as a justification for the presentation of this succinct discussion. He then discusses the drug digitalis, the chemical structure of the contents of the leaf, the preparations and the choice of the most useful ones. Along with this he lays much emphasis quite rightly on biologic assay and proceeds to discuss briefly the mechanism of its therapeutic and toxic actions and its effect on the electrocardiogram. Turning then to its clinical employment he discusses this phase under twelve separate headings and then goes on to chapter four, in which he presents in moderate detail the questions of dosage, the practical use of the drug under various conditions, its maintenance dose and its use as a means of preventing decompensation, along with its contraindications, and he further mentions agents which he considers to be contraindicated in the presence of digitalis administration, as well as those medications which are useful as auxiliaries to digitalis in the treatment of the cardiopathic patient. He closes with a bibliography of about seven pages which, while helpful, is little more than briefly representative of the more important



work of the last two decades. In general his recommendations are perhaps a little on the conservative side. It is evident that the author accepts very largely the influence of American cardiology and pharmacology. Unfortunately he has not supported his statements by personal experiences in the form of case histories or group studies on cases, although he has documented them from the literature. The typography and makeup of the volume are both satisfactory. There is an erratum sheet of eight items which certainly does not represent all of the errata observed in the book. All in all the volume is acceptable and should prove of considerable constructive help to the medical profession in Argentina and perhaps well beyond its borders.

**Pathology and Treatment of War Wounds.** By Sir Almroth E. Wright M.D. F.R.S. Director of the Inoculation Department and Principal of the Institute of Pathology and Research, St. Mary's Hospital, London. Researches from the Inoculation Department, St. Mary's Hospital. Cloth. Price 21s. Pp. 208 with illustrations. London: William Heinemann Ltd. 1942.

This volume consists of a collection of papers and lectures by Sir Almroth Wright and his associates during World War I. Articles have been selected from the Proceedings of the Royal Society of Medicine of 1915 and the *Lancet* of 1916, 1917, 1918 and 1919. The papers deal with problems of wound infections and their treatment, the growth of the bacillus of gas gangrene, acidemia in gas gangrene, acidosis of shock and suspended circulation, the physiology of wounds and related topics. The object of the volume presumably is to make more available for use in World War II information gained in World War I. The eminence of the author as a pioneer in the field of infectious disease makes the collected papers of particular interest to students of the problems of wound infections. Nevertheless the rapid development of sulfonamide therapy within the past few years and the newer modes of thinking about the therapy of infection make much of the discussion seem queer today. The terms "apo-phylaxis," "epi-phylaxis," "ec-phylaxis" and "kata-phylaxis" seem almost quaint now. The character of the war wounds of World War II has probably changed many of the modes of treatment as compared with World War I. It would be unwise, however, to forget some of the important lessons derived from the wounds of the first world war, and for that reason this volume should be in the hands of physicians and surgeons concerned directly with these problems. Sulfonamide therapy has not made obsolete the basic principles of immunology, and it will be unfortunate if overenthusiasm for chemotherapy should lead to the forgetting of lessons learned at great cost in the past. The volume is well printed, well bound and adequately illustrated. If for no other reason than a historical one its publication, in the opinion of the reviewer, is worth while.

**An Introduction to Materia Medica and Pharmacology.** By Hugh Alister McGuigan Ph.D. M.D. Professor of Materia Medica, Pharmacology and Therapeutics, University of Illinois College of Medicine, Chicago, and Elsie E. Krug B.S. R.N. Science Instructor, St. Mary's School of Nursing, Rochester, Minn. Third edition. Cloth. Price \$3.50. Pp. 779 with 83 illustrations. St. Louis: C.V. Mosby Company. 1942.

Since McGuigan rewrote the older Brodie textbook on materia medica in 1936, two more editions have been necessary. This attests the book's usefulness. The present edition is longer by 200 pages than the first, and to the reviewer, who has taught the subject for several years, this seems unfortunate. The book has become encyclopedic, which adds to its value as a work of reference but discourages the busy student nurse who wants, and should have, a concise, pertinent textbook. A single course involving both pharmacology and therapeutics, as in the usual materia medica for nurses, is difficult to present because of the two approaches necessary, that from drugs and that from diseases. McGuigan and Krug consider the subject from the pharmacologic point of view, which is definitely the superior in a book of this type.

There are certain attitudes in the book which, it may be hoped, will be rectified in later editions. One is the use of proprietary names in certain places in the text without their official counterparts. Thus Cremalin, Atophan, Veronal, Nembutal and Pyramidon appear without qualification in some places and more correctly in parenthesis in other places. Of doubtful desirability for nurses, even in a source book, is the inclusion of such rare or archaic agents as cotarnine, coriandrum sativum (with a full page colored plate, of which there are too many of uncertain value for nurses), quillaja bark, serpentaria, kino,

krameria, black wash, creosote carbonate, sulfur tablets, ichthyol pills, rhus glabra, asafetida pills and althea (described both as "much used" and "rarely prescribed"). A lack of judicious selection is indicated by giving more space to the bromides than to the barbiturates, for giving detailed chemical formulas for the relative unimportant steps in the degradation of gallic acid to catechol and for giving in detail the method of intravenous injection, which is usually reserved for physicians. In certain places the colored plates appear to be without explanation in the text as with *Camellia thea*. The description of the "syndrome of crocodile tears" is misplaced in a book on materia medica for nurses. The printing is for the most part excellent, although the chart showing the action of caffeine is partly illegible and the picture of the cretin very dim. In most places American spelling is used, and it would have been preferable to express amoebiasis, bacteriocidal, Hindoo and leucemia in more ordinary form. It is disappointing that the revision could not include the changes of the current revisions of the U.S. Pharmacopeia and the National Formulary.

There are occasional therapeutic lapses from sound practice such as the mention of sulfanilamide given intravenously, the use of alcohol for chills from exposure and to break up a cold in shock, and as a poultice for erysipelas, and the recommendation of bromides as the physiologic antidotes for camphor, without reference to more potent sedatives. Colchicine does not appear in the index or under gout, no mention is made of dihydrotachysterol in the discussion of the parathyroids, mercurial diuretics are recommended in nephrosis, and mercury is stressed instead of bismuth in the treatment of syphilis (without mention of orally absorbable bismuth compounds). In the treatment of burns, blood and plasma transfusions are not mentioned and the recommendation of cardiac depressants when the heart is overstimulated or inflamed is at best loosely stated. The physiologic discussions are generally good, as are the pharmacologic sections. The relatively few questions at the end of the chapters are more proper and relevant than those in many text books, and the limitation of references is also commendable in a book for nurses. The volume is far more than the "introduction" suggested in its title, but it should be a satisfactory textbook for materia medica and a valuable reference book for later years.

**Nasal Medication. A Practical Guide.** By Noah D. Fabricant M.D. M.S. Associate in Laryngology, Rhinology and Otolaryngology, University of Illinois College of Medicine, Chicago. Cloth. Price \$2.50. Pp. 197 with 20 illustrations. Baltimore: Williams & Wilkins Company. 1941.

The last forty years have seen great developments in rhinology. The first great advance followed the discovery of the medical uses of cocaine as a local astringent and anesthetic and the form of practice was determined by anatomists and surgeons. The pronounced surgical point of view that arose developed its own evils, and it required the physiologist to correct errors resulting from behavior predicated on the idea that operative procedures were the chief reliance for the cure of many diseases of the nose.

Knowledge of normal function and behavior of the lining membrane of the nose and its accessory sinuses received its main impetus in this country from the studies of Proetz, Hilding and others. Medications freely used up to this time were found harmful to ciliary action of the cells of the mucosa of the nose. Only preparations which had been widely favored were seen to carry the threat of lipid pulmonary changes. Walsh and others pointed out, furthermore, that immunologic changes could be obtained locally following instillation of certain bacterial preparations.

To Fabricant is due the acknowledgment of a carefully controlled physiologic study pointing out "the significance of the pH factor as a basis for the treatment of upper respiratory infection." This textbook begins with a well written introductory portion that is of anatomic, histologic and physiologic interest. The author then takes up the practical aspects of nasal medication founded on his own and those other physiologic and immunologic studies of the past ten or fifteen years which have so much altered the thinking and practice of rhinology.

Because the discussion is not academic, and because the material covered is of prime importance, this work is just the sort of textbook the practicing rhinologist should read and carefully follow.

## Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS BUT THESE WILL BE OMITTED ON REQUEST.

### HALOWAX ACNE

**To the Editor**—A man aged 26 who handles DeGaussing cables daily has a stubborn acneform condition which he and six of his co workers attribute to some ingredient in this cable. Can you tell me what the ingredients are? Has Halowax which these cables contain been known to sensitize or poison any workers? His wife has some of the same lesions on the arms and face. How might one explain that? The man has had these acne like lesions for six months, has had x ray and other treatments with little good effect and now he has come to me. He has been away from his work for five weeks. The improvement has not been convincing. Could his liver be involved or damaged?

Adrian H Scolten MD Portland Maine

**ANSWER**—Degaussing cables are used on ships. Each cable consists of a number of strands of copper wire coated with a white metal that may be zinc or tin or silver. Around the strands is wrapped Halowax, which consists essentially of trichloronaphthalene and chlorodiphenyl. This acts as an insulator and is water proof and fire proof. Around the Halowax cover is wrapped a transparent wrapping of cellophane. Around this is wrapped some rubberized fabric and this again is covered with woven rayon. Many of these individual cables are grouped together and covered with rubberized insulating material to form one large cable.

Halowax is impregnated into the rayon covering of the cable and is freely sprinkled between the individual cables comprising the large cable.

When these cables are spliced, especially if the splicing occurs in a closely confined space on board ship, the electricians are exposed to the solid granular form of Halowax and to the fumes of it as the cable splice is "boiled out" to seal.

Halowax acne among workers doing this work is common. It has occurred in practically every shipyard where the Degaussing cables are handled. Halowax acne is described by

Schwartz Louis and Tulipan Louis. A Textbook of Occupational Diseases of the Skin. Philadelphia, Lea & Febiger, 1939.

Drinker C K, Warren M F and Bennett G A. Certain Chlorinated Hydrocarbons. *J Indust Hyg & Toxicol* 19: 283 (Sept) 1937.

Jones Jack W and Alden, Herbert S. An Acneform Dermatitis. *Arch Dermat & Syph* 33: 1022 (June) 1936. Skin Hazards in American Industry. *Pub Health Bull* 229 part II, pp 7-12.

Morris C E and Tabershaw I R. Cable Rash—A Note on a New Cleansing Mixture. *THE JOURNAL* Jan 16 1943 p 192.

Halowax does not sensitize workers. It causes an acneform eruption on the face, arms and other exposed parts of the body of every worker who is sufficiently exposed to it and does not take the recommended preventive measures.

Yellow atrophy of the liver has occurred among workers exposed to these substances.

It has been reported that the wives, children and others who handle or wash the Halowax soiled clothes of workers have also developed such acneform lesions.

The treatment of these cases consists in preventing further exposure to the Halowax by placing exhaust ventilation over processes in such a manner as to draw the fumes away from the worker, by the use of protective ointments on the face, by the daily change to clean work clothes, and by daily compulsory supervised shower baths after work. The work clothes should be cleaned daily at the factory and not be taken home. The individual lesions are best treated by making a slight incision and expressing the contents. The patient should be given a strong cleansing solution for the face, such as "Tersus," made by Doak Company, Cleveland, or tincture of green soap, and advised to use it several times a day. At night he should use lotio alba. X-rays should be used cautiously if at all because the rationale for their use is not the same as in acne vulgaris.

Liver function tests are advised for the patient to see whether he has suffered any liver damage.

### ELEVATED ST SEGMENT OF ELECTROCARDIOGRAM

**To the Editor**—What is the significance of a slight elevation of the ST segment in leads 2 and 3 with no other electrocardiographic finding?

M D, Wisconsin

**ANSWER**—A slight elevation of the ST segment in leads 2 and 3 without other electrocardiographic findings is not of dependable diagnostic significance.

### DIAGNOSIS OF SUDDEN COLLAPSE

**To the Editor**—A white man aged 39 apparently in good health with a normal previous history was suddenly seized with an attack of severe precordial pain radiating to the left arm, dyspnea, cyanosis and collapse which occurred while he was sitting and observing hunting field trials. His blood pressure was not obtainable. He was attended by a nearby physician and sent home after rallying from this attack. On arising one day after having been in bed two weeks he felt a severe pain in the right upper quadrant of his abdomen which was followed by nausea and vomiting for two days. This subsided with restriction of diet and bed rest. Dyspnea on exertion in bed continued and an upright position was necessary. An electrocardiogram was normal. He was hospitalized for observation at this time and the usual blood examination (complete blood count and Wassermann test) was normal as was the urinalysis. An electrocardiogram was negative for myocardial damage or coronary artery disease at this time. The blood pressure was 122 systolic 62 diastolic. One week later a precordial pain suddenly developed, which was relieved by morphine. Subsequently a headache and paralysis of the left side of his face and left arm with a weakness of muscular action of his left leg developed. The blood pressure in the left arm was 110/62 and in the right arm 122/70. Following this he slowly regained use of his left arm. During the ensuing three weeks period there appeared occasional petechiae involving the fingers of his left hand. Dyspnea still persisted on moderate exertion in bed. Repeated blood count, urinalysis and blood chemistry were normal. During his stay in the hospital examination of the heart did not show enlargement or murmurs and the force of contraction appeared only slightly impaired. A third electrocardiogram was made about five weeks after the initial attack and again failed to show any deviation from normal. The paralysis on the left side gradually cleared up and after six weeks stay in the hospital he was sent home. Slight dyspnea on exertion still persisted after discharge from the hospital. The general physical examination now is essentially normal except for a slight residual weakness of the left arm and the blood pressure in the left arm is 110/60 as compared with 124/80 in the right arm. All electrocardiograms were interpreted by a qualified cardiologist. Is it possible that this patient had had coronary artery disease in spite of three successive normal electrocardiograms? Could abdominal symptoms, petechiae and paralysis on the left side be explained on any other basis than that of embolic phenomena for example a focal vascular disturbance?

M D, New Jersey

**ANSWER**—One is not justified in diagnosing serious heart disease with myocardial failure in the presence of a normal physical examination of the thorax and repeatedly normal electrocardiograms especially if one assumes the heart to be absolutely normal in size, in such a case as that noted here. It is a safe rule that dyspnea is not to be ascribed to failure of a heart that is normal in size. Also it is extremely rare to have systemic arterial embolism, which would include cerebral embolism unless there is more evidence than has been given in this case either of myocardial infarction with intracardiac thrombosis, subacute bacterial endocarditis almost always implanted on obvious valvular disease or congenital heart defects, definite mitral stenosis with left auricular enlargement, or arrhythmia such as auricular fibrillation in which auricular thrombosis may occur. It is indeed difficult on the findings as presented to link together under one heading the various symptoms in this case, namely the severe precordial pain with collapse at the onset, the severe pain in the right upper quadrant of the abdomen with nausea and vomiting for two days, the dyspnea on slight exertion afterward, the recurrent precordial pain and the paralysis on the left side. On the other hand, the blood pressure difference in the two arms and the petechiae involving the fingers of the left hand are not important and are probably simply related to disturbance of the circulation in the left arm secondary to the hemiplegia.

If one could feel doubtful about the normality of the physical examination of the heart and the electrocardiogram, then a diagnosis of myocardial infarction followed by dilatation and failure of the left ventricle and cerebral embolism secondary to intracardiac thrombosis would be in order. That, even on the face of the case report as given, is the best bet. Other rarer conditions, such as dissecting aortic aneurysm and extensive peripheral vascular disease, including periarteritis nodosa, are much less likely.

### INTRANASAL VACCINATION AGAINST COLDS

**To the Editor**—Recently I was requested to purchase from the Cutter Laboratories a substance called N V Nasal, a bacterial vaccine supposedly good to prevent colds and respiratory infections by the nasal spray method. Could you give me any information as to the value of this type of medication?

M D, Idaho

**ANSWER**—The use of bacterial vaccines by the intranasal spray method is based on experimental evidence (Cannon and Walsh) that by this method a greater concentration of immune bodies is found in the nasal mucosa than in other organs and tissues of the body, and in some instances a concentration equal to that found in the blood serum. In other words it appeared that the immune bodies might be produced locally in the mucosa and remain there in greater concentration. On the theory, therefore, that greater protection might be afforded if immune bodies could be accumulated at the port of entry of the infection,

the intranasal method of vaccine therapy in human beings was started

Clinical experience is not sufficiently conclusive to endorse this form of prophylaxis. In general, cold vaccines, no matter what the route of administration, have not come up to expectations. There have not been any forms of cold vaccines which have been accepted by the Council on Pharmacy and Chemistry. Present day medical opinion supports the view that no substance or mixture of substances can be relied on to prevent or cure colds.

#### References

- Walsh T E and Cannon P R. Immunization of the Respiratory Tract. A Comparative Study of the Antibody Content of the Respiratory and other Tissues Following Active Passive and Regional Immunization. *J Immunol* 35 (July) 1938.  
Walsh T E. Intranasal Vaccine Spray. Its Use in Prophylaxis Against the Common Cold. *Ann Otol Rhin & Laryng* 49 875 (Dec) 1940.  
Bailey G H and Shorb M S. Heterophile Antigen in Pneumococci. *Am J Hyg* 13 831 (May) 1931. Cold Preparations Under Cold Scrutiny, *The Journal* Feb 22 1941 p 708.

#### COCAINE AS LOCAL ANESTHETIC

To the Editor—Dr Stapleton states in a communication to The Journal (Oct 24 1942 p 642) that 2. When used locally either topically or injected it [cocaine] should be combined with epinephrine to prevent absorption. Is it safe to inject cocaine under any conditions? I was taught that cocaine injected would always result in severe cocaine poisoning. Has something new been added that cocaine can now be used parenterally?

Michael A Ferrara, M.D. Norwich Conn

ANSWER—It is possible that the inquirer has misinterpreted what he was taught. Cocaine, of course, was the first local anesthetic agent and was used some sixty years ago. The original work on the effects of local agents when injected was all done with cocaine. The classic contributions of Halsted illustrate this fact. When procaine hydrochloride was introduced during the early years of this century it proved to be much less toxic than cocaine when injected, and the injection of cocaine therefore became less common. However, in one large clinic many thousand tonsillectomies were performed with one fifth of 1 per cent cocaine as the sole anesthetic agent used. Injections were done deliberately with an extremely small syringe and excellent results were obtained. A teacher of pharmacology might say that cocaine when injected after the fashion ordinarily employed for procaine hydrochloride, would result in a high percentage of severe reactions and that such use of cocaine was not advisable.

The addition of epinephrine to local anesthetic solutions adds an advantage and a disadvantage. Epinephrine itself is a toxic agent and some patients are hypersensitive to its effect just as some patients are hypersensitive to the effects of local anesthetic agents. It has the advantage, however, of constricting the capillary bed in the region injected or in the mucous membrane where topically applied, thus reducing the rate and possibly the amount of absorption. Since toxicity depends on several factors (including the rate of absorption) epinephrine may be of value. It is generally understood that the upper limit of concentration of epinephrine in anesthetic solutions should be 5 minims of 1 to 1,000 solution in 100 cc. of anesthetic solution to be injected. Higher concentrations of epinephrine have been found to be unnecessary and often dangerous. Whether much higher concentrations of epinephrine are permissible with anesthetic agents to be topically applied is an unsettled question.

The answer to the question "Has something new been added?" is definitely "No." To the question "Is it safe under any condition to inject cocaine?" the answer is probably "Relatively safe." The best safeguard is the application of meticulous care and deliberation in the administration of local anesthetic drugs with due consideration for the pharmacologic characteristics of the drug used.

#### RADIUM EMANATION OR X RAYS FOR HYPERTROPHIC TONSILS IN PURPURIC PATIENT

To the Editor—Can a local application of a radium plaque filtered or unfiltered, help tonsillar hypertrophy? The sufferer in question has thrombocytopenic purpura and for that reason the tonsils though tremendously big cannot be removed.

M.D., Massachusetts

ANSWER—Radium emanation, if it could be used in the amounts and after the method employed by the staff at Johns Hopkins Hospital, might be useful in a case such as that described. If emanation is not available, then either roentgen therapy or radium would be the next method of choice. It is not practicable to use a plaque with a small amount of radium. It would be difficult to keep the plaque in place long enough for satisfactory results.

#### HIGH RED CELL COUNT AND HEMOGLOBIN

To the Editor—A plethoric extremely muscular white man aged 28 whose nude weight is 199 pounds (90 Kg.) height 5 feet 5½ inches (165 cm.) standard weight 143 pounds (65 Kg.) complains of pain in his right heel. The onset of the pain was in November 1940 while he was operating a sewing machine. X-ray examinations revealed roughening of the os calcaneus, suggesting a bursitis. However, the question of thrombosis of an artery resulting from polycythemia came up. The following blood studies were obtained Aug 25 1942: red blood cells 6,230,000, hemoglobin 16.2 Gm, white blood cells 10,650. Schilling differential stab cells 5 per cent segmented cells 57 per cent lymphocytes 26 per cent mononuclears 9 per cent, eosinophils 2 per cent basophils 1 per cent. The smear revealed no normoblasts. The platelet count was 405,000 and hematocrit 49 volumes per cent. September 22 1942: red blood cells 6,980,000 hemoglobin 17.2 Gm, white blood cells 11,000. Schilling differential stab cells 6 per cent, segmented cells 44 per cent lymphocytes 38 per cent mononuclears 8 per cent, eosinophils 3 per cent basophils 1 per cent. The smear revealed no normoblasts. The platelet count was 450,000 hematocrit 46 volumes per cent. At no time has the spleen been felt. The patient has a natural ruddy color, is unusually well built and appears to be healthy. The essentially normal platelet count, the normal smear and the essentially normal hematocrit seem opposed to a diagnosis of polycythemia.

Charles L. Steinberg MD, Rochester N.Y.

ANSWER—The first blood count is within normal limits for a young adult man (Wintrobe M.M. *Bull Johns Hopkins Hosp* 53 118 [Sept] 1933). As the second hematocrit was somewhat lower than the first it would appear that the higher red count and hemoglobin value were due to an error in technique. Errors in red cell counting and hemoglobin determinations are common. There is not sufficient evidence for a diagnosis of polycythemia in this case.

#### COLOR VISION TEST CHARTS

To the Editor—In view of the government's calling for use of the Ishihara color blindness test charts and the report by local surgical supply houses that they are not obtainable in the United States as they were made in Japan and the supply in this country is exhausted I cannot but ask whether manufacture in the United States is precluded by some patent right that has not as yet been taken over from the enemy or whether our technicians have not yet learned how to print them. I can hardly believe that we are technically unable to reproduce them and the fact that *Life* magazine back in 1939 printed some of the charts in the magazine would seem to show that they can be made here. These charts seem to be a necessity and I can think of few matters in which The Journal can better exert itself than in assuring that the profession have access to an adequate supply of them and at a reasonable price—not the \$7.50 original price or the \$15 which was asked for the last one I heard of for sale. They are called for not only for use of the eye specialists but by every general practitioner who examines a truck driver for a civilian employee's job.

E. M. Wilder M.D. Sacramento Calif

ANSWER—The American Optical Company has published and has on sale, at approximately \$10 retail a Pseudo-Isochromatic Color Test which was designed for use by the Army and Navy. This contains a set of colored plates similar to the ones found in the Ishihara and the Stilling color tests and atlases and is quite adequate for use in testing for color blindness.

#### GLASS CARTRIDGES FOR ANESTHETIC SOLUTIONS

To the Editor—Kindly let me know whether there are any objections against using 1 per cent or 2 per cent procaine hydrochloride epinephrine solutions filled in glass cartridges which have a rubber plunger on one side and a rubber cap on the other side. Does any possibility exist of contamination when puncturing the rubber cap with the injection needle? If there is any literature on this subject I should appreciate it if you would give references.

E. Markey Pullen M.D. New York

ANSWER—There are certain physical peculiarities in the behavior of a cartridge in a cartridge syringe. For instance owing to the elasticity of the rubber plunger there may be a tendency for the cartridge to "suck back" when pressure is released. Of course there are certain advantages, such as speed and convenience.

The possibility of contamination when puncturing the rubber cap does exist and it is therefore desirable to disinfect the surface of the rubber cap as well as possible before use. Seventy per cent alcohol has been employed for this purpose. A soft metal protective cap is used on one brand of cartridge. This cap can be flamed gently. The advisability of dispensing solutions in this manner is debatable.

#### Reference

- Appleton J. L. T. and Grossman L. I. Sterility of Local Anesthetic Solutions in Ampules. *J Am Dent A* 24 611 (April) 1937.

#### TREATMENT OF UNDESCENDED TESTIS IN INFANCY NOT ADVISED

To the Editor—Please advise the earliest age to begin gonadotropin injections for an undescended testis in a baby now 10 weeks old.

M.D. New York

ANSWER—The baby is entirely too young to start treatment. If the testis has not descended by the time the boy is 3 or 4 years old the method of treatment can be decided on at that time.

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## LIFE AFTER NEPHRECTOMY

HERMAN L KRETSCHMER, M D

CHICAGO

Whenever told that removal of one kidney is indicated, a patient always, or nearly always, asks three questions 1 Can I live with only one kidney? 2 Will it shorten my life? 3 Will the removal of one kidney handicap me and limit my work and activities?

It is extremely interesting to note the great regularity with which these questions are asked and, in most instances, they are asked before the question of operative mortality is discussed. It almost seems to be intuitive.

To the first question one answers "yes" without hesitation and cites many instances illustrative of the fact that patients live for a long time after a nephrectomy, and one further fortifies the remark with the statement that some patients are born with only one kidney and live to a ripe old age only to die of some intercurrent disease or some accident. In response to the second question one answers "no." In reply to the third question one answers in the affirmative by stating that certain precautions must be taken.

However, if the patient asks one to present evidence in support of these statements, then one finds oneself in a position of embarrassment as the result of a lack of information on these points. In order to be able to answer the question How about life after nephrectomy? based on evidence I thought it might be interesting and desirable to study in detail a series of patients on whom nephrectomy had been performed.

This paper is based on a study of 156 patients. They were asked to report in person at the Presbyterian Hospital, where the examinations were carried out. Neither technical details of the operation nor operative mortality and morbidity will be dealt with here. The number of cases does not represent all the patients on whom I have performed nephrectomy but represents only those patients who, in response to my request for study and examination, presented themselves at the hospital. It was my opinion that this was the only accurate method so far as evaluation is concerned, since a study based on answers to a questionnaire would be open to doubt.

In this study the following data were recorded: intervals that elapsed between nephrectomy and examination, presence or absence of urinary symptoms as well as general symptoms, question of whether or not the patient had pain in the remaining kidney, results of the physical examination, changes in weight since

the operation, blood pressure before operation and on examination, analysis of the urine, including chemical examination and culture, nonprotein nitrogen of the blood, results of the Newburgh test, results of examination of the genitourinary tract with roentgen rays and intravenous pyelograms.

In table 1 is given a list of the various lesions for which nephrectomy was performed.

### NEPHRECTOMY FOR TUBERCULOSIS

Forty-nine patients on whom I performed nephrectomy for renal tuberculosis presented themselves for examination. The youngest patient was 10 years of age, the oldest 75, the average age was 44 years and 6 months. The longest period between the operation and examination was twenty-four years and eleven months, the shortest one year and four months, the average time was ten years and three months.

*Urinary Symptoms*—Fifteen patients had some burning and frequency of urination. An analysis of these cases disclosed that the symptoms in 2 cases were due to benign prostatic hypertrophy. An analysis of the remaining 13 cases is given in table 2.

Two patients had an attack of acute pyelitis, one four years, the other six years after nephrectomy, and 1 patient passed a stone.

*Pain in the Remaining Kidney*—There was only one instance in this group in which the patient subsequently developed pain in the remaining kidney.

*Physical Examination*—The results of the physical examination are given in table 4.

*Weight*—In 4 cases there has been some loss of weight. The largest gain was 62 pounds (28 Kg.).

*Blood Pressure Studies*—In only 7 cases were changes in the blood pressure noted. In 4 there was an increase and in 3 a decrease, as presented in table 5.

*Urinalysis*—Albumin was present in 6 cases and pus in 13 cases. Tubercle bacilli were found in smears or in guinea pigs or both in 10 cases.

*Cultures*—Positive cultures were obtained in 14 cases (table 6).

*Blood Chemistry*—In 10 cases there were no records of preoperative studies of the nonprotein nitrogen. Of the remaining 39 cases the studies disclosed that the nonprotein nitrogen values were increased in 9 cases. In only 3 cases were the values above 50 mg. per hundred cubic centimeters of blood, as recorded in table 7.

*Newburgh Test*—The test was performed on 35 of the 49 patients. Of the 35, 24 passed and 11 did not, a percentage of 69 disclosing normal function.

*Roentgen Examination*—In 11 cases the intravenous urograms revealed definite changes from the normal,

such as dilatation of the pelvis, clubbing of the calices with irregularity, and dilatation of the ureter. In 5 of these 11 cases a proved tuberculosis of the remaining kidney was present.

Scoliosis was present in only 3 cases.

TABLE 1—Lesions for Which Nephrectomy Has Been Performed

	Patients
Renal tuberculosis	49
Renal calculi	47
Hydronephrosis	40
Renal tumor	11
Miscellaneous	14
Total	161

TABLE 2—Urinary Symptoms in Fifteen Cases of Tuberculosis

No	Sex	Age	Diagnosis	Comment
1	♀	44	Hypertension	
2	♀	40	Hypertension	
3	♀	4	Contracted bladder	
4	♀	58	Contracted bladder	
5	♀	46	Contracted bladder	
6	♀	49	Tuberculosis of bladder	
7	♂	40	Tuberculosis of bladder?	Presacral neurectomy
8	♀	31	Tuberculosis of bladder	
9	♂	3	Tuberculosis of bladder and kidney	
10	♂	48	Tuberculosis of bladder and kidney	
11	♀	44	Tuberculosis of bladder and kidney bilateral	
12	♀	33	Tuberculosis of bladder and kidney	
13	♀	44	Tuberculosis of bladder and kidney	

TABLE 3—General Symptoms

	Patients
Edema of ankles	3
Dyspnea	4
Headache	2
Constipation	2
Spastic bowel	2
Fatigue	1

## NEPHRECTOMY FOR CALCULI

Forty-two patients who had nephrectomy for stone presented themselves for examination. The oldest patient was 76, the youngest 19, the average age was 51. The longest period between the operation and the examination was twenty-one years, the shortest period one year and one month, the average period was seven years and nine months.

**Pain in the Remaining Kidney**—There were 4 patients in this group who subsequently developed pain in the remaining kidney. The pain suffered by 2 of these patients was due to the presence of stones and of 1 to recurring attacks of pyelonephritis, no reason for the pain of 1 was found other than enlargement of the kidney outline as shown in roentgenograms.

**Weight**—The weight either remained the same as it was prior to operation or it increased. Three patients gained 50 pounds (22.7 Kg.).

**Blood Pressure Studies**—Seven patients showed changes in the blood pressure readings. Four showed an increase and 3 a reduction, the blood pressure of 1 prior to operation was not recorded, although twenty years later it was abnormally high, as listed in table 10.

**Urinalysis**—Albumin was present in 6 patients (in 2 due to stones in the kidney), and pus was present in 11. Positive cultures were obtained in the urine of 15 patients, as shown in table 11.

An analysis of the group in which urinary conditions were noted discloses that the cause of the positive findings in the urine of 6 patients (33 1/3 per cent) is quite independent of nephrectomy, since in 3 the findings are due to benign prostatic obstruction and in the other 3 to chronic prostatitis. In 3 the changes are due to stones in the remaining kidney. In 3 there are present definite hypertension and cardiac enlargement. In 6 cultures were positive. One patient has had several attacks of pyelitis. The remaining 5 have no symptoms and were unaware of the fact that their urines were positive on culture. Of the entire group of 42 patients, positive cultures were obtained in 15.

**Blood Chemistry**—There was an increase in the non-protein nitrogen values in the blood in 14 cases. In only 3 cases were the readings over 50 mg. per hundred cubic centimeters of blood, and in 11 cases the readings were between 40 and 50 mg. per hundred cubic centimeters of blood.

**Newburgh Test**—The test was made on 38 of the 42 patients. Of these 38, 25 passed and 13 did not, 66 per cent passing.

**Roentgen Examination**—Plain films and intravenous urograms revealed that 11 patients had enlargement of the kidney shadow, 3 patients scoliosis, 6 patients enlargement of the kidney pelvis and 3 patients dilatation of the ureter.

## NEPHRECTOMY FOR HYDRONEPHROSIS

There were 40 patients studied in the hydronephrosis group. The youngest was 3 years, the oldest 77 years of age. The average age was 35 years and 6 months.

TABLE 4—Results of Physical Examination

Sex	Age	Positive Findings	Time Since Operation		Comment
			Yr	Mo	
♀	47	Systolic murmur	2	2	
♀	41	Hypertension	21	4	
♀	40	Cardiac hypertrophy, hypertension	11	2	
♀	41	Draining sinus, perianal abscess, tuberculosis	4	11	Due to tuberculosis in remaining kidney
♀	4	Moderate mitral insufficiency	11	8	
♂	51	Cardiac hypertrophy, hypertension	4	9	
♂	"	Cardiac hypertrophy, coronary colitis	6		
♀	"	Cardiac hypertrophy, hypertension, colitis	10	8	
♀	41	Thyroid enlargement, slight	11	7	
♀	39	Inguinal hernia	10		
♂	63	Benign prostatic hypertrophy	14	10	Transurethral resection
♂	70	Benign prostatic hypertrophy	20	3	Transurethral resection
♀	40	Carcinoma of breast	1	4	
♂	37	Osteoma of hard palate	1	8	
♀	31	Obesity (pituitary ovarian deficiency)	3	7	
♀	40	Thyroid of uterus	3	4	

TABLE 5—Blood Pressure

Sex	Age	Before Operation	After Operation	Time Since Operation
♀	44	110/70	176/94	21 years 4 months
♀	40	100/80	160/110	11 years 2 months
♀	61	110/72	150/90	4 years 2 months
♀	51	150/100	180/110	19 years 6 months
♀	"	130/86	115/70	6 years
♀	46	170/110	100/76	12 years 3 months
♂	51	210/100	170/90	4 years 9 months

The longest interval between the operation and the examination was nineteen years, the shortest eight months, the average seven years.

**Urinary Symptoms**—Only 4 of the 40 patients stated that they had urinary symptoms. The following lesions

were responsible for the symptoms prostatic obstruction 2 cases, spinal cord bladder 1 case and acute cystitis 1 case

*General Symptoms*—The general symptoms given in table 12 were noted

TABLE 6—Positive Cultures

	Cases
Hemolytic colon bacilli	1
Colon bacilli	7
Streptococcus viridans	1
Hemolytic streptococcus aureus	2
Eberthella	1
Diplococci	1
Staphylococcus albus	1

TABLE 7—Cases in Which Nonprotein Nitrogen Was Above 50 Mg

Sex	Age	Before Operation, Mg per 100 Cc	After Operation, Mg per 100 Cc	Diagnosis
♂	42	27	50	Tuberculosis of other kidney
♂	49	28	56	Tuberculosis of bladder
♂	44	30	70	Tuberculosis of other kidney

TABLE 8—Urinary Conditions Presented by Patients With Calculi

Sex	Age	Positive Findings	Time Since Operation
♂	73	Benign prostatic obstruction	1 year 8 months
♂	76	Benign prostatic obstruction	13 years 3 months
♂	57	Recurrent pyelitis stone in kidney	4 years 6 months
♂	58	Pyelitis stone in kidney	5 years 2 months
♂	34	Pyelitis stone in kidney	9 years 8 months
♂	54	Recurrent pyelitis	5 years 3 months
♂	30	Impacted stone in ureter	20 years
♂	51	Nocturia (1 ×)	12 years 10 months
♂	28	Nocturia	4 years 9 months

*Pain in Remaining Kidney*—Only 2 patients complained of pain in the remaining kidney

*Physical Examination*—The data given in table 13 were obtained on physical examination

*Weight*—All patients have held their previous weight or gained weight, in several instances as much as 50 pounds

*Blood Pressure Studies*—Increase in blood pressure was noted in only 3 cases, as recorded in table 14. In 1 case (male) the blood pressure decreased from 160/115 before operation to 125/75 three years and eight months after operation

*Urinalysis*—In only 4 cases was the presence of albumin disclosed, a few pus cells were disclosed in 8, casts in none. In 17 cases the urine was sterile, in 2 no cultures were obtained, in 11 growth on culture was obtained as shown in table 15

*Blood Chemistry*—In only 4 cases was there an increase in the nonprotein nitrogen values in the blood. Values of 44, 41, 95 and 44 mg per hundred cubic centimeters of blood were recorded. In 13 the nonprotein nitrogen before operation was not recorded

*Newburgh Test*—The test was performed on 31 of the 40 patients. Of the 31, 22 passed and 9 were unfavorable, a percentage of 70 disclosing normal function

*Röntgen Examination*—Examination disclosed the presence of scoliosis in 6 cases. Flat film disclosed an enlargement of the kidney outline in 4 cases (compensatory hypertrophy). The intravenous pyelograms disclosed a slight enlargement of the pelvis in 7 cases

In 3 the question was raised as to whether or not the enlargement was due to hypertrophy (functional following overwork of one kidney). In 1 case there was definite hydronephrosis, and in 1 there was clubbing of one calyx. In several cases old films for purposes of comparison were not available

## NEPHRECTOMY FOR TUMOR

Eleven patients on whom nephrectomy was performed for malignant tumor reported for examination. The youngest patient was 14 years of age, who at the time of operation was 1 year and 2 months old. The oldest patient was 72 years of age. The average age was 50 years. The longest period that elapsed between operation and examination was twelve years and ten months, the shortest one year and one month and the average time was five years and eight months

*Symptoms*—Urinary symptoms were lacking, general symptoms too were lacking, except for 1 patient who had indefinite pains in the right upper quadrant (possible recurrence?)

*Pain in Remaining Kidney*—None of the patients complained of pain in the remaining kidney

*Physical Examination*—Examination was negative in all cases

*Weight*—There was no loss of weight in this group of patients, either they have the same weight they had at the time of operation or they have gained. The largest weight gain was 40 pounds (18 Kg.)

TABLE 9—General Conditions Presented by Patients With Calculi

Sex	Age	Positive Findings	Time Since Operation
♀	37	Cardiac enlargement hypertension	4 years 5 months
♂	71	Cardiac enlargement (present at time of operation)	1 year 8 months
♀	68	Cardiac decompensation	1 year 3 months
♀	72	Anginal attacks?	6 years 10 months
♂	76	Mild angina	13 years 3 months
♂	40	Hypertension (present before operation)	1 year 7 months
♀	41	Cholelithiasis	5 years 8 months
♀	44	Cholelithiasis	3 years 3 months
♀	31	Cholelithiasis	1 year 1 month
♂	61	Peptic ulcer	6 years 1 month

TABLE 10—Blood Pressure

Age	Sex	Preoperative	Postoperative	Time Since Operation
37	♀	130/105	120/100	4 year 3 months
30	♂	Not stated	200/170	20 years
44	♂	150/110	200/95	17 years 9 months
30	♀	140/80	180/100	1 year 1 month
30	♂	137/90	160/92	3 years 1 month
30	♀	130/90	150/80	1 year 8 months
31	♀	130/90	130/80	1 year 1 month
41	♂	160/90	150/70	6 year 1 month

TABLE 11—Positive Cultures in Urine

	Patients
Colon bacilli	3
Hemolytic streptococci	2
Hemolytic diplococci	1
Hemolytic Staphylococcus albus	1
Staphylococcus aureus	1
Staphylococcus albus	1
Proteus bacilli	1
Eberthella	1
Salmonella	1
Diplococci	1

*Blood Pressure*—There were no changes in the blood pressure except in 1 case in which the blood pressure was 125/80 before operation and at present is 176/110 seven years after nephrectomy. The patient is now 62 years of age and has cardiac enlargement

**Urinalysis**—Examination of the urine revealed the presence of albumin in only 2 cases and the cultures in all were sterile

**Blood Chemistry**—In 5 cases there was an increase in the nonprotein nitrogen—namely, 44, 46, 51, 56, 59 mg per hundred cubic centimeters of blood. In

TABLE 12—General Symptoms

Sex	Age	Symptom	Flapso of Time Since Operation
♂	77	Angina	16 years
♂	72	Intermittent claudication	8 years
♂	62	Angina ?	3 years
♀	35	Dyspnea on climbing stairs	6 years
♀	47	Gallstones	8 years

TABLE 13—Results of Physical Examination

Sex	Age	Positive Findings	Time Since Operation
♂	37	Occasional extrasystole	13 years 10 months
♂	73	Rough aortic second sound	15 years 6 months
♂	73	Systolic murmur	8 years 10 months
♂	62	Cardiac enlargement moderate	3 years 2 months
♀	40	Enlarged thyroid	15 years 8 months
♀	30	Systolic murmur	2 years 8 months

other words, there was a beginning impairment of kidney function in 5 of the 11 cases, or in 45.4 per cent.

**Newburgh Test**—The test was performed on 10 patients and not on 1. Of the 10, 9 passed and 1 failed, a percentage of 90 passing.

**Röntgen Examination**—In 1 case a slight hydronephrosis and a slight scoliosis exist. In 1 case two small stones which were present in the opposite kidney before operation have increased slightly in size since nephrectomy, six years and seven months ago.

#### NEPHRECTOMY FOR MISCELLANEOUS LESIONS

In table 16 is given a list of the various lesions for which nephrectomy was performed.

The youngest patient was 31 years of age, the oldest 73, the average age was 52 years. The longest period between operation and examination was twenty years, the shortest two years, the average time was nine years and six months.

TABLE 14—Increase in Blood Pressure

Sex	Age	Preoperative	Postoperative	Time Since Operation
♀	60	142/90	170/90	11 years
♀	73	150/100	206/112	16 years 6 months
♀	25	118/74	150/60	14 years

TABLE 15—Growth on Culture

	Patients
Colon bacilli	4
Hemolytic streptococci	2
Hemolytic Staphylococcus albus	2
Hemolytic Staphylococcus aureus	1
B. alkaligenes	1
Eberthella	1

**Symptoms**—Two women, aged 70 and 73, have had an occasional attack of frequency of urination. One patient has right upper quadrant pain due to cholelithiasis.

**Pain in Remaining Kidney**—There were no instances of pain in the remaining kidney.

**Physical Examination**—Examination was negative for all patients except 2. 1 patient had an increase in

the blood pressure from 142/68 before operation to 195/85 five years after operation. The patient is 70 years old and has a systolic murmur, hypertrophy of the left ventricle and extrasystoles. One patient has an enlarged thyroid.

One patient had a decrease in blood pressure from 170/84 to 134/80 six years and nine months after operation.

**Weight**—Four patients have had an increase in weight, 9 have shown no change and 1 patient showed a loss of 4 pounds (1.8 Kg.).

**Urinalysis**—Examination of the urine revealed the presence of leukocytes in 3 cases. Cultures were sterile in all but 4 cases, in which organisms were obtained as shown in table 17.

**Blood Chemistry**—The nonprotein nitrogen studies in all cases were normal before operation, the nonprotein nitrogen was increased in only 1 case.

**Newburgh Test**—In this group of 14 patients the test was made on 12, all of whom passed, giving 100 per cent.

**Röntgen Examination**—Studies revealed 1 case in which the kidney outline was enlarged and 1 in which there was a slight scoliosis. Intravenous pyelograms disclosed that in only 1 case was a slight enlargement of the pelvis evident (hypertrophy?).

TABLE 16—Lesions for Which Nephrectomy Was Performed

	Patients
Ureteroaginal fistula	1
Solitary cyst with pronounced renal atrophy	1
Carbuncle	2
Ichthyococcosis	1
Renal hernia	1
Suppurative pyelonephritis	1
Atrophic pyelonephritis	1
Retroperitoneal perirenal lymph anglioma	1
Lymphoplasia supernumerary kidney	1
Acute pyogenic infection	1
Total	14

#### CARDIAC INVOLVEMENT

In answer to the question "What about cardiac function after nephrectomy?" this study discloses that cardiac enlargements, murmurs, attacks of angina and extrasystoles occurred as follows: in tuberculosis, 12.24 per cent, stone, 11.9 per cent, hydronephrosis 17.5 per cent, and in the miscellaneous group, 7.1 per cent. An analysis of the group discloses that 3 of the 7 patients with tuberculosis were over 50 years of age. Of the 5 patients with stone who had cardiac changes 1 was 52 and the other 4 patients ranged from 62 to 76 years. In the hydronephrotic group 5 of the 7 patients were over 60. In the miscellaneous group the 1 cardiac patient was over 70.

#### HYPERTENSION

What about the blood pressure after nephrectomy? What can we tell our patient will happen to his pressure after nephrectomy?

In the tuberculous group there was an increase in blood pressure in 4 cases and a decrease in 3. In other words, the patient has a 12.25 per cent chance of an increase in his blood pressure. In 1 case there was a reduction in the pressure from 280/100 to 175/70, which is still up.

In the stone group there was an increase in 5 cases, or 11.9 per cent, and a decrease in 3, or 7.1 per cent.

In the hydronephrosis group there was an increase in 3 cases, or 7.5 per cent.



In the tumor group there was only 1 case that showed an increase, or 9 per cent

In the miscellaneous group there was an increase in only 1 case, or 7.1 per cent

#### NEWBURGH TEST

Of the 156 patients who returned for examination the Newburgh test was done on 126, of which number 92, or 73 per cent, passed. The patients are thus divided sharply into two groups: the smaller groups, composed of 12 miscellaneous and 10 tumors, in which all but 1 passed, whereas in the larger groups of hydronephrosis, tuberculosis and stones there was a very definite and constant percentage running between 66 and 70, and critical analysis of all the data available discloses no reason for this sharp and apparent definite difference. When these groups are correlated with elevation of blood pressure, retention of nonprotein nitrogen or other factors there are no constant deviations which would indicate any of them as a source of the difference. It is true that scattered throughout these groups there are occasional hypertensives and some increased nonprotein nitrogen, but these cases are so evenly distributed that they are definitely not statistically significant. It is possible that further search will reveal some factor which is more constant in determining this distinct difference while, on the other hand, it may be a matter of chance.

The conclusions reached in this study are that 73 per cent of those patients with only one kidney are able

TABLE 17—Growth on Culture

	Patients
Hemolytic <i>Streptococcus viridans</i>	1
Hemolytic streptococcus	1
Colon bacilli	1
<i>Staphylococcus aureus</i>	1

to pass a test as rigid as that of the Newburgh concentration test, which is by far more drastic than many of the other tests popularly used, and that in certain series practically 100 per cent are able to pass the requirements of this test with one kidney only.

#### SCOLIOSIS

During this study I was impressed by the frequency with which Dr. Squire, head of the X-ray department of Presbyterian Hospital, reported the presence of scoliosis. This led to a review of the preoperative films. The films were also reviewed by Dr. Kellogg Speed.

Scoliosis was present in 18 of the 156 patients and was present on the side opposite the nephrectomy. A comparison of the present films disclosed that scoliosis was absent in 3 cases before operation and developed since operation.

Comparison of the films is summarized in table 18.

The occurrence of scoliosis in the various lesions for which nephrectomy was performed is given in table 19.

#### SUMMARY

From a review of the data obtained in this study the following statements are justified:

1 The average length of time that elapsed between the nephrectomy and examinations was eight years and two months. The longest period since the nephrectomy in this series was twenty-four years and eleven months.

2 The oldest patient at the time of nephrectomy was 72, one year and eight months having elapsed since the operation. The oldest patient studied in this series

is 77, a period of sixteen years having elapsed since the operation. The youngest patient at the time of nephrectomy was 10 months of age, a period of four years and six months having elapsed since the operation.

3 Pain in the remaining kidney does not occur with any great regularity, although the impression seems to prevail that this phenomenon is common following nephrectomy. It occurred in only 7 cases in this series.

TABLE 18—Comparison of Films

	Patients
Complete correction since nephrectomy	1
Almost complete correction since nephrectomy	1
Less scoliosis since nephrectomy	1
No change in scoliosis	7
Increase in scoliosis	2
Not present before operation	3
No preoperative films available	2

In some of the cases in which it occurred a pathologic condition in the remaining kidney, disclosed by study, was responsible for its presence. In short if the patient complains of pain in the remaining kidney one should not automatically assume that the pain is due to compensatory hypertrophy when in reality it may be due to organic disease.

4 There were 18 patients (11.5 per cent) who had cardiac involvement, 4 of whom were under 50 years of age. One patient had the cardiac hypertrophy before operation. The incidence of cardiac enlargement in a group of patients over 50 with nephrectomy is therefore about what one can expect in a similar age group with no nephrectomy.

5 In the largest number of cases the weight remained the same or there was an increase. In only 5 was there a loss. A gain of as much as 50 pounds was noted in 7 cases.

6 In 14 cases there was an increase in the blood pressure. Eliminating patients in whom hypertension was present before operation, the study discloses that the patients are well along in years, having reached a time in life when hypertension might be expected. There were only 2 patients with hypertension who were under 50 years of age. In 6 cases there was a reduction in the blood pressure but the amount of the reduction was not pronounced or very precipitate.

TABLE 19—Scoliosis Among Nephrectomized Patients

	Patients
Stone and scoliosis	8
Hydronephrosis and scoliosis	5
Tuberculosis	3
Tumor	1
True supernumerary kidney	1
Total	18

7 The results of the urinalysis depend on the lesion for which the nephrectomy was performed. In the 49 cases of renal tuberculosis pus was present in 14 and albumin in 6. In the 42 cases of stone, pus was present in 11 and albumin in 6, whereas in the remaining groups of 65 cases pus was present in 11 and albumin in 6. The cultures were more frequently positive in the group in which nephrectomy had been performed for stone. All cultures in the tumor group were sterile, four were positive in the miscellaneous group, eleven were positive in the group for hydronephrosis, fourteen were positive in the group for tuberculosis.

8 Nonprotein nitrogen studies were made in 146 of the 156 cases. The nonprotein nitrogen value was increased in 36, or 24.65 per cent. Of these 36 cases the nonprotein nitrogen value was normal before nephrectomy in 22, no preoperative studies were made in 8, and the nonprotein nitrogen was elevated before operation in 6 and remained so. So that, excluding the cases in which preoperative determinations were not made, elevation of nonprotein nitrogen occurred in 15 per cent.

9 Seventy-three per cent of those patients with only one kidney are able to pass the Newbough concentration test.

10 Scoliosis was present in 18 of the 156 patients.  
122 South Michigan Avenue

#### ABSTRACT OF DISCUSSION

DR. MONROE E. GREENBERGER, New York. Dr. Kretschmer has confirmed statistically the impressions that many of us have gained through clinical observation. Recently Addison has cast a doubt on the opinion held for many years that only a portion of the glomeruli are open at any one time. The newer physiologic observations signify that all functioning renal nephrons carry their loads simultaneously and that when some are removed the others must increase their load. Two additional complications presented by these tuberculous patients are amyloidosis and post-nephrectomy sinuses. In routine follow ups using the simple congo red test as modified at Ser View Hospital we find a high incidence of amyloidosis. For diagnosis we require 90-100 per cent absorption of the dye. This is found relatively often after nephrectomy for tuberculosis occasionally pyonephrosis, rarely cancer. There is usually an associated amyloid nephrosis. It is a frequent cause of albuminuria in these patients. The commonest postnephrectomy occurrence of amyloidosis is in cases with persistent tuberculous sinuses. Because of the amyloid nephrosis involving the single remaining kidney and the resulting uremia we believe in active, rapid treatment of tuberculous sinuses. An occasional patient may get along well. If these sinuses are not cleared up rapidly, amyloidosis will develop with resulting uremia. We try various methods of irrigation and if the sinus is not closed within six to eight weeks we advocate radical surgical removal of the sinus.

DR. STANLEY R. WOODRUFF, Jersey City, N. J. Dr. Kretschmer's study does not entirely answer the three questions cited at the beginning of the paper. Accompanying his study of the living patients should also go a historical review of those who have died, and for what reason. With these data at hand one would be better fortified to answer more intelligently the question whether a patient can live with one kidney. The answer is yes, and he can also die from uremia shortly after nephrectomy. Naturally those conditions in which there has been a gradual upbuild of compensatory function, as hydronephrosis, tumor and calculous pyonephrosis, will show the best postoperative results. One would expect to find in the 49 patients operated on for tuberculosis of the kidney that urinary symptoms and actual evidence of the disease was noted in the bladder or the remaining kidney. Patients should be taught that nephrectomy is more often a conservative operation than a radical one and that only in certain instances will it be necessary to inhibit activities in postoperative living. Dr. Kretschmer's study certainly supports this statement. Tuberculosis heads the various conditions requiring nephrectomy in the need of postoperative care, and we can only hope for the time to come when patients with this condition will be given proper subsequent treatment. Patients who have been nephrectomized for calculous disease should be studied for a possible cause, nearly all other patients show conditions in which postoperative care means little.

DR. HERMAN L. KRETSCHEMER, Chicago. In this series there were 47 patients who were operated on for renal tuberculosis. Seven of these patients are still having symptoms due to tuberculosis of the bladder and the removed kidney. In some of them the symptoms are due to contracted bladders, the result of the renal tuberculosis. I wish to agree with Dr. Woodruff as regards the importance of postoperative care in the management of the patient on whom one has performed a nephrectomy.

## THE REPAIR OF CRANIAL DEFECTS WITH TANTALUM

AN EXPERIMENTAL STUDY

LIEUTENANT (J. G.) ROBERT H. PUDENZ  
MEDICAL CORPS U. S. NAVAL RESERVE

The surgeon planning repair of a cranial defect has a large number of methods from which to choose. At the present time the most favored technics are those which employ autogenous tissues particularly bone and cartilage. However, the use of substances alien to the host has continued despite the popular aversion to the production of a foreign body reaction. Furthermore, enthusiasm for the alloplastic materials has recently been revived by the encouraging reports of Geib,<sup>1</sup> Beck<sup>2</sup> and Peyton and Hall<sup>3</sup> on the repair of cranial defects with tantalum. In this paper certain observations on the experimental and clinical use of tantalum for this purpose are reported.

Before I discuss the alloplastic methods it is well to consider the advantages and disadvantages attending the use of autografts. Bone is obtained either from the adjacent skull with the Muller-Koenig technic or one of its modifications or from the ribs, tibia, ilium or scapula. The principal advantage of these technics is that the living tissue of the host is used, thus obviating reaction to a foreign body. The objections to the use of autogenous bone are that either a more extensive procedure or a second operation is required and that absorption of the grafts may occur. Ney<sup>4</sup> has reported 44 cases of cranioplasty with autogenous bone from World War I in 34 of which there was either partial or complete absorption of the grafts. These observations however, are at variance with those of other authors. Grant and Norcross,<sup>5</sup> who have reviewed the literature on cranioplasty observed 58 cases for periods of time varying from nine months to nineteen years after operation. Satisfactory results were obtained in 48 of these patients and absorption of the grafts was noted in only 3 instances.

Peer<sup>6</sup> has recently stated that fresh autogenous rib cartilage is the most satisfactory cranioplastic material. He points out that it lives as cartilage as long as the patient survives. However Grant and Norcross object to its use for this very reason. The defects, by remaining cartilaginous are never solid. A second disadvantage, also applicable to the use of bone, is that satisfactory repair from the cosmetic standpoint is not always obtained, owing to the shape of these grafts.

In the discussion of the alloplastic methods the use of celluloid will first be considered. Ney has described 300 cases of cranioplasty in which this substance has been used. He reports only five failures in his unusually large series of cases. Furthermore, in 4 of these 5 cases the celluloid plates were successfully reinserted.

From the Department of Neurology and Neurosurgery, McGill University Faculty of Medicine and the Montreal Neurological Institute and from the Departments of Surgery and Pathology, National Naval Medical Center, Bethesda, Md.

This article has been released for publication by the Division of Publications of the Bureau of Medicine and Surgery of the U. S. Navy. The opinions and views set forth in this article are those of the writer and are not to be considered as reflecting the policies of the Navy Department.

1. Geib, F. W. Tantalum Skull Plates. *J. A. M. A.* **117**: 817 (July 5) 1941.  
2. Beck, C. S. Repair of Defects in Skull by Read-Made Tantalum Plates. *J. A. M. A.* **115**: 798-799 (March 7) 1942.  
3. Peyton, W. T. and Hall, H. B. The Repair of a Cranial Defect with a Tantalum Plate. *Surgery* **10**: 711-715 (Nov.) 1941.  
4. Ney, K. W. The Repair of Cranial Defects with Celluloid. *Am. J. Surg.* **44**: 394-399 (May) 1939.  
5. Grant, F. C. and Norcross, N. C. Repair of Cranial Defects by Cranioplasty. *Ann. Surg.* **110**: 488-512 (Oct.) 1939.  
6. Peer, L. A. Types of Buried Grafts Used to Repair Deep Depressions in the Skull. *J. A. M. A.* **115**: 357-360 (Aug. 3) 1940.

at a later date. The disadvantages of celluloid have been discussed by Grant and Norcross, who point out that it is a foreign body, is nonrigid and may become soft and ineffective. In 1 case in which they reoperated because of severe headache the celluloid plate was invested in a capsule several millimeters in thickness. This intense and progressive type of connective tissue response to celluloid has been demonstrated in experimental animals by Penfield.<sup>7</sup>

In 1941 Geib and later Beck and Peyton and Hall described the successful use of vitallium plates for the closure of cranial defects. The plates were well tolerated in all of Geib's 4 cases. His longest period of observation at the time of writing was two years. One of his patients died of an unrelated cause and at autopsy there was no evidence of an unfavorable reaction to the metal. Peyton and Hall describe a good clinical result in their case at the end of six months of observation. Beck reports the successful use of vitallium in 4 cases. He has overcome one disadvantage attending the use of this metal, namely the necessity of having the plates cast to fit the defect, by employing broad vitallium strips cast in several sizes. These can be bent to the desired contour at the time of operation.

In addition to vitallium and tantalum there are other metals which have been demonstrated to be comparatively inert in tissue. The various types of stainless steel have found a wide application in orthopedic surgery. More recently Campbell and his colleagues<sup>8</sup> have shown that titanium is not cytotoxic either *in vitro* or *in vivo*. This metal is an alloy composed of nickel, cobalt, chromium and molybdenum, with a small amount of beryllium added if it has to be cast. However, to my knowledge, the use of these metals for the repair of cranial defects has not been reported.

Tantalum is an element, the seventy-third in the periodic table. It is a bluish white metal resembling steel in its physical properties and glass in its chemical characteristics. The ductility of tantalum enables it to be drawn into wire or rolled into sheet while in the cold state. It is this property which is of value at the operating table. Owing to its malleability flat tantalum sheet can be cut to fit the defect with tin shears or heavy surgical scissors and then hammered or bent to the desired contour. With regard to its chemical properties, tantalum is resistant to all of the inorganic acids except hydrofluoric and fuming sulfuric acids. Furthermore, it is resistant to weak alkalis, strong alkalis in weak concentrations and the salts, except those which hydrolyze to form strong alkalis.

Before I discuss the published experimental and clinical data on tantalum it is fitting at this point to mention the fundamental investigations of Bothe and his colleagues<sup>9</sup> on the surgical metals. These workers have studied the reaction of bone to metallic implants. They conclude that the unfavorable reaction of the bone is due not to electrolysis but to the physical and chemical properties of the metal itself. Similarly, the unfavorable reactions to alloys are due to the presence of toxic metals, e. g. nickel, copper and manganese, in them. In their conclusions they point out that vitallium comes nearer to meeting the requirements of a surgical alloy than does stainless steel. Finally they mention that

tantalum may be the material of choice when sufficient data on this metal are available.

Burch and Carney<sup>10</sup> were the first workers to use tantalum in surgery. They successfully employed bone plates and screws and wire in both animal and human tissue. This work has been confirmed by Burke<sup>11</sup> who was the first observer to publish results attending the surgical use of this metal. He was particularly impressed by the lack of reaction when tantalum wire was used as a cutaneous suture.

In collaboration with Odom I<sup>12</sup> have published the results of experiments in which tantalum foil of  $\frac{1}{1000}$  inch thickness was used to protect cerebral wounds from the ingrowth of connective tissue and blood vessels from the overlying structures. In this study the metallic foil provoked a minimal encapsulation in connective tissue and was far superior to the other materials used. In another series of experiments<sup>13</sup> the reaction to Cushing's hemostatic clips fabricated from tantalum ribbon was compared to that attending the use of clips cut from the standard silver ribbon. In this study only a slight marginal neuroglial reaction and/or minimal encapsulation by connective tissue occurred around the tantalum ribbon. In contrast the silver clips provoked an intense inflammatory reaction which eventually led to encapsulation in dense connective tissue. As a result of these findings tantalum clips have replaced silver clips in all neurosurgical procedures carried out at the Montreal Neurological Institute.

#### METHODS AND MATERIALS

Tantalum plates were implanted in the cranial defects of 11 cats. The operative procedures were carried out under sterile conditions using intraperitoneal soluble pentobarbital anesthesia. The scalp and underlying fascia were incised in the sagittal plane and retracted laterally. An incision was then made into the temporal fascia along its line of attachment to the calvarium. This fascia and the temporal muscle were reflected from the skull with a periosteal elevator. By this means a satisfactory exposure of the calvarium was obtained. The several types of cranial defects were made with a trephine and mastoid rongeurs. Tantalum plates  $\frac{1}{10}$  inch in thickness were used in all the experiments with one exception.

Three separate techniques were used in the emplacement of the tantalum plates. In 6 cats bilateral trephine holes approximately 1.5 cm in diameter, were made. In these animals only one of the cranial defects was repaired with the metal. The tantalum disks were cut to fit and were supported in position by small spicules of bone projecting into the defect from the inner table of the skull. No other method of fixation of the plates was used. In a second group of 4 animals midline rectangular defects, approximately 2.5 by 1.5 cm, were made. In this group the tantalum plates were secured to the skull with two 35 gauge tantalum wires, one on each side. In 1 animal a large round midline defect was made and covered with a disk of tantalum  $\frac{1}{100}$  inch in thickness, which was bent to conform with the convexity of the surrounding skull. This was the only experiment in which the tantalum plate was used to cover, rather than fill, the cranial defect.

10 Burch J. C. and Carney H. M. Personal communication to the author.

11 Burke G. L. The Corrosion of Metals in Tissues and an Introduction to Tantalum. *Canad. M. A. J.* 43: 123-128 (Aug.) 1940.

12 Pudenz R. H. and Odom G. L. Meningocerebral Vascular An Experimental Study of the Effect of Human Amniotic Membrane, Amnioplast, Beef Allantoic Membrane, Cargile Membrane, Tantalum Foil and Polyvinyl Alcohol Film. *Surgery* 12: 318-344 (Aug.) 1942.

13 Pudenz R. H. The Use of Tantalum Clips for Hemostasis in Neurosurgery. *Surgery* 12: 791-797 (Nov.) 1942.

7 Penfield W. G. *Principles of the Pathology of Neurosurgery*. New York: Nelson & Loose Leaf Surgery, 1927.

8 Campbell Eldridge, Merowsky, Arnold and Hyde Gertrude. Studies on the Use of Metals in Surgery. I. Comparative Determinations of the Cytotoxicity of Certain Metals in Fibroblast Culture. *Ann. Surg.* 114: 472-479 (Sept.) 1941.

9 Bothe R. T. and Davenport H. A. Reaction of Bone to Metals II. Lack of Correlation with Electrical Potentials. *Surg. Gynec. & Obst.* 74: 231-234 (Feb.) 1942.

At the time of closure all bleeding was carefully controlled with the electrocautery. The temporal muscles were approximated to the skull with bridging sutures of silk extending across the midline. Interrupted black silk sutures were used to close the other layers, and a sterile dry dressing was applied.

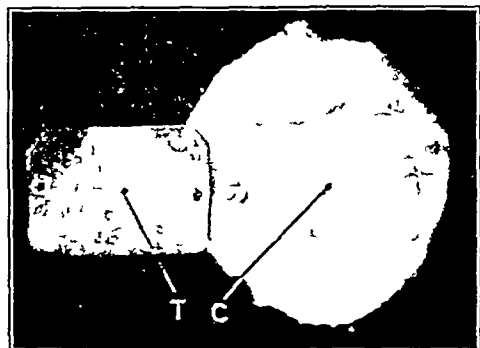


Fig 1 (cat 1)—Appearance of outer aspect of calvarium. Specimen taken after period of survival of one hundred and ninety seven days. The tantalum plate (T) has been reflected from the defect on the wire hinge. Note the inner layer of the connective tissue capsule (C).

The animals were killed after periods of survival varying from twenty-seven to three hundred and eighty days. There was no evidence of reaction to the metal during the observation period in any of the animals. In addition to occasional palpation of the site of implantation of the metal, roentgenograms of the skull were made, either during the interval phase or just prior to death, to determine whether any marginal necrosis of bone had occurred.

At the end of the survival period the animals were again deeply anesthetized with intraperitoneal soluble pentobarbital. The neck was incised and both internal carotid arteries and internal jugular veins were exposed. A cannula was inserted into one of the arteries and the head perfused with isotonic solution of three chlorides followed by 10 per cent solution of formaldehyde.

When the tissues were firmly fixed, the site of implantation of the tantalum plates was carefully

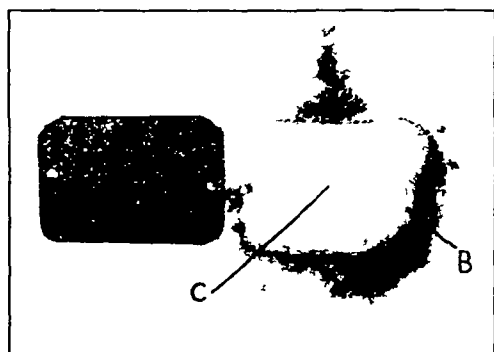


Fig 2 (cat 1)—Appearance of specimen under transillumination demonstrating the thinness of the connective tissue lamina (C) and the marginal proliferation of bone (B).

exposed. Due care was taken to leave tissue relationships undisturbed. This was accomplished by removing the scalp and galea with sharp dissection, incising the temporal muscles and pericranium at an appreciable distance from the plate and cutting the bone and dura at the periphery. By this means the calvarium, with the overlying muscles and pericranium and the underlying dura attached was removed *en masse*. The specimens were preserved in 10 per cent solution of formaldehyde to await further study.

## RESULTS

In all the experiments the tantalum plates were enveloped in delicate translucent layers of connective tissue which were continuous with the pericranium. The capsule was completely formed at the end of twenty-seven days and interestingly enough, showed no tendency to progressive thickening. Even at the end of three hundred and eighty days, the longest period of survival, the bluish white luster of the metal was easily perceptible through the delicate layers of the capsule. These layers were tightly adherent to the tantalum plates and intracapsular fluid formation was absent. The inner layer was adherent to the dura but easily separable from it. Finally, when the capsules were opened the lining was invariably found to be smooth and glistening. Certain of these characteristics are illustrated in figures 1 and 2.

The changes in the bone bordering the tantalum plates were of particular interest. Osteoblastic activity was not hindered and even at the end of twenty-seven days the proliferating bone at the edge of the defect had closely approximated the edge of the metal. In the animals surviving three hundred and seventeen and three hundred and eighty days there was a complete closure of the cranial defect by the new bone formation. This osteoblastic proliferation was confirmed by microscopic study. The osseous layer was so closely adherent to the tantalum plates that when the latter were removed an accurate bony impression of them remained (figs 3, 4 and 5). Proliferation of bone over the external surfaces of the plates was absent in all instances.

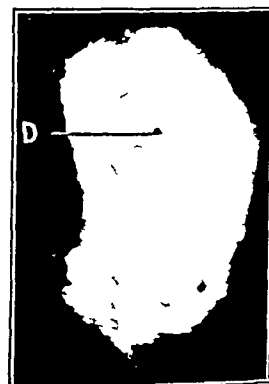


Fig 3 (cat 2)—View of outer table of calvarium showing the site of the cranial defect (D). Specimen taken after period of survival of three hundred and eighty days. In this animal the cranial defect has been completely obliterated by the regrowth of thin lamina of bone beneath the tantalum plate. An osseous impression of the tantalum plate remains.

## COMMENT

These observations on the experimental use of tantalum plates for the repair of skull defects have again confirmed the inertness of this metal in animal tissue. Furthermore, the studies demonstrate that tantalum is a satisfactory material for this purpose. There are several points of evidence in favor of these statements: 1. Although encapsulation of the metal in connective tissue occurred it was not progressive in character. This would obviate the possibility of local pressure on the brain by a steadily thickening capsule. Even after three hundred and eighty days the connective tissue envelop was thin, translucent and tightly adherent to the metal. 2. The presence of the metal did not interfere with the normal regeneration of bone. After approximately eleven months the cranial defects were closed by a thin osseous layer formed beneath the metal. 3. There was no corrosion of any of the tantalum plates. In their report on the use of tantalum for the repair of cranial defects, Peyton and Hall state that an ideal cranioplastic material should be (1) nonirritating both

electrically and chemically, (2) strong and inelastic (3) light in weight, (4) nonabsorbable and (5) malleable. Tantalum fulfils all these requirements except that of lightness in weight. It has an atomic weight of 180.9, about three times that of iron. However, the ability to use a thin sheet of the metal compensates for this disadvantage. Furthermore, despite its heaviness none of the patients who have had a cranial defect repaired with tantalum have, to my knowledge, been aware of any sensation of heaviness or pressure.

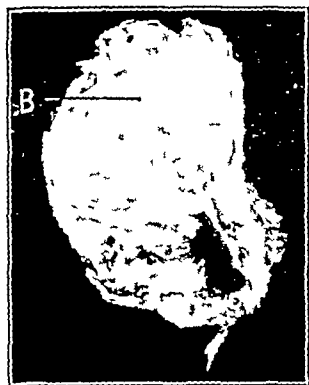


Fig 4 (cat 2)—Appearance of inner table, confirming the closure of the defect with new bone (B).

Although no clinical reports on the use of tantalum for cranioplasty have appeared in the literature, the metal has been so used by several workers. Fulcher<sup>14</sup> who was the first to use the metal for cranioplasty in clinical subjects, has employed tantalum sheet  $\frac{1}{40}$  inch in thickness to repair rather large defects of 2 patients. Excellent results were obtained in both instances. Penfield,<sup>15</sup> Cone<sup>16</sup> and Spurling<sup>17</sup> have had similar encouraging results. They have obtained the desired contour of the metal plates by hammering them either over convex surfaces or in concave molds. I would suggest the use of a rawhide mallet and a hollow wooden mold. The latter should be designed so that any desired degree of convexity is attainable. Holes can be drilled through the plates to permit wiring to the skull and the escape of any blood or cerebrospinal fluid which may collect beneath them.

#### SUMMARY AND CONCLUSIONS

These experimental studies indicate that tantalum is a satisfactory alloplastic material for the repair of cranial defects. It has the desirable qualities of noncorrosiveness, inertness in tissue, nonabsorbability, absence of toxic ingredients and malleability.

This last quality enables the surgeon to form the flat tantalum sheet to the desired contour at the operating table. In view of these characteristics, the use of this metal should be considered in the repair of many of the cranial defects which will inevitably occur as a result of craniocerebral injury in the present war, and particularly in those repairs in which a satisfactory cosmetic result is of utmost importance.

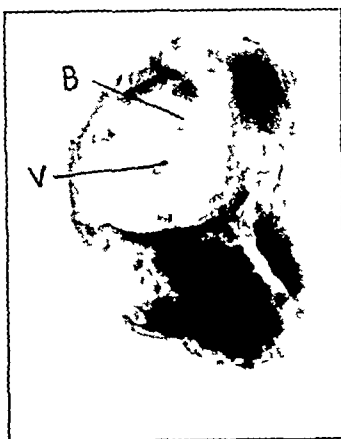


Fig 5 (cat 1)—Appearance of inner table under transillumination. Note the density of the osseous tissue (B) at the center of the defect and the newly formed channels of the dural vessels (V).

## THE TREATMENT OF ACUTE CHOLECYSTITIS

### AN EVALUATION

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The great variability of the clinical course and pathologic picture of acute cholecystitis requires the individualized treatment of this condition. This has not been common practice. Instead rigid and to a certain extent contradictory, plans of treatment have been recommended. These range from operating early as in appendicitis, to delaying surgery until the acute manifestations of the disease have entirely subsided. Both methods have much to commend them and no doubt have favorably influenced the treatment of this condition. This controversy however has not been without danger, since attempts to assimilate and apply the two methods have been confusing to the practitioner. In recent years at the Peter Bent Brigham Hospital each patient with acute cholecystitis has been treated as an individual surgical problem.<sup>1</sup> The results have been so satisfactory and the mortality rate so much improved that a restatement of our views and a clarification of the issues involved seems desirable.

The program which we have utilized is as follows. Regardless of how slight the signs and symptoms may be as soon as the diagnosis of acute cholecystitis has been established immediate hospitalization is urged. Acute cholecystitis is such a potentially serious disease that the idea of treating the patient at home has been abandoned entirely, and our results have justified this change. Early hospitalization does not necessarily indicate that early surgery will be carried out but affords an excellent opportunity to institute treatment which will prepare the patient for surgery at an ideal time.

The extent and severity of the inflammatory process in the gallbladder are estimated by physical examination plus an evaluation of the patient's general condition. The accepted conservative measures are then instituted: (1) relief of pain by morphine, (2) semisitting position with heat to the abdomen, (3) administration of fluids by the intravenous or subcutaneous routes to hydrate the patient properly and (4) constant gastric suction if the patient is vomiting or distended. Routine laboratory studies, including urine and blood examinations, are made.

Although many patients with acute cholecystitis respond promptly to treatment, the possible concomitant complications must not be disregarded and even in mild cases the signs, symptoms and laboratory data should be evaluated at frequent intervals. In severe cases this should be continued throughout the night. Obviously, this would not be practicable if the patient should be treated at home.

#### CLINICAL TYPES

We attempt to classify each patient clinically, i.e. in accordance with the duration and severity of the attack and the response to general treatment. This aids the

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Read before the Section on Surgery, General and Abdominal at the Ninety-Third Annual Session of the American Medical Association, Atlantic City, N. J., June 12, 1942.

1. Zollinger, Robert. Acute Cholecystitis. *New England J. Med.* 224:533 (March 27) 1941.

14. Fulcher, O. H. Personal communication to the author.

15. Penfield, W. G. Personal communication to the author.

16. Cone, W. A. Personal communication to the author.

17. Spurling, R. G. Personal communication to the author.

clinician to decide the subsequent course of treatment for each patient and to determine safely the optimum time for early or late surgery. There are at least three major clinical groups. The first group comprises the majority of patients, whose signs and symptoms subside after adequate treatment with rest, fluids and relief

TABLE 1—Indications for Early or Delayed Surgery

Early	
1	Good risk patient seen shortly after onset (24 to 48 hours)
2	Exacerbation of symptoms while under treatment
3	Progression of signs or symptoms while under treatment
4	Signs of generalized peritonitis
Delayed	
1	Patient seen late with decreasing signs and symptoms
2	Elderly or poor risk patients with decreasing signs and symptoms

of pain. These patients are sometimes well prepared for surgery within five or six days. However, many clinical variations of this group are encountered. For example, some patients present minimal signs and symptoms of acute cholecystitis—perhaps because the attacks have been mild or because the physician was not called until the acute episode had quieted down. We are convinced that it is safer to send these patients to the hospital, even if it is a first attack. They usually respond promptly to general conservative measures and can be operated on without undue risk within eighteen hours of admission. Other patients, with more pronounced symptoms, respond promptly to conservative treatment within forty-eight hours with the return to normal of their temperature, white cell count and physical findings. If operation is not carried out when the proper state of hydration is obtained, a few of these patients will have an exacerbation of symptoms after forty-eight hours. It is impossible to predict the course of their disease when treated conservatively, hence, early hospitalization and surgery are urged. Many other patients show slow but progressive improvement, with subsidence of acute manifestations after three days. Although we feel that it is best to operate early in these cases, we have not hesitated to delay operation when the progress is satisfactory.

The second group includes those patients whose temperature, white cell count and physical findings remain

TABLE 2—Surgical Treatment

		Number of Deaths	Mortality Per Cent
Total operations	146	4	2.6
Cholecystectomy	70	0	0
Cholecystectomy and choledochotomy	67	1	1.5
Cholecystostomy	28	3	10.7
Cholecystostomy and choledochotomy	1	0	0
Common duct stones removed		23	
Incidence of common duct stone		14.9%	

practically constant, with no response to initial treatment. Operation should not be delayed in this group and should be performed within thirty-six to forty-eight hours, after the fluid balance has been adjusted.

The third clinical group is made up of the small number of patients whose signs and symptoms show rapid progress. These patients are acutely ill and usually require simple drainage of the gallbladder as soon as possible.

## TIME FOR OPERATION

As stated before, we attempt to individualize the treatment of each patient. It is very difficult to make fixed rules to govern the proper time for surgery in acute cholecystitis. However, an emergency operation is rarely necessary. Sufficient time should elapse to allow for proper hydration of the patient (table 1). By early operation we mean that which is performed within twelve to forty-eight hours after admission of the patient to the hospital. This is done under the following circumstances: 1 When the patient is a good risk and is seen soon after the onset of the attack, within twenty-four to forty-eight hours. 2 When the patient, progressing satisfactorily under conservative treatment, develops an exacerbation of symptoms. If the patient's physical findings, temperature and white blood count increase or sufficient distress returns to necessitate administration of morphine, operation should not be delayed. 3 When the signs and symptoms fail to respond to, or increase under, treatment. It is not unusual to find that these patients have an extracholecystic abscess. They are usually quite ill and sometimes it is best to do no more than a cholecystostomy. 4 In a small group of patients who are acutely ill with signs of generalized peritonitis, in all likelihood associated with acute cholecystitis. In some instances there may be a question of differential diagnosis between

TABLE 3—Indications for Cholecystostomy

- 1 Elderly patients or those accounted poor surgical risks who present a well defined mass
- 2 Seriously ill patients for whom minimal surgery is desirable
- 3 Presence of an abscess about the gallbladder
- 4 When technical difficulties prevent cholecystectomy

acute cholecystitis, acute appendicitis or perforated ulcer. These patients are first given fluids and then are operated on within a matter of a few hours after their admission to the hospital.

Operation is delayed and conservative measures are continued if the patient is seen forty-eight hours or more after the onset of the acute attack and the signs and symptoms have subsided under conservative treatment. It is our feeling that postponement of the operation for a few days is all that is necessary. We tend to delay operation on elderly patients if they progress satisfactorily under conservative treatment. Likewise, operation is delayed if a patient is a poor risk, because of a pathologic condition other than that related to the acute cholecystitis. It should be remembered, however, that in many of the groups that have been mentioned an exacerbation of symptoms may occur requiring early surgery. Furthermore, one must remember that occasionally the signs, symptoms and laboratory data are misleading and do not give reliable information as to the actual severity of the pathologic process involving the gallbladder. This is especially true among elderly persons.

## CLINICAL ASPECTS

During the past five years we have operated on 146 patients with acute cholecystitis in the Peter Bent Brigham Hospital according to the plan of individualized treatment just outlined. Despite the fact that immediate hospitalization has been urged for these patients, we have noted little evidence of a trend in this direction. As a matter of fact only 45, or 30 per

cent, of our patients entered the hospital within forty-eight hours of the onset of the acute attack. This, no doubt, varies in different clinics. Allen and Wallace<sup>2</sup> found that approximately 85 per cent of their patients were admitted during the early period. Chart 1 shows the duration of symptoms from the onset of the acute attack until operation. This period is more important than the interval between admission to the hospital and operation. Only 7 patients were operated on within twelve to twenty-four hours after admission and a total of 15 patients were operated on during the first forty-eight hours. Relatively few of our patients, therefore, were operated on early after the onset of the attack. This was partly due to the fact that it seemed desirable to complete their preoperative preparation or perhaps because the symptoms had existed for a longer period of time when admitted. Considerable weight in favor of early operation may be drawn from the fact that there were no deaths among 57 patients operated on within eight days of the onset of an acute attack of cholecystitis.

Acute cholecystitis is primarily a disease of middle life. Our patients varied in age from 19 to 77 years

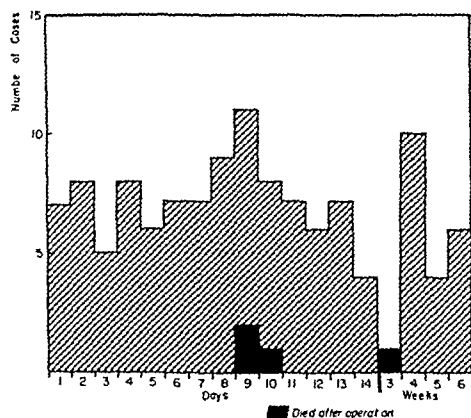


Chart 1—Duration of symptoms. Note that only 15 patients were operated on within forty-eight hours of the onset of the acute symptoms. Furthermore there were no deaths within eight days of the onset of symptoms.

(chart 2) Forty-five of them were less than 45 years old, in which group there were no deaths. As one would expect, it was primarily the older patients who died, all 4 being patients between 45 and 65 years of age. Yet we have never considered that advanced age in itself is a contraindication to surgery.<sup>3</sup> There may be a tendency to postpone or advise against operating on older patients having their first attack of cholecystitis. However, one cannot but be impressed after reviewing many case histories, that many of those could have been treated surgically with far greater safety.<sup>3</sup> That the elderly patient can withstand cholecystectomy is illustrated by the fact that 31 of our patients were above 65 years of age and 16 of these above the age of 70. There were no deaths in this group.

The mortality among 146 patients with acute cholecystitis, having 156 operations on the gallbladder during the five year period from 1937 to 1941, was 2.6 per cent (table 2). Cholecystectomy was performed on 70 patients without mortality. This indicates the safety of removing the acutely inflamed gallbladder completely

in properly selected cases. In recent years we have practiced almost as a rule emptying the acutely distended gallbladder through a trocar. If the field is properly walled off, the danger of spreading infection is far less than the hazard of poor exposure. It must be remembered that only in about one half of the cases is it possible to obtain a positive culture, the inflammatory reaction in the remainder is due to chemical and mechanical causes.

On 57 patients choledochostomy was performed in addition to cholecystectomy with but one death. Twenty-three of these patients were found to have one or more common duct stones, making an incidence of 14.9 per cent of all cases. Formerly it was thought that since the cystic duct was frequently blocked by a calculus in acute cholecystitis it was unlikely that any stones escaped into the common duct. Our

experience over a period of years has indicated the opposite, as we have consistently found a 12 to 15 per cent incidence of common duct stones in these cases. It has been our feeling that exploration of the common duct has added little or nothing to the total mortality, provided the patients have been properly prepared for operation. If we suspect from the patient's history that a common duct stone may be present, we tend to delay

operation as long as progress is satisfactory in order that the inflammatory reaction about the common duct may subside. The technical procedures in this region can then be more easily and safely performed. Operation is also delayed if the history, physical examination or laboratory findings (high diastase values) indicate that acute pancreatitis is associated with the acute gallbladder condition.

Twenty-eight patients had cholecystostomy with a mortality of 10.7 per cent. Removal of the gallbladder is obviously more desirable, but in a few cases it is better to rely on simple drainage.

The high mortality that is associated with this procedure reflects its use in the more serious cases. We believe that a tendency to perform a greater number of cholecystostomies has been partly responsible for lowering our mortality. In general, cholecystostomy has been utilized under the fol-

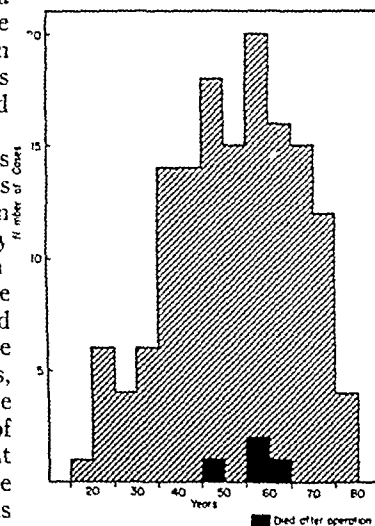


Chart 2—Age distribution. Three of the 4 deaths occurred between the ages of 55 and 65 years. However there were no deaths among 31 patients operated on above the age of 65. Old age is not necessarily a contraindication to operation.

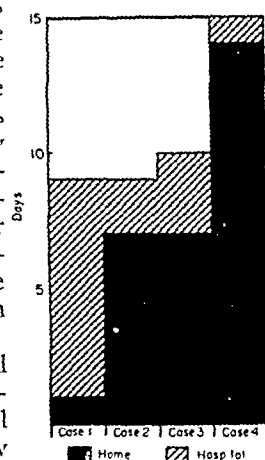


Chart 3—Deaths. Three of the 4 patients who died had been treated at home from seven to fourteen days. In case 1 the period of hospitalization was unduly prolonged.

<sup>2</sup> Allen A. W. and Wallace R. H. Acute Cholecystitis, Arch Surg 43: 762 (Nov.) 1941.

<sup>3</sup> Quigley T. B. Biliary Surgery in the Aged. New England J Med 221: 970 (Dec. 21) 1939.



lowing circumstances (table 3) (1) in elderly or poor risk patients in whom a well defined mass can be demonstrated in the gallbladder region, (2) in the seriously ill patients who obviously cannot stand a formidable operative procedure, (3) when an abscess is encountered about the gallbladder and the general peritoneal cavity is walled off and (4) when for technical reasons it would be extremely difficult to remove the inflamed gallbladder especially when the structures cannot be properly identified. It is better for the surgeon to drain the gallbladder if technical difficulties make him uncertain of the correct procedure. We advise that the gallbladder of such patients be removed within two or three weeks during the same hospital admission. However if the patient is elderly or a poor risk, this may be postponed indefinitely in the hope that he will encounter no further difficulty.

The incidence and dangers of perforation have contributed to the differences of opinion in the treatment of acute cholecystitis. It has been pointed out that, the longer the operation is delayed, the greater is the incidence of perforation with a resultant higher mortality rate. The perforation usually is sealed off by the adjacent structures and an abscess is formed in the region of the gallbladder. A free perforation with escape of the contents of the gallbladder into the peritoneal cavity is relatively infrequent. This danger is probably greater for patients who have had previous abdominal surgery with fixation of the omentum elsewhere. We have had 2 patients in the last five years with a free perforation. Both were subjected to early operation because of the signs of generalized peritonitis, and both recovered. As a rule, persistent pain associated with increasing local signs of inflammation implies that the gallbladder has perforated and that an extracholecystic abscess is forming.

Occasionally this has been unexpectedly encountered because the signs and symptoms were so mild. Therefore early hospitalization and frequent evaluation of the patient's progress are important if this complication is to be avoided and a low mortality maintained.

The incidence of complications associated with acute cholecystitis is high 24 per cent. The majority of these are associated with the pulmonary system. Wound infections were second in frequency.

There were four deaths among the 146 patients operated on for acute cholecystitis. It is of some significance that all 4 of these patients had had their disease at least eight days before operation (chart 3). Three of the 4 patients had had the condition for seven to fourteen days before entrance to the hospital and all were operated on within three days after admission to the hospital. One patient, however, was sent to the hospital within twenty-four hours and conservative measures were followed for one week. In retrospect we feel that this patient should have been operated on earlier. The cause of death of 3 of the patients was infection. One patient had an *Escherichia coli* septicemia, while another had a peritonitis due to the same organism. In addition to acute cholecystitis 2 patients had a stone located outside the gallbladder. One death was the result of a cranial intraventricular hemorrhage.

#### SUMMARY

The patient with acute cholecystitis should be hospitalized as soon as the diagnosis is established, regardless of how mild the symptoms may seem. It is a common and serious condition with possibilities that cannot be predicted except by frequent evaluation of

the patient's progress. Clinical groups based on the duration and severity of symptoms and their response to standard conservative measures provide a clue to the selection of the proper time for surgery either early or delayed. Sufficient time must be allowed to hydrate the patient properly and prepare him for operation. Rarely does a patient require emergency surgery. A mortality of 2.6 per cent was obtained over a period of five years in the surgical treatment of 146 cases of acute cholecystitis. The incidence of common duct stones associated with acute cholecystitis was 14.9 per cent. Our experience indicates that although early hospitalization is ideal from the standpoint of the patient, a low mortality can be obtained regardless of whether he is seen early or late, provided he is treated as an individual surgical problem.

#### ABSTRACT OF DISCUSSION

DR FRANK GLENN New York. At the New York Hospital Dr Heuer and I have over the past nine years kept a careful account of patients we have treated for acute cholecystitis and we have adhered to a policy of operating on all after adequate preoperative preparation unless there is some contraindication. We have treated surgically 379 patients with acute cholecystitis. There have been no deaths in those under 40. Three deaths occurred in a group under 50, and the remainder occurred in patients over 50. It is in this group of patients over 50 that we most frequently see the complications associated with cholecystitis, and it is in this group that we see mortality occur regardless of whether they are treated medically or surgically. Individualizing should be encouraged. The adverse reports concerning the surgical treatment of acute cholecystitis are the result of inadequate preparation for operation, failure to recognize contraindications to surgical therapy and improper surgical technique. Our mortality rate in 379 cases of acute cholecystitis is 2.37 per cent and we may compare that with a group of 1176 nonacute cases in which the mortality rate was 2.71. Acute cholecystitis is essentially a disease of young adult life occurring most frequently in women of childbearing age. It may occur in younger and does occur in older persons. In the older it is almost without exception a complication of a long standing biliary tract disease. The common type of patients with acute cholecystitis is therefore a good surgical risk. They will in the majority of instances recover from the attack, as the authors have pointed out but they do so to enter later into the group that contribute to the mortality rate to biliary tract surgery today.

DR HENRY F. GRAHAM Brooklyn. There are certain facts about acute cholecystitis that we should always keep in mind in every case. The first is that operation early in the disease, that is in young people is free from danger. Second that operation early in the acute gallbladder attack has a low mortality. We collected a group with a mortality in 167 cases of 3.9 per cent. In 1 of those cases there was an acute pancreatitis. Heuer sometime ago showed 112 cases in which operation was performed before perforation had occurred with a mortality of 1.8 per cent and the Postgraduate gallbladder clinic shows a mortality for acute cholecystitis without pancreatitis of 2.9 per cent. The third point is that no surgeon can determine the exact disease process present in the gallbladder by any clinical or laboratory examination. I have operated on patients who seemed to have no acute inflammation present and have taken out a gangrenous gallbladder. In the fourth place, infection is usually negligible during the first few days. Dehydration and other complicating factors are late manifestations of the disease. What operation to do in each individual case seen late is debatable and must be carefully considered.

DR D. W. BARROW, Lexington Ky. In an analysis of 167 cases of acute cholecystitis recently made no other factor was so closely correlated with the mortality rate as the interval elapsing between onset of symptoms and hospitalization. Of the 167 patients, only one fifth 20.6 per cent came within twenty

four hours after onset of symptoms. The mortality rate in this group was 3 per cent, and, if the 2 patients who died following cholecystectomy through an incision originally intended for an appendectomy are excluded the mortality rate was zero. Of the patients coming to the hospital one to three days after onset the mortality rate was 6 per cent and of those coming more than three days, who formed more than half the series the mortality rate was 10 per cent. The patients in these groups were treated both by prompt operation after adequate preoperative preparation and by conservative measures. As far as we could tell the mortality rate particularly in the third group, was about the same when treated in either way which reemphasizes the importance of bringing the patients to the hospital early before too great damage to the liver and body homeostasis has occurred. In this group of 167 patients there was no way in which the subsequent clinical course could be determined by any method available. Every patient with early acute cholecystitis, even though the initial manifestations may be mild should be considered as potentially seriously ill and measures including hospitalization intended to preserve physiologic function should be instituted promptly.

DR MOSES BEHREND, Philadelphia. I have never subscribed to the idea that an acute cholecystitis was an emergency operation. Patients with acute empyema of the gallbladder have a high mortality and should not be operated on immediately. I do not believe that so many operations of cholecystostomy are necessary in the treatment of acute cholecystitis. These patients must be hospitalized. Home treatment, such as the giving of food and water, are prohibited. Instead they are given intravenous fluids and fluids by hypodermoclysis. I take exception to the belief that one cannot tell clinically by palpation and physical examination and by the pulse and temperature whether or not the symptoms are subsiding. I like the term "opportunity time" for the operation, and the opportune time for these patients is the interval when all the symptoms of acute cholecystitis have subsided. They will subside if they receive absolutely nothing by mouth. I do not fear perforation, because if these patients are hospitalized the complication is not a serious factor. If the gallbladder should perforate the patient can be operated on immediately. At operation there is not any mechanical difficulty in recognizing the structures during an attack of acute cholecystitis if the symptoms and signs are allowed to subside. This is one of the reasons why I have not performed a cholecystostomy for at least ten years in these acute cases. With the use of a long handled knife it is easy to cut along the peritoneal covering of the common duct, cystic duct and the gallbladder itself, then by teasing the peritoneal structures away with a curved scissors—blunt, not pointed—the structures around the foramen of Winslow can be definitely recognized.

DR ELLIOTT C CUTLER, Boston. Like Dr Behrend I believed one could withhold surgery until most of these patients got well. The trouble is that the mortality figures under those circumstances were more than double those we now present. Only when we carried out cholecystostomies on these critically ill, elderly people and people with burst gallbladders or seriously incapacitated poor risk individuals did our mortality rate remain high. A low mortality requires individualization of every patient. We have been through just the same thing in appendicitis. We are reaching the same philosophical attitude toward the biliary tract as a whole. Each case is different. I am satisfied that our mortality has been improved and I am satisfied that a large percentage of the improvement was due to numerous cholecystostomies, much as I despise that operation. Two days ago a man came into the hospital with intestinal obstruction and vomiting. He had been sick for ten days. We gave him an Abbott-Miller tube inflated him and the gallbladder was blown off free. I wasn't going to tackle a poor risk patient who had a blown off gallbladder and a peritonitis by trying to take the gallbladder out. I sewed the tube in and left his gallbladder, and he made a prompt recovery. He may have to have his gallbladder out but he will be alive. I would reemphasize the need for individualization. In those who seem to be doing pretty well one can wait and do an operation of election in three to six days but if they don't improve steadily and rapidly one had better perform an operation.

## THE PHENOMENON OF 'BLACK DERMOGRAPHISM'

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AND

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The term 'black dermographism' designates the fact that under certain conditions a well defined black line appears where the skin is stroked with certain metals.

This phenomenon was first reported by the Russians Lmdin and Kusmenko<sup>1</sup> in 1925. They contrasted the well known red and white dermographisms with black dermographism and stated that only the latter was to be regarded as a true one i.e. actual writing on the skin, since both the white and red dermographisms are due to stimulation of the nerve and muscle fibers of the blood vessels of the skin.

According to these authors the black writing which appears on the skin following application of certain blunt metallic implements with moderate pressure represents not a chemical but a physical process due to the particles of the metal rubbed off by friction and remaining on the skin. While they originally assumed that a hysterical condition was a necessary prerequisite for the phenomenon Lmdin later retracted this idea.

TABLE 1—Metals Producing Black Dermographism on Prepared Skin

Metal	Reaction	Bar In
Silver	Positive	
Copper	Positive	3
Aluminum	Positive	3
Nickel	Positive	
Zinc	Positive	
Tin	Positive	1, 15
Gold	Positive	1
Brass	Positive	1
Cold (fine than 18 carat)	Positive	3

Breitmann<sup>2</sup> was the next to study this phenomenon. He observed that the black dermographism appeared not only in women who used face or body powder but also in factory and dock workers who had never used powder in their lives. Furthermore Markow, Berlin and Minkina<sup>3</sup> have pointed out that an especially high incidence of black dermographism is encountered among workers engaged in particularly dusty occupations (cement mixing, stucco work and the like). Breitmann<sup>2</sup> advanced a chemical theory and held that the appearance of black dermographism is dependent on the character of the skin lipoids. He was of the opinion that finely dispersed particles of the metals are deposited in the upper layers of the skin as the result of some unknown alterations of the lipid metabolism of the skin. Breitmann based this assumption in part on the observation that the black lines will not appear when the skin is washed with alcohol or ether thereby temporarily removing the skin lipoids. Moreover, this author supposed that the phenomenon usually appears in association with some endocrine disturbance, especially of the thyroid gland.

From the Department of Dermatology and Syphilology, University of Pennsylvania School of Medicine. John H. Stoke, M.D., director. Read before the Section on Dermatology and Syphilology at the Ninety Third Annual Session of the American Medical Association, Atlantic City, N. J., June 12, 1942.

<sup>1</sup> Lmdin, P. J. and Kusmenko, A. On Black Dermographism. *Medicheskaya* 1925, 72.

<sup>2</sup> Breitmann, P. Ueber den schwarzen Dermographismus. *Munchen med. Wchnschr.* 77: 2055, 1930.

<sup>3</sup> Breitmann, M. Zur Frage des schwarzen Dermographismus. *Med. Wchnschr.* 4: 29, 1928. *Munchen med. Wchnschr.* 76: 634, 1929.

<sup>4</sup> Markow, Berlin and Minkina. *Klin. med. (ru.)* 1930, no. 5.

This chemical theory was supported by Russinow and Sutorichin<sup>5</sup> and Jurjew.<sup>6</sup> The former described an instance of black dermographism in a patient suffering from chronic copper poisoning. Leščenko<sup>7</sup> was unable to decide whether to believe in the mechanical or the chemical explanation but states that in his experience

TABLE 2—Metals Incapable of Producing Black Dermographism on Prepared Skin

Metal	Reaction	Hardness
Gold (finer than 18 carats)	Negative	2.5 3
Platinum	Negative	4.3
Iron	Negative	4 5

TABLE 3—Composition of 18 and 14 Carat Gold

Composition of 18 carat gold	Composition of 14 carat gold
80% fine gold	60% fine gold
15% copper	31% copper
5% silver + zinc	9% silver + tin

the phenomenon occurs chiefly in neurotic persons as well as in patients with organic conditions.

The German school of thought (Hauck and Dietel<sup>8</sup>, Krantz,<sup>9</sup> Hosp,<sup>10</sup> Bork,<sup>11</sup> Dietel,<sup>12</sup> Joch,<sup>13</sup> Riehl<sup>14</sup>), on the other hand, adhered strictly to the pure physical explanation. Goldschlag<sup>15</sup> and Koga<sup>16</sup> also subscribed to this view. Hauck and Dietel<sup>8</sup> emphasized however the necessity of differentiating between a "true" black dermographism which occurs without any previous preparation of the skin, as they claim in only a small percentage of human beings (27 per cent), and that type which can be produced at will in any one by the preceding application of zinc oxide. Hosp<sup>10</sup> reports that he was able to produce positive results in every one tested under suitable conditions, even in corpses. Finally, it is of interest to note that the phenomenon can be produced not only on the human skin but also on filter paper<sup>9</sup> and cloth.<sup>14</sup>

#### ORIGINAL INVESTIGATIONS

The phenomenon of "black dermographism" can under certain conditions be regularly evoked with the use of a number of different metals (figs 1 and 2). It should be noted at this point that in order to produce the black lines on paper (fig 3), cloth, wood and occasionally on human skin it is sometimes necessary to perform as many as six heavy strokes on the same line. The metals capable of producing a positive reaction on a powdered skin are listed in table 1, metals tested and found incapable of evoking this phenomenon are listed in table 2. Gold occupies an intermediate position: gold finer than 18 carats belongs to group 2, while gold less fine than 18 carats belongs in group 1.

- 5 Russinow A J and Sutorichin W N Irkutsk m J 7 345 1929  
 6 Jurjew F S Klin med (russ.) 6 489 1928  
 7 Leščenko G Trudy ukrain psichonev Inst 7 117 1928  
 8 Hauck and Dietel F Chemische und klinische Untersuchungen zur schwarzen Hautschrift Zentralbl f Haut u Geschlechtskr 31 413 1929  
 9 Krantz W Zur Frage des schwarzen Dermographismus München med Wchnschr 76 1295 1929  
 10 Hosp E Untersuchungen über die Schwarze Hautschrift Dermat Wchnschr 91 1895 1930  
 11 Bork A Ueber das Wesen des schwarzen Dermographismus Ztschr f d ges Neurol u Psychiat 123 224 1930  
 12 Dietel F Ueber schwarze Hautschrift Dermat Wchnschr 92 950 1931  
 13 Joch W Zur Frage der schwarzen Hautschrift (Dermographismus niger) Erlangen Dissertation 1931  
 14 Riehl Jr G Schwarze Hautschrift Zentralbl f Haut u Geschlechtskr 37 325 1931  
 15 Goldschlag F Demonstration der schwarzen Hautschrift Zentralbl f Haut u Geschlechtskr 32 795 1930  
 16 Koga K Ueber die schwarze Dermographie Hifu-to-Hitsunyo 1 451 1933

This is probably due to the higher copper content of the lower grade gold (table 3).

Most of our experiments were performed with a half-dollar coin of a gross weight of 192 grains, consisting of 173.61 grains of silver and 19.29 grains of copper. However numerous tests made at random have shown that all the metals mentioned in table 1 constantly react in the same manner.

The phenomenon of black dermographism can be evoked only when the skin, paper, cloth or other surface is dusted with certain inorganic powders as listed in table 4. Table 5 presents a list of those inorganic powders which do not evoke dermographism.

Lastly, table 7 presents a summary of all chemicals tested. It shows that with the exception of tin and titanium salts, which constantly produce positive results, and of bismuth and silver salts, which regularly give negative findings, all other metals include both positive and negative compounds. Thus some salts of calcium, magnesium, potassium, sodium, zinc, copper, silicon and so on constantly produce positive, while others of the same metals give negative, results. The response to a given salt is always the same regardless of the metal used in stroking if carried out on the same surface (skin, paper, and so on). However, not infrequently a given substance will produce a negative reaction on the skin and a positive reaction on coarse paper (table 7). This may possibly be explained by the highly hygroscopic nature of some compounds, which are able to absorb even the slight moisture of a clinically normal skin, thus tending to obviate the friction.

Regarding face powders, it should be pointed out that any kind—cheap or expensive—permit the elicitation of black "writing." Twenty well known brands of face powder were tested in this respect. Face powder consists principally of finest talcum, titanium dioxide, magnesium stearate, calcium carbonate, insoluble lake colors and synthetic perfume. Of these ingredients titanium dioxide and calcium carbonate make for strongly positive reactions.

Dust, notably street and factory dust, is also capable of preparing the skin for black dermographism.

Despite many consultations with chemists, physicists and metallurgists, we have been unable to set up any

TABLE 4—Substances in Powder Form Reacting Positively with the Metals Listed in Table 1

Aluminum hydroxide	Magnesium oxide
Barium sulfate	Magnesium carbonate
Barium oxide	Mercurous iodide (yellow)
Barium sulfide	Potassium sulfide
Calcium carbonate	Potassium sulfide
Calcium sulfate	Silica dioxide
Calcium oxide	Sodium oxalate
Calcium carbonate	Sodium fluoride
Cobalt carbonate (purple powder)	Tin dioxide
Cobalt phosphate (purple powder)	Tin oxide
Copper monochloride	Titanium oxide
Iron sulfate	Titanium dioxide
Ferric phosphate	Zinc oxide
Lead carbonate	Zinc sulfate
Magnesium ammonium phosphate	

kind of principle according to which it might be predicted whether a given inorganic powder will or will not give rise to this phenomenon. Although it is true that organic compounds practically never produce positive results (sodium oxalate being an exception), it is equally true that many inorganic salts consistently fail to produce reactions. The most obvious explanation is of course the varying degrees of hardness of the powdered substances. While we accept this explanation there are several apparent exceptions: iron carbonate

(hardness 4) and zinc carbonate (45) produce negative results with silver and copper, while iron sulfate (2) and barium sulfate (3) bring on the phenomenon. Although these exceptions cannot be accounted for on a single basis, two possible sources of error should be mentioned: (1) one chemical or another, despite due care, might have contained small amounts of impurities capable of altering the hardness, (2) the references regarding the degree of hardness of ordinary chemical compounds not used in the metallurgic industry are difficult to obtain and often quite old and at variance.

Table 6 shows how differently the various salts of the same metal used in preparation of the skin react, even such closely related compounds as sodium sulfate and sodium sulfite, for example. We would stress that, with the exception of sodium sulfite, all sulfur compounds react negatively and that therefore the sugges-

high moisture content of their skins as well as to the unusual thinness of the epidermis. The skins of these animals regularly fail to react in this manner even when covered with those inorganic powders which bring on

TABLE 7—Summary of the Chemicals Tested for Black Dermographism

Metal	Substance Tested	Reaction	Hardness
Aluminum	Aluminum hydroxide	Positive	2
	Aluminum sulfate	Negative	
	Aluminum silicate (fullers earth)	Negative	
Barium	Barium sulfate	Positive	3
	Barium oxide	Positive	
	Barium sulfide	Positive	
	Barium iodide	Negative	
Bismuth	Bismuth salicylate	Negative	
	Bismuth subgallate	Negative	
	Bismuth citrate	Negative	
Calcium	Calcium sulfate	Positive	3
	Calcium diphosphate	Negative	
	Calcium triphosphate	Negative	
	Calcium oxide	Positive	
	Calcium lactate	Negative	
	Calcium carbonate	Positive	
Cobalt	Cobalt carbonate (purple powder)	Positive	
	Cobalt phosphate	Positive	
Copper	Copper arsenate	Negative	
	Copper monochloride	Positive	
	Copper stearate	Negative	
Iron	Iron sulfate	Positive	2
	Iron oxalate	Negative	
	Ferric phosphate	Positive	
	Iron carbonate	Negative	
Lead	Lead carbonate	Positive	4
	Lead oxide	Negative	
Magnesium	Magnesium ammonium phosphate	Positive	6
	Magnesium salicylate	Negative	
	Magnesium oxide	Positive	
	Magnesium trisilicate	Negative	
	Magnesium stearate	Positive	
	Magnesium peroxide	Negative	
	Magnesium carbonate	Positive	
	Magnesium stearate	Negative	
Mercury	Mercuric oxide (red)	Negative	4
	Mercurous iodide (yellow)	Positive	
	Mercurous chloride	Negative	
Potassium	Potassium sulfide	Positive	2
	Potassium tartrate	Negative	
	Potassium titan fluoride	Negative	
	Potassium percarbonate	Negative	
	Potassium nitrate	Negative	
	Potassium chloride	Negative	
	Potassium sulfite	Positive	
Silicon	Silicon dioxide	Positive	
	Silicic acid (ortho)	Negative	
Silver	Powdered silver	Negative	
	Silver acetate	Negative	
	Silver lactate	Negative	
	Silver nitrate	Negative	
Sodium	Sodium bicarbonate	Negative	2
	Sodium phosphate	Negative	
	Sodium oleate (soft)	Negative	
	Sodium oxalate	Positive	
	Sodium fluoride	Positive	
	Sodium borate	Negative	
	Sodium benzoate	Negative	
	Sodium bitartrate	Negative	
	Sodium chlorate	Negative	
	Sodium chloride	Negative	
	Sodium phosphate	Negative	
	Sodium sulfate	Negative	
Strontium	Strontium salicylate	Positive	2
Sulfur	Sulfur precipitated	Negative	15-5
	Sulfur sublimed	Negative	
	Sulfur washed	Negative	
Tin	Tin dioxide	Positive	67
	Tin oxide	Positive	
Titanium	Titanium oxide	Positive	6
	Titanium dioxide	Positive	
Zinc	Zinc hydroxide	Negative	4
	Zinc oxide	Positive	
	Zinc stearate	Negative	
	Zinc sulfate	Positive	
	Zinc carbonate	Negative	

TABLE 5—Substances in Powder Form Reacting Negatively with the Metals Listed in Table 1

Aluminum sulfate	Silicic acid (ortho)
Aluminum silicate	Powdered silver
Barium iodide	Silver acetate
Bismuth salicylate	Silver lactate
Bismuth subgallate	Silver nitrate
Bismuth citrate	Sodium sulfite
Calcium diphosphate	Sodium sulfate
Calcium triphosphate	Sodium bicarbonate
Calcium lactate	Sodium phosphate
Copper arsenate	Sodium chlorate
Copper stearate	Sodium oleate
Iron oxalate	Sodium borate
Iron carbonate	Sodium benzoate
Lead oxide	Sodium bitartrate
Magnesium salicylate	Sodium chloride
Magnesium trisilicate	Trisodium phosphate
Magnesium stearate	Strontium salicylate
Magnesium peroxide	Sulfur precipitated
Mercuric iodide (red)	Sulfur sublimed
Mercurous chloride	Sulfur washed
Potassium tartrate	Zinc hydroxide
Potassium titan fluoride	Zinc stearate
Potassium percarbonate	Zinc carbonate
Potassium nitrate	Talc
Potassium chloride	

TABLE 6—Differences Between the Reactions on Skin and on Paper with Certain Compounds

Substance Tested	Reaction	
	On Skin	On Paper
Barium iodate	Negative	Positive
Bismutum carbonate	Negative	Positive
Acidum potassium pyro antimonate	Negative	Positive
Mercurous chloride (electrolytic)	Negative	Positive

tion that black dermographism might be due to a sulfur compound (e. g. silver sulfide) may be promptly dismissed.

Hygroscopic and crystalline powders are ineffective in these experiments. Furthermore, results are always negative when the experiment is performed on a smooth, slippery surface, such as damp skin due to perspiration or wetting, greasy skin, glass or smooth, shiny paper. This is due to the fact that the nature of these surfaces eliminates friction, and physical junction of metal and powder is thus prevented.

When any of the powders listed in table 4 are applied to greased skin, the immediate reaction is negative, after some time (from half an hour to three hours), however, the reaction becomes positive if the powder has absorbed the fat. Similar observations have been made on skin areas sprinkled with water or damp with sweat, as soon as the powder has eliminated the moisture, the black lines can again be made to appear. Failure of the black dermographism to appear on the skins of animals including cats, rabbits and guinea pigs is probably due largely to the relatively

very strongly positive results on human skin. The importance of the relative thickness of the horny layer can also be observed in human beings. Thus it has been shown that the black lines can be evoked especially readily on the volar surface of the hand, where the

horny layer is as a rule particularly well developed. It is generally more difficult to produce a reaction on a naturally oily skin than on a dry skin. It may be said, in short, that the result depends entirely on the amount of friction when little pressure is exerted, far fewer particles can be rubbed off the metal by moist or greasy skin, or other smooth slippery surfaces (glass, shiny paper) than by skin with a rough, dry surface.

The black line can readily be washed off with water or rubbed off with a cloth. It is generally possible to cause the reaction to reappear after a short time. However, when a skin area previously treated with zinc oxide is cleansed with benzine or some other fat solvent or is washed thoroughly with soap and water the phenomenon cannot be brought on again unless zinc oxide is reapplied to the skin. When the black line is removed

strated that the chief constituent of the black line was silver in instances in which the phenomenon had been evoked with a silver coin (fig 4) and copper (fig 5) when copper metal was used. This conforms perfectly with the fact that minute black particles can be seen

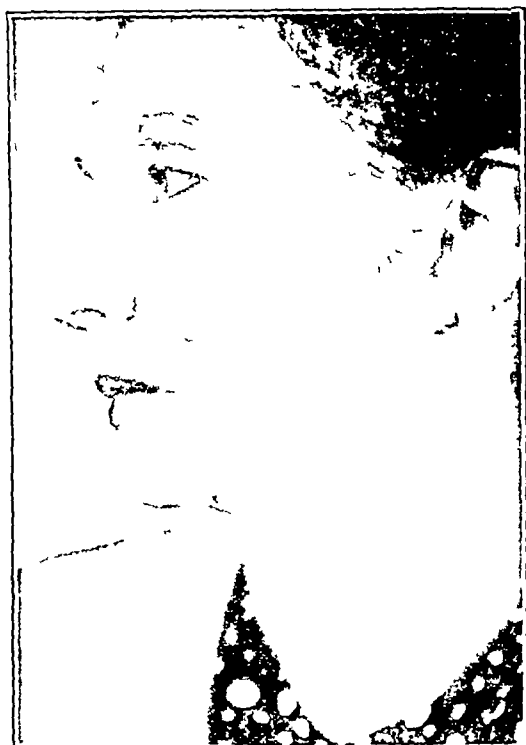


Fig 1 — Black dermographism on skin dusted with zinc oxide using a silver coin

with ethyl acetate or benzene and the same sponge is rubbed over the unpowdered skin of a control subject the black dermographism can be evoked by stroking the site with a metal. This is undoubtedly due to the transfer of some of the powder in the fat solvent medium, for the phenomenon cannot be evoked in this manner when the black line is rubbed off with plain water. Cleaning the coin with alcohol, ethyl acetate and the like does not prevent the appearance of the black line.

Since the possibility has to be considered that the fineness of a given powder might be the determining factor with regard to this phenomenon, experiments were undertaken with colloidal zinc oxide (granule size 1 micron). The results obtained with this substance were identical with those obtained with a coarse grained powder of the same compound.

Dr J W Lentz made photospectrometric examinations of the black line produced by rubbing a half dollar and pure copper on pieces of filter paper previously sprinkled with various inorganic powders. He demon-

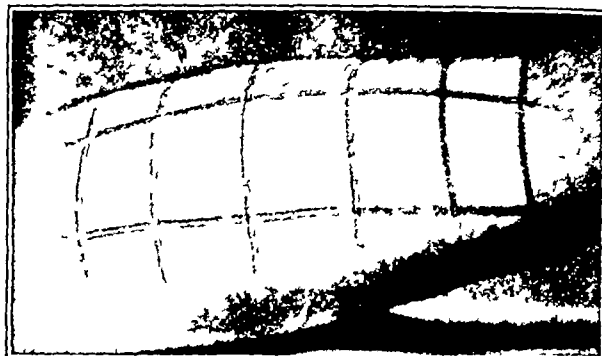


Fig 2 — Black dermographism on skin dusted with titanium dioxide using a silver coin

when the skin is examined with a lens. It is certain, we believe, that the black lines are caused by metallic deposits.

#### COMMENT

Is the black dermographism to be regarded as a chemical or a physical phenomenon?

On the basis of the following facts we are convinced that this is strictly a mechanical and not an electrolytic process. 1 Black dermographism occurs only in association with the use of those powders, salves and pastes leaving on the skin paper cloth or wood powder residues which are harder than the metallic substance used for the "writing." 2 The harder the powder the harder the metal which must be employed to evoke the black line on a suitable surface. For example, iron with a hardness of 4 to 5 does not "write" when zinc oxide (4.5) is used but brings out the black lines following application of extremely fine sand (hardness 7). 3 A considerable amount of friction is neces-

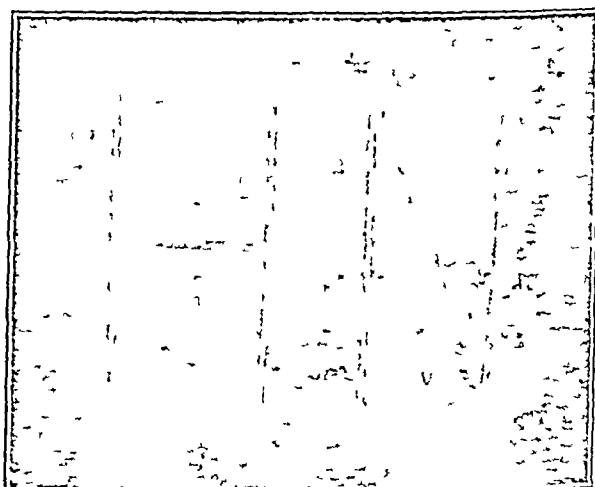


Fig 3 — Black dermographism on paper towel dusted with zinc oxide using a silver coin

sary to produce the black lines. Mere pressing of the metal does not suffice, nor does gentle rubbing. The mechanical theory receives additional support from the facts that the manifestation appears immediately at the site of the stroke, that the skin must be dry for the phenomenon to occur, that the same result (black lines)

is obtained from the use of a variety of metals and of powders of various colors (white, yellow, purple) and that it is possible to demonstrate the presence of the metals (silver, copper and others) in the black lines by means of photospectroscopic or chemical analysis.<sup>5</sup>

Just why almost all organic and many inorganic powders fail to bring on the reaction is not as yet fully understood. This can be partly explained by their relatively low degree of hardness, particularly of the organic compounds, and also perhaps by the fact that these powders readily absorb water and thus tend to prevent the occurrence of the phenomenon by taking up some of the moisture in the skin, thereby diminishing friction. This view would seem to be supported by the observation that certain powders react negatively on the skin but positively on paper.

Is the black dermographism actually a form of dermographism?

Cases of red, white, yellow (Schurer,<sup>17</sup> Adlersberg and Perutz<sup>18</sup>) blue (Koschewnikow<sup>19</sup>) and purpuric (Macleod<sup>20</sup>) dermographism are erroneously so called because in these instances the appearance of the "writing"

visual differences due largely to variations in the moistness and oiliness of the skin. The phenomenon will appear in all persons with dry, nonoily epidermis. The former assumption that hysteria, neurasthenia or endocrine disturbances play a role has to be rejected. The fact that the phenomenon can be evoked in the skin of a corpse conclusively demonstrates that this process cannot be regarded as a biologic reaction.<sup>10</sup>

#### SUMMARY

Black dermographism connotes the fact that under certain conditions a black line will appear at a skin site stroked with certain metals. Black dermographism not infrequently occurs in women wearing silver or cheap gold jewelry on powdered skin areas.

Black dermographism is a physical phenomenon. The earlier theory that it is of some biologic or diagnostic significance is erroneous.

Strictly speaking the term "black dermographism" is a misnomer, since the reaction can be evoked not only on the skin but also on coarse paper, cloth and wood.

422 Medical Arts Building



Fig. 4—Spectrogram of a filter paper dusted with zinc oxide and stroked with silver coin showing heavy deposition of silver in the black line.

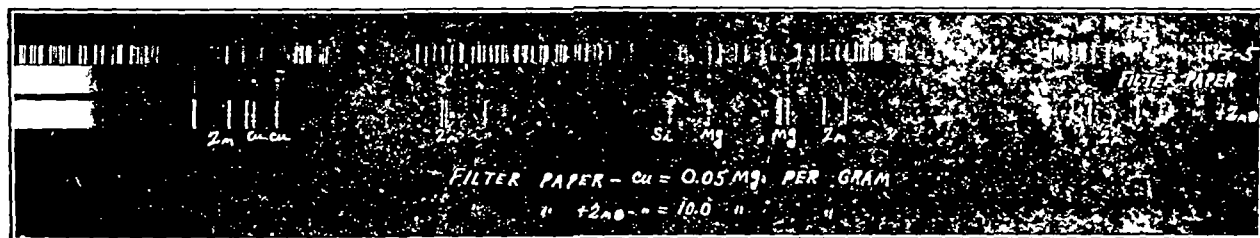


Fig. 5—Spectrogram showing quantitatively the increase of copper (two hundred times more than that of the control) after a filter paper dusted with zinc oxide is stroked with copper.

ing' is due to certain responses in the cutaneous blood vessels and not to reactions of the surface of the skin itself. On the other hand, the designation "black dermographism" is incorrect, strictly speaking, since the writing takes place not on the epidermis per se but really on the powder dusted on the skin. Proof of this lies in the fact that the same effect can be produced on coarse paper, linen cloth, wood and other rough surfaces.

Black dermographism is not infrequently observed in women who wear trinkets and cheap jewelry of silver and gold on powdered areas. The same effect occurs on skin surfaces soiled with street factory or mine dust.

In principle the phenomenon may be evoked on any human skin by the use of appropriate inorganic powders. It must be noted however that there are indi-

#### ABSTRACT OF DISCUSSION

DR. SAMUEL M. PECK, New York: I thank the authors for clearing up many questions which I had about this condition in years past. It seems strange that it had not been reported previously in American literature. We meet this phenomenon in our clinical practice frequently. How often have most of us had patients come to us for some other condition and say, "You know I have too much acid in my system. All my rings are turning black on my skin. When they consulted me about what they should do about this I was at a loss either to give them an explanation for the phenomenon or to offer any suggestions which might be of use. As has been pointed out the term dermographism should be dropped because we are not dealing with an urticarial phenomenon and since the whole process is probably on a physical basis I have noted in a number of my patients that they do not always show this black writing on the skin under apparently similar conditions such as wearing the same sort of jewelry and using the usual cosmetics and toilet soaps. In a number of cases the skin under wedding rings would turn black. This phenomenon occurred only at certain periods in their menstrual cycles. While I believe that this might be due to a difference in the dryness or moisture of the skin this physical condition of the skin was influenced indirectly by the endocrines and therefore might then be said to be on a glandular basis."

17. Schurer, J. Leber ikterische Hautschrift. *Deutsche med. Wchnschr.* 48: 593 (May 5) 1922.  
18. Adlersberg, D. and Perutz, A. Untersuchungen über die Anreicherung von im Blute kreisenden Farbstoffen in Hautquaddeln. Ein Beitrag zur Frage der ikterischen Hautschrift. *Klin. Wchnschr.* 11: 942, 1932.  
19. Koschewnikow, P. W. Der blaue Dermographismus. *Arch. f. Dermat. u. Syph.* 171: 238, 1935.  
20. Macleod, J. M. H. Diseases of the Skin. London: H. K. Lewis & Co., 1920.

DR NELSON PAUL ANDERSON, Los Angeles This phenomenon was described in the English literature under the term of "metallic writing" at least over fifty years ago (Ferrier, David Note on a Peculiar Condition of the Skin in Paraplegia, *Brit M J* 1 341, 1879) The first observation that was made was on patients who had a cerebral hemorrhage The subsequent edema on one side of the body presented metallic writing on that side, while the other side of the body did not present such a phenomenon The first investigators in England thought that this was due to some chemical change in the skin Later they made further investigations, which I believe included most all of the metals that Drs Urbach and Pillsbury have mentioned

DR MARION B SULZBERGER, New York Dr Anderson has pointed out that the fact that metals will sometimes produce black marks on the skin has been known for a long time However I think that Dr Urbach and Dr Pillsbury contribute something of great interest when they show, not that metals will write on the skin, but the important role which certain powders at the skin surface play in producing this form of writing In other words, many of the cases that may have been previously considered to be due to peculiar changes in the sweat and in the chemistry of the skin surface and which were sometimes even explained away as due to stigmatization and hysteria may simply be produced by the powder on the surface of the skin

DR PAUL E BECHET, New York In my library there is a monograph in French of four or five hundred pages, published some sixty years ago, solely on the subject of dermatographism The book contains a full chapter on black dermatographism and what is of great interest, many paragraphs of that chapter are devoted to the important role played by black dermatographism in demonology, black magic and witchcraft, which caused so much torture and burnings at the stake in the Middle Ages There is no question of a doubt in my mind that many ordinary dermatoses because of their mistaken association with leprosy, demonology and witchcraft have caused the torture, violent death and social excommunication of hundreds of innocent persons who were unfortunate enough to be born in the ignorant ages

DR ERICH URBACH, Philadelphia I would be much indebted to Dr Anderson if we could get the reference, because we took the pains to consult the ten best known dermatologic textbooks in the country, and we found the name "black dermatographism" or something of this sort only in the book by the Suttons All the other books do not mention it at all and therefore we are not familiar with the term "metallic writing" and would like to know more about it Dr Sulzberger's observation is more interesting than ours, but it would need some explanation whether it is chemical or physical Referring to Dr Bechet, I have not mentioned that in Europe this kind of black dermatographism was used quite often as magic in order to deceive people I remember this kind of amusement very well when I was a boy A man would come out and say 'Now write your name on me' and this, of course, made a very deep impression on all the people

**Intellectual Honesty**—Two million soldiers and sailors in training centers and in stations in the tropics are living under sanitary controls that are far beyond anything that most of them ever knew existed Other millions are learning the principles and practices of first aid in case of injuries and tens of millions are taking keen interest in problems of diet Demands in the armed services, in sanitation and medicine, in industry and agriculture for young men and women with scientific training are far beyond the capacity of educational institutions to supply To carry on almost any of the work of the world in the future some kind of serious scientific training will be necessary, with the result that the uses and the methods of science will always be in the minds of people and often also the clear thinking and the intellectual honesty it requires—Moulton, F R Science and Technology, *Am A Advance Science Bull*, July 1942, p 34

## TUMORAL CALCINOSIS

ALBERTO INCLAN, MD

WITH THE COLLABORATION OF DR P LEON AND  
DR M GOMEZ CAMPEJO PATHOLOGISTS

HAVANA, CUBA

Under the name tumoral calcosinosis I am presenting 3 unusual cases of a calcified growth of unknown etiology and pathogenesis to which I have found but little reference in a careful search of the medical literature. All 3 patients with this condition have been treated at the Mercedes Hospital in Havana 1 having been seen in the cancer service and the other 2 in the orthopedic service It is interesting to note that all 3 of the patients are Negroes and that they live at points far distant from Havana and from one another

CASE 1—P Q, a Negro girl aged 18 years first seen Oct 17, 1934 complained chiefly of pain and of a tumor in the left gluteal region Her story was that two years earlier she had suffered a fall, receiving a blow on the left gluteal region She attached no importance to her injury, which was



Fig. 1 (case 1)—Appearance of the left gluteal region before operation

in no way disabling Shortly before being seen however, she began to notice slight pain on sitting and a swelling at approximately the site of her previous injury Physical examination was largely negative except for the condition in the left gluteal region This region appeared decidedly prominent but without color changes of the skin There was no venous dilatation nor local increase in temperature Palpation revealed the presence of a large hard mass of bony consistency This mass was smooth rounded and attached apparently to the ilium Roentgenograms showed a dense osteochondromatous shadow superimposed on the shadow of the ilium The central portion of the shadow was of great density contrasting with which there was greater permeability of the marginal portions (the lateral view) Routine laboratory studies were made, revealing a slight anemia and a leukocyte count of 14,000 with an essentially normal differential count A diagnosis of giant osteochondroma of the ilium was made and operation was advised

On December 19, under spinal anesthesia, I made a long incision along the iliac border, planning to reflect away the gluteal muscles and reach the point of attachment of the tumor to the bone However, I was greatly surprised to find the external iliac fossa uninvolved and a huge tumor mass of bony

Read before the Section on Orthopedic Surgery at the Ninety Third Annual Session of the American Medical Association Atlantic City N J, June 10 1942



consistency within the muscles themselves. I therefore made a second incision in the midline of the gluteal region and perpendicular to the first incision, reaching the tumor as soon as the fascia was divided. There was no plane of cleavage, all three gluteal muscles and their bursae being involved, so that I began doing a massive resection, starting from the

Because of the unusual findings at operation I carried out some complementary investigations on the patient. A Mantoux test, chest roentgenograms and determination of the sedimentation rate which were all normal helped to rule out tuberculosis. Various bacteriologic studies of the liquid found within the tumor proved it to be sterile. The blood calcium was 11.4 mg, the phosphorus was 4.7 mg and the phosphatase level was 3.28 Bodansky units. Chemical studies of the liquid showed the presence of calcium carbonate.

The pathologist's report was as follows:

**Gross Examination**—The tumor was a hard mass which, when cut, appeared to be composed of large cavities full of a white milky fluid resembling colloidal calcium.

**Microscopic Examination**—Slides were obtained by routine methods without previous decalcification. The tumor mass was composed of large calcareous deposits separated from one another by thick fibrous connective tissue trabeculae. The connective tissue found in the trabeculae was dense and fibrous, that found in the thinner trabeculae showing hyaline degeneration. The walls of the cavities were rich in macrophages and foreign body giant cells. The macrophages contained lipid substances. Toward the periphery histiocytes charged with lipid substances were seen and the vessels showed perivascular lymphocytic infiltration.

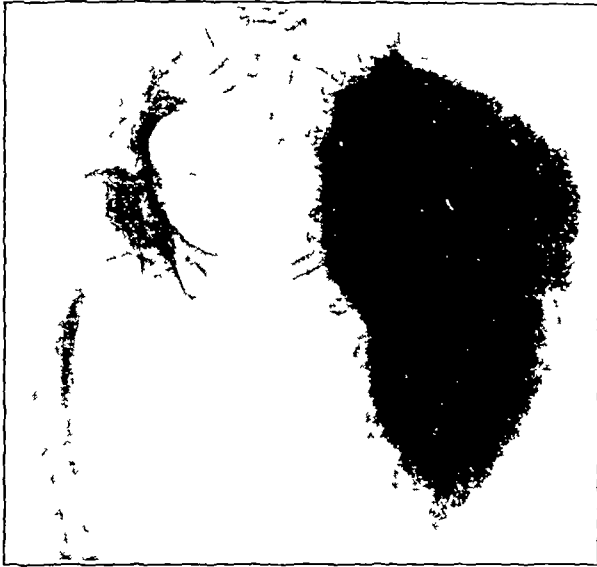


Fig 2 (case 1)—Shadow on left ilium similar to giant osteochondromatous tumor.

inferior portion of the tumor. At this point I found the sciatic nerve compressed by the tumor. When it was incised, this tumor proved to be different from any I had ever seen, being composed of numerous cells or cavities which were filled with a white, milky, dense liquid somewhat like magnesia magma, which I took to be colloidal calcium. In other portions of the tumor the muscle was infiltrated and apparently affected by a more advanced calcifying process. These portions had a putty-like consistency and gave a gritty sensation on being cut. The two pathologic types alternated with each other in different portions of the mass which involved all the gluteal muscles, sometimes showing large cystlike deposits of the



Fig 4 (case 1)—Section of one of the large calcareous deposits under low power magnification limited by thick bands of fibrous connective tissue.

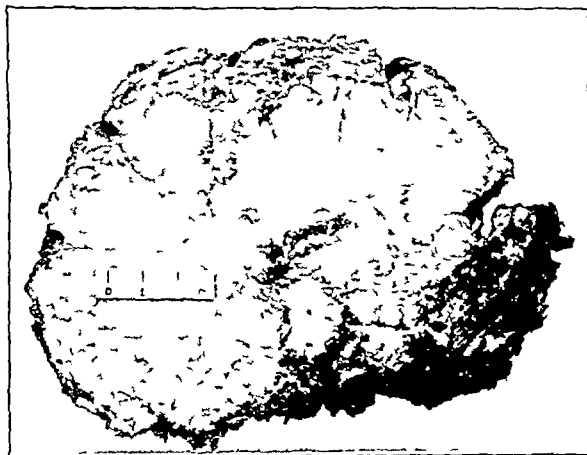


Fig 3 (case 1)—Cut section of the gluteal tumor showing large compact calcareous deposits.

aforementioned milky substance. The blood supply was meager. I resected about half of the tumor, closing the skin and leaving a small drain at the most dependent portion of the incision for it was rather difficult to occlude the large cavity that was left after the tumoral mass had been removed. This portion of the wound healed slowly, draining serous exudate containing amorphous calcium salts for a period of two weeks.

The patient received high voltage roentgen therapy following her operation, the remainder of the tumor diminishing in size after this treatment. Seven years after the operation no new calcified tumors have appeared either in the viscera or in the periarticular structures, which speaks against the possibility of this condition being a generalized calcinosis.

The diagnosis of neoplasm, either benign or malignant, may be eliminated. A careful search for parasites was made, though trichinosis is extremely rare in Cuba, and none were found in the numerous cut sections which were made and studied with a microscope. Myositis ossificans was also eliminated clinically, roentgenologically and microscopically.

**CASE 2**—E. A., a Negro youth aged 19, first seen by my associates and me Sept 17, 1935, complained chiefly of swelling and severe pain in the left hip. He stated that two years before without suffering any injury he began to notice a hard swollen area in the upper part of the left thigh which later spread proximally toward the hip joint and iliac crest. Pain was severe from the onset and seemed to be worse at night, keeping the patient awake. Walking did not aggravate the pain nor did he notice limitation of motion at the hip, but he tired easily, so much so that he had to abandon his work.

Physical examination was negative except for the condition of the left hip and thigh. There was decided prominence of the posterolateral portion of the left thigh proximally, the circumference of the limb at that point being 60 cm as compared to 49 cm on the opposite side. No changes in the color of the skin and no prominent veins were visible. Palpation



Fig. 5 (case 1)—Section of the calcareous globules which make up the characteristic deposit of the tumor and the connective tissue network (Rio-Hortega medium power magnification silver carbonate stain)

revealed the presence of a large hard tumor which appeared to be fixed to the underlying tissues but not to the skin. A similar tumor about the size of an orange was found in the sacral region. The skin over the second tumor appeared lighter in color and was adherent to the tumor mass. The most prominent portion of both tumors appeared soft and fluctuating. Roentgenograms showed the presence of extremely dense shadows with indefinite margins in the left trochanteric and gluteal regions and a cylindric dense shadow over the sacrum. Similar dense shadows though of lesser size were seen in the periarthritic structures of the opposite hip. Examination of the stool revealed the presence of ascaris hook worm and tricocephalus ova but there was no occult blood. The Kahn and Wemicke reactions of the blood were negative and the blood count was well within normal limits.

The fluctuating portion of the sacral tumor was aspirated and 2 cc of an odorless, thick milky fluid was withdrawn.



Fig. 6 (case 1)—Showing the intimate contact between the calcareous globules and the connective tissue network (Rio-Hortega high power magnification silver carbonate stain)

Chemical studies of this liquid showed a high albumin content and the presence of calcium carbonate in suspension. Microscopically amorphous calcium crystals but no cells or bacteria were seen. Cultures showed no growth and animal inoculations gave negative results.

A biopsy of the gluteal tumor was done which grossly showed the same pathologic type as that seen in case 1, I then

extirpated the sacral tumor. The latter appeared to arise from the areolar connective tissue found between the aponeurotic origin of the latissimus dorsi and sacrospinalis muscles and the sacrum. This tumor was removed together with the adherent skin, and lateral skin flaps were mobilized and brought across to close the defect.

I have been unable to have the patient come back for reexamination, though I have ascertained that he is alive nearly seven years after the operation and nine years after the onset of symptoms.

The pathologic report on the excised tumor was as follows:

**Gross Examination**—The specimen was a rounded mass doughy in consistency, the size of an orange and covered by skin on three fourths of its surface. On incision the tumor was found to be composed of cystic cavities, varying in size from 0.5 to 3 cm which contained a white milky fluid. The walls of the cyst were smooth well defined and clearly demarcated from the surrounding fibrous connective tissue.

**Microscopic Examination**—Sections through the borders of the cysts showed large calcareous deposits which rested on an ill defined cellular stratum in which numerous histiocytes and foreign body giant cells were seen. Under higher magnification an intense fibroblastic reaction was visible and also foamy plasma cells similar to those seen in xanthomas. The polymorphonuclear giant cells were seen to contain calcareous inclusions. Ovoid double refractory bodies staining deeply



Fig. 7 (case 2)—Appearance of the tumor over the sacrum and the left gluteal region following biopsy of the latter

with the basic stains were seen occasionally at the edge of the cavity. These bodies did not resemble any phase of the life cycle of any parasite known to us. Beyond the wall of the cavity there was areolar connective tissue rich in blood vessels and containing lesser amounts of deposited calcium salts. The vessels showed endarteritis and perivascular lymphocytic infiltrations. Toward the periphery and away from the cavity bundles of degenerating muscle fibers separated by dense fibrous connective tissue were seen.

**CASE 3**—L. H. G., a Negro girl aged 10 years, seen by us on Dec. 5, 1940, complained chiefly of a tumor of the right elbow. The parents stated that three months previously they had noticed a swelling about 1 cm in diameter on the posterolateral aspect of the child's right elbow. The tumor was not painful and grew rapidly without producing local or systemic symptoms of any kind. Motion of the elbow joint was free and not painful. She was seen by her local physician, who treated her with massage for a few days, with further increase in the size of the tumor. She was seen at another hospital when the tumor was the size of an orange. Aspiration revealed the presence of a milky liquid. X-ray examination revealed a large calcified tumor at the level of the lower end of the humerus. Laboratory examination revealed coagulation time normal, calcium 10.9 mg, urea 27 mg and dextrose 90 mg per hundred cubic centimeters. The Kahn reaction was negative.

A urinalysis showed numerous pus cells and renal pelvis cells in the sediment.

Physical examination was essentially negative except for the right elbow, in which a tumor the size of half an orange was seen on its posterolateral aspect. The tumor mass projected outward on each side of the triceps tendon and its external portion was covered by distended shiny skin. Over this portion the tumor appeared soft and definitely fluctuating. The base of the tumor was hard and adherent to the epicondylar and epitrochlear muscular insertions. There was no increase in the local temperature or venous circulation and no regional lymphadenopathy. The position and shape of the tumor made me think that it arose from the subtricipital bursa, and the sharply outlined, very dense shadow led me to make a diagnosis of calcinosis or calcareous granuloma and decide on its removal.

The laboratory work done at our hospital revealed the following:

A blood count showed erythrocytes 4 250 000, hemoglobin 105 per cent, color index 1.02, leukocytes 8 000, lymphocytes 38 per cent, monocytes 2 per cent, neutrophils 54 per cent and eosinophils 6 per cent. The Kahn reaction was negative. Blood cholesterol was 232 mg, calcium 115 mg and phosphorus 41 mg per hundred cubic centimeters and phosphatase level 76 Bodansky units.

Under brachial plexus anesthesia an elliptic incision was made around the portion of skin which was adherent to the tumor. By blunt dissection the tumor was enucleated from under the triceps tension which was found to be thinned out. The lateral portions of the tumor were calcareous and involved the epicondylar and epitrochlear muscles, from which it had to be carefully dissected in order that injury to the radial and ulnar

The pathologic report was as follows: This tumor was identical with that already described in case 1. The macroscopic appearance was practically the same although the tumor mass was smaller.

The patient was readmitted Jan. 14, 1942. She stated that six months after being discharged from the hospital she noticed

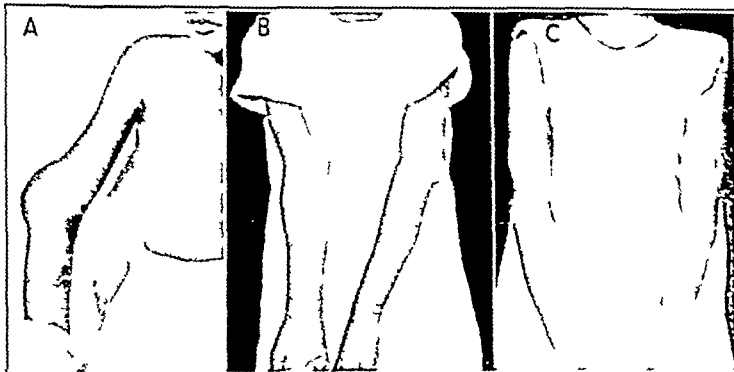


Fig. 9 (case 3)—A, tumor of right elbow; B, location of the new tumor of the left elbow and the aspect of the right elbow eight months after operation; C, appearance following excision of tumors of both elbows.

a small, hard, nonpainful nodule on the outer aspect of her left elbow. This nodule grew rapidly during the succeeding months without ever being painful or interfering with motion at the elbow joint. Three months after the onset of the first tumor she noticed a similar nodule on the inner aspect of her right elbow. The latter grew slowly. Examination revealed the presence of a large hard tumor on the outer aspect of the left elbow very similar in appearance to the one seen on the patient's previous admission. A new tumor was not found at the site of the former operation on the right elbow but a small hard mass was present at the level of the ulnar groove below the medial epicondyle. There were no neurologic signs in the distribution of the ulnar nerve.

Laboratory work on admission showed erythrocytes 4 720 000, hemoglobin 65 per cent, leukocytes 13 000, lymphocytes 30 per cent, monocytes 2 per cent, neutrophils 68 per cent and eosinophils 0. The cholesterol was 225 mg, phosphorus 48 mg, calcium 9 mg and phosphatase 37 mg per hundred cubic centimeters.

The patient was given a course of a substance<sup>1</sup> which I have found successful in hastening resorption of calcified deposits in bursitis without any effect.

On March 13 I operated on the right elbow finding a tumor which was identical grossly with the one removed at the previous operation. The ulnar nerve was included in though not compressed by, the temporal mass and had to be dissected out carefully. The postoperative course was uneventful. The patient then received a second course of the substance<sup>1</sup> and high voltage roentgen therapy to the tumor of the left elbow without noticeable improvement. The tumor was then removed surgically on April 20. It was found deep to the triceps tendon and appeared to arise from the subtricipital bursa. No new tumors have appeared during the month of observation since her last operation. Her blood cholesterol on May 16 was 268 mg. Her general condition is perfect.

#### COMMENT

As I have said before, it is difficult to name and classify the clinical entity which I have just described and illustrated. Undoubtedly it is an atypical calcinosis which does not correspond to the types described by Steinitz and others,<sup>2</sup> namely all calcinosis

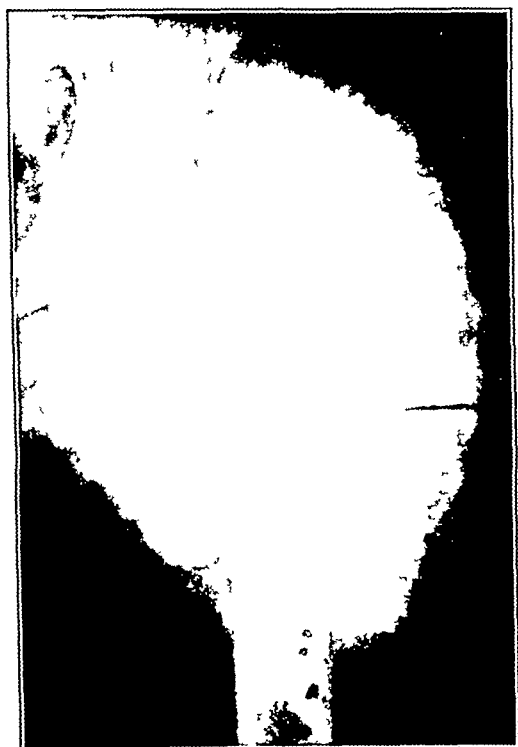


Fig. 8 (case 2)—Shadow of the gluteal tumor.

nerves might be avoided. The wound was sutured in layers and the elbow was immobilized in plaster for ten days, the operative wound healing by primary intention. Postoperative roentgenograms showed that practically the entire tumor had been removed. Chemical analysis of the liquid found within the tumor showed a high content of calcium phosphates and carbonates. Bacteriologic studies gave negative results.

<sup>1</sup> Robes Anti Rheumatic Injection, marketed by Robes Intravenous Products, Inc. called in Cuba Patogenol Gardier. It is stated to contain mercury bichloride 0.9 mg, guaiacum solids 0.3 mg and sodium chloride 0.0066 Gm. per hundred cubic centimeters of 8 per cent alcohol (J. A. M. A. 86:1713 [May 29] 1926).

<sup>2</sup> Steinitz H. Calcinosis circumscripta ("Kalkgicht") und Calcinosis universalis. *Ergebn d. inn. Med. u. Kinderh.* 33:216 (1931). Lutz J. Fletcher. Calcinosis Universalis. *Ann. Int. Med.* 14:1270 (Jan.) 1941. Rothstein and Welt.<sup>6</sup>

circumscripta and calcinosis universalis. It is not similar either to Virchow's<sup>3</sup> metastatic calcinosis. However, the microscopic aspect of the calcareous deposits and their chemistry do resemble those of the different forms of calcinosis which have been described. Geschickter and Lewis,<sup>4</sup> studying tumors of the bursae, present 1 case in which the microscopic appearance is similar to that in my cases. A similar condition is described by Adrian as being reported by Milian and Neveu.<sup>5</sup> This occurred in a woman aged 39, and the lesion was in the prepatellar bursa. Microscopically, the authors could find no tumor tissue and termed the condition calcareous granuloma.

Characteristics which may be of significance in my cases are that 2 of the 3 patients were female, all 3 were Negroes, there was a history of preceding traumatism in 1 case, there was a lack of symptom pain in 2 cases, there was absence of other calcifications in the skin, subcutaneous tissues, fascia and viscera and of changes in the skin, such as scleroderma, there was absolute articular integrity with no deformities, rigidities, contractures or disturbances in the gait, normal circulation and normal blood calcium and phosphorus were present, there was absence of localized or systemic infection, parasites were not found, the serologic reactions were negative, there were no tuberculous lesions and no skeletal deformities in the skull and thorax.

Only 1 case showed an increase in blood cholesterol, and it is to be regretted that more detailed specialized studies of the fat, calcium and phosphorus metabolisms could not be carried out.

I am of the opinion that my cases cannot be grouped under any of the conventional types of abnormal calcification such as myositis ossificans, metastatic calcinosis, calcinosis universalis and calcinosis circumscripta,

my cases as to symptoms, course and roentgen aspects. The predominating characteristics of my cases are the sign "tumor," the gigantic and progressive nature of the calcification, the spread of the growth beyond the muscular and bursal structures and the anatomic distribution to regions in which bursae and gliding cellular tissue are present.



Fig 11 (case 3)—Tumor of right elbow

One cannot say with certainty whether the process begins in the bursae and spreads to the muscle or whether the reverse is true. However, in favor of the first hypothesis there is the fact that these tumors have always been found in regions in which bursae are commonly present.

The pathogenesis of this condition remains obscure, the explanations given by various investigators for the pathogenesis of calcinosis universalis and calcinosis circumscripta being in my opinion open to criticism.

The treatment in my cases has been surgical resection of the tumor, followed in 1 case by high voltage roentgen therapy. Owing to the local character of the lesion, I have not tried any of the methods of treatment advocated for calcinosis universalis.

According to Rothstein and Welt,<sup>6</sup> there is no specific treatment of calcinosis; medical treatment such as with solution of parathyroid extract, insulin and pilocarpine as well as physical therapy, heliotherapy, roentgen therapy and even surgery being of little avail. Brooks, Craig and Lyall have used disodium hydrogen phosphate to mobilize calcium and increase its excretion, but this treatment has failed in the hands of Rothstein and Jacobowitz. Kennedy uses a ketogenic diet rich in fats, basing the rationale of his treatment on the observations of Froehlich and Nelson that such a diet delays the union of fractures, but he has been unable to obtain good results. In other hands this treatment has also failed. Recently Ramsdell published the results obtained on a patient operated on more than a year before and presented 3 more patients with a syndrome of calcinosis treated by hemithyroidectomy and parathyroidectomy, with great improvement. The cases were typical of calcinosis universalis.

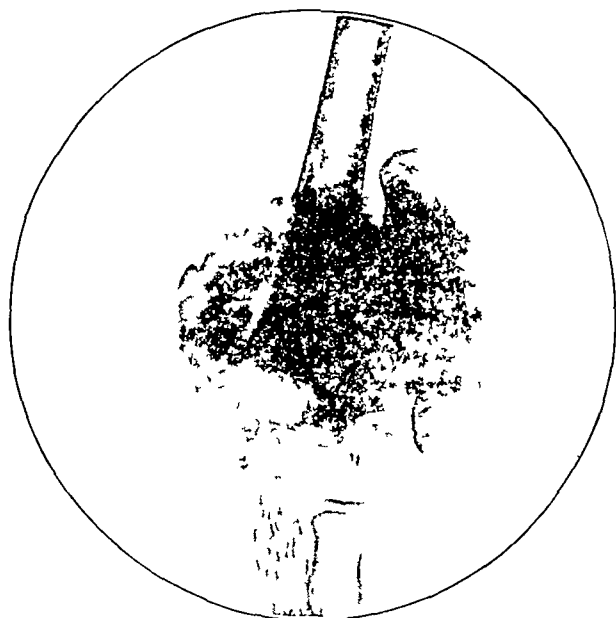


Fig 10 (case 3)—Tumor of right elbow

which have already been described, for they differ from these clinically, roentgenologically and pathologically. Thirty-seven cases of calcinosis universalis reported in the literature by various authors bear no resemblance to

<sup>3</sup> Virchow, Rudolf. Ueber Kalkmetastasen. Virchow's Arch f path Anat 8: 103, 1855.

<sup>4</sup> Geschickter, C. F. and Lewis, Dean. Tumors of Tendon Sheaths, Joints and Bursae. Am J Cancer 22: 96 (Sept.) 1934.

<sup>5</sup> Milian and Neveu. Bull et mem Soc Anat de Paris 2: 827, 1900.

<sup>6</sup> Rothstein, Jacob and Welt, Sara. Calcinosis Universalis and Calcinosis Circumscripta in Infancy and Childhood. Am J Dis Child 52: 368 (Aug.) 1936.

## CONCLUSIONS

I have presented 3 cases of calcareous granuloma or tumoral calcinosis, not having found in the literature reports of any cases equal to these clinically, roentgenologically or pathologically

All 3 tumors occurred in the Negro race which may be mere coincidence, owing to the limited number of cases seen

In all 3 I found characteristically the presence of a calcified tumor, with rapid and gigantic growth, which apparently arose from a bursa and subsequently invaded the surrounding muscle

Resection and high voltage therapy have arrested, limited or cured the lesion

I have failed to determine the etiology of this interesting pathologic entity in the cases studied

Manrique 208

## ABSTRACT OF DISCUSSION

DR ROBERT SCHROCK, Omaha This exhaustive study leaves us without suggestion as to what further might be done. The interesting feature is the close comparison which Dr Inclan and his collaborators brought out of this calcium material to the material that is practically always seen in calcinosis universalis, also their tie-up from an anatomic location to the regions where bursae normally are. I think they have come close to giving us an explanation of this through the tumors apparently originating in the bursae, then invaginating, as they emerge through the bursal sac, invading the surrounding tissue to this tremendous deposition of material, which apparently in all 3 cases is exactly similar. We are most appreciative of Dr Inclan's report

DR RALPH K GHORMLEY, Rochester, Minn I had a case that is almost identical with Dr Inclan's second case and his third one. A boy aged 14 years came to the clinic six years ago. His immediate complaint was of a large tumor on one buttock which looked on the photograph to be almost identical to the lesion in the first or second of Dr Inclan's photographs. The roentgenogram showed a large, multilocular mass. We removed the tumor, which was a subgluteal bursa. It was multilocular. Many of the sacs were filled with a thick, heavy, calcified mass, almost pasty. Some of the sacs had thin fluid. Some of the fluid was slightly discolored, some of it was lemon colored and almost clear. The fluid was reported to contain mainly calcium phosphate. The boy had had another lesion on one elbow which had been excised by his home physician before we saw him. He went home and in a couple of years came back with another one on the opposite buttock. We went through the same procedure. These tumors weighed in the neighborhood of 4,000 Gm at the time of their removal. Later the boy came back for a research study and stayed with us for six weeks, during which time his calcium balance was studied by our chemists, who concluded that his calcium balance was normal. Nor did the roentgenologic studies show any evidence of decalcification of the bones, although we estimated that he had lost an enormous amount of calcium during the months we had him under observation. This boy had two sisters who had identical lesions. We found a similar case reported in a French journal of pathology in 1898. I believe this case was identical to ours and in this case too there was a familial history, two or three members of the same family had the condition. I don't know what the condition is any more than Dr Inclan does. I believe the lesions are bursae with an unusual tendency to calcify. In our case there was an interlying unusual deposit of lipid in the cells at the base of the bursa. This may or may not have had any significance. In our case too since the last tumor was removed we have been able to keep the boy from any recurrence by giving him small doses of sodium citrate, which procedure was suggested to us by a member of the medical staff

DR ALBERTO INCLAN, Havana, Cuba I appreciate the contribution of the discussers. I am not sure that these tumors come only from bursae, as the situation of 2 of these tumors was in places where there are no bursae. That is, I haven't

found any bursae described in those locations in the anatomic textbooks. I refer to the localization on the internal aspect of the elbow and the one in the sacral region this coming from the areolar connective tissue underneath the tendon at origin of the latissimus dorsi. These are the only places where we could be sure that these tumors arose, but there are no bursae anatomically known in those two places. On one of the microscopic sections shown we see the calcifications actually infiltrating the muscle fibers, suggesting that if the tumor arose from a bursa it certainly did not remain confined to its place of origin. These are the reasons why I hesitate in calling this tumor calcareous granuloma of the bursa or, as is suggested, to call it bursal calcinosis. In reference to Dr Ghormley's case, in none of my cases has a familial tendency been present

PRIMARY LYMPHOID TUMORS OF THE  
RECTUM RESEMBLING INTERNAL  
HEMORRHOIDS

## REPORT OF THREE CASES

CAPTAIN TOM E SMITH

MEDICAL CORPS, ARMY OF THE UNITED STATES

Owing to the fact that no report of a primary lymphoid tumor of the rectum resembling internal hemorrhoids could be found in the literature, it was deemed advisable to present 3 cases of rectal lymphoid tumors resembling internal hemorrhoids which occurred in my practice between January and June 1941

There are numerous cases of primary rectal lymphoid tumors reported in the literature, but these cases have occurred in the rectal ampulla and not in the anal canal

N D Smith<sup>1</sup> of the Mayo Clinic reported 1 case of lymphosarcoma in the anal canal but he made no mention of this tumor clinically resembling an internal hemorrhoid

Kallet<sup>2</sup> of Detroit reported a myosarcoma of the rectum resembling an internal hemorrhoid, and this was the only report found in the literature in which a sarcoma was reported as clinically resembling an internal hemorrhoid. It is only natural to assume that if the muscle tissue of the anal canal could become sarcomatous it would likewise be possible for the lymphoid tissue to become sarcomatous

In my series of three primary lymphoid tumors there were 1 case of lymphosarcoma and 2 cases of benign lymphomas

The term lymphoma is used because it signifies a benign condition. Other terms have been used in the literature as synonyms such as benign lymphoid hyperplasia, giant cell lymphoblastoma and lymphadenoma

There is much confusion regarding the nomenclature of lymphoid tumors as pointed out in an article by Hayes, Burr and Pruitt<sup>3</sup>. I have no desire to enter into this report the numerous arguments for different pathologic terms because of the possibility of increasing confusion. The reader is referred to the article by these authors for a classic discussion of the numerous terms and the arguments advanced by the proponents for the adoption of the several terms

From the Department of Proctology, Baylor University College of Medicine, Dallas, Texas

Released for publication by the War Department Manuscript Board which assumes no responsibility other than censorship for the contents of this article

Read before the Section on Gastro-Enterology and Proctology at the Ninety Third Annual Session of the American Medical Association, Atlantic City, N. J., June 10, 1942

<sup>1</sup> Smith, N. D. Lymphosarcoma of the Rectum and Sigmoid. *Tr. Am. Proct. Soc.* **34**: 160, 1933

<sup>2</sup> Kallet, H. I. and Saltzstein, H. C. Sarcoma, Melanoma and Leukosarcoma of the Rectum. *Tr. Am. Proct. Soc.* **33**: 75, 1932

<sup>3</sup> Hayes, Herbert, Burr, H. and Pruitt, L. T. Lymphoid Tumors of the Colon and Rectum. *Tr. Am. Proct. Soc.* **40**: 214, 1939

## REPORT OF CASES

CASE 1—Mrs T L, aged 42, was seen on Jan 6, 1941 in consultation because of rectal protrusion. The protrusion had been present for "several months," so the patient stated, and on detailed questioning she said that the protrusion had been noticed for a period of from two to three months. There was inconvenience caused by the protrusion, but the patient stated that there was no anorectal pain, bleeding, discharge or itching. The patient referred to the rectal protrusion as the "piles."

Inspection, palpation and endoscopy revealed what was clinically diagnosed "second degree hemorrhoids." There was slight induration in the left lateral area, so it was thought that thrombosis was present. The right anterior and right posterior internal hemorrhoids were not unusual.

A hemorrhoidectomy was performed at St Paul's Hospital on January 8 and the tissue was sent to the hospital pathologist according to hospital routine for tissue examination.

The pathologist Dr Jack Goforth reported "hemorrhoids" and "rectal lymphosarcoma grade IV, radiosensitive" (figs 1 and 2).

After numerous consultations and a complete roentgen study by Dr Glenn Carlson, no other foci of lymphosarcoma could

be found, and the patient had an uneventful recovery. She left the hospital in five days and all wounds were healed in forty-five days.

Tissue examination was done and the pathologist Dr J M Hill reported (1) hyperplasia of submucosal lymphoid tissue in

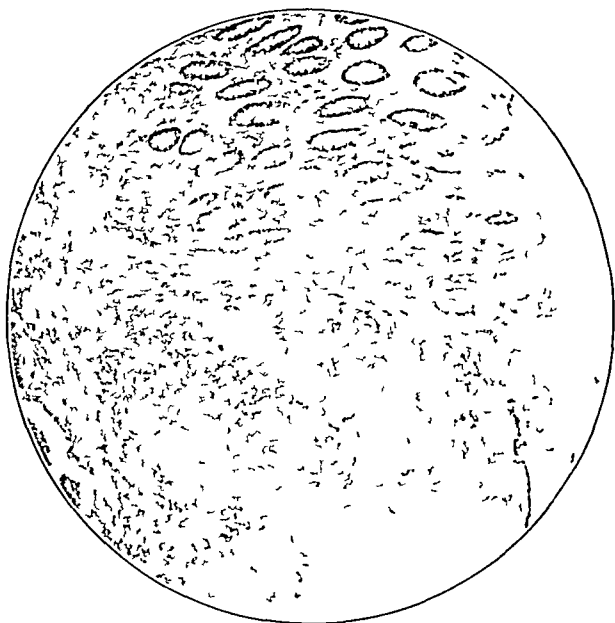


Fig 1 (case 1)—Lymphosarcoma of the rectum. Section shows lymphoid tissue below the mucous membrane of the internal hemorrhoidal zone.

be found and it was agreed that the tumor was primary in the rectum. A series of twenty-four roentgen treatments were then given by Dr Carlson over a period of twenty-four days.

The convalescence was uneventful except for mild radiation sickness. All wounds were healed in forty-five days.

The patient was seen at monthly intervals for one year and twice in the last six months. Inspection and anorectal endoscopy were negative for recurrence at each examination.

The inguinal lymphatics were negative at the onset and have remained so to date.

CASE 2—Mrs D B, aged 36, was seen in consultation on May 6, 1941 for pain in the rectum, protrusion from the rectum and blood streaks on the toilet tissue following defecation. The symptom of protrusion was noticed from two to three months before consultation, however, the patient stated that she had been "constipated" all her life. Pain following defecation of moderate severity and streaking of blood on the toilet tissue had been noticed for two months. Anorectal inspection, palpation and endoscopy revealed (1) an ulcer in the posterior part of the anal region with hypertrophic anal papilla and (2) second degree internal hemorrhoids with thrombosis in the right posterior internal hemorrhoid.

Hemorrhoidectomy, anal ulcerectomy and papillectomy were done one week later, on May 13, at Baylor University Hos-

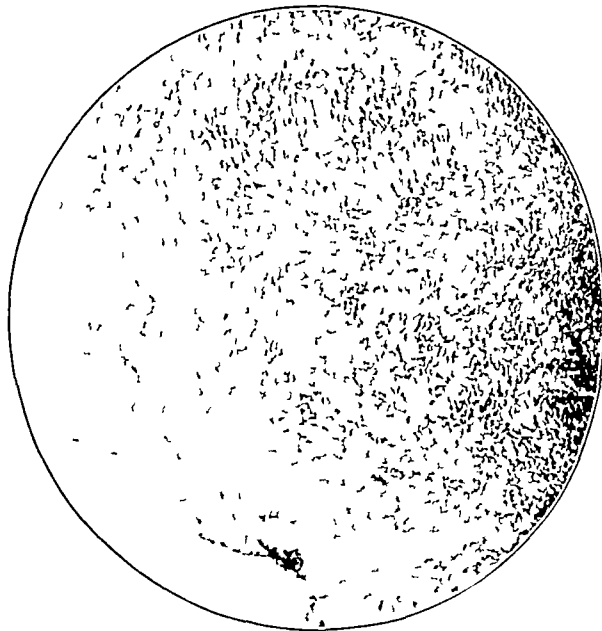


Fig 2 (case 1)—Lymphoma of the rectum. Lymphoid tissue is devoid of germinal centers and lymphoblasts predominate.

pital, and the patient had an uneventful recovery. She left the hospital in five days and all wounds were healed in forty-five days.

Tissue examination was done and the pathologist Dr J M Hill reported (1) hyperplasia of submucosal lymphoid tissue in

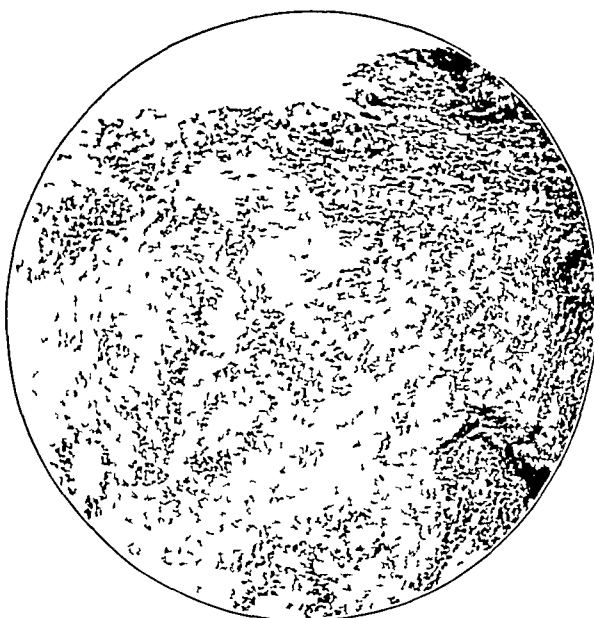


Fig 3 (case 2)—Lymphoma of the rectum. Section shows benign hyperplasia of the lymphoid tissue. Germinal centers are present.

CASE 3—Mr P C, aged 21, was seen in December 1940 because of rectal bleeding and protrusions. Both symptoms had been present for six months and the bleeding was at this time intermittent and not as great in amount as it had been in the beginning. The bleeding was always bright red. Anorectal examination revealed second degree internal hemorrhoids with thrombosis in the left lateral hemorrhoid.

Owing to the fact that the patient was a college student it was suggested that he wait until the summer recess of 1941 to have a hemorrhoidectomy.

Hemorrhoidectomy was performed on June 6, 1941 at Baylor University Hospital, and the tissue was sent for pathologic examination in compliance with the hospital's routine.

The pathologist reported hemorrhoids and hyperplasia of submucosal lymphoid tissue in the wall of the rectum (fig 4). Hospitalization lasted five days, and the wounds were healed in thirty days.

Follow-up examinations were done at three month intervals for almost a year without evidence of recurrence of a lymphoid tumor.

#### COMMENT

Roentgen therapy was not given in the last 2 cases since the tumors were benign and tissue healing in both was normal, with no tendency toward recurrence.

It is interesting that each case was clinically diagnosed as hemorrhoids because there were no other changes visible or palpable to stimulate one to think of any other lesion. While it is true that induration



Fig 4 (case 3)—Lymphoma of the rectum. Benign hyperplasia is shown in the germinal center of the internal hemorrhoidal zone below the mucous membrane.

to palpation was present, the zones were freely movable by the examining finger, and on endoscopy the maroonish purple look of internal hemorrhoids was present and, in fact, hemorrhoids were present in each case as proved by microscopic examination.

In an analysis of the 3 cases it will be noted that in each there was one hemorrhoidal zone with enough induration to provoke thinking of thrombosis in the internal hemorrhoidal zone. Thrombosis is occasionally seen in one or more of the three cardinal hemorrhoidal areas and is the usual cause of induration to the palpating finger in that zone.

From these cases it would seem necessary to remember that, while thrombosis is the usual cause of induration in the internal hemorrhoidal zones, all indurated internal hemorrhoids should be saved for microscopic examination of the tissue.

The primary purpose of reporting these cases was to make an appeal for histopathologic examination of all excised anorectal tissue, since all of these cases were diagnosed correctly from tissue study when the clinical preoperative diagnosis did not allow for the lymphoid changes present.

Correct tissue diagnosis of lymphosarcoma in case 1 led to early roentgen therapy and will deserve credit for the patient's life if she continues to live and not have lymphosarcomatous recurrence. Had this specimen been thrown away it is possible that without the aid of roentgen therapy she probably would not have had the close follow-up examinations and the process might have become extensive before she presented herself again.

In the other 2 cases correct tissue diagnosis has put all on guard and check-up examinations will be made at regular intervals with the use of roentgen therapy immediately should either or both show lymphoid tissue regeneration.

#### SUMMARY AND CONCLUSIONS

1 Because no cases of primary rectal lymphoid tumors resembling internal hemorrhoids could be found in the literature 3 such cases are here reported.

2 All surgically removed anorectal tissue regardless of the clinical diagnosis should be studied microscopically.

3 Early, sufficient roentgen therapy was given a patient with primary rectal lymphosarcoma of the anal canal following surgical excision, and clinically good results were proved by the test of time for one and one half years.

#### ABSTRACT OF DISCUSSION

DR CURTIS ROSSER, Dallas, Texas: This paper emphasizes particularly the constant necessity for careful microscopic examination of all tissue removed from the anorectum. Proctologists are in accord concerning the possibility of malignant degeneration or tuberculosis in inflammatory processes such as fistulas and ulcers. The possibility of specific tissue reaction in connection with hemorrhoids is not so well understood, however, and in some institutions there is a tendency to object to the routine examination of removed hemorrhoidal tissue. Dr Hirschman has reported the discovery of a colloid carcinoma in an internal hemorrhoid and I have reported 4 instances of malignant degeneration of hemorrhoidal tissue. Dr Smith's cases concern lymphoid deposits in the hemorrhoidal zone which require careful microscopic study to differentiate them from internal hemorrhoids. The various malignant and benign lymphoid tumors found in the rectum are remarkable primarily because of the variation in gross structure and appearance which means that the cooperation of the pathologist is always an essential in the final diagnosis. There is no agreement at this time as to the proper management of lymphoid intestinal tumors. Apparently, however, irradiation is advisable if the cells appear to be radio sensitive; otherwise surgical removal is probably indicated.

DR SIMON B. KUFNER, New Haven, Conn.: I want to add another case of lymphosarcoma of anal origin which was reported by me at the American Proctologic Society in 1938. No doubt the reason Dr Smith didn't find this in the literature is that at the time I reported my case I emphasized the fact that it had to be differentiated from lymphogranuloma venereum because of the stricture and overgrowth of tissue around the anus and also because the patient was a Negro. The man had been referred to me after he had had a hemorrhoidectomy. Pathologic examination showed lymphosarcoma but on account of the other factors I continued further studies on him at the rectal clinic of the Yale Medical School. There we made Frei tests which were negative and we did a biopsy of the inguinal nodes which showed lymphosarcoma. He was referred to our tumor clinic and was given roentgen therapy. He did well and continued his work as a laborer but died about four years later of pneumonia. The question of lymphosarcoma not of the anal region but of the rectum is presented by Bensaude in a paper which he published about fifteen years ago. He reported about 20 cases and showed some beautiful color plates, however, as Dr Smith brought out these cases were not lymphosarcoma of the anal region but lymphosarcoma of the rectum.



DR CLAUDE C. TUCKER, Wichita, Kan. In 1938 Dr C. A. Hellwig and I presented a paper before this section entitled "Proctologic Tumors," which was published in *THE JOURNAL*. At that time we laid emphasis on the pathologic examination of all tissue removed at the time of the operation. For the past twelve years we have sent all our tissues to the laboratory. We stated that many of the malignant tumors in our material were small and that 18 of the 52 malignant tumors were discovered during routine microscopic examination of what seemed clinically harmless lesions. In 6 of the malignant cases, cancer developed in previously existing anal lesions: 1 adenocarcinoma in a fistulous tract, 1 squamous cell carcinoma in a fissure, 3 adenocarcinomas in hemorrhoids and 1 basal cell carcinoma in external hemorrhoids. Since the publication of our paper we have had 3 cases of lymphosarcoma of the rectum which had their origin in the anal canal and were not suspected of malignancy. I feel that all tissue surgically removed should be reexamined.

CAPT. TOM E. SMITH, M. C., A. U. S. I have read Dr Kleiner's article in the 1938 Transactions of the American Proctologic Society and, if my memory serves me correctly, he did not refer to his case of lymphosarcoma as resembling an internal hemorrhoid. I have found no record in the literature of a cancer such as that reported here looking exactly like a benign lesion. There are numerous cases of rectal lymphosarcoma reported which were found by proctoscopic examination and digital palpation, but these stimulated thinking of malignancy. I wish to make a plea that anorectal tissue be sent to the pathologist even though on the surface it looks as though it should be thrown away.

## THE TREATMENT OF EXPERIMENTAL SHOCK FROM REPEATED HEMORRHAGE

A PRELIMINARY REPORT ON THE USE OF PURE AMINO ACIDS AND OF HYDROLYZED PROTEIN

ROBERT ELMAN, M.D.

AND

CARL E. LISCHER, M.D.

ST. LOUIS

The amino acids of hydrolyzed protein have been shown in previous studies<sup>1</sup> from this laboratory and clinic to be effective in promoting the synthesis of serum albumin and in various types of hypoproteinemia. Nearly all of these were instances of chronic or subacute hypoproteinemia, many of nutritional origin. In this preliminary report we present experimental evidence that the same mixture of amino acids and polypeptides is beneficial in the therapy of acute protein loss which occurs in severe uncompensated (i. e. fatal) hemorrhage. Although the value of plasma and whole blood transfusions is an established principle of vast importance in the treatment of shock, it is probable that in wartime the number requiring such treatment might well exceed the available supplies of plasma and that in the armed forces many situations might arise in which blood donors were not available. Because of the relative ease and economy with which amino acid solutions can be made, stored, transported and given intravenously, they possess obvious practical advantages.

In experiments to be described in detail at a later date, we have found that dogs (in groups of 10) sub-

jected to repeated hemorrhage (10 cc per kilogram every hour) show a fairly constant drop in blood pressure, many of the symptoms of shock seen in man, and a fatal outcome on the average of 37 hours following the beginning of the experiment. This course of events was not changed when the removed blood was replaced immediately with 10 per cent dextrose in saline solution. However, when the replacement fluid consisted of a solution containing 5 per cent hydrolyzed protein and 5 per cent dextrose, the beneficial effect was quite evident and significant. In the first place, the blood pressure was maintained at a higher level, secondly, the mean survival was over five hours or nearly 50 per cent longer, and finally the amount of blood which could be removed before death was 25 per cent greater than in the controls. The magnitude of the effect was as great as that achieved with citrated plasma. Two hydrolyzed protein solutions<sup>2</sup> were used, both enzymatically digested, one from beef plasma, the other from casein (Amigen), the same beneficial effect was noted with each. However when a mixture containing all of the essential amino acids (as pure crystals) was used<sup>3</sup> the beneficial effect, while definite, was not as pronounced as in the case of the hydrolyzed protein. This may have been due either to known differences in amino acid composition or to the fact that the larger aggregates of amino acids (polypeptides) which comprised 30 per cent of the protein hydrolysates are more beneficial than simple amino acids. The amount of nitrogen present was the same in the two solutions.

Caution must be expressed before applying the encouraging results of these experiments to the clinical treatment of surgical shock from hemorrhage. In the first place the present experiments, while satisfactory for the study of fatal shock due to uncomplicated loss of blood, differ in many respects from the conditions occurring in patients. Moreover, the method of fluid administration was much more rapid than the usual slow intravenous injections used clinically. In the second place the physiologic and biochemical mechanisms involved require much further investigation. We suspect, however, from a few observations, that the introduced amino acids and polypeptides are effective because they enable the liver to synthesize protein more rapidly, thus providing an added source of albumin from which to supply that lost in subsequent bleedings.

Nevertheless further study seems justified because the practical advantages of solutions of hydrolyzed protein should make it a welcome alternative for, or a supplement to, plasma transfusions. Thus the injection of 1 liter of plasma will always require bleeding four donors and considerable processing, whereas solutions of amino acids and polypeptides are as convenient to give as dextrose and saline solution.

### SUMMARY

In fatal surgical shock experimentally produced by repeated hemorrhage, immediate replacement with a solution of hydrolyzed protein containing amino acids and polypeptides exerted a definite therapeutic effect as shown by prolongation of the survival time, an increase in the amount of hemorrhage which could be sustained and a higher level of blood pressure as compared with the controls, in which dextrose alone was used or in which there was no replacement. A solution containing pure crystalline amino acids exerted a similar but less pronounced effect.

<sup>2</sup> Supplied through the courtesy of Dr. Warren M. Cox, Jr. of Mead Johnson & Company, Evansville, Ind.  
<sup>3</sup> Supplied through the courtesy of Dr. D. F. Robertson, Merck and Company, Rahway, N. J.

Aided by a grant from the Commonwealth Fund.  
From the Department of Surgery, Washington University School of Medicine and Barnes Hospital.

<sup>1</sup> Elman, Robert and Weiner, D. O. Intravenous Alimentation. *J. A. M. A.* **112**: 796 (March 4) 1939. Elman, Robert. Acute Protein Deficiency (Hypoproteinemia) in Surgical Shock. *ibid.* **120**: 1176 (Dec. 12) 1942. Parenteral Replacement of Protein with the Amino Acids of Hydrolyzed Casein. *Ann. Surg.* **112**: 594 (Oct.) 1940. Elman, Robert, Weiner, D. O. and Bradley, Eugene. Intravenous Injections of Amino Acids (Hydrolyzed Casein) in Postoperative Patients. *ibid.* **115**: 1160 (June) 1942.

EFFECT OF DIETHYLSTILBESTROL ON  
NEUROLOGIC SYMPTOMS OF CAR-  
CINOMA OF PROSTATE

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AND

HENRY R VIETS, MD

BOSTON

The rapid reduction of obstruction of the urethra by carcinomatous tissue in the prostate gland, when patients are treated by the estrogen diethylstilbestrol,<sup>1</sup> as reported by Kahle and Maltry,<sup>2</sup> Herbst,<sup>3</sup> Kahle, Ogden and Getzoff,<sup>4</sup> Heckel and Kretschmer,<sup>5</sup> Wishard<sup>6</sup> and Clute and Willets,<sup>7</sup> has led to an investigation of a similar "unblocking" phenomenon in the release of cerebrospinal fluid when obstructed by metastases secondary to prostatic carcinoma. Metastatic lesions in the lumbosacral spine, causing pain in the legs from direct pressure on nerve roots or invasion of the spinal canal causing blockage of the cerebrospinal fluid and traction on the roots, are commonly discovered on roentgen examination and lumbar puncture in patients with prostatic cancer. The relief of these symptoms may be of more urgent concern than the urinary dysfunction, and thus the patient's chief complaint is "neuritis" or "rheumatism" rather than urinary retention. The history of a case of this type is here set forth, with notes on the rapid amelioration of the symptoms following the use of diethylstilbestrol.

## REPORT OF CASE

**History**—W C F K, a married man aged 69, American, a carpenter who had worked at his trade until six weeks before admission, was admitted to the Neurological Service of the Massachusetts General Hospital May 5, 1942 because of difficulty in walking and pain in his legs of six to eight weeks' duration. The pain, which did not have segmental distribution, was intensified by walking, coughing or straining. There were no symptoms of prostatic obstruction.

**Physical Examination**—The patient was well developed. He could not move about briskly in bed because of pain in his legs and back. When asked to walk, he did so with a slow, deliberate gait. In all acts he guarded the lumbar spine, in which no motion appeared. There was tenderness over the spinous processes of the first three lumbar vertebrae. Coughing, straining, flexion of the head on the chest or of the thighs on the abdomen all accentuated the pain, suggesting that it might be due to a process involving the nerve roots in the lumbar region. The knee jerks and ankle jerks were not obtained, but no sensory changes, paralysis or atrophy were noted.

By rectal examination a hard, enlarged prostate gland was palpated. The tone of the rectal sphincter was normal. Roentgen examination showed osteoplastic metastases involving the first three lumbar vertebrae. A study of the cerebrospinal fluid pressures and dynamics showed almost complete "block" of the spinal canal between needles inserted between the twelfth

thoracic and first lumbar and the fifth lumbar and sacrum. The fluid obtained from the second locus was yellow, with a protein content of 798 mg per hundred cubic centimeters. Atypical cells, thought by the pathologist to be malignant, were aspirated from the epidural space between the third and fourth lumbar vertebrae.

**Laboratory Reports**—The serum acid phosphatase was 4.4 and 4.5 Gutman units on two determinations; the upper limits of normal being regarded as 4. Serum alkaline phosphatase was 7.8 Bodansky units, the normal range being considered as 3 to 5. The serum phosphorus was 3.9 and 4 mg per hundred cubic centimeters on two determinations. The daily urinary excretion of 17-ketosteroids was on two occasions estimated as 10.4 and 7.3 mg within the normal amount for elderly men without prostatic disease. The red blood cell count was 5,250,000 per cubic millimeter of blood and the hemoglobin 14.4 Gm per hundred cubic centimeters (Sahli). The white blood cell count, the differential count and the urine were within the limits of normal and the Hinton test on the blood and the Wassermann test on the cerebrospinal fluid were negative.

**Treatment**—A course of twelve intramuscular injections of 10 mg daily of diethylstilbestrol in oil was begun sixteen days after admission. The patient felt better within twelve hours, was walking about the ward without pain in four days and regarded himself as well eight days after treatment was started. Twelve days after his first treatment the dynamics of the cerebrospinal fluid were normal and the protein was greatly

*Cerebrospinal Fluid Findings Before and After Treatment  
with Diethylstilbestrol of Spinal Metastatic Carci-  
noma Originating in the Prostatic Gland*

	Before Treatment		1 <sup>st</sup> Day of Treatment		7 <sup>th</sup> Day of Treatment	
	T1 <sup>2</sup> /L1	L5/S	T1 <sup>2</sup> /L1	L5/S	T1 <sup>2</sup> /L1	L5/S
Color	Clear	Yellow	Clear	Yellow	Clear	Clear
Initial pressure in mm of water	170	70	170	105	200	150
Respiration and pulse oscilla- tions	Good	Fair	Good	Good	Good	Good
Rise on jugular compression bilaterally in mm of water	300	170	200	200	200	200
Flow	Rapid	Slow	Rapid	Rapid	Rapid	Rapid
Protein in mg /100 cc	91	798	105	167	4	5

reduced in amount. He was discharged from the hospital on the thirteenth day of treatment with orders to take diethylstilbestrol 6 mg daily by mouth.

**Subsequent Course**—Three weeks after discharge, while he was still taking 6 mg of diethylstilbestrol daily, firm pitting edema of the lower legs and ankles developed. On examination it was noted that both testes had become atrophic and some hypertrophy and tenderness of subcutaneous breast tissue had developed. The dosage of diethylstilbestrol was reduced to 3 mg a day, by mouth and the patient, free of pain, returned to his work.

On August 6, seventy-seven days after the treatment was started, he was readmitted to the hospital for study having received a total of 120 mg of diethylstilbestrol intramuscularly and 231 mg orally. He felt well and had a good appetite, and his weight had increased from 158 to 162 pounds (71.7 to 73.5 Kg). He reported that he could do twice as much work as his 40 year old partner. No personality changes were noted. He had lost his libido. The prostate gland had become soft, smooth and half its previous size. Edema of the ankles and mild gynecomastia persisted. Knee jerks and ankle jerks were now easily obtained. There was no tenderness or guarding of the lumbar spine on walking or pain on coughing or on flexion of the neck or thighs. Lumbar puncture showed complete disappearance of the cerebrospinal fluid "block," with the protein values at the twelfth thoracic and first lumbar and the fifth lumbar and sacrum not significantly elevated (as shown in the accompanying table).

The urinary output of 17-ketosteroids had dropped to 2.2 mg a day, the serum acid phosphatase was 6.4 Gutman units, alkaline phosphatase 6.2 Bodansky units and serum phosphorus 3.2 mg per hundred cubic centimeters. The urine white blood cell count and differential count remained normal but the

From the Neurological Service, Massachusetts General Hospital.  
1 Diethylstilbestrol. Report of the Council on Pharmacy and Chemistry, American Medical Association, J A M A 119: 632-635 (June 20) 1942.

2 Kahle P J and Maltry E. Treatment of Hyperplasia of the Prostate with Diethylstilbestrol and Diethylstilbestrol Dipropionate. New Orleans M & S J 93: 121-131 (Sept.) 1940.

3 Herbst W P. The Effects of Estradiol Dipropionate and Diethylstilbestrol on Malignant Prostatic Tissue. Tr Am A Genito-Urin Surg 93: 195-202 (1941).

4 Kahle P J, Ogden H D Jr and Getzoff P L. The Effect of Diethylstilbestrol and Diethylstilbestrol Dipropionate on Carcinoma of the Prostatic Gland. Clinical Observations. J Urol 48: 83-98 (July) 1942.

5 Heckel N J and Kretschmer H L. Carcinoma of the Prostate Treated with Diethylstilbestrol. J A M A 119: 1087 (Aug. 1) 1942.

6 Wishard W N Jr. The Clinical Use of Stilbestrol in the Treatment of Carcinoma of the Prostate. Indiana Univ M Center Quart Bull 4: 59 (Jan.) 1942.

7 Clute Richard and Willets A T. The Treatment of Cancer of the Prostate with Castration and the Administration of Estrogen. New England J Med 227: 863-869 (Dec.) 1942.

red blood cell count had dropped to 3,780,000 per cubic millimeter of blood and the hemoglobin to 11.9 Gm per hundred cubic centimeters (Sahli).

Roentgen examination showed no definite change in the metastases in the lumbar vertebrae. A study of a specimen obtained from a needle biopsy of the prostate gland disclosed malignant tissue, although comparative histologic evidence of regressive changes under treatment could not be definitely established, since the needle biopsy before treatment had failed to yield prostatic tissue.

The patient continued to take diethylstilbestrol by mouth for seventy-seven days, remaining free from symptoms during this period. Three months later, however, symptoms returned with pain in the lumbar region and in the legs, made worse by coughing or sneezing. His gait became unsteady and weak. On examination Dec. 4, 1942 the condition was not dissimilar to that found previous to diethylstilbestrol treatment. The cerebrospinal fluid "block," however, was even more pronounced than it had been before, the total protein in the lower needle being 750 mg per hundred cubic centimeters. Bilateral orchiectomy was done and in five days the patient was completely relieved of his symptoms. An examination of the cerebrospinal fluid two weeks after operation showed that the "block" had completely disappeared, the total protein being 80 mg per hundred cubic centimeters.

A subsequent note giving more details of the later treatment of this patient will be forthcoming. In the meantime we may contrast the rapidity and completeness of the relief of the cerebrospinal fluid block by diethylstilbestrol and by operation. The operation of bilateral orchiectomy appears to have removed a more severe block in quicker time than the treatment with diethylstilbestrol.

#### COMMENT

Adult prostatic epithelium, whether normal, hyperplastic or malignant, is known to undergo regression of activity and atrophy when the androgenic substances are greatly reduced in amount, either by castration or by inactivation through the administration of estrogens such as diethylstilbestrol.<sup>8</sup> Kahle and Maltry<sup>9</sup> treated 14 patients with prostatic hyperplasia with diethylstilbestrol and noted a consistent decrease in the size of the gland. Similar results in a series of cases of carcinoma of the prostate are reported by Kahle, Ogden and Getzoff,<sup>4</sup> whose patients were also examined for histologic evidence of regressive changes by Schenken, Burns and Kahle.<sup>8</sup> Comparative changes have also been shown by Heckel and Kretschmer.<sup>5</sup> Chute and Willett's<sup>7</sup> give the actual measurements, by the use of proctocystograms, of the prostate gland before and after treatment with diethylstilbestrol, showing a reduction in size.

In addition to the reduction in size of the gland, the secondary lesions of bone metastases are also affected. Huggins, Stevens and Hodges<sup>11</sup> demonstrated by serial roentgenograms increased density of bone metastases in patients under treatment by castration. Kahle, Ogden and Getzoff<sup>4</sup> observed less consistent changes in serial roentgenograms as well as definite regression of lymph node metastases in 2 patients treated with diethylstilbestrol.

That the serum acid phosphatase level is usually elevated in carcinoma of the prostate with metastases has been shown by Robinson and the Gutmans<sup>9</sup> as well

as by Herger and Sauer.<sup>10</sup> Huggins and Hodges<sup>11</sup> observed a sharp decrease in serum acid phosphatase in 5 patients treated with estrogens as well as in 6 out of 8 patients after orchiectomy. In 3 patients given injections of the androgen testosterone dipropionate after orchiectomy, pain recurred and the serum acid phosphatase levels rose. In our case, contrary to the usual findings, the serum acid phosphatase increased after treatment from 4.4 to 6.4 Gutman units.

Satterthwaite, Hill and Pickard,<sup>12</sup> who have treated 10 patients by castration, with relief of symptoms, have noted that the urinary output of 17-ketosteroids in patients suffering from prostatic carcinoma, with or without metastases, is within normal limits for elderly men but falls significantly after operation, as it did in our case after treatment with diethylstilbestrol.

A number of side effects have been reported in the treatment of cancer of the prostate with diethylstilbestrol, or by castration, which include hypertrophy of breast tissue, testicular atrophy and the loss of libido and the power of ejaculation. In patients treated by castration loss of sexual capacity, hot flashes and temporary edema of the ankles have also been observed.

Possibly of significance is a reduction in the number of red blood corpuscles and the amount of hemoglobin in the blood. Our patient showed a decrease from 5,250,000 red blood corpuscles per cubic millimeter to 3,780,000 per cubic millimeter and a loss of hemoglobin from 14.4 Gm per hundred cubic centimeters to 11.9 Gm per hundred cubic centimeters. No definite statement can be made at the present time as to whether this change resulted from the carcinoma itself or from the treatment.

Before diethylstilbestrol was used, in the case reported there was almost a complete "block" in the cerebrospinal fluid between the two needles inserted in the lumbar spine at the levels below the twelfth thoracic vertebra and the fifth lumbar vertebra. The fluid showed the characteristics of From's syndrome, with a yellow color, a total protein content of 798 mg per hundred cubic centimeters and a partial response to rise after jugular compression in the lower needle. Subsequent to the taking of diethylstilbestrol by injection and by mouth, the cerebrospinal fluid "block" disappeared, as shown by the establishment of normal color, the return of the dynamics on jugular compression to normal and the reduction of the protein to 52 mg per hundred cubic centimeters. The evidence is clear that the treatment with diethylstilbestrol actually reduced the compressing element in the spinal canal which acted particularly as a means of blocking the pathway of the cerebrospinal fluid. The use of this estrogenic substance, therefore, served to release the "block," and presumably this was the principal factor in relieving the symptoms of pain and difficulty in walking. Prior to treatment the patient was worse in the upright position or when coughing or straining. Subsequently none of these maneuvers caused pain. After leaving the hospital, the patient was able to carry on a usual day's work as a carpenter without a recurrence of his symptoms.

8 Huggins, Charles, Stevens, R. E. Jr. and Hodges, Clarence V. Studies on Prostatic Cancer. II. The Effects of Castration on Advanced Carcinoma of the Prostate Gland. *Arch. Surg.* **12**: 209-223 (Aug.) 1941.  
Huggins, C. C. and Gosse, C. I. The Present Status of Castration for Carcinoma of the Prostate. *Cleveland Clin. Quart.* **9**: 80-86 (April) 1942.  
Schenken, J. R., Burns, E. I. and Kahle, P. J. The Effect of Diethylstilbestrol and Diethylstilbestrol Dipropionate on Carcinoma of the Prostate Gland. II. Cytologic Changes Following Treatment. *J. Urol.* **18**: 99-112 (July) 1942.

9 Robinson, J. A., Gutman, F. B. and Gutman, A. B. Clinical Significance of Increased Serum Acid Phosphatase in Patients with Bone Metastases Secondary to Prostatic Carcinoma. *J. Urol.* **42**: 602-618 (Oct.) 1939.

10 Herger, C. C. and Sauer, H. R. Relationship of Serum Acid Phosphatase Determination to Presence of Bone Metastases from Carcinoma of Prostate. *J. Urol.* **16**: 286-302 (Aug.) 1941.

11 Huggins, Charles and Hodges, Clarence V. Studies on Prostatic Cancer. I. The Effect of Castration of Estrogen and of Androgen Injection on Serum Phosphatases in Metastatic Carcinoma of the Prostate. *Cancer Research* **1**: 293-297 (April) 1941.

12 Satterthwaite, R. W., Hill, J. H. and Pickard, E. F. Experimental and Clinical Evidence on the Role of the 17 Keto Steroids in Prostatic Carcinoma. *J. Urol.* **46**: 1149-1153 (Dec.) 1941.

Huggins, Stevens and Hodges<sup>8</sup> reported a case, with similar symptoms to ours, responding favorably to orchietomy. A man aged 71 had abdominal and low back pain, numbness over the buttocks and posterior part of the thighs as well as urinary and fecal incontinence. The deep reflexes in the legs were absent. The cerebrospinal fluid was yellow with an increase in protein content. Roentgen rays disclosed extensive osteoplastic metastases. Within three days after bilateral orchietomy, the patient was relieved of pain and in seven weeks continence was restored, a decubitus had healed and the cerebrospinal fluid had become clear. Details of the fluid are not given, but the evidence points to a release of "block," as in our case, by orchietomy, without the use of diethylstilbestrol.

#### CONCLUSIONS

A patient with carcinomatous metastases from the prostate causing a "block" in the pathway of the cerebrospinal fluid and pain from pressure or traction on the spinal nerve roots was relieved by treatment with diethylstilbestrol. The response was rapid and remarkably complete. The release of the "block" was demonstrated by serial lumbar punctures at appropriate levels, as well as by the relief of pain and the return of the knee jerks and ankle jerks.

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### THE EFFECTS OF ASCORBIC ACID IN RELATION TO LEAD ABSORPTION

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CINCINNATI

The experimental observations described in the following paragraphs were prompted by the reports of Holmes and his associates<sup>1</sup> on the beneficial effects of the administration of ascorbic acid to persons suffering from chronic lead poisoning. These investigators noted a decided reduction in the symptoms of exposed workmen and an apparent decrease in the lead content of the blood and the urine following the daily ingestion of ascorbic acid. This was associated with an increase in the number of erythrocytes, a decrease in the number of stippled erythrocytes and an increase in the hemoglobin content of the blood. They inferred that ascorbic acid combined with lead to form a relatively insoluble or unionized compound that might be eliminated through the bile into the feces.

The importance of these conclusions from a practical point of view, stimulated our efforts to verify them. If they proved to be true in our hands, it would be feasible to supply the necessary ascorbic acid in convenient form as a prophylactic measure, in addition to the procedures concerned with the control of the lead exposure.

While our work was in progress, other experimental studies, as well as case reports, have appeared in evi-

dence of widespread interest in this subject. Dannenberg, Wideman and Friedman<sup>2</sup> have described an unsuccessful attempt to treat a case of lead poisoning with ascorbic acid. Pillemer and his colleagues<sup>3</sup> have reported that animals poisoned with lead do not respond favorably to ascorbic acid therapy. However, these investigators as well as Betti<sup>4</sup> carried out experiments on animals the results of which clearly indicate that ascorbic acid protects animals against the toxic effects of lead absorption although it is not quite clear whether any specific benefit is conferred beyond that incident to the prevention of a deficiency of the vitamin. Marchmont-Robinson<sup>5</sup> has reported his observations on a group of workmen exposed to lead and has concluded that the administration of ascorbic acid is beneficial in terms of reduction of toxic symptoms but that it is without significant effect on the urinary lead excretion. Neither conclusion appears to have been fully substantiated by adequate control data.

#### METHODS OF STUDY

*Selection and Classification of Exposed Workmen*—An ideal group of four hundred men was available for study in a plant for the manufacture of tetraethyl lead. Since this organic lead compound is dangerously volatile at ordinary temperatures and is also susceptible of absorption through the skin, every precaution is taken to control the manufacturing processes against leakage or escaping vapor. In addition, general and locally applied ventilation is employed to maintain the lead concentration in the air within safe limits.

At intervals of three weeks, each man receives a special examination, the nature of which is indicated by the accompanying record form. Laboratory work includes a determination of the hemoglobin by the Haden-Hausser method at each examination. At every fourth examination (twelve week intervals) a complete blood study is made including enumeration of the erythrocytes, stippled erythrocytes and leukocytes, a differential leukocyte count and a determination of the hemoglobin. At this time also a clinical urinalysis is made. If any suggestive signs or symptoms exist, specimens of urine, feces or blood or all three are sent to the Kettering Laboratory of Applied Physiology (University of Cincinnati College of Medicine) for determination of the lead content. When suggestive evidence of early toxic effects exists, the man's work is changed. By early toxic effects we do not mean lead colic, neuritis or encephalitis but rather unexplained fatigue, headache, slight loss of weight, insomnia, indigestion, constipation, anorexia, mental excitement, dreams, hemoglobin under 75 per cent, red count under 4,200,000 or increase in numbers of stippled erythrocytes. Frequently a change in diastolic blood pressure to 60 or lower which persists from week to week is the earliest physiologic sign of toxic effect.

In addition to the special examination, each man receives annually a complete physical examination, which includes a roentgenogram of the chest.

As an additional check on the lead exposure, a group of seventy-two representative workmen is studied

From the Medical Department of the Dye Works, E. I. DuPont de Nemours & Co. (Drs. Evans and Norwood) and the Kettering Laboratory of Applied Physiology, University of Cincinnati College of Medicine.

<sup>1</sup> Holmes, Harry N., Amberg, Edward J. and Campbell, Kathryn. Vitamin C Treatment in Lead Poisoning. *Science* **59**: 322-323 (April 7) 1919. Holmes, Harry N., Campbell, Kathryn and Amberg, Edward J. The Effect of Vitamin C on Lead Poisoning. *J. Lab. & Clin. Med.* **24**: 1119-1127 (Aug.) 1939.

<sup>2</sup> Dannenberg, Arthur M., Wideman, Arnold H. and Friedman, Paul S. Ascorbic Acid in the Treatment of Chronic Lead Poisoning. Report of a Case of Clinical Failure. *J. A. M. A.* **114**: 1439-1440 (April 13) 1940.

<sup>3</sup> Pillemer, L., Seifter, Joseph, Kuchin, A. O. and Ficker, E. E. Vitamin C in Chronic Lead Poisoning. *Am. J. M. Sc.* **200**: 322-327 (Sept.) 1940.

<sup>4</sup> Betti, C. The Action of Ascorbic Acid and the Cortical Hormone on Experimental Lead Intoxication. *Gazz. San.* 1940 no. 2 abstr. Rass. M. Industr. **11**: 485, 1940.

<sup>5</sup> Marchmont-Robinson on S. W. Effect of Vitamin C on Workers Exposed to Lead Dust. *J. Lab. & Clin. Med.* **26**: 1478-1481 (June) 1941.



On a large sheet, every complaint and every illness resulting in loss of time during the year, together with the length of time lost were listed for each man. The results of quarterly urine and fecal lead analyses were listed for the year of the experiment and for the previous year when neither group was receiving ascorbic acid. Lead analyses on the blood of the men, carried out before and during the administration of ascorbic acid to the test group, were tabulated on the same sheet. All abnormal urinary findings were noted. All leukocyte counts above 10,000 and all erythrocyte counts below 4,300,000 were recorded, as were hemoglobin determinations below 75 per cent and stippled erythrocyte counts in excess of 10 per hundred thousand (fifty fields).

During the past few years, workers at the Haskell Laboratory of Industrial Toxicology in Wilmington, Del., under the direction of Dr. John H. Foulger, have made extensive studies of blood pressure and pulse changes. In brief, they have found that diastolic blood pressure readings greater than 93 or less than 65, pulse

TABLE 2—Lead Concentration in Blood of Group Not Taking Ascorbic Acid and Group Taking Ascorbic Acid During the Year Prior to and During the Administration of Ascorbic Acid

Lead in Mg per 100 Gm of Whole Blood	Frequencies of Occurrences of Concentrations Indicated			
	Workmen Not Taking Ascorbic Acid		Workmen Taking Ascorbic Acid	
	1939	1940	1939	1940
0.000				
0.01				
0.02	1	2	1	1
0.03	10	7	4	12
0.04	11	8	11	6
0.05	1	4	3	3
0.06	1	4	2	3
0.07	1		3	
0.08			1	
Total	25	25	25	25
Mean and probable error	0.043 ± 0.001	0.046 ± 0.001	0.051 ± 0.002	0.043 ± 0.001
Standard deviation	±0.012	±0.012	±0.015	±0.011

pressure greater than 58 or less than 30 and pulse rates greater than 89 or less than 61 are definitely abnormal. All circulatory abnormalities fitting these criteria and occurring during the year among the men of the two groups were tabulated on the large sheets.

#### EXPERIMENTAL RESULTS

The large charts of assembled data are not shown for lack of space, but a series of smaller tables present the essential data and compare the thirty-six men taking ascorbic acid to the thirty-six controls with respect to the excretion of lead in urine and feces, the concentration of lead in the whole blood, the microscopic blood findings, the circulatory abnormalities and the early complaints that may conceivably be related to mild toxic effects of lead absorption.

Table 2 shows the results of the analyses of the blood. The data on both groups, as presented here, apply only to persons on whom results were obtained both in 1939 and in 1940. A scattering of unpaired figures resulting from failure to obtain blood samples at the right time and from the loss of a few samples in transit had to be discarded. There is only one set of results that shows any noteworthy divergence from the others

From the statistical point of view this difference between the mean value for the test group during the period of administration of ascorbic acid and that for any of the other sets of results is not quite four times its own probable error and is not certainly significant. In physiologic terms the difference is so slight as to be

TABLE 3—Urinary Lead Concentration of Group Not Taking Ascorbic Acid During the Years 1939 and 1940

Lead in Mg per Liter	Frequencies of Occurrence of the Concentrations Indicated	
	In 1939	In 1940
0.000	1	1
0.03	1	1
0.06	2	4
0.09	7	7
0.12	21	20
0.15	7	11
0.18	4	9
0.21	5	1
0.24		2
0.27		
0.30	1	9
0.33	1	1
Totals	116	144
Mean and probable error	0.096 ± 0.003	0.107 ± 0.003
Standard deviation	±0.051	±0.057

of little or no consequence regardless of its statistical interpretation. If any doubt could be entertained on this score, it would be dispelled by the data on the urinary lead concentration as recorded in tables 3 and 4. Previous experience has demonstrated clearly that changes in the availability of lead within the body have a proportionally greater effect on the urinary lead concentration than on the lead concentration in the blood.

The results obtained on the samples of urine were first listed for the individual quarters in which the samples were obtained. The dates of sampling were the same for the test and the control group and were also approximately the same for the two years repre-

TABLE 4—Urinary Lead Concentration of Group Taking Ascorbic Acid During the Year (1939) Prior to Taking It and During the Year in Which It Was Taken

Lead in Mg per Liter	Frequencies of Occurrence of the Concentrations Indicated	
	In 1939	In 1940
0.000	1	
0.03	17	20
0.06	75	47
0.09	36	51
0.12	27	15
0.15	9	15
0.18	2	5
0.21	4	1
0.24	1	1
0.27	1	
0.30		
0.33		1
Totals	159	144
Mean and probable error	0.105 ± 0.001	0.103 ± 0.003
Standard deviation	±0.050	±0.050

sented. The distribution of the results was generally similar for the respective quarters throughout the years, and therefore, for purposes of comparison, they were combined for each year, as seen in tables 3 and 4. Samples were lacking for some of the individual subjects during one or more quarters in 1939, and therefore there was a smaller total number of results for 1939

There is no reason for supposing that this fact could influence the general spread or any other characteristic of the data as a whole. It is obvious that no significant change occurred in the urinary lead concentration either as between the control and test group or between the years 1939 and 1940.

TABLE 5—Fecal Lead Concentration of Group Not Taking Ascorbic Acid During the Years 1939 and 1940

Lead in Mg. per Gm. Ash	Frequencies of Occurrence of the Concentrations Indicated	
	In 1939	In 1940
0.0119	46	48
0.12	5	68
0.24	10	18
0.36	4	5
0.48		1
0.60	1	1
0.72		
0.84		
0.96	1	-
1.08		
1.20		
1.3214.9	1	
Totals	116	141
Mean and probable error	0.13 ± 0.011	0.18 ± 0.008
Standard deviation	±0.12	±0.118

Any differences which might occur in the fecal lead content or concentration from quarter to quarter, from year to year or from one group to another would have to be interpreted with great caution in view of the overwhelming predominance of ingested lead over excreted lead in determining the extent of the fecal lead elimination. Nevertheless the fecal results expressed in terms of the quantity of lead per gram of fecal ash have been tabulated in tables 5 and 6. The most cursory examination of the results demonstrates the similarity of the groups throughout the period involved in this respect.

TABLE 6—Fecal Lead Concentration of Group Taking Ascorbic Acid During the Year (1939) Prior to Taking It and During the Year in Which It Was Taken

Lead in Mg. per Gm. Ash	Frequencies of Occurrence of the Concentrations Indicated	
	In 1939	In 1940
0.0119	47	49
0.12	61	70
0.24	1	19
0.36	2	1
0.48	1	1
0.60		1
0.72		
0.84		
0.96	1	1
1.08		
1.201319		1
Totals	198	144
Mean and probable error	0.161 ± 0.008	0.188 ± 0.007
Standard deviation	±0.11	±0.142

Table 7 gives the pertinent clinical data and the general findings of the clinical laboratory for the two groups. No significant difference can be seen in the numbers of erythrocytes or of stippled erythrocytes, or in the hemoglobin content of the blood. Likewise the number of abnormal circulatory findings was approximately the same in the two groups. There was little difference in the number or severity of the complaints that could be referred to possible lead effects. These

complaints were grouped under the main headings of gastroenteric tract symptoms, constipation, headache, nervousness, fatigue and rheumatic pains. The gain in weight differed insignificantly. It was surprising to find no difference in the two groups in the matter of symptoms, since in checking the men who took ascorbic acid, twenty-one of the thirty-six, or 58 per cent, reported some improvement such as less fatigue, more regular bowel movements, improvement in appetite and sleeping. However, verbal reports were similar in a large group of lead workers being given all the vitamins except ascorbic acid. As may be seen from table 7, there were more of the ascorbic acid group who lost time due to sickness than in the control group, and the total time lost was greater.

#### CONCLUSIONS

Ascorbic acid nutrition in workers in a large plant was found to be generally poor and somewhat poorer in lead workers than in others.

TABLE 7—Clinical Findings on 36 Men Taking 100 Grams of Ascorbic Acid Daily for a Year Compared with Clinical Findings on 36 Men Not Taking Ascorbic Acid

	Group Taking Ascorbic Acid		Control Group	
	Number	Per Cent	Number	Per Cent
Abnormal blood pressure	90	2	2	6
Abnormal pulse pressure	10	1	8	2
Abnormal pulse rate	20	5	10	5
Low red blood count	1	1	10	2
Low hemoglobin	10	1	8	2
High count of stippled erythrocytes	11	1	11	1
Weight increase	20	56	19	53
Net average gain in pounds	16		0.5	
Gastroenteric complaints	1	1	1	3
Constipation	12	33	13	36
Headache	9	1	11	1
Nervous complaint		8	3	8
Fatigue and rheumatic pain	1	1	7	19
Lost time illness	15	4	17	5
Lost time	4 days		6 days	

Careful study of a large group of lead workers failed to reveal any effect of ascorbic acid taken orally in daily quantities of 100 mg. on the lead concentration in the blood or on the elimination of lead in the feces or urine.

No difference was noted in the physical condition of the men or in the number and severity of complaints. No change was found in the numbers of erythrocytes or stippled erythrocytes or in the hemoglobin in the blood.

No reason has been found for recommending the use of ascorbic acid to minimize the effects of lead absorption.

**The Movement Westward**—When our forefathers were sick they faced the necessity not only of overcoming their diseases virtually unaided but also of withstanding the treatment that was designed to cure them. Only the sturdy survived. Those who lived to carry on the race possessed a physical fiber that was both tough and resilient—a constitutional endowment that they needed when the movement westward began. Although historians tell us that the pioneers climbed mountains, waded through swamps, swam rivers, endured extremes of heat and cold, suffered from thirst and hunger on the plains and fought the hostile Indians because of the lure of gold or the promise of new and more fertile lands, it is also possible that they left the East to escape their doctors.—Irving Frederick C. Safe Delivrance, Boston, Houghton Mifflin Company, 1942.



## Clinical Notes, Suggestions and New Instruments

### TREATMENT OF EPILEPTIFORM ATTACKS CAUSED BY CALCIFIED ADRENALS

WILLIAM LINTZ M.D. BROOKLYN

**History**—I P S F, a boy aged 11 years, when seen in 1937, gave the history of having suffered from epilepsy since he was 2½ years old. The convulsions first came on shortly after an ordinary attack of measles suffered at that time. For a few years they were very frequent but gradually diminished in number until they averaged only two to three attacks a month. These convulsions were not preceded by an aura. An upset stomach or an oral temperature of 100 F or more, from whatever cause, was very sure to bring on an attack. No individual article of diet, condition of the bowels or nervous strain was responsible for these convulsions. They began spontaneously, like lightning from a clear blue sky, apparently without cause, as on one occasion when after spending a prolonged afternoon at the movies, he ran a block to his car only to be seized by a violent convulsion in front of it.

These convulsions did not begin in any special part of the body. They were general, with practically every muscle participating. They were clonic in character, lasting from one to five minutes, during which time there was complete loss of consciousness. There was no foaming at the mouth and no biting of the tongue. There was no loss of strength of the sphincters. At the end of an attack the patient gradually regained consciousness without having the slightest recollection of the convulsion. He not infrequently vomited and felt 'lousy' for the rest of the day. The attack was not followed by confusion, drowsiness or sleep. These attacks occurred equally day and night and during his sleep.

The boy had a brilliant mind. At 11 he already had been graduated from elementary school. He was highly intelligent, possessed an unusual fund of knowledge and had an excellent memory. I found him good natured, kind and lovable. He tired very easily and could not participate in strenuous games. When he was 3 or 4 years old it was impossible for him to walk ten blocks. Even at 11 he had to be in bed by 7 and certainly never later than 9 o'clock. His legs would give out. He petered out toward the end of a game. He had a tendency to constipation.

A tonsillectomy was performed and the patient had pneumonia at 1, an attack of measles was followed by an obscure illness and then by these convulsions at 2½ years of age. An appendectomy performed later on gave no relief from these attacks.

There was a definite history of allergy on the mother's side and of diabetes on the father's side.

**Physical Examination**—The boy weighed 89 pounds (40.4 Kg), was 58½ inches (149 cm) tall and had a blood pressure of 88 systolic and 75 diastolic. His body was covered with numerous supernumerary adrenal spots—those brown black

eliminated certain foods to which by cutaneous test and by history he was found to be allergic and substituted 3 to 4½ grains (0.2 to 0.3 Gm) of phenytoin sodium for the phenobarbital. His convulsions were unabated.

I next saw the patient two years later when he was 13 years of age and at the end of the second year in high school. As usual, he was at the head of his class.

In view of the utter lack with the exception of the convulsions, of all stigmas of long standing epilepsy—mental deterioration, aura, lingual injury and loss of sphincter control—and an absent family history of epilepsy, in spite of the previous diagnosis of epilepsy made by many colleagues of unusual reputation in this field, I decided to re-study the case.

I asked the patient to keep a diary and I was struck by the tremendous spontaneous intake of sweets—ice cream candy, sodas, puddings and honey.

Many blood examinations were made. Typical findings are as follows: Hemoglobin 75 per cent, red blood cells 3,770,000,



Arrows point to calcified adrenals. The previous atonic and redundant large intestine became normal after vitamin B therapy.

white blood cells 8,350, polymorphonuclear leukocytes 69 per cent, small lymphocytes 18 per cent, large lymphocytes and transitionals 10 per cent and eosinophils 3 per cent. Microcytes and poikilocytes were present. The results of the sugar tolerance test are given in the accompanying table.

The basal metabolic rate varied between minus 2 and minus 12.

A gastric analysis, in which crackers and water were used, gave negative results as the result of physical and chemical examination of 260 cc of stomach contents extracted after forty-five minutes. The feces were normal.

**Examination**—Fluoroscopy of the chest showed a very small heart—drop heart, otherwise everything was normal.

A gastrointestinal series of roentgenograms was completely negative. On previous investigations atony and redundancy of the large intestine had been found. I find that the administration of large doses of vitamin B restores such bowels to normal. Pancreatic studies proved negative.

These roentgenograms showed what was of paramount importance—complete calcification of both adrenal glands.

The peculiar sugar tolerance reaction and the completely calcified adrenals changed the entire aspect of the condition. For the first time there was a lucid and logical explanation

#### Results of Sugar Tolerance Test

Sugar tolerance test—100 Gm. of dextrose used	Urine Sugar
Fasting 85.7 mg. per 100 cc. of blood	Negative
1 hour 85.7 mg. per 100 cc. of blood	Negative
2 hours 85.7 mg. per 100 cc. of blood	Negative
3 hours 85.7 mg. per 100 cc. of blood	Negative
4 hours 85.7 mg. per 100 cc. of blood	Negative

spots from which Coopman was able to extract epinephrine. The blood count was normal and urinalysis gave negative results.

**Treatment**—In the past he had been on all sorts of diets and had been given all sorts of enemas and all his life he had been taking daily 2 grains (0.13 Gm) of phenobarbital. I placed him on a high calcium diet especially rich in vitamin B,

of all the symptoms. The diagnosis of epilepsy was abandoned. The obscure illness after the attack of measles which was followed by these attacks of convulsions was evidently caused by tuberculosis of both adrenal glands with their subsequent calcification. For tuberculosis to follow measles is by no means a rare occurrence.

While I was unable to do a blood sugar determination during a convulsion, it is evident from the sugar tolerance tests that he was unable to mobilize dextrose when he most needed it. That hypoglycemia will produce convulsions is too well known for discussion. In fact, it is the basis for treatment of certain mental diseases.

The disturbed physiology of the adrenals explains the patient's symptoms. If one bears in mind what epinephrine does, it is evident that all his symptoms are explained by his calcified adrenals.

Epinephrine stimulates the conversion of glycogen in the liver and possibly in the muscles, into dextrose which is then poured into the circulating blood. The level of the blood sugar rises, and if it exceeds the renal threshold some sugar will be excreted into the urine. If the liver has previously been emptied of the glycogen, it is stated that a rise in the blood sugar level may still result from epinephrine.

Epinephrine performs the following functions:

1 It aids the redistribution of the blood in the body and increases the force and rate of the heart. A large dose of epinephrine may cause the minute output of the heart to increase by 90 per cent, partly by an increase of rate and partly through an increased output per beat. It thus enables the heart to cope better with a larger venous return.

2 It mobilizes liver glycogen and provides sugar for the active tissues.

3 It diminishes fatigue in the skeletal muscles. This is an important action. The muscles work to better advantage because of the increased supply. It constricts the vessels of the skin, but the vessels supplying the skeletal muscles dilate. In addition, it has been stated that epinephrine increases the force of contraction both of normal and of fatigued muscles in response to stimulation through its motor nerve.

4 It possibly increases the red blood cell count and thus the oxygen carrying power of the blood by stimulating the smooth muscle of the capsule of the spleen, which discharges the red blood cells stored in the interstices of the pulp.

5 It brings about relaxation of the bronchi, facilitating ventilation of the alveoli.

6 It is responsible for dilatation of the pupils and closure of the sphincters.

What better treatment is there, next to the administration of dextrose intravenously, than a shot of epinephrine for the treatment of hypoglycemia? The liver is vitally concerned with the regulation of the normal level of the blood sugar. When the blood sugar rises it stores glycogen, and it is aided in this process by insulin. When the blood sugar falls it responds in two ways. 1 It mobilizes glycogen by converting it into dextrose. It is stimulated to act in this way by impulses reaching it from the sympathetic nervous system and by the epinephrine. 2 It forms new glycogen mainly from protein and is stimulated to do this by the diabetogenic hormone.

Since normally only 5 Gm of dextrose is present in the blood and since the sugar may be consumed suddenly and excessively, the mechanism of replacement must be very finely balanced. Yet in this patient it was grossly disturbed.

The adrenal cortex is essential to life, the medulla is not. If both adrenals are removed death results in from four to five days. Accessory cortical tissue must be present in order to survive.

I believe that the reason for the number of convulsions becoming smaller as he grew older is that he was developing accessory adrenals.

**Treatment**—This was simple and effective. Instead of relying on his liver as the storage place and warehouse for his sugar, he now carries in his pocket some form of dextrose to be taken at frequent intervals.

I do not believe that this is a patient to be treated with the usual high protein, high fat diet as a patient with hypoglycemia resulting from hyperinsulinism. This condition is entirely differ-

ent from such a hypoglycemia, in which by administering excessive amounts of dextrose one would further stimulate the secretion of insulin, thus increasing the hypoglycemia further by establishing this vicious cycle. He also takes adrenal cortex extract orally three times a day between meals.

#### RESULTS

The boy is now a brilliant student in college. He is in perfect health. In the last three years he has had two attacks—one after playing football and the other following an all night fraternity spree. In both instances he omitted taking dextrose. Under the circumstances, both attacks could have been predicted and avoided. Recently he suffered from an attack of mushroom poisoning, which produced violent gastrointestinal symptoms but no convulsions.

I wonder whether Caesar and Napoleon, who supposedly suffered from epilepsy, did not have a similar condition. They also possessed brilliancy instead of the mental deterioration common to epilepsy of long standing.

Epileptic patients should have made not only a sugar tolerance test but x-ray studies of the pancreas and adrenal glands.

36 Plaza Street

## Special Article

### STATISTICS ON THE PATIENT LOAD OF PHYSICIANS IN PRIVATE PRACTICE

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With the induction of thousands of physicians into the armed forces and the resulting changes in the density, distribution and composition of physician groups, the problem of determining precisely the number of physicians required for the civilian needs of an area and the number that could be shifted from one area to another or to the armed services has become more than ever important. Any such determination requires accurate knowledge about (a) the number of persons who will demand medical care, (b) the amount of medical care they will require and (c) the physicians time necessary to supply the required service. Spe-

TABLE 1—District of Columbia Questionnaire

The physicians were asked to state:			
1 Number of patients (different individuals) seen and visits made to or by residents of the District of Columbia last week (August 30-September 5)		Patients	Visits
In office			
In hospital			
At patient's home			
2 Number of patients (different individuals) seen and visits made to or by persons living outside the District of Columbia (August 6-September 5)		Patients	Visits
In office			
In hospital			
At patient's home			
3 What is your daily routine by the clock in seeing patients in		Week days	Sundays
Office			
Hospitals			
Home visits			
Hospital or public clinics			

cific knowledge on the three variables is unfortunately difficult to obtain. However, the integration of the three variables equals the number of patients seen by the physicians of an area in a given unit of time. Therefore, as a first approach toward a quantitative estimate of civilian needs for medical care, use can be made of data on the patient load carried by physicians. Such data have been collected for Washington, D. C., and the state of Maryland and constitute the basis of this report.

From the Division of Public Health Methods, National Institute of Health, U. S. Public Health Service. A study carried out for the Committee on the Allocation of Medical Personnel of the Procurement and Assignment Service.

## MATERIAL AND METHOD

The data on the patient load of physicians are derived from successive studies which the Procurement and Assignment Service for Physicians, Dentists and Veterinarians made in the District of Columbia and in the state of Maryland<sup>1</sup> in 1942 primarily to obtain information about the number and proportion

TABLE 2—*Maryland Questionnaire*

The physicians were asked to state	
1	Number of patients (different individuals) seen last week (October 8-October 10)
A	Patients living in the county (or Baltimore City) where you practice
	In office
	In hospital
	At patient's home
B	Patients living in Maryland outside the county (or Baltimore City) where you practice
	In office
	In hospital
	At patient's home
C	Patients living outside Maryland
	In office
	In hospital
	At patient's home
2	How many hours a day do you routinely spend in your office seeing patients?

TABLE 3—*Percentage of Practicing Physicians Who Replied to the Questionnaire from District of Columbia*

Age, Sex, and Color	All Practitioners	General Practitioners	Specialists
White males			
Under 35	66	54	79
35-44	64	63	65
45-64	63	58	66
65 and over	65	68	60
All white males	64	61	66
Negro males			
Under 45	49		
45 and over	41		
Females			
All ages	48		

of nonresident patients seen by the physicians of Washington, D. C., and of the communities of Maryland. The studies were conducted by means of questionnaires sent to all the physicians in private practice.

The first of the studies covered the District of Columbia (table 1).

Within a week's time from the date on which the questionnaires were mailed 50 per cent of the physicians had replied and by the time the study was closed replies had been received from 60 per cent of the practitioners.

From a preliminary analysis of the responses it became apparent that within the week's span for which information was requested the number of visits or calls did not exceed by any substantial amount the number of "patients." What differences existed between "visits or calls" and "patients" usually arose from the amount of services rendered in hospitals. It was also apparent that the physicians were on the whole not in a position to describe the day's routine in terms of the hours of the clock generally spent in the office or hospital or at the homes of patients. A high proportion of them frankly admitted they could not give any definite information on the point, and others simply left the question unanswered.

In view of these observations the questionnaire was simplified in the succeeding inquiry made in Maryland (table 2).

Space for the physician's signature was left on the questionnaire and almost all the physicians duly signed the replies, generally adding helpful explanatory comments about their activities.

The number of physicians in private practice to whom the questionnaires were sent equaled 991 in the District of Columbia

and 1,623 in Maryland. Replies were received from 507 or 60 per cent, of the practitioners of the District of Columbia and 1,065, or 66 per cent, of the Maryland physicians.

The percentage of replies obtained from each age, sex, and race group of the District of Columbia physicians is reported in table 3. It will be noted that among the white male practitioners replies were received from 64 per cent, while less than 50 per cent of the Negro male and of the female practitioners answered. It may be that some of the last group identified the questionnaire with the procuring of physicians for the armed services and therefore assumed that a reply was not really desired.

When the white male physicians of the District of Columbia are classified according to type of practice into general practitioners and specialists (practice limited to a specialty as indicated in the records of the Medical Society of the District of Columbia) it is found that a slightly higher percentage of specialists than of general practitioners replied. The difference is particularly noticeable in the under 35 age group but it should not be forgotten that the numbers involved are small. On the whole it appears that the several age groups of physicians replied in equal proportion to their number.

A tabulation of the total number of Maryland physicians according to age, sex, color and specialty for October 1942 is not available. However a comparison can be made between the distribution of the several categories of physicians who replied and the distribution observed among those counted in a survey made in June 1942. Of the total physicians who replied 93 per cent were white males, 4 per cent Negro males and 3 per cent white females. In June the white males constituted 92 per cent of all practitioners and the Negroes and the females 5 and 3 per cent respectively. Among all the physicians enumerated in June 67 per cent practiced in Baltimore City and among the physicians who replied 65 per cent practiced in that city. In the count of Baltimore City physicians 56 per cent of the physicians were general practitioners. Of the replies to the

TABLE 4—*Average Weekly Patient Load of White Male General Practitioners*

Age Group	Number of Physicians Giving Information	Weekly Patient Load					
		Averages				Standard Deviations	
		Office	Hospital	Home of Patients	Total	Office	Total
		Washington, D. C.					
Under 35	26	96	8	25	129	49	6
35-44	58	107	10	13	120	71	8
45-64	43	89	7	2	98	68	9
65 and over	29	40	3	15	58	40	5
All ages	156	86	8	21	115	68	8
Baltimore							
Under 35	51	107	7	27	136	67	7
35-44	77	113	9	38	160	67	9
45-64	123	67	6	30	103	58	8
65 and over	57	47	2	27	71	38	7
All ages	288	82	6	21	110	61	8
Maryland, Exclusive of Baltimore City							
Under 35	35	122	8	12	142	79	9
35-44	79	122	10	38	189	75	8
45-64	97	96	6	27	119	69	7
65 and over	51	43	3	14	63	37	4
All ages	262	96	7	29	132	71	8
Maryland (Total)							
Under 35	86	110	7	39	147	79	8
35-44	156	123	9	38	170	71	9
45-64	220	75	6	29	110	59	7
65 and over	88	43	2	19	65	37	5
All ages	550	89	7	20	106	68	8

questionnaire, 51 per cent were from general practitioners. The percentage of white male practitioners equaled 43 in the June census, it equaled 40 among the physicians who replied to the questionnaire.

Other comparisons between the composition of the sample of physicians who cooperated in the study and of the total number

<sup>1</sup> Dr F. N. McGovern, chairman of the District of Columbia Procurement and Assignment Service, Mr Theodore Wiprud, executive secretary of the Medical Society of the District of Columbia and Dr C. W. Maxson, chairman of the Maryland Procurement and Assignment Service, cooperated in these studies.

enumerated four months previously also reveal only slight and insignificant differences. Therefore, it seems safe to conclude that both in the District of Columbia and in Maryland the physicians who replied to the questionnaire are on the whole fairly representative of the total physician population in the two areas, at least for the characteristics noted.

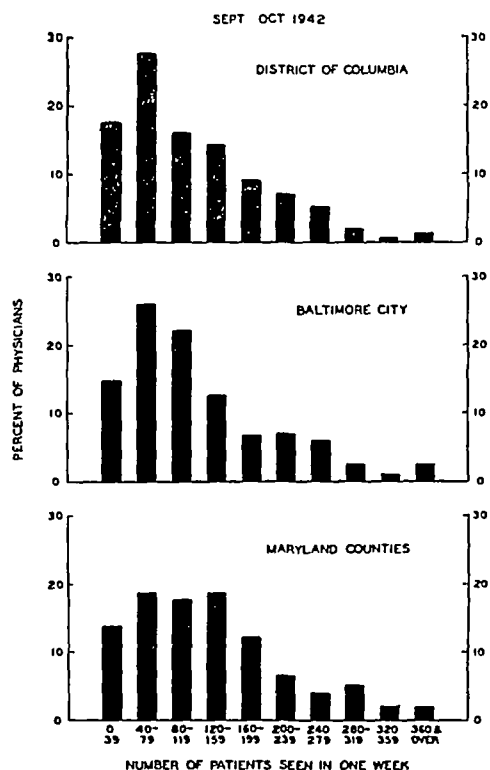


Chart 1—Patients seen in one week by white male general practitioners September-October 1942

Not all of the total 1,662 replies received have been utilized for the purposes of this study. The reasons for excluding some of the schedules are several. In the District of Columbia sample lack of internal consistency due to misunderstanding of the term "visits or calls" has been a relatively frequent cause for exclusion. In both samples the records of physicians who were absent from their practice all or part of the week have not been included. Furthermore, some of the physicians who routinely render service in clinics counted clinic load among the patients seen. Such records, when they could be identified, have also been discarded.

With reference to possible inaccuracies in the statements made by the physicians no check has been attempted, nor can any estimate be made at present of the amount or direction of any bias that may have been introduced in the replies.

#### WEEKLY PATIENT LOAD OF GENERAL PRACTITIONERS

In the group of general practitioners are included all the physicians except those whose practice is actually limited to a special field of medicine.

The distribution of the number of patients per physician and the average weekly patient load of the physicians of the four age groups considered are shown in charts 1 and 2 and table 4. With reference to the variation among physicians, chart 1 shows that the number of patients seen in a week may range from less than 40 to more than 300. The wide dispersion is emphasized by the values of the standard deviation. These values indicate that the total patient loads of two thirds of the general practitioners, when all ages are combined, vary between 30 and 200 patients weekly, and the office patient loads vary between 20 and 150 patients. This wide range probably reflects the many

varieties of activities of the general practitioner. Some services may require only a few minutes of attention while others may require several hours. Moreover, even among general practitioners there will be some whose services are preponderantly of a kind requiring either a low or a high expenditure of time per patient. It must not be forgotten either that notwithstanding special efforts to eliminate them from the computations, there may be included a few physicians whose patient load as stated contained clinic patients. It is pertinent in this respect to note that the range and standard deviation are nearly the same for practitioners of Baltimore City, Washington, D. C., and the state of Maryland outside Baltimore City.<sup>2</sup>

It will be noted also that the percentage distribution of physicians in terms of weekly patient load is almost identical in Baltimore and Washington, the distribution in both instances being skewed in favor of the higher patient loads. The average weekly patient load carried by the physicians is almost the same in the two cities: 119 for Baltimore and 115 for Washington. For the Maryland counties the more rural areas of the state, the mean patient load is 132, higher than for either of the two cities.

Among the four age groups into which the general practitioners are classified there exist differences which are especially striking because they are found in each of the three populations examined. The highest average patient load is carried by the physicians between 35 and 44 years of age. The physicians under 35 demonstrate a slightly lower average but nevertheless higher than that for the ages 45 years and above. The men 65 years and above possess the lowest patient load, less than one half of that of the men between 35 and 44 years.

The differences in the patient load carried by the four age groups of physicians are best evident for the number of patients seen in the office but are also apparent for the patients seen at the hospital and at the patient's home. With reference to these observations it is of interest to point out that there is a positive and substantial correlation between the number of patients seen in the office and the number seen at hospitals and the homes of the patients. The coefficient of correlation of the two variables ranges from +0.41 to +0.66 for the four age groups of physicians in Washington, D. C., Baltimore City and the Maryland counties. The correlation would indicate that the general practitioners who have a larger office practice also have more home and hospital visits to make.

Among the Washington, D. C., general practitioners, 75 per cent of the total average weekly patient load consists of office patients. The percentage is 69 for the Baltimore City general practitioners and 73 for the general practitioners of Maryland outside of Baltimore. Thus the Baltimore City practitioners

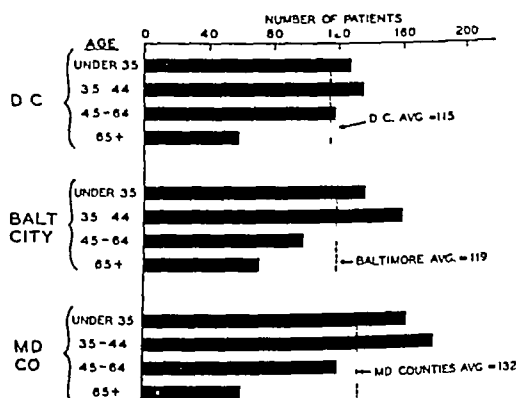


Chart 2—Average number of patients seen in one week by white male general practitioners by different age groups

make proportionately more home and hospital calls than do the physicians of the other two areas. The ratio of home to office calls can be used to express the same relationship. Among Baltimore City general practitioners the ratio equals 38 per cent while among the general practitioners of Washington, D. C. and

2 For the District of Columbia sample the records of the medical society were utilized for this information. For the Maryland sample the information reported in the 1942 Directory of the American Medical Association was used.

3 It is necessary to point out that Baltimore City is an independent political subdivision of Maryland and is not contained in any of the twenty three counties of the state.

of the Maryland counties it equals 24 and 30 per cent respectively. There is a tendency for this ratio to increase with age that is the older general practitioners make relatively more home calls than do the younger ones. In the Washington, D. C. sample, the ratio is 24 per cent for the men under 35 years of age and 38 per cent for the men 65 years and older. In the Baltimore City sample, the ratio is 26 per cent for the former and 64 per cent for the latter age group, and among the practitioners of the Maryland counties, the ratios are 27 and 33 per cent for the two age groups in the order named.

The small number of Negro male and of female physicians both Negro and white does not permit adequate comparison with respect to age and specialty. The great majority of Negro physicians are general practitioners, but the female physicians are mixed specialists and general practitioners. The pertinent data for Washington, D. C., and Baltimore are presented in table 5. From the table it is seen that Baltimore Negro physicians carry a heavier patient load than the Washington ones, and the age effect already mentioned is rather pronounced in both groups. Among the female physicians it is found that the younger practitioners have a greater patient load than the older

TABLE 5—Average Weekly Patient Load of Negro Male and of Female Physicians

Age Group	Number of Physicians Giving Infor mation	Weekly Patient Load					
		Averages				Standard Deviations	
		Office	Hos pital	Home of Patients	Total	Office	Total
		Negro	Males—Washington	D	C		
Under 45	24	110	9	32	151	84	96
45 and over	24	46	3	14	63	40	50
All ages	48	78	6	23	107	73	88
Negro Males—Baltimore							
Under 45	13	106	10	26	142	60	68
45 and over	16	75	6	32	113	56	76
All ages	29	88	8	30	126	60	74
Females—Washington D C							
Under 45	13	65	13	13	91	41	60
45 and over	6	34	3	16	73	36	59
All ages	19	69	10	14	86	34	53
Females Baltimore							
Under 45	6	67	16	9	87	86	91
45 and over	10	31	14	5	50	37	44
All age	16	43	15	6	64	60	68

physicians. It is also observed that the Washington female physicians have a larger number of patients than the Baltimore ones, and both apparently carry a much lower patient load than the males.

#### PATIENT LOAD AND TYPE OF PRACTICE

In terms of the number of physicians involved, the major types of specialty represented by the practitioners include internal medicine, surgery, obstetrics and gynecology, pediatrics, ophthalmology and otorhinolaryngology<sup>4</sup> and neurology and psychiatry. The other specialists are represented by so few physicians that their average patient loads are not discussed.

The data of table 6 reveal that all six stated groups of specialists practicing in Washington, D. C., have a slightly lower average patient load than the general practitioners. In Baltimore City instead it is found that the general practitioners carry a lower patient load on the average than do the pediatricians and the ophthalmologists and otorhinolaryngologists.

The differences between specialists and general practitioners relative to patient load is striking in the case of neurologists and psychiatrists, whose patient load is about one fourth that of the general practitioners. For both the Washington and the Baltimore neurologists and psychiatrists the men above 45 have a larger patient load than the men below that age. But for the remaining specialties, in general, the younger men have the greater patient load.

Other differences between specialists and general practitioners are observed with regard to the relationship of office calls to total calls. In particular, the ophthalmologists and otorhinolaryngologists in both cities studied see a very high proportion of their patients in the office. On the other hand the proportion of patients seen at home by pediatricians is above the average of that of the general practitioners.

TABLE 6—Average Weekly Patient Load of White Male Physicians Engaged in Practice Limited to Special Fields

Age Group	Number of Physicians Giving Information	Weekly Patient Load						Standard Deviations	
		Office	Average			Total	Office	Total	
			Internal Medicine	Wash- ington	Home of patient				D C
Under 45	37	72	9	15	96	48	41		
45 and over	18	63	11	17	91	65	51		
All ages	55	71	10	14	95	54	61		
Internal Medicine—Baltimore									
Under 45	25	81	8	17	106	79	40		
45 and over	48	48	11	0	59	41	6		
All ages	81	49	10	17	76	40	4		
Surgery—Washington D C									
Under 45	25	77	24	9	105	70	101		
45 and over	14	56	15	5	76	33	4		
All ages	37	66	21	8	95	59	55		
Surgery—Baltimore									
Under 45	16	80	0	14	114	68	86		
45 and over	39	71	26	3	100	61	5		
All ages	55	74	25	11	110	65	5		
Obstetrics and Gynecology—Washington D C									
Under 45	22	86	19	7	112	6	41		
45 and over	9	50	8	1	70	24	2		
All age	31	75	16	8	99	7	41		
Obstetrics and Gynecology—Baltimore									
Under 45	17	63	14	5	85	55	5		
45 and over	50	52	27	9	88	5	47		
All ages	67	56	21	7	84	27	41		
Pediatrics—Washington D C									
Under 45	18	67	10	5	82	31	4		
45 and over	9	63	10	19	92	1	40		
All ages	27	67	10	12	99	3	41		
Pediatric —Baltimore									
Under 45	7	67	15	4	86	5	5		
45 and over	17	47	14	7	68	5	17		
All age	24	51	15	0	66	50	6		
Ophthalmology and Otorhinolaryngology—Washington D C									
Under 45	23	107	8	4	114	43	43		
45 and over	17	71	4	3	78	11	41		
All age	40	89	7	7	103	41	47		
Ophthalmology and Otorhinolaryngology—Baltimore									
Under 45	17	105	21	2	128	69	71		
45 and over	4	99	18	3	120	77	84		
All ages	21	100	19	3	122	74	80		
Neurology and Psychiatry—Washington D C									
Under 45	5	18	1	19	38	7	6		
45 and over	8	21	15	2	38	6	31		
All age	13	20	10	1	31	7	26		
Neurology and Psychiatry—Baltimore									
Under 45	6	20	4	5	29	14	19		
45 and over	6	19	11	4	34	9	18		
All age	12	20	7	4	31	12	15		

\* Less than 0.5

The standard deviation of the patient load of specialists is, with the exception of the surgeons of both cities and of the ophthalmologists and otorhinolaryngologists in Baltimore much smaller than that found in the case of general practitioners. This may well be due in part to the greater homogeneity of the activities of specialists in comparison with general practitioners.

4 These two specialties have been combined because of the large number of eye, ear, nose and throat specialists included in these samples.

## PATIENT LOAD AND OFFICE WORKING TIME

Usable data on time spent in the office are available only for the Maryland physicians. The average time routinely spent in the office seeing patients each day is 52 hours for Baltimore general practitioners and 59 hours for the general practitioners of the Maryland counties (table 9). The average time differs somewhat for the several age groups, and the variation between age groups for hours in the office follows the same pattern as the variation relative to patient load (table 4). The practitioners 35-44 years old spend the highest average number of hours in the office seeing patients, the men 65 years and over spend the lowest. The men under 35 are second so far as concerns number of office working hours. Although the differences are not large, some significance can be attached to the fact that they are similar in the two samples.

The differences between the age groups not only reveal that the younger physicians have a higher patient load and spend

discussed. Only the ophthalmologists and otorhinolaryngologists, whose average daily office working time is 56 hours, spend more time in the office seeing patients than do general practitioners. The average daily office working time of the other groups is as follows: internal medicine 44 hours, surgery 44 hours, obstetrics and gynecology 37 hours, pediatrics 33 hours.

## ESTIMATE OF PRESENT VOLUME OF MEDICAL CARE

The data on the patient load of physicians offer the possibility of arriving at a measure of the amount of medical services given by the physicians of a community to private patients. The product of the average weekly patient load by the total number of physicians of the community will give the number of persons who visited the physician or were visited by him during the week. If it is assumed that the physician's year is composed of fifty weeks, then the number of persons seen in one week multiplied by 50 will yield an estimate of the

TABLE 7—Estimated Annual Services Required from Private Practitioners

Type of Practitioner	Total Annual Services			Average Annual Services per Person		
	Washington D. C.	Baltimore	Maryland (Total)	Washington D. C.	Baltimore†	Maryland (Total)‡
Male white						
General	1,771,000	1,077,000	5,966,000	0.13	0.25	0.07
Limited						
Internal medicine	475,000	314,000	410,000	0.07	0.20	0.21
Surgery	411,750	414,000	551,000	0.11	0.49	0.29
Obstetrics and gynecology	370,700	127,500	10,000	0.1	0.7	0.18
Pediatrics	101,000	51,000	0,000	0.1	0.1	0.1
Ophthalmology and otorhinolaryngology	410,850	57,100	411,100	0.40	0.42	0.06
Neurology and psychiatry	1,100	8,770	43,000	0.04	0.04	0.07
Other§	20,000	18,000	27,450	0.0	0.1	0.17
All male white practitioners	18,110,000	5,008,000	8,111,000	4.07	5.63	4.00
Negro male	786,100	51,100	504,000	0.01	0.40	0.06
Female	210,000	108,000	164,000	0.09	0.19	0.00
All practitioners	4,801,100	5,518,700	8,000,000	5.86	6.17	4.07

\* Assuming a population of 830,000.

† Assuming a population of 514,100.

‡ Assuming a population of 1,931,000.

§ Exclusive of radiology, industrial medicine and surgery, clinical pathology and anesthesiology.

TABLE 8—Percentage of Services and of Practitioners According to Type of Practice (White Male Physicians)

Type of Practice	Washington D. C.		Baltimore		Maryland (Total)	
	Services	Practitioners	Services	Practitioners	Services	Practitioners
General	46.2	41.1	51.8	51.5	71.2	63.6
Limited						
Internal medicine	19.4	11.4	7.0	10.0	4.9	7.5
Surgery	11.0	17.0	8.6	9.5	6.7	7.1
Obstetrics and gynecology	8.5	8.9	0.5	8.7	4.1	0.2
Pediatrics	5.0	5.4	5.1	6.1	4.0	3.9
Ophthalmology and otorhinolaryngology	10.7	11.2	7.4	0.5	5.9	5.6
Neurology and psychiatry	0.0	0	0.8	0.7	0	1.0
Other*	5.1	4.8	4.3	4.3	0.7	0.5
All types	100.0	100.0	100.0	100.0	100.0	100.0

\* Exclusive of radiology, industrial medicine and surgery, clinical pathology and anesthesiology.

more time in the office but also reveal that per unit of time spent in the office the younger physicians see more patients than the older. Thus, from table 9 it is seen that the younger physicians those below 45 years of age see in their offices about 20 patients a week for every hour daily spent in the office. This relative office patient load falls to about 9 patients weekly for every hour spent daily in the office by the men 65 years of age and over.

The relationship between the average number of patients seen in the office and the number of hours the practitioners spend in their offices is illustrated in chart 3, which deals only with the men under 65 years of age. The average number of weekly patients increases at an almost constant rate for each additional hour spent in the office. From 30 weekly office patients for the practitioners who spend two hours daily in the office the office patient load increases to an average of 140 patients for the men who spend eight hours in the office. Each additional hour means an average increment of 18 patients weekly, or, assuming a five day week, 3.6 patients daily. From the results it can be estimated that on the average the office visit lasts seventeen minutes per individual.

In Baltimore, the general practitioners spend more time in the office than do the majority of the groups of specialists

total number of calls or services rendered by the private practitioners in a year. The results of these computations for Baltimore City, the whole state of Maryland and Washington, D. C., are shown in table 7. An estimated total of 5,518,700 calls are made annually by the private practitioners of Baltimore and 4,864,450 by the practitioners of Washington, D. C. Thus an average of 62 services per person are furnished in Baltimore and 59 in Washington, D. C. The services given in Maryland outside of Baltimore City, amount to only 3.4 per person and Maryland as a whole thus receives 47 physicians' services per person annually. For the two large urban centers the average number of calls per person is nearly identical but much higher than that for the more rural areas of Maryland. The increase of medical services in relation to greater urbanism was observed by Collins<sup>5</sup> in the material collected by the Committee on Costs of Medical Care. Collins's averages were lower than those obtained in the present sample, and the discrepancy may be due to several factors, among which are the facts that the survey by the Committee

5 Collins, S. D. Frequency and Volume of Doctors' Calls Among Males and Females in 9,000 Families Based on Nationwide Periodic Censuses 1928-31. Pub. Health Rep. 55: 1977-2020 (Nov. 1) 1940. reprint 2205.

on Costs of Medical Care was made over a decade ago, followed a completely different procedure and involved a different kind of population

The difference between urban and rural areas relative to the amount of medical care furnished not only may reflect differences in morbidity or in the mores with reference to demand for medical care, but also may be caused by the flow of patients from rural to urban areas. Therefore the differences observed in table 7 do not necessarily mean only that Washington and Baltimore residents receive more medical care than do the residents of the counties of Maryland but they also may mean that the physicians of the two cities furnish service to a substantial number of persons not resident there. For example, in the survey from which the Washington, D. C., data were acquired<sup>6</sup> it was found that 15 per cent of the patients of the physicians who replied to the questionnaire were nonresidents of the District of Columbia. Correcting for this flow of patients would reduce the annual number of calls per person among Washington D. C. residents to 5. This average is not much larger than that computed for the state of Maryland.

Comparing Washington and Baltimore, one finds differences in the distribution of physicians according to type of practice and according to color and to sex. These differences are demonstrated in the total annual number of services given. Thus, although the populations of the two cities are almost of the same size, it is estimated that the general practitioners of Baltimore annually make 3,022,600 calls to private patients as compared with 1,771,000 made by the Washington general practitioners. On the other hand, a greater number of services are given by the Negro and female physicians and the internists

TABLE 9—Average Number of Hours Spent in Office Seeing Patients (White Male General Practitioners)

Age Group	Average Number of Hours per Day (± Standard Deviations)		Estimated Average Number of Weekly Office Patients per Hour Spent in Office	
	Baltimore	Maryland Counties	Baltimore	Maryland Counties
Under 30	5.2 ± 1.8	6.1 ± 1.8	20	20
30-44	5.8 ± 2.0	6.5 ± 1.6	19	20
45-64	4.9 ± 1.8	5.5 ± 1.8	14	16
65 and over	4.7 ± 1.6	5.3 ± 2.0	9	8
All ages	5.2 ± 1.8	5.9 ± 1.8	16	16

of Washington than by the corresponding groups of physicians in Baltimore.

It has already been seen that the majority of the groups of specialists have a smaller patient load and shorter office working hours than do the general practitioners. However, a comparison between the percentage of estimated annual services given by the several types of practitioners and the percentage of each type of practitioner reveals a close parallelism. This is shown in table 8. Except for the neurologists and psychiatrists, who constitute 3 per cent of the private practitioners but give less than 1 per cent of the total physicians' services, there is on the whole little difference between the relative frequency of the specific types of practitioners and the proportional amount of medical services given by each type.

#### COMMENT

The data presented here concern the activities of physicians as they are manifest at present in the areas surveyed. Obviously, the situation described cannot be equal to present conditions. With the withdrawal of some 25 to 30 per cent of the physicians from these areas the average patient load per remaining physician has certainly increased, and it is probable that the increase may have affected the younger age groups more than the older. The data presented should be carefully evaluated in relation to the peculiarities of the times, but there is no doubt that the results of the analysis bring out certain important features pertinent to the solution of the problem of measuring civilian demands for medical care and of estimating numerical criteria for the selection of physicians from the population.

In the first place there are apparently age differences with regard to patient load and to office working time of physicians. Hence, the withdrawal of men below 45 years of age from a population has not the same effect as that of withdrawing men above that age. Not only do the younger men see a greater number of patients and spend more time in the office seeing

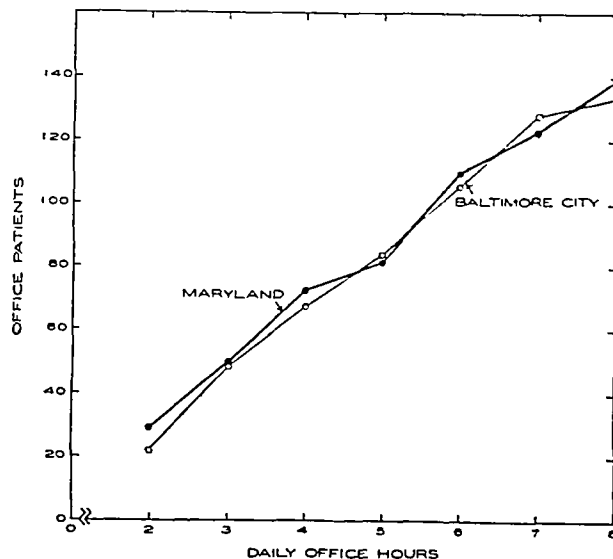


Chart 3—Average number of office patients seen in one week by Maryland general practitioners (white males under 65) according to daily number of office hours. The Maryland curve includes figures for Baltimore City.

patients but they also see more patients in a given unit of time than do the older men. The general practitioners under 45 years of age have a patient load 25 to 50 per cent greater than that of other men between 45 and 64 years of age and more than twice as large as that of general practitioners 65 years and older. In Washington D. C. among the white male general practitioners, for example although the men under 45 years constitute less than 50 per cent of the physicians, they see almost 60 per cent of the patients. These findings serve to emphasize the need for careful consideration of the

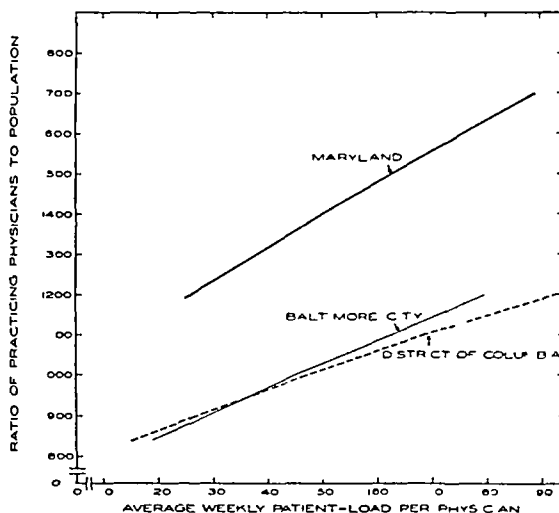


Chart 4—Estimated change in average patient load of remaining physicians as ratio of physicians to the population decreases. The Maryland curve includes figures for Baltimore City.

age distribution of the physicians of a community when preparing to establish the number that can be released for military service. For example, in a community containing two physicians one 35 and the other 65 years of age one could maintain that the removal of the younger man will mean the loss of not one half but of two thirds of the physicians.

<sup>6</sup> Ciocco Antonio Pond M. A. and Altman Isidore A. Survey of Practicing Physicians in Washington M. Ann. District of Columbia 11: 454-457 (Nov.) 1942.



With reference to the specific problem of arriving at a measure of the civilian demand<sup>7</sup> for medical services, data on the patient load of physicians offer a simple and direct approach if it is assumed that at present the demand does not exceed the capacity to meet it. The information on the patient load permits the calculation of the total medical services furnished to a population.

TABLE 10—Estimated Average Patient Loads for Specified Ratios of Physicians to Population

Ratio of All Active Private Practitioners to Population	Number of White Male General Practitioners		Average Weekly Patient Load of Remaining Practitioners	Percentage Increase in Patient Load	
	To Be Withdrawn	Remaining		Over Present Average of Total	Over Present Average According to Age of Remaining Practitioners*
Washington, D. C.					
1:838 †	0	88	115	0	0
1:900	25	160	127	10	12
1:1,000	67	241	147	28	24
1:1,100	68	210	160	47	48
1:1,200	124	184	193	68	87
Baltimore					
1:841 †	0	108	119	0	0
1:900	2	170	129	8	11
1:1,000	22	211	143	20	20
1:1,100	136	272	167	41	41
1:1,200	170	330	180	51	50
State of Maryland					
1:1,190 †	0	948	123	0	0
1:1,200	9	999	126	1	1
1:1,300	60	838	128	10	14
1:1,400	110	768	140	20	27
1:1,500	210	726	144	0	41
1:1,600	210	670	146	41	61
1:1,700	210	629	149	1	8

\* Assuming proportion of general practitioners to all practicing physicians is same as of Oct. 1, 1942.

† Ratio on Oct. 1, 1941.

‡ Assuming that all withdrawals are below 45 years of age.

tion, as has already been shown and in addition offers a measure of the effects of the withdrawal of physicians in terms of the amount of work that will have to be assumed by the remaining physicians in order to provide the amount of services furnished at present.

Table 10 and chart 4 illustrate for Washington, D. C., Baltimore and the state of Maryland the relationship of the reduction in the ratio of physicians to population to the patient load of the remaining white male general practitioners. The effects of the reduction of physicians on the average patient load are almost the same in Baltimore and in Washington. For example, by reducing the ratio of physicians to population to 1:1,000, the average weekly patient load of the remaining general practitioners would be increased to 145 in Baltimore and 147 in Washington. For Maryland the relationship is established at a different level of ratio of physicians to the population since we are dealing with a combined rural and urban population.

In the last column of table 10 an attempt is made to measure the effects of the age differences in patient load in relation to the age selection of the physicians withdrawn from the population. Assuming that all the physicians withdrawn from civilian practice are below 45 years of age, the increase in the patient load due to the reduction of physicians has been computed on the basis of the patient load now carried by the men who remain. Thus an increase in the patient load of the general practitioners of Baltimore City to 180 patients per week means an increment of 51 per cent if the increase is calculated from the all age average of 119, and of 75 per cent when the present patient load of the remaining practitioners is taken into account.

Since the data of table 7 and chart 4 furnish a measure of the amount of work that would have to be assumed by the practitioners remaining in a population after the withdrawal of a stated number, a first step is available toward the solution of

the primary and most important problem of estimating how many physicians it is possible to withdraw from a population and still satisfy the present demand for physicians' services.

An adequate solution requires, in addition, a precise evaluation of the maximum patient load that physicians can be expected to carry. Once that maximum is known, then the number of physicians needed to satisfy the present civilian demand for medical care can be easily determined from data of the kind presented in table 10 and chart 4. The information collected in the present survey does not furnish a conclusive and definitive measure of the maximum patient load, but, mainly for the sake of illustrating the method to be employed, some tentative values can be derived from the results of the analysis.

For example, it could be assumed that private practitioners can be expected to work at most between 2,000 and 2,500 net hours annually. In a five day week and a fifty week year this would mean a working day of between eight and ten hours. It will be recalled that the general practitioners who spend eight hours in their office see on the average 140 patients weekly, and it can be calculated that those who spend nine hours in the office see an average of 158 patients weekly. Seeing patients in the office facilitates speed and economy of action, hence it can be reasoned that these values represent approximations of the average maximum patient load of private general practitioners.

According to the foregoing premises, the maximum number of patients that can be seen by a general practitioner would vary between 140 and 160 weekly, on the average. Let us return to chart 4 and table 10 to appreciate the significance of these maxima in terms of the ratio of physicians to the population and of the present patient load. A weekly average patient load of 140 would require a ratio of one physician to 960 persons in Washington, D. C., one to 970 in Baltimore and one to 1,315 in Maryland. A weekly average patient load of 160 requires instead a ratio of one physician to 1,060 persons in Washington, D. C., one to 1,085 in Baltimore and one to 1,475 in Maryland. From table 10 it will be seen that a weekly average patient load of 140 for Washington, D. C., represents an increase of approximately 22 per cent over the present patient load or, when the ages of the remaining general practitioners are considered of approximately 26 per cent. If instead 160 patients weekly are considered the maximum average patient load, then the increments over the present patient load become approximately 39 and 48 per cent, respectively. Similar results are obtained for Baltimore City and the state of Maryland.

To evaluate correctly these resulting increments, it should not be forgotten that already the present average patient load per physician represents an increase of perhaps 25 per cent over that of 1940. Thus, if the patient load of a group of physicians is

TABLE 11—Estimated Number of Specialists per Hundred Thousand Population for Specified Ratios of Physicians to Population

Special Practice	Number of Specialists per 100 000 Population					
	Washington D C		Baltimore		Maryland (Total)	
	Ratio of All Private Practitioners to Population					
	1 1 000	1 1 100	1 1 000	1 1 100	1 1 000	1 1 100
Internal medicine	94	8	50	71	51	47
Surgery	84	8	7	65	48	44
Gynecology and obstetrics	6	34	70	64	37	34
Pediatrics	37	30	40	40	26	24
Ophthalmology and otolaryngology	78	19	36	49	38	35
Neurology and psychiatry	0	18	33	20	13	19

increased by 40 per cent for example, over that of the present it is actually increased by about 75 per cent over that existing in 1940. Therefore the pertinent question to be asked, before accepting any proposed value of the maximum patient load, is whether or not the remaining physicians are able to sustain the added burden.

When the upper limit of the ratio of all physicians to population is established in the manner indicated, an attempt can also be made to arrive at the ratio of the several types of practitioners needed for a population. Since the proportion of services

7 The demand for medical services is not to be confused with the need for such services. Obviously the number of patients actually seen by physicians will not except under ideal conditions equal the number of persons needing medical care.

rendered by each of the several types of practitioners is essentially equal to the proportion of each type of practitioner, it can be inferred that any decrease in the total number of physicians will affect equally the general practitioners and each of the groups of specialists. Thus, by maintaining constant the relative number of each kind of specialists, the decrease in absolute number can be estimated in relation to the decreases in total number of physicians. Table 11 presents the results of estimating the number of specialists per hundred thousand population when the ratio of physicians to population is reduced to specified limits. If it is accepted that the ratio of physicians to population can be reduced to 1,000 in urban centers such as Baltimore and Washington, according to the calculations presented in table 11 it will be necessary to retain for each 100,000 persons, eight to nine internists, seven to eight surgeons, six to seven obstetricians and gynecologists and so on. In a state which contains both urban and rural elements, a relatively smaller number will be required to furnish the same amount of services as that currently provided.

It is important to realize that these results are based in part on certain assumptions that have not been fully proved and are presented here mainly to illustrate the method of approach. However, it seems clear that the results of the study warrant the conclusion that data on the patient load of physicians offer a simple and direct approach to a solution of one aspect of the problems arising from the withdrawal of physicians for the armed services. When all is considered, the amount of medical care that the population can receive depends not only on the number but also on the working capacity of the physicians practicing in the population.

#### SUMMARY

Data on the number of patients seen in one week by physicians in private practice were obtained in a survey conducted in the District of Columbia and in the state of Maryland by mailed questionnaire. In Maryland, data were also secured on the number of hours a day routinely spent in the office seeing patients.

Replies were received from 60 and 66 per cent of the physicians in the District of Columbia and Maryland respectively. The distribution of replies by type of practice and age, sex, and color of the practitioners supports the belief that on the whole a representative sample was obtained of the physician population questioned.

The average weekly patient load among general practitioners is 115 patients in Washington, 119 in Baltimore and 132 in Maryland outside of Baltimore. Differences by age in these areas are striking. Physicians 65 years and older have an average patient load of less than half the average for men between 35 and 44, the latter being the group with the highest number of patients. Physicians under 35 had a higher average patient load than the group 45 to 64 years old.

Approximately 70 to 75 per cent of the patients attended by general practitioners are seen in the office. There is a strong tendency for the older men to make relatively more home calls than the younger men.

On the whole, specialists carry a somewhat smaller patient load than do general practitioners. For psychiatrists and neurologists the patient load is very low, since by the nature of their work the number of patients they can see in one week is necessarily small. The younger specialists apparently see the greater number of patients.

General practitioners of Maryland spend five to six hours daily on the average in routine office practice. Specialists spend about four. It is found that the more time spent in the office the more patients are seen, with the number of patients increasing at an almost constant rate for each additional hour.

From the data collected estimates can be made of the total amount of medical services given by the physicians of the communities involved and thus a measure obtained of the effect of withdrawing physicians for the armed forces. The data permit also an estimate of the maximum volume of services that a physician can be expected to furnish. Such information should prove valuable in establishing quantitative criteria to determine the essentiality or availability of physicians in relation to the needs of the community.

## Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING ARTICLE  
HOWARD A. CARTER, Secretary

### THE THERAPEUTIC VALUE OF ULTRAVIOLET RADIATION

(Continued from page 170)

#### UNDESIRABLE RESULTS IN DERMATOLOGY

Many of the inflammations, especially when acute or subacute (eczema, psoriasis and the like), may be made more acute or to spread or change character by too vigorous treatment with ultraviolet radiation. For instance, a patch of subacute eczema of any type may change to exudative eczema and may then become more or less generalized (infectious eczematoid dermatitis). Although a patch of chronic psoriasis will usually tolerate and may even be benefited by an erythema dose, on the other hand the patch may spread over the area of erythema if the normal skin is not protected. When treating individual lesions of any dermatosis it is advisable to protect the surrounding normal skin. Generalized psoriasis, especially if it is of the more acute or inflammatory type, if treated too vigorously, may change to universal psoriasis or dermatitis exfoliativa. The same phenomenon is observed at times in cases of eczema. It is admitted that vigorous treatment may at times make large patches of psoriasis and eczema disappear but such treatment is risky.

Large doses of solar radiation and of artificially produced ultraviolet radiation may precipitate attacks of herpes simplex and lupus erythematosus. Erythema and even suberythema doses of ultraviolet radiation applied to the normal skin of patients suffering from lupus erythematosus may cause the development of the disseminated type of the disease. In certain individuals infra-red rays or any form of heat applied for a considerable period will provoke a mottled erythema and pigmentation known as erythema ab igne.

The so-called sailors' skin or farmers' skin is a peculiar condition of the skin of the exposed parts occurring in persons who are exposed to solar radiation more or less constantly for many years. The skin is wrinkled and dry and keratotic of the senile type are likely to develop. These in turn not infrequently change to cancer. Farmers' skin may consist only of permanent freckles most commonly seen on the shoulders, the upper part of the back, the chest and the backs of the hands. These freckles are not especially dangerous but occasionally one may change to a keratosis and later to cancer. Farmers' skin in many ways resembles the so-called x-ray or radium skin (x-ray or radium sequelae). It also resembles xeroderma pigmentosum, a condition due to exceedingly low cutaneous tolerance to light.

It becomes manifest on the exposed parts of such patients early in life being most pronounced on the face. The eyes are congested the skin is dry and atrophic ectropion develops and there are innumerable freckles of the permanent type and keratoses of the senile type. Curiously, many of the keratoses change to basal cell epitheliomas rather than to epitheliomas of the prickle cell variety. Patients who have a low cutaneous toleration to light not only should avoid direct sunlight and artificially produced ultraviolet radiation but should avoid strong daylight because diffused sunlight and reflected light from snow, water and sand contain large amounts of ultraviolet radiation. If such patients find it necessary at times to be exposed to strong solar light, the face and hands should be protected with veils, walnut stain, an alcoholic solution of glycerite of tannin or cream containing dark substances, such as burnt sugar or ichthammol. A preparation which has been found effective to protect the skin against the effects of ultraviolet radiation is the following:

R	Phenyl salicylate	1 Cm	gr
	Tannic acid	5 Cm	5
	Wool fat		
	Petrolatum flavum	aa q s ad 100 Cm	3i

For very mild cases, a coating of yellow petrolatum followed perhaps by a dark colored powder may provide sufficient protection. The fad of exposing bodies of children to solar radiation and artificially produced ultraviolet radiation daily and indefinitely without medical supervision may eventually give rise to farmers' skin in a small percentage of children who happen to be idiosyncratic.

Hydroa vacciniforme is a rare bullous disease, mostly of children, limited to the exposed parts and occurring during the spring, summer and fall. The etiology is supposed to be associated with the effect of light on the skin of a susceptible person. Hematoporphyria has been found in the urine of these patients and it is thought that this and other substances may have something to do with sensitization to light. In the same category may be placed pellagra and summer prurigo melanosus, simulating chloasma and argyria, has been reported following sunburn.

Certain substances when injected into the body or painted on the skin appear to cause sensitization to light. There is one instance in the literature (Meyer-Betz) in which hematoporphyria was injected. Exposure to the light caused edema of the hands and face. Eosin when painted on the skin combined with exposure to light may result in severe dermatitis. Oil of bergamot and perfumes on the skin may be followed by dermatitis and pigmentation on even mild exposure to sunlight or ultraviolet radiation (berlock dermatitis). Attempts in this way have been made to modify or cure leukoderma with occasional success.

Skin affected with certain diseases especially with the desquamating fungous diseases such as chromophytosis when subjected to radiation that causes tanning may assume a peculiar appearance, so much so as to interfere with diagnosis. Chromophytosis is a good example. The patches of eruption are of a yellowish brown and the surrounding normal skin tans so that its color matches fairly well that of the affected areas. The patches of disease do not tan because the slightly thickened horny layer absorbs the radiation. Exfoliation of this horny layer leaves white patches which are in sharp contrast to the surrounding tanned skin. Urticaria and certain forms of recurrent acute dermatitis of the face, neck, forearms and hands are at times thought to be due to sensitization to light.

Conjunctivitis and other eye troubles may be caused by excessive exposure to direct sunlight, reflected sunlight and radiation from ultraviolet generators. Ultraviolet rays from the so called cold quartz lamp are particularly prone to produce conjunctivitis. Depending on the exposure and the susceptibility, the inflammation may be slight or severe, transient or persistent. Arctic explorers and mountaineers occasionally have snow blindness. In the industrial field, acetylene and arc welders have trouble with their eyes unless they wear goggles.

Ordinary glass will protect the eyes from ultraviolet rays, but, for protection from all ultraviolet wavelengths and visible light, it is preferable to use glass of a dark color—amber, green or black. It is important that the goggles be edged with soft opaque material that will obstruct the passage of light between the goggles and the skin.

#### SUNBURN

Ordinary sunburn is known as erythema solare and dermatitis actinica. In this category may, of course, be placed burns caused by ultraviolet radiation from any source. The reaction may consist of no more than a slight erythema—a flush—or definite erythema accompanied by a sensation of heat followed in a few days or a week by itching and exfoliation. If the reaction is more severe there is edema, vesiculation, erosion and perhaps exudation. The subjective symptoms are burning and itching. Depending on the degree of reaction, spontaneous recovery occurs, as a rule in from a few days to a few weeks. Occasionally recovery is delayed. Erythema and edema have been known to endure for months. Regardless of severity, in the absence of complications sunburn does not produce a scar. When the area burned is extensive, there may be constitutional symptoms consisting of malaise, headache, fever and vomiting. In fact, a more or less severe constitutional reaction may occur

in the absence of a burn when radiation is applied to the entire body. Such a reaction indicates that the dose is too high for the individual.

Mild and moderate local sunburn requires little if any treatment. Ointment of rose water or almond emulsion may allay the sensations of burning and dryness. When such a burn is extensive and especially when accompanied by constitutional symptoms, the patient may have to spend a few days in bed. Whether the burn is local or more or less generalized, the type of topical treatment indicated depends on the cutaneous objective and subjective symptoms. Constant wet dressings of boric acid, sodium bicarbonate, watery extract of witch hazel or diluted solution of aluminum acetate are indicated when there is vesiculation, erosion and exudation or when the burning sensation is distressing. When the skin is inflamed and dry, applications of the following lotion may be prescribed:

1. Zinc oxide		
Magnesium carbonate	rr	80 Gm
Alcohol		150 cc
Menthol		0.3 Gm
Phenol		2.0 cc
Lime water q. s.	rr	1200 cc
		5 ii f3 s gr ii f3 s f3 ii

Uncented cold cream containing 1 gram (0.06 Gm) of menthol and 1 drachm (4 Gm) of petrolatum or hydrous wool fat to the ounce (30 Gm) may be used for the same purpose.

Tan and ordinary freckles disappear completely in time, provided light is avoided. Their disappearance can be hastened by the application of lotions and creams that encourage desquamation. Formulas for such remedies are in all textbooks on dermatology.

#### METABOLISM

The blood sugar of normal men is not influenced to any extent by ultraviolet irradiation. In some persons with diabetes the blood sugar may be temporarily diminished. The decrease is probably due to increased excretion of insulin and may be accompanied by increased storage of glycogen in the heart, liver and muscle.

It is the opinion of most authorities that irradiation of lactating women increases to some extent the quantity and antirachitic potency of the milk.

Irradiation of moderate intensity increases endogenous nitrogen metabolism. Residual nitrogen is usually diminished. The excretion of uric acid is said to increase giving support to the use of ultraviolet in the treatment of gout. Ultraviolet irradiation may double the fat content of the blood, cholesterol increasing by 30 per cent.

The effect of ultraviolet irradiation on respiration is to make it easier, deeper and less frequent although total ventilation per minute remains constant. It is generally accepted that basal metabolism is not influenced by ultraviolet irradiation. When an increase in metabolic rate is observed on isolating the nude body it is due predominantly to the cooling effect of the moving air. If the air temperature is high with little or no air movement the chemical heat regulating mechanism is brought into action and the metabolic rate diminishes.

Ultraviolet irradiation exerts a glycogen storing effect, preventing the lowering of the respiratory quotient after muscular exercise which lowering is due to glycogen impoverishment.

Practically all attempts to show effects of light on normal growth processes of man and animals have been negative. Animals will grow as well in darkness as in light if the diet is complete.

Ultraviolet has no influence on the activity of the thyroid. The goiter producing power of cabbage is reported to be increased by ultraviolet irradiation.

The antirachitic effect of ultraviolet occurs in the lowermost cells of the horny layer and in the prickle cells of the malpighian layer while the production of erythema takes place in the basal cells (germinativum) of the malpighian layer and in the corium. The horny, clear and granular layers act as filters. Ergosterol and cholesterol can be activated by ultraviolet rays which pass

through the epidermal layer of the skin. Blood in the superficial capillaries absorbs only a small percentage of energy incident on the skin.

The "burn" produced by ultraviolet takes a few hours to appear and the longest wavelength that can produce it is about 3,150 angstroms. The curve representing relative effectiveness of different wavelengths rises to a maximum at 2,967 angstroms, descends to a minimum at 2,800 angstroms, then rises again to a small maximum near 2,500 to 2,450 angstroms and extends to an undetermined shorter wavelength. Blondes are from 40 to 170 per cent more sensitive than brunets, men 20 per cent more sensitive than women. Persons between 20 and 50 are more sensitive than those younger or older. There is an average maximum sensitivity in March-April and in October-November. A person with an unstable nervous system, an overactive thyroid gland, elevated blood pressure or active tuberculosis shows increased sensitivity. The sensitivity increases at the menses—a maximum being reached on the first day of the cycle—and then declines to normal. After the second month of pregnancy the sensitivity definitely increases until the seventh after which it diminishes somewhat, being still high at term. Increased sensitivity is correlated with thyroid hyperactivity and with an increased number of open capillaries in the skin. An acid diet increases sensitivity. Salts exert a protective action, an acid saline less than an alkaline.

Erythema shows the reactions of the 'triple response' and depends on the setting free of H substance. The acidity of the gastric juice increases simultaneously with its beginning.

Pigment formation and therapeutic benefit are independent, coordinate phenomena proceeding simultaneously in the same direction. Pigment formation is dependent on individual factors: race, coloring, constitution and body function. It can be used as an index in treatment. It is also a measure of adaptation, since pigment formation, horny layer thickening and chemical alterations of the skin cell proteins run parallel.

#### THE EYE

The cornea begins to absorb at 3,600 angstroms and transmits to between 2,950 and 3,000 angstroms, and the crystalline lens transmits to 3,060-4,190 angstroms, according to age. The vitreous transmits wavelengths as short as 2,300 angstroms, with a broad absorption band from 2,500 to 2,800 angstroms. The lens absorbs wavelengths as short as 2,950 angstroms with no ill effects, but shorter wavelengths produce a severe ophthalmia. Sunlight is ordinarily harmless, but when the ultraviolet component is increased by reflection, as from sand, water, ice or snow, it produces "snow blindness." Glowing arcs and metals which emit energy shorter than 2,950 angstroms are injurious and special ultraviolet absorbing glasses should be worn. The damage is usually limited to conjunctivitis and blepharitis with pricking pain and uncomfortable foreign body sensation. Edema and contraction of the lids and corneal erosion may occur. Long continued exposure to intense ultraviolet may produce functional disturbances, such as color scotomas and constriction of the peripheral field. Amblyopia and central scotoma have been noted in "snow blindness." Eclipse blindness is due to intense local action of infra red rays.

It is still a question as to whether intense ultraviolet produces lenticular cataract. Many incline to the view that glass workers' cataract is due to the intense infra-red rays which interfere with the nutritional functions of the ciliary body. It is probable that the higher incidence of cataracts in workers exposed to molten glass and metals is due to increased rate of precipitation of light denatured protein when the lens is heated above body temperature by exposure to large sources of radiant heat and when low concentrations of calcium, or other substances producing a similar effect, are present.

Claims have been made that some persons can see wavelengths as short as 3,130 angstroms. This is due to excitation of the retina by fluorescent (longer) wavelengths. The aphakic eye sees shorter wavelengths than the normal eye.

#### PHOTODYNAMIC OR OPTICAL SENSITIZATION PATHOLOGY

It is possible to sensitize living cells, like photographic plates, and thus produce abnormal conditions in which light or luminous rays and longer ultraviolet rays are as active as the shorter

ultraviolet. The effective wavelengths are those absorbed by the sensitizer. Sensitization occurs at 4,000-5,800, 3,650-3,150 and 2,500 angstroms. The sensitizers are exogenous taken in with the food and endogenous arising within the organism. Most sensitizing substances are fluorescent but fluorescence is not the cause. Ultraviolet effects can occur either in the presence or in the absence of oxygen, but the photodynamic effects occur only in its presence. Among photodynamic sensitizers are erythrosin, rose bengal, rhodamin, anthracene derivatives, acridine dyes, methylene blue, quinine, chlorophyll, hypericin and the porphyrins. Gold salts and chemicals of the sulfonamide group are also sensitizers.

Continued and prolonged exposure to sunlight or to the energy of artificial sources containing much ultraviolet may cause systemic disturbances as well as inflammatory and degenerative changes in the skin. The systemic disturbances are not understood but deaths of infants following short exposure have been reported and severe reactions in adults.

Photodynamic 'triple response' produced by intradermally injecting rose bengal and hematoporphyrin is similar in appearance to urticaria solara and is produced by the wavelengths absorbed by the particular sensitizer. The response is immediate. It is followed by pigmentation and does not occur in the absence of oxygen. The mechanism of the urticarial response includes a photochemical reaction not definitely affected by temperature and a thermal reaction greatly modified by changes in temperature. The latter is probably due to the action of the H-like substance on the small vessels of the skin. The photosensitizer is a carotenoid pigment.

The relation of ultraviolet to pellagra is difficult to evaluate. The clinical impression that sunlight is harmful to the pellagrins has been confirmed again by Smith and Ruskin according to whom the seasonal incidence of pellagra is conditioned by the degree of dietary deficiency and the intensity of the solar radiation. Exposure of a susceptible subject, who has been subsisting on a deficient diet, to the sun's rays precipitates the acute manifestations of pellagra. Pellagrous lesions however occur in the absence of sunlight and they may heal in the presence of exposure to direct sunlight or to ultraviolet radiation. Spies suggests that pellagra is a systemic condition which in itself is the real cause of pellagrous dermatitis and not exposure to the rays of the sun. Under conditions sunlight may act as an irritant and precipitate cutaneous lesions. But any kind of irritant may predispose an area to localization of the dermatitis, the absence of which however indicates little as to the cure of the disease. Porphyrinuria in pellagra has been described.

Repeated irritation by ultraviolet rays can cause chronic lesions, which may be precancerous such as keratosis senilis and xeroderma pigmentosum. It is an open question as to whether xeroderma pigmentosum and skin cancer are really associated with photodynamic action. Roffo believes that in the carcinogenic production of skin cancer by ultraviolet the photodynamic action of cholesterol plays the most important part. The photoactivity is due to the emanation of hydrogen peroxide or similar products. Korbler does not believe that the frequency of skin cancer is due solely to exposure to strong sunlight, although it may result in sensitization due to local increase in porphyrin.

The action of radiation is paradoxical in this regard. If the cells of the basal layer of the skin receive an excessive quantity of radiant energy the two protective processes of cornification and pigmentation become abnormally great (hyperkeratosis and hyperpigmentation) and a third degenerative process starts. People lacking in pigment or much exposed to ultraviolet rays show the highest percentage of skin cancer. The developing neoplasm occurs in the place of greatest proliferation, beginning in a wartlike hyperkeratosis, a precancerous change. A cancer develops from a precancerous lesion not only as a result of a continuation of the initial insult but as a result of any continued trauma. Thus ultraviolet rays do not cause cancer in themselves. They produce characteristic cell changes leading to precancerous lesions in the skin. Any irritation, including continuously and excessively applied ultraviolet rays, can cause the precancerous change to become malignant.

# THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY FEBRUARY 13, 1943

## TREATMENT OF CEREBROSPINAL FEVER

The current increase in the number of cases of meningococcic meningitis in various parts of the country, which was to be expected in view of the military and industrial mobilization has emphasized recent advances in the treatment of the disease. These improvements depend almost wholly on the use of the sulfonamide compounds. Until recently many clinicians experienced in this disease advised combined treatment with some form of antiserum and a sulfonamide compound at least for the more serious cases. However, the shift from intraspinal to intravenous serum therapy, advocated especially by Herrick and Hoyle had generally prevailed. Accumulation of data seems now to show that drug treatment alone will bring better results than combination with such an agent as foreign serum, which, even when given intravenously may initiate a considerable number of reactions.

In England, for example a statistically adequate number of patients treated with serum alone gave a fatality of 36.6 per cent as a whole. Of those under 1 year of age 67.2 per cent died of those from 1 to 4 years 38.6 per cent and of those from 5 to 14 years 22.7 per cent. With sulfonamide compounds plus serum, of those under 1 year 32.5 per cent died from 1 to 4 years 16.5 per cent from 5 to 14 years 8.4 per cent, from 15 to 24 years 4.3 per cent, from 24 to 44 years 14.1 per cent and 45 years and over 32.3 per cent, with a total fatality of 13.8 per cent. Treatment with sulfonamide compounds alone gave better rates in each age group: under 1 year 22.4 per cent, from 1 to 4 years 12.3 per cent from 5 to 14 years 5.5 per cent, from 15 to 24 years 2.5 per cent, from 25 to 44 years 6.6 per cent and 45 years and over 28.8 per cent, with a total fatality of 9.2 per cent. Aside from the rare and practically always fatal cases of Waterhouse-Friderichsen's syndrome with circulatory collapse, hem-

orrhage into the adrenals and hemorrhagic rash, the prompt diagnosis and early vigorous treatment, preferably with sulfadiazine, will save cases which had fatal prognosis with serum therapy, and in practically all cases recovery is much more prompt.

Other sulfonamide compounds may be used instead of sulfadiazine, including sulfathiazole, which was formerly held to be less effective because it was less uniformly excreted into the cerebrospinal fluid. Most important is the prompt securing of a high blood concentration of 15 mg per hundred cubic centimeters. Lumbar puncture is necessary practically only for initial diagnosis and an attempt should be made to find the organism by blood culture. The proper dosage of the sulfonamides is provided in detail in New and Nonofficial Remedies, 1942 pages 139 to 166.

## INTELLECTUAL WORKERS AND PHYSICAL EXERCISE

Few studies have been made to determine the amount and nature of physical exertion which is optimal for those in sedentary occupations involving primarily concentrated and prolonged activities of the higher mental centers. Observation leads to the conclusion that most persons engaged in intellectual occupations take too little physical exercise for maximum health. Most medical students, for example, are inclined to indulge little or not at all in physical exercise. Those engaged in intellectual endeavors report that strenuous exertion (usually when they are not used to it) results in an appreciable decrease in ability to make constructive intellectual efforts during the immediately subsequent hours or even days. Although such observations cannot be used as scientific evidence the problem of balancing physical conditioning with maximum intellectual output is particularly pressing today when the curricula of schools devoted to advanced education are being modified to include conditioning for military service.

The armed forces plan to induct all physically fit boys 18 years of age or older. By methods of selection which have not yet been announced in detail a number of these young men will be selected to attend colleges and universities. While attending these institutions they will be expected to engage in strenuous and prolonged intellectual endeavors. During this period they are to be paid and housed by the armed service involved and will be just as much in the military service as those in camp or at the front. They will be required, no doubt to take certain physical hardening courses and sports, probably provided for specifically by the respective service involved.

Good physical condition is favorable rather than detrimental to intellectual work. Nevertheless the primary purpose of placing these soldiers in colleges and universities rather than at the battle fronts is to give them the intellectual training which they can receive

1 Lindsay J W Rice E C Selinger M A and Robin Teroy. The Waterhouse Friderichsen Syndrome. Active Bilateral Suprarenal Hemorrhage. Am J M Sc 201 263 (Feb.) 1941. Kewer A T. The Waterhouse Friderichsen Syndrome. Ann Int Med 16 787 (April) 1942. Monfort J A and Meherling J H. The Waterhouse Friderichsen Syndrome. Am J Dis Child 62 144 (July) 1941.

only from the former source. The physical "conditioning," therefore, is the secondary rather than the primary consideration. The intensity and amount of exercise for the soldier-student should be subordinated to the intellectual training. In determining the amount of exercise required of soldiers in colleges and universities, cognizance must be taken of individual variability and of the hours and nature of mental concentration required. The program of physical training of student-soldiers must be carefully controlled with a view to determining the best combination. If the physical training interferes with the maximum utilization of the educational facilities, the major purpose of the announced program will have been hindered.

#### AMERICAN SOCIETY FOR RESEARCH IN PSYCHOSOMATIC PROBLEMS

In recent years the development of medicine has revealed increasing interest in the patient as a whole. Whereas recent discoveries in pharmacology, biochemistry and endocrinology may be more spectacular, they are likely to make us overlook the steadily growing need of integrating all this specialized knowledge in the light of the functions and structure of the total organism. Logically psychiatry became the focus for crystallization of these unifying tendencies. Dr. William Allen White pointed out that psychiatry deals with the total reactions of the organism. In somatic medicine the patient's stomach, liver or blood vessels are the doctor's concern, in psychiatry the patient's actions are investigated. Psychosomatic medicine attempts to bring together these two points of view. In the psychosomatic approach the investigators seek to find the relationship between what the stomach is doing and what the patient as a whole is doing. How do the patient's emotions, his effort, hopes, discouragements and anxieties influence the different parts of his body? Psychosomatic medicine, however, is not a new specialty, the gradual penetration of the psychiatric point of view into general medical thought will cause the medical specialties to take the lead in exploring the psychologic component in disease.

The journal *Psychosomatic Medicine* says

Emphasis is put on the thesis that there is no logical distinction between mind and body, mental and physical. It is assumed that the complex neurophysiology of mood, instinct and intellect differs from other physiology in degree of complexity but not in quality. Hence again divisions of medical disciplines into physiology, neurology, internal medicine, psychiatry and psychology may be convenient for academic administration but biologically and philosophically these divisions have no validity. It takes for granted that psychic and somatic phenomena take place in the same biological system and are probably two aspects of the same process that psychological phenomena should be studied in their psychological causality with intrinsically psychological methods and physiological phenomena in their physical causality with the methods of physics and chemistry.

The psychomatic interest in medicine is not novel. Such ancient expressions as melancholia (*melas* black,

*chole* bile) reflect concepts concerning the relation of mental symptoms to bodily functions. New in the present psychosomatic movement is the integration of advanced methods of physiologic and clinical investigation with modern methods of dynamic psychology. The two avenues of research—the somatic and the psychologic—meet now on the level of present day knowledge.

Understanding of the patient's mental condition in the past was primarily a question of intuition, usually called the art of medicine or, in its more superficial form, 'bedside manner'. Psychosomatic research strives to transmute this art into a science, basing conclusions on well established principles affecting the relationship of emotions and bodily functions.

During the past ten years various research centers have focused their investigative work on the study of psychosomatic conditions.<sup>1</sup> The impetus of the war has greatly increased this interest. Probably few physicians realize how many such centers are now active in this field. Among the older medical projects have been those at Presbyterian Hospital in New York, the Institute for Psychoanalysis in Chicago and the Massachusetts General Hospital in Boston. Dr. Somer Weiss, before his untimely death, had planned a series of investigations. The studies already completed have concerned cardiovascular diseases, injury from accident, gastrointestinal disorders, diabetes mellitus, asthma and hay fever, as well as biologic processes. Correlation between emotional factors and the ovarian cycle has been a project of special note. Studies by psychologists and physiologists on animals, following the lead created by investigation of the conditioned reflex, have contributed much, for example the work of H. S. Liddell and his group at Cornell University and of W. Horsley Gantt and Curt P. Richter at Johns Hopkins University.

On Dec. 18, 1942 an inaugural meeting of the American Society for Research in Psychosomatic Problems was held in New York in conjunction with the annual meeting of the Association for Research in Nervous and Mental Diseases. This meeting was organized by the board of editors of *Psychosomatic Medicine*. An incentive for the foundation of this new society was the growing interest of the armed forces in the study and treatment of psychosomatic conditions. Disturbances such as war neurosis and the more acute forms of 'pilot's fatigue' are primarily of psychosomatic nature and constitute one of the major problems of aviation medicine. The American Society for Research in Psychosomatic Problems attempts to provide a platform for the exchange of ideas and experiences in this vital and rapidly expanding approach to medicine.

<sup>1</sup> Dunbar Flanders, *Emotions and Bodily Changes*, Columbia University Press, 1938. Weiss, Edward and English, O. Spurgeon, *Psychosomatic Medicine*, Philadelphia, W. B. Saunders Company, 1943.

## VITAMIN D AND DIHYDROTACHYSTEROL

Among the products derived from ergosterol on irradiation are two compounds with closely similar structure, calciferol and tachysterol. The former, known as vitamin D<sub>2</sub> in the European literature, is known here, when dissolved in oil, as viosterol. About twelve years ago the suggestion was made that the toxic effects of overdosage with irradiated ergosterol were due to something other than vitamin D: an active calcifying factor was discovered which would not cure rickets. This substance was identified as a dihydrotachysterol, a derivative of tachysterol. This substance, known also as A. T. 10, has the property of increasing the level of serum calcium and also of causing a definite urinary excretion of phosphorus, properties which suggested its use in human parathyroid tetany, with highly favorable results.<sup>1</sup>

The early claims that dihydrotachysterol was ineffective in curing rickets were reinvestigated by Shohl and his co-workers<sup>2</sup> who concluded that it is effective in curing the low calcium type of experimental rickets, the high calcium type is not as susceptible to cure by dihydrotachysterol, though large doses show an effect. Nevertheless the Harvard investigators believe that dihydrotachysterol resembles vitamin D more than it does the hormone of parathyroid as regards the effects on serum calcium and phosphorus. The kind of experimental animal employed exerts a pronounced influence on the relative actions of dihydrotachysterol and vitamin D. Correll and Wise,<sup>3</sup> who used chicks in their studies, observed that, when compared on the basis of rat units, dihydrotachysterol was somewhat more potent for chicks than is cod liver oil and much more potent than the vitamin D from irradiated ergosterol. The calcium-phosphorus metabolism of the chick is more responsive to dihydrotachysterol than to vitamin D from the usual sources.

A still further differentiation between dihydrotachysterol and vitamin D has been reported by the Harrisons.<sup>4</sup> Through the experimental device of comparing creatinine clearance with phosphate clearance, the magnitude of reabsorption of phosphate in the renal tubules has been estimated. In normal animals this maximum rate under controlled conditions is increased by the administration of vitamin D thus serving to support the level of phosphate in the blood. After dihydrotachysterol is given, the maximum phosphate absorption rate remains unchanged. On the basis of these studies it is concluded that vitamin D is essential

for certain cellular functions in the body and cannot be replaced by dihydrotachysterol. Indeed, the point is made that the characteristic action of dihydrotachysterol depends on the presence of vitamin D.

Thus it has been possible, with further research, to indicate functional differences between these compounds, which grossly show considerable similarity. Furthermore, investigations of the comparative activity of the two substances, already of proved worth in therapeutics have emphasized again the high specificity of biologic function conditioned by slight changes in the structure of chemical agents.

## Current Comment

## RESERVE PROTEIN IN THE LIVER

In his classic paper on glycogen in 1903 Pfluger<sup>1</sup> suggested that the liver might serve as a storehouse for protein as well as for carbohydrate. Experimental evidence has accumulated which indicates that the contention of Pfluger was correct. In 1906 Scitz<sup>2</sup> showed that the feeding of protein to fasted experimental animals resulted in an increase in liver protein which in a degree was comparable to the augmentation of liver glycogen that follows the administration of carbohydrate to fasted animals. In more modern work Addis and his co-workers<sup>3</sup> have studied the protein content of the tissue of animals fed different amounts of protein daily for a number of days. As the amount of protein ingested by the animals was increased the proportion allocated to the liver, blood, serum and kidney increased, while there was a slight fall in the proportion allotted to the carcass. The protein enrichment of the liver which follows the administration of high protein diets is associated not only with hyperplasia or hypertrophy but also with an increased content of protein per unit weight of tissue.<sup>4</sup> Moreover, the relative loss of protein during abstention from food is greatest for the liver. During a seven day fast the livers of rats lose 40 per cent of their protein as compared to a loss of 20 per cent for the kidneys, 8 per cent for muscle, skin and skeleton and 0 per cent for the eyes, testicles and adrenals. Deposit protein in the liver is apparently not made of any particular protein fraction. The studies of Luck<sup>4</sup> show that all the liver proteins, including albumin, globulin and pseudoglobulin, participate equally in the function of storage. It has been claimed, however, that storage protein can be differentiated microscopically from structural protein, the former having a droplet structure in the liver cells.<sup>5</sup> The importance of the protein stores of the body is becoming increasingly appreciated. The reserve protein helps to

1 Albright, Fuller, Bloomberg, Esther, Drake, Truman and Sulko witz, H. W. J. Clin. Investigation **17**, 317 (May) 1938. MacBride, C. A. The Treatment of Parathyroid Tetany with Dihydrotachysterol. J. A. M. A. **111**, 304 (July 23) 1938. Rose, Edward and Sunderman, F. W. Effect of Dihydrotachysterol in Treatment of Parathyroid Deficiency. Arch. Int. Med. **64**, 217 (Aug.) 1939.

2 Shohl, A. T., Fan, C. H. and Farber, Sidney. Proc. Soc. Exper. Biol. & Med. **42**, 529 (Nov.) 1939. Shohl, A. T. and Farber, Sidney. J. Nutrition **21**, 147 (Feb.) 1941.

3 Correll, J. T. and Wise, E. C. J. Nutrition **23**, 217 (March) 1942.

4 Harrison, H. E. and Harrison, Helen C. Am. J. Physiol. **137**, 171 (Aug.) 1942.

1 Pfluger, F. Glykogen. Arch. f. d. ges. Physiol. **96**, 1, 1930.  
2 Scitz, L. Die Leber als Vorratshammer für Eiweissstoffe. Arch. f. d. ges. Physiol. **111**, 309, 1906.

3 Addis, Thomas, Lee, D. D., Jew, W. and Poo, I. J. The Protein Content of the Organs and Tissue at Different Levels of Protein Consumption. J. Nutrition **19**, 199 (Feb.) 1940.

4 Luck, J. M. Proteins. I. The Question of Protein Storage. J. Biol. Chem. **115**, 491 (Sept.) 1936.

5 Addis, Thomas, Poo, I. J. and Jew, W. The Quantities of Protein Lost by the Various Organ and Tissue of the Body During a Fast. J. Biol. Chem. **115**, 111 (Aug.) 1937.

6 Berg, W. Ueber den mikroskopischen Nachweis der Eiweisspeicherung in der Leber. Biochem. Ztschr. **61**, 429, 1914.



protect the liver against injury by toxic agents. Thus, twenty minutes of chloroform anesthesia are usually fatal to protein depleted dogs, while well fed animals tolerate one hour of anesthesia with little injury to the liver.<sup>7</sup> The experimental hepatic cirrhosis which is produced in rats fed a low protein diet and given dilute alcohol to drink for a protracted period may be prevented if the amount of protein in the diet of the animals is increased.<sup>8</sup> These examples are typical of a large number of comparable observations. Reserve stores of protein are important. The role played by the liver in this connection adds one more function to the long list of functions known to be performed by this organ. The observed relationship between an inadequate amount of dietary protein, the consequent low protein reserve and enhanced susceptibility to hepatic injury by a variety of toxic agents is noteworthy.

### B VITAMINS IN CANCEROUS TISSUES

The occurrence of the vitamins of the vitamin B complex in all forms of living matter constitutes a strong presumptive evidence of their essential nature for the fundamental vital processes. It has been demonstrated that riboflavin plays a part in cellular oxidation. Warburg showed that the oxidation processes in cancerous tissues differed significantly from those in noncancerous tissues. Investigators at the University of Texas Biochemical Institute determined the distribution of the enzymes concerned with cellular oxidations in different types of cancer in an attempt to evaluate the significance of the results in terms of the transformation to the cancerous condition. Pollack and his associates<sup>1</sup> made riboflavin assays on a variety of human and animal tumors and on noncancerous tissues. Most of the cancers were found to contain about 2 to 3 micrograms of riboflavin per gram of moist tissue, the lowest value being 1.1 and the highest 7.4. The riboflavin content of cancers appears to be of about the same order of magnitude as those of brain, lung, spleen and muscle, and much below those of liver, heart and kidney. Noncancerous tissues require nicotinic acid for their essential functions, but little is known about the requirements of cancerous tissue. Taylor and his co-workers<sup>2</sup> found that in noncancerous tissue the nicotinic acid content amounted to 18 to 178 micrograms per gram of fresh tissue, while the range for the cancerous tissue was from 13 to 59 micrograms per gram, with most of the values between 18 and 29 micrograms per gram. They therefore conclude that the transformation to the cancerous state involves a decrease in nicotinic acid content. Whether this signifies low

utilization of this vitamin or low storage capacity and efficient utilization is not clear. The comparative constancy of the vitamin level in tumors may be an indication of the essential nature of the vitamin for cancer metabolism. Biotin has considerable interest as a possible essential catalyst for cancerous processes. Pollack and his co-workers<sup>3</sup> found that the biotin content of cancerous tissue was never as high as that of kidney or liver and mostly was lower than that of heart. The biotin level of cancerous tissue appeared to be approximately of the same order as that of brain, lung, spleen and muscle. In the case of hepatoma induced by p-dimethylaminoazobenzene the cancer contained much less biotin than the control tissue. None of the cancers studied can therefore be classified as a biotin rich tissue. Cancers apparently neither particularly require nor are associated with a high biotin content. Investigations by Taylor and his co-workers<sup>4</sup> into the role of pantothenic acid demonstrated that a large drop in vitamin content occurs in the transformation of rat liver to hepatoma by feeding p-dimethylaminoazobenzene. Almost all the human and rat cancers contained about the same amount of pantothenic acid as did noncancerous spleen, lung and skeletal muscle, which are decidedly poorer in this factor than liver, heart, kidney and brain. The results indicate that cancerous tissues probably do not have any greater need for pantothenic acid than do noncancerous tissues.

### FLUCTUATIONS IN HYPERTENSION

Extreme fluctuations of the blood pressure may occur without drug intervention. C. V. Allen<sup>5</sup> who has studied for years the effect of drugs on blood pressure, expresses skepticism about the enthusiastic reports on certain preparations. Factors which produce enthusiasm include "(1) failure of recognition by those who report favorably that the blood pressure of most hypertensive subjects varies greatly and (2) failure of recognition by those who report favorably of the nonspecific effect of any kind of treatment. A third factor may be a difference in the genesis of the hypertension of different groups studied. Fluctuation of blood pressure in hypertension if presented in terms of interpretation that result in reporting the highest figure observed before treatment and the lowest figure after treatment, will give credit to any medicament even a placebo of distilled water. Because anxiety will increase blood pressure the reassurance of repeated conferences with a physician may result in a reduction of pressure that cannot be ascribed to a specific remedy. In presenting criteria for the evaluation of any form of therapy, the author differentiates between hypotensive effects and relief of symptoms, many methods relieve the latter. If these criteria were followed, the author asserts, 'those who treat hypertension would be freed of the state of constant confusion which now exists.'

<sup>1</sup> Pollack M. A., Taylor Alfred Wood, Alethea Thompson R. C. and Williams R. J. B. Vitamins in Cancerous Tissues. III. Biotin. *Cancer Research* 2: 748 (Nov.) 1942.

<sup>2</sup> Taylor Alfred, Pollack M. A., Hofer M. J. and Williams R. J. B. Vitamins in Cancerous Tissues. IV. Pantothenic Acid. *Cancer Research* 2: 72 (Nov.) 1942.

<sup>3</sup> Allen C. V. *Vascular Clinics* XVI. Why Are So Many Preparations Said to Reduce Blood Pressure in Cases of Hypertension? *Proc. Staff Meet. Mayo Clin.* 17: 521 (Oct. 7) 1942.

<sup>7</sup> Miller L. L. and Whipple G. H. Chloroform Injury Increases as Protein Stores Decrease. *Am. J. M. Sc.* 199: 204 (Feb.) 1940.  
<sup>8</sup> Moise T. S. and Smith A. H. Regeneration of Liver Tissue on Various Adequate Diets. *J. Exper. Med.* 40: 13 (July) 1924.

<sup>8</sup> Lillie R. D., Daft F. S. and Sebrell W. H. Jr. Cirrhosis of the Liver in Rats on a Deficient Diet and the Effect of Alcohol. *Pub. Health Rep.* 56: 1255 (June 13) 1941.  
Daft F. S., Sebrell W. H. and Lillie R. D. Production and Apparent Prevention of a Dietary Cirrhosis in Rats. *Proc. Soc. Exper. Biol. & Med.* 48: 228 (Oct.) 1941.  
Dietary Hepatic Cirrhosis, editorial. *J. A. M. A.* 120: 625 (Oct. 24) 1942.

<sup>1</sup> Pollack M. A., Taylor Alfred, Taylor Jean and Williams R. J. B. Vitamins in Cancerous Tissues. I. Riboflavin. *Cancer Research* 2: 739 (Nov.) 1942.

<sup>2</sup> Taylor Alfred, Pollack M. A., Hofer M. J. and Williams R. J. B. Vitamins in Cancerous Tissues. II. Nicotinic Acid. *Cancer Research* 2: 744 (Nov.) 1942.

# MEDICINE AND THE WAR

*In this section of The Journal each week will appear official notices by the Committee on War Participation of the American Medical Association, announcements by the Surgeon Generals of the Army, Navy and Public Health Service, and other governmental agencies dealing with medicine and the war and such other information and announcements as will be useful to the medical profession*

## TUBERCULOSIS CONTROL PROGRAM OF THE U S PUBLIC HEALTH SERVICE

SURGEON GENERAL THOMAS PARRAN

U S Public Health Service

Recognizing the special threat of tuberculosis during wartime, the United States Public Health Service established an Office of Tuberculosis Control shortly after war was declared. Although there has been no apparent increase in the amount of tuberculosis in this country the objective circumstances favoring such an increase are much in evidence. Particularly is this true in the many congested war areas.

In addition to maintaining general standards of health and medical care, there are certain specific measures which can be undertaken to prevent a wartime rise in tuberculosis incidence and fatality. These are defined in the objectives of the Office of Tuberculosis Control:

- 1 Chest x-ray examination of workers in war industries, with follow-up of newly discovered cases by state and local health departments

- 2 Extension of this service to families of war workers found to be tuberculous

- 3 Extension of the case finding program of the armed forces to include all recruits of the Coast Guard

- 4 Development of a workable system by which cases of tuberculosis discovered in rejected recruits will be reported promptly to state and city health departments in order that immediate clinical examination, treatment and other care may be provided within the limits of available local resources

- 5 Encouragement and assistance in the establishment of chest x-ray examination procedures in the admitting rooms of general hospitals and state hospitals for the mentally ill

- 6 At the request of state and municipal health departments, rapid inventory of existing control programs, and assistance in the reorganization of such programs in accordance with wartime needs

At the present time the Public Health Service has eight 35 mm photofluorographic units in operation in war industries. In assigning the units, special attention is given to the needs of shipyards, ordnance plants, air depots and other essential establishments where no facilities for chest x-ray examinations are available. The small film units are lent to state health departments for a limited time, primarily to demonstrate the need for such services to get local programs started and to train local personnel. Industrial concerns are encouraged to procure their own equipment and personnel for carrying on the work permanently.

Each unit consists of a medical officer, a technician, a clerk and complete equipment for exposing and proc-

essing from three hundred to five hundred small films per eight hour day. The equipment can be used continuously, three shifts a day, when sufficient personnel is available.

The Public Health Service also has two 4 by 5 inch units available for special projects.

In cooperation with the District of Columbia Health Department one of the small film units is being used in Washington, D C, to make chest x-ray films of government employees. In the first survey of 5,404 employees in one agency, 66 cases of reinfection tuberculosis were discovered by x-ray examination, including 42 minimal, 22 moderately advanced and 2 far advanced cases. Positive cases are reported immediately to the family physician and local health department for clinical study, determination of activity and disposition. It is hoped that during the coming year additional units will be provided to enable the Public Health Service to examine large numbers of government employees.

Orders have just been placed for ten additional small film units, and necessary personnel is being recruited. With twenty units in full operation during 1943, it is hoped that two million chest x-ray examinations will be made by the Public Health Service in cooperation with state health departments.

A consultation staff of part time and full time specialists in the fields of tuberculosis and roentgenology is being developed for service to state and municipal health departments during 1943. The full time consultants, who will be commissioned officers, will make careful inventories of each state program and assist in developing plans to provide care for cases of tuberculosis newly discovered as a result of surveys in industries, war industry communities and routine chest x-ray screening of recruits by the armed forces. Immediate plans include the employment of a specialist in medical records who will analyze control activities on the federal, state and local levels and assist the states in developing adequate systems of follow-up records, which are essential for successful tuberculosis control.

The Office of Tuberculosis Control collaborates closely with the National Institute of Health in its research activities. Some of the material collected as a part of the service program will be used for research into administrative practices. Such close correlation of research and service should shorten the lag between research and the application of its results.

This office works in close cooperation with the Division of Industrial Hygiene of the National Institute of Health, and the National Tuberculosis Association.

Details of the program have been presented at the formal meetings of the national organizations of experts in the fields of tuberculosis and roentgenology.

The support and cooperation of these specialists have been earnestly solicited in order to achieve economy in the use of medical manpower and to avoid duplication of effort.

The increase in tuberculosis mortality in Great Britain is being carefully observed. A significant development was the announcement by the minister of health on Oct 8, 1942 that he has authorized local health authorities to grant financial assistance to families while the bread winner is undergoing sanatorium treatment. This development will bear close watching, because sooner or later we must face the same social and economic problems in this country.

Consultation service to the states in inventory and reorganization of tuberculosis programs is already paying dividends in intensification of case finding among industrial workers and better utilization of limited facilities for inpatient and outpatient care and supervision.

Our principal task now is to extend tuberculosis control activities so as to cover the greatest number of people in the shortest possible time with all available governmental and voluntary resources and personnel.

In addition to preventing an expected rise in tuberculosis mortality during wartime a foundation can be laid for a postwar program which will have for its ultimate objective the eradication of tuberculosis in the United States.

## REPORT FROM RUSSIA

[NOTE—From Russia by cable comes this report of the Twenty-Fifth Anniversary Session of the All Union Institute of Experimental Medicine—En]

The Soviet Scientists Antitascist Committee transmits a communication from Prof Nikolai Grashchenko corresponding member of the Academy of Sciences of the Union of Soviet Socialist Republics, reporting on the scientific session of the All Union Institute of Experimental Medicine (VIEM) held in Moscow on the occasion of the twenty fifth anniversary of the great October Revolution. In this session the achievements of the institute in the course of the twenty-five years of Soviet power were summarized in twenty-seven papers. Some of the papers dealt with the problems of army medical service and requirements for protection of health in wartime.

A paper by Professor Vishnevsky and his colleagues demonstrated that certain theoretical concepts when developed clinically are effective in the treatment of thoracic femoral and joint wounds. These were wounds of grave nature requiring long treatment, frequently resulting in permanent crippling and having a high mortality. Correct surgical methods, local anesthesia and use of bandages soaked in Peruvian balsam have given good results in the treatment of serious lesions and in restoring the functions of the organs or the limbs involved. A clinic under the supervision of Vishnevsky gives surgical and medical treatment for serious cerebral and spinal wounds and injuries of the peripheral nerves. This clinic was the first to cooperate with field hospitals in testing the effectiveness of sulfonamide compounds in the treatment of cerebral injuries. We developed a number of original methods in the employment of these drugs such as the 20 per cent emulsion made up of two or three of the sulfonamides, the streptocide, the sulfadine and the sulfathiazole. This clinic was first to carry out surgical and medical treatment of grave injuries to the spinal column and the spinal cord without encountering such complications as cystitis or bed sores.

The clinic of Professor Chetverikov did pioneer work in investigating pathogenic micro organisms in cerebral injuries, particularly of the role of anaerobic infection and methods of combating it. Professor Sakharov developed a method of restoring function, particularly speech function accompanying cerebral trauma. Prof A Luria in charge of a branch clinic in the Urals devised a method of surgical treatment of trauma to the peripheral nerves. Some conclusions based on more than 700 cases and more than 400 operations were made both for and against surgical methods of treatment. Dr Izratov of the same branch developed methods of restorative therapy for lesions of the peripheral nerves. Rational therapeutic methods making allowance for residual functions of the upper extremities secure restoration of motor function many times more rapidly than by physical therapy and curative gymnastics alone. Prof M Borovsky demonstrated on experimental material the significance of peripheral section of a nerve in genesis

of dystrophic processes. Formation of ulcers in limbs and other trophic disorders are largely associated with a peculiar condition of peripheral section following injury to the nerve. Progression of a dystrophic process can be prevented by injection of 70 per cent alcohol into the distal section of the injured nerve. These data were confirmed by Professor Golub working in a military hospital in the rear. Professor Anokhin discussed results of his theoretical and clinical investigations of formol treated nerve used as a transplant to bridge large defects of injured peripheral nerves. He also reported on advances made in the treatment of neuralgia.

Prof A Braunstein explained the mechanism of action of thiamine on pain. He studied also thiamine hypovitaminosis processes associated with lesions of the central and peripheral nervous system. These data demonstrate the exceptional therapeutic value of thiamine in the treatment of lesions of the cerebrum, the spinal cord and the peripheral nerves. Prof M Shemiakin discussed the mechanism of biological action of vitamin K, which proved to be a powerful agent in increasing the prothrombin content of the blood and decreasing hemorrhages. Professor Smorodintsev reported on methods of early diagnosis of typhus as developed in his laboratory and based on concepts advanced before the war by Prof A I Joffe of the Leningrad branch of the VIEM. He discussed also the specific prophylaxis of typhus. Prof S Smorodintsev carried out an experimental and epidemiologic comparative study on three kinds of vaccines: original and modified vaccine. During sparrows vaccine successfully developed and introduced into practice by Professor Kravtsovsky and the Cox vaccine. Of exceptional interest were two papers by Professor Petrishcheva on new insecticides in collaboration with an experimental chemotherapeutic prophylaxis of rickettsias. Petrishcheva made use of the immense vegetable resources of western Siberia and waste products of the coal industry to produce very powerful insecticides in the form of emulsions, solutions and powders against lice, bugs and other parasites which spread contagious diseases. In the second study Petrishcheva used lice as experimental object. She infected lice with rickettsias after having saturated them with sulfonamides. Chemotherapeutic effects were then studied.

Bacteriostatic and bactericidal substances were tested on a large scale as anti-septics in infectious diseases and in wound infections. Results of the studies were reported by Professor Ermoleeva. Dr Chumrakov proposed a rapid method of neuro virus encephalitis diagnosis. To prove the virus nature of encephalitis neutralization reaction was previously used. This required however a great number of white mice, shortage of which is now felt and considerable time—one to three weeks. Dr Chumrakov makes use of complement fixation as developed for diagnosis of some children's infections by Professor Joffe and for typhus by Professor Smorodintsev. This reaction proved extremely effective for rapid diagnosis and is accessible to city bacteriologic laboratories.

## ARMY

MEDICAL OFFICERS AND ENLISTED MAN  
DECORATED FOR GALLANTRY

The War Department has announced the award of the Silver Star for gallantry in action at Semem, New Guinea, on Dec 7, 1942 to seven officers of the Medical Corps and one enlisted man of the Medical Department. The officers were decorated for caring for the sick and wounded and for working "courageously and fearlessly, entirely oblivious of his personal safety, while continually being bombed and strafed by enemy planes." The enlisted man was decorated for similar heroism and for special care which saved the life of an officer.

One of the officers honored was Major Lemuel E Day, who died on Dec 22, 1942. The Silver Star will be presented to his widow, Mrs. Lucille Day, who lives at 6142 North Kirkwood Avenue, Chicago.

The other officers cited are Major Parker C Hardin, whose wife, Mrs. Catherine S Hardin, lives at 701 Sixth Street, Charleston, Ill., Major Herbert B Shields Jr. whose father, Mr. Herbert B Shields, lives at 1702 West Cherokee Street, Enid, Okla., Capt Lloyd W Taylor, whose wife Mrs. Dorris Taylor, lives at 631 O'Farrell Street, San Francisco, Capt William F Edwards, whose wife, Mrs. Lucy Edwards, lives at 615 Beharrell Avenue, New Albany, Ind., First Lieut Julius I Gutow, whose father, Mr. Herman Gutow, lives at 5634 Maybury Grand, Detroit, and First Lieut Nathan Brooks, whose wife, Mrs. Mary Brooks, lives at 19323 Sorrento Avenue, Detroit.

The enlisted man honored is Sergt Frederick Kosak, whose mother, Mrs. Thekla Kosak, lives at 104-46 119th Street, Richmond Hill, Queens, New York City. After detailing his courageous care of the wounded, Sergeant Kosak's citation reads: "Especially noteworthy was his care of Major Daniel K. Edwards previously wounded in action, whom he covered with mattresses and whose life undoubtedly was saved thereby. It is the hospital tent in which he lay was riddled with projectiles, many being killed and wounded."

## HOSPITAL TRAINS

The Surgeon General of the Army in 1939 directed the planning division of his office to submit recommendations for suitable plans for modern hospital trains. According to Lieut Col Thomas N Page, U S Army Medical Corps, in the February issue of *Modern Hospital*, the train that was designed comprised fifteen cars, including a ward car with thirty berths for patients, two ward cars with berths for 32 bed patients each, a standard dining car to feed 300 patients, a standard pullman to quarter the train detachment, standard pullman cars to provide berths and seats for 225 walking sick and wounded patients, a baggage car for supplies and office space for the surgeon. Six of these trains have been procured and are now in service, giving excellent results. The unit car has space for a kitchen, dressings room, dispensary, cook's quarters and officers' quarters. These trains are for use only in the zone of the interior and not in the communications zone. Trains for the communications zones must be made up in their entirety and be able to run on the various railroads encountered.

COUNTY SOCIETY HONORS ITS  
MILITARY MEMBERS

The Mecklenburg County Medical Society at Charlotte, N C., honored its thirty members who are in the military forces of the country, January 5, by dedicating a plaque which bears their names. Dr Parks M King, who served as a captain in the medical department of the first world war, dedicated the plaque. Dr King also served as a hospital steward in the Spanish-American War. Following the dedication Capt Samuel Hartman read a paper on jaundice and yellow fever vaccination, and Capt Ed F Hardman and Lieuts F L Blair and Thomas A Brady read a paper on orthopedic problems at the Station Hospital, Morris Field.

ARMY-NAVY E AWARD TO  
DAVIS AND GECK

Brig Gen Fred W Rankin, chief consultant in surgery, Surgeon General's Office, U S Army, Washington, D C., and President of the American Medical Association, on January 6 presented the Army-Navy E award to the management and several hundred employees of Davis and Geck, Inc., Brooklyn, manufacturers of sterile surgical sutures, in which work this company has specialized for more than a third of a century. The E award flag and lapel emblems to be worn by every employee of this company were accepted by Mr B F Hirsch, general manager, on behalf of the management, and by Miss Ethel Bagley, on behalf of the employees, most of whom are women. Other speakers during the ceremonies were Comdr P T Crosby of the U S Navy Medical Corps, Hon John Cashmore, president of the borough of Brooklyn, and D L Tilly, president of the Chamber of Commerce of Brooklyn.

PROFESSOR HERMS CALLED TO  
ACTIVE DUTY

Prof William B Herms head of the division of entomology and parasitology at the University of California has been called to active duty and assigned to teach tropical medicine at the Army Medical Field Service School, Carlisle Barracks, Pennsylvania. Professor Herms has been a reserve officer for many years and now holds a commission as a lieutenant colonel in the Sanitary Corps.

## THE DARNALL GENERAL HOSPITAL

The Darnall General Hospital situated on Herrington Lake between Boyle and Mercer counties in Kentucky, was leased from the state government by the War Department in July 1941 for the care and treatment of the mentally ill in the military service. Construction work on the new building began on July 29, 1941 and was finished on Jan 27, 1942.

The present bed capacity is 272 and a 520 bed expansion is already under construction which should be finished by the end of the month. The main building is a six story reinforced concrete and brick structure designated for the care of 250 mental cases. The expansion consists of six permanent brick structures that will care for 480 additional mental cases, and one 40 bed ward for duty personnel.

The hospital has been named in honor of the late Carl R. Darnall, brigadier general, a distinguished officer of the Medical Corps. The administrative and professional staff consists of the following officers:

Col Clyde C Odum commanding officer  
Lieut Col John D Lamon Jr executive officer and chief of the surgical service  
Lieut Col Theodore C C Long chief of the neuropsychiatric service  
Major James P Sullivan chief of the medical service  
Major Joseph K Norris administrative and personnel officer and chief of staff  
Major Charles E Nixon assistant chief of neuropsychiatric service  
Major William R Calt post engineer  
Capt O B McVee registrar and receiving and evacuation officer  
Capt Maurice Lev chief of laboratory service  
Capt Ira P Burdum assistant surgical service  
Capt Marvin A Cox chief of dental service  
Capt Ned Feldman post exchange officer  
Capt Robert P Kemble ward officer  
Capt Robert D Ralph chief of eye ear nose and throat section  
Capt Dayton D Salton ward officer  
Capt William L Sharp ward officer  
Capt George J Sutherland ward officer  
Capt Wylie F Steen chaplain  
Capt Rondell H Tanner assistant medical service and hospital inspector  
Capt Edward S Truber ward officer  
Capt William C Traylor medical supply officer  
1st Lieut Lester L Burnick ward officer  
1st Lieut Michael B Dunn psychology consultant  
1st Lieut Harry I Loresy quartermaster officer  
1st Lieut Joe L Lue CO Det medical department  
1st Lieut Charles L Meistrolf assistant dental service  
1st Lieut J Lloyd Morrow ward officer  
1st Lieut Victor H Rosen ward officer  
1st Lieut Herman M Serot ward officer  
1st Lieut E M C Stamm finance officer  
2d Lieut Raymond W Beagles CO Det of patients  
2d Lieut Glenn J Bock Jr director of dietetics  
Mr Arthur L Wilson chief warrant officer

## AVIATION MEDICAL EXAMINERS

The fifth class in aviation medicine for Aviation Medical Examiners to be graduated under the system of training whereby the didactic portion of the course is conducted at the School of Aviation Medicine in Texas and the practical portion at three army air forces classification centers was graduated on Dec 17 1942. Graduation exercises were held at each of the three centers. The list of graduates follows:

**ALABAMA**  
Cecil Howell Blackburn 1st Lieut Birmingham  
Lamb Bolton Myhr 1st Lieut Birmingham  
John Carey Patterson 1st Lieut Tuscaloosa  
Lance Charles Price 1st Lieut Florence

**ARIZONA**  
Sterling P Hoffmann Jr 1st Lieut Tucson

**ARKANSAS**  
Jim McKenzie 1st Lieut Hope  
James Otto Pierce, 1st Lieut Marked Tree  
Hugh Walter Savage 1st Lieut Little Rock

**CALIFORNIA**  
Nicholas Edward Builey 1st Lieut Manhattan Beach  
Lewis Claude Blackburn 1st Lieut Santa Barbara  
Leland Bowman Blanchard 1st Lieut San Jose  
William Guerin Bradley 1st Lieut Los Angeles  
Arthur Horace Buell 1st Lieut Long Beach  
Vincent Michael Downey 1st Lieut Oakland  
James Timmons Dresser 1st Lieut Bakersfield  
James Edward Feldmeyer 1st Lieut Clovis  
Leyon K Garrison 1st Lieut Piedmont  
Chester Randolph Goddard 1st Lieut Orange  
Victor Adam Herrmann 1st Lieut Los Angeles  
Cecil Wayne Hoff 1st Lieut San Bernardino  
Harve William Jourdan Jr 1st Lieut Los Angeles  
Robert Francis Kelly 1st Lieut Los Angeles  
Michael Michaels Mihita 1st Lieut Oakland  
Marco Robert Rago 1st Lieut Los Angeles

**COLORADO**  
Robert Rehm 1st Lieut Colorado Springs

**CONNECTICUT**  
Donald A Davis 1st Lieut Danbury  
William Ernst Furniss 1st Lieut West Hartford  
William Peter Goergen, 1st Lieut Danbury  
Charles William Neuhardt 1st Lieut New Hartford  
Coles Walker Raymond 1st Lieut Litchfield  
William Moses Schubert 1st Lieut New Britain

**DELAWARE**  
James Richard Durham Jr 1st Lieut Wilmington

**DISTRICT OF COLUMBIA**  
Theodore C Bedwell Jr Major Washington  
Joseph Aloysius Dugan 1st Lieut Washington  
John Harry King Jr Major, Washington  
Henry Joseph Wegrocki 1st Lieut Washington  
Claude Benjamin White Major Washington

**FLORIDA**  
Daniel H Funkenstein 1st Lieut Jacksonville  
Elvin Gilmore Neal 1st Lieut Jacksonville  
James Robert Nieder 1st Lieut Delray Beach  
Donald George Stannus 1st Lieut Miami Beach  
Norman H Steiner 1st Lieut Tampa  
Dile Sloan Wil on Captain Miami

**GEORGIA**  
William Kendall Jordan Captain Macon  
William Colbert Phillips 1st Lieut Richland

**IDAHO**  
Wilford William Beck Jr 1st Lieut Blackfoot

**ILLINOIS**  
Charles E Ahlm Captain Chicago  
Edwin Francis Baker 1st Lieut Ashton  
Bernard Everette Cohler 1st Lieut Chicago  
William Cooley Jr Captain Peoria  
Chester Cochran Doherty Major Chicago  
Robert Chatterton Fringer Captain Rockford  
Jack Tilden Haskins, 1st Lieut Glencoe  
Clarence Vernard Hodges 1st Lieut, Chicago  
Francis John Hultgen 1st Lieut Chicago  
David Elmer James 1st Lieut Belvidere  
George Peter Kaplan 1st Lieut Chicago  
George Jerome Kivdera 1st Lieut Chicago  
Harold Thomas Lawler 1st Lieut Peoria  
Howard James McNally 1st Lieut Chicago  
Charles Louis Noggle 1st Lieut Chicago  
Donald Herbert Root Captain Quincy  
John Bernard Roth 1st Lieut Morris  
Alfred George Schultz 1st Lieut Jacksonville  
Tommy Richard Young Captain Mount Carmel

**INDIANA**  
Ralph Emory Barnett 1st Lieut Peru  
John Edward Fisher 1st Lieut Clarksburg  
Lloyd Markham Headley 1st Lieut Lebanon  
Emory Brisco Lett 1st Lieut Loogootee  
Joseph Douglas McDonald 1st Lieut Evansville  
Jack McKittrick 1st Lieut Washington  
Robert Wright Owsley Captain Hartford City  
James Gaylord Shanklin 1st Lieut Hammond  
William Clayton Stafford 1st Lieut Plainfield  
Daniel Cody Tweedall 1st Lieut Evansville  
William John Warn 1st Lieut Milan  
H Haskell Ziperman, 1st Lieut Indianapolis

**IOWA**  
Vail Burdette Adams Captain West Burlington  
Clemment Willroth Byrnes Captain Dunlap  
Kenneth Marshall Lemon 1st Lieut Council Bluffs  
Robert Lee Sells Jr 1st Lieut Iowa City  
David Forrest Shaw Captain Britt  
Orville Donald Thatcher 1st Lieut Fort Dodge  
Paul Edward Tramp 1st Lieut Audubon

**KANSAS**  
John Aldi 1st Lieut Emporia  
Guy William Cramer 1st Lieut Parsons  
Archie Fea Dougan 1st Lieut Kiowa  
Cecil Edward Petterson Captain Topeka  
Francis Adams Thorpe 1st Lieut Pratt

**KENTUCKY**  
Frank Krenning Bo e 1st Lieut Atchison  
Max Costlin Captain Louisville  
Morton Atherton Cundiff 1st Lieut Somerset  
Leo Esbin 1st Lieut Evans  
Samuel Glenn Marcum 1st Lieut Irvine  
Charles Barbour Wathen 1st Lieut Morganfield  
Richard Hunt Weddle 1st Lieut Somerset

**LOUISIANA**  
Sam Fliss Hartman 1st Lieut New Orleans  
Ford I MacPherson 1st Lieut Baton Rouge  
Orin Vincent Prejean 1st Lieut New Orleans  
Herman Rubinstein 1st Lieut New Orleans  
Eugene Sullivan Rogers 1st Lieut New Orleans  
James Wallace Schonlau 1st Lieut Winnfield  
Max Suter 1st Lieut New Orleans  
James William Vaudry Captain (N G) Thibodaux  
William Benjamin Wiener 1st Lieut New Orleans  
Everett John Witt 1st Lieut New Orleans

**MAINE**  
Kenneth Alexander Laughlin 1st Lieut Portland

**MARYLAND**  
Arnold Lewis Field 1st Lieut Baltimore  
Milton Gusack 1st Lieut Chevy Chase  
Joseph Marshall Keith 1st Lieut Baltimore

**MASSACHUSETTS**  
Alfred Walter Basamania 1st Lieut Holyoke  
Harold Brody 1st Lieut Lowell  
George William Geiss 1st Lieut Arlington  
Roger Dolor Hebert 1st Lieut Chicopee  
William McKendree Jefferies 1st Lieut Boston  
Edward F Lawler 1st Lieut Lawrence  
Walter Ovid McCammon, 1st Lieut Boston  
Howard Nelson Simpson, 1st Lieut Longmeadow

**MICHIGAN**  
William H Anderson Captain Ewen  
John Burge Byers 1st Lieut Grand Rapids  
Vincent H Carstensen 1st Lieut Detroit  
Louis Elmer Doerr Jr 1st Lieut Detroit  
Lewis Jennings Geerlings 1st Lieut Fremont  
Robert M Heavenrich 1st Lieut Saginaw  
William Ramsey Kavanaugh 1st Lieut Kalamazoo  
Jerry Hal McVieckle 1st Lieut Detroit  
Richard Louis Rapport 1st Lieut Flint  
Edward George Seybold 1st Lieut Ann Arbor  
Ralph Hunt Sullivan Jr 1st Lieut Lansing  
Franklin Lyle Watters 1st Lieut Detroit

**MINNESOTA**  
Wallace C Beckman 1st Lieut Minneapolis  
Frederick Martin Graham 1st Lieut Rochester  
John William LaBree 1st Lieut Minneapolis  
Duncan Voss Luth 1st Lieut Duluth

**MISSISSIPPI**  
James Eddy Coc 1st Lieut Leland  
Albert Frederick William Habeeb 1st Lieut Vickburg  
Edmund Arthur Melvin 1st Lieut Gulfport  
John Andrew Murfee 1st Lieut Amory  
**MISSOURI**  
William Bayne Allen 1st Lieut Kansas City  
Walter Baumgarten Jr 1st Lieut St Louis

James Clinton Cope 1st Lieut Lexington  
Charles Holloway Lewellen 1st Lieut Kansas City  
Warren M Loneragan Captain St Louis

**NEBRASKA**  
Vernon Krueger Anderl 1st Lieut David City  
William Paul Ward 1st Lieut Lincoln

**NEVADA**  
Lin Sheut Felder 1st Lieut Winnemucca

**NEW HAMPSHIRE**  
Edward Donald Aclim Captain Nashua

**NEW MEXICO**  
Leslie Louis Dwyer 1st Lieut Las Cruces

**NEW JERSEY**  
Dominic Donald Borrelli 1st Lieut Trenton  
Charles Pluener Campbell 1st Lieut Westfield  
Maxwell Xavier Colby Captain Long Branch  
Vincent Gregory Fay Captain Lynton  
Morris Colthel Captain Ventnor  
Angelo Bartholomew Inncone Captain Orange  
Charles Peter Ringe 1st Lieut Teaneck  
John R Rocco Captain Jersey City

**NEW YORK**  
Harry Ageloff 1st Lieut New York  
Ralph Edmond Baxter 1st Lieut Brooklyn  
Floyd Maurice Breed 1st Lieut Norwich  
John A Cooke Jr 1st Lieut Monticello  
James Edward Corrigan 1st Lieut Patchogue  
Joseph B Cramer 1st Lieut Rochester  
Joseph Charles Lira 1st Lieut Niagara Fall  
Cortez Ferdinand Inloos Jr 1st Lieut New York  
Roland L Faulkner 1st Lieut Schenectady  
Dwight R Griffith Captain Delkaville  
William Hildebrand Jr 1st Lieut Kenmore  
Frank Charles Horck Jr Captain Niagara Falls  
Russell Houghton Hooker 1st Lieut New York  
Maurice Joseph Keller 1st Lieut New York  
Robert Landesman 1st Lieut New York  
Manuel Phillip Landman 1st Lieut Brooklyn  
George Harold Kaye 1st Lieut New York  
Mervyn M Foster 1st Lieut Brooklyn  
Howard Robert Lawrence 1st Lieut Medina  
Kenneth Bedell Lewis 1st Lieut Rockville Centre  
John King Lucca 1st Lieut Staten Island  
Francis Dunn Maloney 1st Lieut Hempstead  
John R Murphy Captain Saratoga Lake  
Paul J O Connor 1st Lieut New York  
Stanley Frank Ogorzaly 1st Lieut Yonkers  
Laurence Louis Paltz 1st Lieut New York  
Clarence O Peterson Jr 1st Lieut Mount Vernon  
John Brice Plass 1st Lieut Poughkeepsie  
John Archibald Rodger 1st Lieut Moravia  
Woodrow Wilson Schier 1st Lieut Manhattan  
Irving Ernest Sisman 1st Lieut New York  
Harold Lawrence Sutton 1st Lieut Hempstead  
Charles H Thom Jr 1st Lieut Staten Island  
Harry Randall Tollefsen Captain New York  
John Joseph Van Buren Captain Brooklyn  
John M VanderLinde 1st Lieut Brooklyn

Harold S Wadro Captain New York  
Joseph Allison Cannon Wads worth 1st Lieut New York  
Albert Leopold Wahl, 1st Lieut Mount Vision  
Robert Edward Walton 1st Lieut Kenmore  
Ernest Alfred Weymuller Cap tain Flushing  
Clifford Carmichael Wray Cap tain Rockville Centre

## NORTH CAROLINA

William Frederick Barefoot 1st Lieut Wilmington  
James Verdery Greene 1st Lieut Fayetteville  
William Hugh Patton Jr 1st Lieut Morganton  
Charles Walton Purcell 1st Lieut Raleigh  
Benjamin Anderson Strickland Jr Major Whitakers  
Rufus H Temple Captain Kinston

## NORTH DAKOTA

George Savage Boyer 1st Lieut Grand Forks

## OHIO

Archibald Matus Adam 1st Lieut Lima  
George Davis Bernier Captain Cincinnati  
Hoy DeFore t Bonar 1st Lieut Mansfield  
Harry Bremen 1st Lieut Dayton  
Alexander Sand Fisher 1st Lieut East Liverpool  
Ralph Milton Gignac 1st Lieut Dayton  
Robert Carl Haubrich 1st Lieut Pataskala  
James Ralph Janney 1st Lieut North Baltimore  
Edward Tracey Keating 1st Lieut Hamilton  
George Weston LeSar Jr 1st Lieut Cleveland  
Theodore Long Light Captain Dayton  
Lawrence Joseph Lohr Captain Dayton  
Meyer Nathan Margoli Captain Cincinnati  
Harold Maurice Mesenger 1st Lieut Cleveland  
William Jones Neal 1st Lieut Archbold  
George Fred Nisus 1st Lieut Cleveland  
Earl William Schafer Jr 1st Lieut Cincinnati  
Julius Paul Schweitzer Jr Captain Lakewood  
Harold Eugene Snodden 1st Lieut Zine field

Walter Raymond Stager Captain Dover  
Gwyn Harrison Start 1st Lieut Toledo  
James Walter Tirey Jr 1st Lieut Anna  
Carl Frederick Wagner Captain Cincinnati  
Marlin Richard Wedemeyer 1st Lieut Oak Hill  
Russell Lee Roy Wiessinger 1st Lieut Sidney  
Paul Bernard Winston 1st Lieut Cincinnati

## OKLAHOMA

Herman Robert Bender 1st Lieut, Norman  
Samuel Richard Fryer 1st Lieut Oklahoma City  
William Eton Hubbard 1st Lieut Oklahoma City  
Jesse Day Shupp 1st Lieut Tulsa  
Cyrus Lee Worrall 1st Lieut Oklahoma City

## OREGON

Richard Lester Currin 1st Lieut Klumath Falls  
William Wilmer Ornduff 1st Lieut Portland

## PENNSYLVANIA

Edward Andrew Agnew 1st Lieut Reading  
James R Bell Captain Canons burg  
Kenneth Wells Benjamin 1st Lieut Philadelphia  
Douglas Danford Bond 1st Lieut Bryn Mawr  
Max Cassell Captain Philadelphia  
Frank Edward Check 1st Lieut Wilkes Barre  
Earl David Cramer 1st Lieut Latrobe  
George Winton Crouse 1st Lieut Smithton  
Francis Joseph Ditcher 1st Lieut Tamaqua  
Stuart Watt Dittmar 1st Lieut Chambersburg  
Howard Remminger Erb 1st Lieut Swarthmore  
Irving Alfred Glass 1st Lieut Philadelphia  
Rudolph Karl Clocker Captain Roversford  
Burton Adam Hall 1st Lieut Philadelphia  
Earl Francis Harris 1st Lieut Connelville  
Frederick Guy Holt Captain Shamokin  
Donald Hayden Huffer 1st Lieut York  
William A Johnson Captain Umontwin

Samuel Newton Kelso Jr, 1st Lieut Lewistown  
William Patton McNight, Cap tain Philipsburg  
Smith Davis Morton Captain Pittsburgh  
William Pearlman 1st Lieut, Kingston  
Paul John Pomsard 1st Lieut Dalton  
James Hawthorne Ramsey 1st Lieut Marietta  
George Louis Seifert 1st Lieut Philadelphia  
Alan Eugene Smith 1st Lieut Shrewsbury  
William Pess Stewart 1st Lieut Pittsburgh  
Theodore Roosevelt Whitaker 1st Lieut Sewickley  
Henry Abram Zimmerman 1st Lieut Hollsopple

## SOUTH CAROLINA

Emory Clifton Kinder 1st Lieut Kingstree  
Raymond Hudson Vank Captain Charleston

## SOUTH DAKOTA

Charles Carmine Hoyt 1st Lieut Sioux Falls

## TEXAS

James Edward Anhalt 1st Lieut Memphis  
William Kenneth Tilley 1st Lieut Lebanon  
Alvin B Tripp 1st Lieut Memphis

## TEXAS

Walter Billie Adams Jr Captain Wichita Falls  
Joseph Campbell 1st Lieut San Antonio  
Cecil Harold Dickerson Jr 1st Lieut San Antonio  
Bates Billew Estes 1st Lieut Corpus Christi  
Daniel Emory Hampton Captain Kaufman  
Ralph Franklin Hartman 1st Lieut San Antonio  
Martin Peters Hunter Major Waco  
Ridings Edward Lee Captain Dallas  
Cary Leggett Jr 1st Lieut Port Lavaca  
James Edward Lett III 1st Lieut Dallas  
Edward Bernaghan Miller Cap tain Dallas  
Weldon O Murphy 1st Lieut Amarillo  
Charles W Norvell 1st Lieut Temple

Robert Madison Rothen 1st Lieut Austin  
William M Routon 1st Lieut Kilgore  
Fred William Sellers Captain Houston  
Oliver H Timmins Jr 1st Lieut San Antonio  
Thebert Ruyse Wilson 1st Lieut Liberty  
Eduardo Vimenes 1st Lieut Floresville

## UTAH

John William Pace 1st Lieut Salt Lake City  
James Bradford Westwood 1st Lieut Provo

## VERMONT

Stanford Raphael Bloomenthal Captain Burlington  
Carlton Bond Orton 1st Lieut Waterbury

## VIRGINIA

Herbert Clifton Allen Jr 1st Lieut Richmond  
Warren Alfred Colton 1st Lieut Kecoughton  
Pete Commings 1st Lieut Charlotteville  
Maynard Robert Emlaw 1st Lieut Charlottesville  
Alfred Randolph Garnett 1st Lieut Norfolk  
John Talb Walke 1st Lieut Richmond

## WASHINGTON

William Sebern Butts 1st Lieut Spokane  
Gordon Hall Congdon 1st Lieut, Wenatchee

## WEST VIRGINIA

Keith Elmer Gerchow 1st Lieut, Morgantown  
John Stafford Rogers 1st Lieut Keyser

## WISCONSIN

Robert I Brown Jr 1st Lieut Cazenovia  
Thomas I Calky 1st Lieut Fond du Lac  
William August Langmack 1st Lieut Milwaukee  
James I Murphy 1st Lieut Park Falls  
Weston John Schutz 1st Lieut Shawano  
Paul Fred Schwartz 1st Lieut Milwaukee

## ALLIED ARMIES

Rene Delgadillo Colonel (Bolivian Army)  
Marco Antonio Gaxiola Major (Mexican Army)

## MISCELLANEOUS

## PUBLIC HEALTH UNDER HITLER

The *Reichs Gesundheitsblatt* of Oct 14, 1942 contains under the heading 'The Fight Against Disease' seven pages of advice to doctors on combating the plague' (This "advice has, according to the paper also appeared in leaflet form and may be bought at 15 pfennig per copy from the Reichsverlagsgesamt, Berlin NW 40) It describes in great detail the sources and known ways of spreading the infection and mentions south eastern Russia as one of the regions where plague infested rodents and in particular rats are to be found From these endemic plague centers the disease may be carried by infected rats in freight trains and in ships to far distant countries According to the hygienic conditions prevailing there and the numbers and kinds of rats imported, an epidemic will break out among rats with or without a transmission to man by way of fleas and it may even come to the formation of a new and permanent endemic plague center In some regions, as for instance in southeastern Russia (Astrakhan), other rodents too may harbor the disease, as for instance field mice and ground squirrels

After giving details of the various forms of the plague, such as the bubonic and pneumonic varieties, the article deals at length with prophylactic measures It says that whenever possible the infected person should at once be removed to a hospital

but 'if in exceptional cases a removal to a hospital should prove impossible for instance if the hospitals are overcrowded during an extensive outbreak of the plague, the patient must at least be isolated and all unnecessary communications forbidden Children from houses or families where a case of the plague has occurred must if they have not been put into quarantine, be kept away from school the Hitler Youth home and Hitler Youth service, as well as from all other children'

*Klinische Wochenschrift* Berlin of Oct 24, 1942 in an article by Dr Bruhl on disease of the stomach, says that 'the army of sufferers from stomach diseases has greatly increased in this war

As the cause for this increase in the numbers of patients suffering from stomach troubles we must not solely blame the diet (fresh dark bread cabbage dishes, feeding in communal kitchens) General factors are just as important causes (overwork, vacations irregular way of living and feeding and so on) Thus to eliminate these extragastral harmful influences is an important therapeutic measure The intensive treatment of sufferers from stomach troubles is particularly important today since valuable working hours are lost through their illness'

*Nieuwsblad van het Noorden* Groningen, of Sept 23, 1942 reports that henceforth a great number of medicines will be available only on prescription Cod liver oil and eau de cologne are among others subjected to these regulations

According to the *Deutsche medizinische Wochenschrift* Leipzig of July 31, 1942 to secure the necessary technical medical help for the armed forces and the civil population the planned distribution of all persons who have completed or are completing their training as technical helpers or assistants is necessary. According to a decree by the reich minister for the interior, applications for such personnel and their employment must be made solely through his ministry, which will work in collaboration with the Reich Employment Office for Female Vocations (Reichsvermittlungsstelle für Frauenberufe).

The *Zeitschrift für Urologie* Berlin, 1942, contained an article by Dr. Droschl, who works in a surgical ward in a Grez hospital. He states that the increase in the cases of necessary and prescribed sterilization of men has resulted in a heavy extra burden of work for the hospital and made it necessary to simplify the operation. He then proceeds to give details of the operation.

The *Nieuwe Rotterdamse Courant* of Sept. 17, 1942 reports that last May the Department of Social Affairs began an important extension of the scheme for medical service in the schools. For this purpose it was decided to divide the country into districts, each comprising one or more municipalities. This reorganization is at present in full swing. Much can be done in the already existing eleven districts for school medical service as well as in about thirty-five municipal school doctors' services.

It is intended that the school doctors should in future become full time officials. The district services will cover about forty to fifty thousand persons which means that they will have to cope with an average of from six to seven thousand pupils in the kindergartens and the elementary, advanced elementary and technical schools.

At the University of Utrecht a special course of two months has been established for school doctors. Twenty to thirty-five doctors participated in the course this spring. The second course begins in the autumn.

The state is to bear one third of the costs involved in the school doctors' service. The state will also contribute one third of the costs if important improvements have to be made. The rest of the necessary funds must be raised by the municipalities and perhaps even by the provinces.

### THE TRAINING OF AUXILIARY HOSPITAL WORKERS

According to an agreement reached in Washington early in January by the Subcommittees on Hospitals and Nursing of the Health and Medical Committee, Office of Defense Health and Welfare Services, the responsibility for employing and training auxiliary hospital workers rests with the individual hospital.

The subcommittees concerned with the coordination of wartime hospital and nursing administration decided that it is neither desirable nor practicable for the federal government to foster a training program for hospital auxiliary workers. Dr. James A. Crabtree, executive secretary of the Health and Medical Committee said 'We feel the problem to be entirely local'.

Some professional groups have contended that the federal government should assume at least partial responsibility for training, placing and subsidizing auxiliary workers in hospitals. The series of conferences held over a period of months to weigh all angles of the proposal culminated in final action at a joint meeting of the hospital and nursing subcommittees on January 9.

### CITRUS JUICES RESERVED FOR WAR REQUIREMENTS

Secretary of Agriculture Wickard issued an order January 9, reserving for direct war requirements all citrus juices except unconcentrated grape fruit juice, which also cannot be sold by canners during the remainder of January, February and March, with civilian supplies of this product to be released by canners after this period. The purpose of this regulation is to insure adequate supplies of canned citrus products for government requirements and to conserve tin plate by requiring civilians to use most of these citrus fruits in fresh rather than in canned forms.

### TWENTY FELLOWSHIPS IN PUBLIC HEALTH EDUCATION AVAILABLE

The W. K. Kellogg Foundation has made a grant of \$40,000 available to the U. S. Public Health Service for the purpose of providing twenty fellowships in public health education. The training to be given at the University of North Carolina Chapel Hill beginning March 20, 1943 and continuing until March 1944. The summer quarter will be spent in the field. Successful completion of the studies will lead to a master's degree in public health.

Since a shortage of well qualified health education personnel prevails, these courses are being provided to hasten the time when trained personnel will be available.

The fellowships are open to American citizens between the ages of 19 and 40 and provide a stipend of \$100 a month for twelve months, tuition fees and travel for three months of field experience. The applicant must pay his own travel to and from the university at the beginning and end of training. The minimum educational qualifications are:

- (a) Bachelor of science degree or its equivalent from a recognized college or university with major emphasis on:
  - (1) The basic health medical sciences such as physics, chemistry, biology and physiology.
  - (2) Education with emphasis on educational psychology.
  - (3) The social sciences.

Persons interested who consider themselves qualified should mail their application for fellowship in health education together with a transcript of their college credits and a small photograph not later than March 1 to the Surgeon General, U. S. Public Health Service, Washington, D. C.

### USE OF ROTENONE INSECTICIDE NOW RIGIDLY RESTRICTED

A new federal order has rigidly restricted the use of rotenone insecticides which now may be used only on certain crops against certain insects. Rotenone has become in recent years a popular insecticide for farms, gardens and household use but the former Far Eastern sources of supply have been cut off and only small supplies are coming from South America. Now the finished insecticide must not contain more than 0.5 per cent of rotenone and must not contain any pyrethrum. Any one at the end of 1942 who had more than 500 pounds of rotenone or 5,000 pounds of rotenone insecticide must report to the War Production Board. Dealers must label or tag all packages sold with a statement of the permitted uses and every one involved must preserve for two years complete records of all rotenone handled. Besides certain vegetables the only other permitted use is on cattle against the cattle grub or short nosed cattle louse. The vegetable uses permitted are on peas against pea weevil and pea aphid on beans against Mexican bean beetle on sweet corn against European corn borer, and on broccoli, brussels sprouts, cauliflower, kohlrabi, mustard, kale, turnips and collards for caterpillars and aphids.

### ANALYST FOR THE LEND-LEASE ADMINISTRATION

Mr. M. R. Kneiff, executive secretary of the Catholic Hospital Association of the United States and Canada, St. Louis, has been granted a leave of absence by that association to enable him to accept the position of Principal Trade Requirements Analyst for the Lend Lease Administration. The Rev. Alphonsus M. Schwitalla, president of the Catholic Hospital Association, announced that the services of Mr. Kneiff were requested by Mr. Edward R. Stettinius, Jr., administrator of the Office of Lend Lease Administration.

### CALIFORNIA STATE GAS OFFICER

Dr. Maurice L. Tainter, professor of pharmacology at Stanford University School of Medicine, San Francisco, has been named state gas officer for California by the state council of defense emergency medical service. Dr. Tainter set up the San Francisco gas treatment and protection services for civilian defense.



# ORGANIZATION SECTION

## OFFICIAL NOTES

### COMMITTEE ON STUDENT HEALTH, AMERICAN MEDICAL ASSOCIATION

The Committee on Student Health held its first meeting at Washington D C, January 11 and 12. All members of the committee were present.

Dr Joseph E Rycroft Princeton N J Chairman  
Dr Ruth E Boynton University of Minnesota Secretary  
Dr Arlie C Bock Harvard University  
Dr Frank B Kelly University of Illinois  
Dr O N Anderson Stanford University

Dr W W Bauer, American Medical Association staff, met with the committee.

The committee met first in the office of Col Leonard G Rowntree, chief of the Medical Division of Selective Service, and conferred briefly with Major Gen L B Hershey, director of Selective Service. The committee was entertained at luncheon in Selective Service headquarters in order to meet the following representatives of various government services and other guests, who were as follows:

Major Gen L B Hershey, Selective Service director, Washington D C  
Col George Baehr, Medical Division U S Office of Civilian Defense, Washington D C  
Col A N Baggs, Medical Division National Headquarters, Washington D C  
Col Theodore P Bank, Special Service Division, War Department, Washington D C  
Col Lawrence W Long, State director, Mississippi Selective Service System, Jackson, Miss  
Col L G Rowntree, chief, Medical Division, Selective Service, Washington D C  
Col C R Wells, National Headquarters, Selective Service System (chief Dental Section), Washington D C  
Lieut Col Louis H Renfrow, Dental Section, National Headquarters, Washington D C  
Douglas D Finch, New York State War Council (Photographic Section), Albany, N Y  
Ernest J Jaqua, War Manpower Commission, Washington D C

Hiram A Jones, director, Office of Physical Fitness, New York State War Council  
Frank S Lloyd, Federal Security Agency (Division of Physical Fitness), Washington D C  
Harlan G Metcalf, Federal Security Agency (Division of Physical Fitness), Washington D C  
Watson D Miller, Assistant Administrator, Federal Security Agency, Washington D C  
Robert H Owen, Selective Service Headquarters, Washington D C  
C C Parker Jr, Selective Service, Washington D C  
J R Shurman, Office of Education, Washington D C

An informal discussion of physical fitness and health was held during and after luncheon. Hiram A Jones, director of the Office of Physical Fitness of the New York State War Council, showed a motion picture film descriptive of the statewide program in New York State.

After hearing from Colonel Rowntree and Mr Metcalf of the Federal Security Agency, the committee spent the rest of the day and evening and the next day in discussing and surveying the possible scope of its activities and sources of information as to previous contributions in the field of student health. The following areas to be investigated by various members of the committee were assigned:

1. Information on height, weight and growth of college men and women of today compared with those twenty or more years ago.
2. An analysis and evaluation of physical fitness tests now in use.
3. Information on nutrition of children and standards of nutritional needs.
4. The status of health teaching in colleges, as well as the lower schools and the results of pretesting of young people in the health field.
5. Information to show if possible the comparative health of the nation now and in previous years through the analysis of examinations of men for Selective Service, as well as other sources.

## MEDICAL LEGISLATION

### DISTRICT OF COLUMBIA

**Bills Introduced**—H R 350, introduced by Representative Guyer, Kansas, proposes to prohibit, within the District of Columbia, the manufacture, importation, exportation, transportation, sale, gift, purchase or possession of any spirituous, vinous, malt, fermented and all alcoholic liquors whatsoever which may be used as beverages, except natural wine for religious services, and ethyl alcohol for compounding or manufacturing medicines for internal use and as a disinfectant by physicians, surgeons and dentists in their professions. H R 1567, introduced by Representative Bradley, Michigan, prescribes certain offenses relating to the keeping, injuring and destroying of dogs in the District of Columbia.

### MEDICAL BILLS IN CONGRESS

**Bills Introduced**—S J Res 24, introduced by Senator Capper, Kansas, proposes a constitutional amendment to confer on Congress the power to make laws which shall be uniform throughout the United States on marriage and divorce, the legitimation of children and the care and custody of children affected by annulment of marriage or by divorce. S 65, introduced by Senator McNary, and H R 497, introduced by Representative Angell, both of Oregon, provide for the payment of annuities to blind persons, in an amount not to exceed \$50 per month in case a blind person has an income of less than \$1,200 a year. S 599, introduced by Senator Thomas, Oklahoma, provides that any tuberculous World War veteran whose dis-

ability compensation rating is service connected shall be rated as permanent and total for compensation purposes. S 460, introduced by Senator Capper, Kansas, provides for the uniform regulation of marriage and divorce. Among other things, this bill proposes that no license to marry shall be issued to any person who is insane or an imbecile, proper, epileptic, feeble minded or afflicted with tuberculosis or a venereal disease. S 622, introduced by Senator Walsh, Massachusetts, for himself and Senator Clark, Missouri, proposes to authorize the Veterans' Administration to provide vocational rehabilitation and assistance in securing suitable employment for service connected disabled veterans. S 623, introduced by Senator Walsh, Massachusetts, proposes to extend the federal old age and survivors insurance benefits of the Social Security Act to certain employees of religious, charitable, scientific, literary or educational associations. H J Res 28, introduced by Representative Mundt, South Dakota, and H J Res 36, introduced by Representative Voorhis, California, propose to establish a commission for postwar planning and reconstruction. H J Res 69, introduced by Representative Voorhis, California, proposes to establish the first week in October of each year as "National Employ the Physically Handicapped Week." H R 114, introduced by Representative Voorhis, California, proposes to establish under the Fish and Wildlife Service of the Department of the Interior a research laboratory to study the diseases of domestic rabbits. H R 130, introduced by Representative Bland, Virginia, provides that the fund for the relief of sick

and disabled and destitute seamen belonging to the United States merchant marine service shall also be available for the relief of sick, disabled destitute or needy dependents of deceased seamen H R 639, introduced by Representative Welchel, Georgia, proposes to authorize the Administrator of Veterans Affairs to provide domiciliary care, medical and hospital treatment and burial benefits to certain veterans who were placed on the pension roll by an omnibus bill in 1922 H R 757, introduced by Representative Voorhis, California, provides educational grants in an amount of \$500 per person per year to veterans of the second world war to enable them to continue their education H R 912, introduced by Representative Rankin, Mississippi, proposes to provide liberalized benefits for disabled veterans and their dependents. Among other things this bill (1) would extend the benefits of existing law to any officer enlisted man, member of the Army Nurse Corps (female) or Navy Nurse Corps (female) employed in the active military or naval services of the United States on or after Dec 7 1941, and before the termination of the present war, (2) would provide that in granting hospital treatment and domiciliary care for disabilities not shown to be due to military or naval service, the Administrator of Veterans Affairs be directed to give preference to veterans who have been discharged by reason of disability and to veterans entitled to or receiving compensation, pension, or retirement pay for service connected disabilities and (3) would provide for the vocational rehabilitation of veterans H R 979, introduced by Representative Allen, Louisiana, provides that, while hospitalized for service connected disabilities, war veterans shall be rated as totally disabled H R 981, introduced by Representative Bates, Kentucky, provides that, when selecting sites for location of new hospitals or other facilities for use by the Veterans' Administration, due consideration shall be given the prospective number of veterans to be served by such hospitals or facilities and the sites chosen shall be as near the center of each such veteran group as is practicable and most conducive to the health of such group H R 1119, introduced by Representative Peterson, Georgia, provides pensions to peacetime veterans of the Regular Army, Navy, Marine Corps and Coast Guard suffering from arrested tuberculosis contracted while in service H R 1185, introduced by Representative Rankin, Mississippi, proposes to amend Veterans Regulations so as to provide benefits for any officer, enlisted man, member of the Army Nurse Corps (female) or Navy Nurse Corps (female) employed in the active military or naval service of the United States on or after Dec 7, 1941 and before the termination of the present war H R 1293, introduced by Representative Hare, South Carolina provides that grants-in aid by the United States to any state shall be computed on the basis of the ratio of the per capita income of the United States to the per capita income of such state in lieu of being computed on the basis of equal matching of funds by the United States and the State H R 1509 introduced by Representative Reece, Tennessee, provides that any ex service person shown to have had tuberculosis in a compensable degree and who has drawn a temporary total or permanent and total rating of disability compensation for the tuberculous disease and who is not now drawing a permanent and total rating of compensation but who is drawing the statutory award or rating of disability compensation for tuberculous disease shall hereafter receive not less than \$100 per month which rating shall be continued during the lifetime of the veteran H R 1510 introduced by Representative Sauthoff, Wisconsin proposes to amend the Social Security Act to provide that aid by states to dependent children who are mentally incompetent irrespective of age, be included in computing grants by the United States to such states for aid to dependent children H R 1566 introduced by Representative Bradley, Michigan provides for the punishment of persons transporting and receiving certain stolen dogs in interstate commerce H R 1604, introduced by Representative Forand, Rhode Island proposes to authorize an appropriation of \$1 500 000 to construct a veterans hospital in the state of Rhode Island, with a 300 bed patient capacity, for the diagnosis, care and treatment of general medical and surgical disabilities H R 1723, introduced by Representative Klein, New York proposes to extend the provisions of the Social Security Act relating to old age and survivors insurance benefits to employees of certain nonprofit organizations

## STATE MEDICAL LEGISLATION

## Arkansas

*Bills Introduced*—H 103 proposes to provide \$15 000 to purchase pneumothorax equipment and to pay the fees of physicians for administering pneumothorax treatment to patients certified by the superintendents of the state tuberculosis sanatoriums H 123 proposes to require all persons applying for a marriage license to be examined by a licensed physician to determine the presence of any venereal disease or whether or not such persons are idiots feeble-minded imbeciles epileptic or insane

## California

*Bills Introduced*—S 547 to amend the practitioner examination law proposes that certificate forms provided by other states having comparable laws and by the United States Army or Navy for military personnel may be accepted S 596 to amend the Business and Professions Code provides for the examination and licensing of chiropractors and defines chiropractic as the diagnosis medical surgical mechanical manipulative and electrical treatment of the human foot including the non-surgical treatment of the leg No chiropractor may do any amputation or use an anesthetic other than local A 664 to amend the business and professions code proposes the addition of a new chapter to provide for the issuance of licenses to practice physical therapy defined as the treatment of physical or mental conditions by the use of massage therapeutic massage exercise therapeutic exercise, or by the use of the physical chemical and other properties of electricity (except x rays radium and electrosurgery), heat light or water A 667 to amend the food and drug act proposes to add thyroid to the list of preparations which shall be deemed to be misbranded unless labeled in the required manner A 951 proposes to exempt from taxation the sale of ophthalmic lenses and eyeglass frames and fittings when sold on the prescription of a licensed optometrist

## Colorado

*Bills Introduced*—H 236 proposes the enactment of a practice tax act but exempts therefrom services rendered by chiropractors osteopaths physicians surgeons dentists embalmers nurses, optometrists undertakers, chiropractors, hospitals, cemeteries or state licensed veterinarians H 525 proposes to authorize the state board of medical examiners to grant and revoke licenses to practice chiropractic defined as the diagnosis and medical surgical mechanical manipulative and electrical treatment of ailments of the human foot and leg excepting amputation of the foot or leg or the administration of an anesthetic other than local or the reduction of dislocations or fractures Surgical treatment is further defined to mean the surgical treatment of all minor foot or leg ailments excepting the surgery on the bony structure or ligamentous tissues of the foot or leg

## Connecticut

*Bills Introduced*—S 484 to amend the food and drug act, proposes, among other things to limit to emergencies only the dispensing by a physician veterinarian or dentist of amido-pyrimine barbituric acid cinchophen dimetophenol or derivatives thereof, and narcotic drugs S 559 to amend the law concerning examinations by school medical advisers, proposes that such medical adviser shall interpret to the school nurse teacher, principal superintendent and to the parents of such pupils his findings at the examination and shall recommend how the pupil should be cared for and what provisions, if any should be made at the school for the care and welfare of the pupil S 562, to amend the law concerning health examination of school children proposes to require physicians who make such examinations to make their recommendations concerning the pupil in writing S 678 proposes a penalty of life imprisonment for procuring an abortion whether the abortion is fatal or not S 782 proposes that chiropractors shall be subject to the rules and regulations governing physicians in making and filing death certificates S 783, to amend the chiropractic law proposes to extend the scope of chiropractic practice to include the location and removal of interference with normal nerve function and the right to prescribe and apply hygienic and sanitary measures incident to the care of the body S 784 to amend the chiro-

practic law, proposes to extend the scope of chiropractic practice to include the locating and removal of interference with normal nerve function by any method not including the use of drugs or surgery and including hygienic and sanitary measures incident thereto. S 785, to amend the chiropractic law, proposes to change the educational requirements from four college years of thirty-six weeks each to four college years of eight months each of not less than three thousand six hundred hours. Substitute for H 312 proposes to appropriate \$50,000 for furnishing medical, hospital, obstetric and pediatric care to wives and children of service men when they are unable to purchase such care for themselves. H 716, to amend the law relating to physiotherapy technicians, proposes to repeal the section setting forth qualifications for registration of physiotherapists without examination. H 718 proposes the creation of a state board of examiners in massage which is defined as any process or action of conjoint motion and pressure applied by hand, such as rubbing, stroking, kneading, tapping or other similar manipulation with or without the application of creams, lotions or liniment or the use of hand vibrators or rollers to any part of the human body for the purpose of relieving pains, aches, stiffness or soreness of muscles or for the purpose of inducing blood circulation or reducing conditions of obesity, or for any other remedial purpose including the use of any and all other manual means such as physical exercises for the conditioning of the human body. H 727 proposes the creation of a board consisting of a psychiatrist, a psychologist, a doctor of internal medicine, a surgeon and a psychiatric nurse or social worker to examine all mental patients prior to commitment to any private or state hospital. H 1026 proposes to authorize the court in certain circumstances to order the examination of an accused person to determine whether or not such person is suffering from a venereal disease and if the result of the test is positive to make such order as may be necessary for the detention and treatment of such person.

#### Delaware

*Bills Introduced*—S 38 proposes to authorize the medical council of Delaware to issue temporary emergency certificates to physicians licensed outside the state. S 41 to amend the medical practice act proposes to exempt therefrom the treatment of human ills by prayer or spiritual means in accordance with the tenets of any well recognized religious denomination. S 49 proposes to require all school children to be immunized against smallpox and diphtheria, unless excused by a written statement by a reputable physician.

#### Idaho

*Bill Passed*—H 43 passed the House on January 29, providing that each applicant for a marriage license must produce a certificate signed by a licensed physician certifying that the applicant has been thoroughly examined and that he is not infected with syphilis in a communicable stage. The physician making the examination may not charge more than \$2.

#### Illinois

*Bill Introduced*—S 21, to amend the traffic laws, proposes that a person shall be deemed, prima facie, to be operating a motor vehicle under the influence of intoxicating liquor whose blood wine, saliva or alveolar breath contains more than certain stated percentages of alcohol as determined by a chemical test of such breath or body fluid.

#### Indiana

*Bills Introduced*—S 12, to repeal the present vital statistics law and substitute a more complete one, propose, among other things, that the term 'physician' as used therein shall mean a person lawfully authorized to practice medicine in Indiana. H 28 proposes the creation of a board of chiropractic examiners to examine and license chiropractors and define chiropractic as the science of locating and adjusting the subluxations of the articulations of the human spine and its adjacent tissues. H 187 proposes the appointment of examiners in physical therapy, defined to mean that part of the practice of medicine dealing with the application to pathologic conditions of the physical forces of heat, light, electricity, thermo and hydrotherapy, massage and medical gymnastics and kinesiology.

#### Kansas

*Bills Introduced*—H 121, to amend the medical practice act, proposes to eliminate the requirement that no two of the required four six month periods which must be spent in the study of medicine and surgery may be given within the same twelve months. The purpose of this bill is apparently to enable graduates of accelerated medical courses to obtain licensure in Kansas. H 138 proposes to require each physician attending a pregnant woman to take a blood sample within fourteen days of the first examination and to submit such sample for a standard serologic test for syphilis. H 139 proposes to require each applicant for a marriage license to produce a certificate from a duly licensed physician stating that such person is not infected with syphilis in a communicable stage. Such certificate shall also state that no abnormalities of an anatomic or physiologic nature have been discovered which in the opinion of the examining physician would contribute to a serious incompatibility and so nearly as can be determined that no insanity, feeble-mindedness or epilepsy exists. The physician's fee for each person shall not exceed the sum of \$2.50.

*Bill Passed*—H 120 passed the House on February 2. It proposes to excuse physicians in the military service from renewing their license annually and prohibits revocation of such license during such period.

#### Maine

*Bill Introduced*—H 124 to amend the divorce law, proposes to authorize the granting of divorces on the ground of insanity.

#### Massachusetts

*Bills Introduced*—S 125 to amend the law relating to the commitment of insane persons to state institutions, proposes that no person other than a duly qualified or registered physician in good standing may commit any insane person to a psychopathic institution in the state. H 347 proposes to repeal the law requiring premarital physical examinations and serologic tests. H 352 to amend the law relative to the payment of medical, hospital and other services to dependent children and their parents, proposes to authorize expenses for such services to be paid directly to the person furnishing them when the patient has died or been committed to an institution. H 4-8 to amend the unemployment compensation law proposes that any person absent from work on account of sickness shall not be debarred from receiving benefits under the law. H 507 proposes to prohibit the sale of contraceptive devices except by a registered pharmacist on prescription by a registered physician and no physician shall furnish a prescription for any device purported to be usable for feminine hygiene except when, in his judgment, a condition of infection, irritation, disease or organic ill necessities or justifies such prescription. H 509 proposes to require every parent or guardian of a minor to keep such minor at home when ill with any of the following diseases: sore throat, common cold, grip, measles, chickenpox, mumps, scarlet fever, whooping cough, chills or fever, stiffness in neck, or rash on body. H 512 proposes certain conditions which an employer of a pregnant woman must comply with, especially with regard to extra rest periods, etc. H 797 proposes to authorize the state department of education to make an investigation and a report including medical opinions thereon, on the toxic effects of nicotine and beverage alcohol on school children and youths. H 863 proposes that no person shall be required to submit to vaccination or inoculation of any kind against his will as a condition precedent to attending any public school or institution and that no such certificate of vaccination shall be required for admission to the public schools. Any doctor, nurse or other person who vaccinates or inoculates a child or an adult under guardianship without the written consent of the parent or guardian of said child or adult, will be subject to a fine of \$100 or imprisonment for a year or both. H 866 proposes to authorize the board of health, when it has reason to believe that any person is suffering from syphilis or gonorrhea to cause a medical examination to be made of such person without charge by a qualified physician registered in the commonwealth. H 1198 proposes certain restrictions with respect to the performance of experiments on live animals. In general the proposal authorizes such experiments to be made only by a person holding a license issued by the board of regis-

tration in medicine and only when the experiment is necessary with a view to the advancement of new discovery of physiologic knowledge or knowledge which will be useful for saving or prolonging life or alleviating suffering

#### Michigan

*Bill Introduced*—H 102 proposes the creation of a state board of examiners in naturopathy and that licentiates may practice naturopathy as taught by the recognized college of naturopathy

#### Minnesota

*Bill Introduced*—H 303 to amend the workmen's compensation act proposes to redefine the word 'accident' so as to include "occupational disease, defined as a disease peculiar to the occupation in which the employee is engaged and due to causes in excess of the ordinary hazards of employment, a disease arising out of and in the course of the employment

#### Missouri

*Bills Introduced*—S 9 proposes the creation of a state board of naturopathic registration and examination to examine applicants for licenses to practice naturopathy. The system, method or science of treating diseases of the human body, commonly known as naturopathy, and as taught and practiced by the recognized schools of naturopathy, is declared not to be the practice of medicine and surgery. H 45 to amend the law relating to marriage, proposes to require any person applying for a license to marry to furnish a report of a negative laboratory serologic test for syphilis and an affidavit signed by him or herself that he or she is free from syphilis. If the laboratory test is positive, the applicant must present a certificate from a physician licensed to practice in the state of Missouri certifying that the applicant is not infected with syphilis in a communicable stage

#### New York

*Bills Introduced*—S 311 and A 362, to amend the law relating to the sale of poisonous, deleterious or habit forming drugs or medicines, proposes that no manufacturer, bottler, packer or wholesaler of drugs shall sell such preparations without being registered. S 335, to amend the domestic relations law, proposes to exempt members of the armed forces from complying with the premarital examination requirements. S 377 and A 493, to amend the labor law, propose to authorize payments of unemployment insurance to persons incapacitated through illness who have previously qualified for benefits. A 97 proposes to define x-ray diagnosis as that method of medical practice in which demonstration and examination of the normal and abnormal structures parts or functions of the human body are made by use of x-rays. Any person, the bill provides, who holds himself out to diagnose or to make any interpretation or explanation by word of mouth, writing or otherwise of the meaning of a fluoroscopic or registered shadow or shadows of any part of the human body made by the use of x-rays or who uses x-rays or radium for the treatment of any human ailment will be deemed to be engaged in the practice of medicine. A 514, to amend the law relating to premarital examinations proposes to exempt from the provisions of such law the granting of a marriage license where one of the parties is in the armed forces of the United States

#### North Carolina

*Bill Passed*—H 110 passed the house, January 29. It proposes to authorize state institutions for the care of the sick, feeble-minded or insane to have performed on persons dying in such institution a postmortem examination in the laboratories of incorporated medical schools, after securing the written consent of the decedent person's husband or wife or next of kin

#### North Dakota

*Bills Introduced*—S 57 proposes the enactment of a uniform narcotic act. S 63 proposes to prohibit the sale of barbituric acid except on a written prescription of a doctor of medicine, doctor of dental surgery or doctor of veterinary medicine lawfully practicing his profession in the state. S 77 proposes to provide for the establishment, maintenance and duties of a district board of health and provides that the district health officer appointed by such board shall be a physician and surgeon regu-

larly licensed to practice medicine and surgery in the state of North Dakota

*Bill Passed*—S 58 passed the senate on February 2. It proposes to amend the premarital examination law by authorizing the required laboratory test for syphilis to be performed by the state department of health or by any other state public health laboratory approved by the state health officer

#### Ohio

*Bill Passed*—S 17 passed the senate on January 26. It proposes to exempt from the operation of the sales tax the sale of drugs or medicine compounded, prepared or sold in accordance with or under a prescription issued by a licensed practitioner of medicine

#### Oklahoma

*Bills Introduced*—H 175 proposes that no child shall be received or admitted as a pupil at a public school who has not been successfully immunized against smallpox and diphtheria. H 189 proposes to require certain specified types of domestic employees to undergo a physical examination by a licensed physician or a recognized county or city health unit before being employed and annually thereafter

#### Oregon

*Bills Introduced*—S 77 proposes to repeal the existing law providing for state reimbursement to hospitals for services rendered victims of motor vehicle accidents. H 71 and H 72 propose the repeal of the existing laws prohibiting driving an automobile while intoxicated. The present law provides that persons arrested and charged with so driving may be taken before a duly licensed physician for examination and that the physician's evidence of such examination may be admitted in evidence at a subsequent trial. H 199 proposes to reenact and extend the existing law providing for state reimbursement to hospitals for services rendered victims of motor vehicle accidents so as to cover ambulance firms. H 222 to amend the chiropractic law proposes to require chiropractor at the time of the annual renewal of their licenses to present proof that they have attended a two day educational program conducted by the Oregon chiropractic association. H 229 proposes to reenact and extend the existing law providing for state reimbursement to hospitals for services rendered victims of motor vehicle accidents so as to cover nurses, doctors and owners and operators of ambulances as well. H 244 proposes the creation of a state board of massage examiners and defines the term massage as the method art or science of treating the human body for hygienic or remedial purpose exclusively by rubbing, stroking, kneading, tapping or rolling the same with the hands or by rubbing, stroking, kneading, tapping or rolling the body with any other agency or instrumentality for the purpose of relieving, alleviating and reducing affected parts thereof

#### Pennsylvania

*Bill Introduced*—S 53, a bill to enact an Administrative Agency Law proposes, among other things to prescribe the procedure by which administrative boards may promulgate regulations

#### Rhode Island

*Bill Introduced*—H 591 proposes the creation of a board of examiners for electrolysis, defined as the removal of or preventing the growth of the hair on any part of the human body by means of electrical apparatus

#### Washington

*Bills Introduced*—S 76 proposes to exempt members of the armed forces from being required to continue in full force and effect their license to practice a profession in the state and provides further that such license shall continue valid if it was valid at the time the licensee entered the service. It may be renewed within six months after an honorable discharge. H 108 proposes to require each applicant for a marriage license to present a certificate from a physician licensed to practice medicine and surgery in the state of Washington or from a physician licensed to practice medicine and surgery in any other state showing that such applicant is free from syphilis in a communicable stage

## Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST SUCH AS RELATE TO SOCIETY ACTIVITIES NEW HOSPITALS EDUCATION AND PUBLIC HEALTH)

### CALIFORNIA

**Dr Halverson Named State Health Officer**—The governor has appointed Dr Wilton L Halverson health officer of Los Angeles County as state health officer to succeed Dr Bertram P Brown Sacramento. Dr Halverson who has held the Los Angeles position for more than a year formerly served as health officer of Pasadena for seven years. Born in Litchfield Minn. Dr Halverson graduated at the College of Medical Evangelists Loma Linda in 1929.

**Woman Named Director of State Institutions**—Mrs Doia Shaw Heffner Los Angeles has been named state director of institutions to succeed Dr Fred O Butler medical director and superintendent of the Sonoma State Home Eldridge who has been acting director since the resignation of the late Dr Aaron I Rosanoff newspapers report. In announcing the appointment Governor Warren is reported to have said that Mrs Heffner has long been identified with institutional probationary and human relations activities in Southern California as an attorney and a doctor of administration of social service. From 1936 to 1938 Mrs Heffner was referee of the Los Angeles Juvenile Court where she is now superior court commissioner.

**Psychiatrist Needed**—A psychiatrist is being sought by the Los Angeles County Civil Service Commission for a position with the Los Angeles County Hospital to render professional medical services in the diagnosis care and treatment of patients under observation for mental and nervous diseases. Physicians under 55 years of age whether residents of Los Angeles County or not who have graduated with an M.D. degree from an approved medical school and who have completed at least a one year internship in an approved hospital are eligible for this position. The salary will be \$235 a month. Full information may be obtained from the office of the commission Room 102 Hall of Records Los Angeles and applications must be filed not later than February 17.

**Dr Housman Paroled**—The San Francisco Examiner recently reported that the state board of prison terms and paroles had granted a parole from San Quentin to Dr Nathan S Housman San Francisco effective Dec 18 1942. Dr Housman was charged with failure to keep accurate records of narcotic sales. He entered San Quentin Nov 4 1941 to serve a one to fourteen year sentence for perjured testimony at his trial (THE JOURNAL Dec 13 1941 and Jan 24 1942). The board of prison terms and paroles fixed his sentence at five years and granted him a home and care parole effective after he served eighteen months minus time off for good behavior. When able to work after recovery from a minor operation Dr Housman will take a position approved by the parole board it was stated.

### COLORADO

**Harvey Sethman Enters Military Service**—Harvey T Sethman Denver executive secretary of the Colorado State Medical Society and managing editor of the Rocky Mountain Medical Journal for the past fourteen years was called to active duty as captain medical administrative corps, Army of the United States, February 1. He will be on leave of absence from his position with the society for the duration of his military service. Until further notice during Mr Sethman's absence the executive office and staff of the society and its publications including the Rocky Mountain Medical Journal will be in charge of the following persons, all of Denver.

Dr John S Bouslog secretary Colorado State Medical Society 537 Republic Building

Dr Lyman W Mason acting editor Rocky Mountain Medical Journal 537 Republic Building

Miss Helen Kearney assistant secretary Colorado State Medical Society and business manager Rocky Mountain Medical Journal 537 Republic Building

The trustees request that addresses for official correspondence and exchange journals be appropriately changed noting that the location and mailing address of the society and its journal remain at 537 Republic Building Denver as in the past.

### CONNECTICUT

**Edgar Allen Dies**—Edgar Allen, Ph.D., New Haven, professor and chairman of the department of anatomy at Yale University School of Medicine and director of graduate studies, died, February 3, aged 50, of an acute attack of heart disease reportedly while patrolling the Connecticut shoreline in a Coast Guard auxiliary craft. Dr Allen was born in Canon City on May 2, 1892. He graduated at Brown University in 1915 with the degree of bachelor of philosophy later receiving there the A.M., Ph.D. and Sc.D. degrees. Assistant in biology at Brown from 1913 to 1915 and assistant in embryology and neurology from 1915 to 1917 Dr Allen served the United States Fisheries Bureau as an investigator at Woods Hole Mass. during the summer of 1919 and at Fairport, Iowa during the summer of 1922. From 1919 to 1923 he served at Washington University School of Medicine St. Louis first as instructor and then as associate in anatomy and for a time as secretary of the faculty. He became professor of anatomy at the University of Missouri School of Medicine in 1923, serving as dean from 1930 to 1933, when he joined the faculty of Yale as professor of anatomy.

An associate member of the American Medical Association, Dr Allen held memberships in a number of scientific societies including the American Association for the Advancement of Science the Society of Experimental Biology and Medicine American Society of Zoologists Phi Gamma Delta and Phi Beta Pi. In 1941 he was chosen president of the Association for the Study of Internal Secretions and in 1942 president of the American Association of Anatomists for a two year term. He was vice president of the latter group in 1931. During World War I Dr Allen served in the U.S. Army from May 1917 to February 1919 first as a private and later as a second lieutenant.

He had made extensive contributions to the literature and at one time was a member of the editorial board of *Endocrinology*. Dr Allen made noteworthy contributions to the fields of anatomy and physiology of reproduction and in 1941 was awarded the Baly Medal of the Royal College of Physicians London in recognition of his work on estrogens. With Drs J. P. Pratt and Q. U. Newell Dr Allen is credited with obtaining the first unfertilized human ovum to be recovered from the uterine tubes and definitely identified.

### DISTRICT OF COLUMBIA

**Dr Ives Dies**—James E. Ives, Ph.D., for many years physicist with the U.S. Public Health Service died January 1 of injuries received when he was struck by a street car. He was 77 years of age. He was physicist in the Office of Industrial Hygiene and Sanitation of the public health service from 1921 to 1931 when he became senior physicist. Dr Ives retired in 1936.

**Supreme Court Refuses to Assume Jurisdiction on Validity of Birth Control Law**—In an opinion which did not discuss the merits of the Connecticut laws the United States Supreme Court February 1, refused to assume jurisdiction to pass on the validity of the Connecticut birth control law because of the circumstances under which the case was presented to it. The case was brought before the Supreme Court by Dr Wilder Tileston David P. Smith clinical professor of medicine Yale University School of Medicine New Haven Conn. supported by hundreds of physicians and was an appeal from a decision of the Connecticut Supreme Court of Errors that it was illegal for a physician to prescribe the use of contraceptives even if he believed a married woman's life might be jeopardized by pregnancy. In the recent opinion the Supreme Court said that Dr Tileston was not the proper person to bring the suit because his own life had not been endangered by the state statutes. The decision of the Supreme Court led lawyers to believe that another proceeding could be instituted by patients asserting that the anticontraceptive laws would jeopardize their lives according to newspaper reports.

### ILLINOIS

**Sputum Specimen Not Required to Obtain Sulfonamides**—The state department of health has announced that sulfonamide drugs for the treatment of pneumonia will be furnished free to the physicians of Illinois without requiring a specimen of sputum for typing. Physicians will now be able to institute sulfonamide therapy immediately on making a diagnosis of pneumonia. Type specific antipneumococcus serum of necessity will be available only after the type has been determined. At the request of any physician the state department will send from Springfield one bottle of sulfathiazole together with a case report form. On the return of the completed case report indicating that the drug has been used in the treatment of

pneumonia another bottle will be sent. Serum centers and typing stations will continue to distribute serum and sulfonamide compounds under the same policy as in the past and require sputum typing as in the past. The requirement for a sputum specimen, adhered to in the past, was eliminated by the state department of health to conserve the time of physicians in civilian practice whose work has increased.

**Meeting of Bacteriologists**—The winter meeting of the Society of Illinois Bacteriologists will be held at the Chicago Union February 19. Mr. Howard E. Lind, Chicago, senior bacteriologist, Illinois Department of Public Health, will present a paper on "Observations on Variant Types of *C. Diphtheriae*." John C. Carey, Ph.D., bacteriologist, research laboratory, Hiram Walker & Sons, Inc., Peoria, will read a paper on "Some Factors Affecting the Microbiological Assay for Nicotinic Acid," the co-authors are J. C. Bauernfeind, Ph.D. and Clair S. Boruff, Ph.D., Peoria. Dr. Francis B. Gordon, associate professor of bacteriology, University of Chicago School of Medicine, will read a paper on "Studies on the Problem of Insect Transmission of Poliomyelitis," the co-authors of which are Frank M. Schabel, Ph.D., Harold R. Reames, Ph.D., and Mary E. Snow.

#### Chicago

**Public Forum on Cancer**—A public forum on Chicago cancer problems will be held at the John B. Murphy Memorial Auditorium February 16, under the auspices of the Chicago Cancer Committee, Inc. Dr. Bowman C. Crowell, associate director of the American College of Surgeons, will act as moderator. The tentative program includes the following speakers:

Dr. Ludwig Hektoen, chairman of the committee. The Program of the Chicago Cancer Committee.  
Dr. James P. Simonds, Hospital Facilities for Care of Cancer Cases and Instruction on Cancer to Medical Students—Report of New Survey.  
Dr. Herman A. Bundesen, Cancer Mortality Statistics in Chicago and the Nation.  
Dr. Rollo K. Packard, Relation of the Chicago Hospital Council to the Cancer Problem.  
Mary E. Westphal, R.N., director, Visiting Nurse Association of Chicago Home Care of Cancer Cases.  
Dr. Alexander Brunschwig, Cancer Research in Chicago.  
Mrs. Arthur I. Edison, Local Program of the Women's Field Army.  
Dr. Raymond V. Brokaw, Springfield, Ill., subject to be announced later.

A period for questions and answers pertaining to subjects that have been presented will be provided following the discussions.

#### INDIANA

**Educational Conference on Industrial Health**—The committee on industrial health of the Indiana State Medical Association will hold a two-day conference on industrial health in Indianapolis, February 25-26, to train physicians for war industries. The program will include the following speakers:

Dr. Carey P. McCord, Detroit, Organization and Cost of Medical Services in Industry.  
Dr. Frederick B. Wishard, Anderson, Preemployment Examinations.  
Dr. George S. Bond, Indianapolis, Criteria in the Evaluation of Abnormal Hearts.  
Mr. Andrew T. Court, Detroit, Comments on Sickness Absenteeism.  
Dr. Milton H. Kronenberg, Chicago, Women in Industry.  
Dr. Adolph G. Kammer, East Chicago, Tuberculosis Control in Industry.  
Dr. Harold A. Vonachen, Peoria, Ill., Syphilis Control in Industry.  
Mr. Albert Stump, Indianapolis, Legal Responsibilities of the Industrial Physician.  
Dr. Lewis Schwartz, Bethesda, Md., Diagnosis, Treatment and Prevention of Industrial Dermatoses.  
Dr. Leroy U. Gardner, Saranac Lake, N. Y., Diagnosis of Silicosis.

The dinner session Thursday evening will be addressed by J. J. Bloomfield, Bethesda, Md., sanitary engineer, U. S. Public Health Service, "Industrial Hygiene in War Production" and Dr. Clarence D. Selby, Detroit, "A War to Win." On Friday a symposium on lead poisoning will be conducted by:

Dr. Robert A. Kehoe, Cincinnati, Experimental Studies on Lead Absorption and Excretion in Human Subjects and Their Relationship to the Diagnosis and Treatment of Lead Poisoning.  
Rolla N. Harger, Ph.D., Indianapolis, Measurement of Industrial Lead Exposure by Air Analysis.  
Mr. Jacob Cholak, Cincinnati, Measurement of Industrial Lead Exposure by Analysis of Blood and Excreta of Workmen.

A symposium on industrial injuries, with the following participants, will conclude the session:

Dr. Edmond O. Alvis, Indianapolis, Essentials on First Aid and Later Management of Industrial Eye Injuries.  
Dr. Sumner L. S. Koch, Chicago, Prevention and Treatment of Hand Infections.  
Dr. William V. Woods, Indianapolis, Back Injuries.  
Dr. Harold M. Trusler, Indianapolis, Treatment of Burns.  
Dr. George J. Garceau, Indianapolis, Treatment of Fractures.

The program is part of a plan whereby the state committees on procurement and assignment and on industrial health may assist industry in solving the medical procurement problems of industry. The entire program is designated as Indiana's Emergency Educational Plan in Industrial Health.

#### IOWA

**New Director of Venereal Disease Control**—Dr. Andrew C. Woolfer, Hot Springs, Ark., has been assigned to Iowa by the U. S. Public Health Service to direct the state's venereal disease program during the war period. He succeeds Dr. Regnar M. Sorenson, who is now on active duty with the reserve corps of the public health service at the state board of health, Topeka.

**Pneumococcus Study Course**—The state department of health will conduct a pneumococcus study course in the Medical Laboratories Building, Iowa City, February 16-18, the eighth of these courses to be held in the last four years. Financed by the U. S. Public Health Service, the course will be under the direction of Dr. Milford E. Barnes, Iowa City. Emphasis will be placed on bacteriologic diagnosis, including the Neufeld method and the technique of mouse inoculation.

**Eli Lilly Medal Awarded to Harland Wood**—The Eli Lilly and Company Research Award for 1942 was presented to Harland G. Wood, Ph.D., since 1936 research assistant in bacteriology at the Iowa State College of Agriculture and Mechanic Arts, Ames, January 28, at a joint meeting of the Iowa State College Branch of the Society of Sigma Xi and the North Central Branch of the Society of American Bacteriologists. Dr. Wood was selected for the award on the basis of his contributions to bacterial physiology. Dr. Wood was born on Sept. 2, 1907, in Mankato, Minn. He received the A.B. degree from Macalester College, St. Paul, in 1931 and the Ph.D. in physiologic bacteriology at Iowa State College in 1935. During 1935-1936 Dr. Wood was the holder of a National Research Council fellowship at the University of Wisconsin. The Lilly award consists of \$1,000 and a bronze medal. It is offered by Eli Lilly and Company to a young man or woman under 35 years of age who has made outstanding contributions to knowledge in the fields of bacteriology or immunology while conducting investigative work in a noncommercial research or educational institution in the United States or Canada. The recipient is chosen by an award committee composed of members of the Society of American Bacteriologists, the American Association of Immunologists and the American Society for Experimental Pathology.

#### KANSAS

**Immunization Program in Wichita**—The city of Wichita recently conducted a citywide immunization program to protect children against smallpox and diphtheria. The program was sponsored by the Sedgwick County Medical Society, the county and city health departments and the state board of health. About 8,000 children received the immunization treatment.

**Personal**—Mr. Clarence V. Beck, Emporia, has been named the new attorney for the Kansas State Board of Medical Registration and Examination to succeed Mr. Theo I. Varner, Independence, who is in military service. Mr. Beck was attorney general of the state from 1935 to 1939 and previous to that was county attorney of Lyon County for several terms.

**Accidental Deaths**—A provisional total of 1,349 accidental deaths has been reported for Kansas during 1942. Home accidents accounted for 537 deaths, motor vehicle 365, occupational 228 and public (other than motor vehicle) 219. In 1941 the total of accidental deaths was 1,427, with motor vehicle leading with 537, home 517, public (other than motor vehicle) 190 and occupational 183. Comparing the two years as to types of accidental deaths, there was an increase of accidental deaths except motor vehicle in which a decrease of 172 was recorded. During 1942 Kansas averaged 1 motor vehicle death a day, the lowest number ever recorded since this study was initiated, according to the *News Letter* of the state board of health.

#### MARYLAND

**Dr. Hussey Named Director of Industrial Hygiene Laboratory**—Dr. Raymond Hussey, associate professor of medicine, Johns Hopkins University School of Medicine, Baltimore, and a member of the Council on Industrial Health, American Medical Association, Chicago, has been appointed scientific director of the new Army Industrial Hygiene Laboratory at Johns Hopkins University School of Hygiene and Public Health (THE JOURNAL February 6, page 446). The laboratory will operate under the direction of the occupational hygiene branch of the preventive medicine division of the Office of the Surgeon General of the Army. Dr. Hussey was born in Greensboro, N. C., in 1883 and graduated at Johns Hopkins in 1911. At different times he has been associate in pathology and biophysics at the Rockefeller Institute, assistant professor of pathology at Cornell University Medical College and associate professor at Yale University School of Medicine. He has held concurrent appointments at the University of Maryland School of Medicine and at Johns Hopkins since 1936.



## MICHIGAN

**Keratoconjunctivitis Made Reportable**—The Detroit Department of Health has placed keratoconjunctivitis on its list of reportable diseases, according to *Detroit Medical News*.

**New County Health Unit**—Approval was given on January 4 to the establishment of a new health department in St. Clair County. The new unit will bring the total of counties in the state having full time health services to sixty-seven, leaving only sixteen counties without these services. The first county health department in the state was established in 1927 in Oakland County.

**State Society President Named to Professorship**—The board of regents of the University of Michigan recently appointed Dr. Howard H. Cummings, Ann Arbor, chairman of the department of postgraduate medicine and professor of postgraduate medical education. Dr. Cummings who graduated at the University of Michigan Medical School in 1910 is president of the Michigan State Medical Society.

**Personal**—Dr. Andrew P. Biddle, Detroit, honor member of the Wayne County Medical Society, was elected president of the Detroit Library Commission at its annual meeting January 5, he has been a member of the commission for seventeen years.—Dr. Martin H. Hoffmann has resigned as director of the psychiatric clinic at Eloise Hospital and Infirmary and head of the county psychopathic parole clinic at Eloise.

## MINNESOTA

**Dr. Blalock to Give Judd Lecture**—Dr. Alfred Blalock, Baltimore professor of surgery at Johns Hopkins University School of Medicine and director of the department of surgery, Johns Hopkins Hospital, will give the tenth F. Starr Judd Lecture at the University of Minnesota Medical School, Minneapolis in the Museum of Natural History Auditorium March 11. The subject of Dr. Blalock's lecture will be "Traumatic Shock with Particular Reference to War Injuries." The late Dr. Edward Starr Judd, Rochester, an alumnus of the medical school, established the annual lectureship in surgery a few years before his death in 1935.

**Minnesota Medicine Observes Twenty-Fifth Anniversary**—A special issue of *Minnesota Medicine* in January marked the twenty-fifth anniversary of its founding. The issue contains articles on the development of medicine in Minnesota and the progress of the specialties. The journal had its inception with the appointment of a committee at a meeting of the state medical society in 1916 in Minneapolis. The first issue bearing the title *Minnesota Medicine* was published in January 1918. When the first editor Dr. Ernest F. I. Richards, St. Paul, resigned in 1919 Dr. Carl B. Drake, St. Paul, was appointed to succeed him and still serves in this capacity.

## MISSOURI

**Personal**—Dr. J. Lee Harwell, Poplar Bluff, was appointed to the city board of health on December 30. Drs. Alfred R. Rowe and Walter L. Brandon, Poplar Bluff, are the other members of the board.—Dr. Carl V. Moore, St. Louis, has been appointed an assistant editor of the new journal *Nutrition Reviews*.—Dr. Elmer E. Glenn, Springfield, was recently chosen president of the Missouri Tuberculosis Association at its meeting in St. Louis.

**Ophthalmologists to Return Portion of Fees to Colleagues in Armed Services**—Members of the St. Louis Ophthalmic Society recently announced the adoption of a resolution signifying their agreement to remit for the duration of the emergency to every ophthalmologist in the society serving in the armed forces one half of any and all income derived from professional services to patients of the absent physician. Patients will also be encouraged to return to their own physicians when they reenter practice after the war.

## NEW JERSEY

**Physician Heads Child Care Committee**—Announcement has been received of the recent appointment of Dr. Ellen C. Potter, Trenton, as director of medicine and chairman of the child care committee of the Office of Civilian Defense Director of the State of New Jersey. Others on the committee include Dr. Julius Levy, Newark, consultant to the bureau of maternal and child health, state department of health, and representatives from the state department of public instruction, the state department of labor and various agencies of social work concerned with child welfare.

**Sale of Vitamins Curbed**—The New Jersey Board of Pharmacy announced on January 28 that vitamin preparations that are sold exclusively as foods or food accessories and the labels of which bear no directions for use in the prevention,

mitigation or cure of disease must be labeled "not for medical use" when sold in New Jersey. Otherwise the board will consider the vitamin products as coming within the classification of drugs and medicines within the meaning of the pharmacy act. It was announced in the *New York Times*. A properly balanced diet is the best source of necessary vitamins, it was stated, and it is up to physicians to decide if and when vitamins are needed for the treatment or prevention of disease, and in such cases the concentrated vitamins in the usual capsule form in proper dosage may be prescribed and, of course, in such cases they are drugs.

## NEW YORK

**Chemical Warfare**—A postgraduate course on the medical aspects of chemical warfare will be conducted for the Tompkins County Medical Society at the county memorial hospital, Ithaca, February 16 under the auspices of the committee on public health and education of the state medical society and the health preparedness commission of the state war council. The speakers will be Neal E. Artz, Ph.D., Syracuse, and Dr. John J. Bourke, Albany.

## New York City

**The Harvey Lecture**—Dr. William J. Robbins, director of the New York Botanical Gardens, will deliver the fifth Harvey Society Lecture of the current series at the New York Academy of Medicine February 18. His subject will be "Some Internal Factors Limiting Growth."

**The Brickner Lecture**—Dr. Martin Silberberg, assistant in pathology, New York University College of Medicine, will deliver the eleventh Walter M. Brickner Lecture at the Hospital for Joint Diseases February 26 on "The Influence of the Endocrine Glands on Growth and Ageing of the Skeleton."

**Rheumatism Organization Formed**—The New York Rheumatism Association was formally organized January 22 to unite physicians in New York and environs who are interested in arthritis and rheumatic disorders to improve the treatment of patients with arthritis, particularly those attending the arthritis clinics in Greater New York and to stimulate research on these disorders. Officers are Drs. Russell L. Cecil, president; Martin H. Dawson, vice president, and Edward F. Hartung, secretary-treasurer.

## NORTH CAROLINA

**Physician Reported Missing in Action**—Lieut. (j.g.) Walter Earl Brown, M.C.U.S.N., formerly of Rocky Mount, has been reported missing in action in the performance of his duty and in the service of his country, newspapers recently announced.

## OHIO

**Changes in Health Officers**—Dr. James F. Wilson, Washington Court House, health commissioner of Fayette County and secretary for many years of the Fayette County Medical Society, has been appointed health commissioner of district number four of the Michigan Department of Health with headquarters in Rogers City, Mich.—Dr. Hazellett A. Moore, Oxford, chairman of the Butler County Board of Health since 1939, has been appointed health commissioner of the county. He succeeds Dr. Clifford I. Bildridge who resigned.

## TEXAS

**State Health Officer Reelected**—Dr. George W. Cox, Austin, was recently reelected state health officer for a two year term beginning January 1. He has held the position for six years.

**Personal**—Dr. Marie Elizabeth F. Gentry was recently named director of the maternal and child health division of the Austin City Health Department, succeeding Dr. William W. Kelton, Jr. who has entered the army air corps.—Dr. Pratt June Byars, Fort Worth, was recently named medical adviser of the Texas League for Planned Parenthood. Dr. Byars recently returned to Texas after three years at the Massachusetts Memorial Hospitals, Boston.

**Pharmacologist Becomes Professor of Medicine**—Dr. Raymond L. Gregory has relinquished his professorship of pharmacology at the University of Texas Medical Branch, Galveston, to accept an appointment as professor of medicine and director of the outpatient clinic and continuation courses at the school. Chas. D. Lerke, Ph.D., dean of the school and formerly professor of pharmacology at the University of California Medical School, San Francisco, will temporarily assist in teaching pharmacology at the medical school with Dr. Gregory and other members of the staff.



## GENERAL

**New Editorial Board for Endocrinology**—A new editorial board has been announced for *Endocrinology*. Members are Dr John S L Browne, department of medicine McGill University Faculty of Medicine Montreal Canada Earl T Engle, Ph D, department of anatomy, Columbia University College of Physicians and Surgeons, New York, Carl G Hartman, Ph D, department of zoology, University of Illinois Urbana Ill, Edward C Kendall, Sc D, division of biochemistry, Mayo Clinic, Rochester Minn Fred C Koch Ph D, department of biochemistry, University of Chicago Dr Cyril N H Long, department of physical chemistry, Yale University School of Medicine, New Haven, Conn, and Dr Harry B van Dyke, Squibb Institute for Medical Research, New Brunswick, N J. The managing editor is Dr Edwin B Astwood of the departments of medicine and pharmacology, Harvard Medical School, Boston the associate managing editor is Edward W Dempsey, Ph D, of the department of anatomy of Harvard. A statement of the new policies for the journal appears in the February issue of *Endocrinology*.

**Adjustments of Wages of Hospital Employees**—By General Order No 26 adopted by the National War Labor Board, January 22 adjustments in the wages or salaries of employees engaged in rendering hospital services and employed by nonprofit organizations maintaining and operating hospitals will be deemed approved without submission to the board provided such adjustments do not raise the wages or salaries beyond the prevailing level of compensation for similar services in the area or community. Monthly reports of such adjustments must be submitted to the Division of Review and Analysis of the National War Labor Board, together with such information and data as the division or the board may from time to time require. Such adjustments as are made will be subject to the board's ultimate right of review on its own initiative, but any modification or reversal of the adjustments will not be retroactive. On the other hand, adjustments which will have the effect of raising the wages or salaries above the prevailing level of compensation for similar services in the area must be submitted for approval by the board in the usual manner.

**Follow-Up on White House Conference on Children**—A summary of the two and one-half year follow up program of the White House Conference on Children in a Democracy sponsored by the National Citizens Committee, has just been published. The program, which has been financed by short term grants, ended on January 1. The New York Office has been closed, but the National Citizens Committee will remain intact so that it can be called together when independent citizen action is called for. Miss Katharine F Lenroot Washington, D C, chief of the Children's Bureau, U S Department of Labor, and executive secretary of the White House Conference, has agreed to take over responsibility for correspondence and cooperation with state White House Conference committees and with national organizations in the follow-up program. Miss Lenroot has assigned the responsibility follow up within the bureau to Emma O Lundberg, who has been associated with previous White House Conferences and served as assistant secretary of the 1940 conference. All future correspondence concerning the follow-up program of the White House Conference should be sent directly to Miss Emma O Lundberg, Children's Bureau U S Department of Labor, Washington, D C. The National Citizens Committee was one of two appointed by the 1940 White House Conference on Children to implement its one hundred recommendations in the field of education child health and social welfare. The other, the Federal Interagency Committee, was formed to bring about a working relationship among all the federal offices in any way concerned with children. The report mentions that state follow-up committees were initiated in Arizona Arkansas, California, Colorado Connecticut, Delaware Florida, Indiana, Kansas, Louisiana Massachusetts Minnesota, Montana Nebraska, Nevada North Carolina Ohio Oklahoma Oregon South Carolina, Texas Utah Vermont, Virginia, Washington Wisconsin Wyoming and Puerto Rico and as a result of these activities improvement in considerations in child care was effected in nearly every state program. As a result of its 1941 state White House Conference the Nevada Committee was largely responsible for improvement in adoption laws and legal control for interpartum examinations for venereal disease. The Ninth Regional Conference sponsored by Florida's Committee resulted in the increase of state appropriations for the Aid to Dependent Children funds from \$140,000 to \$2,000,000. The report indicates that the work of the committee was instrumental in bringing about more concentrated programs

throughout the country. During its two and one-half year existence it has worked toward the objectives for which it was created: appropriation and dissemination of educational material working for the cooperation of national organizations in furthering the objectives of the 1940 White House Conference, cooperation with governmental agencies in matters relating to the follow-up program and assistance in the development of state territorial programs adapted to the needs and interests of the state.

**Tropical Medicine Study Begins at Army Medical School**—The Association of American Medical Colleges has made available a list of those taking the course of tropical medicine at the Army Medical School Washington D C under the sponsorship of the association with the financial aid of the John and Mary R Markle Foundation.

Donald C A Butts Sc D Georgetown University School of Medicine Washington D C  
William H Hendlee Ph D Indiana University School of Medicine Indianapolis  
John F Kessel Ph D University of Southern California School of Medicine Los Angeles  
Dr Harry L Douglas University of Kansas School of Medicine Kansas City  
Dr Omar John Fareed University of Chicago School of Medicine  
Dr William C Black University of Colorado School of Medicine Denver  
Robert Barton Dienst Ph D University of Georgia School of Medicine Augusta  
Dr Morris H Brodkey Creighton University School of Medicine Omaha  
Mabel S Ingalls Ph D Albany Medical College Albany N Y  
Dr William Mc D Hammon University of California Medical School San Francisco  
Dr Raymond M Hill College of Medical Evangelist Los Angeles  
Dr Roswell Dorr Johnson Yale University School of Medicine New Haven Conn  
Dr Arthur J Merrill Emory University School of Medicine Atlanta Ga  
Dr Robert C Lowe Louisiana State University School of Medicine New Orleans  
Dr Matthew A Derow Boston University School of Medicine  
Dr William Charles McCarthy Tufts College Medical School Boston  
Dr Robert A Hettig University of Michigan Medical School Ann Arbor  
Dr Thomas H Hunter Columbia University College of Physicians and Surgeons New York  
Dr Thomas P Almy Cornell University Medical College New York  
Dr Howard B Shavin University of Rochester School of Medicine and Dentistry Rochester N Y  
Dr Bertram S Levinson Syracuse University College of Medicine Syracuse N Y  
Dr Donald S Martin Duke University School of Medicine Durham N C  
Dr Henry E Wilson Jr Ohio State University College of Medicine Columbus  
Dr Victor A Diglio Woman's Medical College of Pennsylvania Philadelphia  
Dr Henry Packer University of Tennessee College of Medicine Memphis  
Dr William H Grant Meharry Medical College Nashville Tenn  
Dr Wilton M Fisher Baylor University College of Medicine Dallas Texas  
J Carleton Casey Ph D University of Virginia Department of Medicine Charlottesville  
Dr John W Scott University of Alberta Faculty of Medicine Edmonton Canada  
Dr George T Harrell Jr Bowman Gray School of Medicine Wake Forest College Winston Salem N C

## LATIN AMERICA

**Courses in Tropical Diseases at Havana**—The University of Havana will offer courses in tropical diseases for physicians of the United States armed forces under an arrangement with the American military authorities, newspapers reported January 16.

**Pediatrician Honored**—"Morquio Dav' was observed by the Uruguayan Pediatric Society Sept 24 1942, commemorating the seventy-fifth anniversary of the birth of Dr Luis Morquio the founder of the society. A memorial service was held at the foot of the Morquio monument.

## FOREIGN

**New Director of Lister Institute**—Dr Alan N Drury, Huddersfield lecturer in special pathology at the University of Cambridge and a member of the scientific staff of the Medical Research Council will become director of the Lister Institute, London March 31 on the retirement of Sir John C G Ledingham. The latter has held the position since 1936.

**Personal**—Dr Henry S Souttar London, chairman of the council of the British Medical Association and chairman of the Central Medical War Committee has been made chairman of a mission to report on the medical services for the armed forces in India according to *Science*. During his absence Dr Ralph M F Picken, Cardiff, Wales has been appointed acting chairman of the council.

## Foreign Letters

### LONDON

(From Our Regular Correspondent)

Dec 26, 1942

#### Increase of Tuberculosis in Belgium

The Swedish Committee for the Relief of Belgian Children received during November a report that the food situation in Belgium is heading for a catastrophe. It is generally estimated that 2,725 calories is the minimum necessary for maintenance of life. When the committee began to work in the autumn of 1941 the number consumed in Belgium averaged 1,300. Since then the situation has persistently deteriorated, and according to official figures the number of calories dropped to 886 in July 1942 and rose temporarily to 920 in August.

The effect of this undernourishment is appalling. It has produced an alarming increase in tuberculosis, especially among young persons and children. It is evident that if improvement of diet does not take place tuberculosis will become rife in the whole population and weaken the race. For those who have small fixed incomes it has become almost impossible to buy the few commodities still for sale, because of the increase in price.

#### Scientific Journals for Enemy Prisoners of War

A request for scientific journals made in the *British Medical Journal*, the scientific journal *Nature* and the *Nation* in order that they may be supplied to enemy prisoners of war has met with the following response. Fifty-eight people have sent 2,170 reprints and journals and 34 books on technical and scientific subjects for the use of scientists and physicians who are prisoners in British hands. The papers have been classified according to subjects. The special interests of the prisoners in the various camps are known, and parcels containing 956 papers and journals have been sent to 32 camps. So far only a small part of the demand has been met.

Those willing to contribute journals, reprints of books on scientific, technological or medical subjects are asked to send them to John R. Baker, Burnt Oak, Kington, near Oxford, to write their name and address on the outside of the parcels with the letters 'S P P' (scientific papers for prisoners) and to be patient in awaiting acknowledgment, as the classification and packing have to be done by Mr Baker and his wife in the time they can spare from work and civil defense service. The S P P has the approval of all the authorities concerned with the welfare of enemy prisoners of war.

#### A Safety Hat for Women War Workers

There has been no compulsory style of head dress for women working at machines in war factories, so that many have allowed vanity to override safety, with the result that hundreds of accidents have occurred from hair being caught in the machines. Careful research has been devoted to the production of caps which would be safe, but women have refused to wear them because they were not sufficiently becoming, detrimental to the hair style or uncomfortable. The directorate of a group of thirty factories therefore approached the workers and asked them to put forward their own ideas on the subject. A competition was promoted of which the conditions were that the hat should be attractive and comfortable, contain the worker's hair with a high degree of safety, be hygienic and easily laundered, and have no loose ends. Several hundred designs were submitted. A panel of judges, consisting of a government inspector of factories and four women, selected twenty designs. They took into account the suitability of the design for manufacture in quantity as well as the amount of safety. The winning design came from a woman, to whom a prize of \$250 was

awarded. It is a neat fitting hat, which, viewed from the front has a trace of military smartness but for the rest is mainly of the fish net type, enclosing the hair, yet cool to wear.

#### The War Work of the Society of Friends

Though the Society of Friends cannot reconcile war with their religious beliefs, they have in this war, as in the previous great war, devoted energy and resources to the relief of the suffering produced and shared much of the danger of the combatants. In the Middle East they have a unit of more than 150 members, some of whom are working under the auspices of the British Red Cross, especially on mobile surgical units. They manned a hospital at Tobruk until that place fell. The report on the third year's work describes the establishment of mobile clinics in Syria to which Moslem, Christian and Druse resort, the distribution of medical supplies on the Burma Road, the salvage of \$600,000 worth of medical supplies from the Rangoon docks when the Japanese were closing in and their transport for 3,000 mules into the northern provinces of China, the provision of surgical aid for the raided towns of Burma, sending surgical teams to help the Chinese on the Yunnan front, organization of first aid posts in view of possible air raids on Indian cities and sending forty men including two doctors for medical work in outlying regions of Ethiopia, where there are few facilities for combating the high incidence of sickness. A unit for work in the emergency medical service and other hospitals in England is also mentioned.

#### Sir Norman Walker

The death of Sir Norman Walker has removed a leading figure in the medical profession. Born in 1862, he graduated at the University of Edinburgh in 1884. After a few years in general practice he returned to Edinburgh in 1890 and spent the next few years in postgraduate study. He was attracted to dermatology and in 1892 was appointed assistant physician for diseases of the skin at the Edinburgh Royal Infirmary. He was also appointed lecturer on dermatology at the university. He visited the continent and became a disciple of P. G. Unna of Hamburg, whose pioneer work *The Histopathology of Diseases of the Skin* he translated from the German. Unna, with whom he was on intimate terms, expressed himself as fortunate in his translator. He also translated from the Norwegian Hansen and Looft's 'Leprosy in Its Clinical and Pathological Aspects'. In 1899 he published his most successful 'Introduction to Dermatology,' which went through ten editions. He had great aptitude for administration and in 1907 was elected representative for Scotland on the General Medical Council, of which he became president in 1931. On behalf of the council he paid two visits to India, where he inspected all the medical colleges and several of the numerous medical schools. From 1929 to 1931 he was president of the Royal College of Physicians of Edinburgh. He was also editor of the *Scottish Medical and Surgical Journal* and of the *Edinburgh Medical Journal*. He has left three sons, of whom, one, Dr E. R. C. Walker, is a prisoner of war.

## Marriages

WILLIAM WATT HOBACK, Bethesda, Md., to Miss Sara Florence Crockett of Hillcrest, Va., December 21.

THOMAS FOSTER WHITEHEAD, Richmond, Va., to Miss Gladys Pearl Jenkins of Frostburg, Md., December 26.

RAYMOND RIVKIN, Jamaica N. Y., to Miss Helen Goldstein of Tampa, Fla., in Jacksonville, Fla., in October.

JOSEPH E. ACKER, JR., Knoxville, Tenn., to Miss Elizabeth Chase Gutch of Palo Alto, Calif., November 19.

EDWIN BROOKS WERKHEISER, Shreveport La., to Miss Nellie Sue McNeil of Philadelphia, Miss., October 1.

## Deaths

**Harry Bond Wilmer** ☉ Philadelphia, University of Pennsylvania Department of Medicine, Philadelphia, 1906 associate professor of allergy at the Medico Chirurgical College Graduate School of Medicine, University of Pennsylvania specialist certified by the American Board of Internal Medicine member of the American Association for the Study of Allergy and the American Clinical and Climatological Association, fellow of the American College of Physicians, served as a captain in the medical corps of the U S Army and was stationed at Base Hospital number 10 during World War I, director of medical services and physician in chief, department of allergy Abington (Pa.) Memorial Hospital associate physician and chief, department of allergy, Presbyterian Hospital, aged 58, died, January 16, of heart disease

**Arthur Julius Skeel**, Cleveland University of Wooster Medical Department Cleveland 1897, member of the Ohio State Medical Association formerly professor of anatomy and lecturer on obstetrics at the Cleveland College of Physicians and Surgeons, past president of the Ohio Obstetric Society, president of the Cleveland Academy of Medicine in 1925, served as president of the Hospital Obstetric Society of Ohio, fellow of the American College of Surgeons, a founder of the obstetric outpatient dispensary, consulting obstetrician and for twenty-eight years directing head of the department of obstetrics at St Luke's Hospital, where he died, December 7, of lobar pneumonia, coronary sclerosis and hypertensive cardiovascular disease, aged 68

**George B Kunkel**, Harrisburg Pa., University of Pennsylvania Department of Medicine, Philadelphia 1893 member of the Medical Society of the State of Pennsylvania fellow of the American College of Surgeons, served during World War I on the staffs of the State Hospital for Crippled Children, Elizabethtown, the Harrisburg, Harrisburg State, Harrisburg Polyclinic and the Keystone hospitals, served as president of the Pennsylvania Railroad Surgeons' Association and as surgeon for the Philadelphia and Reading Railroad, for many years a trustee of the Gettysburg (Pa.) College, aged 74 died, December 22, of pulmonary embolism

**Fred L Adams**, Wesley, Iowa State University of Iowa College of Medicine, Iowa City, 1898 formerly a druggist, aged 69 died, December 14, of cerebral hemorrhage and arteriosclerosis

**Mary Alice Asserson**, New York Cornell University Medical College, New York 1901 served as assistant university physician and on the staff for twenty-four years at Teachers College, Columbia University, for many years connected with the health department of New York, at one time secretary of the children's service of the New York Tuberculosis and Health Association, aged 71, died, January 10, of carcinoma of the liver

**Charles E Bayan**, Chester, Ark (licensed in Arkansas in 1903), member of the Arkansas Medical Society, aged 57, died, November 25, in the Veterans Administration Facility, Fayetteville, of carcinoma

**Pern Jefferson Bidwell**, Toledo, Ohio, Starling Medical College, Columbus, 1904 served during World War I on the staffs of the Lucas County and St Vincent's hospitals, aged 63, died, December 23, of coronary occlusion

**George A Blaylock**, Perryville Mo Barnes Medical College, St Louis, 1903 member of the Missouri State Medical Association, past president and secretary of the Perry County Medical Society, aged 63, died November 9 of carcinoma of the liver

**Thomas Emory Camper**, Corunna Mich Hahnemann Medical College and Hospital of Philadelphia, 1924 member of the Michigan State Medical Society and the American Public Health Association in 1936 established and directed the Iron County Health Department and in 1940 established and directed the Shawassee County Health Department aged 45 died, January 3 in the Memorial Hospital, Owosso of coronary occlusion

**Ott Casey** ☉ Clinton, Ind Medical College of Ohio Cincinnati, 1908, served as county coroner for two periods and as a captain in the medical corps of the U S Army during World War I, formerly health officer of Clinton aged 60 died December 29, in the Veterans Administration Facility, Danville, Ill, of coronary arteriosclerotic heart disease

**Charles White Churchill**, Thomson Ga University of Georgia Medical Department Augusta, 1909, member of the Medical Association of Georgia served as county physician and local surgeon for the Georgia Railroad for many years aged 63, died recently of heart disease

**Charles David Collins**, Milwaukee, Wisconsin College of Physicians and Surgeons Milwaukee 1902 served during World War I served on the board of appeals and in various other capacities in the Veterans Administration in Washington D C for many years, aged 64 died December 21, of cerebral hemorrhage

**Raymond Lawrence J Cooley** ☉ Buffalo University of Buffalo School of Medicine 1913 aged 50 on the staff of the Mercy Hospital, where he died, December 22 of heart disease

**Edward Alfred Franklin**, Los Angeles Columbia University College of Physicians and Surgeons, New York, 1905 aged 58, on the staff of the Hollywood Hospital, where he died, November 4 of coronary occlusion

**Adolph Goldhammer**, New York Columbia University College of Physicians and Surgeons New York 1896 aged 69 died December 27, of arteriosclerosis

**John Nelson Goltra**, Evanston Ill College of Physicians and Surgeons, New York 1887 member of the Illinois State Medical Society, veteran of the Spanish American War, formerly on the staff of the Sault Ste Marie (Mich) Hospital, author of "Health and Strength" aged 83 died January 15, of arteriosclerosis and myocarditis

**Alva Silas Grimm** ☉ St Marys W Va College of Physicians and Surgeons Baltimore, 1885 an Affiliate Fellow of the American Medical Association, aged 85 died December 24, of hypostatic pneumonia

**William Albright Haman**, Reading Pa Hahnemann Medical College of Philadelphia 1883, founder and chief of the x-ray department since 1916 charter member and chief of the medical department since 1892 Homeopathic Hospital aged 81 died suddenly, December 20, of coronary occlusion and arteriosclerosis

**Herbert T Hames** ☉ Jonesville S C Medical College of the State of South Carolina, Charleston, 1901 for many years a medical officer in the National Guard and at the time he was honorably discharged held the rank of captain aged 64 died January 4, in the Wallace Thomson Hospital Union of coronary thrombosis

**Edward Mitchell Harding**, Newton Mass College of Physicians and Surgeons, New York 1874 member of the Massachusetts Medical Society, at one time served as second assistant physician at the Danvers State Hospital Hathorne aged 90, died, December 19 of heart disease

**Leo Zeno Hayes** ☉ Force, Pa Medico Chirurgical College of Philadelphia, 1902 on the staff of the Andrew Kauf Memorial Hospital, St Marys formerly surgeon for the Shawmut Mining Company, and Pittsburgh Shawmut and Northern Railroad aged 64, died, December 20 in the Temple University Hospital, Philadelphia, of brain abscess

**James Arthur Jones**, Boston Boston University School of Medicine, 1900, formerly assistant instructor in urinary analysis at his alma mater, served as a medical officer in the Reserve Officers Training Corps during World War I aged 68 for many years on the staff of the Massachusetts Memorial Hospitals, where he died, January 1, of cerebral hemorrhage

**Bertie Rozel Johnston** ☉ Estill, S C University of Georgia Medical Department, Augusta 1917 served during World War I, aged 47, died suddenly, January 1, of coronary occlusion

**John Richard Keesee** ☉ Huntington, W Va Kentucky School of Medicine, Louisville 1905 served overseas and as captain in the medical corps of the U S Army during World War I aged 62 died, December 20 in the Veterans Administration Facility of hypertensive coronary arteriosclerotic heart disease

**Joseph Charles Kelly**, Boston McGill University Faculty of Medicine Montreal Que Canada 1938 began active duty as a lieutenant junior grade in the medical corps of the U S Naval Reserve in April 1942 and was discharged for physical disability in October 1942 served as clinical assistant in ophthalmology at the Massachusetts Eye and Ear Infirmary, aged 33 died December 17, of coronary occlusion

**Valentine John Klein**, Brooklyn University of the City of New York Medical Department 1887 member of the Medical Society of the State of New York on the staff of

St Catherine's Hospital, aged 76, died, December 28, of carcinoma of the rectum

**Hiram L Knapp**, Newark Valley, N Y, University of Buffalo School of Medicine, 1888, member of the Medical Society of the State of New York past president of the Tioga County Medical Society, had been a director and president of the First National Bank of Newark Valley for many years served as president of the village of Newark Valley and board of education, aged 75, died, December 21, of nephritis

**Albert Maxwell Lightstone**, Montreal, Que, Canada, School of Medicine and Surgery of Montreal, 1918, served as a captain in the Canadian Royal Army Medical Corps during World War I formerly registrar of the Woman's General Hospital, Westmount medical officer of the Montreal Sailors' Institute for many years, aged 55 died, December 11

**Samuel Gilmore Logan** Ⓢ Ridgway, Pa Jefferson Medical College of Philadelphia, 1901 past president and secretary of the Elk County Medical Society, member of the Radiological Society of North America Inc on the staff of the Andrew Kaul Memorial Hospital St Marys, physician for the Ridgway borough schools aged 65, was found dead December 21 of coronary disease

**John Joseph Lucy**, Boston, Harvard Medical School, Boston 1920 member of the Massachusetts Medical Society aged 49 served on the staff of the Cambridge (Mass) Hospital and as assistant visiting surgeon on the staff of the Boston City Hospital where he died, December 28, of hypertensive heart disease

**Harry Found MacLeod**, Boston, University of Pennsylvania Department of Medicine Philadelphia 1894 served during World War I aged 71, died December 21, in the Holy Ghost Hospital for Incurables Cambridge, Mass, of cerebral thrombosis and pneumonia

**Reed Madden**, Xenia Ohio, Eclectic Medical Institute, Cincinnati, 1894, member of the Ohio State Medical Association served on the staff of the Ohio Soldiers and Sailors Orphans Home Hospital aged 72 died, December 26, of carcinoma of the prostate

**Saul Marks**, Philadelphia Medico-Chirurgical College of Philadelphia 1914 aged 48 died, December 20, in the Philadelphia General Hospital of coronary occlusion

**Floyd Osborn Mathews**, Charlemonst Mass, College of Physicians and Surgeons Boston, 1920, aged 52, died, December 15, of cerebral hemorrhage

**Herbert Chamberlain Maxwell**, Lubbock, Texas, University of Texas School of Medicine Galveston, 1916, member of the State Medical Association of Texas, physician for the Lubbock Independent School District since 1929 member of the staff of the Lubbock Sanitarium formerly on the staff of Dr Greenwood's Sanitarium, Houston aged 60, died recently of heart disease

**Maurice Carver Melrose** Ⓢ Independence Iowa State University of Iowa College of Medicine, Iowa City 1924, on the staff of the Peoples Hospital, aged 48 died, December 10, of hemorrhage due to hemophilia

**Charles E Merriam**, Rochester, Vt Baltimore Medical College, 1894 member of the Vermont State Medical Society aged 78 died, December 23, of auricular fibrillation

**George W Neilson**, Milwaukee Milwaukee Medical College 1909 member of the State Medical Society of Wisconsin at one time served as vice president of the Milwaukee County Medical Society formerly associate clinical professor of obstetrics and gynecology at the Marquette University School of Medicine, during World War I served as a major in command of a field hospital in France, aged 60 died, December 1 of heart disease

**La Fayette Neufarth**, Mount Healthy, Ohio Medical College of Ohio, Cincinnati, 1883, for many years president of the school board of Mount Healthy, aged 88, died, December 22 of pneumonia

**Thomas Ignatius O'Drain** Ⓢ Philadelphia University of Pennsylvania Department of Medicine, Philadelphia, 1893 aged 74 on the staffs of St Joseph's Hospital St Agnes Hospital and St Mary's Hospital, where he died, January 7, of a ruptured coronary artery

**Isadore Olef** Ⓢ Boston, Harvard Medical School, Boston, 1926 since 1939 assistant professor of medicine at the Tufts College Medical School where he had been teaching assistant in medicine from 1928 to 1930 and instructor in medicine from 1930 to 1939, on the staff of the Boston Dispensary and a member of the associate staff of the Joseph H Pratt Diagnostic Hospital, aged 45, died December 16, in Dorchester of coronary occlusion

**Darbari Ram Pal** Ⓢ Paterson, N J, University of Tennessee Medical Department, Nashville, 1911, during World War I received a special presidential citation for duties on local draft board, division 5, on the courtesy staff of St Joseph's Hospital aged 57, died, December 16, of essential hypertension

**Fletcher Edward Peters**, Defiance, Iowa John A Creighton Medical College, Omaha, 1904 aged 61, died, December 6, of myocarditis

**James Milton Philpot**, Bowling Green Fla Georgia College of Eclectic Medicine and Surgery, Atlanta, 1916 aged 57 died, December 21, in Immokalee of organic heart disease

**John W Pinkston**, Greenville, Ga Southern Medical College, Atlanta, 1889, member of the Medical Association of Georgia, aged 82 died, December 14, of cerebral hemorrhage

**Almon W Pinney**, Norfolk Conn, Hahnemann Medical College and Hospital of Philadelphia, 1900, member of the Connecticut State Medical Society, on the associate staff of the Litchfield County Hospital, Winsted, aged 65, died December 11, of coronary occlusion

**Otis Russell Platt** Ⓢ North Platte, Neb, Chicago College of Medicine and Surgery, 1916 fellow of the American College of Surgeons, served during World War I, on the staff of St Mary Hospital, aged 51, died, December 19, in Lincoln of essential hypertension

**Leopold Putzel**, New York Bellevue Hospital Medical College, New York, 1875 aged 87 was killed, December 14, when he fell from a tenth story window

**Harry Lyon Read**, Louisville, Ky, University of Louisville Medical Department, 1907, member of the Kentucky State Medical Association, aged 63 died December 6, of coronary thrombosis

**Lloyd Wilson Rice**, Montreal Que Canada University of Western Ontario Medical School, London, Ont 1928 captain in the Royal Canadian Army Medical Corps, served overseas during World War I aged 44, died, October 31, in Brockville Ont, of heart disease

**Heber Edward Robinson**, Ogden Utah Jefferson Medical College of Philadelphia, 1906 member of the Utah State Medical Association, on the staff of the Dee Memorial Hospital, aged 62 died, December 9 in Livermore, Calif of cerebral hemorrhage and chronic undulant fever

**Hendric Arnold Ross** Ⓢ Arkadelphia Ark Jefferson Medical College of Philadelphia 1912 past president of the State Medical Board of the Arkansas Medical Society, owner of the Ross Hospital, aged 58, died, December 18 of coronary thrombosis

**James Thweatt Ross**, Macon Ga Jefferson Medical College of Philadelphia 1885, member of the Medical Association of Georgia for many years chairman of the city and county boards of health for many years on the staff of the Macon Hospital, served as chief surgeon for the Georgia, Southern and Florida Railroad aged 81 died December 22 of senility

**Joseph Wilfrid Tetrault**, Montreal, Que Canada School of Medicine and Surgery of Montreal, Faculty of Medicine of the University of Laval at Montreal, 1903, died in December

**Frank Tornholm**, Wahoo, Neb Omaha Medical College 1902, member of the Nebraska State Medical Association, secretary and formerly president of the Saunders County Medical Society served as counselor from the Sixth District Medical Society for many years, was city physician and councilman in Wahoo for several terms, aged 72, died November 10 of cerebral hemorrhage

**Jean Archange Vernier** Ⓢ Detroit, American Medical Missionary College Battle Creek, 1900, formerly instructor of gynecology at her alma mater served as a member of the medical staff of the Woman's Hospital, Detroit and the Battle Creek (Mich) Sanitarium, aged 68 died, December 21, of carcinoma of the stomach

**James Buchanan Wallace** Ⓢ Saline Mich, Detroit College of Medicine, 1901, member of the Michigan State Medical Society at one time a minister served as coroner of Washtenaw County, member of the board of education and health officer of Saline village and township, aged 78 died December 4 of diabetes mellitus

**Cadow B Walling**, Collins Ga University of Georgia Medical Department, Augusta 1902 member of the Medical Association of Georgia, physician and surgeon for the Seaboard Air Line Railway Company, aged 72 died December 13 in the Jelks Hospital, Reidsville, of Brill's fever and pneumonia

## Bureau of Investigation

### SOME MISCELLANEOUS MEDICAL FRAUDS

#### A Variety of Schemes Debarred from the Mails

Fraud orders issued by the Post Office Department have frequently been the subject of extensive articles by the Bureau of Investigation in these pages of THE JOURNAL. Following are brief abstracts of some fraud orders not dealt with previously.

**Consultorio Medico Standard**—This was but one of numerous names used by an S Kemp or Kemps whose full name was said to be Samuel Kemp or Kemps and who operated a diabetes cure swindle from Mexico City. Other titles for his business were Instituto Medico Standard Clinica Medica Alenarr Maria Asuncion Figueroa M A Figueroa Juan Rodriguez Sruvedra J R Sruvedra Dr R F Sanchez and Director S Kemps. The information that follows is taken partly from the records of the Bureau of Investigation of the American Medical Association and partly from the memorandum issued on this case by the Hon Vincent M Miles Solicitor for the Post Office Department. The concern in question first came to the attention of the Bureau of Investigation in December 1937 through an inquiry from a man in Texas. He wrote that as a diabetic patient he was interested in the promoters claim in a Mexican magazine advertisement "Diabetics! Let me hear from you. I have cured thousands suffering from this malady—thousands here in Mexico and other Republics."

The inquirer said that on writing to the advertiser he received a history blank to fill out and a request for \$15 down and a second payment of \$10 when cured. As Dr S Kemps and his Instituto Medico Standard were unknown to the American Medical Association inquiries about them were sent to two American physicians practicing in Mexico City. In answering both implied that Kemps concern was a quack outfit and that part of it advertised as "Maternidad—Chile 26" specialized in abortions. One stated "For many years S Kemp (Samuel Kemp) ran the show alone pretending to be a German specialist but without Degree revaluated in Mexico. However for some time now to avoid legal difficulties he has associated with him a young doctor Fernando M E pinosa graduate of the Universidad de Cuadalyarra in 1930 who does have his title registered with the Department of Health of Mexico. Unfortunately there are no laws in Mexico permitting revocation of license for improper advertising. It got so bad about a year or so ago that rulings were passed forbidding medical advertising and modified to require all advertising to be O K'd by a special department of the Health Department but that has remained a dead letter for apparently anything goes. The physician went on to say "I had a young medical student take in a sample of diabetic urine and try and get as much information as possible. He managed to have an interview with Doctor Kemps. This person is an Austrian and apparently without any formal medical education although he claimed to have studied all over Europe. My informant went several times and said there were always five or six or more clients in waiting but apparently the greater part of their work is done by mail. Kemp said it was not necessary for the patient to come in although it would be preferable and a k'd for a sample of urine which he sent to a laboratory. He made no mention of the necessity for blood examination. On seeing the laboratory report he guaranteed to cure the patient in three or four months. He used a medicine given by mouth a liquid mixture called DBT made especially for him by the Perez Gil Laboratories Criz Tlalpam 1557. He spends large amounts in advertising averages better than a column a day in the two daily newspapers (in each) and more than half a page on Sundays. He boasted of having a good many clients in the United States. The other physician wrote in part about Kemps "I do not know the nature of the treatment which he advertises for the cure of diabetes. There are two or three drugs derived from Mexican plants which are reported to have an influence on reducing the amount of sugar in the urine of diabetics and that probably have some slight beneficial effect on diabetics. The name of one of these is tironadora it is on the market under the name of glucolicina. The botanical name of this plant is tecomanolis. Another is called copalchi and the botanical name of this plant is contrarea latiflora. Finally the Post Office Department at Washington began to investigate Kemps business and found that the man was advertising in various Spanish language newspapers printed in the United States and offering cures for diabetes liver trouble and sexual debility. In a test case the customer sent \$15 by United States money order for treatment of lost manhood. With his reply Kemps sent a short prescription in which it was suggested that for the treatment and cure of his condition the remitter take one tablet of calcium phosphate before meals three times a day and one tablet of nux vomica two hours after meals three times a day. These preparations were to be purchased by the customer from his local drug store. Since medical evidence available to the Post Office showed that the condition loosely described as lost manhood is due to a large number of causes such as advanced years psychic influences and many diseases including some serious ones and that each victim of it must be treated as an individual case and further since Kemps treatment was based on no diagnosis whatever the business in question was declared to be a scheme for obtaining money through the United States mail by means of false and fraudulent pretenses representations and promises. The fraud order debarring it from the United States mails was issued July 15 1942.

**Dynell Spring Water Company**—This concern had for its president a Charles A Coey who for at least twenty years has been exploiting the water of his so-called Dynell Springs in the southwest section of Chicago and at times has played it up in large newspaper advertisement. In a discussion of this business published in THE JOURNAL Sept 15 1928 page 818 it was brought out that Coey had previously engaged in various enterprises such as trucking livery business and a so-called school of motoring and had solicited the public to buy stock in his Dynell concern. The claims that he has made for the water as a treatment for a great variety of diseases and conditions came to the attention of the Post Office Department which on May 9 1942 ordered Coey and his company to show cause on May 28 why a fraud order should not be issued against them. On May 27 the defendant's attorney requested a postponement of the hearing date giving a one reason on the alleged fact that his clients were attempting to dispose of the enterprise and with draw from the mail order business and the attorney was furnished a form of affidavit containing provisions for the abandonment of the claim and informed that if this affidavit was duly executed by the defendant and filed with the Post Office it would be accepted as a basis for disposing of the fraud order charges. At the same time the hearing date was continued at the request of counsel. Thereafter the same counsel for various reasons requested numerous postponements some of which could not be granted and the hearing finally took place on July 31. No appearance however was entered by anyone in behalf of the Dynell concern nor was any answer to the charge received. A few days thereafter a transcript of the proceedings of the hearing was given to the respondent's attorney and an opportunity was furnished him to file a brief on or before August 17. At his request he was granted at least two additional postponements but in spite of his promise to furnish certain affidavits this was not done. At the original hearing the Post Office reviewed the charge that Charles Coey had advertised his product variously called Dynell Water Dynell Mineral Water and Dynell Spring Water under false and fraudulent pretense representations and promises among which were that it is an effective treatment for and will overcome diseases of the liver gall ducts and gall bladder arthritis rheumatism arterio sclerosis high blood pressure diabetes kidney trouble stomach ulcer stomach trouble nephritis and all diseases of the genito urinary tract strikes the death blow to the cause of most diseases. A chemist who appeared as a witness for the government testified that his analysis disclosed that Dynell Water contained silica ferric oxide or aluminum oxide calcium magnesium sulfate chloride sodium bicarbonate radical calcium bicarbonate potassium and nitrate. Also appearing for the government was a physician who testified that he was familiar with the therapeutic effect of these various ingredients all well known to the medical profession and that the principal effect of the water in question when taken as directed would be a tendency toward laxation due principally to the presence of magnesium sulfate and it would also have a slight neutralizing and antacid effect because of the calcium bicarbonate present. He went on to show that the water did not have any significant effect on the various diseases and other conditions played up in the advertising. On Sept 8 1942 the Post Office Department issued a fraud order against the names Dynell Spring Water Company Dynell Spring Water Co Dynell and C A Coey President and debarring them from using the mails. In passing it is worth mention that an interstate shipment of Dynell Water in 1928 was declared in a district federal court to violate the Food and Drugs Act because of the false claims made for the product as a treatment of chronic constipation ulcerated stomach torpid liver high blood pressure rheumatism gastritis neuritis gout gallstone Bright's disease diabetes and some other things.

**International Health Device Corporation and David B Cropp**—In this department of THE JOURNAL April 4 1942 page 1240 appeared a lengthy report of a fraud order issued by the Post Office Department against the Pandiculator Company and Henry C Crowell of Cleveland in the mail order sale of The Pandiculator. This was an alleged spine stretching device which had been on the market for a good many years. At the hearing of this case Crowell a Cleveland attorney had testified that he had purchased the business in 1918 from a David B Cropp. It appears that Cropp in due time resumed the sale of the Pandiculator but adopted another name for his business and his device. It came to the attention of the Post Office Department that Cropp operating under the name The International Health Device Corporation at New York was putting out something known as the Therapeutic Couch or the Cropp Therapeutic Couch the description of which seems to correspond with that of the Pandiculator. Per on who answered his advertisements received a booklet The Human Body which according to the Post Office played up the alleged efficacy of the device in stretching not only the spinal column but the entire skeleton the bony framework of the body involving all its joint and articulation. The musculature the ligaments cartilages and other connective tissues the spinal cord the spinal and sympathetic nervous system the blood vessels arteries glands lymphatic in short every important structure of the body and every functioning organ comes within the direct influence of the Science of Tension Therapy as applied through the Cropp Therapeutic Couch.

We do not offer the Science of Tension Therapy and the Therapeutic Couch as a panacea a cure all for the ill of man kind. We do offer it as a Therapy separate and distinct in itself. It is the most rational and universally applicable means of removing the basic causes of disease all health and physical imperfection with which we are familiar. We believe that there is no method either of medication or of hand adjustment for the correction of diseases and abnormal conditions of the body that can so easily be employed by 100 per cent of suffering humanity with so certain likelihood of definite permanent benefit as can Tension Therapy and the Therapeutic Couch. In addition to the booklet Cropp was said to have issued a circular which reproduced alleged testimonials from laymen osteopaths chiropractors and physical therapists as to the efficacy of the couch in treating such disorders as stomach ulcers rheumatism neuritis diabetes arthritis and

numerous others and also in increasing height and reducing bodily weight and waist line measurements. On Dec 10 1941 the Post Office Department notified David B Cropp and the International Health Device Corporation to show cause on Jan 6 1942 why a fraud order should not be issued against them. After several continuances the hearing was finally held on March 18 and 19. Cropp appeared unaccompanied by an attorney and in his testimony stated that he was not a physician but had studied chiropractic that his couch was safe and harmless and would accomplish the results claimed for it in the advertising. It was reported that he appeared to be in good health and did not look his sixty six years of age and although he had led a life devoted almost exclusively to athletics he attributed his physical soundness to the use of his couch which opinion was discounted by the government.

An expert medical witness for the Post Office testified at length showing that Cropp's mechanism was without virtue as a corrective curative or restorative agent and that the only effect it would produce when used as directed would be the stretching of the body on a straight line parallel to the spine the amount of stretching being dependent on the amount of pressure placed on the wheels at the side of the couch by the patient. It would not be testified cure or correct any disease and in fact it might aggravate some conditions such as tuberculosis of the spine by the application of traction. On Oct 3 1942 a fraud order was issued against the names David Cropp David B Cropp and the International Health Device Corporation and their officers and agents. In one part of the Post Office memorandum Cropp was called Bertram David Cropp and described as formerly a director of physical education and athletics at the University of Colorado and presently the wrestling coach of the West Side Y M C A at New York.

## DANGEROUS TO HEALTH

### Because of Inadequate Warnings on Labels

[EDITORIAL NOTE—These abstracts differ from other abstracts of Notices of Judgment issued by the Food and Drug Administration of the Federal Security Agency which have appeared in these pages in that they deal with nostrums which were misbranded because their labels failed to carry adequate warnings against giving them to children or using them in those pathologic conditions in which they might be dangerous to health, or caution against unsafe dosages or methods or duration of administration or application, for the protection of the user. The abstracts that follow are given in the briefest possible form (1) the name of the product, (2) the name of the manufacturer, shipper or consigner, (3) the date of shipment, (4) the composition, (5) the type of nostrum, (6) the reason for the charge of misbranding and (7) the date of issuance of the Notice of Judgment—which is considerably later than the date of the seizure of the product and somewhat later than the conclusion of the case by the Food and Drug Administration.]

**Hart's Compound Asthma Medicine**—Hart's Asthma Medicine Company, Buffalo, N. Y. Two consignments shipped respectively between March 15 1940 and Jan 13 1941 and on Feb 26 1941. Composition essentially 64 grains of potassium iodide per fluid ounce with glycerin water and flavoring materials including cinnamon and cardamom. Adulterated because it consisted in part of a filthy substance namely mold. Misbranded because label failed to warn adequately against giving it to children or using it in those pathologic conditions wherein it might be dangerous to health or to caution against unsafe dosage or methods or duration of administration or application for protection of users. Further misbranded because label falsely represented that it was efficacious in treating asthma including the relief of paroxysms or spasmodic attacks, bronchitis, colds and hay fever and that it would preserve health.—[D D N J F D C 459 and 460 September 1942.]

**National Pepple's Remedy**—National Pharmaceutical Manufacturing Company, Baltimore. Shipped June 20 1940. Composition chiefly extracts of plant drugs including aloe. Misbranded because label did not carry adequate directions for use or sufficient warnings against employment in those pathologic conditions wherein it might be dangerous to health or caution against unsafe dosage or duration of administration for protection of users. Further misbranded because label failed to bear the common or usual name of each active ingredient.—[D D N J F D C 450 September 1942.]

**O. D. Easy-lax**—Washington Wholesale Drug Exchange (seller) and Liberty Drug Company, both of Washington, D. C. Label instituted Jan 9 1941. Composition essentially phenolphthalein, aloin, strychnine, talc and calcium carbonate with green coloring. Misbranded because label did not adequately warn against use by children or in those pathologic conditions wherein it might be dangerous to health or caution against unsafe dosage or methods or duration of administration. Also misbranded because label carried such false claims as: "They work naturally and form no habit." "A home remedy for indigestion, torpid liver, chronic constipation." Further misbranded because common or usual names of active ingredients were not given on label or a declaration of the quantity or proportion of strychnine present and because carton and label failed to give the address of the manufacturer, packer or distributor and the label to declare the quantity of contents.—[D D N J F D C 451 September 1942.]

## Correspondence

### "THE SUPPLY OF NURSES"

*To the Editor*—I trust that in view of the present acute shortage of nurses you may be able to publish this and that some hospital executive may consider and develop the plan.

When serving in the Militarized Red Cross overseas during the last war, I was assigned as an assistant surgeon to a small English hospital for French wounded, situated not far from Chaumont. I was there from April or May 1917 to January 1919. Then, as now, there existed an acute shortage of trained nurses. Yet the work of the hospital went on at all times smoothly and well in spite of this. The hospital director was a most forceful English woman with executive ability from whom I learned their methods of action. Our nursing force was composed of a trained head nurse, an operating room nurse and one or two other graduate nurses. The remainder were short term, intensively trained volunteer nurses. We got wounded, often direct from the front. These assistant nurses, in operating room, dressing and ward work, did their stuff well, judged by peacetime standards. Those appointed as heads of wards were resourceful and efficient.

I believe I had seen the best of trained nurses both here and abroad and so could judge nurses, for my experience had covered an internship of sixteen months in a New York hospital that employed exclusively recent graduates of training schools, an internship of three months in another, employing selected groups of pupil nurses from the New York, Presbyterian and St. Luke's hospitals, and from then until World War I in contact with surgical procedure both in Hartford and through visits to outside surgical centers. I served in Dr. Blake's Hospital in Paris in 1917 to acquire the then "war surgery."

The following is what I learned from the director and others concerning the composition of this group of nurses in France: 1 All were young women. 2 All volunteered to serve wherever ordered. 3 They were selected for high standards of conduct, physique and patriotism. 4 They were intensively trained surgically, in leading hospitals chiefly in London. 5 The term of training was four or six months. I am not certain which now, but my impression is four months. 6 All those that came to us had been again checked over by the sister of our director and the last desirable screened out before they sailed. By this process we got a body of nurses that for surgical work was adequate. And I feel confident that a skilled onlooker could not have distinguished them in work or deportment, if similarly garbed, from a body of trained nurses.

This method of overcoming a shortage of trained nurses in another war makes me believe that a similar procedure would give equal results today. However, there is no royal road to excellence in any field, and I fancy that the selection and training of a body of nurses such as I describe would prove an undertaking worthy of any one's best effort.

JOHN B. MCCOOK, M.D., Hartford, Conn.

### MAXIMUM DOSAGE OF INSULIN

*To the Editor*—In the editorial on "Insulin Resistance" (THE JOURNAL, January 2, p. 52) reference is made to the fact that a patient received 3,250 units of insulin during a period of twenty-four hours. It is commented that this was probably the largest amount of insulin ever administered to a human being.

Merely for purposes of record, may I refer to a report (Lozinski, Ezra, and Frohlich, Louis I. "Resistance to Insulin." *Canad. M. A. J.* 46:62 [Jan.] 1942) in which is recorded the history of a patient to whom 5,780 units of insulin was administered in a period of twenty-four hours without the development of hypoglycemic shock.

EZRA LOZINSKI, M.D., Montreal.



**Medical Examinations and Licensure****COMING EXAMINATIONS AND MEETINGS**

**ANNUAL CONGRESS ON MEDICAL EDUCATION AND LICENSURE**  
CHICAGO Feb 15 16 1943 Sec Council on Medical Education and Hospitals Dr H G Weiskotten 535 North Dearborn Street Chicago

**BOARDS OF MEDICAL EXAMINERS****BOARDS OF EXAMINERS IN THE BASIC SCIENCES**

Examinations of boards of medical examiners and boards of examiners in the basic sciences were published in THE JOURNAL Feb 6 page 455

**NATIONAL BOARD OF MEDICAL EXAMINERS**

**NATIONAL BOARD OF MEDICAL EXAMINERS** Parts I and II Various centers March 13 Exec Sec Mr Everett S Elwood 225 S Fifteenth St Philadelphia

**EXAMINING BOARDS IN SPECIALTIES**

**AMERICAN BOARD OF ANESTHESIOLOGY** *Oral Part II* New York May 15 16 San Francisco May 22 Chicago June 67 Final date for filing application is 60 days prior to date of examination Sec Dr P M Wood 745 Fifth Ave New York

**AMERICAN BOARD OF NEUROLOGICAL SURGERY** *Oral* Chicago Feb 15 16 Sec Dr R Glen Spurling 404 Brown Bldg Louisville Ky

**AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY** *Written Part I* Various centers Feb 13 Candidates in military service may take Part I at their place of duty *Oral Part II* Pittsburgh May 19 25 Sec Dr Paul Titus 1015 Highland Bldg, Pittsburgh

**AMERICAN BOARD OF OPHTHALMOLOGY** *Oral Parts I and II* New York June 4 5 Chicago Oct 8 9 Final date for filing application is March 1 Sec Dr John Green 6830 Waterman Ave St Louis

**AMERICAN BOARD OF OTOLARYNGOLOGY** *Oral* New York, June 3 5 Final date for filing application is March 1 Sec Dr Dew M Lierle 1500 Medical Arts Bldg Omaha Neb

**AMERICAN BOARD OF PEDIATRICS** *Written* Locally Oct 8 *Oral* New York Nov 20 21 Final date for filing application is Aug 1 Starting July 1 1943 Group I will be abolished Sec Dr C A Aldrich 707 Fullerton Ave Chicago

**AMERICAN BOARD OF PSYCHIATRY & NEUROLOGY** Various centers April or May Final date for filing application is March 1 Sec, Dr Walter Freeman 1028 Connecticut Ave NW Washington D C

**AMERICAN BOARD OF SURGERY** *Written Part I* March 25 Sec, Dr J Stewart Rodman 225 S Fifteenth St Philadelphia

**Mississippi Reciprocity Report**

The Mississippi State Board of Health reports 9 physicians licensed to practice medicine by reciprocity and 1 physician so licensed on endorsement of credentials of the National Board of Medical Examiners on Dec 11, 1942 The following schools were represented

School	LICENSED BY RECIPROCITY	Year Grad	Reciprocity with
George Washington University School of Medicine		(1928)	Dist Colum
University of Illinois College of Medicine		(1937)	New Jersey
Louisiana State University School of Medicine		(1940)	Louisiana
Tulane University of Louisiana School of Medicine		(1938)	Louisiana
Detroit College of Medicine and Surgery		(1922)	Michigan
Western Reserve University School of Medicine		(1940)	Ohio
University of Tennessee College of Medicine		(1941)	Tennessee
Fort Worth School of Medicine		(1903)	Louisiana

School	LICENSED BY ENDORSEMENT	Year Grad
Boston University School of Medicine		(1939)

**West Virginia October Report**

The Public Health Council of West Virginia reports the written and oral examination for medical licensure held at Charleston, Oct 26-28, 1942 The examination covered 11 subjects and included 110 questions An average of 80 per cent was required to pass Three candidates were examined, all of whom passed Ten physicians were licensed to practice medicine by reciprocity The following schools were represented

School	PASSED	Year Grad	Number Passed
Loyola University School of Medicine		(1940)	1
St Louis University School of Medicine		(1926)	1
Western Reserve University School of Medicine		(1933)	1

School	LICENSED BY RECIPROCITY	Year Grad	Reciprocity with
Rush Medical College		(1940)	Illinois
University of Louisville School of Medicine (1937) (1941)		(1934)	Kentucky
University of Maryland School of Medicine and College of Physicians and Surgeons		(1940)	Maryland
St Louis University School of Medicine		(1940)	Missouri
University of Nebraska College of Medicine		(1932)	Nebraska
Medical College of the State of South Carolina		(1929)	South Carolina
Medical College of Virginia		(1936)	Virginia
University of Virginia Department of Medicine		(1937)	Virginia

**Bureau of Legal Medicine and Legislation****MEDICOLEGAL ABSTRACTS**

**Malpractice Sponge Allegedly Left in Bladder in Repairing Prolapsed Uterus**—The plaintiff was suffering from a prolapsed uterus, rectocele and cystocele and the physician defendant undertook surgical procedures for the purpose of suspending the uterus Two incisions, both about 1½ inches long, were made in the vagina one in the anterior and one in the posterior wall The uterus had dropped into the vagina, but, according to the physician, it 'didn't come clear outside', the rectum and the bladder came outside' The bladder was down as low as the uterus and "was protruding through the vaginal wall" The physician had to work close to the bladder wall, which was quite thin, but, so he testified, he did not cut the bladder According to the patient, subsequent to the operation the physician told her that he "had had to build up a new bladder wall"

Some time after the operation the patient began to experience pain in the bladder A roentgenogram showed a "big rock in the bladder with a little tail on it" About twenty-one months after the first operation another physician removed the stone from the bladder Incorporated in the stone on one side was a mass of cotton gauze Alleging that the physician had negligently left the gauze in her bladder during the first operation, which was the only operation to which she had ever submitted prior to the operation for the removal of the stone in her bladder, the patient brought suit for malpractice against the physician defendant From a judgment for the patient, the physician appealed to the Supreme Court of Oregon

The physician claimed that during the operation in question he had neither cut the bladder nor inserted any gauze in the bladder Therefore, so his argument seemed to run, there was no evidence before the trial court to sustain the patient's allegation that the gauze had been left in the bladder by the physician defendant, and the trial court should have granted the motion he had made for a nonsuit or for a directed verdict in his favor In passing, said the Supreme Court, on the propriety of denying a motion for a nonsuit or for a directed verdict for the defendant, one must take as true, even in the face of conflicting evidence the evidence produced by the plaintiff together with every inference of fact that the jury might legally draw from it The evidence at the trial tended to show that the bladder was exposed that a new bladder wall was built up, that cutting was done, that gauze sponges were used in the operation and that a gauze sponge was removed from the patient's bladder twenty-one months later The patient was entitled to show, as she attempted to do by the evidence she introduced, that the physician had had an opportunity to leave a gauze sponge in her bladder and that he was the only one who could have done the act charged If the jury believed the evidence introduced by the patient, as it apparently did, it was justified in finding that gauze was placed and remained in the plaintiff's bladder and that the physician had an opportunity and was the only one who did have an opportunity to place it there and therefore that the defendant did the act charged

Furthermore, continued the court there was ample evidence concerning proximate causation and damage There was evidence from which the jury was justified in finding that gauze was inserted by the defendant in the bladder and allowed to remain there, that in so doing he was negligent and that as a result a condition developed that caused infection and pain and required operative intervention No question of liability for a



mistake of professional judgment was involved. It was not claimed that the gauze should have been inserted in the bladder or that, if inserted, the removal of the gauze at the time of the operation would involve any exercise of professional judgment, or that any incision of the bladder wall should have been made. The whole defense of the physician was that he had made no incision in the bladder, that he had not inserted any gauze in the bladder and that consequently no gauze had been left therein by him. The physician was not employed to enter the bladder, and no necessity to do so was shown. If he did so, even intentionally, his act would be an unauthorized deviation from his employment. On the other hand, an unintentional incision of the bladder would be evidence of negligence. While some courts have held a physician negligent as a matter of law on evidence that he inserted gauze in and failed to remove it from an incision, the court did not believe that the failure to remove sponges is in all instances negligence on the part of the physician. The court did believe, however, that evidence of failure to remove sponges does require the submission of the question of negligence to the jury, since it is *prima facie* negligence for an operating physician to leave a surgical sponge in a wound after the incision has been closed. 41 *Am Jur*, p 213. A different situation might be presented if the placing of a sponge in the bladder had been shown to be proper and the question had arisen only as to the propriety of its removal, but where the defense is that no sponge was inserted the fact, as found by the jury, that one was inserted and permitted to remain, no good purpose therefor appearing, raised a *prima facie* case of negligence. The court therefore concluded that the trial court had properly refused to grant a nonsuit or to direct a verdict in favor of the physician.

During the trial a medical witness called by the patient was asked to assume that in the course of an operation for the suspension of a prolapsed uterus the operating physician placed and left gauze in the patient's bladder and to state whether in that event the physician exercised that degree of care and skill ordinarily used and exercised by physicians in the practice of surgery in the locality and under the circumstances. The witness answered in the negative. The physician contended that the question was improper because 'it assumed is an absolute fact that the operating physician had cut the bladder and placed gauze therein "when the evidence along that line was clearly speculative and conjectural." It is the peculiar function, said the Supreme Court, of the hypothetical question to assume as an absolute fact alleged conditions or events if supported by evidence and to have an opinion based on the hypothesis. The patient, in forming the hypothetical question, should not leave to speculation the facts on which the opinion was to be based. If the plaintiff asks a fair question based on substantial evidence, he may have the expert's opinion on any combination of facts he may choose. He need not include in the question all the details that appear in his own case and certainly cannot include the contradictory matter in his opponent's case. He may lay before the jury by hypothetical questions scientific inferences properly deducible from the facts supported by his evidence. The form of such questions is generally within the discretion of the trial court. The court concluded accordingly that it was proper for the trial court to permit the question propounded.

The physician next complained of certain instructions tendered by the trial court to the jury which, so he contended, stressed the question of ordinary care, ordinary skill and ordinary diligence. While such an instruction is proper in the ordinary negligence case, he insisted, since a malpractice action is not the ordinary negligence case, that such an instruction is clearly erroneous in a malpractice case in which the measure of care is that degree of care and diligence ordinarily and usually exercised by ordinarily careful physicians and surgeons under like circumstances and in similar localities. In ordinary negli-

gence cases, so his argument went, the test is the conduct of the ordinary prudent man under the circumstances and "that a man has acted according to his best judgment is no defense while in a malpractice action the fact that want of success is due to an error of judgment may sometimes be a defense. Even so, answered the court, in this case there was no question concerning the exercise of professional judgment, mistaken or otherwise, so far as the placing or removal of a sponge was concerned. The defendant cannot claim now that he made a mere error of judgment in failing to remove a sponge which he swears he never inserted. If the instruction of the trial court applied to this case the standard of care applicable to ordinary negligence cases, then the instruction was unduly favorable to rather than prejudicial to the physician who was under obligation to exercise that degree of skill, care, diligence and knowledge which is ordinarily possessed by the average of the members of his profession in good standing in similar localities. But continued the court, the jury was properly instructed concerning the defendant's duty as a surgeon. After explaining what negligence ordinarily consists of, the instruction complained of stated that ordinary care in a malpractice action means the care imposed by the law on physicians and surgeons, and the court then said, "by that standard will you measure the responsibility of the defendant in this case." The court could not properly have stopped with a mere definition of negligence as in ordinary negligence cases. It was necessary to go further and apply that general concept of ordinary care to the case of a physician but in truth the duty of care imposed on physicians and surgeons is only a special application of the general law of negligence requiring due care under the circumstances. In malpractice the circumstances are peculiar, and so the general rule is peculiarly adapted to meet them. Among the circumstances are the skill and training of the physician, the inherent difficulties of operative treatment, the impossibility of certainty in diagnosis and cure and the frequent necessity for the exercise of professional judgment, together with the advanced condition of the medical science in the community. In *Staloch v Holm* 100 Minn 276, 111 N W 264 a case cited by the physician, the court, after explaining that a physician is not liable for a mere error in judgment, made the following distinction:

When the physician is actually operating he is employing surgery as an art and if for example he sews up a sponge in an abdomen he has opened. His wrong concerns physical fact and has fairly been held to be governed by ordinary principles of negligence.

The use and removal of surgical sponges continued the court in operative cases may involve the employment of professional skill, but the failure to remove a sponge which should never have been inserted would be evidence of negligence in the general sense that it would involve a failure to exercise reasonable care under all the circumstances. A fortiori, it would be evidence of negligence when subjected to the test employed in the case of physicians and surgeons. The court accordingly held that the instructions complained of were proper.

The judgment in favor of the patient was affirmed—*Caruthers v Phillips*, 131 P (2d) 193 (Or., 1942).

## Society Proceedings

### COMING MEETINGS

Annual Congress on Medical Education and Licensure Chicago Feb 15-16  
Dr H G Weiskotten 535 North Dearborn St Secretary

American Orthopsychiatric Association New York Feb 22-24 Dr Norville C LaMar 149 East 73d St New York Secretary  
Conference of State and Provincial Health Authorities of North America Washington D C March 22-25 Dr A J Chesley 469 State Office Bldg St Paul Secretary

## Current Medical Literature

### AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1932 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (\*) are abstracted below.

#### American Journal of Clinical Pathology, Baltimore

12 545-596 (Nov.) 1942

- \*Observations on Rh Agglutinin of Human Blood R T Fisk Pasadena Calif. and A G Foord Los Angeles—p 545
- Magnesium Silicate Granuloma T L Ramsey Toledo Ohio—p 553
- Blood Sugar Values of Blood Obtained Simultaneously from Radial Artery Antecubital Vein and Finger P H Langner Jr and H L Fies Philadelphia—p 559
- Studies on Platelets III Effect of Heparin in Vivo on Platelet Count in Mice and Dogs A L Copley and T P Robb Kansas City Kan—p 563
- Advantage of Thioglycollate Medium in Routine Diagnostic Bacteriology Mollie Mollo Jeannette E Winter and P Steinberg New York—p 571
- Uremic Phenols II Their Significance in Normal and Pathologic Conditions M Volterra New York—p 580
- Xanthoproteic Index Urea and Creatinine in Plasma of Patients with Renal Insufficiency K S Hubbard J I Mezen and F E Kenny Buffalo—p 590

**Studies on Rh Agglutinin of Human Blood**—Fisk and Foord performed tests for the Rh factor of the blood of 927 adults, of 312 infants and of 9 cases of fetal erythroblastosis. The tests were run with anti rhesus and/or human anti Rh serums. The anti rhesus serums were prepared by immunizing guinea pigs with rhesus monkey blood. The human anti Rh serums were obtained from Rh negative women who had delivered infants affected with erythroblastosis. The results of typing adult blood with the antisera show that the incidence of Rh positive persons was 85 per cent and of Rh negative persons 15 per cent. This agrees with the observations of Landsteiner and Wiener, who reported 15.4 per cent of 448 persons to be Rh negative. The results also suggest no relationship between the presence of the Rh factor and agglutinogens A and B. The results with cord blood compared with adult blood showed a consistent difference in reactivity to guinea pig antisera: the cord blood from the 312 infants reacted positively to these serums, whereas the reactions to two other serums supplied by two Los Angeles hospitals gave a percentage of negative reactions. Of the 191 infants typed with the human anti Rh serum, 10.5 per cent were Rh negative. The degree of agglutination in guinea pig antiserum was always much stronger with cord blood than with adult cells. It was at first suspected that these strong reactions were due to some property in the cord blood which was not altered by repeated washings in saline solution but this seemed unlikely as blood obtained by heel puncture from 9 babies on the tenth day of life reacted in the same way.

#### Cancer Research, Baltimore

2 811-880 (Dec.) 1942

- Inactivation and Conversion of Estrogens in Vitro by Liver and Other Tissues from Human Cancer Patients and from Mice of Strains Susceptible to Mammary Carcinoma G H Twombly and H C Taylor Jr New York—p 811
- Influence of Polished Rice Diet on Spontaneous Mammary Cancers in Mice Treated with Yeast Extract R Lewisohn C Leuchtenberger R Leuchtenberger D Jaszo and Z Dische New York—p 818
- Effect of Intravenous Glycogen Administration on Rate of Growth of Walker Carcinoma 256 and Sarcoma 180 H A Bill San Diego Calif—p 823
- Effect of Variations in Oxygen Pressure on Tumor Transplants M A Pollack A Taylor and C J Sortomme Austin Texas—p 828
- Mechanism of Action of Certain Urea Derivatives on Normal and Tumor Tissue W C Grant and J C Krantz Jr Baltimore—p 833
- Effects of Roentgen Radiation on Tumor Incidence in *Drosophila melanogaster* E W Hartung Jr Cambridge Mass—p 837
- Influence of Carcinogens on Age Incidence of Leukemia in High Leukemia F Strain of Mice A Kirschbaum New Haven Conn and L C Strong Minneapolis—p 841

#### Connecticut State Medical Journal, Hartford

6 911-978 (Dec.) 1942

- Recent Advances in Surgery Particularly from Standpoint of Improving Prognosis with Special Reference to Correction of Protein Deficiencies R Elman St Louis—p 913
- Intussusception in Infants A J Jackson and J J Bowen Jr Waterbury—p 916
- Clinical Study of 105 Patients Treated with Estrogen and Progesterone S M Simon and A F Ullman New York—p 921
- Influenzal Meningitis Report of Case with Recovery C W Brown Hartford—p 926
- Crush Blast and Anesthesia in War Emergencies G J Connor New Haven—p 928
- Wound Healing and Its Complications S C Harvey, New Haven—p 932
- Emergency Field Treatment P W Vestal New Haven—p 937

#### Delaware State Medical Journal, Wilmington

14 223-236 (Nov.) 1942

- Civil Emergency Service H Van Z Hyde New York—p 223

14 237-254 (Dec.) 1942

- American Medicine and the War M F Libheim Chicago—p 237

#### Illinois Medical Journal, Chicago

82 325-404 (Nov.) 1942

- Problem in War Medicine Venereal Disease Control Since Onset of World War II R A Vonderlehr Washington D C—p 344
- Id Analysis of Vision of 200 Consecutive Selectees as Seen by Advisory Board Oculist G H Mundt Chicago—p 347
- Id Analysis of Cardiac Abnormalities in 460 Selectees D E Markson and M P Gethner Chicago—p 350
- Id Neurocirculatory Disease in the Soldier H A Durkin Peoria—p 354
- Id Incidence of Pulmonary Tuberculosis as Detected Roentgenologically in Selected Group of Inductees E E Barth and Fay H Squire Chicago—p 358
- Id Neuropsychiatric Problems of Present War B Boshes Chicago—p 361
- Treatment of Surgical Shock A M Vaughn Chicago—p 365
- \*Burns Treated by Paper Tissue Cod Liver Oil Ointment Dressing After Surgical Cleansing G B Callahan Waukegan—p 368
- The Doctor and the Problem Child P L Schroeder and G L Perkins Chicago—p 373
- Third Stage of Labor R Paddock St Louis—p 379
- Etiology and Treatment of Functional Uterine Bleeding J W Huffman Chicago—p 383
- Susceptibility of Adult Population to Diphtheria A J Levy Gilman—p 390

**Burns Treated by Paper Tissue**—Callahan states that an infected (or uninfected) burn treated by free cleansing with soapy sterile water debrided, dried covered directly by cod liver oil ointment and this covered by a single layer of paper tissue and redressed daily, then less frequently as required, and kept in daily motion will heal in a minimum of time with a minimum of pain and scar formation without contracture. Good surgical measures must be used. Blebs are left intact unless they break in cleansing, as then less open wound is present and less tender surface is exposed. Serum under a clean bleb does not become infected, it acts as a cushion conducive to healing, and it is reabsorbed or spills harmlessly if its covering is kept clean. Maximow showed that noncontaminated tissue bathed in its own fluids healed with rapidity and a minimum of fibroblast proliferation in the scar. To this end Callahan has used a covering that is nonadherent is completely flexible and allows a free film of normal fluid beneath it. Elevation of the burned part and daily motion prevent and minimize stasis as well as act as a prophylactic toward circulatory accidents, thrombi or emboli. Nonadherence and motion permit granulation or epithelialization across the affected area that will not require stretching or breaking in subsequent therapy. The paper tissues packed in their usual store shelf manner are safe to use, although the author does autoclave or flame them. He used them for lesions many years before he autoclaved them and no infection has resulted. Blood agar plates and culture broths of newly opened commercial cod liver oil ointments revealed no growths from the surfaces or the depths of ointments. Such

data show that the paper tissue and the ointments are safe to place and use in the field, or board ship, in a home, in a hospital and in the physician's office

## 82 405-482 (Dec) 1942

- The Physician and the Problem of the Alcoholic Driver L S Selling Detroit—p 423  
Status Asthmaticus J Peters Oak Park—p 428  
Chemotherapy Sulfonamides R F Herndon Springfield—p 435  
Perforating Gunshot and Stab Wounds of Chest A J Toman Chicago—p 437  
Public Health in Wartime H A Holle Chicago—p 440  
Present Status of Shock Therapy S N Clark Jacksonville—p 444  
Gallbladder Disease with Special Reference to Alterations in Anatomy and Physiology of Gallbladder M E Lichtenstein Chicago—p 445  
\*Kaolin-Aluminum Gel (Kalam) in Therapy of Peptic Ulcer T Neuwelt and F Steigmann Chicago—p 450  
The Tuberculous Obstetric Patient F M Meisner Peoria—p 454  
Psychotherapy in General Medicine and Surgery T B Throckmorton Des Moines Iowa—p 460

**Kaolin-Alumina Gel and Peptic Ulcer**—Newwelt and Steigmann used a mixture of alumina and kaolin (Kalam) in the treatment of peptic ulcer in 25 cases. Kalam is an amphoteric gel containing 5 per cent of aluminum hydroxide and 3 per cent of kaolin, both in colloidal form flavored with oil of peppermint and freely miscible in water. The subjects were refractory to other treatment. The dose of the amphoteric gel varied from 1 to 2 teaspoons in a little water three times a day to as much as 4 teaspoons taken as often as every two hours during the day and as needed at night. Some patients used the preparation for several weeks whereas others used it intermittently or steadily for many months of the eighteen months of the study. Six of 15 patients under prolonged and careful observation were decidedly and quickly benefited by the medication, pain, discomfort and vomiting were relieved promptly. The 9 remaining patients found the results indifferent; only 3 of them preferred some other form of therapy. From the results the authors conclude that Kalam represents a new and valuable addition to the therapy of peptic ulcer.

## Indiana State Medical Assn Journal, Indianapolis

35 677-752 (Dec) 1942

- Kenny Treatment of Infantile Paralysis G J Carreau C Mertz and P Reith Indianapolis—p 677  
Report of Results in Kenny Method Elizabeth Kenny Minneapolis—p 679  
Kenny Method of Treatment for Infantile Paralysis W H Cole J F Pohl and M E Krupp Minneapolis—p 681  
Is There a Relationship Between Polomyelitis and Tuberculosis? Isabel Morgan Danville—p 686  
Tularemia Review and Its Present Status in Indiana J W Jackson Indianapolis—p 691  
Chemotherapy in Ophthalmology Review of Recent Literature C W Rutherford Indianapolis—p 697  
Adequate Internal Fixation of Fractures E T Stahl Lafayette—p 702

## Journal of Clin Endocrinology, Springfield, Ill

2 671-776 (Dec) 1942

- \*Comparative Study of Metabolic Effects of Estradiol Benzoate and Testosterone Propionate in Man Kathryn Knowlton A T Kenyon Irene Sandiford Gertrude Lotwin and Ruth Fricker Chicago—p 671  
Comparison of Metabolic Effects of Testosterone Propionate with Those of Chorionic Gonadotropin A T Kenyon Kathryn Knowlton Gertrude Lotwin P L Munson C D Johnston and F C Koch Chicago—p 685  
Metabolic Response of Aged Men to Testosterone Propionate A T Kenyon Kathryn Knowlton Gertrude Lotwin and Irene Sandiford Chicago—p 690  
\*Creatinine Excretion in Women Clinical Significance in Obesity B N Tager and Hazel W Kirsch Los Angeles—p 696  
Premenstrual Headache Relieved by Estrogen Therapy B B Rubenstein Chicago—p 700  
Ethinyl Estradiol Clinical Evaluation M J Groper and G R Biskind San Francisco—p 703  
Male Hypogonadism Effect of Treatment on Genital Growth and Maturity B N Tager Los Angeles—p 707  
Effect of Chorionic Gonadotropic Hormone and of Male Sex Hormone on Height Increase and Bone Development M B Gordon and E M Fields Brooklyn—p 715  
Urinary 17 Ketosteroid Assays in Clinical Medicine N B Talbot and A M Butler Boston—p 724  
Clinical Reviews in Andrologic Endocrinology III Treatment of Seminal Failure R L Pullen J A Wilson E C Hamblen and W K Cuyler Durham N C—p 730  
Endocrine Aspects of Mongolism C E Benda Wrentham Mass—p 737

**Metabolic Effects of Sex Hormones**—Knowlton and her colleagues describe certain of the metabolic effects of estradiol benzoate when given intramuscularly in daily doses of 5 mg

(30,000 rat units) to 2 eunuchoids, 2 women with ovarian insufficiency, 1 of whom was masculinized, and 1 normal woman. In the 2 eunuchoids the effects are compared with those resulting from 5 mg daily of testosterone propionate. The subjects were given weighed diets, consuming the same food each day, of sufficient caloric content to maintain their weight in accordance with the particular individual's activity, desires and capacity. Testosterone propionate caused a characteristic reduction in urinary nitrogen, inorganic phosphorus, sulfate and sodium excretion. In 1 of the 2 eunuchoids, urinary potassium was reduced. Creatinuria, when sustained at high levels by creatine ingestion, was reduced by the androgen. The production of basal heat was unaltered. The estradiol benzoate in the 2 eunuchoids, 1 hypogonadal woman and the normal woman reduced the urinary nitrogen, inorganic phosphorus and sodium excretion. Urinary sulfate was probably reduced in 1 eunuchoid and in the woman; otherwise it was unaffected. Creatine excretion in the eunuchoid, when sustained at high levels by creatine ingestion, was not reduced by estradiol benzoate. Basal heat was unaltered. In the masculinized girl (adrenogenital syndrome) none of the usual metabolic effects of estradiol benzoate were observed. Creatinuria was increased. Hypogonadal women of short stature and with high urinary gonadotropin titers responded well to the metabolic influences of estradiol benzoate or testosterone propionate. It is not clear whether physiologic ovarian secretion exerts any general anabolic influence on non genital tissue.

**Creatinine Excretion and Obesity**—The results of creatinine determinations on 50 normal women from 20 to 45 years of age are tabulated by Tager and Kirsch. From this tabulation they derived expressions for the relationship of creatinine excretion to weight in normally proportioned and in obese women. The optimal weights, as calculated by the method of Willoughby, were further correlated with the actual values of the creatinine excreted for the 50 women. This optimal weight is defined as creatinine optimal weight. For a known level of creatinine excretion by a given patient (whether obese or not) the optimal weight of the patient may be determined by the application of the equation for creatinine weight relationship established for well proportioned women. In the absence of an actual laboratory determination the creatinine excretion and the creatinine optimal weight may be calculated through a conversion equation from the Willoughby optimal weight estimation, based on bone measurements. The creatinine optimal weight is closely compatible with clinical weight evaluations and offers a physiologic basis for the quantitative expression of the nutritional state of the adult woman. Obese women generally excrete less creatinine than the well proportioned ones and show more striking variations in the excretion levels from one individual to another at a given weight. These variations are generally in direct agreement with clinical impressions concerning the muscularity of the obese. The desirability of clinically differentiating overweight individuals on the basis of muscle mass into the macrosonic and microsonic types is suggested to facilitate further metabolic studies in obesity.

## Journal Industrial Hygiene & Toxicology, Baltimore

24 243-294 (Nov) 1942

- The Physiologic Properties of Indium and Its Compound C P McCord S F Meek C C Harrell and C E Heuser Detroit—p 243  
Toxicology of Acrylonitrile (Vinyl Cyanide) II Studies of Effects of Daily Inhalation H C Duddle T K Sweeney and J W Miller Bethesda Md—p 255  
Centerline Velocity Characteristics of Round Openings Under Suction I Silverman Boston—p 259  
Velocity Characteristics of Narrow Exhaust Slots L Silverman Boston—p 267  
Atmospheric Contamination from Casting of Magnesium C R Williams Boston—p 277  
Some Pharmacologic Properties of Polyethylene Glycols of High Molecular Weight (Carbowax Compounds) H F Smyth Jr C P Carpenter C B Shaffer Jane Sexton and Louise Fischer Pittsburgh—p 281  
Absorption of Lead Tetraethyl with Radioactive Lead as Indicator R A Mortensen Los Angeles Calif—p 285  
Leukotoxic Action of Benzol D R Climenko Albany N Y and J McLeod New York—p 289

**Journal of Nervous and Mental Disease, New York**

96 617-748 (Dec) 1942

- Assault Injuries in State Hospital L Carp New York and L P Hawkes Pearl River N Y—p 617
- Peripheral Nerve Injury Following Electrical Trauma Axillary and Radial Nerve Involvement N Savitsky and M J Gerson New York—p 635
- Neurologic Complications in Mother Following Pregnancy T Meltzer Brooklyn—p 641
- Physical Psychiatric and Psychometric Studies of Postencephalitic Parkinsonism D Shaskan Helen Yarnell and Karen Alper New York—p 652
- Comparison of Schizophrenia and Manic Depression with Reference to Emotional Maturity M A Durer Columbus Ohio—p 663
- Suggested Treatment of Spinal Block Caused by Spinal Adhesive Arachnoiditis by Means of Repeated Spinal Air Injection H D McIntire Cincinnati—p 668
- \*Use of Curare in Modifying Convulsive Shock L T Woolley J R Jarvis and G S Ingalls Towson Md—p 680

**Curare in Convulsive Shock**—Since January 1940 Woolley and his associates have administered convulsive metrazol or electric shock therapy, with rare exceptions, only after patients were adequately curarized. Of 38 patients (all other methods of treatment having failed) treated with curare-metrazol shock and/or curare electric shock, 8 have recovered to their pre-psychotic level or better, 7 are now on parole status inside or outside the hospital, 4 are slightly improved in hospital adjustment and 19 are unimproved or worse. Curare is administered intravenously, approximately 11 mg per kilogram of body weight. From thirty to one hundred and twenty seconds should be taken for the injection. Maximal curarization occurs regularly between one hundred and fifty and two hundred and ten seconds after a slow intravenous injection and in thirteen to fifteen minutes after an intramuscular injection. Even if curarization is not complete (arbitrarily determined by the inability of the patient to lift his head) the severity of a convulsion is much modified by the presence of any considerable amount of curare in the circulation. Curare was effective in preventing physical injuries to patients subjected to convulsive shock therapy. It probably increased slightly the required dose of the convulsive agent. It introduces certain hazards, particularly in respiratory embarrassment or failure, but these can be avoided by proper management. Even when the patient is in serious difficulty from respiratory failure, artificial respiration, prostigmine and epinephrine are effective in preserving life. It does not seriously affect the blood pressure and heart action. In proper dosage, properly administered, it is quite safe to use. The results of treatment protected by curare are comparable to those without it.

**Journal Pharmacology & Exper Therap, Baltimore**

76 189-294 (Nov) 1942 Partial Index

- Parenteral Use of Organic Esters W L Lipschutz S D Upham C N Hotchkiss and G H Carlson Pearl River N Y—p 189
- Anticonvulsant Action of Diphenyl Hydantoin and Some Related Compounds P K Knoefel and G Lehmann Louisville Ky—p 194
- \*Experimental Production of Primary Optic Atrophy in Monkeys by Administration of Organic Arsenical Compounds B J Longley M Clausen and A L Tatum Madison Wis—p 202
- Radioactive Tracer Studies on Arsenic Injected as Potassium Arsenite I Excretion and Localization in Tissues F T Hunter A F Kip and J W Irvine Jr Boston—p 207
- Id II Chemical Distribution in Tissues O H Lowry F T Hunter A F Kip and J W Irvine Jr Boston—p 221
- Comparative Therapeutic Activity of Sulfonamides Against Bacterial Infections in Mice E K Marshall Jr J T Litchfield Jr Baltimore H J White A C Bratton and R G Shepherd—p 226
- Studies on Fate of Nicotine in Body I Effect of  $\mu$  on Urinary Excretion of Nicotine by Tobacco Smokers H B Haag and P S Larson, Richmond Va—p 235
- Id II Fate of Nicotine in Dog P S Larson and H B Haag Richmond Va—p 240

**Optic Atrophy from Arsenicals**—Longley, Clausen and Tatum tried to determine whether atoxyl, and the contributing agents tryparsamide, arsenical number 190 and acetarsone are capable of producing blindness in monkeys with an intact and normal central nervous system. The eyes of rhesus monkeys resemble the human eye far more closely than those of the rabbit. Such an anatomic relationship might be expected to be paralleled by a similar reactivity but experimental work can only suggest what might happen in man and only careful clinical

study will reveal what actually does happen. The administration of atoxyl, tryparsamide, acetarsone, 3-amino-4-beta-hydroxy-ethoxy-phenylarsonic acid (number 190) and 4- $\beta$ -( $\beta$ -hydroxy-ethoxy-ethoxy-phenylarsonic acid (number 266), the last containing no nitrogen in the molecule, did cause blindness in monkeys. The work provides an experimental basis for detecting the blinding potentialities of arsenical compounds in man. Now prophylactic procedures designed to reduce or eliminate optic atrophy as a sequence of chemotherapy of neurosyphilis must be looked for.

**Comparative Activity of Sulfonamides**—Marshall and his colleagues compared the therapeutic activity of thirty-three typical sulfonamide compounds on streptococcal and pneumococcal infections in mice. With the exception of sulfapyridine, none were found to be significantly more active than sulfanilamide against streptococcal infection while most of them were less active. On a pneumococcal infection sulfapyridine, sulfathiazole, sulfadiazine, sulfamethylthiazine, sulpirazine and sulfaguanidine were all more active than sulfanilamide. All compounds which were active *in vivo* were also active *in vitro* and there appeared to be no quantitative relation between *in vitro* and *in vivo* activity.

**Military Surgeon, Washington, D C**

91 619-728 (Dec) 1942

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- Soviet Military Field Surgery N Burdenko—p 637
- Medical Problems in Jungle Warfare H P Carter—p 640
- The Soldier Who Drinks Too Much S A Chalmers and M Moore—p 648
- Care and Treatment of Facial Injuries from Military Aircraft P E Williams—p 650
- Equine Encephalomyelitis R Randall—p 659
- Treatment of High Fever Following Head Injury and Suggestion Concerning Ventricular Drainage for Acute Traumatic Hydrocephalus A Ecker—p 670
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- Neurofibrosarcoma of Abdominal Wall with Acute Intracranial Hemorrhage Case Report R A Wise and W K Mansfield—p 685
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**New York State Journal of Medicine, New York**

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- Experiences in Induction Medical Advisory Board and Draft Board Psychiatry Attempt to Evaluate the Present Problem A R Chambers Syracuse—p 2199
- Urachal Calculus, with Consideration of Associated Pathology of Urachus in Adult Life C G Brandler A H Milbert New York and J L Alley—p 2203
- Treatment of Diseases of Muscle A T Milhorat New York—p 2210
- Epidemiologic Aspects and Laboratory Diagnosis of Salmonella Infections S Bornstein Brooklyn—p 2215
- Classification and Diagnosis of Lymphoid and Allied Tumors N C Foot New York—p 2220
- Nature of Acute Lupus Erythematosus P Klemperer A D Pollock and G Baehr New York—p 2225
- Medical Aspects of Acute Disseminated Lupus Erythematosus E C Reifstein Syracuse—p 2227
- Intracerebral Hemorrhage of Traumatic Origin Its Surgical Treatment J Browder and M F Turney Brooklyn—p 2230

**Ohio State Medical Journal, Columbus**

38 1085-1180 (Dec) 1942

- Sulfonamides in Treatment of Ocular Infections A E Braley, New York—p 1101
- Drainage in Appendicitis From Cleveland Appendicitis Survey R M Watkins Cleveland—p 1107
- Role of the Physician in Industry in Control of Acute Respiratory Disease J H Shavlem Cincinnati—p 1109
- Uterus and Vagina Duplex S W Obenour Zanesville—p 1111
- Rational Approach in Osteomyelitis of Frontal Bone Caused by Sinusitis Report of Twelve Cases R G Means Columbus—p 1113
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- Prophylaxis in Pertussis C W Wyckoff Cleveland—p 1122
- Essential Hypertension Observations and Correlation of Some Significant Factors D E Yochem Columbus—p 1127
- Importance of Cobalt in Nutrition J Forman Columbus—p 1131
- Chronic Granulomatous Pyogenic Liver Abscess Case Record Presenting Clinical Problems R M Woolford and Pearl M Zuck Cincinnati—p 1133

**Public Health Reports, Washington, D C**

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- Chaulmoogra Oil in Treatment of Leprosy G W McCoy—p 1727
- Antricola New Genus Amblyomma Gertschi New Species and Notes on Ixodes Spimpalpis (Acarina Ixodoidea) R A Cooley and G M Kohls—p 1733
- 57 1747-1790 (Nov 20) 1942
- Chloracne from Cutting Oils L Schwartz and T A Barlow—p 1747
- Location and Movement of Physicians 1923 and 1938—Turnover as Factor Affecting State Totals J W Mountin E H Pennell and Virginia Nicolay—p 1752
- Disability Table for Urban Workers H F Dorn—p 1761

**Rhode Island Medical Journal, Providence**

25 241-254 (Dec) 1942

- Fears of Infancy and Early Childhood H E Utter Providence—p 241
- Premedical Education in Wartime J W Wilson Providence—p 247

**Southern Medical Journal, Birmingham, Ala**

35 1051-1126 (Dec) 1942

- The Unknown Man in Medicine M P Neal Columbia Mo—p 1051
- \*Acute Hematogenous Interstitial Nephritis W R Mathews Shreveport La—p 1055
- \*Hyperactive Carotid Sinus Reflex with Electrocardiographic Changes During Mechanically Induced Syncope Case I A Gail Lexington Ky—p 1063
- Study of Incidence of Tricuspid Regurgitation at Large General Hospital in the South Report of Two Cases T Winsor and G L Burch New Orleans—p 1065
- \*Choline Chloride in Treatment of Icterus Gravis Neonatorum P G Davis and W A D Anderson St Louis—p 1070
- Felectic Technique for Intracapsular Extraction of Cataract J Green St Louis—p 1076
- Treatment for Fractured Clavicle by Traction F G Hodgson Atlanta Ga—p 1079
- Hardware Store Surgical Instruments W C Brown and I W Breck El Paso Texas—p 1081
- Treatment of Slipped Upper Femoral Epiphyses W K West Oklahoma City—p 1082
- Pentothal Sodium (Sodium Ethyl Thiobarbiturate) Combined Anesthesia H S Phillips and I J Miller Atlanta Ga—p 1086
- Emergency Vein M E Phelps El Reno Okla—p 1091
- Lymphoparathy Venereum Auto serum as Specific Antigen M M Marks Kansas City Mo—p 1092
- Bundle Branch Block Etiology and Prognosis N Bloom and L D Policoff Richmond Va—p 1097
- Intestinal Rupture Following Patient's Attempt to Reduce His Hernia F J Kirby and A E Needle Baltimore—p 1101
- Health Service and the War Effort I C Riggins Richmond Va—p 1101
- Training of Medical Technologists as Function of Medical School I W Digg Memphis Tenn—p 1104

**Hematogenous Interstitial Nephritis**—In 7 cases of renal suppression due to hemoglobinuria (blackwater fever in 3 and hemolysis due to drugs in 4) it was not always possible, according to Mathews to relate the interstitial inflammatory reaction to areas with tubular damage. The distribution of the exudate in the subcortical and cortical zones suggested, for the most part, that it was secondary to tubular damage. However cellular extensions along the interlobular vessels in the cortex, cellular foci and edema in the pyramids in some of the cases appeared to have developed as an independent process. Oliguria or anuria not due to ordinary forms of renal disease, low blood pressure or dehydration may be encountered in a variety of infectious states, hepatic necrosis and excessive intravascular hemolysis. The suppression may terminate spontaneously in diuresis and recovery or may end in death from uremia. In fatal cases the kidneys are usually swollen and show the structural changes of acute interstitial nephritis. Morphologically the condition is characterized by the interstitial lesion, and while its degree may vary, there are no structural details of the exudate itself that distinguish the disease processes of which it is a complication. The lesion is a structural manifestation of hyperergy in hemolytic streptococcus infection and is believed to have the same significance in interstitial nephritis associated with excessive intravascular hemolysis and hepatic necrosis. The theory that renal insufficiency in hematogenous interstitial nephritis is a functional manifestation of a hyperergic reaction has the advantage that it covers the full scope of functional abnormalities that might be concerned in the production of suppression and it is reasonably well supported by the structural changes and clinical facts.

**Hyperactive Carotid Sinus Reflex**—A case of the vagal bilateral type of hyperactive carotid sinus is presented by Gail in which an electrocardiogram made during mechanically induced syncope revealed prolonged ventricular asystoles ranging up to 38 seconds and auriculoventricular blocks. This disturbance of cardiac action resulted in cerebral anoxemia which caused syncope. Atropine sulfate abolished the cardiographic and clinical signs of carotid sinus sensitivity, thus establishing the diagnosis and therapeutic criteria of the case.

**Choline Chloride and Icterus Gravis Neonatorum**—Davis and Anderson studied the fat metabolism of 3 infants with icterus gravis neonatorum with a favorable outcome and the morphologic changes of 4 infants who died. During the course of the disease the prothrombin time of 2 infants was abnormally high. Bile salts 1 to 2 grams (0.06 to 0.13 Gm) daily with vitamin K were administered, but this did not alter the prothrombin time. Vitamin K hypodermically failed to reduce the prothrombin time, suggesting that the abnormal prothrombin time was not dependent completely on the absorption of vitamin K. Because of the close relationship between fat metabolism and vitamin K it seems possible that faulty fat metabolism in the liver prevents normal prothrombin formation. Microscopic study of the liver of babies dying of icterus gravis showed fatty infiltration and hemopoietic activity. It is believed that the cause of choline chloride that was added to a special feeding formula of the infants that recovered was effective in their cure. It appeared that the rate of recovery was definitely accelerated by the choline. An infant so treated but not completely recovered died after pneumonia developed. Although clinically typical, postmortem examination revealed a normal liver and spleen without fatty deposits. Therefore it appears that a diet of vegetable fat supplemented by labile methyl containing choline chloride and labile methyl containing casein is indicated for treating the faulty fat metabolism found in the hepatic dysfunction of icterus gravis.

**Southwestern Medicine, Phoenix, Ariz**

26 355-406 (Nov) 1942

- Treatment of Hydropneumothorax F Hummer San Francisco—p 357
- Surgery of Thyroid Gland H A Barne Flagstaff Ariz—p 368

**Virginia Medical Monthly, Richmond**

69 651-710 (Dec) 1942

- Inability to Selective Service Physicians F T Trice Richmond—p 651
- Focal Infection A C Woods Baltimore—p 652
- Infection of Hand R H Grubb Charleston—p 668
- War and Its Effect on the Mental Health of the Armed Forces D A Thom Boston—p 672
- Hydatidiform Mole Report of Six Cases W C Winn and H H Ware Jr Richmond—p 678
- \*Recent Mortality from Malaria in the United States J B Nichols Washington D C—p 681
- Medical Service to the Sick and Wounded I W Rankin Washington D C—p 682

**Mortality from Malaria**—In 1900 the death rate for malaria in the census registration area of the United States was 7.9 per hundred thousand. Under the vigorous antimalarial procedures then instituted the rate declined to 3.9 in 1905. From 1905 to 1937 the rate fluctuated from 3.8 to a minimum of 1.9 in 1926, without much change in the general trend. The statistics for 1938, 1939 and 1940 show such a significant change in the trend that Nichols presents them. For 1938 the death rate was 1.8, for 1939 it was 1.3 and for 1940 it was 1.1. The annual mortality for the entire period 1930 to 1940 shows that since 1937 there has been a sharp and continued decrease in mortality from malaria in the United States. This suggests that new conditions antagonistic to the disease have been established. The most obvious explanation for the decrease in mortality is that it was the result of the energetic and extensive antimalarial measures that were being carried out in the South, where most of the deaths from malaria in the United States occur.

**West Virginia Medical Journal, Charleston**

38 429-478 (Dec) 1942

- Precordial Pain G C Griffith Philadelphia—p 429
- Recent Advances in Chemotherapy W H Barker Baltimore—p 447
- Hospitals in the War P A McNeill Washington D C—p 453

## FOREIGN

An asterisk (\*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

## British Heart Journal, London

4 121-182 (Oct) 1942

- Hemiplegia in Cyanotic Congenital Heart Disease Beryl Corner and B. Perry —p 121  
Congenital Pulmonary Atresia with Cerebral Thrombosis and Hemiplegia A. Hunter and J. M. Lipscomb —p 124  
\*Partial Heart Block Due to Digitalis M. Campbell —p 131  
\*Blood Pressure and Old Age T. H. Howell —p 143  
Transient Inverted T Waves After Paroxysmal Tachycardia G. M. Currie —p 149  
\*Prognosis in Paroxysmal Tachycardia and Paroxysmal Auricular Fibrillation W. T. Cooke and P. D. White —p 153  
Fainting and Fits in Cardiac Infarction H. Cookson —p 163

**Partial Heart Block Due to Digitalis**—The series of 170 cases of partial heart block were obtained by Campbell from the ten thousand consecutive electrocardiograms taken at Guy's Hospital from 1927 through 1938. There were 141 cases with a prolonged PR interval but no higher degree of block and 29 who also at times had partial heart block with dropped beats. In 26 of the 170 treatment with digitalis was the sole or the important cause of the block and in another 6 it was the probable cause. In those with partial heart block and dropped beats and in those with latent heart block the PR interval averaged 0.21 second. In only 3 of 23 was the PR interval below 0.18 second. When there were no dropped beats the PR interval was on the average increased to 0.26 second. When there were dropped beats there were most often two responses before the dropped beat and the lengthening PR intervals averaged 0.22 second, 0.37 second, dropped beat and the like. This was the average of very varied figures. No special difference could be found between the groups with these different responses. Apart from the presence of latent heart block the etiology of the underlying heart disease did not seem of importance, though congestive failure was usually the indication for digitalis. The presence of a concurrent infection seemed the next most important factor. When there were dropped beats, more than half of the patients had some active infection. With latent heart block active infection was present less often, but it was the cause in a few. Large amounts of digitalis were rarely the cause. In general there seemed to be no severe ill effects even with dropped beats, and the block passed off within two or three days. There seems no reason why the presence of a latent heart block should prevent adequate treatment with digitalis when indicated, but the patient must be watched more carefully than usual.

**Blood Pressure and Old Age**—Howell determined the blood pressure of 120 Chelsea pensioners all veterans of the British army, aged from 65 to 92. Weekly variations of pressure, within narrow limits, were frequent. Infections especially those present with diarrhea or prolonged pyrexia almost always caused a fall in blood pressure. Three main types of blood pressure were observed. The first was of those whose systolic pressure remained above 160 mm. This was classed as raised blood pressure and included 42 per cent of the total persons. The second was of those with a systolic figure below 160 but above 115 mm and the third was of those with a systolic pressure below 115 mm and included 5 per cent of the total. Although the grouping is arbitrary it did correspond with certain clinical classes. Cancer, cardiac failure and infections often lowered the blood pressure. Pronounced arteriosclerosis, in the absence of a raised blood pressure, was usually associated with a poor physical condition. It is suggested that the raised blood pressure of old age is a form of compensation tending to prevent ischemia of vital structures.

**Prognosis of Paroxysmal Tachycardia**—From the private case records of White and those of the Massachusetts General Hospital Cooke and White collected 750 cases of paroxysmal auricular tachycardia between 1928 and 1938. The likelihood of any particular attack ceasing, in spite of the most alarming symptoms, is practically certain. The death of only 7 patients of the series was due, directly or indirectly, to a paroxysm. When a patient who is seriously ill has an attack the occurrence must be regarded with some apprehension and

heart failure as a result of the attack may lead to the formation of intracardiac thrombi and subsequent emboli. Paroxysmal auricular tachycardia in apparently healthy persons seems to have no effect on the prospect of their longevity. When it occurs late in life its prognosis in general is that of the underlying heart disease. Paroxysmal auricular fibrillation is probably common. When the patient is younger than 40 it may be considered to have no prognostic significance while in later life it may be the first sign of a serious heart disorder. The frequency or the duration of the attacks of paroxysmal auricular tachycardia and fibrillation cannot be foretold.

## British J Children's Diseases, Dorking, England

39 97-124 (Oct-Dec) 1942

- \*Achlorhydric Hypochromic Microcytic Anemia in Child Eight Year Old Case J. V. Dacie and P. Ellman —p 97

**Achlorhydric Hypochromic Microcytic Anemia**—Achlorhydric hypochromic anemia is usual only in women between 35 and 50. Dacie and Ellman report its occurrence in a girl of 8. The child's response to iron therapy was satisfactory. achlorhydria persisted when the blood count was normal.

## British Journal of Radiology, London

15 307-340 (Nov) 1942

- Radium Treatment of Cancer of Vagina M. Lederman and W. A. Mayneord —p 307  
Chronic Subperiosteal Abscess J. F. Brailsford —p 313  
Direct Reading Radon Meter for Clinical Purposes I. T. Farmer —p 318  
Effect of Ionizing Radiations on Broad Bean Root L. H. Gray and J. Read —p 320  
Osteochondritis in Sesamoid of Second Metatarsal Case A. S. Johnstone —p 337  
Filling Defects Within Barium Filled Duodenal Cap Case Report C. W. Horncastle —p 339

## British Medical Journal, London

2 535-566 (Nov 7) 1942

- Clinical Significance of Rh Factor K. E. Boorman, B. E. Dodd and P. L. Mollison —p 535  
\*Treatment of Shock by Direct Action on Vegetative Nervous Centers Len S. Stern —p 538  
Recent Trends of Some Infectious Diseases W. J. Martin —p 540  
Reduction of Old Standing Dislocation of Knee Joint F. P. Fitzgerald —p 542

**Treatment of Shock by Action on Nervous Centers**—Stern points out that the ordinary methods of combating shock generally do not give positive results because they do not influence the condition of the central nervous system. These negative results may be explained by the presence of the hematoencephalic barrier. Medicinal substances introduced into the circulation have no effect on the central nervous system whereas the introduction directly into the cerebrospinal canal particularly into the ventricles, often has a decided effect. To obtain a positive effect the substance should be introduced intrathecally. This applies particularly to substances normally present in the cerebrospinal fluid and the blood, such as potassium, calcium salts and certain hormones. The antagonism between the central and peripheral parts of the vegetative nervous system, as regards their reaction to the same substance, explains the absence of a positive antishock action of medicinal substances when introduced directly into the circulation. Actually if these substances do penetrate the central nervous system particularly the vegetative centers, they may produce an opposite effect and thereby neutralize the immediate action which they have produced on the peripheral vegetative organs. To produce a direct action on the vegetative nervous centers the substance should be administered directly into the cerebrospinal fluid. The given substance should be introduced into the ventricles of the brain, as its introduction into the subdural or subarachnoid space is usually without effect because it passes rapidly from the cerebrospinal fluid into the blood stream and does not come into contact with the nervous centers. In the last phase of traumatic shock there is first a considerable fall in the tone of the sympathetic nervous system and a partial rise in the parasympathetic tone. The most effective way of combating traumatic shock in its

later phase is to raise the tone of the sympathetic centers by direct action of the vegetative centers, potassium phosphate does this simultaneously. By direct action on the nervous centers the ionic potassium causes an excitability of the sympathetic nervous centers, whereas the ionic phosphate, by concentrating the ionized calcium, decreases the tone of the parasympathetic nervous centers. Potassium phosphate as an antishock remedy is indicated in all those cases in which the tone of the sympathetic nervous centers is decreased. Potassium phosphate must never be used in cases in which the excitability of the sympathetic nervous centers is increased, such as sometimes occurs in the first stage of shock. If hemorrhage is present it must be arrested, because the rise in blood pressure from potassium phosphate will definitely increase it. To avoid a repetition of shock after potassium phosphate is given, the actual cause of shock in particular painful stimuli, must be removed. Potassium phosphate is introduced directly into the ventricles by cisternal puncture. The fluid (1 cc of a solution of potassium phosphate in a concentration of  $\frac{1}{6}$  gram molecule with a  $pH$  of 7.6) must be introduced with a definite pressure and the direction of the needle must be correct. The patient must be in the horizontal position preferably on the left side, with the head lower than the body.

### Edinburgh Medical Journal

49 657-720 (Nov.) 1942

- Spinal Atrophic Paralysis D. Leys—p. 657  
Concerning Cancer F. E. Reynolds—p. 663  
Differential Diagnosis of Chronic Affections of Lungs C. Cameron—p. 673  
Problem of Perirectal Suppuration T. M. Millar—p. 691  
Chronic Fluorine Poisoning (Fluorosis) Signs and Symptoms I. Spira—p. 707

### Lancet, London

2 531-562 (Nov. 7) 1942

- \*Syncope in Blood Donors Faith C. Poles and Muriel Boycott—p. 531  
Migration of Foreign Bodies L. Rogers—p. 535  
\*Capillary Fragility (Resistance) Negative and Positive Pressure Test Compared G. H. Bell, S. Lazarus, H. N. Munro and H. Scarborough—p. 536  
\*Vitamin C Nutrition In Royal Navy and in Section of Civilian Population During Wartime Geraldine Z. I. McNee and J. Reid—p. 538  
Epilepsy A. Teeling—p. 540  
Ehrlich's Diazo Reaction and Sulfapyridine J. M. Kennedy—p. 543  
Lateral Sinus Thrombosis Case A. G. Tresidder—p. 543

**Syncope in Blood Donors**—Poles and Boycott state that among the first 10,000 voluntary blood donors, a tenth of the yearly number, 28 per cent fainted. Their investigation as to whether any particular type of donor is likely to faint and whether prophylaxis is feasible reveals that fainting after the removal of blood affects the two sexes and different builds of people equally but is more common among the young. The incidence is raised by increasing the amount of blood withdrawn from 440 to 540 cc but not by increasing the speed of withdrawal, and by bleeding tired and hungry people but not by a moderately hot and humid atmosphere. The effect of fatigue is difficult to assess, as now many donors are working longer hours than they have ever before and it is difficult to decide who is and who is not fit to give blood. It seems, however, that a man who is used to night work can be bled when he gets through without any ill effects, while to bleed an air raid warden after an unaccustomed night up will often cause fainting. Seltzovsky (1940) also considered that hunger and fatigue were the two most important causes of fainting by blood donors. The loss of 440 cc of blood leaves 97 per cent of blood donors apparently unaffected, and if there is any fall in blood pressure it is small. This fall cannot be reduced by a previous rest, as emotional tension prevents the systolic pressure from assuming its usual stable level. The donors who show the biggest drop in blood pressure also show a slowing of the pulse rate. In those who faint at the end of bleeding the onset of symptoms is almost always associated with a fall in blood pressure and pulse rate. An orthostatic fall in blood pressure may be a temporary phenomenon due to blood loss. It is maximal five to ten minutes after the donor gets up and accounts for one type of delayed syncope. The most dangerous type of faint is that which occurs a half to six hours after bleeding when the donor is back at work or out in the street.

A number of these donors have a transient orthostatic hypotension after being bled, and if it is detected subsequent fainting can probably be prevented by additional rest. Prophylactically, 40 Gm of dextrose to donors was without effect on the rate of fainting, but for men from hot workshops the rate was suggestively (though on the numbers observed not quite significantly) reduced by the ingestion of a liter of isotonic solution of sodium chloride some hours before bleeding. By this procedure the general rate was reduced to 175 per cent among the last 2,772 donors bled.

**Capillary Fragility**—The capillary fragility or resistance as determined at the same session by Gothlin's method of positive pressure and the method of Dalldorf and Russell for negative pressure was compared by Bell and his co-workers in 142 apparently healthy second year medical students between 18 and 23. The correlation was low, in some persons a high negative pressure (500 mm of mercury) produced no petechiae, in others the critical pressure was accidentally overshoot so that several petechiae were produced. With the low correlations of 0.29 obtained, it is not possible with any degree of accuracy to predict a negative pressure reading from a given positive pressure reading or vice versa. If the data are treated as a grouped series according to the positive pressure readings (or alternatively the negative pressure readings) the low correlation becomes more apparent. Each of the tests is consistent within itself. The correlation between readings of one test in different areas varied between +0.77 and +0.89. The problem as to which of the two methods is preferable is not brought nearer solution, nor is any light thrown on the relative importance of vitamins C and P in increasing the resistance of the capillary walls.

**Vitamin C Nutrition**—The occurrence of sore and bleeding gums in naval ratings and trawler crews which was being labeled scurvy or subclinical scurvy without adequate investigation prompted the authorities to investigate the state of vitamin C nutrition in the Royal Navy. The investigation, McNee and Reid *et al.*, was carried out chiefly by assessing the tissue reserves of ascorbic acid. For control a group of men of similar age and social status engaged in war work in a large motor engineering works was used. Also 9 cases of fully developed scurvy in the wards of the Western Infirmary, Glasgow, during the time the naval investigation was in progress were available. The 9 examples of genuine scurvy in adults do not represent an increase due to war conditions. They were collected to aid the work and would ordinarily have been treated in a number of different hospitals. Most of the 392 Royal Naval ratings and the 176 civilian engineers, whose main sources of vitamin C were potatoes and vegetables, required respectively three and four test doses of 700 mg of ascorbic acid for saturation in the vitamin as compared to five test doses in the spring. Six naval ratings showed sore and bleeding gums out of 118 tested, but it was not possible to associate this with vitamin C deficiency. The ratings of the Royal Indian Navy had lower tissue reserves of vitamin C, yet their teeth and gums were perfect. Evidently good oral hygiene is of major importance in maintaining healthy teeth and gums. The capillary resistance test was of no value in assessing the state of vitamin C nutrition. No relation could be established between the number of petechiae induced and the saturation test. The test was positive in only 1 of 5 patients with fully developed scurvy. In healthy adults, who rely almost entirely on potatoes and vegetables for vitamin C, saturation, as a rule, is extremely deficient. If the present standard of diet is maintained, an outbreak of scurvy is not likely. In adults, at least (growing children are not considered), vitamin C is mainly concerned with tissue repair. In health and ordinary circumstances of service and work the maintenance requirements of this vitamin are small but have not yet been determined accurately.

### Medical Journal of Australia, Sydney

2 353-370 (Oct. 17) 1942

- Pulmonary Tuberculosis The Adelaide Health Survey D. R. W. Cowan—p. 353  
X-Ray Health Survey Conducted by the Adelaide Local Board of Health with Report on First 10,048 Attendances H. K. Fry—p. 357



## Dermatologica, Basel

## 85 378-430 (June) 1942 Partial Index

- \*Bacteriologic and Serologic Studies on Treatment of Gonorrhea with Sulfathiazole A Schnetz—p 377  
Bilateral Atrophic Sclerosis of Testes Due to Virus of Nicolas Favre's Disease (Venereal Lymphogranuloma) A Midana—p 403  
Cutaneous Necrosis Due to Indelible Pencil Case L Darabos—p 411

**Sulfathiazole Therapy of Gonorrhea**—Schnetz points out that the extraordinary variations in the dosage of the sulfonamides required to effect a cure indicate that the mode of action of this therapy is a complex function with distinct variants. The mode of action of the sulfonamides comprises two phases: inhibition of bacterial growth by fixation of the sulfonamide on the bacterium and destruction of the damaged microbes by phagocytosis and bacteriolysis. The fact that with some sulfonamide compounds fresh cases of gonorrhea responded less favorably to treatment than the older cases indicated the involvement of a third factor, namely immunobiologic processes. The dependence of the efficacy on the duration of the gonorrhea, however, is not as striking a factor with the new and more potent preparations. The author describes investigations on the significance of the two main factors, parasite and host, for the success of the chemotherapy of gonorrhea. The sulfathiazole sensitivity of gonococci fluctuates in culture experiment between 1:500 and 1:128,000. Habituation of the gonococci to the chemotherapeutics can be observed *in vivo* and *in vitro*. The gonococidal properties of the human serum have a thermostable and a thermolabile component and seem to be nonspecific and differ individually. Cases of gonorrhea in which chemotherapy fails often show a high serum resistance. The author regards the following as essential factors in successful chemotherapy of gonorrhea: chemosensitivity of the bacteria, the nonspecific gonococidal activity of the serum and the concentration and duration of action of the drug in the body.

## Schweizerische medizinische Wochenschrift, Basel

## 72 781-804 (July 18) 1942

- Present Status of Thoracic Surgery A Brunner—p 781  
Temporary Pulmonary Infiltrates R Staehelin—p 785  
Hormonal Equilibria I Abelin—p 788  
\*Prostigmine in Tinnitus Aurium F Ysander—p 793  
Intracutaneous Suture R von Fellenberg—p 795  
Changes of Hypophysis after Roentgen Irradiation of Testes C A Joel—p 795  
Researches on Vitamin C P Barrelet—p 796

**Prostigmine in Tinnitus Aurium**—Ysander administered prostigmine to 27 patients with tinnitus aurium. In some of his cases impaired hearing was also improved and occasionally this improvement was so pronounced that the patients reported it spontaneously. In order to eliminate the subjective factor as much as possible, the patients were either not told the purpose of the injections or were told that the results might be positive as well as negative. They were urged to watch the effect on the tinnitus, the hearing and the general condition. As a rule patients were given ten injections of 1 cc of prostigmine methylsulfate (1:2,000 solution). The injections were given at intervals of three or four days. This was followed by taking orally 3 tablets of prostigmine bromide daily for several weeks. Some patients reacted favorably after the first few injections. When the effect proved only temporary a new series of injections was given after an interval of one or two months. Most of the patients had previously been treated unsuccessfully by other methods. In the favorably reacting cases the endoauricular sounds were reduced approximately an hour after the injection, and thus improvement persisted longer after successive injections so that after from four to six injections the improvement persisted for the entire interval. Continued oral medication maintained the improvement for a time. The injections produced favorable effects in some and no effect in others. The complete series usually resulted in some improvement. The treatment was completely successful in 2 cases and gave favorable results in 13, irregular results in 10 and none in the remaining 2. The substance probably acts directly on the labyrinth.

## Boletín de los Hospitales, Caracas

## 41 115-170 (May-August) 1942 Partial Index

- \*Lymphogranuloma Venereum (Nicolas Favre or Fourth Venereal Disease) Surgical Therapy of Anorectal Localization A Borja—p 115  
Auricular Flutter Precipitated by Ouabain Injection in Previous Digitalized Patients Case R Zubillaga—p 145

**Lymphogranuloma Venereum**—According to Borjas the most frequent seat of localization in 250 cases of lymphogranuloma venereum was the entire segment formed by the anus, the rectum and the sigmoid flexure. From here the disease progressed to the perineum and the external genitalia. The disease is caused by a filtrable ultravirus the presence of which can be demonstrated by the allergic reaction to Freis antigen. It is a special type of a sclerosing adenolymphocellulitis of the lower segment of the genitourinary tract and of the rectum combined with a sclerosing rectitis. Chronic stenosing rectitis is the most frequent clinical form. It is more grave than the acute lymphogranulomatous rectitis and chronic rectitis without stenosis which are the early and the intermediate stages of the disease. Chronic stenosing rectitis is more frequent in women than in men. It develops along with other venereal infections especially with syphilis. The local symptoms are those of a chronic rectitis, with more or less acute stenosis, local edema, multiple fistulas, abscesses or elephantiasis. Large rectovaginal fistulas are frequent. The general symptoms are those of acute toxemia and stercoremia. Cachexia occurs relatively quickly in untreated cases. The therapy consists of a permanent colostomy. If the latter fails, radical excision of the rectum, as extensive as in cancer, is indicated.

## Hospital, Rio de Janeiro

## 21 643-794 (May) 1942 Partial Index

- \*Sclerous Congestive Splenomegaly and Cardiac Insufficiency: Indications and Opportunity of Operation Annes Dias—p 643  
Scorpion Poisoning: Effects on Vision O de Magalhães—p 709  
Plaster Casts in Local Therapy of Burns: Modern Conceptions on Causes of Death in Burns E Balesdent—p 753

**Splenectomy for Sclerous Congestive Splenomegaly**—Annes Dias reports that a man aged 36 experienced one hundred and thirty rectal and ten oral hemorrhages in the course of fourteen years. A clinical and roentgenologic diagnosis of splenomegaly and Laënnec cirrhosis was made early in the course of the disease. Roentgen therapy was not tolerated. Four applications caused severe leukopenia. The Wassermann reaction was negative. Calcium, liver and antisyphilitic therapy failed. When seen by the author the patient presented symptoms of cardiac insufficiency and ascites. He was put to bed and given the proper treatment for his heart condition, vitamins B and C in large doses and liver extract. Splenectomy was performed two months later. The liver appeared normal, the removed spleen weighed 1,500 Gm. The patient was well and working two years later.

## Revista Médica de Chile, Santiago

## 70 571-662 (Aug) 1942 Partial Index

- \*Peripheral Insufficiency: Test for Its Evaluation D Urrutia, S Vaisman and S Rapoport—p 597  
Examination of Fundus of Eye: Hypertensive Retinopathy S Vaisman—p 626

**Peripheral Shock**—Urrutia and his collaborators utilized the Lewis and Perry epinephrine test in a group of 350 persons. The method determines the state of contractility of the cutaneous capillaries. Normal contractility of the cutaneous capillaries oscillates between 7 and 8 cm of mercury. The persons observed included normal persons and patients with decompensated heart with infections and in postoperative collapse. The contractility of the cutaneous capillaries was normal in 155 normal persons and in 36 patients with decompensated heart (from 7 to 8 cm of mercury). The contractility was diminished (5 cm of mercury) in patients with infections and in those with postoperative shock. The test gave normal figures for patients subjected to minor operations and not exhibiting postoperative shock. The test is more sensitive than the mea-

surement of the venous pressure in the diagnosis of peripheral collapse. The test is also of value in the diagnosis of peripheral collapse due to failing heart. These observations indicate that peripheral collapse in the course of infection or after operations is caused by changes in the tonus of the cutaneous capillaries.

#### 70 665 732 (Sept.) 1942 Partial Index

- \*Surgical Treatment of Angina Pectoris R Valdivieso A Alonzo V and P Toledo A—p 665  
Evolutive Modes and Laboratory Aspects of Early Interarsenotherapy Jaundice—H Alessandri and H Ducci—p 673
- \*Subclinical Cardiac Disturbances in Chronic Tonsillitis L Herve D Fuenzalida S Brodsky y Correa—p 679
- \*Acute Neuritis and Neuromyelitis Maria Freile and S Donoso—p 685  
Clinical Study of Trichinosis H Alessandri and A Neghme—p 690  
Acute Thromboarteritis and Embolisms of Extremities M Casanueva Del C and A Velasco S
- Interesting Technic of Roentgenologic Study of Neck of Femur Technic of Dooley and Its Surgical Applications M Casanueva Del C and I Lacasse—p 699
- \*Possible Chronic Intoxication by Manganese M Kaffman and S Donoso—p 708

**Surgical Treatment of Angina Pectoris**—Of the 4 methods advocated in the surgical treatment of angina pectoris, sympathectomy, thyroidectomy, revascularization of the myocardium and paravertebral alcoholization, Valdivieso and his associates emphasize the last, pointing out that alcoholization or paravertebral block is a simple intervention which does not involve risks and disadvantages of the other methods. They describe their experience with paravertebral alcoholization in the treatment of 6 men aged between 42 and 61. Five of the patients had been treated for syphilis and all of them had received medical treatment for angina, from which they had suffered for from two to five years. Five patients obtained immediate relief; the sixth was free from pain on the third day after alcoholization. The intercostal pain resulting from the intervention may be confused with the anginal pain. Administration of glyceryl trinitrate will aid in differentiating the two since it has no effect on the neuritis. Effects of alcoholization in 2 cases persisted for six months and in 2 others for a year or more, the other 2 cases have been under observation for only one month. The authors review the experiences of other observers and discuss some of the complications that may result such as pneumothorax, pleural effusion, the Bernard-Horner syndrome, medullary accidents and intercostal neuralgia. They conclude that the paravertebral block by alcoholization is the most innocuous method of providing lasting relief to patients with angina pectoris and suggest that the treatment be extended to other types of cardiovascular pain, such as aortalgia.

**Subclinical Cardiac Disturbances in Chronic Tonsillitis**—Herve and his associates point out that in the study of the pathogenesis of rheumatic heart disease it is evident that the role of the infectious focus, particularly that of the tonsils, is estimated variously by different authors. They studied two groups. One comprised 110 patients sent to them from the otorhinolaryngologic clinic, nearly all less than 20 years of age, whose disorder was diagnosed as chronic tonsillitis. The other group comprised 50 rheumatic patients who had undergone examination of the rhinopharynx by a specialist. Cardiovascular examination in the course of tonsillitis, particularly in the recurrent attacks revealed the existence of subclinical cardiopathy in 128 per cent of the cases. Examination of the rhinopharynx in rheumatic disease disclosed the presence of a tonsillar focus in 66 per cent of the cases. From the analysis of the two groups it appears that a relationship exists between the rheumatic disease and the active tonsillar focus. This is manifested by allergic phenomena or by direct or indirect microbic action. When a patient with tonsillitis has a sedimentation rate of over 50 mm an hour and a leukocytosis of more than 12,000, it is probable that rheumatic disease is developing. Electrocardiographic changes related to the duration and intensity of the rheumatic process appearing in the course of tonsillitis suggest the existence of active rheumatic disease. Tonsillectomy of rheumatic patients should be performed only after signs of activity have subsided. The administration of sulfonamide compounds before and after tonsillectomy appears to be an effective method of preventing reactivation. Tonsillectomy is beneficial

for the patient with cardiac rheumatism provided the condition of the tonsil is considered. Tonsillectomy does not modify the cardiac lesions caused by the rheumatic disease. Benefits obtained in a large percentage, but not in all, are diminution or cessation of rheumatic activity in its cardiac or articular manifestations, reduction or disappearance of cardiac insufficiency and possibly prevention of the development of endocarditis lenta. Some patients obtain no benefit from tonsillectomy, but it is impossible to foretell this.

**Acute Neuritis and Neuromyelitis**—Freile and Donoso observed that cases of acute myelitis of unknown etiology were comparatively frequent in their service. They describe 5. The first patient, a man aged 56, presented features of an ascending myelitis and died on the third day. Necropsy disclosed a microscopic abscess in the lateral funiculus of the lumbar part of the spinal cord. The presence of this abscess seems to indicate that the myelitis was of pyogenic origin. This, however, could have been due to medullary softening, which is capable of producing the same appearances, and the abscess was aseptic. Since the necropsy revealed no other septic focus the authors think that a neurovirus was the etiologic factor. Necropsy also disclosed signs of an old meningitis probably of syphilitic origin. They point out that chronic or subacute meningitis is a predisposing factor in ascending myelitis. Three patients between 17 and 33 years of age suddenly developed paralysis of the lower extremities with intense thoracic and lumbar pain and loss of control of the vesical and rectal sphincters. One of these patients died. In view of the absence of morbid antecedents it is assumed that a neurovirus played an etiologic role. The fifth patient, a man aged 44 developed ascending myelitis of Landry's type after having received intrathecal treatment. The paralysis persisted for a month at the end of which time voluntary motion of the limbs returned. The frequency with which neuritic and paralytic symptoms appear in connection with intrathecal treatment is estimated variously at 1 in 1,000 or 1 in 5,000 cases. In 25,372 cases in which the slow method of treatment was employed, not a single complication resulted, whereas, with the supratentorial treatment, one paralytic accident can be expected in every 30 cases. Some observers ascribe these manifestations to the virus of the diseased animal having inflicted the bite, whereas the majority ascribe it to the fixed virus inoculated therapeutically.

**Chronic Intoxication with Manganese**—Kaffman and Donoso report that a man aged 64, three months before hospitalization, developed symptoms indicative of manganese poisoning. He had worked in a mine warehouse, and there was some probability that he had had contact with manganese. The disorder took an unfavorable course and the patient died. The microscopic pictures of the brain suggested two possible diagnoses: (1) vascular cerebral syphilis of the noninflammatory type as described by Alzheimer and Nissl and (2) chronic intoxication by lead or manganese, the two conditions causing almost the same microscopic changes. On account of the war the activity in the manganese mines has increased greatly and inspection revealed that the incidence of manganese poisoning is comparatively high among the workers. In one mine 15 of a total of 200 workers had become completely incapacitated by manganese poisoning. The men worked without masks in an atmosphere densely charged with manganese dust. In other mines no cases of poisoning were apparent. Nearly all the miners with manganese poisoning presented the typical disturbances in their walk. Next in importance are the psychic symptoms in the form of attacks of excitation, depression, unmotivated laughter and even true demented states.

#### CORRECTION

**Syndrome Characterized by Gynecomastia**—In the abstract of this article in the Current Medical Literature on page 152 of THE JOURNAL of January 9 the phrase "increased excretion of estrogenic substance" (appearing in two places) should read "increased excretion of the follicle stimulating hormone", also in the sixth sentence the word "probable" should read "improbable".

## Book Notices

**Surgery of Modern Warfare** Edited by Hamilton Bailey FRCS Surgeon Royal Northern Hospital London Volumes I and II Com-  
piled by Seventy Two Contributors Second edition Cloth Price \$20  
per set Pp 490 481 1000 with 919 illustrations Baltimore William  
Wood & Company 1942

This two volume work, a compilation from some sixty-five hand picked contributors, brings modern war surgery up to date. It represents British surgery at its best and provides information quite different from that ordinarily found in the conventional textbook. Though the work depicts actual wartime surgical practice, it somehow conveys the impression of current experience—timely, new, nascent, living and dynamic in nature, progressive and undergoing rapid development. Unquestionably time, future experience and analyses of results will furnish more final values relative to war surgery, but nothing in the future can rob this work of its present ability to satisfy the reader of today. The book is actually compelling in its interest, so that the reader finds himself thumbing the pages consulting the index, looking up one subject after another, in order to obtain the latest word on methods, procedures, points of view and opinions.

The volumes are beautifully and lavishly illustrated, thereby abbreviating the text through the avoidance of thousands of descriptive words. The illustrations themselves offer a liberal education in modern surgery. If indelibly transposed to "memory's wall," such pictures should result in better surgeons and better surgery, through improving operative technic and clinical judgment.

These two volumes cover all kinds of war wounds resulting from modern warfare. In all there are some nineteen sections and an appendix.

Section I	Wounds	General Considerations
Section II	Wounds	General Operative Considerations
Section III	Wounds	Special Infections
Section IV	Wounds	Special Considerations
Section V	Wounds of	Blood Vessels
Section VI	Wounds of the	Head and Neck
Section VII	Wounds and Injuries of the	Spine
Section VIII	Wounds of the	Trunk
Section IX	Further General Principles	
Section X	Burns and Frost Bite	
Section XI	Peripheral Nerve Injuries and Wounds of Tendons	
Section XII	Methods of Immobilizing the Limbs	
Section XIII	Wounds of Bones and Joints	
Section XIV	Wounds of the Hand and Foot	
Section XV	Amputations	
Section XVI	Otorhinolaryngology in Relation to War Injuries	
Section XVII	Wounds of the Eye and Orbit	
Section XVIII	Surgical Diseases Encountered in Subtropical Countries	
Section XIX	Administration	
Section XX	Appendix	

While all the sections are probably equally good, especial attention might be called to the unusual excellence of certain chapters which should prove a material aid to all surgeons. "Shock and Its Treatment" (chapter V) by Ernest Finch admirably presents present conceptions. This chapter, like many others in the textbook, covers what is definitely known and then under a separate heading discusses the problems which are still controversial in nature. "Skin Grafting in Wounds Involving Skin Loss" (chapter XIX), written by A. H. McIndoe, reveals the great potentialities of skin grafting in relation to reconstructive surgery. Likewise "Wounds of Arteries" (chapter XVIII), by J. R. Learmonth, covers a vast and important field adequately and within a few pages. "Wounds of the Face and Jaws" (chapter XX), by James B. Macalpine, is excellent. Seldom does one have the opportunity of reading a treatise on the important phases of the treatment and management of wounds of the face, jaws and neck that deals so practically and efficiently with the subject. A series of approved procedures are detailed, described and outlined, with effective drawings which clarify and illustrate the subject.

This book depicts a new world in war medicine and surgery. It seems to give just what the reader wants to know. It will prove of great value to military surgeons throughout the world,

and especially to those in America who are just entering on their military service. Because of its illustrations it should be of special value to those engaged in teaching the surgery of modern warfare. The work is of unique value today and will always remain a valuable asset to any medical library.

Dr. Hamilton Bailey is to be congratulated on his selection of contributors, on the arrangement and presentation of the subject matter, and on the so timely production of so important a work on the surgery of modern warfare.

**Human Pathology** By Howard T. Karsner M.D. Professor of Pathology Western Reserve University Cleveland Ohio Sixth edition Cloth Price \$10 Pp 817 with 484 illustrations Philadelphia Montreal & London J. B. Lippincott Company 1942

The first edition appeared in 1926, a printing of a sixth edition within sixteen years speaks well for the merits of this standard textbook. The new edition is in many respects a new work. It has been extensively revised and large parts have been entirely rewritten. Much new material has been included but there also has been much judicious pruning. The format of the book has been changed; it is less bulky, the pages are larger, and for greater ease of reading it has been printed two columns to the page. More than one hundred new illustrations have been added or substituted for less instructive ones. As examples of noteworthy changes in the text may be cited the discussions of vitamin diseases, edema shock, spirochetal diseases, rickettsial diseases, the viruses, infectious granulomas, neoplastic diseases, the pneumonias, anemias, tumors of the endocrine glands, tumors of bones and synovia, and virus diseases of the central nervous system. The obvious care the author has given to this revision is reflected in the well chosen bibliography at the end of each chapter. Nearly seven hundred new references have been inserted, and many of the older references have been deleted. The greater majority of the references now are to readily available articles in English. Despite the many changes, the distinctive features of Karsner's book have been retained. As in the first edition, the book presents morphologic alterations wrought by disease in relation to their functional significance. The point of view throughout the book is thoroughly modern. The work can be warmly recommended to medical students as a sound guide, the mature practitioner of medicine will find it a good work of reference.

**Adventure in Blood Transfusion** By Bertram M. Bernhelm M.D. Cloth Price \$2.50 Pp 182 with 9 illustrations New York Smith & Durrell Inc 1942

Never before has the layman shown such personal interest in the subject of blood transfusion. The yearly number of transfusions has steadily mounted in the last twenty-five years. The development of blood banks in this country has involved thousands of nonprofessional donors. At this writing over 1,200,000 persons have given blood or plasma for the armed forces. Developments in this field have received liberal recognition in the newspapers and magazines, some of the feature articles have been models of exposition of medical subjects for the general public. One cannot help being impressed with the specific knowledge possessed by the layman about blood transfusion. Considering this huge backlog of popular interest it is reasonable to suppose that a book on the subject would have a warm reception and serve a useful purpose. The modern blood donor wishes to know more about the four blood groups, about their detection and about the applications of this knowledge to medicine, biology and the law. He wishes information and reassurance relative to the effect on the donor of giving blood. He is also interested in the use of blood transfusion in military medicine because he is being asked to contribute his blood for that purpose. He is unaware of the long and romantic story of blood transfusion, which would make eminently readable material for the person with an interest in history but without medical background.

This book, it is to be regretted, is not such a book. Written by a surgeon who developed a method of artery to vein anastomosis in 1909, it is preoccupied with his personal experiences with a procedure which rapidly waned when sodium citrate was introduced as an anticoagulant a few years later. The layman will not find in it the answer to most of the common questions which he asks. Only twenty-three pages are devoted to a desultory sketch of the two hundred and fifty year history of the

subject. The bulk of the book, one hundred and fifty-two pages, is occupied by a rather uninteresting case by case report of the development of the method of direct transfusion which the author devised and would not have us forget. A chapter on the role of blood transfusion in the first world war takes only nineteen pages but is sufficiently interesting to be the only part of the book which the reader would like to see expanded. The conclusion is a woefully inadequate chapter of nine pages on the tremendous advances made in the last twenty-five years which betrays the fact that the author has long been dissociated from the field.

Although the general tone is not especially modest, here and there curiously frank and damaging admissions are interspersed. The author states in one place that he published a description of the transfusion cannulas three months before he attempted to use them in a transfusion. He also acknowledges that he was not familiar when he performed his first transfusions with the work of his classmate W. L. Moss on the classification of the blood groups and the necessity for performing compatibility tests.

The style in which the book is written is frequently rhetorical and always circumlocutory. The medical reader is occasionally annoyed by the capitalization of such terms as *menstruonatorum* and Bright's disease. It is difficult to understand the reason for including thirty-four references to the medical literature in a book avowedly written for laymen. It is feared that the reader who seeks gratification for his normal curiosity will be sadly confused by the discussion of outmoded techniques and will lay down the book with his questions unanswered.

**The Surgery of Pancreatic Tumors.** By Alexander Brunschwig, M.D. F.A.C.S. Professor of Surgery, University of Chicago. Illustrated by Gladys McHugh. Cloth. Price \$7.50. Pp. 421 with 123 illustrations. St. Louis: C. V. Mosby Company, 1942.

This monograph is an important milestone in the surgery of the pancreas. The author, whose keen interest in this field is well known, has summarized and brought down to date the pertinent surgical and pathologic literature of pancreatic tumors. This task in itself is an undertaking of some magnitude, a labor which the author has done well.

The surgical problem presented by tumors of the head of the pancreas is particularly the concern of this monograph. The development of knowledge concerning vitamin K, and the significant relationship of this vitamin to cholemic bleeding, has been an important item in lending impetus to the formidable surgery necessitated by tumors of the head of the pancreas.

Any one who essays to deal with the problem presented by pancreatic tumors will do well to give serious study to this effort of Brunschwig. There have been surgical monographs written on the pancreas before. This is the first time, however, that an author has given special consideration to the problem of the surgery of pancreatic tumors in a monograph of this sort. The nature of the surgery required in many such instances truthfully may be described as being heroic. Patients whose pancreatic ducts are not reimplanted into the bowel and for whom partial gastric resection is done as well—such patients surviving the procedure for some time, should constitute interesting subjects for nutritional studies.

**Röntgen Treatment of Diseases of the Nervous System.** By Cornelius G. Dyke, M.D. F.A.C.R. Associate Professor of Radiology, College of Physicians and Surgeons, Columbia University, New York, and Leo M. Davidoff, M.D. F.A.C.S. Chief, Department of Surgery, Attending Neurological Surgeon, Jewish Hospital of Brooklyn. Cloth. Price \$3.25. Pp. 198 with 35 illustrations. Philadelphia: Lea & Febiger, 1942.

Here is a brief compilation of the results of radiation on brain and spinal cord tumors together with effects on other miscellaneous lesions of the nervous system. Also included is a survey of the literature on previous experiences with radium and x-ray therapy in nervous diseases. Since the progress of radiation therapy is of recent evolution, this book is timely and serves a useful purpose in realigning present knowledge on this subject. The more somber aspects of brain tumors are partially dispelled but it remains clear that although radiation therapy offers striking and effective amelioration in many cases it cannot be considered a curative agent. The best and most comprehensive chapter deals with pituitary adenomas and is particularly instructive on present day management of these tumors. The book is augmented by a comprehensive bibliography which

should prove an excellent reference source. There are several defects which are immediately obvious. For one thing, the authors are guilty of serious error in indicating x-ray dosage as 'total dose' or summation of the roentgens given to each of several ports. The value of some of the charts is therefore materially altered. True tumor dosage is not accurately reflected by "total dose." In addition, the book lacks fluency, which might easily have been imparted by careful editing.

**Starling's Principles of Human Physiology.** Edited by C. Loratt Evans, D.Sc. F.R.C.I. F.R.S. Jodrell Professor of Physiology in University College, London. The Chapters on the Special Senses Revised by H. Hartridge, M.A. M.D. Sc.D. Professor of Physiology at St. Bartholomew's Medical College, London. Eighth edition. Cloth. Price \$10. Pp. 1247 with 673 illustrations. Philadelphia: Lea & Febiger, 1941.

This edition of Starling's textbook is much improved over the preceding one in that it gives evidence throughout of more care in preparation and selection of material. The rare feat of successfully integrating the results of new investigations with the classic pictures of function has been successfully accomplished without any ruthless iconoclasm. Of course, it is doubtful whether we have a right to expect any one author, or even any small group of authors, to be able to write in one volume a well balanced textbook of physiology and keep up, at the same time, with the mass of new material being published. While the section on the central nervous system, as well as that on special senses, has been revised thoroughly, that devoted to nutrition is entirely inadequate when one considers the importance this has come to assume in modern civilization. Illustrative material throughout is excellent. The subject index is very complete, but a bibliographic index would be helpful. Specific references are pegged with corresponding subject matter, and general references are grouped at the end of chapter or section. The entertaining style characterizing the original edition has been successfully retained and extended in this edition, which the reviewer considers by far the best of the series for the use of students or physicians.

**Apendicitis crónica. Consideraciones anatómico-clínicas quirúrgicas.** Por el Dr. Fernando M. Bustos, profesor adjunto de clínica quirúrgica de la Facultad de Medicina de Buenos Aires. Taper. 1 p. 130 with 24 illustrations. Buenos Aires: Editorial El Ateneo, 1940.

The author emphasizes the importance of recognizing and treating associated gastrointestinal lesions, particularly those of the colon associated with chronic appendicitis. He attempts to clarify diagnostic confusion existing in this pathologic entity. The relatively high percentage of failures encountered in his series of 535 surgical cases, despite a well planned preoperative and postoperative medical treatment of the associated pathologic condition, is pointed out. The diagnostician, the author stresses, should make every effort to rule out the possibility of genital pathologic change, since the pain of chronic appendicitis is aggravated during the menstrual periods in the majority of cases. On the whole the book offers interesting reading material particularly to the young surgeon.

**Recent Advances in Medicine. Clinical Laboratory Therapeutic.** By G. I. Beaumont, M.A. D.M. F.R.C.I. Physician to the Middlesex Hospital, London, and F. C. Dodds, M.A. O.D.Sc. M.D. Courtauld Professor of Biochemistry in the University of London. Tenth edition. Cloth. Price \$5.00. Pp. 440 with 45 illustrations. Philadelphia: Blakiston Company, 1941.

Most important additions to this volume include the considerations of the sulfonamides, the vitamin B complex and vitamins E, K and P, new methods of treating diabetes, gastroscopy, the uses of diethylstilbestrol, the uses of electroencephalography and of phenytoin sodium in epilepsy, the employment of heparin, sternal puncture and plasma transfusion. In order to make use of much new material, a section on basal metabolism previously included has been omitted.

**The Essentials of Emergency Treatment.** Edited by Herbert Thoms. Cloth. Price \$2. Pp. 144. New Haven: Connecticut State Medical Journal, 1942.

This volume includes a series of essays by a number of Connecticut authors dealing with various factors in emergency medical service. The opening chapter describes the organization and function of this service in Connecticut and is followed by a number of chapters on all of the methods of emergency surgery. This condensation will be found of interest to physicians elsewhere who are concerned with these problems.

## Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS BUT THESE WILL BE OMITTED ON REQUEST.

### INHERITANCE OF ALLERGIC TENDENCIES

To the Editor—Is the disposition to allergic conditions transmitted as a dominant or a recessive characteristic in the mendelian sense? Where can I find literature pertaining to this problem? M D New York

ANSWER—The exact mode of inheritance of allergy has been in dispute for many years. All investigators, however, agree that no single allergic disease is transmitted as such. That which is transmitted is the predisposition to allergic conditions—the tendency to become hypersensitive. The actual appearance of clinical hypersensitivity depends mainly on environmental factors.

Several investigators have conducted extensive studies to determine the genetic basis for allergy. Adkinson concluded that it is inherited as a simple autosomal recessive. Her report, taken from the genetic standpoint, practically eliminates the possibility of a simple dominant. Cooke and Vander Veer, Spain and Cooke, and Bucher and Keeler found that their figures agreed better with a dominant mode of inheritance, although on analysis their findings are in accord with neither the dominant nor the recessive theory. Bray of England has a substantially different report; this is possibly due to the fact that American studies include statistics on large numbers of hay fever sufferers. In England, because of the absence of ragweed pollen, there is far less hay fever. Richards and Balveat believe that allergy is a partial dominant. All these studies show one main thing: allergic inheritance is not a simple mendelian character. Either there are accessory factors or complete dominance is lacking.

Ratner and his associates take a stand opposite to that of most allergists; they assume that allergy is not an inherited character but is due to placental transmission.

It has been noted in almost all studies that allergic individuals with a bilateral positive family history of allergy have a much earlier average age of onset than those with unilateral histories, who in turn have an earlier average age of onset than those with a negative inheritance.

On the basis of these facts, Wiener, Zieve and Fries have postulated a new theory which involves incomplete dominance. They assume that one pair of alleles (which they call genes H and h) determines allergic inheritance. The dominant gene H is for nonallergic individuals, h is the gene for allergy (recessive). Persons with HH have no allergic predisposition and are considered normal. All hh individuals are allergic, and Hh individuals are either allergic or nonallergic. All the Hh individuals, whether they ever develop any form of allergic disease or not, can still transmit the gene h to their offspring. This theory, then, is the only completely adequate explanation thus far advanced which accounts for the large number of allergic persons with negative family histories.

Wiener, Zieve and Fries divide all allergic persons into two groups according to the age of onset, with the dividing line at 10 years of age. Those with the earlier age of onset are the hh individuals. The 18 per cent of the Hh individuals who develop allergic manifestations have the later average age of onset.

Greater attention should be paid in future studies to the variations of age of onset. Females have a later average age of onset than males; each allergic manifestation has a slightly different average age of onset. Hay fever is apt to begin later than asthma, probably because exposure to pollen is intermittent. Thus it would seem that the dividing line between the two groups of allergic individuals should not be set at 10 but should rather assume the form of a sliding scale, varying with individual manifestations and with sex.

#### References

- Adkinson June. The Behavior of Bronchial Asthma as an Inherited Character. *Genetics* 5: 332-418, 1920.  
Cooke R A and Vander Veer A Jr. Human Sensitization. *J Immunol* 1: 201 (June) 1916.  
Spain W and Cooke R A. The Familial Occurrence of Hay Fever and Asthma. *ibid* 9: 521, 1924.  
Bucher C S and Keeler C E. The Inheritance of Allergy. *J Allergy* 5: 611 (Sept) 1934.

- Bray G W. Recent Advances in Allergy. Philadelphia P Blakiston's Sons & Co. 1934.  
Brilgatz R M. Allergic Diseases. Their Diagnosis and Treatment. Philadelphia F A Davis Company 1936.  
Ratner Bret Silberman, D E and Greenburgh Janet E. Allergy in Childhood. Does Heredity Determine the Age of Onset? *J Allergy* 12: 272 (March) 1941.  
Wiener A S, Zieve I and Fries J H. The Inheritance of Allergic Diseases. *Ann Eugenics* 7: 141 (Sept) 1936.  
Cooke A F. Asthma and Hay Fever. Part I. Hypersensitivity. Anaphylaxis Allergy, Springfield Ill Charles C Thomas 1931.  
Cripp L H. Allergy in Identical Twins. *J Allergy* 13: 591 (Sept) 1942.  
Landau Walter and Gay L N. Allergy in Germany. *ibid* 13: 494 (July) 1942.  
O'Keefe E S. An Analysis of 300 Cases of Asthma in Children. *Acc England J Med* 214: 62 (Jan 9) 1936.

### SPINAL FLUID CHANGES IN MULTIPLE SCLEROSIS

To the Editor—The textbooks state that in disseminated or multiple sclerosis the spinal fluid yields a positive colloidal gold curve in about 50 per cent of the cases, some also state that the Wassermann reaction of the spinal fluid is negative. I should like to know the incidence of positive Wassermann precipitin or agglutinin tests of the blood for syphilis in multiple sclerosis.

M D Massachusetts

ANSWER—Demonstrable changes in the colloidal gold reaction in multiple sclerosis were shown in nearly 75 per cent of the patients examined according to the investigations by Merritt who based his findings on a personal examination of 100 cases plus 700 more in the literature. He found a first zone curve in about 25 per cent, a mid zone curve in another 22 per cent, and some slight abnormality in the fluid in a further 24 per cent. It is the first zone curve in the cerebrospinal fluid from cases of multiple sclerosis plus the absence of other abnormalities that is so striking in this disease. The cells and amount of protein may be normal and the Wassermann test negative with a strong first zone colloidal gold test. Such a group of findings is not characteristic of any other disease. Positive Wassermann reactions do not occur in either the blood or the cerebrospinal fluid in multiple sclerosis. If the Wassermann test is found positive in an untreated case, one would always expect other changes in the spinal fluid indicative of syphilis to be found also. The only exception would be if a patient had been thoroughly treated and the other tests had become negative, leaving a positive or a weakly positive Wassermann reaction as the last evidence of syphilis. There should be no confusion between a spinal fluid in a case of multiple sclerosis and a fluid from a case of neurosyphilis, for with active neurosyphilis the cells and globulin are almost inevitably affected. There is no reason, moreover, to believe that the Wassermann or other reactions in the blood sometime would be positive in cases of multiple sclerosis. Neurosyphilis, however, with its many manifestations may produce a syndrome similar to that found in multiple sclerosis, thus confusing the differential diagnosis. One should not depend on cerebrospinal fluid findings alone, but the clinical history, neurologic examination and effects of treatment should all be taken into consideration in differentiating between the two diseases.

#### References

- Merritt H Houston. The Cerebrospinal Fluid in Multiple Sclerosis. *Brain* 57: 56 (March) 1934.  
Merritt H Houston and Fremont Smith Frank. The Cerebrospinal Fluid. Philadelphia W B Saunders Company 1937.

### STERILIZING QUALITIES OF FREE FLOWING STEAM EQUIPMENT

To the Editor—I have a Rochester steam sterilizer in which I should like to sterilize towels and other cloth materials. Since this equipment does not produce steam under pressure but only at the temperature of boiling water I should like to know how much time it would require to sterilize this material if it can be done at all.

R G Wetterstroem MD Olathe Kan

ANSWER—Moist heat at 100 C suffices to kill the vegetative cells of bacteria in a short time, holding at that temperature for 3 to 5 minutes provides an ample margin of safety. Bacterial spores are considerably more resistant. The spore forming pathogenic bacteria to be considered are (1) the anthrax bacillus—spores killed in ten minutes, (2) the gaseous gangrene bacilli—the spores of *Clostridium welchii* are killed in five minutes, those of the other bacilli appear to be somewhat more resistant though precise data are lacking, (3) the tetanus bacillus—the resistance of spores is variable from strain to strain and usually given as fifteen to ninety minutes. Spores of saprophytic bacteria and higher fungi are much more resistant, the survival of such spores (as those of the botulinus bacillus) for twenty-four hours at 100 C is not uncommon. In general, then, sterility is not attained by such treatment.

In the use of equipment such as that mentioned two points are to be noted (1) penetration of cloth and similar materials by free flowing steam is considerably slower than by steam under pressure, packing is of primary importance and the period of sterilization must be regarded as beginning only when the center of packed material reaches the maximum temperature, (2) any statement as to the efficacy of free flowing steam in the destruction of bacteria applies only to normal atmospheric pressures, at an elevation of several thousand feet such treatment will accomplish little more than pasteurization

#### LARVA MIGRANS OR CREEPING ERUPTION

To the Editor—What is the distribution and approximate number (annual) of larva migrans (creeping eruption) in the United States?

N E Ruhl MD Weatherford Okla

ANSWER—The terms larva migrans and creeping eruption have been used to describe the disease caused by a number of different larvae which penetrate the skin. In the United States the causative organism is usually *Ancylostoma braziliense* and the disease is endemic in the southeastern and southern coastal regions, being of sporadic occurrence elsewhere. The highest incidence of the disease is in Florida varying in different sections of the state.

Kirby Smith reported in 1925 an incidence of 2,500 cases covering a period of fifteen years in his practice in Jacksonville, many of his cases coming from central and western Florida, while in the past ten years 45 has been the average number of cases seen at the Miami City Clinic annually.

Creeping eruption has been encountered much less frequently in the Carolinas, Georgia, Alabama, Texas and Oklahoma than in Florida.

Reporting of the disease is not required by the health authorities, and a comparatively small number of the total infestations occurring at any one time are seen by physicians, hence there is no true standard by which the annual incidence of the disease in the United States can be estimated.

#### TREATMENT OF LATE OSSEOUS SYPHILIS

To the Editor—I should like to have an outline of the beginning treatment for tertiary syphilis involving the frontal and parietal bones. The patient is a woman aged 65 in good health otherwise. I do not know whether the condition is acquired or congenital. The eyes react to light and in accommodation. Neurologic signs are negative. The Kolmer and Kahn reactions are 4 plus and there is the involvement of the frontal and parietal bones. Should she have any arsenical treatment or be kept on iodides, mercury and bismuth compounds?

M D Kansas

ANSWER—Information as to the treatment of late osseous syphilis may be obtained in chapters 15 and 17 of the "Modern Treatment of Syphilis," by J E Moore (ed 2, Springfield, Ill., Charles C Thomas), in chapter 17 of "Modern Clinical Syphilology," by John H Stokes (ed 2, Philadelphia, W B Saunders Company), and in numerous other textbooks on the treatment of syphilis.

Speaking generally and in view of the patient's age, it would probably be wise to begin treatment with a course of eight to twelve weekly intramuscular injections of bismuth subsalicylate in oil, each 0.2 Gm, these injections to be administered deep into the muscles of the upper outer quadrant of alternate buttocks. Simultaneously the patient may be given 2 Gm of potassium iodide three times daily, this amount of the drug being administered well diluted with water, milk or any other desired flavored substance after meals. There is no indication for the use of mercury in the modern treatment of syphilis.

On completion of the suggested course of treatment, and assuming that the patient's physical condition is normal except for the syphilitic lesion of the cranial bones, mapharsen may be given at weekly intervals, beginning for a patient of this age with a dose of 30 mg administered by intravenous injection and with subsequent doses of 40 to 50 mg each, depending on the body weight. A representative course of mapharsen would be from twelve to sixteen injections. This in turn should be followed by another course of bismuth and potassium iodide, as outlined.

The aim of treatment for a patient of this age is to give enough treatment to heal the lesions and to prevent their recurrence. For this purpose two courses of bismuth and the one of mapharsen recommended should be sufficient. The effect of this treatment on the blood test is a matter of no importance.

Again depending on the patient's general health and an estimate of her life expectancy, it would probably be desired to test the spinal fluid relatively early in this course of treatment and to base any further treatment than the amount suggested on the result.

#### EXPOSURE TO FUMES FROM HOT NITROGLYCERIN

To the Editor—I am writing for information relative to the toxicity of hot nitroglycerin. I have come in contact with 2 or 3 persons who undoubtedly have suffered rather severe toxicity from inhaling fumes given off by this chemical and I am unable to cope with this as I do not know the contents of the poisonous gas therefore I have no means of ascertaining a rational treatment for such patients. One patient has suffered a spinal cord lesion simulating if not the same as multiple sclerosis. That I may not have erred in my diagnosis I referred this case to the Barnes Hospital Clinic in St Louis and the diagnosis was confirmed as made by me. I shall thank you for any information you may be able to give me.

A J Butner MD, Harrisburg Ill

ANSWER—At low temperatures, such as 50 C, the product of nitroglycerin evaporation is nitroglycerin. At higher temperatures some decomposition may take place with the formation of nitrous oxides along with the nitroglycerin vapors. This mixture of nitrous oxides and nitroglycerin may be expected at such approximate temperature level as 100 C. At much higher temperatures, but still below the explosion temperature, which approximates 250 C, more nitrous oxides are produced and correspondingly a diminution in the proportion of nitroglycerin. Both of these substances are highly toxic although their actions are dissimilar. The action of nitrous gases culminates in massive pulmonary edema. An earlier characteristic effect is the formation of methemoglobin. Less significant actions are related to the nitrites and are shared by nitroglycerin. Nitroglycerin as a liquid form is absorbable through the mucous membranes with readiness. Both nitrous oxides and nitroglycerin are dangerous when inhaled. As little as 2 mg of nitroglycerin may cause severe poisoning. The foremost feature of acute nitroglycerin poisoning is violent headache. In chronic poisoning, blood cell destruction is prominent. The commoner symptoms, in addition to the headache, are visual disturbance, flushed face, tachycardia, nausea, vomiting, lowered blood pressure and excitability even to the point of mania. It is well known that some degree of habituation occurs, which tolerance is quite transitory being lost even over a two day weekend. To avoid this loss nitroglycerin workers are likely to apply some nitroglycerin to their clothing such as a handkerchief. While such procedure may prevent nitroglycerin headache, it will not prevent some other actions of nitroglycerin, such as blood destruction. Also this practice is harmful for the nitroglycerin worker's family and those about them, for example others on street cars, who being unmured may develop headaches from proximity. The occurrence of a chronic condition on the order of a spinal cord lesion, as mentioned in the query, is possible as a result of multiple cord hemorrhages known to occur in nitroglycerin poisoning. While there are chemical antidotes for acute nitroglycerin poisoning, real industrial prevention must center around the control of exposure through the elimination of cutaneous contact and opportunity for vapor inhalation, and alcoholic intake should be rigidly avoided. While the exact temperature is not mentioned in the query, the temperature should be kept as low as is compatible with industrial requirement, since high temperatures increase the dangers involved.

#### SEBACEOUS CYSTS OF CHIN

To the Editor—A woman has many small sebaceous cysts about her chin incident to acne elsewhere on her face. Is there any means other than mechanical whereby these can be eradicated? I seem to have controlled to a large extent the further development of the lesions but I now appear to be faced with the need of removing these one by one by hand unless there is some effective wholesale method, such as use of the x rays.

Ursula G Mandel MD Los Angeles

ANSWER—This type of case is always difficult to treat. Roentgen therapy seems to be the method of choice. Eight to ten treatments given at weekly intervals, with a dosage of 75 to 80 roentgens, unfiltered should be given. Most cases of this type will respond to this form of treatment.

#### CARBON DIOXIDE COMBINING POWER OF PLASMA

To the Editor—In Queries and Minor Notes in The Journal Dec 12 1942 the explanation of the decrease in the carbon dioxide combining power of a plasma after eighteen hours in the ice box is assuredly incomplete. For years in my courses in physiology for medical students I have pointed out that the determination of the carbon dioxide combining power of the plasma of blood which has stood for a number of hours even in the ice box may give a false low reading as the result of glycolysis with lactic acid formation. The lactic acid of course interacts with the alkaline buffers of the blood and thus reduces the alkali reserve and hence the carbon dioxide combining power of the plasma. Glycolysis can be prevented by the addition of sodium or ammonium fluoride to the blood. This problem is adequately discussed in Peters and Van Slyke's "Quantitative Clinical Chemistry" (Baltimore Williams & Wilkins, 1932 and 1935 vol 1, p 129 and vol 2, p 62).

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## THE ROLE OF SURGERY AND IRRADIATION IN CANCER OF THE BREAST

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NEW YORK

There is today much confusion on what constitutes the best method of treating cases of operable cancer of the female breast. A review of the literature throws little light on the subject because of the widely divergent points of view expressed. Unfortunately many opinions are given which are not based on pathologic studies and on careful follow-up physical examinations.

High voltage irradiation was introduced into the armamentarium of therapy about 1923 to 1925. Few clinics in America have had sufficient cases treated by the different methods made possible by varying combinations of surgery and high voltage irradiation, especially since the introduction of the so-called divided dose method by Coutard, to have come to a positive conclusion that would be above statistical errors.

In this report I review the operable cases treated by different methods in an effort to see if it is possible to arrive at a conclusion as to which is the best method to be followed.

Any clinical experiment which involves combinations of radical mastectomy, simple mastectomy or local removal of a breast cancer, together with irradiation as a preoperative measure, or a postoperative procedure, interstitial irradiation and so on, offers no small problem. To carry out the clinical experiment it becomes necessary to lay out a program and adhere closely to it. For purposes of the study I determined to

- 1 Evaluate radiation therapy as the sole agent in the cure of mammary cancer
- 2 Evaluate radical surgery alone
- 3 Evaluate the combination of preoperative irradiation together with radical surgery
- 4 Evaluate the combination of immediate radical surgery and postoperative irradiation
- 5 Evaluate the combination of simple mastectomy with axillary irradiation

Many combinations of therapies, although they have been carried out, cannot be discussed here, as they are not within the realm of this paper. They will be considered in a later paper.

For purposes of facilitating the work, all the breast cases are classified along the following lines:

### I Malignant tumors of the breast

#### Carcinoma

- 1 Primary operable
- 2 Operable after a local excision
- 3 Primary inoperable
- 4 Recurrent inoperable
- 5 Prophylactic

#### Sarcoma

- II Benign tumors of the breast
- III Lesions due to injury
- IV Inflammatory diseases of the breast

During the past twenty-two years there have been admitted to the Breast Department of the Memorial Hospital 12,751 patients, 7,419 of whom had malignant lesions and 5,332 benign and inflammatory lesions. Every cancer case is placed in one of the groups shown in table 1, and it may be of interest to consider the relative proportion of the cases in each classification.

*Primary Operable*—This classification signifies that the surgeon or radiologist still has the opportunity to cure the patient along the standard lines of radical surgery and/or irradiation. It represents that the cancer is confined to the breast and corresponding axilla. No cases involving the lungs, bones or supraclavicular area can be considered operable.

This classification represents the early or fairly early case of breast cancer. As the result in all probability of educational propaganda on the subject of cancer, the relative percentage of the operable group steadily increases. Of the 7,419 cases of cancer 47.6 per cent fell into this group, and these 3,535 cases represent the basis of the present report.

*Operable After Local Excision*—This group represents those operable conditions in which a local removal of a cancer has been done before the patient has come to our hospital, where a radical mastectomy was then done. Many physicians will perform a local removal of a tumor in their office or in the hospital, when they would shudder to think of being called on to perform a radical mastectomy. My impression is that often the thought of its being cancer never comes to them before or during the operation.

This group of 283 cases represents a class that receive bad treatment. In the first place, the physician doing the operation is not trained in surgery. Second, he cuts too close to what he believes to be a benign tumor, instead of making a wide excision for an unknown tumor which later proves to be cancer. He has handled the tumor roughly and unquestionably leaves many cancer cells residual in the wound at the site of his cl

Part of the expense of the follow up work as well as certain funds for clinical research were furnished by the Katherine Straub Cancer Fund. Read before the Section on Surgery General and Abdominal at the Ninety Third Annual Session of the American Medical Association Atlantic City, N. J. June 12, 1942.



This group of patients, therefore, is malhandled from the beginning. They often later come to the surgeon after the disease has entered the lymph nodes, infiltrates local breast tissue and at times even with a nodule or two of skin involvement.

Of the 283 cases classified as "operable after local excision" there was a five year salvage of only 53 cases,

TABLE 1—Classification of Cases

Classification	Cases	
	Number	Per Cent
Primary operable	3 535	47.6
Operable after local excision	283	3.8
Primary inoperable	1 398	18.8
Recurrent inoperable	1 639	22.0
Prophylactic	639	7.2
Sarcomas	29	0.4
Total	7 419	

representing 20 per cent. Had the patient been properly handled at the beginning, she at least would have had a 51 per cent chance of five year cure.

**Primary Inoperable**—This classification signifies that the patient has neglected her disease until it has passed the breast and corresponding axilla, that the disease has entered the supraclavicular space, the chest, or that distant metastasis has occurred. This represents a neglected case, a case advanced beyond the stage at which the surgeon or the radiation therapist has an opportunity for cure by their respective or combined methods.

Fortunately our clinic showed that there is a striking decrease in this group. In 1920 29 per cent of our total breast cancer cases were of this group while in 1935 only 12 per cent were primary inoperable cases—a decrease of two and a half times the percentage of hopeless cases. Of the 1,398 cases of this group, radiation therapy has given a five year salvage in 12, which is 0.8 per cent.

**Recurrent Inoperable**—This group represents patients who have been operated on elsewhere and who came to us for therapy after an irremovable recurrence had been found. As a rule this is a hopeless group. Of the 1,639 cases, 24 have been salvaged by radiation therapy and surgery, producing a 1.4 per cent salvage.

**Prophylactic Group**—By this is meant that group which has had radical mastectomy before arriving at our clinic, where we give the postoperative therapy. The five year salvage is lower than anticipated, namely 15.5 per cent.

TABLE 2—Number of Primary Operable Cases, 1920-1942

Total primary operable cases (22 years)	3 552
Primary operable cases of last 5 years	1 562
Primary operable cases of first 17 years	1 996
These included	
Indeterminate cases	613
Determinate cases	1 383

There were 3,552 primary operable cases treated by a variety of methods. Table 2 gives the distribution of these cases. During the first seventeen years almost 2,000 operable cases were treated. As the result of various causes (table 3) 613 cases are not available for exact studies. It is interesting to note that only 6 per cent were actually lost to follow-up. In the age group of the cancer patient, obviously a fair number are lost from causes other than cancer, such as heart disease, diabetes, arteriosclerosis or nephritis. For the operable cases in which radiation treatment alone in the early

days was given there was no method of biopsy such as aspiration, which would give an exact diagnosis and still allow irradiation. A formal surgical biopsy would not only have jeopardized the life of the patient but have precluded the delivery of adequate radiation, because the operative scar breaks down under heavy irradiation. This accounts for the 270 cases with no proved pathologic condition which had to be excluded. Today aspiration biopsy would have made it possible to include a large part of these cases. The indeterminate cases totaled 613, leaving 1,383 cases in which the pathologic condition is known, as well as the details of the five year end result.

## SURGERY ONLY

Table 5 gives the results of treatment in the four large treatment classifications. Of the 194 cases treated by surgery alone without any radiation, it should be here stated that this group represents a "selected group" as evidenced by the high percentage of five year salvage, the low percentage of axillary involvement, namely 43 (table 6) and the older age level. The "surgery only" group emphasizes that selectivity is clinically proper if the end results show a high degree of success. However, from the point of view of a clinical experiment, "selection" only adds confusion.

When no axillary nodes were involved, 74.2 per cent five year salvage was obtained. This figure is approxi-

TABLE 3—Primary Operable Cases, 1920-1936 Inclusive Listing Determinate Cases and Cases Which Must Be Omitted Statistically

Total number	1,996
Died under 5 years not of cancer	104
Died under 5 years cause unknown	25
Lost under 5 years (6%)	191
Cancer not proved microscopically	2,0
Charts destroyed	2
Indeterminate cases total	613
Determinate cases	1,383

mately the same as that obtained in the better surgical clinics where surgery alone is employed. In the cases in which there was axillary involvement the five year salvage was 47.3 per cent which is decidedly higher than the average obtained in the average good surgical clinic. This figure immediately brings the "surgery alone" group under suspicion and emphasizes the point made by inference that any surgeon can select his patients, but what happens to those who are operable with rather bulky axillary disease who were rejected for the operation and sent to the radiation department for cure? Investigation reveals that irradiation failed to cure them. By costly experience we now know that in mammary cancer, if there is much actual bulk to be handled by radiation therapy, it will fail. In the past we sent many operable patients having at least a "chance" of cure by radical surgery to the x-ray department, where they had less opportunity for cure.

It is interesting that a few patients were treated by simple mastectomy with 71.4 per cent of five year survivals. Even 8 patients were treated by a local removal of the cancer, with 87.5 per cent five year survival. However, the number of patients so treated are too few to have statistical significance.

## PREOPERATIVE IRRADIATION

Preoperative irradiation followed by the radical amputation has many adherents. On theoretical grounds this method of treatment should be one of great value.

For a period of six years we subjected every patient whose condition was operable to preliminary irradiation routinely without any suggestion of "selectivity." When one compares the results when patients are treated in this way with treatment by immediate radical mastectomy followed by irradiation a month or six weeks later, one finds that the cure rate is higher among those

before their surgery given us better end results than treatment with other methods, it would have been worth the time lost, the added expense the morbidity, poor wound healing and fibrosis of the lung. But our experience was quite the contrary. To our mind this phase of the controversial problem of the value of preoperative irradiation is definitely settled. It was a great dis-

TABLE 4—Primary Operable Cancer of Breast, 1920-1936 Inclusive Broken Down into Groups According to Treatment and Duration of Life Showing Totals

Total Number of Cases	Index termi- nate Cases	Cases Anal- yzed	Surgery Only						Surgery Plus Preoperative Irradiation (Mostly Also Had Postoperative Irradiation)						Postoperative Irradiation After Surgery (Without Preoperative Irradiation)						Irradia- tion Only		Year			
			Radical		Simple		Local		Radical		Simple		Local		Radical		Simple		Local							
			+5	-5	+5	-5	+5	-5	+5	-5	+5	-5	+5	-5	+5	-5	+5	-5	+5	-5	+5	-5				
			Axilla Negative																							
									8	1					1									1930		
									1	1					2									1931		
				1					2	6														1932		
			2						3	2					1									1933		
									4	1														1934		
									8															1935		
									12	5					2	2								1936		
			1	1					2	4					4									1937		
			2						6	2					1									1938		
			3	1					10	10					4									1939		
			2	3					8	3					6	1								1940		
			4	3					8	2					4									1941		
			3	2					14	1					5	3								1942		
			11	1					1	3					17	7								1943		
			11	3					23	5					8	3								1944		
			12	3					27	11					9	2								1945		
			16	6					26	16					13	4								1946		
Axilla Positive																										
									5	3					1										1920	
									1	4															1921	
			2						5	2					2										1922	
									1	2					1										1923	
									6	2															1924	
									6	6															1925	
				1					7	10					1	1									1926	
			1	1					3	14					2	1									1927	
			1						6	13					3								2		1928	
			1						6	7	1				3	3									1929	
			6	5					5	8					7	9									1930	
			1	4			1		5	13					5	11									1931	
			5	2					14	30					3	7									1932	
			2	9					3	9					17	33									1933	
			1	9					16	31					8	7									1934	
			6	2					13	28					9	9					1				1935	
			9	6					17	36					14	19									1936	
Axilla Questionable																										
47	20	27				1			1			1									0	1			1920	
57	32	25								1			1		1	4					1	3			1921	
71	33	38	1						2		3	3	2	1							1	9			1922	
62	41	21								1		2	1	1							1	2			1923	
57	23	34									3	1	3	2	1							4			1924	
72	34	38								1		2										4	6		1925	
97	31	66					1				4	2	4	3		1	1								1926	
90	41	49	1								1	2			1	1					2	10			1927	
86	33	53	2		1						3	1	3				1				1	5			1928	
99	36	63									1	1									3	4			1929	
129	49	80									1	1	1	1							3	6			1930	
134	40	94		1	1				1		2	3									4	7			1931	
155	36	110			2		1				1	3			1	1	1	1			6	11			1932	
173	21	152			1		3				5		2		3	1	2		3		1	17			1933	
186	33	153			2	1						1	1	1		2		7			3	10			1934	
211	47	164			3		1	1					3			2		4			4	16			1935	
270	63	207				1		1					1		1		1	1	1		2	15			1936	
1996	613	1383	108	64	10	4	7	1	286	296	29	90	19	14	148	190	22	8	22	9	44	135	Total			

+5 signifies that patient survived five years —5 signifies the patient died under five years. The table shows how every 1 of the 1383 determinate cases was treated.

treated by the latter method. Table 5 shows that 582 patients with operable cancer were subjected to preoperative irradiation followed by radical mastectomy, 236 had no axillary involvement, of whom 163, or 69 per cent, had a five year survival. Of the 337 patients having axillary involvement 119, or 35.3 per cent, had a five year survival, with a 49.1 per cent over all survival of this group so treated.

Had our experience in the treatment of the total 669 patients who received preoperative irradiation

appointment to find that only 35 per cent of the cancers located in the breast proper were sterilized by modern divided dose methods of the x-rays or the radium pack. This 35 per cent is not to be compared with the 77 per cent accomplishment of immediate radical followed by radiation therapy. Disease in the axilla is somewhat less certain of cure by irradiation. In the first place without an operation no one can state with certainty whether the nodes are involved or not. And in the second place, possibly because of the diminished blood supply of

axillary nodes when compared to that of mammary tissue, which has a heavy blood supply, the sterilizing effect on the cancerous tissues is less than in the breast.

Another point of view will help to explain the fact that cases treated by preoperative irradiation followed by surgery do not have as high a cure rate as those treated by immediate surgery and then postoperative irradiation. This is the loss of time necessary for the irradiation to be given. This may take from four to six weeks, then, following the administration of the total dosage, it frequently requires six to eight weeks for the skin to recuperate sufficiently for surgical intervention if heavy preliminary irradiation has been used. Thus there is commonly a loss of three months. In all probability the good done by the preoperative irradiation is more than overcome by the loss of time resultant from delivering the dosage and waiting for the skin damage to repair.

as my group of "surgery only" cases is so highly selected, it may be well to study his cases in comparison with ours in order to establish a method of evaluating irradiation.

A study of table 8 reveals that the five year survival of Harrington having no involvement of the axilla was improved 5 per cent by the addition of irradiation. In his cases in which axillary involvement was present, again 5 per cent was added by irradiation. If we possessed a group of unselected cases treated by surgery alone, which we do not, we could tell how much irradiation adds, but we already know it to be of such great value that it is now too late to start to obtain an unselected group to be treated only by surgery.

Our salvage in the group having axillary involvement, 41.8 per cent, suggests the probability that selection was also used in this group. The improvement cannot be entirely attributed to the addition of irradiation. After

TABLE 5—Primary Operable Cancer of Breast, 1920-1936 Inclusive, Broken Down into Groups According to Node Involved, Treatment and Duration of Life

Lived	Surgery Only						Surgery Plus Preoperative Irradiation (Mostly Also Had Postoperative Irradiation)						Surgery Plus Postoperative Irradiation						Irradiation Only	
	Radical		Simple		Local		Radical		Simple		Local		Radical		Simple		Local			
	+5	-5	+5	-5	+5	-5	+5	-5	+5	-5	+5	-5	+5	-5	+5	-5	+5	-5	+5	-5
Number	69	24					163	73					1	71	22				1	
Per cent	74.2	25.8					69.0	31.0					100	76.8	23.2				100	
Axilla Negative																				
Number	35	39			1		119	218					5	74	103			1		2
Per cent	47.3	52.7			100		33.3	64.7					100	41.8	58.2			100		100
Axilla Positive																				
Number	4	1	10	4	6	1	4	5	28	23	19	8	1	4	22	8	21	8	44	16
Per cent	80.0	20.0	71.4	28.6	85.7	14.3	44.4	55.6	57.8	47.2	70.4	29.6	20.0	80.0	73.3	26.7	77.4	27.6	21.4	75.6
Axilla Questionable																				
Number	108	64	10	4	7	1	286	296	20	21	19	14	148	199	99	8	22	9	44	138
Per cent	62.8	37.2	71.4	28.6	87.5	12.5	40.1	50.9	53.7	46.3	57.6	49.4	61.6	46.4	73.3	26.7	71.0	29.0	24.2	75.8
Total																				

Only cases in which a full five year follow up was possible are included in the +5 (lived 5 years or more) group.

The morbidity from radiation therapy is often overlooked in our consideration, but, when the final chapter of therapy is written the unhappy consequences of this agent should be given their proportionate consideration.

#### RADICAL MASTECTOMY AND POSTOPERATIVE IRRADIATION

Of the 277 patients treated by immediate radical mastectomy followed by irradiation, 95 had no axillary involvement. Of these 73 survived, giving a 76.8 per cent five year survival. Of the 177 patients having axillary involvement, 74 survived, giving 41.8 per cent five year survival. These figures are of prime significance because, when compared with the results of treatment by the method of preoperative irradiation followed by radical surgery, they point to a higher percentage of salvage, even though (see table 6) this group has the highest proportion of axillary involvement, namely 64 per cent. It shows that the patients who came early enough to have no axillary involvement have approximately 77 per cent salvage. It also demonstrates that, of those having axillary disease present, the added irradiation is of very great value. A study of cases with axillary involvement from grade 3 and 4 cancers reveals that radiation therapy is of great value in tumors of high malignancy.

As Harrington of Mayo Clinic has a large series of cases treated both with and without irradiation and

the first thirteen years of this study the base of operability was materially broadened in order to minimize any selection of cases and conform as nearly as possible to the criterion of operability of the average surgeon. This will undoubtedly change our end result figures in the future. It will probably give worse survival figures than these here reported but in all probability, it will increase our percentage of five year survivals of the total.

The only criterion for effectiveness in therapy is the percentage of the total number salvaged. During the first five years, 1920 to 1924 inclusive, only 8 per cent of our total breast cancer material obtained a five year salvage. Some explanation should be attempted as to why this 375 per cent increase in over all salvage occurred. I would suggest first that the patients are coming to the surgeon earlier in the course of their disease as a result of education on the subject of cancer on the part of women. Second as a result of coming earlier there is less bulk of axillary involvement with greatly increased opportunity for cure. Third, by experience we no longer are referring a patient with only a moderate opportunity for cure by surgery to the x-ray department, where there is less opportunity for cure. Fourth, the cure rate has gone up in those cases in which there is axillary involvement, because irradiation is here of decided value, particularly in groups 3

and 4 (on the malignancy scale) Not only does irradiation have a direct inhibitory effect on the remaining cancer cells, probably more important is the locking-up process of the cancer cells in the added scar and fibrous tissue as a result of irradiation Here oxygenation and multiplication of cells are minimized by the unfavorable environment of the cancer cells

At this point consideration should be given to the amount of irradiation desirable as a postoperative procedure Common sense should be our guide A sufficient amount should be given to control the residual axillary disease and at the same time not enough to produce lymphedema of the arm If there is a moderate amount of axillary involvement we prescribe a total of 1,800 to 2,000 roentgens If there is a large amount of axillary disease, with cancer spread over as far as the costoclavicular ligament, we prescribe 2,000 to 2,250 roentgens Surgeons inadvertently produce lymphedema of the arm by infection locally or by inadequate or imperfect axillary drainage Local cancerous disease will produce this undesirable condition unknown causes contribute to the abnormal amount of fibrosis choking venous and lymphatic return from the arm However, knowing that radiation given in large amounts frequently produces it it may be wise to limit the total amount to a reasonable but effective quantity

#### IRRADIATION ONLY

Authorities have stated that external irradiation properly given, should be able to control mammary cancer This has not been our experience We have varied the factors of therapy in many ways to effect control, but only with modest success We have at least proved that it is possible by high voltage irradiation to effect five year survivals Of the 182 patients with operable cancer cases with biopsies given irradiation

TABLE 6—Radical Operations

	Percentage of Positive Node Involvement	Percentage of Five Year Cures
Surgery only	4%	63
Preoperative irradiation plus radical operation	38	49
Radical operation plus postoperative irradiation	64	54

TABLE 7—Five Year Survivals

	Irradiation	Mayo Clinic	Memorial Hospital
Axilla negative	With	75.4%	76.8%
	Without	70.2%	
Axilla positive	With	29.4%	41.8%
	Without	24.3%	

only 44 (24.2 per cent) survived the five year period This is an entirely unselected group of cases The cure rate by irradiation (24.2 per cent) compares unfavorably with that of surgery or a combination of surgery and irradiation (table 5) Roentgen therapy for the treatment of cancer of the breast is not an efficient method in the first place, because over half the patients with operable cancer have disease both in the breast and in the corresponding axilla the latter being poorly controlled by irradiation, and, second mammary cancer as a rule is a resistant type of cancer

#### SIMPLE MASTECTOMY

Some surgeons have become discouraged with the end results of treatment by radical mastectomy and as a result are resorting to simple mastectomy with the addition of axillary irradiation

This movement is not confined entirely to the lowly in surgery It seems to me that it is an unfortunate turn

TABLE 8—Total Numbers and Percentage Salvaged

	Number	Per Cent
Surgery only		
Radical	172	67%
Simple	14	77%
Local	8	58%
Preoperative irradiation plus surgery		
Radical	27	49%
Simple	4	54%
Local	2	38%
Surgery plus postoperative irradiation		
Radical	27	47%
Simple	30	77%
Local	31	71%
Irradiation only	182	24%

TABLE 9—Results in Total Determinate Cases

Total determinate cases	1,382
Number of patients survived five year	693
Percentage of five year survivals (including 182 cases treated by irradiation alone which had only 24% survival)	50.1

of events because those minded in the aforementioned way are disregarding the advances made step by step in this field for a quantity as yet unknown In the first place patients in the average clinic will have axillary involvement of from 55 to 63 per cent If radiation therapy could be relied on to sterilize the disease in the axilla, there would be a real rational basis for this procedure, but, unfortunately, external irradiation by itself is not sufficiently effective to be compared with the 30 to 40 per cent salvage by well done radical mastectomy in cases in which there is axillary involvement In this series of 1,383 cases of primary operable breast cancer are included 97 cases in which a simple mastectomy was done They represent selected cases in which we thought it reasonable on account of age poor general condition and apparent freedom from disease to do only a simple procedure Fourteen patients were treated with surgery only 10 having five year survivals, 71.4 per cent Fifty-three had preoperative irradiation followed by the simple mastectomy Of these 28 (52.8 per cent) survived the five year period Thirty patients were treated by simple mastectomy followed by irradiation of whom 22 (73.3 per cent) survived the five year period

Of course one cannot judge when there is no available axillary material for microscopic study as to our effectiveness in so treating this group One can state that we were fairly fortunate in our selection of material on which to attempt this procedure

#### LOCAL EXCISION

The same can be said of our 63 cases treated by local removal only of the cancer In 7 cases treated by surgery only there were 6 (85.2 per cent) five year survivals After preoperative irradiation 27 patients were subjected to only a local removal of the cancer, with 19 (70.4 per cent) surviving five years Twenty-nine

patients had immediate local removal followed by irradiation of whom 21 (72.4 per cent) survived the five year period

If one were to judge the results of all the cases by the accomplishment of treatment of the 97 simple mastectomies and the 63 local removals, it would appear that such local procedures would be preferable. But it would be disastrous if we were to take a step backward and do simple mastectomies and local removals of cancers as a routine. Those procedures were abolished with the advent of the present day radical mastectomy. One cannot quarrel with the careful selection of cases when, on account of age, poor general condition or other indications, the surgeon elects to carry out the less formidable procedures, provided his end results justify his choice.

It is up to the protagonists of this procedure to produce a series of cases as good as that produced by the combination of radical surgery and irradiation. We shall await with great anticipation a comprehensive report of a series of cases, statistically acceptable, so treated.

In conclusion, table 9 shows that of 1,383 patients with operable cancer carefully traced, 695 survived the five year period, giving an over all salvage of 51 per cent. This figure includes all those given irradiation alone for whom the salvage was much lower than that of treatment by the combination of surgery and irradiation.

#### SUMMARY

A study of five year end results in 3,535 cases in which an attempt was made to evaluate surgery alone, preoperative irradiation, postoperative irradiation and irradiation alone in the cure of operable breast cancer revealed that the cases treated by surgery alone represented a highly selected group and do not well represent a cross section of the accomplishments of treatment by this method. Our study shows that the preferable method of treating operable breast cancer is immediate radical mastectomy combined with postoperative irradiation. In this series so treated, of those with no axillary involvement 76.8 per cent obtained a five year survival, of those with axillary involvement, 41.8 per cent had a five year survival. This represents a higher salvage than is usually reported, the explanation is probably to be found in the following:

1. Patients with breast cancer come to the surgeon earlier than previously.

2. A partial selection of operable material takes place, which gives a higher cure rate for the operable cases but a lower cure rate for the total breast cancer material. Since the base of operability was broadened in 1933, the cure rate of operable cases will, in all probability, diminish, nevertheless we anticipate that the over all cure rate for the total material will continue to increase.

3. Modern irradiation by the divided dose method has definitely increased the salvage. The grade 3 and grade 4 cancers involving the axilla represented cases with an especially grave prognosis. Irradiation, carefully applied, has greatly improved the opportunity for cure of the grade 3 and grade 4 cancers, and it is in this group of highly malignant cancers that irradiation is most needed and of most value.

The poorest end results obtained in this study were in those unselected cases given irradiation only, namely 24 per cent.

In 695 of the total 1,383 cases, the five year period was survived, making a salvage of 51 per cent.

#### ABSTRACT OF DISCUSSION

DR SHIELDS WARREN, Boston. The need for a generally accepted classification for primary cancers of the breast has been well presented. It all too frequently happens that small non palpable lymph nodes contain tumor and that large palpable nodes clinically considered by skilled surgeons to be metastatic are only hyperplastic or the site of extensive infiltration by fat cells. Only when large axillary nodes are fixed can clinical evidence be considered acceptable for establishing the existence of metastases. Needless to say, this inability to make a clinical determination of axillary involvement should not influence the radical operative approach. In the laboratory my associates have been studying the prognostic significance of the extent of lymph node metastasis, that is, whether a patient with two of twenty nodes involved differs significantly in outlook from one with sixteen or all of the twenty involved. While criteria of operability are not in the sphere of the pathologist, it has been my experience that in mucinous carcinoma of the breast there may be extensive ulceration of the skin and a large mass of bulky tumor without metastases having occurred so that successful removal may be carried out. It is ordinarily possible to select the more anaplastic, rapidly growing carcinoma and it is easy for the pathologist, as for the clinician to recognize the totally inoperable acute carcinosis or so called inflammatory carcinoma. With the exception of these two groups of tumors, in my hands at least, attempts at histologic grading of carcinoma of the breast have proved only a disappointment.

DR C. D. HAACSEN, New York. At the Presbyterian Hospital in New York, Dr Stout and I have been much disappointed in irradiation. Not only has it failed to cure cancer of the breast, but we have been unable to show that it actually prolongs life when used for inoperable cases. Thus we have had to fall back on surgery as the sole means of cure and have turned our attention to finding ways of using surgery more efficiently. For this purpose we need a reliable method of classifying breast cancers as curable by operation, for we have evidence to prove that operating in the incurable cases shortens life. In analyzing a series of a thousand cases at the Presbyterian Hospital we have studied some twenty nine different clinical features which seemed to us to be of importance in estimating the true extent of the local disease. In our tabulations we use the punch card method, which we have found exceedingly convenient. We included in our tabulations all cases and did not exclude a so called indeterminate group of cases such as Dr Adair has done. I cannot believe that such exclusion of a selected group of cases is sound statistical practice. From our tabulations we derived a set of criteria for determining operability which we recommend for your consideration. They are (1) the inflammatory type of breast cancer, (2) cases of extensive edema of the breast that is, when the edema involved more than a third of the skin area of the breast, (3) satellite tumor nodules in the skin over the breast, (4) edema of the arm, (5) intercostal or parasternal nodules, (6) supra clavicular metastases, (7) distant metastases, (8) development of breast tumor during pregnancy or lactation (none of our cases were cured in this group), (9) the presence of any two or more of the following signs of locally advanced breast tumor—any two or more, you will note, not any one: (a) ulceration of the skin, (b) edema of the skin of limited extent, (c) fixation of the tumor to the chest wall (solid fixation), (d) axillary lymph nodes measuring 2.5 cm. or more in transverse diameter, proved by biopsy to contain metastases if decision as to operability turns on this criterion alone, (e) fixation of enlarged axillary lymph nodes to overlying skin or to deep structures of axilla, again proved by biopsy to contain metastases if decision as to operability turns on this criterion alone. The application of these criteria of inoperability in the Presbyterian Hospital series of 640 radical mastectomies (1915-1934) would have obviated a total of 110 of the operations and would not have decreased the number of patients permanently cured by a single one.

DR WILLIAM CRAWFORD WHITE, New York. Dr Adair is to be congratulated on his careful study of the Memorial Hospital records for the past twenty-odd years. The five year survival rate in the operative cases compares favorably with those

of other clinics. But I am a little puzzled by the 41 per cent survival rate in the cases of axillary metastases. After studying the charts I think that one factor has been his exclusion of the group of cases in which death occurred without clinical evidence of cancer. I do not think that this group, as a whole, should be excluded without benefit of autopsy. In recent years postoperative roentgen therapy has been used generally. Dr Adair feels that it has been of benefit, and I would like to believe that it is so for the comfort it would give the patient and the surgeon. But in his two tables he has presented practically the same results in cases with surgery alone and in surgery plus roentgen therapy after operation. That likewise has been our experience at the Roosevelt Hospital in a study of five year results. On the contrary, we have definitely been able to prolong the life of some patients comfortably for a short period with roentgen therapy after recurrences have been noted. Dr Adair has had the unusual opportunity of using preoperative roentgen therapy in a large group of cases. It has given him the opportunity that comes to but few to analyze the results in this much debated procedure. He has come to the conclusion that it is not beneficial. We are indeed indebted to him for this valuable contribution. In fact, both surgery and roentgen therapy are often only palliative in the primary operable cases which have been discussed here today. Unknown to us metastases are often outside the operative field in the so called early case. How else to explain the 25 per cent mortality from cancer within five years in the best statistics? All this boils down to the fact that our only hope for improved results rests in cancer education so that the patient may be treated more promptly.

DR E. PAYNE PALMER, Phoenix, Ariz. Most of us who have aided in the educational campaign in cancer feel that we have made some progress during the last quarter of a century as far as the public is concerned, but it is questionable how much progress we are making with the medical profession. Unfortunately we, the medical profession, are an egotistical class as a whole. We don't like to have some one from our town or a neighboring town come in and tell us about cancer, so we pay little attention to them. That is shown by Dr Adair's statistics. I have been working with this problem for almost a half century. We must continue to educate the medical profession through our organizations and go ahead with our education of the public. We must teach the doctor that he must suspect cancer, that cancer of the breast is frequent and that most of the benign tumors should be removed. A specimen should be turned over to the pathologist to examine at the time of removal, and if he feels that the specimen should have a frozen section he should do so. If he feels that it is suggestive of malignancy let him tell you to operate. I prefer to have the pathologist make the diagnosis for me. Then I feel that we are going to give the patient a better chance for a cure. Our method has been in class 1 to do a radical operation and when doing so to go as far as you can with the operation. Then we have those patients irradiated, and we have them irradiated by a man who knows what he is doing and what the dosage should be. In class 2 we give an intensive irradiation forty-eight hours before operation, just short of skin tolerance, and again twenty-four hours before. We then do the radical operation and follow up with irradiation. We have found that our results are better by this method than by doing a radical operation and then irradiating afterward. We feel that it is the proper procedure for these patients. By this method wound healing occurs before irradiation has slowed down the healing process. The other cases, as mentioned here, should be treated radically. If you have a supraclavicular gland, do not class it as a nonoperative case but remove the gland. Such patients are going to die unless you are a radical surgeon and unless you are a radical radiologist. I feel that we should be radical surgically and radiologically.

DR U. V. PORTMAN, Cleveland. It is impossible to expect irradiation by the techniques that we use today to cure cancer of the breast. My idea is that it prolongs life and economic usefulness. Group 1 cases are those without axillary metastases. A woman coming with a tumor in the breast, without palpable nodes and with none of the indications of incurable cancer as

Dr Haagensen pointed out, certainly should have a removal of that tumor and a microscopic examination at once. If the tumor is benign nothing else need be done. If the tumor proves to be malignant, it is up to the surgeon to decide how radical an operation he must do. In my experience the incidence in this type of case has been 25 per cent, with 85 to 90 per cent of survival in group 1. There is a certain percentage that do not survive because the tumors have not metastasized to the axilla but elsewhere. Irradiation has been of no benefit in this group of cases. In group 2, which consists of 25 per cent of our cases, the surgical curability runs 45 to 50 per cent. 50 per cent of these patients are not cured. Therefore postoperative irradiation is indicated and the lives of some of these patients have been prolonged but the patients have not been cured by the irradiation or by the surgery. In group 3 which is 30 per cent of our cases by operation alone only 5 per cent survived five years, and that number would have survived if nothing whatever had been done, but in that group of patients all of a life has been prolonged because 15 per cent of them have been well for five years. In group 4, those with distant metastases at the time they came for examination, 20 per cent of our cases surgery could not cure nor could irradiation cure, but even then lives were prolonged with a little less than 10 per cent survival for five years. I have not yet been able to decide that preoperative irradiation is indicated. It is manifest from Dr Adair's statistics and Dr White's remarks that a classification for carcinoma of the breast is necessary, because, for example, in the 30 per cent recurrences in cases without axillary metastases operations in advanced stages of the disease were being performed because there were recurrences in so few only 10 per cent without axillary metastases.

DR FRANK E. ADAIR, New York. The question raised by Dr Haagensen as to the best method of reporting end results is proper to bring out for discussion. It richly deserves consideration by men more competent as statisticians and mathematicians than we who are here assembled today. At present the method of reporting end results differs so widely in the hands of different reporters and institutions that often no scientific comparison is possible. The method used by us at the Memorial Hospital has been adopted by the hospital after many conferences between staff members and statisticians, including statisticians of insurance companies. Our method of reporting leaves no place for guesswork as to what happened in a given case. Some national medical body would do well to make a study of the most scientific method of reporting end results and then see to it that no other method than the one adopted is acceptable to medical editors. I recognize that my figures seem too high—and in the paper explain it as best I can. Of the operable cases of the first thirteen years, Dr Burton Lee headed the breast service and in those days Dr Lee believed that irradiation would accomplish more than it actually proved to do in mammary cancer. Many of our cases that were on the borderline of operability were treated in the x-ray department with loss of life in practically all. Today, unless the case is definitely inoperable, surgery is employed. This broadens the base of operability more in conformity with operators of other clinics and keeps from such refined selectivity, so that the majority of clinics are talking the same statistical language.

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**The Ordinary Mixed Diet**—Calcium constitutes a larger proportion of body weight than does any other of the mineral elements. It is very unevenly distributed in the body, over 99 per cent of the total amount normally being in the skeletal system. It is also very irregularly distributed among the staple articles of food, many of which are extremely poor in calcium while milk contains it in abundance, and green leaves in fairly liberal relation to their total solids or calories. A food supply may appear liberal and varied and yet unless milk and green leaf vegetables are well represented it may be calcium poor. Hence the "ordinary mixed diet" of Americans and Europeans at least among dwellers in cities and towns is probably more often deficient in calcium than in any other chemical element—Sherman, Henry C. *Chemistry of Food and Nutrition*. New York: Macmillan Company, 1941.

## ENCEPHALITIS

EASTERN AND WESTERN EQUINE AND ST LOUIS  
TYPES AS OBSERVED IN 1941 IN WASHINGTON  
ARIZONA NEW MEXICO AND TEXAS

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SAN FRANCISCO

From studies made on the encephalitides in the United States and Canada during the last decade, the evidence favors setting apart from the many types a group of virus infections which appear to be arthropod borne. These infections have come to be known as western equine and eastern equine encephalomyelitis and St. Louis encephalitis. Now, however, they are recognized to be no longer limited geographically to east and west or in host range to horse and man. Epidemiologically and clinically they are closely related. It would seem reasonable therefore to classify them as members of an increasingly large group of diseases which might well be called arthropod borne virus encephalitides and to consider and study them together.

TABLE 1—Results of Neutralization Tests with Three Neurotropic Viruses on Serums from Patients with a Clinical Diagnosis of Virus Encephalitis, Summer of 1941

	Total Tested	Positive to Eastern Equine	Total Positive to Western Equine	Total Positive to St. Louis	Positive to Western Equine and St. Louis
Yakima Valley Wash	24*	0	18	20	15
Pinal County Ariz	15	0	6	17	5
Other Arizona areas	7**		2	3	1
Upper Rio Grande Valley	6†		6	3	3
Lower Rio Grande Valley and southern Gulf Coast	6	1	0	1	0
Total	61	1	22	44	24

\* One serum taken three days after onset found negative to all viruses; no later specimen obtained.

\*\* Four serums taken eight days or less after onset found negative to all viruses; no later specimen obtained. (Antibody to the St. Louis virus is only occasionally encountered by the eighth day.)

† Two were not tested against the St. Louis virus.

Four serums all taken several weeks after onset were negative to all three viruses.

In this paper the extensive epidemiologic studies made during the summer of 1941 in the relatively isolated Yakima Valley, Washington will be summarized briefly. These studies were of a broad nature, planned in advance and observations begun several weeks before the first case occurred. Investigation of previous epidemics in this area made it possible to predict a recurrence and to outline certain problems for intensive research. In addition observations and investigations made in other areas of the western United States will be reported. These other areas studied include Arizona, New Mexico and Texas. Part of the

results from the Washington<sup>1</sup> and Arizona<sup>2</sup> investigations have been reported elsewhere in more detail, but those from other states are now presented for the first time.

It is often true that comparative studies of several relatively small outbreaks manifesting different age, sex and occupational characteristics, occurring in areas with certain topographical, agricultural and zoological differences yield information not obtained by the study of a single though large, epidemic. An attempt will be made to interpret some of the differences and similarities noted.

## HUMAN CASES

Sufficient data for a diagnosis of a virus encephalitis were available from 69 human patients: 26 from the Yakima Valley, Washington, 18 from Pinal County, Arizona,<sup>2</sup> 9 from other portions of that state, 7 from northwestern Texas and southeastern New Mexico (upper Rio Grande Valley) and 9 from southern Texas and the lower Rio Grande Valley. The diagnosis was based on a combination of clinical findings, spinal fluid examinations and virus neutralization tests.<sup>3</sup> Only those cases are included in which the clinical diagnosis was confirmed by either spinal fluid examination or the neutralization test, both in most cases.

**Virus Neutralization Tests.**—In table 1 are presented the results of virus neutralization tests on 61 of the 69 patients. Unfortunately, both acute and convalescent serums were available for only 12 of the 25 Arizona cases and for but 9 of the 26 from Yakima. From patients in the latter area the titer of antibodies for the St. Louis virus was shown to increase during the interval between the two bleedings of 3 patients, and in 2 of these it also increased for the western equine virus. In 4 others an increase was demonstrated for the western equine strain only. As has been previously emphasized, a positive test on a convalescent specimen cannot be attributed with certainty to the current disease unless an earlier specimen has been demonstrated to have no antibody or antibody of a lower titer. Some diagnostic significance has been attached to single positive tests for the equine viruses, since in most instances (but not all<sup>4</sup>) antibodies to these viruses in human beings are found only following a clinically recognized encephalitis.

Most of the Yakima cases must be attributed to the western equine virus for antibodies to the St. Louis virus were found in the serums of many normal persons of this area. In Arizona most cases were caused by the St. Louis virus, for an increase in antibody titer for this virus was most frequently demonstrated. All those tested from the upper Rio Grande Valley neutralized the western equine virus and 3 of 4 tested

1 Hammon W. McD. Gray J. A. Evans F. C. and Izumi E. M. Western Equine and St. Louis Encephalitis: Antibodies in the Sera of Mammals and Birds from an Endemic Area. *Science* 94: 305-307 (Sept. 26) 1941. Hammon W. McD. Reeves W. C. and Izumi E. M. Mosquitoes and Encephalitis in the Yakima Valley, Washington. II. Methods for Collecting Arthropods and for Isolating Western Equine and St. Louis Viruses. *J. Infect. Dis.* 70: 267 (May-June) 1942. Bang F. B. and Reeves W. C. Mosquitoes and Encephalitis in the Yakima Valley, Washington. III. Feeding Habits of *Culex tarsalis* Coq. a Mosquito Host of the Viruses of Western Equine and St. Louis Encephalitis. *ibid.* 70: 273 (May-June) 1942. Reeves W. C. and Hammon W. McD. Mosquitoes and Encephalitis in the Yakima Valley, Washington. IV. A Trip for Collecting Live Mosquitoes. *J. Infect. Dis.* 70: 275 (May-June) 1942. Hammon Reeves Brookman Izumi and Gjullin<sup>15</sup>. Hammon Lundy Gray Evans Bang and Izumi<sup>20</sup>. Hammon Reeves Brookman and Izumi<sup>18</sup>. Hammon Reeves Brookman and Gjullin<sup>20</sup>.

2 Meiklejohn Gordon and Hammon W. McD. Epidemic of Encephalitis Predominantly St. Louis Type in Pinal County, Arizona. *J. A. M. A.* 118: 961-964 (March 21) 1942.

3 Hammon W. McD. and Izumi E. M. A Virus Neutralization Test Subject to Standardization Used with Western Equine Encephalomyelitis, St. Louis Encephalitis and Mouse Adapted Poliomyelitis Viruses. *J. Immunol.* 43: 149-157 (Feb.) 1942.

4 Buss and Howitt<sup>12</sup>. Hammon<sup>13</sup>.

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against the St. Louis virus neutralized it also. The southern Texas cases were chiefly of unknown etiology. Bloods drawn from horses and cows in the last area indicated infection with eastern and western equine and St. Louis viruses. In every area there was evidence of the presence and activity of at least two viruses.

In Texas 1 patient was encountered with antibodies to the eastern equine virus. This was a girl 8 years of age who suffered from a relatively mild clinical encephalitis. Fever, stiffness of the neck and an increased spinal fluid cell count were reported by the physician, Dr. G. R. Daschelle of Brownsville, who saw the child once at an office visit during the early acute stage. About three weeks later following apparent recovery, she was found, on examination by me, to have a unilateral Babinski sign with slight spasticity and overactive tendon reflexes in the same leg. She became ill during an outbreak of encephalomyelitis in horses which was proved to be due to the eastern equine virus by repeated isolation of this virus from the brains of horses.<sup>5</sup> This epizootic began on the Boca Chica flats at the mouth of the Rio Grande River in the area where this girl lived. Blood from an unvaccinated horse on the same ranch was tested and found to have antibodies to the eastern and the western equine viruses. This is the only case<sup>5a</sup> of the eastern type infection reported in man except during the 1938 outbreak in Massachusetts.

These blood serum tests, together with tests previously reported from some of these same areas<sup>6</sup> and others including California,<sup>7</sup> Colorado<sup>8</sup> and North Dakota,<sup>9</sup> reported by others, indicate that mixed epidemics may predominate in the Western states. From the experience in Texas it is seen that all three viruses, and probably another one, may be present in the same area. The presence of another virus is postulated because bloods from a number of cases of clinical encephalitis which occurred at the time of the horse epizootic, and just after, failed to neutralize any of the three viruses known to be present. I have been informed that blood from a number of other clinically similar cases from central Texas<sup>9a</sup> which were examined in another laboratory also failed to neutralize these three viruses. Blood from both of these Texas groups was taken late enough to rule out St. Louis virus infection.

In table 2 it will be noted that the proportion of normal persons in the Yakima Valley with antibodies to the St. Louis virus increases with the length of residence in the valley. This was not a function of age. Similar findings were reported in 1940.<sup>10</sup> None of the

52 normal persons tested had antibodies to the western equine virus, although in the group tested the previous year five such were found in a group of 75 (6⅔ per cent).<sup>11</sup> Undiagnosed infections occur therefore, with both viruses. In these instances the central nervous system is either not involved or only slightly involved as far as can be determined by history.

**Clinical Diagnosis**—Symptoms, physical findings and clinical laboratory tests did not vary significantly from those reported previously from these and other areas.<sup>12</sup> At present no specific etiologic diagnosis can be made on the basis of these clinical data alone.

**Sex and Age**—Table 3 presents data on sex and age from epidemics in six western areas. In Yakima in 1941 the incidence in the two sexes was equal. The previous year 81 per cent of the cases were in males.<sup>13</sup> The average age of the 26 patients in 1941 was conspicuously less than that of the previous season.<sup>13</sup> The Arizona patients, though predominantly infected by the St. Louis virus, were 60 per cent children under 12 years of age.<sup>2</sup> Seventy-eight per cent were males. These are in sharp contrast to the findings in the St. Louis City and County epidemic of 1933,<sup>14</sup> where

TABLE 2—Antibodies to St. Louis Virus in 1941 in Normal Persons Residing in the Yakima Valley by Years of Residence

Years of Residence in Yakima Valley	Antibodies St. Louis Virus		Per Cent Positive
	Negative	Positive	
0-3	10	1	9.1
4-7	5	3	40.0
8-11	4	3	
12-15	0	1	76.9
16-19	1	5	
20	5	16	
Total	25	27	51.9

the mean age was high and the sex distribution equal. The upper Rio Grande Valley cases were restricted almost entirely to the 50 to 70 year age group, while the lower Rio Grande and southern Gulf Coast cases were mostly in children. No significant sex differences were noted in either of these groups. The sex and age distribution for Kern County, Calif., as given by Buss and Howitt,<sup>15</sup> and of the St. Louis City-County outbreak have been included in the table for comparison.

Although mention has frequently been made of the high susceptibility to encephalitis during infancy and early childhood, based largely on animal experiments<sup>16</sup> and the one relatively small Massachusetts outbreak of

5 Randall, Raymond and Eichhorn, E. A. Westward Spread of Eastern Type Equine Encephalomyelitis Virus. *Science* 93: 595 (June 20) 1941. Mohler, J. R. Report of the Chief of the Bureau of Animal Industry 1941. U. S. Dept. of Agriculture, Sept. 15, 1941.

5a Since this paper was written 2 other cases of eastern equine infection in man have been reported from Texas. These were diagnosed on a similar basis during the summer of 1942. Boles, S. W. and Irons, J. V. Laboratory Observations on Virus Encephalitis. *Texas State J. Med.* 38: 260-264 (Aug.) 1942.

6 Meklejohn and Hammon. Hammon<sup>13</sup> Hammon and Howitt<sup>10</sup>

7 Howitt, Beatrice F. Viruses of Equine and of St. Louis Encephalitis in Relationship to Human Infections in California, 1937-1938. *Am. J. Pub. Health* 29: 1083-1097 (Oct.) 1939. Buss and Howitt<sup>15</sup>

8 Philip, C. B., Cox, H. R. and Fountain, J. H. Protective Antibodies Against St. Louis Encephalitis Virus in the Serum of Horses and Man. *Pub. Health Rep.* 56: 1388-1391 (July 4) 1941.

9 Breslich, P. J., Rowe, P. H. and Lehman, W. L. Epidemic Encephalitis in North Dakota. *J. A. M. A.* 113: 1722-1724 (Nov. 4) 1939.

9a Since this paper was written a report of these cases has been published. Woodland, J. C. and Smith, E. M. Acute Encephalitis. Mild Epidemic Observed at Station Hospital, Fort Sam Houston, Texas. *J. A. M. A.* 120: 358 (Oct. 3) 1942.

10 Hammon, W. McD. and Howitt, Beatrice F. Epidemiological Aspects of Encephalitis in the Yakima Valley. Mixed St. Louis and Western Equine Types. *Am. J. Hyg.* 35: 163-185 (March) 1942.

11 Hammon<sup>13</sup> Hammon and Howitt<sup>10</sup>  
12 Dingle, J. H. The Encephalitis of Virus Etiology. *New England J. Med.* 225: 1014-1022 (Dec.) 1941. Meklejohn and Hammon. Buss and Howitt<sup>15</sup> Hammon<sup>13</sup> Report on the St. Louis Outbreak of Encephalitis.<sup>14</sup>

13 Hammon, W. McD. Encephalitis in the Yakima Valley. Mixed St. Louis and Western Equine Types. *J. A. M. A.* 117: 161-167 (July 19) 1941.

14 Report on the St. Louis Outbreak of Encephalitis. *Pub. Health Bull.* 214. U. S. Treasury Department. Public Health Service, January 1935.

15 Buss, W. C. and Howitt, Beatrice F. Human Equine Encephalomyelitis in Kern County, Calif. 1938, 1939 and 1940. *Am. J. Pub. Health* 31: 935-944 (Sept.) 1941.

16 Sabin, A. B. and Olitsky, P. K. Age of Host and Capacity of Equine Encephalomyelitis Viruses to Invade the Central Nervous System. *Proc. Soc. Exper. Biol. & Med.* 38: 597-599 (May) 1938. King, Lester. Studies on Eastern Equine Encephalomyelitis. IV. Infection in the Mouse with Fresh and Fixed Virus. *J. Exper. Med.* 71: 95-106 (Jan. 1) 1940. Sabin, A. B. Constitutional Barriers to Involvement of the Nervous System by Certain Viruses with Special Reference to the Role of Nutrition. *J. Pediatr.* 19: 596-607 (Nov.) 1941. Morgan, I. M. Influence of Age on Susceptibility and on Immune Response of Mice to Eastern Equine Encephalomyelitis Virus. *J. Exper. Med.* 74: 115-132 (Aug. 1) 1941. Schlesinger, Morgan and Olitsky.<sup>15</sup>

the eastern type equine infection, study of these data from some of the many western epidemics of western equine and St. Louis encephalitis (table 3) shows that age and sex incidence vary greatly. This would seem to indicate that environmental factors affecting exposure to the infection play an important role in determining both age and sex distribution. Obviously none of the earlier general statements regarding a characteristic age and sex distribution for any one of these infections are now tenable.

**Case Fatality Rates**—Case fatality rates for these same western areas are presented for comparison in table 3. Variation in fatality rates may be partly dependent on age incidence, it would appear. In all instances shown in the table in which the sample is of significant size, the higher case fatality rates occurred in outbreaks when the higher age groups were principally affected. This is true regardless of whether the St. Louis or the western equine infection predominated. The data from New Mexico and Texas are too meager and incomplete to render any rate significant.

#### ENTOMOLOGIC ASPECTS

The following characteristics were found common to all areas studied: (1) annual epizootics of encephalomyelitis in horses, (2) an epidemic of human encephalitis,

western equine virus were isolated for the first time in naturally infected mosquitoes.<sup>18</sup> The former was found three times and the latter five times in *Culex tarsalis*. Although laboratory experiments showed that several *Aedes* mosquitoes transmit the equine virus (reviews<sup>19</sup>), not one was found infected among 4,353 of these which were caught and tested. To date no laboratory transmission tests have been attempted with *C. tarsalis*<sup>19a</sup> except those now in progress in Texas in our field laboratory. There, Reeves and I have just completed successful preliminary transmissions of the St. Louis virus by the bite of *Culex tarsalis* and several other species of mosquitoes. The epidemiologic evidence tending to incriminate *C. tarsalis* as a vector for both western equine and St. Louis virus has been summarized elsewhere.<sup>20</sup> This evidence is based on its geographic distribution, seasonal activity, selective feeding on domestic animals and the isolation of viruses from naturally infected specimens.

Mitamura's claim of the transmission of the St. Louis virus by *Culex pipiens*<sup>21</sup> has recently been confirmed by Reeves, Hammon and Izumi.<sup>22</sup> Moreover, it has been shown that *Aedes lateralis* will transmit both the St. Louis (Reeves and Hammon<sup>23</sup>) and the western equine virus (Reeves<sup>24</sup>).

TABLE 3—Sex, Mean Age, Deaths and Case Fatality Rates of Encephalitis in Man in Six Western Areas

Area and Year	Predominant Type	Total Cases	Males	Females	Mean Age in Years	Deaths	Per Cent Deaths
Yakima 1940	Western equine	38	47	11	46	13	22.4
Yakima 1941	Western equine	26	13	13	25	3	11.5
Arizona 1941	St. Louis	27	21	6	17	1	3.3
Upper Rio Grande Valley 1941	Both	7	4	3	61	1	
Lower Rio Grande Valley 1941	Unknown etiology	9	3	6	9	3	
Kern County Calif. 1938, 1939, 1940 <sup>18</sup>	Western equine	116	70	40	10	11	9.5
St. Louis 1933 <sup>14</sup>	St. Louis	1,097	549	548	40	221	20.0

\* Sex and exact age of 1 patient unknown

\*\* Sex and exact age of 3 patients unknown

itis, (3) intermittent flooding (in most instances irrigation), (4) high summer temperature, (5) large numbers of mosquitoes and (6) evidence of the presence of both St. Louis and western equine viruses. Although studies made by us did not include California, the central valley areas of this state also fulfil the six conditions noted. However, another important southwestern human epidemic (St. Louis 1933) occurred under slightly different circumstances.<sup>14</sup> This epidemic occurred in a nonirrigated area during a summer of unusual drought. This resulted in unusual localized areas of intense *Culex* mosquito breeding in the stagnant sewerage and drainage ditches.

The Massachusetts human outbreak of 1938 was also of the sporadic type, occurring during a summer in which there were heavy rains in a nonirrigated area.<sup>17</sup> Thus, in all areas, outbreaks of encephalitis which involved man were associated with the presence of large numbers of mosquitoes. It may be concluded that epidemics may be expected in most instances to recur annually in irrigated areas, only occasionally elsewhere.

During the testing of 12,000 mosquitoes and 4,000 other arthropods for the presence of virus, during the Yakima Valley survey in 1941, St. Louis virus and

Since overwintering of the virus in *Aedes* eggs appeared improbable on the basis of experiment<sup>25</sup> and precedent, ticks and reduviids have been considered in this role. *Dermacentor andersoni*<sup>26</sup> and *Dermacentor*

18. Hammon W. McD., Reeves W. C., Brookman Bernard, Izumi I. M., and Gjullin C. M. Isolation of the Viruses of Western Equine and St. Louis Encephalitis from *Culex Tarsalis* Mosquitoes. Science 94: 328-330 (Oct. 3) 1941. Hammon W. McD., Reeves W. C., Brookman Bernard, and Izumi I. M. Mosquitoes and Encephalitis in the Yakima Valley, Washington. I. Arthropods Tested and Recovery of Western Equine and St. Louis Viruses from *Culex Tarsalis* Coquillett. J. Infect. Dis. 70: 263 (May-June) 1942.

19. Davis M., Hammon W. McD., Reeves W. C., Brookman Bernard, and Gjullin C. M. Since writing this we have succeeded repeatedly in effecting transmission of both western equine and St. Louis viruses by the bite of *Culex tarsalis*, thus completing the evidence necessary to incriminate it as a vector of both viruses in this area. Hammon W. McD., Reeves W. C., and Gray, M. Mosquito Vectors and Inapparent Animal Reservoirs of St. Louis and Western Equine Encephalitis Viruses read at Convention of American Public Health Association, St. Louis during October 1942. J. Am. Pub. Health A. to be published.

20. Hammon W. McD., Reeves W. C., Brookman Bernard, and Gjullin C. M. Mosquitoes and Encephalitis in the Yakima Valley, Washington. V. Summary of Case Against *Culex Tarsalis* Coquillett as a Vector of the St. Louis and Western Equine Viruses. J. Infect. Dis. 70: 278 (May-June) 1942.

21. Mitamura T., Yamada S., Hazato H., Mori K., Hosoi T., Kitaoka M., Watanabe S., Okubo K., and Temjin S. Ueber den Infektionsmodus der epidemischen Enzephalitis. Experimentelle Untersuchungen über ihre Ansteckung durch Mücken. Tr. Jap. Path. Soc. 27: 573-580, 1937.

22. Reeves W. C., Hammon W. McD., and Izumi I. M. Experimental Transmission of St. Louis Encephalitis Virus with *Culex pipiens*. J. Immun. Proc. Soc. Exper. Biol. & Med. 50: 125-128 (May) 1942.

23. Reeves W. C. and Hammon W. McD. To be published.

24. Reeves W. C. Newer Developments in Knowledge of Insect Hosts and Vectors of Western Equine and St. Louis Encephalitis. Proc. Twelfth Ann. Conf. California Mosquito Control A. (1941) 1942 pp. 23-27.

25. Merrill M. H. and Ten Broeck Carl. The Transmission of Equine Encephalomyelitis Virus by *Aedes Aegypti*. J. Exper. Med. 62: 687-695 (Nov. 1) 1935.

26. Syvertsen J. T. and Berry G. P. An Arthropod Vector for Equine Encephalomyelitis. Western Stream. Science 54: 186-187 (Aug. 21) 1936.

17. Feemster R. F. and Getting V. A. Distribution of the Vectors of Equine Encephalomyelitis in Massachusetts. Am. J. Pub. Health 31: 791-802 (Aug.) 1941. Getting V. A. Equine Encephalomyelitis in Massachusetts. An Analysis of the 1938 Outbreak. A Follow Up of Cases and a Report of a Mosquito Survey. New England J. Med. 224: 999-1006 (June 12) 1941.

variabilis<sup>27</sup> have been demonstrated to be capable of transmitting western equine and St Louis virus, respectively, in the laboratory. A reduviid, *Triatoma sanguisuga* was found infected with the western equine virus in Kansas pastures<sup>28</sup>. Since *Culex tarsalis* overwinters as an adult, it might also serve to carry the virus over from one season to another.

#### OTHER VERTEBRATE HOSTS

The Yakima Valley of Washington is a fertile, flat, irrigated valley encircled and subdivided by barren sagebrush hills. Several gaps are formed in these ranges of hills to the north and south by the course of the Yakima River and are so constructed that migration of wild mammals into the valley is quite improbable. This makes it unlikely that equine encephalomyelitis was introduced in this way. Wild migratory birds do enter the valley along the course of the river.

Encephalomyelitis in horses was first recognized in the valley in 1938. As is shown in table 4, there have been since 1938 annual equine and human outbreaks. Despite extensive vaccination of horses for the western equine type of infection during 1939, 1940 and 1941, cases occurred at many and scattered points throughout the valley, either distant from or in close proximity to human cases. As may be seen in the table there is no numerical relation between the number of equine and human cases. Vaccination of horses did not appear to reduce the incidence of the disease in man. These facts render it unlikely that either man or horse acquires the disease directly one from the other or through an insect vector infected by biting only these hosts. From these and other data it appears reasonable to postulate the presence of a widespread, inapparent reservoir.

As a part of the program of study during the 1941 outbreak all of the reported cases in horses were visited and the diagnosis confirmed by clinical examination or autopsy. It is likely that most of the disease in horses in the Yakima Valley was western equine encephalomyelitis, since no case was seen in a horse vaccinated by a competent veterinarian and since in our hands both subcutaneous and intranasal inoculation of the St Louis virus has failed to produce clinical encephalitis in horses<sup>29</sup>.

Although numerous cases of encephalomyelitis occurred in horses in all the regions studied, no other vertebrate except man was noted to be visibly affected. In the Yakima Valley area approximately one thousand mammals and birds, equally divided between wild and domestic, were bled for serum neutralization tests against western equine and St Louis viruses. As controls one hundred and thirty serums from an apparently encephalitis free area on Puget Sound were tested. These controls were negative. In the epidemic valley area approximately 50 per cent of the domestic fowl, 25 to 35 per cent of the domestic mammals and wild birds and 8 per cent of the wild mammals had antibodies for both St Louis and western equine viruses. These antibodies we attribute to previous infection of

a mild or inapparent nature. The detailed results of these studies are published elsewhere<sup>30</sup>.

Bloods from horses and cows from Texas were found positive to both these viruses and to the eastern type as well.

Previous to these surveys only a few neutralization tests had been reported on the serums of animals exposed to natural infection<sup>31</sup> except on horse and man. During the same season when these extensive studies were made Howitt obtained somewhat similar results in a study of the serums of domestic animals in California, though she found a lower proportion of reactors to the St Louis virus<sup>32</sup>.

The eastern equine virus occasionally produces epizootic disease in certain birds<sup>33</sup>. Ten Broeck<sup>34</sup> was probably the first to use the neutralization test to determine the presence of infection in birds. He found antibodies to the eastern virus in a flock of fowls associated with an epizootic in horses. Western equine virus has been isolated from a single prairie chicken which was shot during the course of a survey<sup>35</sup>.

All these viruses have now been shown repeatedly to circulate in the blood of a number of mammals and birds following subcutaneous inoculation<sup>36</sup>. Evidence<sup>37</sup> that a source for arthropod infection may be readily available in the Yakima Valley<sup>37</sup> and the California Valley<sup>38</sup>—this potential reservoir has been shown to be predomi-

TABLE 4—Approximate Number of Cases of Encephalitis in Man and Horses Yakima Valley 1938 to 1941

Year	Man	Horse
1938	4	4
1939	31	500
1940	53	20
1941	26	40

nantly domestic in nature, associated intimately with the farm, small towns and suburban areas. Elsewhere the reservoir might be of an entirely different nature depending on the feeding habits of the vector and the species of vertebrates present in sufficiently large numbers to serve as a satisfactory reservoir.

#### PROPHYLAXIS AND CONTROL

Vaccines prepared against the eastern and western equine viruses are now available for human use from commercial firms and will probably afford protection to

27 Blattner R J and Heys F M. Experimental Transmission of St Louis Encephalitis to White Swiss Mice by Dermacentor Variabilis. Proc Soc Exper Biol & Med 48 707 710 (Dec) 1941.

28 Kutselman C H and Grundmann A W. Equine Encephalomyelitis Virus Isolated from Naturally Infected Triatoma Sanguisuga. Lec Technical Bulletin 50 Kansas Agricultural Experiment Station October 1940 pp 115.

29 Hammon W McD, Carle B N and Izumi E M. St Louis Encephalitis in the Horse. Experimental and Natural Proc Soc Exper Biol & Med 49 335 340 (March) 1942.

30 Hammon W McD, Lund, H W, Gray J A, Evans F C, Bang F and Izumi E M. A Large Scale Neutralization Survey of Certain Vertebrates as Part of an Epidemiological Study of Encephalitis of the Western Equine and St Louis Types. J Immunol 43 75 86 (May) 1942.

31 Howitt Beatrice F. Comparative Susceptibility of Wild and Domestic Birds and Animals to the Western Virus of Equine Encephalomyelitis (Br Strain) in California. J Infect Dis 67 177 187 (Nov Dec) 1940. Hammon and Howitt<sup>30</sup>.

32 Howitt Beatrice F. Relationship of St Louis and Western Equine Viruses of Encephalitis to Man and Animals in California. Proc Twelfth Ann Conf Calif Mosquito Control A (1941) 1942 pp 3 23.

33 Davis W A. A Study of Birds and Mosquitoes as Hosts for the Virus of Eastern Equine Encephalomyelitis. Am J Hyg Sect C 32 45 59 (Sept) 1940.

34 Ten Broeck Carl. Birds as Possible Carriers of the Virus of Equine Encephalomyelitis. Arch Path 25 759 (May) 1938.

35 Cox H R, Jellison W L and Hughes L E. Isolation of Western Equine Encephalomyelitis Virus from a Naturally Infected Prairie Chicken. Pub Health Rep 56 1905 1906 (Sept 26) 1941.

36 Hammon Lund, Gray, Evans, Bang and Izumi<sup>30</sup>, Davis<sup>33</sup>, Howitt<sup>31</sup>, Ten Broeck<sup>34</sup>.

36a In the recent transmission experiment with both viruses referred to in footnote 19a, *Culex tarsalis* was successfully infected by feeding on chickens or ducks which though showing no signs of disease had been inoculated (subcutaneously) forty-eight hours previously with a small amount of a very dilute virus suspension. The mosquitoes later transmitted the virus to other fowl. This proves that these insects can serve in nature as inapparent reservoirs for mosquito infection.

37 Hammon, Lund, Gray, Evans, Bang and Izumi<sup>30</sup>, Hammon and Howitt<sup>31</sup>.

38 Howitt<sup>31</sup>.

men as well as to horses<sup>38</sup> However, in most outbreaks morbidity and fatality rates have been so low that mass immunization programs are not indicated<sup>39</sup> For restricted groups bivalent or monovalent vaccine has a definite place

From the distribution of cases in the areas we have studied and in those reported by others, together with the recently determined distribution of possible reservoirs in two areas, it becomes apparent that in these localities rural, small town and suburban areas offer the greatest exposure risk Persons who can move into the central areas of cities at the time of an epidemic might well do so to reduce risk of infection Individuals should, of course, adopt all the known methods for protection against mosquito bites Communities which are sufficiently interested in protection of the human population will attempt control of mosquito breeding This may be expected to present many difficulties and will require techniques which are not employed in the control of *Anopheles* for malaria Passage and enforcement of zoning regulations excluding domestic fowl and stock from residential areas might effectively reduce the number of infected mosquitoes in many of those areas in which high morbidity rates now prevail

#### COMMENT AND CONCLUSIONS

1 It is suggested that eastern and western equine and St Louis encephalitis be classed as members of a group to be called the arthropod borne virus encephalitides

2 Outbreaks occurring in 1941 in Washington, Arizona New Mexico and Texas were studied Serum neutralization tests to several viruses were made on 61 patients

3 On the basis of present knowledge an etiologic diagnosis cannot be made on the basis of clinical findings To make a definite etiologic diagnosis it is necessary to make serologic tests on both an early and a late serum specimen, especially in a St Louis infection

4 The proportion of normal persons in the Yakima Valley with antibodies to the St Louis virus increases with length of residence in the valley (0 to 3 years 91 per cent, 12 to 20 years 76.9 per cent) Few were found with antibody to the western equine virus

5 Evidence was obtained indicating the presence of three and possibly four encephalitic viruses in Texas, and for the presence of at least two in each of the other areas (two isolated from the Yakima Valley)

6 From Texas is reported the first case of probable eastern equine infection in man occurring outside of the Massachusetts outbreak The diagnosis is based on clinical history, a positive serum neutralization test on a convalescent specimen and the isolation of the virus from horses involved in the same epidemic

7 Epidemiologic comparisons were made between each of the epidemics studied and between these and several other reported outbreaks

8 Age and sex incidence and case fatality rates vary definitely in different areas, regardless of which virus predominates Previous statements regarding "typical" age and sex distribution and fatality rates of epidemics due to each of these viruses must be revised It is concluded that environmental factors of exposure strongly

influence age and sex distribution and in turn the fatality rates, for these appear to be a function of age (increasing with the mean age)

9 Conditions especially favorable to mosquito breeding were present at the time of epidemics in all areas studied In irrigated areas epidemics tended to recur annually, elsewhere sporadically as mosquito breeding conditions became favorable

10 *Culex tarsalis* mosquitoes were found to be hosts of both western equine and St Louis viruses in the Yakima area Since these findings, *C. tarsalis* and several other mosquitoes, including *Culex pipiens*, have been demonstrated to be capable of transmitting the St Louis infection in the laboratory The role of mosquitoes as vectors of this disease now appears to be established

11 Epidemiologic evidence indicates that in the Yakima Valley there is a widespread inapparent reservoir of these viruses Strong evidence toward the incrimination of domestic animals, especially fowl, in this role is afforded by the results of neutralization tests on the serum of a large group of mammals and birds In addition it has been demonstrated that these animals when suffering an inapparent experimental infection have virus present in the peripheral blood

12 Vaccines against the equine viruses are available, practical and probably effective and should be used in selected groups of heavily exposed persons Because of low encephalitis morbidity rates in most areas they are not recommended for mass immunization programs

13 Mosquito bite protection, larva control, residence in central urban areas and animal zoning restrictions in peripheral urban areas should afford protection in many epidemic areas

#### ABSTRACT OF DISCUSSION

DR CARL T. BROFCK, Princeton N. J. Equine encephalomyelitis, St Louis encephalitis and poliomyelitis have much in common There are three outstanding characters that I should like to discuss briefly (1) These diseases are more prevalent in summer than at other times of the year, (2) there are localized outbreaks in different parts of the country and (3) serologic evidence shows that they have a much wider distribution than the clinical evidence indicates The fact that these diseases are more prevalent in summer suggests transmission by biting insects You have heard evidence for the transmission of the equine disease by mosquitoes This may not be the only method of transmission of this virus for in our laboratory we have been unable to get evidence for transmission by mosquitoes in natural outbreaks in pheasants The epidemiology suggests that the St Louis virus is also insect borne and there is other evidence to support this view, but it is not as good as with the horse virus disease There is no evidence that poliomyelitis is transmitted by biting insects, perhaps because we have such a poor animal for laboratory experiments, but the possibility that this virus can be transmitted in this way has not been definitely ruled out The second point, that there are localized outbreaks of these diseases, suggests that there are reservoir hosts which show no clinical evidence of disease but from which the virus may go to more susceptible animals The evidence is getting stronger all the time that this is the condition with the horse virus, and the work of Hammon and his associates shows that it may be possible with the St Louis virus There is no evidence at present that this is true for poliomyelitis The widespread distribution of neutralizing antibodies to equine encephalomyelitis virus and the St Louis virus found by Hammon and his co-workers in a number of animals and birds and the presence of antibodies to the two viruses in the same serums are most suggestive One thing seems clear, and that is that in future work search must be made for more than one virus in infected individuals or animals It seems possible that clinical

38 Schlesinger R. W. Morgan I. M. and Olitsky P. K. Significance of Neutralizing Antibody in Experimental Equine Encephalomyelitis Its Relation to the Disease in *Man* J. A. M. A. 119: 618-620 (June 20) 1942

39 Hammon W. McD. Suggestions for the Possible Control of the American Summer Encephalitides Correspondence J. A. M. A. 118: 66-68 (Jan. 23) 1942

disease may be due to the simultaneous infection with two or more viruses, whereas if there is a single virus present a host may often respond only by the production of neutralizing antibodies with no clinical symptoms. There are so many unsolved problems in these diseases caused by neurotropic viruses that much more work must be done before we can be positive about them.

DR E. C. ROSENOW, Rochester, Minn. Despite the excellent and painstaking work which has been done on the virus the problem is still not solved. I am impressed by the fact that not only one but several types of virus were found, judging by neutralization tests even in the same host, by the vast areas covered by the epidemic and by the changes in the clinical and pathologic picture of the disease as it occurred in the center and outskirts of epidemic areas as the epidemic disappeared. By the use of special methods for the bacteriologic study of material obtained in the epidemic (1941) and by inoculation of animals by methods usually employed it has been possible to isolate and demonstrate simultaneously an encephalitic type of streptococcus and encephalitic virus, as now understood, not only in persons and horses ill with encephalomyelitis but in nine other species of animals, birds or fish manifesting symptoms or lesions of encephalitis in dog, hog, sheep, bat, mink, chickens, goose, wild ducks, pheasant and fish. Virus and this same type of streptococcus have also been demonstrated in emulsions and filtrates of emulsions of mosquitoes and flies within the epidemic zone and proved absent remote from the epidemic. The relationship between the streptococcus and virus was not limited to their demonstration side by side in the material obtained from the nervous and other tissues affected and in other material. Encephalitis streptococcus antigen was demonstrated in persons ill with or in contact with encephalitis by the cutaneous reaction following intradermal injection of the euglobulin fraction of the serum of horses that had been immunized with the encephalitis type of streptococcus and with the euglobulin fraction of the serum of horses that had been immunized with equine encephalomyelitis virus (western type) and by the precipitation reaction. Control injections and precipitation reactions proved negative. The serum of persons, horses and other animals developed antibodies for the streptococcus as well as for virus during attacks of this disease. The encephalitis antistreptococcus serum appeared to have curative effects in the treatment of persons ill with encephalitis. The virus has been produced experimentally from the streptococcus far removed from its original source by growing it in an autoclaved medium (chick mash) which does not turn acid from prolonged growth of the streptococcus and in the brain of fish by merely adding the streptococcus to the water in which normal goldfish and rainbow trout were kept.

DR IRVING J. SANDS, Brooklyn. Those of us who have worked with encephalitis cases since 1917 or so have become convinced that we were dealing with processes caused by different agents. We felt that there were many viruses, not one virus, and it was our conviction that the solution to the problem would rest in the hands of epidemiologists, immunologists and bacteriologists. Measles encephalitis, vaccinia and smallpox encephalitis present a different anatomic picture from mumps and German measles encephalitis. They are different even clinically. Certainly the poliomyelitis picture caused by a virus cannot at all compare with the encephalitudes mentioned in the other diseases. After an attack of poliomyelitis the child is well and normal, except for the paralysis resulting from the death of a certain number of anterior horn cells. However the child that has had Economo encephalitis remains a cripple for life. Dr. Sylvester R. Leahy and I reported a series of cases of Economo encephalitis from the Bellevue Psychiatric Hospital (Mental Disorders in Children Following Epidemic Encephalitis, *THE JOURNAL*, Feb. 5, 1921, p. 373). In the last decade one has not encountered any cases of Economo encephalitis. At least one does not meet postepidemic encephalitic syndromes following encephalitis as we had fifteen years ago which would seem to indicate that there are some neutralizing antibodies or agents that completely enable an individual to recover from the type of encephalitis that we now encounter as compared with those of 1917-'25 and '28. There is another disease which is rather trying and which we have seen in the

contagious disease hospital. That is the Guillain-Barre syndrome, which some of us are beginning to believe may be virus borne.

DR MAX H. WEINBERG, Pittsburgh. It is unfortunate that the author did not dwell at all on the clinical phases. We must impress on ourselves that we are not dealing with one disease. I for one have seen quite a few cases of Economo encephalitis since 1928. Only last Sunday I saw a case in Brooklyn of postencephalitic parkinsonism with hemiparesis, which is no doubt a case of Economo encephalitis as we diagnose it clinically, and it is not over four or five years old. We must remember the clinical as well as the serologic differences between the encephalitis of St. Louis and the old one Economo for instance. A good many of the patients with St. Louis encephalitis, if I am not mistaken, had hemorrhagic nephritis. This was not the case with the Economo encephalitis. We get in Economo disease not so much mental as parkinsonian changes. Another difference is that Economo encephalitis did not occur in the summer. The first attack in the United States came on in the late fall of 1918. That is when the first case showed up in New York City, and all through that winter we had encephalitis. For three years we had Economo encephalitis every winter. There were differences in the type of encephalitis from year to year. The first year it was manifest mainly by lethargy, that is why the Economo form is called lethargic encephalitis. The third year there was a larger percentage of Borna cases. We must bear in mind, therefore, that in order to be able to present a picture we shouldn't bring out one phase and leave the rest out.

DR JOSEPH W. MOUNTAIN, Washington, D. C. I should like to ask Dr. Bang to elaborate on the control measures that he briefly outlined, also to say in his judgment whether or not these control measures are susceptible of being incorporated into routine administrative practices of state and local health departments. I happen to be chief of the State Relations Division in the Public Health Service, and we are constantly being importuned to institute measures both in anticipation of an outbreak of this disease and when the disease is upon us.

DR L. W. LARSON, Bismarck, N. D. We had an opportunity in Bismarck to study 95 cases during 1941 which were hospitalized. The onset of the disease was invariably abrupt. The average patient complained of headache as the predominating symptom, a few complained of nausea but very few had any vomiting. After a variable number of hours a lethargy developed. The physical findings were characterized by an absence of ophthalmic signs and of neurologic findings which is contrary to some of the other types of encephalitis that have been reported in previous years. The severity of the disease varied a great deal. Some of the patients merged from the lethargy into an actual coma. A very few had delirium. Many of the patients with delirium were very young; in fact, I think three of the four were infants. The temperature ranged from 99.6 up to 102 or 103 F. The pulse usually rose in proportion to the temperature. The diagnosis was confusing in some instances because the patients had signs and symptoms that are too often regarded as being influenzal in nature. However the blood findings indicated leukocytosis with mononuclear increase. The diagnosis was usually based on spinal fluid findings of slight increase in pressure and definite increase in the number of white cells which ranged from a minimum of 30 up to 500. Invariably the differential count in the spinal fluid showed a decided preponderance of lymphocytes. There were a few exceptions, however, especially in young children, in which the first spinal tap revealed a fluid with a preponderance of polymorphonuclear leukocytes. However subsequent taps showed that this preponderance of polymorphonuclears had changed over to a preponderance of lymphocytes. The Pandy test for globulin showed a slight globulin increase but not of any great significance. The cultures that were carried on routinely in our laboratories in the two hospitals failed to reveal the presence of any pyogenic types of organisms. Now as to the sequelae in those 95 cases to the best of our knowledge we have no evidence of sequelae at the present time. I trust that we can make a further report of these cases to clear up the question of the sequelae. But it is obviously too early to do that.

Dr. FREDERICK B. BANG, Princeton, N. J. We are all, of course, interested in the control of this disease. It seems that the disease has a reservoir. The evidence is good that both St. Louis and western poliomyelitis are transmitted by mosquitoes and particularly by *Culex tarsalis*. Thus there are three ways that we might control the disease. Get rid of the reservoir. That would involve, on the basis of the present evidence, getting rid of domestic fowl, as far as Yakima is concerned. Secondly, we may get rid of *Culex tarsalis*. This mosquito breeds in overflows from irrigation areas. In Yakima the entire economy of the valley depends on irrigation. Thus control of the mosquito is very difficult. I think that much can be done along these lines. Finally we have the human being. We may prevent the disease in man by administration of vaccine. This is possible only for the western equine and the eastern equine so far. This means that in an area where we can expect to see encephalitis, where it has already begun to appear during the summer, it would be a good idea for those who are continuously exposed to mosquitoes to take such a vaccine. However, since we cannot predict where and when an epidemic will occur, we do not believe that widespread vaccination should be undertaken in any group unless there is good reason for it, such as a beginning epidemic.

## DOES VITAMIN A DEFICIENCY EXIST IN CLINICAL UROLITHIASIS?

A CLINICAL AND PATHOLOGIC STUDY OF  
NINETY-EIGHT CASES

HUGH J. JEWETT, M.D.

LOUISE L. SLOAN, Ph.D.

AND

GEORGE H. STRONG, M.D.

BALTIMORE

Although experimental<sup>1</sup> and clinical investigations<sup>2</sup> have suggested a relationship between vitamin A deficiency and urolithiasis, our observations based on a study of 98 cases have failed to disclose any evidence of such a relationship in the human being. There can be no doubt that a vitamin A free diet may result in a high incidence of urinary calculi in rats, but a certain skepticism with regard to an actual clinical relationship recently has arisen. This skepticism has resulted from (1) the disagreement among different investigators with regard to the reliability of some of the tests of the light sense and the adequacy of the norms which have been used in diagnosing moderate degrees of vitamin A deficiency,<sup>3</sup> (2) the lack of improvement in the light sense following administration of vitamin A to certain patients with urinary calculi<sup>4</sup> and (3) the extensiveness of the

pathologic changes associated with the urinary calculi in laboratory animals which have been deprived of vitamin A.<sup>5</sup>

Our investigation has consisted in a clinical study of 20 patients and a microscopic examination of 78 autopsy cases, with urinary calculi. In the clinical group we have attempted to select more reliable visual tests for vitamin A deficiency and have supplemented these subjective tests with the determinations of the level of vitamin A in the blood.

### CLINICAL STUDIES

In obtaining our data, 20 patients with urolithiasis in the Brady Urological Institute<sup>6</sup> and 40 normal subjects comprising a control group were given the following series of tests:

1. Ophthalmoscopic examination was made of the ocular media and fundus, the visual fields were tested, and the visual acuity with correction was determined in order to exclude patients with conditions other than vitamin A deficiency which might affect the light threshold.

2. The curve of dark adaptation was determined as follows. The patient was first light adapted by having him view for three minutes an illuminated field the brightness of which was 1,100 millilamberts. At the end of this period of light adaptation a series of measurements of the light minimum or achromatic threshold was made at intervals to determine the rate of decrease in the threshold during dark adaptation. These measurements were continued for forty minutes or longer, until there was no further significant decrease in the threshold. The test field subtended a visual angle of 1 degree and was located 15 degrees to the nasal side of the fixation point. This particular region was selected for two reasons. First the anatomic studies of Osterberg<sup>7</sup> showed that the concentration of rods is greatest in the region of the retina about 15 degrees from the fovea. Secondly, by making tests of the temporal rather than the nasal retina, i.e., by locating the test spot in the nasal field, we avoid testing the area bordering on the normal blind spot, where slight shifts in the direction of fixation of the eye may result in pronounced changes in the threshold.

3. At the completion of this test, when the eye was fully dark adapted, the threshold was measured at the fovea and at eighteen different locations in the nasal and temporal meridian of the visual field.

The instrument used in making the threshold measurements was devised by one of us (L. L. S.) and has been described elsewhere.<sup>8</sup> A description of the preexposure field has not yet been published. It consists essentially of a sheet of flashed opal glass illuminated from the rear by a bank of twelve daylight fluorescent tubes. The distance of the patient from the illuminated surface is such that the vertical dimension of the oblong screen subtends a visual angle of 53 degrees, the horizontal dimension a visual angle of 62 degrees. A circle at the center of the screen, the diameter of which subtends a visual angle of 8 degrees, is used to maintain fixation approximately at the center of the screen. The patient is allowed to direct his gaze to any point within the limits of the circle. This is less fatiguing than the attempt to maintain perfectly steady fixation in one direction.

### RESULTS OF VISUAL TESTS

The average curve of dark adaptation of the 20 patients with urolithiasis and the average curve of the control group of forty normal subjects are shown

Read before the Section on Urology at the Ninety Third Annual Session of the American Medical Association, Atlantic City, N. J., June 10, 1942.

From the James Buchanan Brady Urological Institute, the Wilmer Ophthalmological Institute, and the Department of Pathology, Johns Hopkins University School of Medicine and Hospital.

Dr. Hugh W. Joseph gave many helpful criticisms and suggestions. Dr. Richard H. Follis, Jr. reviewed the pathologic material. Dr. Heinz Herrmann determined the values of vitamin A in the blood.

1. Osborne T. B. and Mendel L. B. The Incidence of Phosphatic Urinary Calculi in Rats Fed on Experimental Rations. *J. A. M. A.* **60**: 32-33 (July 7) 1917. Higgins<sup>5</sup>, Bliss, Livermore and Prather<sup>3</sup>.

2. Higgins C. C. Prevention of Recurrent Renal Calculi. *Surg. Gynec. & Obst.* **63**: 23-34 (July) 1936. Ezickson W. J. and Feldman J. B. Further Studies of Vitamin A Deficiency in Individuals with Urinary Lithiasis. A Report of Further Clinical Studies and Investigations on Thirty Six Patients. *Urol. & Cutan. Rev.* **43**: 302-304 (May) 1939. Long and Pyrah<sup>4</sup>, Ezickson and Feldman<sup>10</sup>.

3. Palmer C. E. The Dark Adaptation Test for Vitamin A Deficiency. *Am. J. Pub. Health* **28**: 309-315 (March) 1938. Isaacs, Bertha L., Jung F. T. and Ivy A. C. Vitamin A Deficiency and Dark Adaptation. *J. A. M. A.* **111**: 777-780 (Aug. 27) 1938. Booher, Lela E. and Williams, Dorothy E. Study of Biophotometer as Means of Measuring Vitamin A Status of Human Adults. *J. Nutrition* **16**: 343-354 (Oct.) 1938. Sloan, Louise L. Instruments and Techniques for the Clinical Testing of Light Sense. I. Review of the Recent Literature. *Arch. Ophthalm.* **21**: 913-934 (June) 1939.

4. Long, Hilary and Pyrah, L. N. Role of Vitamin A Deficiency in Etiology of Renal Calculus. *Brit. J. Urol.* **11**: 216-232 (Sept.) 1939. Ezickson and Feldman<sup>10</sup>.

5. Higgins C. C. The Experimental Production of Urinary Calculi. *J. Urol.* **20**: 157-170 (Feb.) 1933. Bliss A. R. Jr., Livermore C. R. and Prather E. O. Jr. The Relation of Vitamin A and Vitamin D to Urinary Calculus Formation. *ibid.* **20**: 639-652 (Dec.) 1933.

6. Brady Urological Institute history, numbers 24882, 30302, 30133, 28860, 29325, 29706, 29755, 29457, 29401, 28914, 29691, 28505, 28483, 28387, 13784, 27741, 10988, 29378 and 29137. Johns Hopkins Hospital number 224565.

7. Osterberg G. Topography of the Layer of Rods and Cones in the Human Retina. *Acta ophthalm.* 1935, suppl. 6.

8. Sloan, Louise L. Instruments and Techniques for the Clinical Testing of Light Sense. III. An Apparatus for Studying Regional Differences in Light Sense. *Arch. Ophthalm.* **22**: 233-251 (Aug.) 1939.



in chart 1. The close agreement in the two curves shows that there is no significant increase in the average threshold of the patients with kidney stones which would be expected if the majority of these patients had even moderate degrees of vitamin A deficiency. A further analysis of the data was made in order to determine

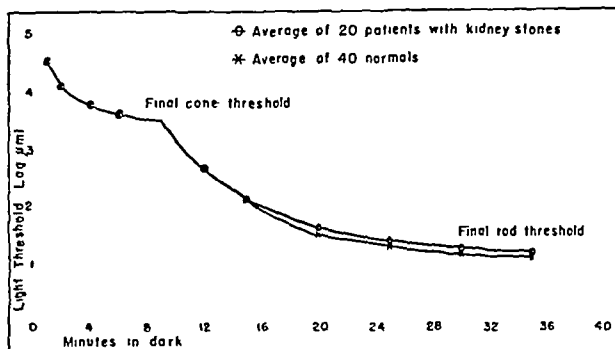


Chart 1—Rate of decrease in threshold during dark adaptation measured at 15 degrees from fixation point in nasal field. Average adaptation curve of (1) patients with urolithiasis and (2) control group.

whether or not any 1 of the patients with stones had dark adaptation curves above the normal range either in the first section, where the thresholds are determined primarily by the cones or in the second section, where they are determined by the rods. The individual values of the final cone thresholds are shown in the two frequency distribution graphs of chart 2, which gives the data for the 20 patients with urolithiasis and for the control group of 40 normal subjects. The frequency distribution of the thresholds is similar for the two groups. None of the patients with kidney stones have thresholds higher than are found in the control group. The final rod thresholds (after thirty-five minutes of dark adaptation) are given in chart 3. These graphs also show similar frequency distributions for the two groups of patients, none of the patients with stones have rod thresholds higher than are found in the normal group.

The measurements of the final thresholds at nineteen different locations throughout the horizontal meridian have been analyzed in similar fashion. Chart 4 shows the average threshold gradient curves for the group of 20 patients with stones and for the 40 subjects of the control group. It is apparent that there are no signifi-

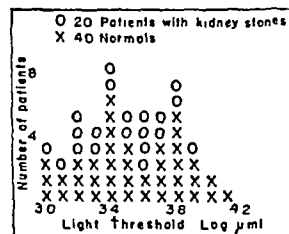


Chart 2—Distribution of individual values of final cone threshold at 15 degrees in nasal field.

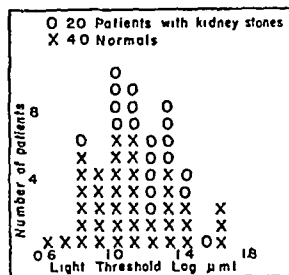


Chart 3—Distribution of individual values of final rod threshold at 15 degrees in nasal field.

cant differences in the average threshold gradient curves of the two groups. In order to determine whether or not any of the patients with urolithiasis had thresholds outside the normal range, the average value of the threshold at the nineteen different locations was computed for each patient. These values are shown in chart 5 in the form of frequency distributions for the

two groups. The graphs show that none of the patients with stones have thresholds greater than some of the subjects in the control group. There is moreover no evidence of any significant trend toward higher thresholds in the group of patients with urolithiasis.

#### LABORATORY STUDIES

Determinations of the concentrations of vitamin A in the blood plasma were made in the 20 cases of urolithiasis and in 33 normal controls.<sup>9</sup> A comparison between these two groups is made in chart 6, which shows the distribution of the individual values. None of the patients with urinary calculi had less vitamin A in the blood than the normal subjects. One subject in the control group had a rather low value for vitamin A in the blood, but this individual showed no other evidence of vitamin A deficiency. The reason for this subnormal value as yet has not been determined.

Analysis of the calculi in the 20 cases of urolithiasis showed that the calculus in 4 instances was calcium phosphate. In all of these the urine was infected, and in 2 it was alkaline. There were 7 cases in which calcium phosphate was mixed with oxalate. In 6 of these the urine was sterile and acid, but in 1 the urine was alkaline and contained *Proteus vulgaris*. There were

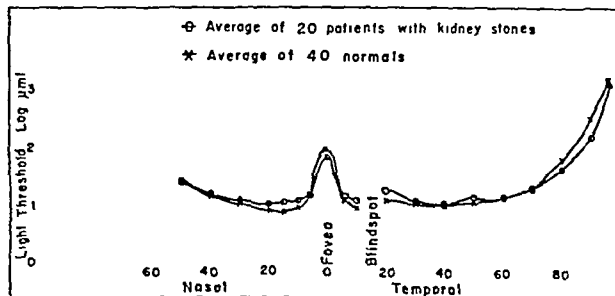


Chart 4—Final thresholds after complete dark adaptations at nineteen locations in horizontal meridian. Average threshold gradient curves of (1) patients with urolithiasis and (2) control group.

5 cases of almost pure calcium oxalate calculi, in all of which the urine was acid and in 2 instances was infected. In the last 4 cases the stones were not recovered for analysis, and in 1 of these hyperparathyroidism was present.

Certain investigators have reported a number of cases of urolithiasis in which pathologic dark adaptation failed to improve after large doses of vitamin A.<sup>4</sup> In one of these reports<sup>10</sup> it was assumed that the failure to improve was the result of lack of assimilation or utilization of the vitamin. However, the conditions leading to inadequate assimilation or utilization of vitamin A are largely known. If they are found not to be present it has usually been accepted that failure to improve on vitamin A therapy means that the rise in the visual threshold is not due to vitamin A deficiency. Steven and Wald<sup>11</sup> in their careful investigation, have confirmed this conclusion and have set up for their criterion for vitamin A deficiency a

9 The estimation of vitamin A in the blood was carried out according to Kimble's method (Kimble M. S. Photocolorimetric Determination of Vitamin A and Carotene in Human Plasma. *J. Lab. & Clin. Med.* 24: 1055-1065 [July 1939]). For the standardization we used crystalline beta-carotene and U. S. P. Reference Cod Liver Oil No. 2 containing 1700 U. S. P. vitamin A units per gram. The final reading was made in a Klett Summerson photoelectric colorimeter.

10 Ezickson W. J. and Feldman J. B. Signs of Vitamin A Deficiency in the Eye Correlated with Urinary Lithiasis. A Report of Clinical Studies and Investigations on Twenty Five Patients. *J. A. M. A.* 109: 1706-1710 (Nov. 20) 1937.

11 Steven David and Wald George. Vitamin A Deficiency. A Field Study in Newfoundland and Labrador. *J. Nutrition* 21: 461-476 (May) 1941.



decrease in the visual threshold within at least two weeks of regular vitamin A supplementation. These authors assert that a visual threshold above a "normal range" is an inadequate criterion, for high visual thresholds may result from a variety of congenital and acquired abnormalities other than a deficiency in vitamin A. They state that a correlation of the threshold of the dark adapted eye with response to vitamin A

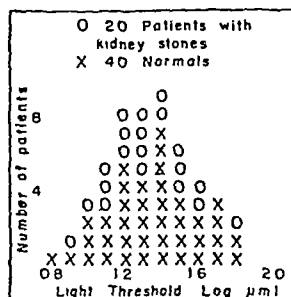


Chart 5—Distribution of individual values of final rod threshold in horizontal meridian. The value given for each individual are the average of measurements at nineteen different locations.

therapy or with the level of vitamin A in the blood has indicated a relatively low incidence of vitamin A deficiency in the general population.

As a check on these clinical and laboratory studies we examined the autopsy material in 78 cases in which urinary calculi were present. Wolbach and Howe<sup>12</sup> have shown that in the albino rat and guinea pig the specific effect of a deficiency of vitamin A is the replacement of the various epithelial lined structures of the body by a stratified squamous keratinizing epithelium and in almost every instance keratinization of the trachea and bronchi preceded that of the urinary tract. Wilson and DuBois<sup>13</sup> and Blackfan and Wolbach<sup>14</sup> showed that the same changes were encountered in infants dying of vitamin A deficiency, and the latter authors state that the commonest and earliest appearance of the keratinizing metaplasia is in the trachea and bronchi. These and other pathologic changes occurred in laboratory animals when urinary calculi resulted from vitamin A deficiency.

In none of our 78 autopsy cases was there any evidence of metaplasia in the bronchi or bronchioles. Dr. Richard H. Follis Jr. of the Department of Pathology has summarized the findings in the urinary tract as follows: "There are 3 cases of keratinizing squamous metaplasia, all of which are associated with marked inflammation."<sup>15</sup> This in itself can cause changes histo-

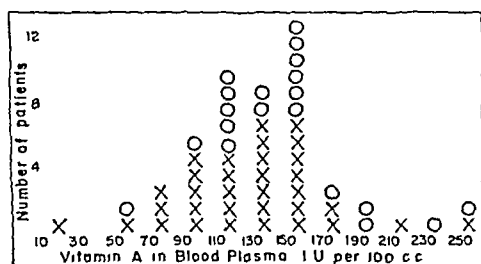


Chart 6—Distribution of individual values of concentration of vitamin A in the blood plasma.

logically indistinguishable from those produced by vitamin A deficiency. There are 3 instances of epithelial proliferation associated with pyelitis cystica or cystitis

cystica which does not resemble the alterations following deprivation of vitamin A.<sup>16</sup> Furthermore it is not conceivable that vitamin A deficiency could be so widespread as is this type of metaplasia which is so frequently encountered in autopsy material. There is 1 case of squamous metaplasia of the ureter associated with inflammation.<sup>17</sup> This is an early change and yet shows none of the other early changes characteristic of vitamin A deficiency."

#### SUMMARY AND CONCLUSIONS

The rate of dark adaptation and the thresholds of the completely dark adapted eye were determined for 20 patients with urolithiasis and compared with 40 normal subjects. In addition the vitamin A content of the blood in these patients with urolithiasis was determined and compared with that of 33 normal controls.

In 78 autopsy cases with urolithiasis the respiratory and urinary tracts have been examined for the epithelial metaplasia characteristic of vitamin A deficiency.

In none of these 98 cases was there any evidence of vitamin A deficiency.

Although a vitamin A free diet produces widespread epithelial changes which may lead to the formation of urinary calculi in experimental animals as yet there is no positive proof that a "subclinical" vitamin A deficiency is an etiologic factor in urolithiasis in man.

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#### ABSTRACTS OF DISCUSSION

DR. DAVID M. DAVIS, Philadelphia. Dr. Jewett and his co-workers have delivered a blow to the rather shaky foundations of the hypothesis that vitamin A deficiency is an important cause of stone formation. That hypothesis rested principally on the finding by other investigators that there was definite vitamin A deficiency in a series of stone cases. However, similar series of other kinds of diseases have also apparently shown vitamin A deficiency, particularly one series of noncalculous urinary tract disease and one series of certain skin diseases. The authors have largely nullified those findings by showing that under careful experimental investigations their series has shown no such vitamin A deficiency. What then, is the relation, if any, of vitamin A deficiency to calculous or noncalculous disease of the urinary tract? One can only say that it still remains to be elucidated. Another member of this section, Dr. Prather, one time hypothesized that perhaps in these little animals, particularly rats, the incidence of stone formation might in some way be associated with obstructions caused in these tiny ureters by the proliferation of the epithelium that occurs in vitamin A deficiency. That is certainly a thought which would also tend to explain why it occurs in little animals and not in larger animals such as man.

DR. RUBIN FLOCKS, Iowa City. Following a discussion of the subject with Dr. Jewett I reviewed the material at the University Hospitals and found that there was no evidence of vitamin A deficiency as an associated factor in 100 patients with calcium urolithiasis. This tends to confirm the careful work of Dr. Jewett. He has proved conclusively that in patients with calcium urolithiasis there is no more vitamin A deficiency than in any comparable group of patients with some other disease. However, I wondered whether the problem had been completely cleared up in view of the fact that in most of the patients with stone in the urinary tract the picture that we see at the time we see the patient is an end result. It is not

<sup>12</sup> Wolbach, S. B. and Howe, P. R. Tissue Changes Following Deprivation of Fat Soluble A Vitamin. *J. Exper. Med.* 42: 753-778 (Dec.) 1925.

<sup>13</sup> Wilson, J. R. and DuBois, R. O. A Report of a Fatal Case of Keratomalacia in an Infant with Postmortem Examination. *Am. J. Dis. Child.* 26: 431-446 (Nov.) 1923.

<sup>14</sup> Blackfan, K. D. and Wolbach, S. B. Vitamin A Deficiency in Infants. A Clinical and Pathological Study. *J. Pediatr.* 3: 679-706 (Nov.) 1933.

<sup>15</sup> Johns Hopkins Hospital General Pathology Nos. 16850, 15012 and 10094.

<sup>16</sup> Johns Hopkins Hospital General Pathology Nos. 17343, 11826 and 8118.

<sup>17</sup> Johns Hopkins Hospital General Pathology No. 10361.

the picture at the time when the stone is actually forming, and it may well be that, at the time the stone or nucleus started, one of the initiating factors was a vitamin A deficiency. This fits in with some of the experimental work done on animals. It fits in with the known rapid formation of small calculi in acutely ill, bedridden, vitamin deficient individuals. The further growth of these stones, however, has no relation to vitamin A deficiency, as Dr Jewett and his co-workers have conclusively proved. Whether or not vitamin A deficiency is an important associated factor in the formation of the nucleus is, I believe, still a question which can be answered only by providing some means of demonstrating whether or not the patients are vitamin A deficient during the time of the formation of the nucleus. Certainly in light of this work such studies would be worth while.

DR HUGH J JEWETT, Baltimore With regard to the suggestion of Dr Flocks that perhaps vitamin A deficiency may be present in the beginning, I have this to say. That is purely hypothetical and I think the burden of proof rests on him. These patients with urolithiasis who show a pathologic adaptation when studied with the biophotometer actually may not have a vitamin A deficiency. I can't go into a detailed account of the biophotometer and the criticisms which are found in the literature with regard to it. It is essentially an instrument which fails to give constant results on the same individual day after day. In other words, lack of reproducibility in the results is one of the criticisms. All these patients who are suspected, after biophotometer tests or other tests, of having a vitamin A deficiency should have their blood levels checked for vitamin A.

## A MECHANISM OF FATIGUE IN NEURO-PSYCHIATRIC PATIENTS

### A PRELIMINARY REPORT

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Fatigue is frequently observed in patients with neuropsychiatric complaints. The mechanism by which fatigue is produced has been little understood by either neuropsychiatrists or others. This preliminary report presents evidence suggesting one of the possible mechanisms and the animal experimentation on which the procedures adopted are based.

Spontaneous hypoglycemia has been noted by many investigators who have attempted to define the variety of settings in which it occurs. Previously Harris,<sup>1</sup> Ross and Josephs<sup>2</sup> and more recently Wauchope,<sup>3</sup> Conn, Wilder and others have reviewed the subject.

Blood sugar levels may fall following interference with many factors in the normal homeostatic mechanism. Liver disease and disease of the pancreas, either from known adenoma or from hyperplasia of the islands of Langerhans, have been cited as the important factors which may cause spontaneous hypoglycemia. Faulty dieting, including errors in intake of carbohydrates and

the lack of assimilable vitamins has also been a known factor. The pituitary-adrenal syndromes of the well known Simmonds' disease and Addison's disease have long been recognized as associated with hypoglycemic manifestations. Recently Rennie and Howard<sup>4</sup> presented a paper on hypoglycemia and tension depression. They studied neuropsychiatric cases and discovered, with their dextrose tolerance test by the oral route the so-called flat curves and found, when these patients were recovering from their tension depressive symptoms, that the oral dextrose tolerance curve returned to near normal.

We were interested in this hypoglycemic state of the disease because of the so-called pernicious inertia which was the most prominent symptom of a patient who was referred to one of us by a neuropsychiatrist and a group of patients who were seen as a part of office consultation. We therefore undertook a study of the underlying metabolic processes, particularly as they affected their dextrose metabolism to see whether we could not in some way determine the factors which produced the hypoglycemia.

### EXPERIMENTAL EVIDENCE

Although there are a multiplicity of factors involved in the homeostatic mechanisms which maintain blood sugar levels, we shall discuss mainly those mechanisms associated with the insulin regulatory system.

The exact manner in which the secretion of insulin is controlled is as yet undetermined. Two main theories are propounded to explain this phenomenon—the neurogenic and the humoral. Unfortunately, neither explains all the various manifestations in their entirety. Proof must come from indirect determinations, since the quantity of insulin present in the blood stream is too low to be determined by chemical means or biologic assay.

*Neurogenic*—That both myelinated and nonmyelinated nerve fibers supply the islands of Langerhans was demonstrated in 1902 by Gentes.<sup>5</sup> Further it was shown by McCrea<sup>6</sup> that these fibers are in communication with branches of the right vagus nerve.

Many workers have observed the effects of stimulation of the right vagus on the blood sugar level. Britton<sup>7</sup> reported a decrease in blood sugar following such stimulation. However, this occurred only when the pancreatic vein was intact but not when it was ligated. An increase in insulin secretion into the pancreaticoduodenal vein was noted after vagal stimulation by Dietrich.<sup>8</sup>

A fundamental contribution was made by Clark<sup>9</sup> who found that drugs which stimulate the parasympathetic nervous system produce a fall in the blood sugar level of intact rabbits; this effect did not occur following section of the vagus.

The foremost proponents of the vagal stimulation of the island cells have been La Barre and his asso-

<sup>4</sup> Rennie, T. A. C. and Howard, J. E. Hypoglycemia and Tension Depression. *Psychosomatic Med.* 4: 273 (July) 1942.

<sup>5</sup> Gentes, M. Notes sur les terminaisons nerveuses des îlots de Langerhans du pancréas. *Compt. rend. Soc. de biol.* 54: 212, 1902.

<sup>6</sup> McCrea, E. D. The Abdominal Distribution of the Vagus. *J. Anat.* 50: 18, 1924, 1925.

<sup>7</sup> Britton, S. W. Studies on the Conditions of Activity in Endocrine Glands. *Am. J. Physiol.* 74: 291 (Oct.) 1925.

<sup>8</sup> Dietrich, S. Untersuchungen über Diabetes und Insulinwirkung. II. Mitteilung. Der direkte Nachweis der Insulinsekretion des Pankreas. *Arch. f. exper. Path. u. Pharmacol.* 125: 336, 1927.

<sup>9</sup> Clark, G. A. The Influence of the Vagus on the Islets of Langerhans. Part I. Vagus Hypoglycemia. *J. Physiol.* 50: 466 (March) 19.

From the Medical Department of the Michael Reese Hospital and the University of Illinois College of Medicine.

Read before the American Society for Research in Psychosomatic Problems, inaugural meeting New York, Dec. 18, 1942.

<sup>1</sup> Harris, Seale. Hyperinsulinism and Dysinsulinism. *J. A. M. A.* 83: 729 (Sept. 6) 1924. Hyperinsulinism and Dysinsulinism (Insulogenic Hypoglycemia). *Internat. Clin.* 1: 9 (March) 1932.

<sup>2</sup> Ross, S. G. and Josephs, H. W. Metabolism of Recurrent Vomiting. *Am. J. Dis. Child.* 28: 447 (Oct.) 1924.

<sup>3</sup> Wauchope, G. M. Hypoglycemia. *Critical Review. Quart. J. Med.* 2: 117 (Jan.) 1933.

ciates. They reported that the normal dextrose level of a dog may be reduced by transfusion of blood from the pancreatic vein of another animal during stimulation of its right vagus nerve.<sup>10</sup>

Pursuing this problem further, these same investigators<sup>11</sup> seem to have established a relationship to a center in the thalamus which stimulates the pancreatic secretion of insulin when the blood sugar rises. The impulses are transmitted through the vagus tracts to the island tissue. They used 3 dogs with isolated circulatory and nervous systems. In this manner it was discovered that, although removal of the cerebral hemispheres did not prevent the hyperinsulinism resulting from the transfusion of hypoglycemic blood through the isolated head, the separation of the thalamus did abolish this hyperinsulinism. However, Gayet and Guillaumie<sup>12</sup> were unable to confirm these results.

Those who support the humoral control believe that the blood sugar level is the predominant factor in insulin secretion. This view is given support by the work of Phillips,<sup>13</sup> who did not find any effect on sugar tolerance after vagotomy, and by Long and Fry,<sup>14</sup> who claimed that glycogen resynthesis in muscle was not influenced by section of the vagi.

Houssay and his co-workers<sup>15</sup> have shown that the pancreas can produce its own internal secretion after all its extrinsic nerve supply has been removed and that the control of insulin secretion is directly dependent on the blood sugar level. Most workers seem to agree that the blood sugar level is the primary factor but that the neurogenic factor serves in emergencies.

Not much evidence substantiates the claim that the secretion of insulin is dependent on other hormones produced by the endocrine glands whose secretion in turn is controlled by the blood sugar level.

The presence of a "pancreatropic" factor in the pituitary gland is claimed by some while others seem to believe that thyroid extract sensitizes the secretion of insulin.

A more comprehensive view has been taken by Soskin and his collaborators,<sup>16</sup> who believe that the output of insulin is relatively constant and that there is a homeostatic blood sugar regulating mechanism which depends primarily on the liver and which is controlled by the opposing influences of the pituitary, adrenal and pancreatic hormones.

With these experiments in mind and the fact that these psychoneurotic patients studied showed hypoglycemia as one of the important factors of their fatigue we searched for further evidence as to the modus

operandi that brought about this hypoglycemic factor in man. Psychiatric and medical literature is voluminous concerning the effect of emotional impulses on the somatic system. It is also well known that continued physiologic activity in any tissue may lead to either hypertrophy or hyperplasia, depending on the type of tissue involved.

Since the pancreas is an end organ and subject to vagal stimulation, we felt that it was logical to assume that the hypoglycemia of psychoneurotic patients was due to a long-continued stimulation of the right vagus nerve. This is based on the hypothesis that emotional processes occur somewhere in the higher integrated cortical centers and that the emotional impulses first go through the hypothalamus and are relayed to the autonomic nervous system, both sympathetic and parasympathetic systems being involved.

Those patients who are depressed would have a more constant stimulation by these emotional factors going through this pathway. It may even be possible that certain emotions influence definite pathways in the nervous system, localizing in the particular organs involved. Therefore this stimulation may lead to increased activity and irritability of the cells of the islands of Langerhans. This may be a temporary or a prolonged manifestation dependent on the degree and duration of the psychic and emotional impulses involved in the mechanism.

In order to establish the validity of this hypothetical conclusion, we studied 4 patients as a preliminary contribution. We first investigated the metabolism of these patients to rule out any other factors which could cause this hypoglycemic state. In none of these patients did clinical evidence of disease explain this manifestation. We then resorted to the intravenous dextrose tolerance test which had been established as a standard in the metabolic laboratories of the Michael Reese Hospital and previously reported by Soskin and his co-workers. We utilized the intravenous method because it gave use more definite scientific criteria as to what happens to the dextrose given to patients in order to study their tolerance. It removed the uncertainty of the variation of absorption which frequently leads to false interpretations when the oral method of dextrose tolerance is used for experimental observations.

Some of these patients showed on  $\frac{1}{3}$  Gm. of dextrose per kilogram of body weight when given intravenously a flat curve which had been previously interpreted as that seen commonly in hyperinsulinism. In order to substantiate the theory of vagus control in man we repeated the aforementioned experimentation after paralyzing the vagus with hypodermic injections of  $\frac{1}{75}$  grain (0.0009 Gm.) of atropine and found that the blood sugar curves which were previously flat returned to a new normal. A review of the literature concerning the effect of atropine on blood sugar is variable. Studies have not been conducted in patients or animals under the influence of atropine and with the use of the intravenous dextrose tolerance test. We wish to emphasize this statement because we do not think it is justifiable to draw conclusions from the results of the oral administration of dextrose as affected by drugs. One must always take into consideration the factor of the prolonged and variable absorption of dextrose in the gastrointestinal tract. Therefore we felt it justifiable to conclude that continued vagal stimulation in

10 La Barre J. Sur l'augmentation de la teneur en insuline du sang veineux pancréatique après excitation du nerf vague. *Compt rend Soc de biol* **96** 193 (Jan 28) 1927.

11 La Barre J. The Role of the Central Nervous System in the Control of Pancreatic Secretion. I. The Secretion of Insulin During Hypoglycemia. *Am J Physiol* **94** 13 (July) 1930.

12 Gayet R and Guillaumie M. Experiences concernant l'effet de l'excitation électrique du vague sur l'insuline secretion. *Compt rend Soc de biol* **112** 1197 (April 1) 1933.

13 Phillips R A. The Influence of the Vagus Nerve on the Glycemic Level. *Am J Physiol* **105** 257 (Aug) 1933.

14 Long C N H and Fry Edith G. The Effect of Vagotomy on Muscle Glycogen Resynthesis. *Am J M Sc* **185** 884 (June) 1933.

15 Houssay B A, Lewis J T and Foglia V G. La fonction endocrine du pancreas normal ou enerve pendant l'hypoglycémie insulinique. *Compt rend Soc de biol* **101** 239 (May 24) 1929.

16 Soskin Samuel, Allweis M D and Colin D J. Influence of the Pancreas and Liver on the Dextrose Tolerance Curve. *Am J Physiol* **109** 155 (July) 1934. Soskin Samuel, Mirsky I A, Zimmerman L M and Heller R C. Normal Dextrose Tolerance Curves in the Absence of Insulin in Hypophysectomized Depancreatized Dogs. *Am J Physiol* **114** 648 (Feb) 1936.

the psychoneurotic patient was an important factor in producing functional hyperinsulinism and concomitant hypoglycemia.<sup>17</sup>

#### REPORT OF CASES

The following cases are presented to substantiate this evidence

CASE 1—L. M., aged 52, a professional man, complained of extreme fatigue and weakness following a common cold. Long after all signs of infection had subsided the malaise continued, and the patient was unable to carry on his usual professional duties. In his history there had been many periods of prolonged weakness associated with a tendency to perspire profusely. Long vacations were necessary, absenting him from his occupation. Exhaustive physical examination failed to reveal any organic explanation for this symptom complex. The blood pressure was 118 systolic and 76 diastolic. The basal metabolism was minus 35 per cent. Urine and stool analyses gave negative results. The blood count was within the limits of normal. Liver function tests gave negative results. The intravenous dextrose tolerance test, with  $\frac{1}{2}$  Gm of dextrose per kilogram of body weight, gave the following results (chart 1): fasting 92, one-half hour after the intravenous administration 92, one hour 76, one and one-half hours 72, two hours 53. This test was repeated three weeks

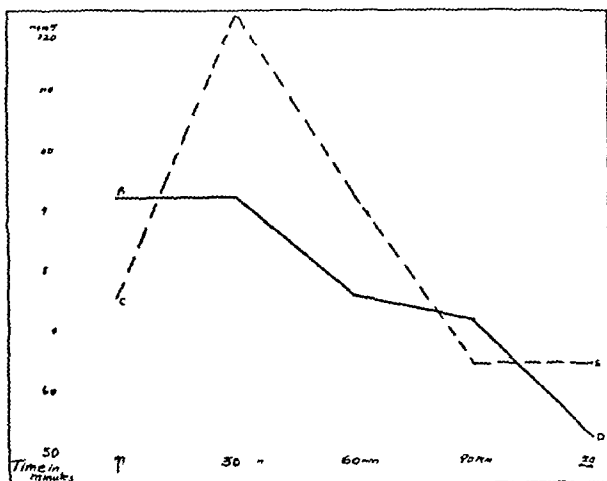


Chart 1 (case 1)—Intravenous dextrose tolerance test (B) before injection of atropine and (C) approximately thirty minutes after injection of  $\frac{1}{4}$  grain of atropine. A: fasting blood sugar; in both tests dextrose was then given. D: fatigue. E: no fatigue.

later, after hypodermic injection of  $\frac{1}{4}$  grain of atropine sulfate. Sufficient time was allowed for a good therapeutic effect of this drug before a fasting sample was withdrawn and the dextrose again injected intravenously. The following results are recorded: fasting (before atropine) 70, fasting (after atropine) 76, one-half hour after injection of dextrose 123, one hour 93, one and one-half hours 65, two hours 65.

**Follow-Up**—Since beginning his new regimen of divided feedings plus atropine, described later, he has been able to carry out his occupation well and feels clinically improved.

17 The reader is referred to the following citations:

- Danielopolu, D. Stoicescu, S. and Cimino-Berenger. Die Wirkung des Atropins auf die Glykämie beim Menschen. *Klin. Wchnschr.* 10: 311 (Feb. 14) 1931.
- Casanegra, A. Influencia de las diferentes dosis de atropina sobre el metabolismo glucido. *Semana med.* 1: 803 (March 10) 1932.
- Wachholder, K. Zur Frage der blutzuckersenkenden Wirkung des Insulins nach Vagotomie bzw. nach Atropin. *Arch. f. exper. Path. u. Pharmacol.* 175: 62-66 (March 21) 1934.
- Zagari and Pucci. Influenza dell'atropina sull'uroglicemia insulinica. *Riv. di pat. sper.* 3: 161 (Feb. 15) 1935.
- Hrubetz, M. C. The Blood Sugar Level After Administration of Pilocarpine, Atropine and Acetylcholine. *Am. J. Physiol.* 114: 551 (Feb.) 1936.
- Hrubetz, M. C. The Blood Sugar Level After Administration of Physostigmine and Atropine. *ibid.* 118: 300 (Feb.) 1937.
- Watanabe, F. Ueber die Unterdrückung der Pilocarpinhyperglykämie durch das Atropin. *Tohoku J. Exper. Med.* 27: 413 (Nov. 25) 1935.
- Watanabe, F. Ueber die hemmende Wirkung des Atropins auf die Peptonhyperglykämie. *ibid.* 27: 416 (Nov. 25) 1935.

At present he has submitted himself to a brief psychoanalytic treatment of his complaints, with therapy directed at those psychodynamic manifestations.

CASE 2—Mrs. H. L., aged 46, a housewife, had a syndrome of headaches, epigastric distress and diarrhea, recurrent in nature for the past two years after moderate exertion. There was definite weakness and fatigue following these attacks and

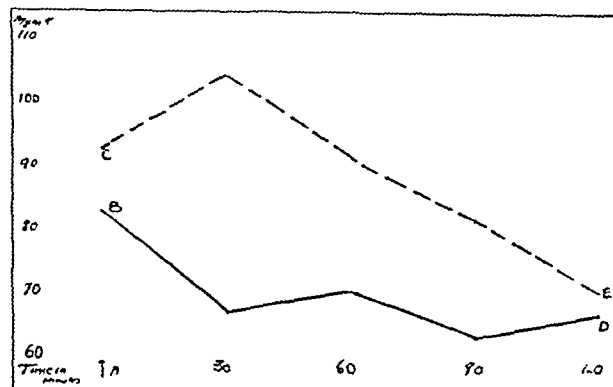


Chart 2 (case 2)—Intravenous dextrose tolerance test (B) before injection of atropine and (C) approximately thirty minutes after injection of  $\frac{1}{4}$  grain of atropine. A: fasting blood sugar; in both tests dextrose was then given. D: fatigue. E: no fatigue.

asthenia and hunger on moderate exertion. On one occasion, while playing golf, she had a syncopal attack associated with profuse perspiration. Because she had received only transient relief from the psychiatric approach and was bedridden a great part of the time, her psychiatrist asked us to review her case for a possible organic source of her fatigue. She had a history of recurrent migraine which had subsided six years before, after a thorough psychoanalytic treatment. She had had an appendectomy twenty-six years before admission.

Physical examination was essentially negative. Blood pressure was 140/86. There was diffuse tenderness of the left half of the abdomen not associated with any palpable masses.

Intravenous pyelography and complete gastrointestinal studies were negative. Urine and stool analyses were negative. The basal metabolism was plus 61 per cent. Blood chemistry was normal. Blood agglutination tests for organisms of the various dysentery groups were negative, as were fresh and cultured stools for *Endameba histolytica* and other organisms causing diarrhea. The blood count was normal. Liver function was normal.

The intravenous dextrose tolerance test, with  $\frac{1}{2}$  Gm per kilogram of body weight, was as follows: fasting 83, one-half hour after intravenous injection of dextrose 67, one hour 71, one and one-half hours 63, two hours 67. The next day in order to see whether we could "shock" the dextrose regulating

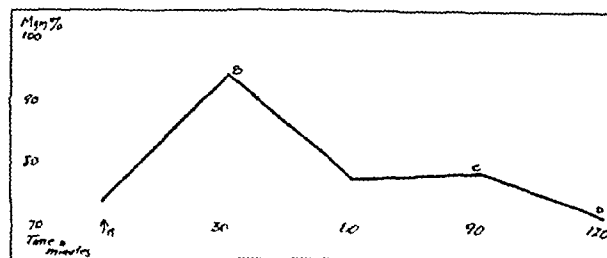


Chart 3 (case 3)—Intravenous dextrose tolerance test without atropine. A: fasting blood sugar—fatigue. B: no fatigue. C: moderate fatigue. D: more extreme fatigue.

mechanism with a higher dose, we tried  $\frac{3}{4}$  Gm per kilogram, and a typical posthypoglycemic-hyperglycemic curve was produced. The results were as follows: fasting 83, one-half hour after  $\frac{3}{4}$  Gm per kilogram 158, one hour 102, one and one-half hours 40, two hours 40.

The first test, e. g.,  $\frac{1}{2}$  Gm was repeated three weeks later, after injection of  $\frac{1}{4}$  grain of atropine sulfate hypodermically. The results were as follows: fasting (before atropine) 89,

fasting (after atropine) 93,  $\frac{1}{2}$  Gm per kilogram was given intravenously and then, in one-half hour, the blood sugar was 105, in one hour 92, in one and one-half hours 82 in two hours 71 (chart 2)

The patient has now been on the therapeutic regimen here outlined for two months. She has done remarkably well and is able to engage in her social activities and attend her numerous

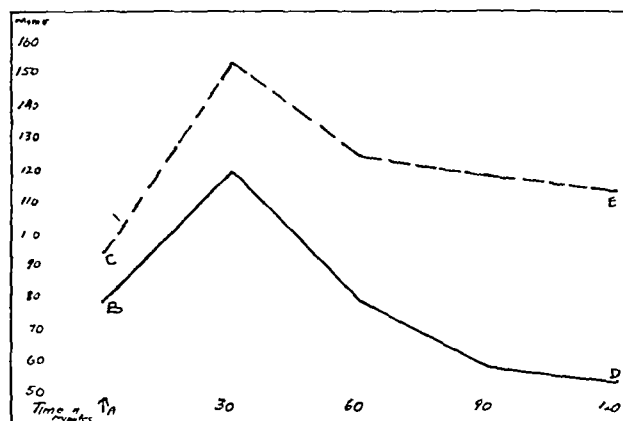


Fig. 4 (case 4)—Intravenous dextrose tolerance test (B) before injection of atropine and (C) approximately thirty minutes after injection of  $\frac{1}{2}$  grain of atropine. A fasting blood sugar in both tests; dextrose was then given. D fatigue. E no fatigue.

civic organizations. She sleeps eight to ten hours each night without sedation and has a normally functioning gastrointestinal tract.

CASE 3—Mrs. H. S., aged 44, gave a long history of weakness, "shaking sensations," profuse perspiration and protracted diarrhea. These symptoms would come mainly when she was under emotional strain. She quite accidentally discovered that taking sugar would alleviate these symptoms to some extent. Thorough physical, laboratory and roentgenologic examinations failed to reveal any significant findings. The liver function tests were negative. The intravenous dextrose tolerance test with  $\frac{1}{2}$  Gm per kilogram of body weight was as follows: fasting 73, one-half hour 93, one hour 76, one and one-half hours 78, two hours 71. We were not able to repeat this test after the injection of atropine but exhibit this case to illustrate the tendency to a "flat type of curve." The patient had to leave the city immediately after the first test because of her work in the American Women's Voluntary Services. We therefore put her on the medical and therapeutic regimen described and she has been on this plan for three weeks. She puts in from ten to twelve hours a day. She does not fatigue. She has no diarrhea. The "shaking sensations" have entirely disappeared and she reported by letter that she has not felt as well in the past fifteen years as she has in the last six weeks (chart 3).

CASE 4—Mr. Y., aged 43, a machinist gave a bizarre history of recurrent attacks of tachycardia and palpitation with associated weakness of the legs. These attacks arose suddenly, would last for a few hours and were accompanied by profuse sweating and faintness. They became so severe that he was unable to continue with his occupation and remained at bed rest a great deal of the time.

He had had an appendectomy three years previously.

Physical examination was essentially negative. The blood pressure was 130/70. There was a moderate tachycardia. The electrocardiogram was normal. Urine and stool analyses were negative. Complete gastrointestinal roentgenograms were negative. A blood count was normal.

One-third Gm of dextrose was injected intravenously with the following results: fasting 80, one-half hour 120, one hour 80, one and one-half hours 60, two hours 56.

Although this was not a typical "flat" curve it did present a good hypoglycemic effect. It is of interest to note that his weakness was improved about one-half hour after the first tolerance test but was definitely worse at the end of two hours.

Following the injection of atropine, the dextrose tolerating curve was as follows: fasting (before atropine) 100, fasting

(after atropine) 95, one-half hour 154, one hour 125, one and one-half hours 118, two hours 114. In this instance there was no associated weakness at the end of the test (chart 4). The patient has been on the therapeutic regimen for four weeks. He has gained somewhat in weight. His tachycardia, palpitation and weakness have almost completely disappeared and he gets a slight recurrence only when he suffers from a severe emotional upset and, since he has been reassured of the lack of serious aspect of this picture, he has reported that he has for the first time a sense of well-being.

Having made these observations, the next step was to develop a therapeutic approach to the problem of continued hypoglycemia. In order that not too readily absorbable carbohydrates in the form of simple sugars be given to the patients, the accompanying diet was outlined.

It will be seen that this is essentially a high protein, moderately high fat and relatively high carbohydrate diet, but the carbohydrates are in the more complex form and take a more prolonged period for their com-

### Outline of Diet

#### Foods Allowed

Cereals	All cooked and dry: macaroni, spaghetti, noodle and rice
Bread	Enriched white, whole wheat, crackers and Melba toast (include daily in diet)
Soup	Vegetable milk soup
Meat	Lean meat and fowl
Fish	Lean fish, shrimp and oysters
Eggs	Two daily, poached and boiled
Cheese	Small portions
Vegetables	All cooked and raw
Fruits	Fresh, stewed and canned
Beverage	Milk, buttermilk, fruit juices, tea, coffee and cream
Dessert	Fruit, gelatin, simple puddings and sponge cake
Butter	Specified amounts

#### Food to Avoid

Very fat meat or fish, oil, pastry, fried foods and pure sugar. In case of diarrhea omit raw fruit and vegetables, onions, cabbage, corn, dried peas and beans.

#### Diet Order

Protein	141 Gm
Fat	120 Gm
Carbohydrate	250 Gm
Calories	2710

#### Menu

Breakfast	Dinner	Supper
Orange juice 4 oz	Cream of vegetable soup 4 oz	Oyster cocktail
Cream 2 oz	Broiled lake trout	Broiled steak 3 oz
Oatmeal	oz	Double baked potato
Butter 1 pat	Stewed rice	Fresh broccoli
Bread 2 slices	Tomato salad	Head lettuce
1 glass	Lemon and oil dressing 1 teaspoon	Lemon and oil dressing 1 teaspoon
Coffee	Butter 2 slices	Bread 2 slices
	Fresh apple juice	Butter 1 pat
	Sponge cake	Fresh fruit cup
	Milk 4 oz	Tea with lemon
	No sugar	
10 a.m.—Milk 4 oz		
3 p.m.—Orange or grapefruit juice (fresh) 6 oz		
8 p.m.—Milk 4 oz		

Note: If the amount is not indicated in ounces or measurement consider average portion.

plete digestion. This was based on twofold evidence: first, that the injection of dextrose in normal dogs at a slow rate greatly increases the tolerance of these animals to subsequent more rapid injection<sup>18</sup> and, second, the deamination of protein and the formation of carbohydrate goes on at a much slower rate in the liver and therefore the liver will give a more prolonged

18 Jordan, E. M. The Effect of Injected Glucose on Tolerance. *Am. J. Physiol.* 80: 441 (April) 1927.

secretion of dextrose over a longer period of time and the postdigestive hypoglycemia in these patients will be delayed if necessary to the next intake of food. However, we felt that more frequent feedings than the normal three meals a day was an additional factor of safety to prevent hypoglycemia from becoming manifested in these patients.

In addition, we thought it was clinically indicated from the experimental evidence accumulated that the vagal nerve would be in a state of partial paralysis with the addition of physiologic doses of atropine  $\frac{1}{200}$  grain (0.0003 Gm.) three times a day by mouth to the regimen, and finally, in order to assure more complete utilization of dextrose in their muscle metabolism, small doses of thiamine hydrochloride were also given three times a day.

#### RESULTS OF THIS MANAGEMENT

The striking and rapid disappearance of the so-called pernicious inertia made a profound impression on us in the clinical course of these patients. When these patients had been more or less bedridden previously, we found that they were able to assume their normal routine type of living quickly. The fatigue disappeared. One patient who had diarrhea, which may be a symptom of hypoglycemia or vagotonia, had normal bowel movements without any other attempt at gastrointestinal control either dietary or medicinal. Although there are too few cases from which to draw any general conclusions, our main reason in reporting the evidence is to stimulate repetition by those who may have an opportunity from their clinical material to study these manifestations in their patients. Furthermore, it may be mentioned incidentally that the psychoneurotic symptoms of these patients were reported to their neuro-psychiatrists as definitely improved.

#### CONCLUSIONS

1 Fatigue may be a prominent symptom of neuro-psychiatric complaints.

2 There is experimental and clinical evidence to show that a possible mechanism is hyperinsulinism.

3 This hyperinsulinism may be the result of temporary or prolonged stimulation of the right vagus nerve resulting from emotional processes being relayed through the hypothalamus to the autonomic nervous system.

4 The injection of atropine prevents this stimulation and allows the blood sugar curves to return to near normal.

5 Definite clinical improvement has been noted in the few cases thus far studied.

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## THE FEMALE OBSTRUCTING PROSTATE

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AND

HAROLD A. O'BRIEN, M.D.

DALLAS, TEXAS

John Caulk<sup>1</sup> in 1921 in a paper entitled "Contracture of the Vesical Neck in the Female" as far as we have been able to find is the first to suggest resection for bladder neck obstruction in the female. In that paper only 1 case was reported. In 1935 he again called attention to the subject.

In 1933 Nesbit<sup>2</sup> reported 2 cases of bladder neck obstruction which he cured by resection.

In 1934 Fite<sup>3</sup> reported 1 case in which resection accomplished a brilliant cure.

Caulk in 1937 reported a total of 15 cases coming under this classification. Twelve of these were due



Fig. 1.—Cross section of posterior part of female urethra showing a rich prostatic gland.

to inflammatory contractures, 1 the result of lobulations at the orifice cystoscopically similar to prostatic lobes, 1 the result of a subtrigonal hypertrophy and the other a large papillary mass.

The Dutch urologist Van Houtum,<sup>6</sup> in an article titled "Prostatism in General and in the Female" reported 2 instances, 1 in a woman aged 41 and 1 in a woman aged 27.

In 1931 Folsom<sup>7</sup> first emphasized the clinical importance of the group of glands surrounding the posterior

From the Department of Urology, Baylor University Medical College. Because of lack of space this article has been abbreviated for publication in *THE JOURNAL*. The complete article appears in the author's reprints.

Read before the Section on Urology at the Ninety-Third Annual Session of the American Medical Association, Atlantic City, N. J., June 10, 1942.

1. Caulk, J. R. *J. Urol.* **6**: 341-343 (Nov.) 1921.
2. Caulk, J. R. and Patton, J. *J. Urol.* **33**: 504-512 (Feb.) 1935.
3. Nesbit, R. M. *Urol. & Cutan. Rev.* **37**: 291-293 (May) 1933.
4. Fite, E. H. *Urol. & Cutan. Rev.* **38**: 163-165 (March) 1934.
5. Caulk, J. R. *Internat. Clin.* **4**: 136-148 (Dec.) 1937.
6. Van Houtum, I. *Geneesk. bl. u. klin. en lab. v. d. prakt.* **37**: 155-185, 1939.
7. Folsom, A. I. *The Female Urethra*. *J. A. M. A.* **97**: 1345-1350 (Nov. 7) 1931.

**The Stomach of Birds**—The Biological Survey division of the Department of Agriculture has been our chief source of authentic information regarding the food of birds. They have examined the stomachs of over 112,000 birds, including practically every species found in this country. They marshal imposing figures not only as to the type but as to the quantity of larvae, worms, insects, scale lice, weed seed and other noxious substances eaten by birds. It is estimated, for instance, that in one state (Iowa) the tree sparrows (not English sparrows) alone eat approximately 875 tons of weed seed in one year! Nearly 10 tons every day of summer! They have presented convincing figures of the same sort regarding birds which destroy the boll weevil, the chinch bug and the Japanese beetle.—Menninger, William C. *Bird Study Bull. Menninger Clin.* **6**: 94 (May) 1942.

part of the female urethra. He felt then and we feel now that an infection harbored through the years in these glands is probably the cause of the bizarre pathologic picture seen in this portion of the female urethra (figs. 1, 2, 3, 4 and 5).

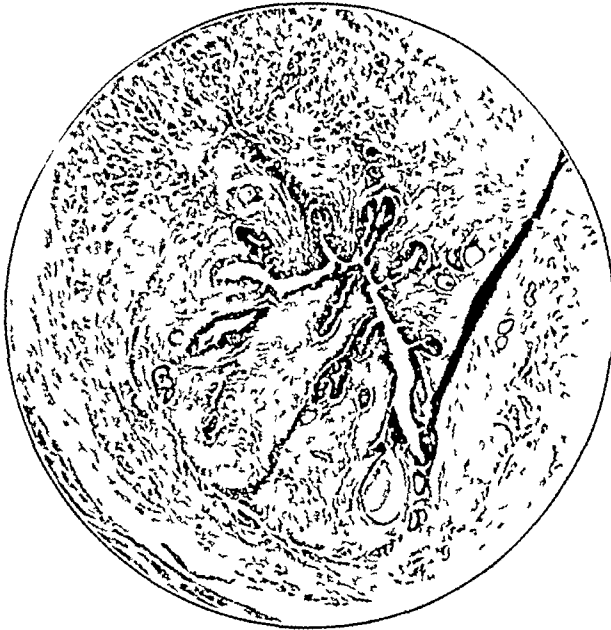


Fig. 2—Female periaurethral prostatic glandular supply.

From our observations of this interesting and important lesion we are convinced that prostatism is a clinical entity that is seen much more frequently in women than is recognized and properly treated. Physicians

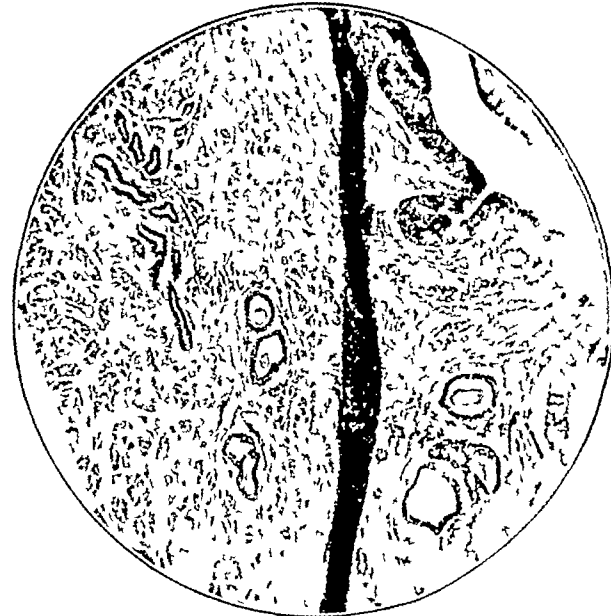


Fig. 3—High power view of figure 2 showing prostatic glands with retained secretion.

have so long had their minds closed to the female prostate as nonexistent that they often fail to ask the proper questions to get an accurate and revealing history. Yet, it is our firm conviction that many women who have some type of prostatism are going without proper treatment because physicians have not fully

realized that such conditions do exist and do cause all the clinical symptoms that are seen in similar conditions in men.

Clinically these cases present, in addition to a bladder irritation, some degree of difficulty in voiding. This is varied in our series of cases from simply a sense of obstruction and unfinished business on through varying degrees of obstruction to complete retention. Three out of 15 of our cases have shown this final stage of obstruction, viz. retention. The urine in these cases may show nothing of importance or, on the other hand, be heavily loaded with pus.

In 4 of our cases the bladder urine showed ++ pus or more, while the urines collected from the right and left kidneys showed no pus and no organisms. In each of these cases the bladder mucosa was not inflamed. Therefore we feel that these cases represent a similar

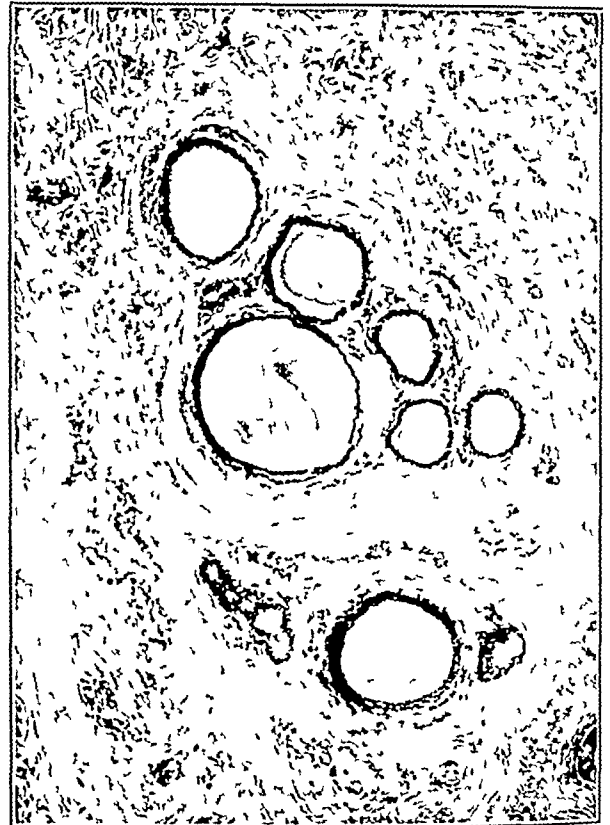


Fig. 4—High power view of another group of female prostatic gland with retained secretion.

group in the male, in which the pus originates in the posterior part of the urethra from the prostate and seeps back into the bladder through the relatively weak internal vesical sphincter.

A plain cystogram either in or sodium iodide being used will frequently reveal a filling defect in the region of the internal orifice similar to the defects seen in men in prostatic hypertrophy (figs. 6, 7 and 8).

On cystoscopic examination one may find a normal bladder wall or a grossly trabeculated wall with cellules and even diverticula and calculi. The best observation of the bladder neck in our opinion is made by using both the close vision cystourethroscope and the pan-endoscope. At times we have found the retrograde lens of great value in evaluating a collaret type of enlargement such as seen in figure 11. Not infrequently the bar or collaret may be felt by palpating the urethra through the vagina with the cystoscopic sheath in place.



The majority of the cases that we have seen as well as those reported in the literature show a fibromuscular hypertrophy (fig 9) with fibrous hyperplasia and varying grades of inflammatory reaction. In some cases actual gland structures have been reported, and these seem to be identical with similar lesions in the male.

We have for years considered these cases in the female as an end result of an old chronic prostatitis of varying degrees of severity and showing a variety of type of reaction, and, since we now have ample pathologic evidence that there is a group of glands surrounding the posterior part of the female urethra, which Caldwell<sup>8</sup> goes so far as to identify as strictly a homologue of the prostate in the male, we may with propriety assume that the two pathologic entities are in fact identical.

Therefore we feel that the most plausible explanation for the pathologic lesion we are discussing is, first, the existence of a homologous group of glands surrounding

In discussing transurethral resection in the female one must readily realize that we have to be much more careful in our technic. First, for the simple reason that since we are dealing with miniature prostates we must be more sparing in our bites of tissue removed to insure

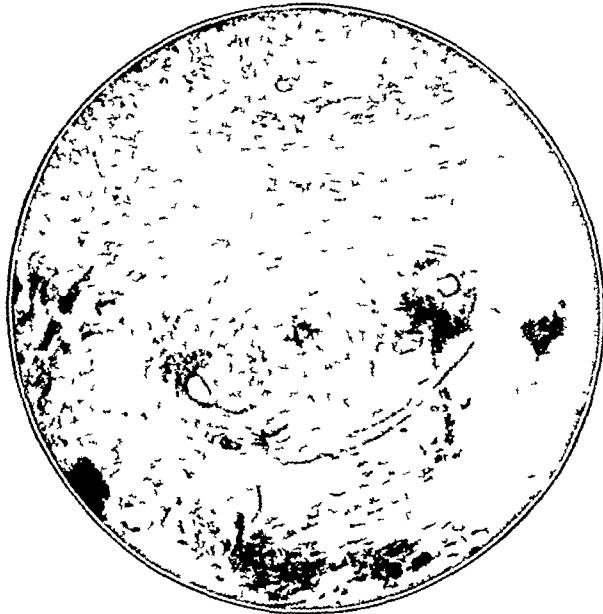


Fig 5—Cross section of posterior part of urethra of full term fetus with prostatic gland structures

the posterior part of the female urethra and, second, that these glands do become infected and that after harboring this infection for months or years these bars, collarets and cicatricial contractions are produced.

Dr Hargrove of Baton Rouge, La., supplied figures 10 and 12. This tissue was removed transvesically by a rectoscope loop from a nodular mass filling the posterior part of the urethra in a woman and producing a complete obstruction. We think any one would agree that this is really and truly an adenomatous enlargement of the female prostate. So that while the majority of the cases are inflammatory in character, yet we can and do see frank adenomatous overgrowth.

These lesions lend themselves very readily to transurethral resection. The results are as satisfactory as they are in the male. We should therefore recognize this as a gross clinical entity and begin to offer to these patients the great relief we have for years been affording the male who is similarly affected.



Fig 6—Opaque cystogram in woman with retention. The prostate can be clearly seen as a defect in the lower margin of the bladder shadow. Also cellular diverticula and ureteral regurgitation.

against cutting through the urethrovaginal septum second, for the reason that we do not, as far as we have observed, have a capsule that may be seen during resection and hence act as a guide, third because excessive fulguration may be as bad as too deep a



Fig 7—Opaque cystogram of woman showing filling defect characteristic of small prostatic enlargement.

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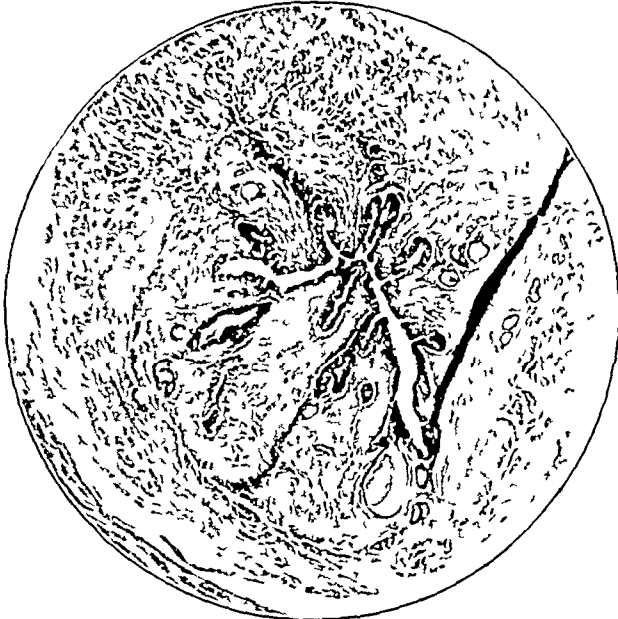


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In 5 of our cases the resection was limited to the lower segment of the urethral circumference since we were in these cases dealing with a bar

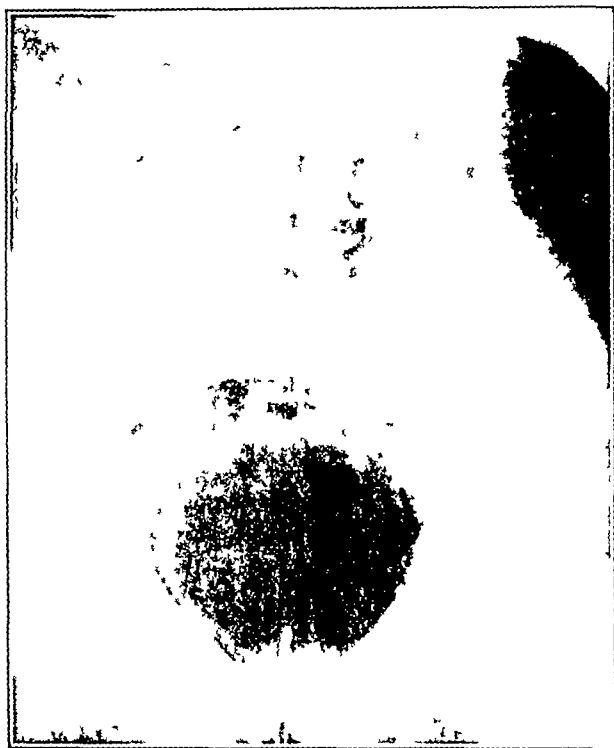


Fig. 8—Air cystogram in female showing filling defect characteristic of enlarged prostate.

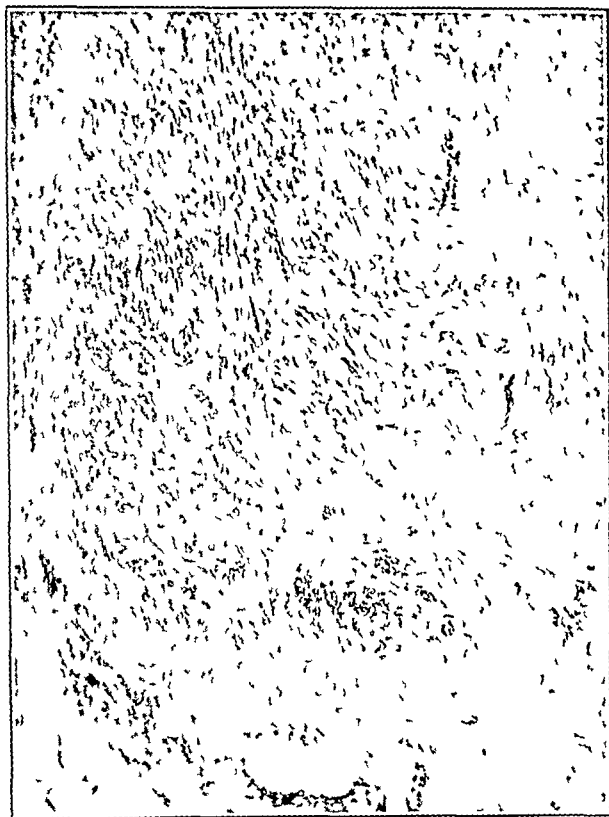


Fig. 9—Section of tissue removed at resection showing the typical fibromuscular hypertrophy with fibrous hyperplasia.

In 9 cases the entire circumference of the urethra was resected. It was necessary to resect the upper segment in 1 of these cases, in which no result was obtained after the first resection which was limited to the lower segment.

Only one death occurred following resection in this series of cases and that of a woman aged 67 with rather severe diabetes who had myocardial damage resulting from a previous coronary occlusion. She had complete retention with blood urea 50.9 mg. She died from cerebral hemorrhage.

After this somewhat cursory discussion of the female obstructing prostate we will report 3 of our cases in some detail, leaving the remaining case histories to be published in detail at the end of the paper.

Hattie B., a Negro woman aged 50 came to the outpatient department of Parkland Hospital complaining of having had gradually increasing bladder trouble for the past five years characterized by frequency, burning and difficulty in voiding. This difficulty had grown gradually worse in recent months until she had complete retention of urine. At the time of admission she was unable to void and, when she was catheterized 12 ounces (355 cc.) of urine was removed. A plain film

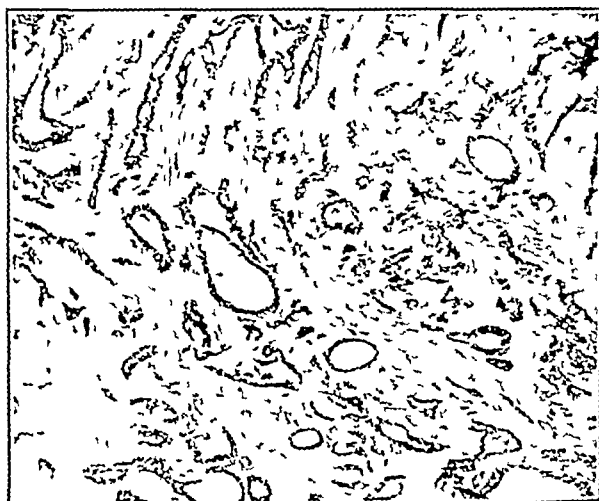


Fig. 10—Section in Dr. Hargrove etc. of actual adenomatous hypertrophy of the female prostate gland.

of the kidney, ureter and bladder tract was negative. A cystogram showed a definite filling defect characteristic of mild prostatic hypertrophy (fig. 13). Cystoscopy showed a bladder wall grossly trabeculated with some evidences of a recent acute inflammation. Observation of the bladder neck disclosed a perfectly typical bilateral intraurethral enlargement (fig. 14) with a very acute angle at 12 o'clock and two lateral masses protruding into the lumen of the urethra. These masses were separated from each other at 6 o'clock by a small amount of intervening tissue which did not seem to be hypertrophic.

A transurethral resection was done at which time approximately 12 Gm. of tissue was removed (fig. 15). No unusual difficulties were encountered. A catheter bag was left in place. The patient made a very uneventful convalescence. On the fourth day the catheter was removed. She had complete incontinence for a few weeks and then began to regain control and in three months was entirely continent and has remained so. She feels well and voids her urine normally in every way. She has no retention.

Mrs. H. aged 67 also seen at Parkland Hospital was first seen for bladder irritation and difficulty in voiding which had resulted in retention. The urine was grossly infected.

Cystoscopy showed a collar-like type of enlargement completely surrounding the internal urethral orifice. The bladder was grossly trabeculated. After preliminary drainage, resection was done. Several bites of tissue were removed from 3 o'clock

through 6 to 9 o'clock. A bag catheter was left in place. Convalescence was very good and on the fifth day the bag was removed. She still was unable to void any urine; the catheter had to be replaced, and during the next three weeks she had fever and there were large amounts of pus in the urine. At intervals the tube was removed in the hope that her inability to void was due to an edema, but at no time could she void.

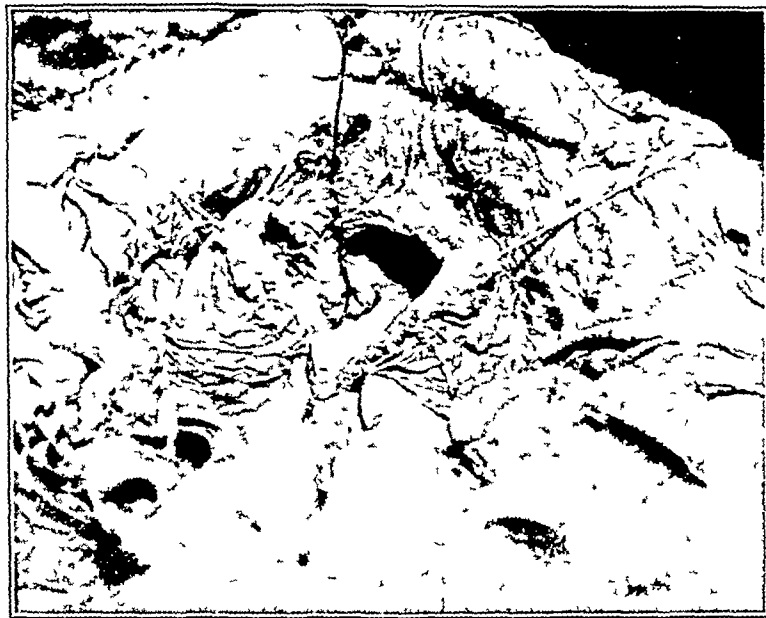


Fig. 11—Cystic specimen of female bladder opened from above showing internal vesical orifice surrounded by collar type of prostatic enlargement.

Cystoscopy was done again. The resected area was healed nicely, but the remaining upper half of the collar was even more prominent than on previous cystoscopy. Resection was done again at which time the upper half of the collar was removed. When this was done it was found that some more tissue had to be removed at the site of the first resection. At this sitting nearly 6 Gm. of tissue was removed. Her convalescence was satisfactory and after removal of the catheter on the fourth day she could void freely but had a minor degree of incontinence which lasted only a short time. When last seen six weeks after final operation, she was voiding satisfactorily and her general health had improved. She had perfect control and no residual urine.

Mrs. H., a white woman aged 67, had begun to have frequency, burning and difficulty seven years before. This increased gradually until four years later she was unable to void any urine at all. She was seen in one of the large clinics and after careful examination was told that she had paralysis of the nerve of the bladder. This diagnosis was made in spite of the fact that her neurologic findings were normal and her spinal fluid examination was negative. She was told that she would have to learn to catheterize herself and thus empty and wash out her bladder twice daily, for nothing could be done to get her well. She went home and carried out this regimen for the following three years when she began to feel bad in a general way, being miserable, very weak and having headaches.

At this point we saw her. She gave us the immediate impression of being seriously ill. A plain film of the kidney, ureter and bladder tract showed three stones apparently located in the bladder. Her urine was foul with a terrible odor.

Cystoscopy showed a fiery red bladder over its entire area. It was grossly trabeculated and cellulated and in the dome showed one wide mouthed diverticulum. The three stones could be seen plainly, one part of one being in a cul-de-sac. The ureteral openings could not be identified and no indigo-carmines appeared over a period of twenty to thirty minutes. Efforts to catheterize the ureters were made even though they could not be seen but with no success. On observing the internal vesical orifice we could see a very pronounced bar which we thought was

the cause of the obstruction. Excretory urograms showed nothing.

When the patient entered the hospital catheter drainage was instituted and dextrose and saline solution were given intravenously but in spite of these measures she rather rapidly grew worse with the blood urea going from 121 to 176 mg. She died on the fifth hospital day in a typical uremic convulsion.

An autopsy showed massive bilateral hydronephrosis and hydroureter as seen in figure 16. The bladder opened from above showed the stones, trabeculae, the diverticulum and the transverse bar at the internal vesical orifice. Figure 17 shows a larger view of the bladder. The prostatic bar can be seen plainly at the internal urethral orifice.

We feel reasonably sure that if this woman had been recognized as having prostatism when first seen and proper measures had been taken such as a transurethral resection she would have had a good result and her upper urinary tract would have restored itself to a reasonably normal status.

#### CASE HISTORIES

**CASE 1**—Mrs. T. V. F., white, aged 42, was complaining of frequency, dysuria, nocturia and slowness of the stream. These symptoms had been present for about ten years and had appeared following radium implantation for the treatment of carcinoma of the cervix. During the five months prior to examination all these symptoms had been definitely increased in severity.

Examination showed the presence of a stricture of the urethra and a chronic granular urethritis with thickening and elevation of the posterior lip of the internal orifice.



Fig. 12—High power view of figure 10.

A transurethral resection of the thickened posterior lip was carried out with a McCarthy resectoscope under sacral anesthesia. A two way catheter was left in the bladder for constant irrigation the first forty eight hours. The postoperative course was entirely uneventful.

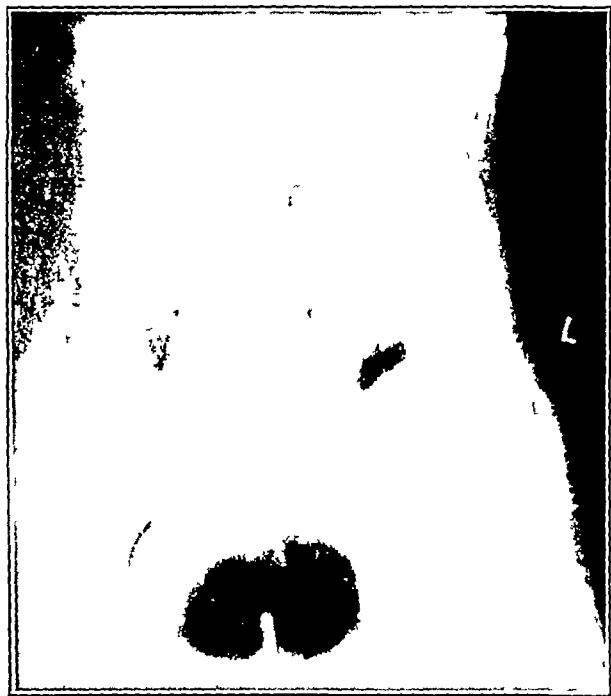


Fig. 13—Air cystogram in case H. L. showing rather pronounced filling defect in region of prostate.

The pathologic diagnosis was muscular hypertrophy of the prostate.

One month after the resection the patient was entirely free from all urinary distress, although she still had to get up once at night to void.

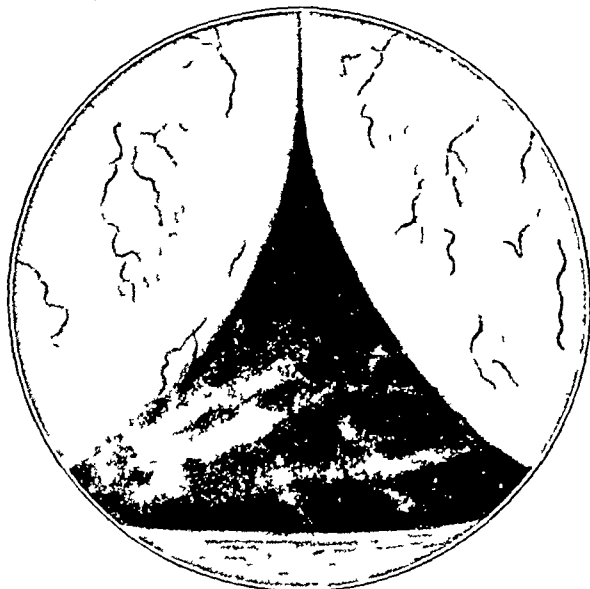


Fig. 14—Drawing by Lewis Waters showing bilateral type of enlargement of prostate in case H. B. Panendoscopic view.

CASE 2—Mrs. J. W. S., white, aged 60, complained chiefly of difficulty in passing urine. She first noticed this trouble two years prior to examination and stated that the difficulty in starting her stream was definitely increasing in degree. During the six weeks prior to examination she had had complete retention on two occasions requiring catheterization.

During the two years that her symptoms had been present she had received some relief from dilations of the urethra; however, as soon as these treatments were stopped the difficulty in starting the stream recurred.

Her general physical findings were normal.

Examination of the urethra showed a persisting stricture, so that a number 24 I. cystoscope was held rather tightly in spite of the history of frequent urethral dilations during the past two years. There was pronounced thickening of the posterior lip of the urethral orifice. The ureteral orifices were normal in appearance and the bladder surface appeared quite normal. There were a few pus cells noted in the catheterized specimen.

Preoperative determination of the urea showed 25 mg. per hundred cubic centimeters of blood.

Under sacral anesthesia a transurethral resection of the obstructing tissue of the internal urethral orifice was performed with the McCarthy resectoscope. Six pieces of tissue were taken starting at 3 o'clock going through 6 o'clock and around to 9 o'clock.

Postoperative convalescence was uneventful and the patient got in excellent immediate and late postoperative result.

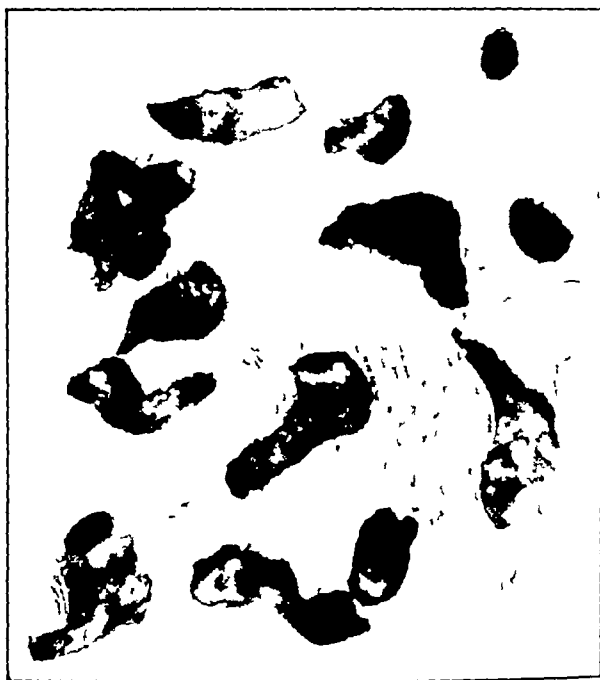


Fig. 15—Tissue removed from H. B. shown in figures 13 and 14.

CASE 3—Mrs. J. L. H., white, aged 72, first seen in April 1937, complained of difficulty in passing urine, a frequency of thirty minutes to an hour during the day and six to eight times at night, urgency and suprapubic pain.

Examination showed a definite stricture of the urethra so that a number 16 cystourethroscope had to be used for the examination. In addition there was observed a pronounced chronic granular urethritis. In spite of regular urethral dilations the patient obtained only partial symptomatic relief. Repeated determinations of residual urine showed from 1 to 3 ounces (30 to 90 cc.) on each occasion.

On Sept. 26, 1937 the patient developed a complete retention and was admitted to Baylor Hospital where examination was carried out under general anesthesia. The stricture had been dilated so that a number 24 cystoscope could easily be introduced. We observed a thickened bar of tissue across the floor of the internal orifice, and it was decided to resect this since there was no other explanation for the complete retention.

With a McCarthy resectoscope only four pieces of tissue were removed from this thickened bar, and a two way catheter was left in for continued drainage of the bladder.

Convalescence was stormy. During the next three days there was an elevation of temperature to 103.5 F. on each

day. Following this however, the temperature gradually subsided to normal and the patient was discharged from the hospital on the tenth postoperative day. At that time she was able to void freely and had no trouble with urinary control.

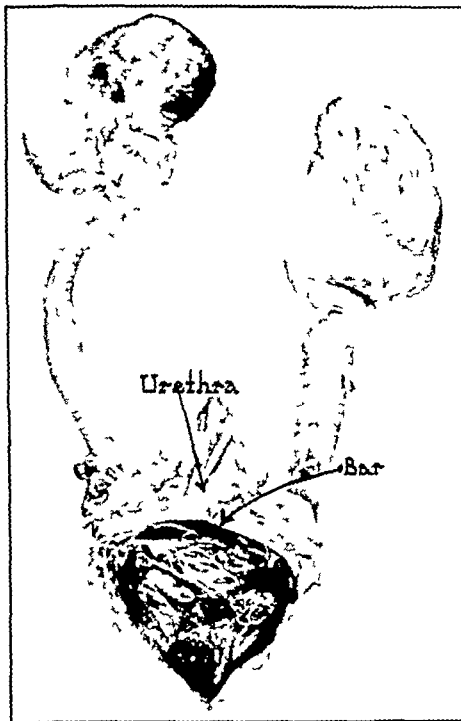


Fig. 16—Autopsy specimen of Mrs. H. showing bilateral hydronephrosis and hydroureter with trabeculated bladder wall, one diverticulum, two bladder stones, and a prostatic bar, the cause of the entire pathologic picture.



Fig. 17—A closer view of the opened bladder and urethra showing diverticulum, trabeculae, stones, and prostatic bar.

The late result has been satisfactory although the patient still voids one to two times at night and the catheter urine continued to show about grade 1 of pus in the centrifuged sediment.

The pathologic diagnosis of the tissue removed was chronic inflammation of the urethral mucosa.

CASE 4—Miss L. K., white, aged 25, complained of frequency of urination, nocturia, and dysuria. These symptoms had been present for a year in spite of the fact that the patient had been receiving all types of local treatment to the urethra during this time.

At the time of our first examination she was complaining of spasmodic like pain in the urethra and bladder that would occur at frequent intervals and would cause her to void every few minutes. These attacks would last for an hour or two and then she would suddenly get relief. During these attacks she was never able to void more than a few drops of urine, although after the spasm passed she could then completely empty her bladder.

On examination we found the urethra of normal caliber and the urethral mucosa showing only a slight congestion in the posterior portion. There was a thickening of the tissue of the internal urethral orifice involving the entire circumference. The bladder was normal on inspection of the interior and the upper urinary tract was normal.

Under general anesthesia a transurethral resection of the fibrous tissue from the internal urethral orifice was carried out, tissue from the entire circumference being removed in the amount of 3 Gm.

The pathologic diagnosis was chronic urethritis with epithelial hyperplasia.

A catheter was left in for two days following the resection. The patient left the hospital on the fifth day. She obtained an excellent immediate postoperative result. She was last examined one year following her resection and had been very comfortable, although at the time she had mild spells of dysuria that would last for a day or two.

#### ABSTRACT OF DISCUSSION

DR. NELSON F. OCKERBLAD, Kansas City, Mo.: I have never seen a case of female prostate obstructing or otherwise. This paper of Folsom and O'Brien does excite my interest. I have sometime had this experience. The wife of one of my patients, whom I had resected for prostatic obstruction, has come to me somewhat timidly and secretively to suggest that she thought that she needed the same sort of an operation as she was having the same symptoms and her prostate was undoubtedly at the bottom of the trouble. Residual urine in the female is not particularly rare and is generally due to one of two causes: (1) neurogenic bladder of whatever type and (2) stricture of the urethra. The female urethra is a subject concerning which the authors know a great deal. It has been my experience in dealing with women who complain of trouble in the urethra that in fully one half the cases you do for them the quicker they will get well.

DR. RICHARD NESBIT, Ann Arbor, Mich.: Just eleven years ago in this section Dr. Folsom discussed this same problem and called our attention to the subject. He said that many women have difficulty at the vesical outlet and few have real obstructive lesions there. It is important to realize that in all of the cases reported not only by Folsom but by others in which relief has been brought about by transurethral resection, there have been three definite objective findings which have been of value in diagnosis. First of all there has been residual urine, second there has been trabeculation of the bladder, and third there has been a palpable lesion which could be seen with a cystoscope or a urethroscope. During the past year I have seen 2 women who might fall into this category. They had difficulty with urination. One of them had complete retention of the urine requiring catheterization. Neurologic examination was negative in both of these cases. In both there was residual urine. There was a moderate degree of trabeculation, and on pantoscopic examination a visible bar was present which was not palpable by vaginal examination on the instrument. In these 2 cases we suspected that there might have been a neurogenic contraction of the vesical outlet or the internal sphincter. A procedure was utilized in order to differentiate this point. I believe Alec Hepler first suggested it. A local anesthetic agent was injected



into the lumbar sympathetic, after the manner described by Alton Ochsner for the treatment of inflammation of the vein from phlebitis. One can tell whether this injection is taking hold, because immediately the patient's legs get an increase in warmth. In both cases the visible contracture of the vesical outlet disappeared on cystoscopy, so we were saved the embarrassment of having operated on a functional rather than an organic bar which is something to hold in mind. It is very important that we observe residual urine, trabeculation of the bladder and a palpable lesion. Do the authors advocate prostatic massage in any of these cases?

DR HERMAN L. KRETSCHMER, Chicago. I agree in part with Drs. Folsom and O'Brien, what I disagree with is the title of their paper. Obstruction at the neck of the bladder in both children and adult females is a rare lesion. However, it occurs more frequently than is generally recognized. Many girls and women with trabeculation and hydronephrosis have as the underlying cause obstruction at the bladder neck. This condition is frequently overlooked and as a rule the patients when consulting the doctor come in late in the course of the disease after irreparable damage to the upper urinary tract has occurred. Therefore it behooves all of us to be on the lookout for these cases to remove the obstruction before damage to the upper urinary tract has taken place. I agree with the authors that the treatment is transurethral resection. The patients belong to this group on whom we have performed transurethral resection. We have had most satisfactory results. The point on which I disagree is that of the selection of the title, namely, The Female Obstructing Prostate, because it is my opinion that the female does not have a prostate.

DR VINCENT J. O'CONOR, Chicago. The lesion described by Drs. Folsom and O'Brien has been a matter of interest to me for a long time. I have encountered 9 women with unmistakable mechanical obstruction of the vesical neck. The authors have had the opportunity of studying Kodachrome photomicrographs of the tissue removed by transurethral resection in these 9 patients. The obstructing tissue removed from the patients we have seen has not been of uniform character. Some of these tissues are purely fibromuscular, some are granulomatous or inflammatory and some have a predominance of glandular elements. I agree that the term "prostatism" in the female is quite misleading. We must not confuse these patients with the hermaphrodite or pseudohermaphrodite who actually appear to be female yet have male gonadal tissue. Before proceeding to resect an apparent obstruction at the bladder neck in women it is imperative that we recognize what, if any, part relaxation of the floor of the bladder plays. In cystocele moderate or advanced, there often appears cystoscopically to be an increase in the size of the internal sphincter or vesical neck. The neurologic examination must be negative, there must be both visual and palpable tissue apparently obstructive in character and there must be residual urine that cannot be explained by relaxation of the bladder floor before the indications are clear for transurethral resection of the female bladder neck.

DR A. I. FOLSOM, Dallas, Texas. Those women that Dr. Ockerblad had apparently knew better about what was the matter with them than he did. He said the less you do for them the better. That isn't my experience. Dr. Nesbitt's suggestion of a neurogenic contraction of the internal vesical sphincter is a thing which I am not sufficiently familiar with to discuss, but my impression is that the neurogenic disturbance of the internal vesical sphincter is a relaxation. He asked if I massaged these. As a matter of fact I massaged one for him in his own clinic one day and showed him the secretion coming out of the duct. Dr. Kretschmer takes issue with me as to the term. I don't know any better term for it and I don't see any use of quibbling over terms. Caldwell, whom I consider to be as good a pathologist as there is in this country, has definitely gone on record as saying that there is a definite homologue of the prostate. I am surprised that you do not know that Virchow found prostatic calculi in women in the posterior part of the urethra, and if you will look at the article that I first published in 1931 you will find a beautiful illustration of a large prostatic calculus and there are corpora amylacea. I do not care what

you call it. If this is not the right thing to call it we will call it something else, but as a matter of fact, we have no proper term for the condition in the female. Prostatic hypertrophy is not adequate. I think there is no objection to calling this "female prostatism." O'Connor's suggestion about cystocele brings up a thing that I have very definite convictions about. I have many records of women who have been operated on for cystocele, for relief of bladder irritation, and I have then had to go in and clear up a posterior urethral inflammatory lesion and get them well. Now I have no argument, of course, with the gynecologist about doing a cystocele operation of any kind that he wants to do as long as the indications are definitely gynecologic but I believe that the gynecologist who operates on women with bladder trouble and does this repair of the cystocele purely for bladder trouble is going to fail ten times to where he succeeds once.

## Clinical Notes, Suggestions and New Instruments

### LEAD INTOXICATION FROM A BULLET LODGED IN THE SPHENOID SINUS AND SURGICAL REMOVAL OF THE BULLET

LIEUTENANT COMMANDER CHARLES J. FUTCH

MEDICAL CORPS, UNITED STATES NAVY, RESERVE, RETIRED

The present war era will undoubtedly result in an intensified study of the effects of retained lead and a brief review of the possibilities in such cases is apropos at this time. Lead intoxication from absorption by way of the mucous membrane of the nasal mucosa is rare. Secondly, the removal of a bullet lodged in the sphenoid sinus is an unusual problem of surgery.

There has been some change in opinion from that expressed by Ambrose Pare<sup>1</sup> in the sixteenth century. "Experience

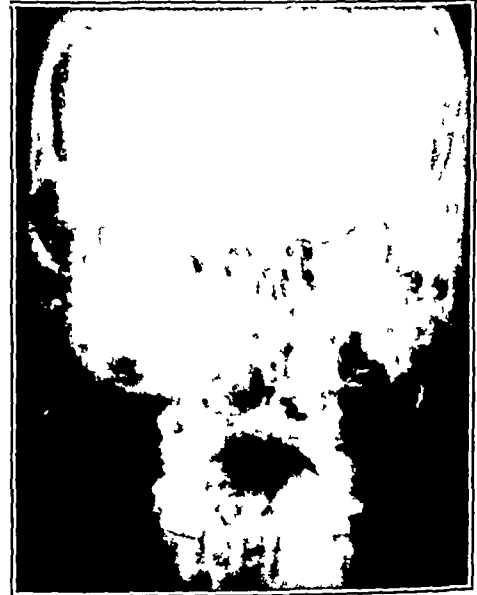


FIG. 1.—Anteroposterior view of the skull showing lead fragment at the point of entrance at the superior margin of the left orbit. The main body of the bullet may be seen lodged in the left sphenoid sinus.

teaches us that lead (which some say is poisonous because mercury is derived from it) can remain a long time in our bodies without causing any corruption as we can recognize

This article has been released for publication by the Division of Publications of the Bureau of Medicine and Surgery of the U. S. Navy. The opinions and views set forth in this article are those of the writer and are not to be considered as reflecting the policies of the Navy Department.  
1. Pare, Ambrose. *Oeuvres complètes d'Ambroise Pare*. Paris: M. L. Grigne, édition 3, 347, 1840-1841.

in those cases of arquebus wounds where the ball has remained in the flesh a space of three, four and even ten years, and has moved from top to bottom without causing any putrefaction or harm which demonstrates that [lead] has no poisonous qualities but rather possesses a familiarity with our nature." In contradistinction to Pares' opinion, there were physicians of the Middle Ages who definitely associated colic and palsy with lead. To Tanquerel des Planches<sup>2</sup> goes the credit of first correlating the manifestations and symptoms of lead intoxication.

The earliest reported case of plumbism caused by the retention of lead bullets was made by Bronin<sup>3</sup> in 1867. Willard Machle<sup>4</sup> made a careful study of more than 40 cases and published a monograph on the subject of lead poisoning from retained bullets. This series, as presented by Machle, shows 3 cases of retention and of the removal of bullets from the head and brain, but no reference has been found in the total literature of the removal of a bullet from the sphenoid sinus.

It is stated by Cecil<sup>5</sup> that subcutaneous or intramuscular deposits of lead enter the blood stream so slowly that intoxication from bullets, if it occurs at all, is very rare, but it is now recognized that lead may be absorbed from the gastro-

upward outside the frontal bone and a large fragment entering the orbital fossa. The fragment lodging externally was mostly removed. The patient further stated that he was unconscious and delirious an unknown period of time and was not expected to live for the first month after the accident. He was confined in the hospital for three months and returned to work four months after the accident. The fragment entering the orbital fossa was disclosed by roentgenograms to have lodged in the left sphenoid sinus from which he was told the removal would be fatal.

During the next several years he noted but few symptoms referable to the accident. He occasionally noted some vague "distress" and a weird feeling in the vertex and experienced half-hour attacks of panting about once a month. No further signs or symptoms were observed until about two years before I saw him (eight years after the accident) when he began to note progressive aching in both legs which he ascribed to long hours of work. This aching of the legs had increased during the last two weeks to the degree of being unbearable. The patient also reported split second flashes of unconsciousness during the last two years, occurring about once every three to four weeks.

The patient consulted Dr. Leonard Thompson of San Pedro about six months before for a general physical examination mainly because of the aching of his legs and a feeling of general weakness and extreme constipation.

At that time physical examinations and roentgenograms of the chest were reported negative. Two weeks before I saw him the patient experienced faintness, panting and chilliness which lasted for ten minutes and was followed by trembling of the upper extremities. Consulting his physician again he was referred to me. On the basis of physical examination and x-ray study Dr. Thompson suspected lead intoxication.

Dr. Cullen Ward Irish saw the patient in neurologic consultation. Dr. Irish reported that in his opinion there was some toxicity of the central and peripheral nervous systems from the absorption of lead for the past ten years. Subjective and objective findings were as follows: Severe aching was experienced in the calves of the legs and across the shoulders and radiated into the upper extremities. There was little involvement of the motor nerves as is frequently seen in lead poisoning and no wrist or foot drop. Atrophy in the muscles of the upper and lower extremities was obvious. This hypotonia and atrophy in the calves was ascribed to lead poisoning of the anterior horn cells of the spinal cord. The spasticity which appeared when the patient was sitting, standing and walking indicated that there was also some involvement of the spinal pyramidal tracts. There was some optic atrophy due undoubtedly to lead absorption. The scotoma as found in the left retinal field was undoubtedly caused by the initial bullet trauma. The brief losses of memory described by the patient were probably petit mal epilepsy which attacks are not unusual in lead absorption. It was apparent in the recent past that there had been a rapid progression of symptoms, and in the neurologist's opinion the remnant of bullet in the left sphenoid sinus would have resulted fatally had not the nidus of absorption been removed.

Dr. Irish ordered the use of calcium by mouth and vein to attempt to fix disseminated and free lead in the bones.

#### LABORATORY OBSERVATIONS

The major physical and laboratory manifestations of plumbism as given in the series presented by Machle<sup>4</sup> are shown in the accompanying table. The comparison is made with observations set down in the last column on my patient.

The present case is exceptional in the fact that the laboratory tests for lead were all negative; however, the gastrointestinal, joint muscle and central nervous system manifestations were severe and classic for lead intoxication.

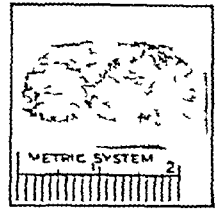


Fig. —The extracted bullet

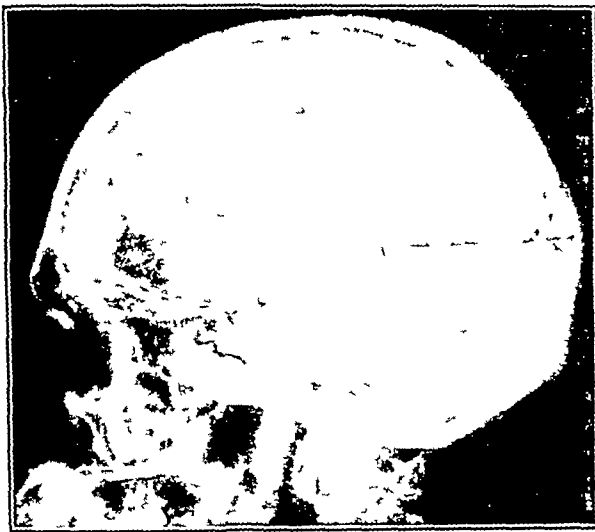


Fig. 2—Lateral view of the skull showing the fragments of lead in the orbit and the bullet on the floor of the left sphenoid sinus.

intestinal tract, from the respiratory tract and also from the mucous membrane of the nose and mouth.

#### REPORT OF CASE

J. W., a man aged 34, was assisted into the office, Dec. 23, 1941, by a friend. His legs apparently were not able to accept his body weight, he was pale, emaciated and apprehensive. He carried roentgenograms in his hand which he presented with the abrupt question "Can you take this bullet out?" When answered with a cautious affirmative he demanded that the removal be done immediately, stating that he did not believe he would survive if this effort should be deferred. When advised that the operation in itself might result in mortality he was indifferent and continued to be insistent on immediate effort even the day before Christmas. The attitude of the patient was impatient, irritable and mandatory.

The relevant history leading up to the present time was as follows:

In September 1931 the patient was engaged in target practice at a shooting gallery where the 0.38 caliber revolver which he was using accidentally discharged. The bullet struck the left supraorbital ridge, where it split a small part passing

<sup>2</sup> Tanquerel des Planches. *Traite des maladies de plomb ou saturnismes*. Paris 1839.

<sup>3</sup> Bronin de Sion. *Etiologie de la colique de plomb*. Union med 3 89 1867.

<sup>4</sup> Machle, Willard. *Lead Absorption from Bullets Lodged in the (Report of Two Cases)*, reprinted with additions from J. A. M. A 115 1536 1541 (Nov. 2) 1940.

<sup>5</sup> Cecil R. L. *A Textbook of Medicine*. Lead Poisoning. Philadelphia, W. B. Saunders Company 1940 p. 547.

## OPERATION

The approach to the left sphenoid sinus was done by the submucous route. The submucous resection was carried farther posteriorly from the bony septum and the mucous membrane dissected from the anterior face of the sphenoid sinus. Sewall's sphenoid chisel was used to remove the anterior wall of this sinus, and the opening was enlarged with the Faraci sphenoid punch. With focal illumination, after suction, the edge of the bullet fragment was seen and grasped with the Hartmann forceps and rocked back and forth until it was felt to be free, and then the bullet was removed. A permanent opening was made through the mucous membrane of the anterior wall of the sphenoid by nasal approach. The mucous membrane was approximated and gently packed in position. There was little bleeding, and the patient made an uneventful recovery with definite improvement in the nasal breathing following the incidental submucous resection.

## COMMENT

The patient at this time, approximately five weeks after the operation, is remarkably improved in general health, has discarded in turn crutches and double cane and now carries but one cane, which he says he feels he will soon dispose of perma-

## Summary of Forty Reported Cases

	Machle's Cases			Present Case
	Present	Absent	No Information	
Interval to onset	12 days to 48 years less than 1 year 12 1 to 10 years 5 10 or more years 17 (6)			8 years
Location of missile	Bone and joint 24 soft tissue, 13 (3*) bathed with synovia 8			Sphenoid
Type of missile	Bullet 19 hot 11 shrapnel 7 (**)			Pf to bullet
Dissemination	15	1	24	Yes
Associated diseases	26	1	13	No
Vomiting constipation or colic	26	2	12	All three
Arthralgia paralysis or central nervous system symptoms	26	1	11	Yes severe
Lead line	10	5	17	No
Stippling	14	3	21	No
Anemia	12	4	24	No
Lead in urine	Significant concentration 2 present (qualitative) 9 absent 3 (26)			No
Recovery	Complete 11 partial 2 died 5 (22*)			Yes

\* Number of cases in which there was no information

nently. The patient has lost his irritability, his petit mal attacks and his extreme constipation and says that he now feels mentally and physically more adequate to carry on than at any time since his initial accident.

## CONCLUSIONS

1. A man aged 34 has carried a lead bullet in the left sphenoid sinus for ten years as the result of the accidental discharge of a revolver.

2. Symptoms of true lead intoxication began approximately eight years after the accident and were characterized by nausea, extreme constipation, arthralgia (severe in the inferior extremities), spasticity of the muscles of the inferior extremities when at rest and some toxic dementia.

3. Laboratory findings were not positive as was expected.

4. The bullet was removed by submucous resection approach. No complications were encountered.

5. The patient has improved rapidly relative to all symptoms six weeks after removal of the bullet.

6. A neurologist has advised giving large amounts of calcium to fix free lead that may be present in the tissues.

1930 Wilshire Boulevard

## Special Articles

ANDREAS VESALIUS AND THE "FABRICA"  
1543-1943

ARTURO CASTIGLIONI

NEW HAVEN, CONN.

Among the classics of the Renaissance which truly represent the struggle and glory of that period, the *Fabrica* of Vesalius holds a foremost place. Written by a learned humanist and an indefatigable research worker, a great physician and a fine artist, it is still worthy of our admiration as a magnificent product of science and art.

Andreas Vesalius was born in Brussels on Dec. 31, 1514 and numbered many distinguished physicians among his kin. In early youth he began the study of anatomy, which he pursued at Louvain and Paris. He soon recognized that the professors, who taught out of Galen and relegated dissection to barbers, could neither teach nor even learn. Convinced of Galen's infallibility, they shunned personal observation and ignored research. When war between the German emperor and the king of France paralyzed the University of Paris, Vesalius returned to Louvain and then went to Italy, where anatomy was taught actively in many schools. He resided first in Venice and then in Padua, where on the sixth of December 1537, the day after his promotion to Doctor of Medicine, he became professor of surgical medicine and anatomy at the school which the proud republic of Venice considered as its most precious treasure. Padua was the center of the scientific thought of the Renaissance, and the young Fleming was soon its most popular teacher.

Within five fervid years his life's great work was begun and ended. In the year 1537 his first writing, a Commentary on Rhazes, was published in Louvain. In 1538, in order to offer a correct guide for students, surgeons and artists, he published the six Anatomical Tables, three of which had been drawn by his friend and countryman Stephen van Calcar and three by himself. These were a definite innovation in anatomic illustration and were promptly plagiarized. In 1540 he published the Commentaries on the anatomic books of Galen. In this same year he began to collect observations and prepare the drawings for his master work, the *Epitome* and the *Fabrica*. The first was planned as a guide to anatomy for common people and at the same time acted as an announcement for the more extensive work, which came to light in a splendid edition by Oporinus in Basel on May 5, 1543.

At the beginning of his anatomic teaching Vesalius felt the desire to recall from the dead the science of the ancients, which he believed to have been misunderstood and misinterpreted by their followers and their commentators. It was the current tendency of the Renaissance to return to the pure sources of the classics and to free the schools from the teaching of the Arabs. Vesalius said explicitly that his aim and his hopes were that anatomy "could reach such a point to be equal to that of old." The respect for the ancients was alive in him. At Padua, where he was charged "by the illustrious Senate of Venice, which is far the most liberal in the endowment of the higher branches of learning, with the teaching of surgical anatomy," he devoted the greatest effort to his investigations "in a way that nothing could be found in his procedure that fell short

of the traditions of the ancients" The Anatomical Tables (1538), which had to replace the traditional fugitive sheets which were very popular among students and physicians, brought the first attempt of reproductions from direct observation But Vesalius still accepted the galenic anatomy or at least he had not yet corrected many of its mistakes The anatomy of the liver, of the uterus, of the bladder, of the sternum is still galenic But he had begun to dissent, trying first to rely on the authority of pregalenic scholars, believing that the Alexandrian anatomists, having dissected human bodies, had really possessed a better knowledge of anatomy The study of Galen's work which he made with the greatest diligence in order to prepare the new edition of the anatomic books, published in 1540 by the Giunta in Venice in a splendid and very accurate form, gave the proof of the astonishing fact that "in the manifold and infinite divergence of the organs of the human body from those of the monkeys Galen had hardly noticed anything except in the fingers and the bend of the knee" Now, definitely sure of this fact, in the first edition of the *Fabrica* the young professor of anatomy took his stand He knew and clearly proved and affirmed that it was impossible to rely on Galen and that the story of anatomy had to begin anew He rebelled against the anatomists who asserted that in Galen's books not even the slightest error could be found, that any other book on anatomy was absolutely useless and had to be condemned to the stake He fought against the absurd assertion that, if some differences from Galen's description should be found in the anatomy of human bodies, these had to be ascribed to the changes to which the organs may have been subjected in the course of time, but not to an error of the Prince of Physicians, which was inadmissible Vesalius could not countenance servile adherence to Galen, which meant renunciation of independent observation and free judgment He starts from anatomy, which he correctly considered the foundation of medical knowledge

The program and the original conception of the work are given by the title itself<sup>1</sup> It was conceived as a complete system of anatomy ordered in an organic way and based exclusively on independent personal observation The dissection is no longer a pure formality, the barber or the surgeon has nothing more to do in the anatomic theater The professor himself, without the help of any book, has to dissect and teach The frontispiece of the *Fabrica*, where the teacher appears in the act of dissecting and explaining, is an eloquent declaration of principles

The text of the book is in perfect accord with this program The exposition of the subject is ordered so that the reader may obtain an exact knowledge of all structures There are no longer isolated descriptions of single organs or claims to new discoveries The whole anatomic structure of the human body is examined and studied in its integrity Every organ, every bone, every muscle, every vessel finds its correct place in the general design, its denomination, the exact description of its anatomic form, the explanation of its functions

The *Fabrica* is the book of a man of the Renaissance who, having started from humanism with a sound knowledge of Greek, Latin and Arabic authors, had emancipated himself from the tradition and was fully aware of the originality of his observations and conclusions The personality of the teacher is constantly

predominant The direct communication with the pupils is evident Vesalius presented first his own observations, then the mistakes of other authors and his corrections, never posing as an authority but always inciting the reader to examine to control and to judge by himself

The illustrations of the book are an essential part of this work Stephen van Calcar was a fine artist and a keen observer whose name deserves to be perpetually bound to Vesalius's glory, we know that every single drawing was made under the guidance of Vesalius, who took great care in supervising the engraving and discarded the pictures which he did not like or which had not come out satisfactorily

The figures of the *Fabrica* belong to the most interesting pages in the history of art in the Renaissance The men in Vesalius's book are alive, their muscles are in action The general figures are in attitudes which remind one of the Antinous or the Aphrodite of classic times, sometimes meditating on the problem of life or death as figures of a great drama who show the inner secrets of their life I may say that the animating spirit of the Renaissance has revived the corpses of the criminal or the prostitute made them appear on the beautiful background of the Italian landscape and invested them with a touch of beauty and of glory They form the link between the free and joyous life of the Renaissance and scientific thought the eloquent witnesses who stand forever as the proof of the unending struggle

There are books which play in history the role of battles Vesalius's *Fabrica* was such a battle, fought by one man alone against a host of enemies, a battle from the first to the last page, sometimes fought with a chivalrous respect for the adversary, sometimes with strong blows

With this book, in the twenty-eighth year of his life, Vesalius reached the climax of his activity and deliberately threw himself into one of the fiercest battles which ever was fought for independence of thought against tradition and authority The world of the scientists was upset, in Paris Vesalius's teachers were the first to attack their former pupil, in Germany Galen's authority was still holding sway, in Italy not all of Vesalius's pupils accepted the truths he had proclaimed A great number of books of pamphlets, of letters addressed to scientists and princes found their way into publicity in order to undermine the position of the rebel Vesalius, deeply hurt, gave a prompt and sometimes violent answer to his opponents, then he left his school, burned his books and among them destroyed some works not yet published He became the physician of Charles V, followed the emperor in his journeys and later became physician to Philip II of Spain The history of the last years of his life, of his pilgrimage to Jerusalem, of his death on the island of Zante where he landed ill, unknown and abandoned, has often been told, but the mystery of his end has not yet been solved One thing is sure, however after the publication of his anatomic books, his work as teacher and as anatomist was brought to an end From the first day when he began his public dissections at Padua until the last moment of his life, he stood courageously against all his enemies, answering with good arguments He never recanted one word of what he had written, never changed his attitude and always maintained full responsibility for his assertions and absolute faithfulness to his principles

1 *De humani corporis fabrica libri septem*

The *Fabrica* was published contemporaneously with another revolutionary book, written by another learned physician and former student at Padua—the *Revolutions of the Celestial Bodies* by Nicolas Copernicus. Vesalius's work found its way notwithstanding the violent attacks, the vulgar offenses, the accusation of heresy and in spite of the lukewarm hypocritical eulogists and the brazen plagiarists. The contests and the discussions which arose at the time of its publication are nowadays forgotten and the names of Vesalius's enemies, the great professors who embittered his life and were respected as infallible authority, have only a remote historical resonance, but the date of the publication of the *Fabrica* marks a definite event in the history of science, the beginning of scientific anatomy.

Yale University School of Medicine

## HANDBOOK OF NUTRITION XXIII

### MEDICAL EVALUATION OF NUTRITIONAL STATUS

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NEW YORK

*These special articles on foods and nutrition have been prepared under the auspices of the Council on Foods and Nutrition. The opinions expressed are those of the authors and do not necessarily reflect the opinion of the Council. These articles will be published later as a Handbook of Nutrition.—Ed.*

Evaluation of nutritional status is designed primarily to determine whether a person is malnourished. At once this stated aim raises several questions: What is malnutrition? What are its specific manifestations? If it is to be recognized, its characteristics must be known. Which of these should be selected as a basis for detection? Assuredly the methods must be founded on qualities which adequately represent malnutrition.

The very name evaluation of nutritional status indicates that the procedure includes something more than placing a person in either of the two categories: well nourished or malnourished. If malnutrition is found it is also desirable to ascertain its severity. Malnutrition occurs in all degrees. If a sufficiently large number of persons at random were examined by the most sensitive and specific methods, their nutritional condition would form a continuous series from perfection to extreme malnutrition. It is necessary to classify the series into degrees, to establish standards and to have a scale of rating. Then a person's status may be compared with standards and rated accordingly. Here we are concerned with something more than detection of malnutrition; we also want to measure it. For this is needed a system of examination which is not only specific but also sensitive. The methods must permit distinction of fine differences in measuring malnutrition.

In answering the questions: What is malnutrition? and What items should be examined? it will be seen that the concept of malnutrition, the methods and criteria of evaluating it are inseparably linked. For the methods and criteria reflect the views on the nature of malnutrition. All three aspects have been undergoing an evolution during the past half century.

#### CROSS SECTIONAL METHODS OF EXAMINATION

Most of the methods of examining for nutritional status have been devised for application on large groups of persons, especially school children and army recruits.

Here the examination is a screening process that will both separate and rate the malnourished.

One of the early methods, the physician's estimate from inspection, has undergone a series of changes. In 1905 Koppe<sup>1</sup> regarded nutrition as one of eight components of constitution. To him nutritional status was indicated by the amount of panniculus adiposus. Each of the constitutional components, including subcutaneous fat, was rated in five grades. The grades for all components totaled and averaged gave the score for constitution. Obviously nutritional status was completely obscured in constitution.

In 1908 Gastpar<sup>2</sup> used three items for judging and five grades for designating nutritional status. Pupils were divided into two groups, anemic and nonanemic, according to the circulation in cutaneous and mucous membranes. The first group was then divided into two, the latter into three subgroups according to musculature and subcutaneous fat. The grades were: good, fair, poor, fair and anemia, poor and anemia.

Hogarth<sup>3</sup> appraised nutrition as part of physical condition. The latter was composed of three factors: physical stature, general nutrition, circulation in the superficial membranes. Each factor could be rated in five possible grades. Musculature and panniculus adiposus were the basis of judgment for nutrition. The possible ratings were: (1) excellent muscular development, (2) well nourished and healthy, (3) medium, (4) thin or fat and flabby tissues, (5) very thin. But nutrition lost much of its identity in the three figured score for physical condition.

According to Howarth<sup>4</sup> physical state is evidenced by height, weight and nutrition. His basis of judging nutrition was: skin and mucous membranes, hair, alertness, muscular tone. There were three grades of nutrition.

In the Dunfermline system<sup>5</sup> the following points were taken into consideration: height and weight in relation to age, general appearance, mucous membranes, skin and subcutaneous tissues, muscular tone and development, facial expression, carriage, movements, voice, interest and attention. At first nutritional status was recorded as good (above average), medium (average) and bad (below average). Later "the nutrition of the healthy child of good social standing" was the basis of classification, being given the rating: excellent. When nutritional status just fell short of this it was regarded as good. When it was on the borderline of serious impairment it was designated as "requiring supervision." When it was seriously impaired it received the notation "requiring medical treatment."

Against the systems of evaluation by inspection there was considerable criticism. In a frank critique the London County Council report<sup>6</sup> for 1909 pointed out serious difficulties. Anemia was so complicated by

<sup>1</sup> Koppe, O. Wie bestimmen wir die Konstitution der Schüler? *Ztschr. f. Schulgesundheitspf.* 18. Der Schularzt 3: 219-224, 1905.

<sup>2</sup> Gastpar. Die Beurteilung des Ernährungszustandes der Schulkinder. *Ztschr. f. Schulgesundheitspf.* 21: 689-702, 1908.

<sup>3</sup> Hogarth, A. H. *Medical Inspection of Schools*. London: Oxford University Press, 1909, chapter 11, pp. 158-159.

<sup>4</sup> Howarth, W. J. in Kelly, T. N. *Medical Examination of Schools and Scholars*. London: P. S. King & Son, 1910, chapter 3, p. 39.

<sup>5</sup> Mackenzie, Alister. *Seventh Annual Report on the Medical Inspection of School Children in Dunfermline*, 1912-1913. Edinburgh: Turnbull & Spears, pp. 18-20.

<sup>6</sup> Report of the Education Committee of the London County Council Submitting the Report of the Medical Officer (Education) for the Twenty One Months Ended 31st December 1908. London: London County Council, 1909, pp. 16-19.

complexion that it was difficult to assess by inspection. Furthermore, it stated, the physician himself introduced a large personal element.

Indeed, the shortcomings of the inspection methods were numerous and serious. At first nutrition was overshadowed as a component of constitution or physical condition. But, even when nutritional status was the specific and sole objective, clinical examination in practice showed lack of uniformity and agreement. The general criticism was that it failed because of subjectivity in judgment. There are reasons for much of this subjectivity. As has been noted, there was no agreement on items regarded as indicative of nutrition for judgment of status. Then too, standards were relative rather than absolute. Laveran<sup>7</sup> remarked that estimate of status depended on comparison with variable or unsatisfactory standards. Conditions just previously or most frequently seen influenced the rating assigned to a person. Moreover, there was much variation in number and names of groups, i.e., in rating scale. But even when all these points of variation were fixed, there was still much disagreement. When a group of children were examined by several physicians, using the same items and scale, there was still no uniformity in the ratings.<sup>8</sup> Derryberry<sup>9</sup> stated "Whether a child is rated as malnourished or not depends more on the physician who is the examiner than it does on the actual condition of the child." It became clear that even under rigidly controlled conditions there was a large element of subjectivity in the physician's judgment.

In the need for an objective method of judging nutrition a new approach was taken. Since normal growth is a manifestation of satisfactory nutrition, growth was taken as a measure of the nutritive state. The immediate question then was: How shall growth be measured?

As weight and height had been used to follow growth and development, they were used to measure nutrition.<sup>10</sup> They were referred to each other, and individually or in combination to age: weight for age, weight for height, weight for height and age, and height for age. Standard weights were derived from statistical analysis of data collected on children supposedly in good nutritive condition. These standards were presented in reference tables.<sup>11</sup> In other instances weight and height were used in a simple ratio to give an index number which could be compared with a standard.<sup>12</sup>

As early as 1909 Oeder<sup>10</sup> and Oppenheimer<sup>13</sup> pointed to inaccuracies in using weight as the measure of nutrition. Gradually the reasons became clear. For one thing, as it was by no means certain what consti-

tuted normal growth the suitability of available height and weight standards was open to question. Scarcely less difficult was the question: How much deviation from average should be allowed for individual variations? These points led to much cross criticism. But troublesome as they were, there was still a more serious criticism.

From a study in which there was no more underweight in a group on a poor diet than in a group on a good diet<sup>14</sup> the validity of weight as an index of nutrition was considerably shaken. Indeed selection by weight was much less accurate than by clinical examination<sup>15</sup> when each was referred to dietary data. As might be expected selection by weight and by clinical examination when compared directly showed serious disagreement.<sup>16</sup> In this discrepancy the clinical examination, for all its acknowledged shortcomings was regarded as superior. Unfortunate as were the instances when children were diagnosed as malnourished by weight but were well nourished according to clinical examination, much more serious were the instances when children rated by weight as well nourished showed pronounced signs of malnutrition. It was evident that methods employing weight as the measure were inaccurate for estimating the state of nutrition.

In retrospect it is seen that unwittingly the enormous misdirected labors over many years in using weight were based on a fallacy in logic. Because persons showing pronounced deviations in weight are malnourished it was inferred erroneously that persons not showing these deviations are well nourished. Actually, on the basis of weight it is not possible to characterize normal nutrition. Nevertheless weight was extensively used in this country until 1930, when the mass of accumulated evidence against it overwhelmed it.

Meanwhile, as soon as the defects of methods using weight in association with height and age as a basis of judging nutrition became evident steps designed to remedy them had been taken. Most attempts were aimed at supplying new standards in the hope of making the methods accurate. These modifications developed simultaneously, took several lines.

One type was the determination of standards of weight in normal nutritive condition. In attempting to appraise the nutritive status of adults by weight Oeder<sup>17</sup> encountered difficulties similar to those in using the method during growth. He attempted to find the normal nutritive condition so that he might determine the range of body weight associated with it. Of bodily constituents, fat was found to be the one

14 Hughes Elizabeth and Roberts Lydia. Children of Preschool Age in Gary, Indiana. Bureau Publication 122. U. S. Department of Labor. Children's Bureau 1922. part II. pp. 101-102.

15 Roberts Lydia. The Nutrition and Care of Children in a Mountain County of Kentucky. Bureau Publication 110. U. S. Department of Labor. Children's Bureau 1922. pp. 28-32.

16 Manny F. A. A Comparison of Three Methods of Determining Defective Nutrition. Arch. Pediat. 75: 88-94 (Jan.) 1918. Clark Taliaferro, Sydenstricker Edgar and Collins Selwyn D. Weight and Height as an Index of Nutrition. Weight and Height Measurements of 9,973 Children Classified upon Medical Examination as Excellent, Good, Fair or Poor in Nutrition as Judged from Clinical Evidence. Pub. Health Rep. 38: 39-58 (Jan. 12) 1923. Baker S. Josephine and Blumenthal J. L. Methods of Determining Malnutrition. Nations Health 5: 47-50 (Jan.) 19-1. Clark Taliaferro, Sydenstricker Edgar and Collins Selwyn D. The New Baldwin Wood Weight Height Age Tables as an Index of Nutrition. The Application of the Baldwin Wood Standards of Nutrition to 506 Native White Children without Physical Defects and with Good or Excellent Nutrition as Judged from Clinical Evidence. Pub. Health Rep. 39: 518-525 (March 14) 1924. Dublin L. I. and Gehlert J. C. Do Height and Weight Tables Identify Undernourished Children. New York. New York Association for Improving the Condition of the Poor 1924.

17 Oeder Gustav. Der normale Ernährungszustand des erwachsenen Menschen. Med. Klin. 5 (2): 1225-1229 1909.

7 Laveran quoted by Pignet. Du coefficient de robusticité. Bull. med. 15: 373-376 1901.

8 Franzen Raymond. Physical Measures of Growth and Nutrition. New York. American Child Health Association 1929. chapter 1. pp. 117. Derryberry<sup>9</sup>.

9 Derryberry Mayhew. Reliability of Medical Judgments on Malnutrition. Pub. Health Rep. 53: 263-268 (Feb. 18) 1938.

10 Oeder Gustav. Das Körpergewicht des erwachsenen Menschen bei normalen Ernährungszustand und seine Berechnung. Ztschr. f. Versicherungsmed. 2: 212 (Jan.) 1909. Paton D. N. and Findlay Leonard. Child Life Investigations. Poverty, Nutrition and Growth. Studies of Child Life in Cities and Rural Districts of Scotland. Medical Research Council Special Report Series No. 101. London. His Majesty's Stationery Office 1926. pp. 48-57.

11 Baldwin B. T. and Wood T. D. Weight Height Age Tables for Boys and Girls. New York. American Child Health Association 1932.

12 Greenwood Arthur. The Health and Physique of School Children. Westminster. P. S. King & Son 1913. chapter 2. pp. 10-11.

13 Oppenheimer Karl. Ein Versuch zur objektiven Darstellung des Ernährungszustandes. Deutsche med. Wchnschr. 35: 1815-1835 1909.

altered most extensively in starvation and adiposity, representing extremes of nutritive disturbance, and the one reacting most sensitively to change in nutrition. Consequently he regarded fatty tissue as the index of nutritive condition. He listed four signs of normal nutritive condition, including a definite thickness of fat layer on the abdomen. He recorded the normal range in the thickness of this fat layer and the corresponding body weight. Then his line of reasoning led him to displace use of weight by measurement of the fat layer on the abdomen.<sup>18</sup>

Another kind of attempt to improve the use of weight methods was the calculation of normal standards in relation to physique. By 1912 it was becoming apparent that variations in type of body build had to be considered in judging growth by weight and that these variations had to be taken into account in the prediction of normal weight. During the latter half of the nineteenth century several index numbers derived from formulas containing various bodily measurements had been used in following physical development or expressing body build or constitution.<sup>19</sup> Some of these contained weight as a factor. As Bornhardt<sup>20</sup> pointed out, transposition in his equation made it possible to solve for weight. Several other formulas or ratios, most of them patterned after the earlier models, were proposed for determination of theoretical weight with which actual weight could be compared.<sup>21</sup> In other instances the procedure was to measure body build by dimensions other than weight and to note the weight associated with them.<sup>22</sup>

Still another approach ushered in the use of nutritional indexes. Recognizing the errors in judgment by weight and the subjectivity of a physician's inspection, Oppenheimer in 1909 devised a method that would be objective but have a clinical basis.<sup>23</sup> He argued that physicians, recognizing that certain bodily parts reflected malnutrition more sensitively and accurately than does weight, based their judgment subconsciously on the relation of these parts. Each physician, he asserted, tended to rate the nutritional status according to his

estimate of musculature and adipose tissue. But individual judgment of these parts differed appreciably because of the difficulty in making proper allowance for the complicated differences in body build. To overcome this difficulty, Oppenheimer selected three bodily dimensions which reflected the relation of body parts decisive in the physician's estimate and which could be objectively measured. From these three dimensions he propounded two formulas: one gave the measure of nutrition, which increased with age and growth, the other gave the quotient of nutrition, which was influenced only by nutritive condition. Twenty-five years later the same rationale<sup>24</sup> and almost the identical measurements were adopted in working out the ACH index,<sup>25</sup> except that a different relation of measurements and a reference table were used.

Attempts to make allowance for variations in body build in the appraisal of nutritional status took another direction. With the realization that the ratio of height-weight failed to indicate accurately whether the amount of muscle and fat corresponded to the skeleton, other sets of dimensions were suggested. From anthropometric studies of growth Pirquet<sup>26</sup> found that weight referred to sitting height in the form of a ratio yielded a numerical index, "pelidsi," which he regarded as an objective measure of nutritive condition.

At the same time the widespread prevalence of malnutrition in Austria and Germany during World War I created an emergency; the American War Relief Commission and Quakers<sup>2</sup> desired a rapid and objective method of selecting the children needing supplementary food. Ratios containing various physical measurements which had been used for many years to express body build, constitution or physical fitness were turned from their original purpose and were applied, either unchanged or changed, as measures of nutrition.<sup>19</sup> Several new but similar ratios appeared, some containing weight as an item. In all of them a change in a measurement and therefore in the resulting quotient, the index number, was regarded as indicating a shift in the nutritive status. Since these equations contained measurements presumed to reflect body build, they were regarded as more sensitive and accurate than weight-height in evaluating nutritional status.

But evidence showed that all these indexes, formulas, equations and ratios aimed to refine or replace the height-weight method had its same defects.<sup>28</sup> They

18 Oeder Gustav. Die Fettpolsterdicke als Index des Ernährungszustandes bei Erwachsenen. *Med. Klin.* 6 (1) 657-662 (April 24) 1910.

19 The early as well as the later indexes are cited in References on the Physical Growth and Development of the Normal Child. Publication 179. U. S. Department of Labor. Children's Bureau. 1927. They are described by Max Guttman (Ist eine objektive Beurteilung des Ernährungszustandes des Menschen möglich?) *Arch. f. Kinderheilk.* 72:23-49 (1923). Paton D. N. and Findlay. Leonard. Child Life Investigations. Poverty, Nutrition and Growth. Studies of Child Life in Cities and Rural Districts of Scotland. Medical Research Council Special Report Series No. 101. London: His Majesty's Stationery Office. 1926. pp. 48-57. and McCloy C. H. Appraising Physical Status. The Selection of Measurements. Iowa City: University of Iowa. 1936.

20 Bornhardt A. Die Körperwägungen der Einberufenen als Mittel zur Bestimmung der Tauglichkeit zum Militärdienst. *St. Petersburg med. Wehnschr.* 3:108-109 (1896-1897).

21 Gaertner Gustav. Körpergewicht und Körperlänge des Menschen. *Wien med. Wehnschr.* 62:317-322 (Jan. 27) 1912. Oeder Gustav. Das Körpergewicht des erwachsenen Menschen bei normalen Ernährungszustand und seine Berechnung.<sup>10</sup> Ueber die Brauchbarkeit der proportionellen Körperlänge als Massstab für die Berechnung des Körpergewichts erwachsener Menschen bei normalem Ernährungszustand. *Med. Klin.* 5:461-465 (March 28) 1909. Die Gartner'sche Normalgewichtstabelle für Erwachsene. *Berl. klin. Wehnschr.* 52:1086-1092 (Oct. 18) 1915. Ein neuer Index ponderis für den zentralen normalen Ernährungszustand Erwachsener. *Deutsche med. Wehnschr.* 42:1073-1074 (Aug. 31) 1916.

22 Pryor Helen B. and Stolz H. R. Determining Appropriate Weight for Body Build. *J. Pediatr.* 3:608-622 (Oct.) 1933. McCloy C. H. Appraising Physical Status. The Selection of Measurements. Iowa City: University of Iowa. 1936, chapter 4, pp. 43-65. Appraising Physical Status. Methods and Norms. Iowa City: University of Iowa. 1938, chapter 4, pp. 34-47.

23 Oppenheimer Karl. Ueber eine Methode zur ziffermässigen Bestimmung des Ernährungszustandes. *Ztschr. f. Schulgesundheitspf.* 22:880-889 (1909). Ein Versuch zur objektiven Darstellung des Ernährungszustandes.<sup>13</sup>

24 Franzen Raymond. Physical Measures of Growth and Nutrition. New York: American Child Health Association. 1929, chapter 1, pp. 1-17.

25 Franzen Raymond and Palmer G. T. The ACH Index of Nutritional Status. New York: American Child Health Association. 1934. Nutritional Status Indexes. Method of Obtaining Measures of Musculature, Subcutaneous Tissue and Weight with Allowance for Skeletal Build (Boys and Girls 7 to 12 Years of Age). New York: American Child Health Association. 1935.

26 Pirquet Clemens. Sitzhöhe und Körpergewicht (System der Ernährung II). *Ztschr. f. Kinderh.* 14:211-228 (1916).

27 Sonderheft über die Kinderspeisung in Deutschland. Herausgegeben vom Deutschen Zentrallausschuss für die Auslandshilfe. E. V. Berlin. *Ztschr. f. Schulgesundheitspf.* 25:177-240 (Nov. 7) 1922.

28 Clark Taliaferro. Sydenstricker Edgar and Collins Selwyn D. Indices of Nutrition. Application of Certain Standards of Nutrition to 506 Native White Children without Physical Defects and with Good or Excellent Nutrition as Judged from Clinical Evidence. *Pub. Health Rep.* 38:1239-1270 (June 8) 1923. Guttman Max. Ist eine objektive Beurteilung des Ernährungszustandes des Menschen möglich? *Arch. f. Kinderh.* 72:23-49 (1923). Paton D. N. and Findlay. Leonard. Child Life Investigations. Poverty, Nutrition and Growth. Studies of Child Life in Cities and Rural Districts of Scotland. Medical Research Council Special Report Series No. 101. London: His Majesty's Stationery Office. 1926. pp. 57-65. Souther Susan P. Eliot Martha M. and Jeness Rachel M. A Comparison of Indices Used in Judging the Physical Fitness of School Children. *Am. J. Pub. Health.* 29:434-438 (May) 1939. Jeness Rachel M. and Souther Susan P. Methods of Assessing the Physical Fitness of Children. Bureau Publication 263. U. S. Department of Labor. Children's Bureau. 1940.



were vulnerable to the same criticisms. Actually, they revealed more about body build than about nutrition. Naturally the application of these methods to adults was based on other considerations than growth, but the results were just as unsuccessful as those on infants and children.

#### LONGITUDINAL PROCEDURE

In contrast to the preceding cross sectional methods of examining growth, the longitudinal procedure of following the growth curve was also suggested as a measure of nutrition. Greenwood<sup>29</sup> proposed that the percentage growth per year in height and weight, respectively, be the standard of comparison. Failure to increase in weight at a given rate would bring a designation of malnutrition. According to one criterion, lack of gain or loss in weight for each month of three successive months was cited as a means of screening children with poor growth.<sup>30</sup> It has been asserted that the weight curve is the most accurate measure of growth.<sup>31</sup> This method has been successfully used in animal experiments in nutrition. But the animals were inbred and selected. Besides, they were subjected to dietary deficiencies with pronounced interference with growth. For both human beings and experimental animals, the so-called normal growth curves have changed over the past three decades. No one knows whether greatest growth has yet been obtained, whether greatest is optimum, in short, what optimum growth is. And no one knows how slight a deviation in growth curve should be regarded as malnutrition. Thus the very same objections to use of absolute weight may be leveled against the use of the growth curve.

Recently there appeared a method which combines the longitudinal and cross sectional procedures permitting application of either.<sup>32</sup> A grid prepared from height, weight and age is purported to give ratings during the period of growth on physique, development, nutrition and physical status. The slope or gradient of the developmental curve is said to give a measure of nutritional status. If measurements are limited to a single observation, a tentative estimate of nutrition can be made. Since height, weight and age are the only measurements used, it is similar to previous growth methods and it may therefore be open to the same difficulties and objections. Its class limits, admittedly arbitrary, are different, but it remains to be seen whether they are free of the defects which have restricted the use of all growth methods.

There is no desire to disparage or discredit the proper use of deviations in growth, shown by height or weight, as an indication of malnutrition. It should never be forgotten that an obvious and unequivocal disturbance in weight—or other measurements—indicate serious malnutrition. About this there has never been an argument. Used within this limitation—and this is a serious limitation—a weight method has distinct value. It is when it is used beyond its restrictions that its fundamental defects emerge. It breaks down at the

very point at which it is most needed, the borderline zone. It does not satisfactorily separate the slightly abnormal from the normal. Then when the scale is set at unequivocal limits the method is not a sufficiently sensitive screen for detecting malnutrition. In addition, for other reasons it will be seen that it is too inadequate and insensitive to serve as the primary screen of malnutrition.

In 1935 Dr. Roberts<sup>33</sup> wrote "It should be understood at the outset that the whole question of the use of growth criteria for assessing nutrition has been undergoing severe criticism in the last few years, and most of the commonly used methods have been largely discredited. We are indeed at the moment in a situation where we have lost confidence in the old methods and as yet have nothing new that is satisfactory to take their place." When this was written, little was at hand. But developments were in the offing. Through new knowledge nutrition had already extended into a new and vast domain. Among its many practical aspects, it opened a new and different approach to the evaluation of nutritional status. In the last few years, progress in this direction has brought forth new methodologies and has accentuated the distinct and fundamental limitations of previous procedures based on growth.

#### DEFICIENCY DISEASES

Following Eijkman's experimental production of beriberi by diet in 1897, Grijns formulated the conception of deficiency diseases.<sup>34</sup> He showed that certain foods contained an unknown essential substance which cured or protected against beriberi. When foods lacking the essential were eaten, beriberi resulted. It was clear that deficiency of an essential substance in food produced disease. To this substance Funk gave the name "vitamine."

It had long been known that calories were necessary for growth and maintenance, for with insufficient caloric intake, impaired growth or actual loss of weight, i.e., undernutrition, ensued. During the decade 1912-1922 it was found that a series of chemically unidentified substances, present in very small amounts in natural foods, were likewise essential for growth and maintenance. When the diet was deficient in any one of them, retarded growth or actual decrease in weight took place.

In the same period it was further shown that the "vitamine" protecting against beriberi was identical with one of the unidentified substances indispensable for growth. Then from animal experiments it was found that lack of each of the growth substances resulted in a separate specific disease which had its analogue in man. Thus scurvy, xerophthalmia and rickets were found to be deficiency diseases, each arising from lack of a different substance. In this dual role each substance was essential not only for prevention of these diseases but also for promotion of growth. As additional essential substances were demonstrated, it was noted that a deficiency in each not only impaired growth but also produced a specific disease. More recently, pellagra and ariboflavinosis have been identified as defi-

29 Greenwood Arthur. *The Health and Physique of School Children*. Westminster: P. S. King & Son, 1913, chapter 2, p. 11.

30 Turner C. E. and Nordstrom Alfred. *Extent and Seasonal Variations of Intermittency in Growth*. *Am J Pub Health* 28: 499-505 (April) 1938.

31 Friedenthal Hans. *Allgemeine und spezielle Physiologie des Menschenwachstums*. Berlin: Julius Springer, 1914, p. 47.

32 Wetzel N. C. *Physical Fitness in Terms of Physique Development and Basal Metabolism with a Guide to Individual Progress from Infancy to Maturity. A New Method for Evaluation*. *J A M A* 116: 1187-1195 (March 22) 1941.

33 Roberts Lydia J. *Nutrition Work with Children*, revised edition. Chicago: University of Chicago Press, 1935, chapter 3, pp. 42-43.

34 The developments leading to the modern concept of dietary essentials are reviewed in the book by E. V. McCollum, Elsie Orent Keiler, and H. G. Day. *The Newer Knowledge of Nutrition*, ed. 6. New York: Macmillan Company, 1919, chapter 2, pp. 15-31.

ciency diseases. Thus it has been demonstrated that lack of each essential substance produces a specific deficiency disease.

According to accepted nomenclature, each substance came to be designated by the generic name vitamin and an alphabetic letter. Thus xerophthalmia, beriberi, keratitis, pellagra, scurvy and rickets, the major deficiency diseases which historically have occurred in epidemics and endemics, resulted from lack of vitamins A, B<sub>1</sub>, B<sub>2</sub>, P-P, C and D respectively. With the chemical isolation and identification of the vitamins, it has been convenient to give each a more descriptive name as follows: B<sub>1</sub>, thiamine, B<sub>2</sub>, riboflavin, P-P, niacin (nicotinic acid), C, ascorbic acid. Vitamins A and D have yet to be given such a designation.

Meanwhile the concept of deficiency diseases had been extended to embrace those disorders arising from deficiency of essentials other than vitamins, e. g. protein, calcium and iron. Thus, lack of an essential whether a vitamin, protein or mineral, produces its own particular and specific deficiency disease.

From these facts may be formulated the principles epitomizing the newer knowledge of diet and nutrition: (1) a number of essential substances are contained in food, (2) a deficiency of each essential substance in the diet interferes with growth and maintenance and induces a disease, (3) the relationship between the nature of the dietary deficiency and of the resulting disease is characterized by specificity. These principles have had a profound influence on nutritional science, especially the concept of nutritional status and means of appraising it.

This knowledge of dietary essentials gave a new approach to the detection of malnutrition. It suggested surveys in which diets were analyzed for deficiencies in the essential items.<sup>35</sup> This procedure is based on the assumption that evidence of dietary deficiency indicates impaired nutritional status, usually in the form of deficiency diseases. Despite its many possible sources of unavoidable inaccuracies, the dietary method yields highly informative results. But it has several drawbacks. It is costly, laborious and time consuming. By the time the data are collected and analyzed, the information is obtained many months after it is needed. Then too, it reveals only the most recent dietary habits. Thirdly, its evidence on malnutrition is indirect. Fourthly, it indicates only the malnutrition due to dietary deficiency. Nevertheless the information derived from it has been helpful, since deficient diet is the most frequent cause of malnutrition. To furnish information on cause is really its principal use. This method has shown that there is nationwide consumption of deficient diets<sup>36</sup> and suggests that there is widespread prevalence of malnutrition.

Along with the recognition that dietary deficiencies produce specific diseases came a period of closer study of these diseases leading gradually over the years to improvement in their detection. At first before their etiology was known these diseases, since they mostly occurred in combination in the same person, were not clearly differentiated and were therefore frequently confused. In time the major deficiency diseases were

separated by their main characteristics and several accompanying signs. Even today this work of resolving deficiency diseases into pure form continues. Through inducing the experimental form and through curing the natural form by pure specific therapy, it has been possible to elucidate much about the specific and characteristic signs, the sequence of events and the site of early lesions in each major deficiency disease. In all this, animal experimentation has given many valuable clues. As a result, our knowledge of each deficiency disease in its acute manifest form has been greatly extended and refined. Not a few treatises have been written on these diseases. The older books contain very complete descriptions, although many points must be interpreted in the light of latter day advances.<sup>37</sup> Recent books and articles present newer developments.<sup>38</sup>

But with all this knowledge the occurrence of deficiency diseases in this country has not been generally noted except in city hospitals or endemic regions. Although nationwide dietary inadequacies have been revealed by surveys, frank deficiency diseases on such a scale have not been seen. According to their concept, clinicians rightly assert that they do not see deficiency diseases. But they are incorrect in concluding that there is no widespread prevalence of them. What are the reasons for this apparently irreconcilable conflict between the evidence from dietary surveys and from clinical observations? It is probable that many classic cases pass unrecognized. But even if these were detected and included, the statistics on the prevalence of deficiency disease would not come near approaching the figures on faulty diets recorded in surveys. There is a more significant reason for the seeming discrepancy. In assertions by clinicians that deficiency diseases are not generally prevalent, the traditional severe acute form

37. Avitaminosen und verwandte Krankheitszustände edited by W. Stepp and P. György. Spezieller Teil in Enzyklopaedie der klinischen Medizin. Berlin: Julius Springer, 1927. Vedder, E. B. Beriberi. New York: William Wood & Co., 1913. Marie, A. Pellagra translated by C. H. Lavender and J. W. Babcock. Columbia S. C.: State Company, 1910. Wood, F. J. A Treatise on Pellagra for the General Practitioner. New York: D. Appleton & Co., 1912. Niles, G. M. Pellagra in American Problem. Philadelphia: W. B. Saunders Company, 1912. Roberts, S. R. Pellagra. History, Distribution, Diagnosis, Prognosis, Treatment. Etiology. St. Louis: C. V. Mosby Company, 1914. Harris, H. I. Pellagra. New York: Macmillan Company, 1919. Hess, A. F. Scurvy Past and Present. Philadelphia: J. B. Lippincott Company, 1920. Hess, A. F. Rickets Including Osteomalacia and Tetany. Philadelphia: Lea & Febiger, 1929.

38. The Vitamins. A Symposium Arranged Under the Auspices of the Council on Pharmacy and Chemistry and the Council on Foods of the American Medical Association. Chicago: American Medical Association, 1939. Youmans, J. B. Nutritional Deficiencies. Philadelphia: J. B. Lippincott Company, 1941. Williams, R. R. and Spies, T. D. Vitamin B<sub>1</sub> (Thiamine) and Its Use in Medicine. New York: Macmillan Company, 1938. Jolliffe, Norman. Vitamin Deficiencies and Liver Cirrhosis in Alcoholism. Quart. J. Stud. Alcohol, 1: 517-557 (Dec.) 1940. The Neuropsychiatric Manifestations of Vitamin Deficiencies. J. Mount Sinai Hosp., 8: 658-667 (Jan-Feb.) 1942. Wei, S. Soma and Wilkins, R. W. The Nature of the Cardiovascular Disturbances in Nutritional Deficiency States (Beriberi). Ann. Int. Med., 11: 104-148 (July) 1937. The Nature of the Cardiovascular Disturbances in Vitamin Deficiency States. Tr. A. Am. Physicians, 51: 341-371 (1936). Sebrell, W. H. and Butler, R. E. Riboflavin Deficiency in Man. A Preliminary Note. Pub. Health Rep., 53: 2282-2284 (Dec. 30) 1938. Kruse, H. D. Sydenstricker, V. P. Sebrell, W. H. and Cleckley, H. M. Ocular Manifestations of Ariboflavinosis. Pub. Health Rep., 55: 157-169 (Jan. 26) 1940. Sydenstricker, V. P. Sebrell, W. H. Cleckley, H. M. and Kruse, H. D. The Ocular Manifestations of Ariboflavinosis. J. A. M. A., 114: 2437-2445 (June 22) 1940. Harris, Seale. Clinical Pellagra. St. Louis: C. V. Mosby Company, 1941. Sydenstricker, V. P. and Armstrong, E. S. A Review of Four Hundred and Forty Cases of Pellagra. Arch. Int. Med., 59: 883-891 (May) 1937. Spies, T. D. Pellagra in A Textbook of Medicine by American Authors, ed. 5, edited by R. L. Cecil. Philadelphia: W. B. Saunders Company, 1940. pp. 624-631. Eliot, Martha M. and Park, E. A. Rickets in Brenneemann's Practice of Pediatrics. Hagerstown, Md.: W. F. Prior Company, Inc., 1938. vol. I, chapter 36. Mackay, H. M. M. and Goodfellow, L. Nutritional Anemia in Infancy with Special Reference to Iron Deficiency. His Majesty's Stationery Special Report Series No. 157. London: His Majesty's Stationery Office, 1931. Youmans, J. B. The Diagnosis of Nutritional Edema with Particular Reference to the Determination of Plasma Proteins and Consideration of their Behavior in Nutrition. The Newer Diagnostic Methods. Proceedings of the Round Table on Nutrition and Public Health. New York: Milbank Memorial Fund, 1938. pp. 166-173.

35. Bigwood, E. J. Guiding Principles for Studies on the Nutrition of Populations. Geneva: League of Nations Health Organization Technical Commission on Nutrition, 1939. part I, pp. 20-137.

36. Stiebeling, Hazel K. and Phipard, Esther I. Diets of Families of Employed Wage Earners and Clerical Workers in Cities. Circular 507. U. S. Department of Agriculture, Bureau of Home Economics, 1939.

has been meant. In this country this classic form is relatively infrequent, instead, the deficiency diseases are present in other forms.

The predominant clinical point of view has carried the concept that a deficiency disease begins or has its significance when it becomes perceptible, usually on simple inspection. Often all or most signs must be present. Clearly that point is not the beginning of the disease. Rather, the disorder is already well advanced before it is diagnosed. Such a practice does not detect the disease in its early or mild form. Over the years, numerous physicians have recognized this point.

Several early investigators attempted to divide the course of scurvy and pellagra into stages, they noted the earliest stage and its characteristics. Some, like Roussel,<sup>39</sup> interested in early diagnosis, set down their observations on the earliest sign, stressing the importance of discovering the site of initial change. Moreover, they distinguished a period before the disease proper appeared, before its well known signs were fully developed. As early as 1541 Echthius<sup>40</sup> enumerated symptoms by which "an approaching scurvy might be foretold", in 1567 Wierus<sup>41</sup> described similar observations. Many subsequent observers recognized a prodromal, incipient or latent period in both pellagra<sup>42</sup> and scurvy<sup>43</sup>. Added still later were the names *forme fruste*, *prepellagra* or *prescurvy*, *subclinical state*. About 1917 other investigators conceived that a deficiency disease like scurvy might exist below the level of clinical detection by any sign, but to this state they applied names already carrying other connotations. Thus several names were applied to the same state, conversely,

several states were designated by the same name or names. In scurvy Hess<sup>44</sup> drew distinctions which defined these several concepts. He recognized three types of scurvy: the florid, with well developed signs of the full blown condition, the subacute, the commoner form, presenting a group of incompletely developed symptoms, the latent resulting from a negative balance in vitamin C during the period prior to the onset of clinical manifestations. In view of the importance previously attached to weight as an index of nutritional status, it is significant that Hess emphasized the normal weight of children affected with subacute scurvy.

At the same time it was recognized that scurvy might be observed in still another state, the so-called monosymptomatic state<sup>45</sup>. Cheadle<sup>46</sup> in 1878 had forecast this eventuality. This occurrence has been confirmed not only for scurvy but also for pellagra. During the last decade numerous epidemics or instances of gingivitis<sup>47</sup> and glossitis<sup>48</sup> demonstrated to be attributable to deficiency in ascorbic acid and niacin respectively have been observed. Some investigators have distinguished degrees of one sign in avitaminosis C<sup>49</sup>. Despite the differences in concepts about the several states and the lax use of terms applied to them, all investigators have agreed that most deficiency diseases occur in these states.

#### EARLY DIAGNOSIS

In recent years there has been a distinct trend toward early diagnosis of all diseases. It has been recognized that a disease starting with internal manifestations cannot be seen and may yield no signs until it is far advanced, even more so if the lesion is in a silent area, that a disease with early external signs may pass unnoticed into an internal phase or that disease with a persistent or progressive external lesion may develop to a considerable point below the level of perception. In short, most disease has reached the advanced state before it is detected by the unaided senses, its early or mild stage develops unobserved.

39 Roussel Theophile. *Traite de la pellagre et des pseudo-pellagres*. Paris, J B Bailliere et fils 1866 chapter 1 pp 4 10

40 Echthius Jo. *De scorbuto vel scorbutica passione*. Epitome 1541 cited by Lind James. *A Treatise on the Scurvy* ed 3 London S Crowder 1772 part 3, chapter 2 pp 302 305

41 Wierus Jo. *Medicorum observationum hactenus incognitarum lib 1 de scorbuto* cited by Lind James. *A Treatise on the Scurvy* ed 3, London S Crowder 1772 part 3 chapter 2 pp 308 311

42 Frapolli Francisci. *Animadversiones in Morbum Vulgo Pelam* Milan Joseph Galeati 1771 pp 19 21 Jansen W. *De Pellagra Morbo in Mediolanensi Ducatu Endemio Lugundi Batavorum* 1787 in Frank J P. *Delectus Opusculorum Medicorum Antehac in Germaniae Diversis Academiis Editorum* Ticini P Galeati 1790 9 pp 325 387 Titius S C. *Oratio de Pellagrae Morbi inter Insulariae Austriacae Agricolae Grassantis Pathologia Viteburgi* 1792 in Frank J P. *Delectus Opusculorum Medicorum Antehac in Germaniae Diversis Academiis Editorum*, Ticini P Galeati 1793 12 pp 121 176 Lussana Filippo. *Sulla Pellagra* Ann Univ de Med 169 449 520 1859 Tuzcek Franz. *Klinische und anatomische Studien über die Pellagra* Berlin Fischer's Medic. Buchhandlung 1893 pp 10 25 Babes Victor and Sion V. *De Pellagra in Specielle Pathologie und Therapie* edited by Hermann Nothnagel Vienna Alfred Holder 1901 vol 24 part 2 2d half section 3 pp 39 2 Roussel. *Traite de la pellagre et pseudo pellagres* Sandwith F M. *Pellagra in Egypt* J Trop Med 1 63 70 (Oct) 1898 Pellagra Encyclopaedia Medica Edinburgh William Green & Sons 1901 vol 9 pp 244 249

43 Lind James. *A Treatise on the Scurvy* ed 3 London S Crowder 1772 part 2 chapter 2 pp 98 117 Echthius<sup>40</sup> Wierus<sup>41</sup> Brunerus Balthazaro. *De scorbuto tractatus duo* 1589 cited by Lind James. *A Treatise on the Scurvy* ed 3 London S Crowder 1772 part 3 chapter 2 pp 315 317 Curran J O. *Observations on Scurvy as it Has Lately Appeared Throughout Ireland and in Several Parts of Great Britain* Dublin Quart J Med 4 83 134 (Aug and Nov) 1847 Immerman H. *Scorbut Scharbock* (Engl. Hirschfeld) in *Handbuch der allgemeinen Ernährungsstörungen* by Birch Hirschfeld H Senator and I Immerman 2d half pp 581 603 in *Handbuch der speziellen Pathologie und Therapie* edited by H V Ziemssen Leipzig C W Vogel 1876 vol 13 2d half Hoger Studies in Scurvy<sup>45</sup> Hutinel V. *Les maladies des enfants* Paris Asselin and Houzeau 1909 vol 2 pp 451 453 Czerny A D. *Die Ernährung der deutschen Kinder während des Weltkrieges* Monatsschr f Kinderh 21 1 13 (April) 1921 Hess. *Subacute and Latent Infantile Scurvy*<sup>45</sup> Morawitz P. *Ueber hamorrhagische Diathesen in Jahreskurse für ärztliche Fortbildung* Munich J F Lehmanns 1919 vol 10 pp 9 49 Mouriquand G and Michel P. *Les états scorbutiques passagers et récidivants* Compt rend Soc de biol 1 734 737 1921 Godlewski Henri. *Carence partielle et prescurbut* Presse med 29 682 683 (Aug 27) 1921 Nassau Erich and Singer M J. *Zur Kenntnis des Vorstadiums der Barlow'schen Krankheit* Jahrb f Kinderh 98 44 62 1922 Leichtenritt. *Klinische und experimentelle Barlow Studien*<sup>45</sup> Kleinschmidt H. *Latenter Skorbut oder infektiöse Purpura?* Arch f path Anat u Physiol 246 131 139 1923 Freund Barlow'sche Krankheit<sup>45</sup> Frolich Theodor. *Malnutrition and Latent Scurvy* Arch Dis Childhood 10 309 312 1935

44 Hess Alfred F. *Subacute and Latent Infantile Scurvy*. The Cardiorespiratory Syndrome (a New Sign) J A M A 68 235 239 (Jan 27) 1917

45 Leichtenritt Bruno. *Klinische und experimentelle Barlow Studien* Ztschr f d ges exper Med 29 658 708 1922 Freund Walther. *Barlow'sche Krankheit*. *Kindliche Skorbut in Handbuch der Kinderheilkunde* edited by M von Pfaundler and A Schloßmann ed 3 Leipzig F C W Vogel 1923 vol 1 pp 716 717

46 Cheadle W B. *Three Cases of Scurvy* Supervening on Rickets in Young Children Lancet 2 685 687 (Nov 16) 1878

47 Hanke Diet and Dental Health<sup>45</sup> Kramer Untersuchungen über C Hypovitaminosen bei Parodontopathien nach der Methode Tillman modifiziert von Jeßler und Niederberger der deutsche Militärarzt 2 489 493 (Dec) 1937 Demoulin Pierre. *Resultats favorables obtenus par l'emploi de la vitamine C dans la thérapeutique des gingivites marginale* Rev belge de stom 35 164 170 (June) 1938 Roff F Stanley and Glazebrook A J. *The Therapeutic Application of Vitamin C in Periodental Disease* J Roy Nav M Serv 25 340 349 (Oct) 1939 *The Therapeutic Use of Vitamin C in Gingivitis of Adolescents* Brit Dent J 68 133 141 1940 Bouillat and Riman drasso A. *Div huit gingivites de la bouche dont treize gueries* traitées par l'acide ascorbique Presse med 1st em 541 (May 22 23) 1940 Campbell H Gordon and Cook R P. *Treatment of Gingivitis with Ascorbic Acid* Brit M J 1 360 361 (March 8) 1941 Dechaume M. *Gingivitis arthritides dentures et avitaminose* J Clin Dent A 7 420 422 (Aug) 471 474 (Sept) 1941 Marti (uto Sol ona and Sales Ricardo I. *Vitamin C* *Vitaminoterapia en odontologia* Rev Odont 20 73 80 (Feb) 1941 Crane and Wood<sup>49</sup>

48 Jamin H. *Stomatitis dentone* Arch Int Pasteur de Tunis 14 126 129 (No 1) 1925 Nogues. *Epidemie de glo ite observée au Senegal* Bull d Soc path exot et de a fil de l'Ouest Africain 18 501 507 (No 6) 1925 Mathus C and Guillet. *Sur la nature de l'épidemie de glossites observée au Senegal* ibid 18 586 590 (No 7) 1925 Katzenellenbogen I. *Ueber eine epidemie des Glo itis in Palästina* Arch f Dermat u Syph 151 269 277 1928 Atchroyd W R Krishnan B G and Primrose R. *Stomatitis of Dietary Origin* Lancet 2 825 828 (Oct 14) 1939 Katzenellenbogen I. *Nicotinic Acid in Endemic Glossitis* Lancet 1 1260 1262 (June 3) 1939

49 Hanke Milton T. *Diet and Dental Health* Chicago University of Chicago Press 1933 Crane Marian M and Wood Philip W. *A Study of Vitamin C Nutrition in a Group of School Children* New England J Med 224 503 509 (March 20) 1941

The trend to diagnosis of early or mild disease showed the limitations of the unaided senses. It became necessary to turn to instruments or procedures that would reveal changes within the body or extend vision beyond the limits of the unaided eye. The x-rays, the Wassermann reaction, chemical methods for blood, urine and tissue and the microscope for examination of blood, urine and tissue have added greatly to the physician's skill in earlier detection and diagnosis. Similarly, long ago the pathologist, recognizing that much was occurring below the threshold of his vision, turned to the microscope to open the realm of cellular pathology.

So it has been with the detection of deficiency diseases. The early and mild states are below the manifest level. The pathogenesis of deficiency diseases makes the existence of these states thoroughly understandable. Among the manifestations of a deficiency disease on a dietary basis are lowered concentrations of the essential factor in the blood, depleted storage in the body's reservoirs, diminished excretion, microscopic change in the tissue in the initial site, gross morphologic and functional change. These manifestations, it should be stated, are not necessarily or ordinarily concurrent. To detect these states below the manifest level, investigators have had recourse to new procedures and instruments. For most deficiency diseases these states have been demonstrated by appropriate methodology. Hess's<sup>50</sup> visualization of a state characterized by a negative balance in the vitamin has been confirmed by biochemical methods in analyses of blood and urine. Indeed, low blood values for ascorbic acid have been found in a definite proportion of population samples.<sup>51</sup> True, some investigators have argued that such values for ascorbic acid in the absence of other signs do not constitute scurvy. Judged by clinical criteria, the condition is not scurvy. Not until it has advanced to macroscopic tissue changes and developed signs is it designated scurvy. But that view draws a purely arbitrary distinction. Its justification is that it differentiates two states of severity in the process. One is the lesser developed state, the other the fully developed disease. But whatever the former is called, it is a step in the process. As a practical matter it may call for treatment.

Several procedures have been employed to elicit or detect the so-called monosymptomatic state before the sign has become manifest. It is obvious that the value of this approach for recognition of the incipient deficiency disease depends on testing or examining for the earliest sign. Instruments and methods have been devised for the detection of night blindness<sup>52</sup> and capillary fragility,<sup>53</sup> as evidence of avitaminoses A and C respectively. These conditions occur, but they are not

monosymptomatic, for it has been shown that they are not the earliest signs of these avitaminoses.<sup>53</sup>

More illuminating on the existence of the early state in a deficiency disease has been the observation of morphologic changes imperceptible to the unaided eye. Beginning changes in bones in infantile scurvy revealed by x-ray examination have been described.<sup>54</sup> Biomicroscopy, however, has disclosed still more about the early state of several deficiency diseases. Just as the microscope was highly useful to the pathologist in extending his range of vision to lesser changes in post mortem tissue, it has now proved highly informative to apply it in deficiency diseases to changes in living tissues. It is particularly revealing when the tissue site among the first showing changes is selected for observation. Using this procedure, I have found early specific biomicroscopic changes in four deficiency diseases: in the conjunctiva in avitaminosis A,<sup>55</sup> in the cornea in ariboflavinosis,<sup>56</sup> in the tongue in aniacinosis<sup>57</sup> and in the gum in avitaminosis C.<sup>58</sup>

Thus, alteration in transport and storage and microscopic changes in tissue show that deficiency diseases do exist in an early state which is undetectable by ordinary clinical methods.

In this morphologic study of these deficiency diseases, with biomicroscopic in conjunction with macroscopic examination, it was possible to see all gradations and to reconstruct the sequence of changes. These observations combined with the results from administration of specific therapy, revealed new states. Besides the severe and early acute forms, I noted chronic states of varying intensity from mild to severe. These chronic states took on immediate significance because of their predominance in the population.

While each of the four deficiency diseases avitaminosis A, ariboflavinosis, aniacinosis and avitaminosis C has its individuality as a separate and specific entity, all in the evolution and recession of their particular lesions showed a similarity in their biologic behavior. They reflected a definite biologic pattern. From this was elaborated a concept of deficiency states, their nature, their evolution how they may be recognized and their response to specific therapy.<sup>60</sup>

According to this concept, the specific pathologic process in a tissue in a deficiency disease<sup>60</sup> is characterized by velocity, intensity and duration. Of the velocities occurring, the range may be classified arbi-

50 Kruse H D. Chemical Methods for Determining the Plasma Level of Vitamin C. *Am J Pub Health* 31: 1079-1082 (Oct.) 1941. Milam D F. A Nutrition Survey of a Small North Carolina Community. *ibid* 32: 406-412 (April) 1942. Milam D F, and Wilkins Walter. Plasma Vitamin C Levels in a Group of Children Before and After Dietetic Adjustment. *Am J Trop Med* 21: 487-491 (May) 1941.

51 Jeans P C and Zentmire Zelma A. Clinical Method for Determining Moderate Degrees of Vitamin A Deficiency. *J A M A* 102: 892-895 (March 24) 1934. Hecht Selig. Dark Adaptation and the Diagnosis of Avitaminosis A. *Nutrition: The Newer Diagnostic Methods*. New York: Proceedings of the Round Table on Nutrition and Public Health. Sixteenth Annual Conference of the Milbank Memorial Fund (March 29-31) 1938, pp. 32-62.

52 Hess A F, and Fish Mildred. Infantile Scurvy. The Blood, the Blood Vessels and the Diet. *Am J Dis Child* 8: 385-405 (Dec.) 1914. Göthlin G F. A Method of Establishing the Vitamin C Standard and Requirement of Physically Healthy Individuals by Testing the Strength of Their Capillaries. *Skandinav Arch f Physiol* 61: 225-270 (May) 1931.

53 Hunt Eleanor P and Hayden Kenneth M. Medical Evaluation of Nutritional Status. IV. The Reliability of Visual Threshold During Dark Adaptation as a Measure of Vitamin A Deficiency in a Population Group of Low Income. *Milbank Memorial Fund Quart* 20: 139-168 (April) 1942. Kruse H D. The Gingival Manifestations of Avitaminosis C with Especial Consideration of the Detection of Early Changes by Biomicroscopy. *ibid* 20: 290-323 (July) 1942.

54 Park E A, Guild Harriet G, Jackson Deborah and Bond Marian. The Recognition of Scurvy with Especial Reference to the Early X-Ray Changes. *Arch Dis Childhood* 10: 265-294 (Aug.) 1935.

55 Kruse H D. Medical Evaluation of Nutritional Status. IV. The Ocular Manifestations of Avitaminosis A with Especial Consideration of the Detection of Early Changes by Biomicroscopy. *Pub Health Rep* 56: 1301-1324 (June 27) 1941. *Milbank Memorial Fund Quart* 19: 207-240 (July) 1941.

56 Kruse H D, Sydenstricker V P, Sebrell W H and Cleckley H M. Ocular Manifestations of Ariboflavinosis. *Pub Health Rep* 55: 157-169 (Jan 26) 1940. Sydenstricker V P, Sebrell W H, Cleckley H M and Kruse H D. The Ocular Manifestations of Ariboflavinosis. *J A M A* 114: 2437-2445 (June 22) 1940.

57 Kruse H D. The Lingual Manifestations of Aniacinosis with Especial Consideration of the Detection of Early Changes by Biomicroscopy. *Milbank Memorial Fund Quart* 20: 262-289 (July) 1942.

58 Kruse H D. The Gingival Manifestations of Avitaminosis C with Especial Consideration of the Detection of Early Changes by Biomicroscopy. *Milbank Memorial Fund Quart* 20: 290-323 (July) 1942.

59 Kruse H D. A Concept of Deficiency States. *Milbank Memorial Fund Quart* 20: 245-261 (July) 1942.

60 To many persons the term "deficiency disease" connotes a disorder arising solely from a deficiency in the diet. True, dietary inadequacy is the most common cause, but there are many other causes and conditioning factors. They are discussed in a separate article in this series by Dr Norman Jolliffe. As the result of any of these causes and conditions tissues are deficient in or cannot use the essential. It is desirable that the term deficiency carry this broader meaning.

trarily and most simply into two principal categories which are subdivided. The acute process is rapid in appearing, in running its course and in receding under treatment. Somewhat less rapid is the subacute or mild acute process. Differing from these in velocity, the chronic process is slow in onset, progress and response to treatment. Even slower is the mild chronic process.

Since the pathologic process may be of any intensity, it is convenient to graduate arbitrarily the range in two degrees, mild and severe. Therefore the acute and the chronic process may be either mild or severe. With grouping by form and intensity, the simplest classification of processes provides the categories mild acute, mild chronic, severe acute and severe chronic. These are the same groups that were enumerated in designating a process according to its velocity.

If uninterrupted, the process manifests its changes in a definite sequence which may be divided into stages. Therefore in each of the categories it may be divided into stages. Naturally the duration of the process will be a factor determining its stage.

(To be continued)

## Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING ARTICLE

TENTATIVE MINIMUM REQUIREMENTS FOR ACCEPTABLE ELECTRICAL HEARING AIDS WERE PUBLISHED IN THE JOURNAL MAY 11 1940. THESE REQUIREMENTS ARE REVISED FROM TIME TO TIME AS THE RESULT OF THE IMPROVEMENTS AND CHANGES MADE IN THE INSTRUMENTS. THE COUNCIL ON PHYSICAL THERAPY WISHES TO EXPRESS ITS APPRECIATION FOR THE VALUABLE ASSISTANCE RENDERED IN THE PREPARATION OF THIS REPORT BY THE CONSULTANTS ON AUDIOMETERS AND HEARING AIDS. THE CONSULTANTS ARE DR. W. E. GROVE, CHAIRMAN, AND DRS. GEORGE M. COATES, EDWIN P. FOWLER, WALTER HUGHSON, ISAAC H. JONES, DEAN M. LIERLE, DOUGLAS MACFARLAN, C. STEWART NASH, HORACE NEWHART, PAUL E. SABINE AND BURT R. SHURLY.

HOWARD A. CARTER, Secretary

### MINIMUM REQUIREMENTS FOR ACCEPTABLE ELECTRICAL HEARING AIDS

A hearing aid acceptable to the Council on Physical Therapy of the American Medical Association shall improve at least 30 decibels for speech the hearing of the deafened ear for which it is prescribed or fitted. Firms shall meet the following requirements:

1. Hearing aids shall have imprinted on each transmitter and air or bone conduction receiver a model number (type or class) or some equally suitable identification.

2. The manufacturer shall supply the Council on Physical Therapy with a graph giving the amount of amplification.

3. The manufacturer shall state the voltage and current consumption at maximum setting.

4. The hearing aid shall be free from unwarranted noises such as sizzling, frying, humming, clicking and whistling sounds.

5. The manufacturer shall furnish to the Council a copy of its guaranty to the purchaser.

6. There shall accompany each hearing aid clearly written instructions for its use.

7. The manufacturer shall give evidence that adequate facilities for servicing the instruments are available and shall furnish names and addresses of servicing agencies.

8. The manufacturer shall agree to furnish from stock to the Secretary of the Council on Physical Therapy a hearing aid for inspection and test. On the request of the Secretary, the manufacturer shall supply him with an order on any of the authorized agents for an instrument for test. On the completion of tests the instrument shall be returned complete to the manufacturer.

9. All material used in manufacture shall be of first grade and the workman-ship skilfully performed.

10. The firm shall be responsible for the ethical merchandising practices, financial dealing and contracts of its agents, sales representatives and service men with the purchasers of the instruments. The standards of merchandising and the acceptability of advertising shall meet the Rules of the Council on Physical Therapy.

## REPORT OF THE COUNCIL

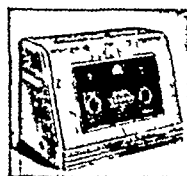
THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT  
HOWARD A. CARTER, Secretary

### McINTOSH SINUSTAT ACCEPTABLE

Manufacturer: McIntosh Electrical Corporation, 225-235 North California Avenue, Chicago.

The McIntosh #1518 Sinustat is said by the manufacturer to provide a simple means of obtaining various forms of sinusoidal and galvanic wave currents capable of producing rhythmic contractions of muscular tissue both striated and unstriated at frequencies corresponding to the norm of each. The unit is encased in a walnut cabinet measuring 20 inches by 13 3/4 inches by 12 1/2 inches and weighing 49 pounds. It is designed for operation on 100-115 volts, 60 cycle alternating current. Standard accessories include treatment cords, metal treatment handles, interrupting treatment handle with spongio disk, 4 by 6 "kantbern" pads and rubber bandages.

On the control panel of the unit are located a push button switch for selecting the kind of current, a meter recording patient current intensity, a red light and a green light indicating sinusoidal and galvanic currents respectively, two rheostats, one controlling the patient circuit and the other the speed of waves, a line switch and a polarity switch. A transformer, a heavy duty motor, a full wave rectifier tube, a condenser and a variable speed motor are mounted on the chassis.



McIntosh Sinustat

The report of the Council's investigation of the apparatus is as follows:

The McIntosh #1518 Sinustat is a generator designed primarily for electrical muscle stimulation. It has six current forms as follows:

1. A direct current which is designated as a straight galvanic current. This is an essential current for muscle stimulation using the make and break technique for ion transfer and other direct current applications.

2. A surging interrupted direct current, which is designated as galvanic unidirectional current. This current can be used for the electrical stimulation of muscles with an intact nerve supply and where, in addition, the polar effects of the direct current are desired.

3. A surging uninterrupted direct current with alternate polarity which is designated as a galvanic smooth, the form of this current, according to the name plate, is sinusoidal in form. This current is effective in the stimulation of paralyzed muscles, that is, muscles exhibiting the reaction of degeneration. This current was tested on patients and experimental animals.

4. A surging interrupted direct current with alternate polarity, which is designated as galvanic rough. It is similar in form to 3, only interrupted. This is effective for the electrical stimulation of skeletal muscles with an intact nerve supply.

5. A tetanizing current, which is designated as a 320 sinusoidal current. This produces a sustained tetanic contraction of the skeletal muscle with an intact nerve supply. This current produces similar effects to any faradic current. This current could be used for the so-called "muscle faradization."

6. A surging 320 cycle alternating current, which is designated as a 320 sinusoidal wave. Evidence is not available that this current is useful; in fact, the Council's experimental work tends to show that this type of current may produce harmful effects.

## CONCLUSIONS

Current 1 is an essential current

Current 2 can be used for the stimulation of a muscle with nerve supply intact and when at the same time constant polar effects are desired. It is not essential but can be used.

Current 3 is an essential current for the treatment of muscle giving the reaction of degeneration.

Current 4 is an essential current for the stimulation of a muscle when the nerve supply is intact.

Current 5 is not an essential current, although it will produce complete tetanus of a muscle. It can be used when a complete sustained tetanic contraction may seem desirable.

Current 6 is a current for which there is no definite evidence of usefulness or harmlessness.

The Council voted to accept the McIntosh #1518 Stimulator for inclusion on its list of accepted devices.

## Council on Pharmacy and Chemistry

### REPORTS OF THE COUNCIL

THE COUNCIL HAS AUTHORIZED PUBLICATION OF THE FOLLOWING  
REPORTS AUSTIN E. SMITH, M.D., Secretary

#### ZINC INSULIN CRYSTALS

and

#### CRYSTALLINE ZINC INSULIN INJECTION

Because of difficulty in arriving at a name which would accurately describe this insulin preparation and be approved by the Insulin Committee of Toronto, the Council has held in abeyance any report on this subject although the subject has been under consideration since the introduction of these agents into the medical armamentarium. Because of its responsibility to the public and to the physician the Council was of the opinion that it should not delay issuance of an explanation concerning the status of zinc insulin crystals but a desire to obtain complete cooperation from all interested bodies motivated a delay. However, the patents for insulin have expired and standards have now been set up by the United States Pharmacopeia for enforcement by the Food and Drug Administration.

Three forms, (1) solution of an amorphous form of insulin, (2) solution of protamine zinc insulin and (3) solution of zinc insulin crystals, are now available commercially and have been accepted for inclusion in New and Nonofficial Remedies. There have been two current designations for preparations of zinc insulin crystals, in the United States it was marketed as "Insulin specially prepared as Solution of Zinc Insulin Crystals" and in Canada as "Insulin made from Zinc Insulin Crystals." As the Council on Pharmacy and Chemistry was of the opinion that differentiation between "amorphous" and "crystalline" insulin was not made sufficiently clear by these designations considerable correspondence was conducted with the Committee Advisory to the Insulin Committee of Toronto with a view to adoption of a name more accurately descriptive of the preparation. Finally, the designation "Solution of Zinc Insulin Crystals—a specially purified preparation of Insulin" was evolved and appeared to be satisfactory to both the Council and the Committee Advisory. This term was to encompass the product originally described as "Insulin, specially prepared in the form of zinc insulin crystals."

Just as it appeared that the status of the problem was ready for publication, correspondence arrived at the Council office indicating that the discussion was again to be opened. The arguments for this were not convincing to the Council, and it therefore held to its decision regarding the acceptance of the designation "Solution of Zinc Insulin Crystals—a specially purified preparation of Insulin," and voted to accept Zinc Insulin Crystals and Solution of Zinc Insulin Crystals—a specially purified preparation of Insulin, for inclusion in New and Nonofficial Remedies.

However, the U S P Revision Committee adopted the following designations for insulin preparations, although at present the U S P XII contains a monograph only on Insulin Injection.

Injectio Insulini (Insulin Injection)

Injectio Zinc-Insulini Crystallini (Crystalline Zinc Insulin Injection)

Injectio Zinc-Insulini Protaminæ (Protamine Zinc Insulin Injection)

As a result of its consideration of commercially available insulin solutions made from zinc-insulin crystals, the Council concluded that clinically it is impossible to differentiate between Insulin Injection U S P prepared from zinc insulin crystals and that prepared from amorphous insulin, and that under the provisions of the federal Food, Drug and Cosmetic Act a manufacturer could prepare a solution of zinc insulin crystals and, without any statement as to its source, label and market it simply as Insulin Injection. Thus no label distinction between ordinary insulin solution and solution zinc insulin crystals is required.

After reviewing the findings, the Council voted to publish immediately the foregoing statement and to accept for inclusion in New and Nonofficial Remedies, Zinc-Insulin Crystals and Crystalline Zinc Insulin Injection.

**ZINC INSULIN CRYSTALS**—Zinc insulin crystals occur as a crystalline preparation of the active antidiabetic principle of the internal secretion of the islands of Langerhans of the pancreas. The crystals contain a small amount of zinc (not less than 0.45 per cent and not more than 0.9 per cent), which is chemically combined with the active principle. The presence of zinc or some other heavy metal such as nickel or cobalt is essential because only in the presence of traces of such elements has the active antidiabetic principle been prepared in a pure crystalline form. Each milligram of the crystals is equivalent to approximately 22 units of insulin. The product is marketed in the form of crystalline zinc-insulin injection.

Zinc insulin crystals occur as small colorless rounded untwinned uniaxial rhombohedral crystals possessing a negative optic sign parallel or zero extinction between crossed Nicols and a mean index of refraction for lithium light of  $1.535 \pm 0.002$  with a birefringence of 0.005. It is sparingly soluble in water, insoluble in alcohol, chloroform and ether but soluble in dilute acid and dilute alkali. The isoelectric point of zinc insulin crystals is about 5.3. The crystals are stable if kept at a low temperature.

Transfer to a microscope slide approximately 0.1 mg of zinc insulin crystals, add 0.1 cc of distilled water, thoroughly wet the crystals by stirring with a small glass rod. The crystals do not dissolve completely but give rise to a turbid suspension, under microscopic examination the crystals conform to the petrographic description of zinc insulin crystals. The crystals brown rapidly when heated above 220°C and melt with decomposition between 230 and 240°C.

Transfer about 20 mg of zinc insulin crystals to a platinum boat, weigh the boat and its contents within a weighing pig, place the boat in a vacuum desiccator over phosphorus pentoxide and dry to constant weight using the weighing pig, to prevent the absorption of water during weighing. The loss in weight does not exceed 7.0 per cent. In the following quantitative determinations it is more convenient to weigh the zinc insulin crystals directly and to calculate the results to a dry basis rather than attempt to weigh the extremely hygroscopic dry material.

Dissolve 50 mg of zinc insulin crystals in 5 cc of water by the addition of sufficient tenth normal hydrochloric acid to effect solution. Transfer to a centrifuge tube and add 2 cc of 10 per cent trichloroacetic acid with shaking. Let stand ten minutes and centrifuge. Decant into a 10 cc volumetric flask, add 2 cc of Nessler's reagent and make up to volume. Allow to stand five minutes, transfer to a colorimeter and compare with a standard made up similarly and containing 0.055 mg of ammonium sulfate. The color does not exceed that of the standard solution.

Transfer 18 mg of zinc insulin crystals to a 100 cc volumetric flask, add 2 cc of tenth normal hydrochloric acid, dilute to the mark with distilled water and shake to dissolve the crystals. Transfer 10.0 cc of this solution to a separator, add about 20 cc water, 10 cc chloroform and 2 cc dithion reagent (prepared by dissolving 15 mg dithion in 100 cc redistilled chloroform). Make the solution alkaline by the addition of ammonia water and shake until the chloroform layer is colored a clear pink. Drain the chloroform layer into a clean flask and repeatedly extract the aqueous layer with small portions of chloroform to which has been added a few drops of dithion reagent until the chloroform is no longer colored pink. At this point the aqueous layer may be discarded. Transfer the combined chloroform extracts to a clean separator and extract twice with 15 cc portions of 0.02 normal ammonia water to remove the excess dithion. After each extraction wash the water layer with a small quantity of fresh chloroform and then add to the main chloroform extract. Dry the combined chloroform extracts with a small quantity of anhydrous reagent quality sodium sulfate, decant the solution into a 50 cc volumetric flask, rinse the sodium sulfate several times with fresh chloroform and make the solution to volume with chloroform. Compare the solution in a colorimeter with a standard made as described above using 10.0 cc of a solution containing 0.001 mg zinc per cubic centimeter (3.357 mg zinc acetate  $[Zn(CH_3COO)_2 \cdot 2H_2O]$  per liter). The zinc content is not less than 0.45 per cent nor more than 0.9 per cent.

Transfer about 10 mg of zinc insulin crystals to a platinum dish, add two drops of concentrated sulfuric acid, ash slowly and ignite to constant weight at 600°C. The ash is not more than 50 per cent more than the zinc sulfate calculated from the zinc content and in no case is it more than 3.30 per cent.



**CRYSTALLINE ZINC INSULIN INJECTION**—A solution of zinc insulin crystals, a preparation containing the active antidiabetic principle of the pancreas, combined with a small amount of zinc (not less than 0.2 and not more than 0.40 mg per thousand units of active principle in the solution)

**Actions and Uses**—Crystalline zinc insulin injection may be used in the treatment of diabetes mellitus when regulation of diet has been unsatisfactory in control of the disease. Because of its chemical purity, solution of zinc insulin crystals is especially indicated for patients who may be expected to exhibit allergic reactions to insulin. Experience has indicated that the occurrence of such reactions may thus be avoided or minimized. Although early clinical observations indicated that the action of crystalline zinc insulin injection as compared with that of insulin may be slightly delayed and somewhat prolonged, further clinical experience has shown however, that in patients under careful observation crystalline zinc insulin injection and insulin may be used interchangeably.

**Dosage**—The potency of crystalline zinc insulin injection is measured in terms of standard units of insulin. The general principles underlying its administration are the same as those covering the use of insulin, and under ordinary circumstances the two solutions may be regarded as interchangeable. The crystalline zinc insulin injection is usually best administered subcutaneously fifteen to thirty minutes before a meal. The time and number of the doses and the amount of solution must be determined by the need of the individual patient each of whom requires accurate dietary regulation and meticulous clinical study.

Marketed solutions of zinc insulin crystals are water clear and contain from 1.4 to 1.8 per cent w/v of glycerin for isotonicity, 0.1 to 0.25 per cent w/v of phenol or tricresol as a preservative and sufficient 0.01 normal hydrochloric acid to yield a pH of from 2.5 to 3.5. The biologic activity of the solution is expressed in U S P insulin units per cubic centimeter. Solutions of zinc insulin crystals are stable, provided the storage temperature does not exceed room temperature. Crystalline zinc insulin injection meets the requirements for identity and purity provided in the U S P XII under *Injectio Insulini*.

#### CRITERIA FOR EVALUATION OF SKIN DISINFECTANTS

Examination of the literature on skin disinfectants and of the data submitted to the Council in support of such preparations betrays the lack of adequate guiding criteria for the evaluation of surface disinfectants. To aid in clarifying the situation, the Council has declared the advisability of data such as the following in support of any skin disinfectant submitted to the Council for consideration:

1 Phenol coefficients or other *in vitro* tests in the absence and in the presence of serum using both vegetative bacterial cells and clostridial spores, with suitable recovery mediums containing, if known, neutralizing substances for the disinfectant being tested.

2 Data on germicidal efficiency under conditions simulating actual use by the method of Price (Price, P. B. *The Bacteriology of Normal Skin. A New Quantitative Test Applied to a Study of the Bacterial Flora and the Disinfectant Action of Mechanical Cleaning* *J Infect Dis* 63:301 [Nov-Dec] 1938; Ethyl Alcohol as a Germicide *Arch Surg* 38:528 [March] 1939) or better still by an extension of the method of Price (Bernstein, L. H. T. *Standardization of Skin Disinfectants* *J Bacteriol* 43:50 [Jan] 1942). The complications due to possible effects of the germicide on the skin itself should be taken into consideration (Cromwell, H. W. and Leffler, Ruth. *Evaluation of 'Skin Degerming' Agents by a Modification of the Price Method* *ibid*, p. 51).

3 Data on germicidal efficiency by an animal method such for example as suggested by Alice H. Kempf and W. J. Nungester (*An In Vivo Test for the Evaluation of Skin Disinfectants*, *ibid*, p. 49) or R. W. Sarber (*ibid*, p. 50).

4 Evidence from animal experiments regarding irritant action on skin and mucosae and regarding systemic toxicity.

5 Critical clinical evidence supporting claims of harmlessness and efficacy.

6 Data on the bacteriostatic activity as distinguished from the germicidal activity of the disinfectant.

#### NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

AUSTIN E. SMITH, M.D., Secretary

**DEXTROSE** (See New and Nonofficial Remedies, 1942, p. 418)

The following dosage form has been accepted:

READYFLASK, INC., LAKEWOOD, OHIO

Dextrose 5% (W/V) in Isotonic Solution of Sodium Chloride 1,000 cc. Each 100 cc. contains 5 Gm. of dextrose and 0.85 Gm. of sodium chloride-U S P.

**ISOTONIC SOLUTION OF SODIUM CHLORIDE** (See New and Nonofficial Remedies, 1942, p. 425)

The following dosage form has been accepted:

READYFLASK, INC., LAKEWOOD, OHIO

Isotonic Solution of Sodium Chloride 1,000 cc. Each 100 cc. contains 0.85 of sodium chloride-U S P in distilled water.

**QUININE DIHYDROCHLORIDE** (See New and Nonofficial Remedies, 1942, p. 217)

The following dosage forms have been accepted:

ENDO PRODUCTS, INC., RICHMOND HILL, N. Y.

Ampuls Solution Quinine Dihydrochloride 0.25 Gm. (3¾ grains) in 1 cc. 0.5 Gm. (7½ grains) in 1 cc. 1.0 Gm. (15½ grains) in 2 cc. Each ampul contains the stated amount of quinine dihydrochloride dissolved in distilled water.

**TETANUS TOXOID, ALUM PRECIPITATED** (See New and Nonofficial Remedies, 1942, p. 516)

The following dosage form has been accepted:

PITMAN-MOORE CO., INDIANAPOLIS

Tetanus Toxoid (Alum Precipitated) 1 cc. vials in packages of two 1 cc. vials (two immunizing doses) and 10 cc. vial (ten immunizing doses).

**PURIFIED SOLUTION OF LIVER** (See New and Nonofficial Remedies, 1942, p. 368)

The following dosage forms have been accepted:

JOHN W. WETH & BROTHER, INC., PHILADELPHIA

Purified Solution of Liver, 5 U S P injectable units per cc. 10 cc. rubber stoppered ampoule. A sterile aqueous solution of liver preserved with 0.5 per cent phenol.

Purified Solution of Liver, 10 U S P injectable units per cc. 10 cc. rubber stoppered ampoule. A sterile aqueous solution of liver preserved with 0.5 per cent phenol.

**ETHYL AMINO BENZOATE** (See New and Nonofficial Remedies, 1942, p. 65)

The following dosage form has been accepted:

WINTHROP CHEMICAL CO., INC., NEW YORK

Anaesthetic Jelly 1½ oz. collapsible tube

**PENTOTHAL SODIUM** (See New and Nonofficial Remedies, 1942, p. 463)

The following dosage form has been accepted:

ABBOTT LABORATORIES, NORTH CHICAGO, ILL.

Ampoules Pentothal Sodium 50 Gm. with 0.3 Gm. anhydrous sodium carbonate as a buffer. Multiple dose ampul.

**THIAMINE HYDROCHLORIDE** (See New and Nonofficial Remedies, 1942, p. 555)

The following dosage form has been accepted:

LAKEVIEW LABORATORIES, INC., MILWAUKEE

Solution Thiamine Hydrochloride, 100 mg. per cc. 15 cc. vial. Preserved with 0.5 per cent of chlorobutanol.

**PYRIDOXINE HYDROCHLORIDE** (See New and Nonofficial Remedies, 1942, p. 563)

The following dosage forms have been accepted:

THE LAKEVIEW LABORATORIES, INC., MILWAUKEE

Ampuls Pyridoxine Hydrochloride, 50 mg. per cc. 1 cc. Pyridoxine Hydrochloride, 50 mg. per cc. 5 cc. vial. Tablets Pyridoxine Hydrochloride 5 mg.



# THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, FEBRUARY 20, 1943

## ANTIBODY FUNCTION OF LYMPH NODES

For fifty years it has seemed logical to immunologists to assume that specific antibodies are formed as internal secretions by certain fixed tissues. Attempts to determine the essential immunologic endocrines, however, were unsuccessful. Hektoen and his co-workers<sup>1</sup> found that removal of the stomach, small intestine, pancreas, thyroid, spleen and other organs whose surgical removal is compatible with life does not materially reduce the power of the remaining tissues to produce specific opsonins and agglutinins. From this failure they concluded that the antibody producing tissues must be widely distributed throughout all organs, and they directed attention particularly to the capillary endothelium as the most probable tissue. Support was given to this theory by physical or chemical reticuloendothelial blockade, both stimulation of specific precipitin production<sup>2</sup> and almost complete suppression of production<sup>3</sup> being reported as a result of minimal or maximal blockade with such agents as india ink, carmine particles or colloidal dyes. The alleged production of specific hemolysins in certain reticuloendothelial tissue cultures<sup>4</sup> and their reduced production in animals in which the reticuloendothelial system has been greatly reduced in volume by exposure to x-rays<sup>5</sup> support this conclusion.

As early as 1898, however, Pfeiffer<sup>6</sup> had directed attention to lymphatic tissues as the probable source of antibodies. He titrated the bacteriolysins in various organs of rabbits previously injected intravenously with nonviable bacterial vaccines and at times found these antibodies in higher concentration in the spleen than in the blood stream. This, however, was not generally considered proof of local specific antibody formation,

since similar splenic concentrations were noted in rabbits passively immunized by serum transfer. McMaster and others,<sup>7</sup> however, have recently strengthened the evidence, having shown that in mice local histologic reactions in regional lymph glands are associated with a definite increase in local specific agglutinins, the local titer at times reacting two to four times that of the blood serum.

A crucial test of the lymph gland theory of specific antibody production has now been reported by Ehrlich and Harris<sup>8</sup> of the department of pathology of the University of Pennsylvania School of Medicine. The Pennsylvania pathologists selected the popliteal lymph node of rabbits as offering a unique opportunity for such study. This gland is the only lymph node draining the hind foot and is supplied with afferent and efferent lymphatics of sufficient size for convenient aspiration. With a tuberculin syringe they could readily collect from 0.2 to 0.6 cc. of lymph from each vessel, amounts sufficient for antibody titration. Ehrlich and Harris therefore injected suspensions of formed antigens, such as heat killed bacilli or washed erythrocytes, into the plantar surface of the left hind foot. At various intervals after this injection they aspirated lymph from both the afferent and efferent lymphatics of the left popliteal gland, with simultaneous titrations of the blood serum, of aqueous extracts of the popliteal gland and of subcutaneous tissues of the injected hind foot. Controls were run with homologous products from the opposite or noninjected leg, or from control leg tissues injected with a heterologous antigen (e.g., egg white).

In all cases the agglutinin or hemolysin titer was higher in the efferent than in the afferent lymph of the injected popliteal gland. Difference was not noted between the afferent and efferent lymph of the control noninjected popliteal space. After passage through the vaccinated lymph node the antibody titer was often increased as much as a hundredfold to a titer often exceeding that of the blood serum. Extracts of the injected foot tissues usually showed titers as low as the titer of the afferent popliteal lymph. The titer of popliteal node extracts was often from two to ten times higher than that of the blood serum, the control popliteal gland showing only traces of specific antibodies.

From this and other evidence Ehrlich and Harris conclude that both hemolysins and agglutinins are formed within regional lymph nodes. They found that antibodies began to appear in the regional nodes from two to four days after plantar injection and reached their highest concentration by the sixth day. Local antibody formation was preceded and accompanied by local

1 Hektoen Ludwig and Curtis A. R. *J. Infect. Dis.* **17**: 409, 1915.

2 Standenorth G. *Ztschr. f. Immunitätsforsch.* **38**: 19, 1923.

3 Gay F. P. and Clark Ada R. *The Reticuloendothelial System in Relation to Antibody Formation*. *J. A. M. A.* **83**: 1296 (Oct. 25) 1924.

4 Carrel, Alexis and Ingebrigsten, R. *J. Exper. Med.* **15**: 287, 1912.

5 Hektoen Ludwig. *J. Infect. Dis.* **17**: 419, 1915.

6 Pfeiffer R. and Marx. *Ztschr. f. Hyg.* **27**: 272, 1898.

7 McMaster P. D. and Hudack S. S. *J. Exper. Med.* **61**: 783 (June) 1935.

8 Ehrlich W. E. and Harris T. N. *J. Exper. Med.* **76**: 115 (Oct.) 1942.

hyperplasia. The local tissue proliferation was chiefly of the lymphatic type, from which they concluded that the lymphocytes are the major (or perhaps the only) local cells responsible for antibody synthesis.

#### CALIFORNIA PHYSICIANS' SERVICE AND HENRY KAISER'S PERMANENTE FOUNDATION

The hearings before the Pepper subcommittee reported in THE JOURNAL have made physicians familiar with the problems related to the provision of medical service created when Mr. Henry Kaiser undertook to provide for the employees of his various interests in California, Oregon and Washington. The January issue of *California and Western Medicine* publishes some information as to the present status of this situation in California. There are about 87,000 employees in the Richmond yards. The plan in operation provides for a 50 cent weekly payroll deduction for the provision of complete medical care and hospitalization to Kaiser employees who are injured or who may be taken ill from nonindustrial causes. The plan now covers 52,000 employees who have consented to the deduction. To these employees are available the facilities of the Maritime Commission's field hospital and six first aid stations, also the services of a staff of some fifty physicians and a 78 bed hospital in Oakland. This hospital was an old hospital named the Fabiola Hospital, which was purchased, rebuilt and renovated with the sum of \$500,000 loaned by Mr. and Mrs. Henry Kaiser under the name of the Permanente Foundation. An additional wing of 75 beds is being added to the original 78 beds.

The income of the plan, it is reported, is designed to meet current expenses and to amortize the loan of \$500,000 from Mr. and Mrs. Kaiser. Several commercial insurance carriers handle industrial accident liabilities in the plant. The industrial medical fees paid by the insurance companies also accrue to the foundation. The Permanente Foundation is a nonprofit venture. When the \$500,000 advanced by Mr. and Mrs. Kaiser has been repaid in full, further profits are to be used for the promotion of medical research, for the rehabilitation of disabled physicians, for the endowment of hospital beds and for the teaching of industrial medicine. The plan is administered by Dr. Sidney R. Garfield under an agreement which allows him to draw up to \$25,000 annually in salary. A statement by Dr. Garfield, according to *California and Western Medicine*, indicates that thus far he has not drawn any salary from the funds of the foundation but has, in fact put into current operating funds some \$10,500 of his own money, with the understanding that this also is to be repaid from the funds that accrue in the future. The statement in *California and Western Medicine* indi-

cates that the facilities and the quality of the medical service provided are excellent.

One of the chief questions raised before the Pepper hearings concerned the relationships of the Procurement and Assignment Service to the medical care plan of Mr. Kaiser. On this subject *California and Western Medicine* says:

Early in its existence in California Procurement and Assignment Service became aware of the building up by Mr. Kaiser and Dr. Garfield of a staff of physicians for both the industrial and nonindustrial medical care of Kaiser employees. The Kaiser staff of some thirty physicians (early in 1942) represented a group of young men, all but two of whom were definitely of military age.

A review of the Kaiser medical staff showed that practically every one of the thirty physicians should be declared available for military service because of his age, at the same time Procurement and Assignment Service had no intention or desire to break up an established staff which was caring for an important segment of the industrial population.

Complaints had been heard from the medical profession that the Kaiser staff was practicing "corporate medicine," that Dr. Garfield had resorted to "piracy" in hiring his physicians—that the whole operation was an unethical one that doctors eligible for military service were being offered sanctuary and protection from Selective Service. Procurement and Assignment Service took the attitude, however, that its function had nothing to do with ethics and that its approach to the problem must be from the point of view of the distribution of physicians between military and civilian agencies.

At the same time, Procurement and Assignment Service put Dr. Garfield on notice that his staff members were vulnerable to induction into the Army by Selective Service because of their low average age. This warning was given for the protection of the staff, to obviate the disruption that might occur if a large part of the staff was classified I-A by local draft boards and forced into military service.

On the basis of the above reasoning a program was worked out whereby Dr. Garfield would clear through Procurement and Assignment Service any physicians who were under consideration for employment on his staff. It was understood that those physicians who otherwise would be available for military service were not to be employed by Dr. Garfield except for a temporary period, while they awaited the issuance of their commissions and orders for active duty.

A second part of this program called for the replacement of any four young staff members every ninety days, replacements were to be by physicians over military age or physically disqualified and rejected for military service. Procurement and Assignment Service agreed under this program to declare "essential" the remaining members of the Garfield staff until the time for replacement of each staff member should come up.

This program was put into operation. Procurement and Assignment Service has referred to Dr. Garfield no less than twenty-five physicians who are either too old for military service or have been rejected by the Army. Some of these have been acceptable to Dr. Garfield and have been employed by him; some have been unable to perform the medical duties with satisfaction. Nine of the former members of the Garfield staff have been accepted for military duty and have been replaced by other physicians. The program is somewhat behind schedule at present because Dr. Garfield found it necessary shortly after the start of the program to increase his staff to care for the increasing number of employees who have signed up for the plan and to cover the expanding program of the shipyard.

The California Physicians' Service, a nonprofit medical care organization sponsored by the California Medical Association, has also undertaken the health care of wartime industrial employees in shipyards and

other areas on an area basis. Outside the industrial plants its services are provided to employees and their families who reside in Federal Housing Authority projects which have been built around the industrial plants. The California Physicians' Service operates a medical center in each of the housing areas that it serves. The staff physicians and nurses in the medical centers give immediate care to the industrial employees and their families and refer to members of the California Physicians' Service in the immediate vicinity cases which require hospitalization, surgery or more extensive medical care. The Federal Public Housing Authority adds the monthly charge for California Physicians' Service to the rental of the housing unit and turns the collections over to the California Physicians' Service. *Under this arrangement any profit that may accrue must be returned to the subscribing employees and their families in the form of either reduced fees or increased services.* The cost of hospitalization is included in the California Physicians' Service fee.

Among questions not yet determined are (1) the extent to which the Permanente Foundation plan will be expanded to care for families of employees, (2) whether or not the Garfield plan will be expanded to include care of employees living outside the service area of the hospital in Oakland. One San Francisco physician has already been employed to make house calls. (3) the extent to which the Permanente Foundation and the California Physicians' Service may work out a cooperative plan, (4) the financial arrangements involved when an employee finds that by living in a Federal Housing Authority housing project he is entitled to medical care both from the Permanente Foundation and from the California Physicians' Service plan.

Readers of THE JOURNAL will remember that physicians in Oregon worked out arrangements satisfactorily for the Kaiser employees near Portland. It should be remembered, however, that the chief question at issue in the Pepper hearings was the utilization of medical manpower and the desire of the Kaiser organization to retain the young physicians in its hospitals whereas the Procurement and Assignment Service had designated them as eligible for service with the armed forces. It will be observed that nine of these physicians are now with the armed forces. The alleged opposition of the medical societies of the states concerned to prepayment plans for medical service seems to have been introduced into the discussion for the one purpose of prejudicing public opinion on the other issue. The manner in which California Physicians' Service has been cooperating with other agencies in supplying medical care in the emergency that prevails is in itself proof of the lack of validity associated with introducing that point in the hearings.

## FIBRINOGEN EMBOLI FROM SUPERFICIAL BURNS

A timely addition to our knowledge of the pathology of superficial burns has been made in a study of the toxicity of heated human plasma recently reported by Kabat and Levine<sup>1</sup> of the Department of Physiology, University of Minnesota. In the course of extensive experiments on thermal shock in anesthetized cats it was noted that a small proportion of the animals succumbed within a few minutes after burning. The respiration stopped suddenly, the heart beat was slow and irregular and the blood pressure fell precipitously. Artificial respiration usually did not result in recovery. Hemoconcentration was minimal at the time of death. Since the sudden death could not be explained on the basis of fluid loss and since nervous factors had been experimentally eliminated the phenomenon was attributed to a toxin.

Measurements of subcutaneous temperatures in experimental scalds showed that temperatures of 55 to 65 C are reached and maintained for several minutes. Citrated cat blood was therefore heated to 65 C for one minute and from 3 to 4 cc of this heated blood injected intravenously into the same animal. The respiration ceased within two minutes. The heart continued to beat for five minutes. Artificial respiration was without avail. Rapid death was also observed following intravenous injection of 2 cc of heated autogenous plasma. Intravenous injection of heated serum even in much larger amounts was without toxic effects. The supernatant of centrifuged heated plasma also was nontoxic. This suggests that the fine precipitate formed in the heated plasma is the toxic agent. The precipitate is presumably partially denatured fibrinogen.

Evidence indicates that the particle size rather than the chemical constitution of this precipitate determines its toxicity, since heated plasma can be rendered innocuous by simple homogenization in an apparatus capable of breaking up tissue cells. As much as 40 cc of homogenized heated plasma can be injected without appreciable toxic reaction. Evidence also indicates that the rate of injection rather than the volume injected determines toxicity. In one experiment for example, 13 cc of heated plasma was injected slowly without producing rapid death. The injected cat survived for four days during which time it was very weak and made almost no spontaneous movements. Necropsy showed a perforating gastric ulcer 1 cm in diameter.

To test possible applications to human medicine a similar study was made of the effects of intravenous injections of heated human plasma into unanesthetized rabbits. Human plasma heated to 56 to 65 C showed the same type of precipitate as that observed with heated cat plasma, while precipitate was not formed in heated human serum. Rapid injection of 2 to 5 cc

<sup>1</sup> Kabat, Herman and Levine. *Milton Science* 96: 476 (1941)  
1942

ot heated human plasma into the ear vein of a normal rabbit resulted in prompt respiratory arrest, death taking place in from five to ten minutes. The centrifuged precipitate of the heated plasma gave the same toxic reaction, while the plasma supernate was nontoxic. Also the precipitate in heated human plasma could be rendered nontoxic by homogenization. Here also it is presumably the particle size rather than chemical composition that determines toxicity. Microscopic examination of the lungs of rabbits which died from injection of heated human plasma revealed widespread and numerous capillary protein thrombi.

The possibility that capillary emboli may play an important part in the pathology of severe burns was suggested by earlier investigators. Frankel,<sup>2</sup> Bardeen<sup>3</sup> and others, for example, noted minute capillary thrombi in the liver, spleen and kidneys in cases of burns while Billroth<sup>4</sup> had previously supported the embolic theory of Curling's ulcer. Salvioh,<sup>5</sup> Vaccarezza<sup>6</sup> and others found that canine blood became hypocoagulable following severe burns and that previous defibrination of the blood rendered the dogs more resistant to lethal burns.

Determination of the exact chemical composition of the toxic "fibrinogen precipitate" must precede any attempts at logical therapy.

## Current Comment

### THE COCOANUT GROVE FIRE

The Cocoanut Grove night club fire in Boston on Nov. 28, 1942, in these days, each of which brings some new tale of conflict or disaster, now seems like ancient history. Some of the medical aspects of that disaster were discussed in *THE JOURNAL*.<sup>1</sup> A preliminary report by Moulton, technical secretary of the National Fire Protection Association, indicates that the lessons of that disaster will not be lost. The onset and course of the fire, the structural features and design of the property, fire fighting operations, activities of emergency organizations and the factors which contributed to the immensity of the disaster are fully described. Most of the victims died from burns and inhalation of smoke and flame. The statement of Dr. Watters, associate medical examiner of the Southern Suffolk District, says he remembered only one broken bone—a rib—in the hundreds of bodies he examined, apparently people died too quickly to fight for their lives. The victims seem to have been overcome by something more than carbon monoxide. The report reviews the different theories which have been proposed to explain the rapid spread of the fire and to account for the fumes described by survivors as acrid but not identified. Fire experience all too clearly shows that the fear of being burned to death or suffocated, the

rush of smoke and hot gases and the sight of spreading flame completely alter the pattern of logical human behavior and produce panic. In this disaster as in others panic unquestionably played a huge part in the number of fatalities. The activities of emergency organizations were on the whole satisfactory although they demonstrated one serious fault: there was no apparent central authority in charge at the fire. The club was poorly provided with exits; many exits were completely obscured by false walls, doors were kept locked, revolving doors jammed as usual and behind these two hundred bodies were found even those exits which were available were not all clearly marked. At the close of its term the Grand Jury then in session voted ten criminal indictments with the possibility of more to come. What emerges from this report in particularly bold relief is the ease with which this great loss of life could have been entirely avoided.

### NEW OPPORTUNITIES IN HEALTH EDUCATION

Last week an announcement of fellowship made available by the W. K. Kellogg Foundation through the United States Public Health Service for training personnel in health education was published in *THE JOURNAL*, page 525. This training will take place at the University of North Carolina at Chapel Hill beginning March 20, 1943 and be completed in March 1944. This action is based, according to a communication from the United States Public Health Service<sup>1</sup> on the tremendous demand for well qualified health education personnel needed in local and state health departments. This opportunity for training in public health education should be welcomed by interested physicians or educators. The field of health education has long lacked physicians who can teach or teachers with an adequate background of the medical sciences. Out of training such as this teachers with the necessary basic qualifications should be developed. There will be an increased demand for them after the cessation of hostilities not only in the United States but presumably elsewhere. In this connection attention is called to the action of the Trustees of the American Medical Association in providing a short refresher course in health education at the headquarters of the American Medical Association under the direction of the Bureau of Health Education. Qualified applicants may register for two weeks' observation, demonstration and participation in the health education work of the American Medical Association. No tuition or fees are involved but the applicant is expected to defray his own expenses. Full information may be had from the Bureau of Health Education.

1 Letter of Jan. 23, 1943 to Bureau of Health Education from I. R. Coffey, Assistant Surgeon General, Division of Sanitary Reports and Statistics, U. S. Public Health Service.

2 Candidates will present a background of basic cultural education, basic science including physics, chemistry, biology, physiology, and bacteriology, training in education and educational psychology, and social science education. The minimum educational qualifications will be a Bachelor of Science degree or its equivalent with major emphasis on basic medical science education or the social science. The fellowships are open to American citizens between the age of 19 and 40 inclusive. A stipend of \$100 per month for twelve months plus tuition fees and travel for three months of field experience will be allowed. The applicant however must pay his own travel to and from the university at the beginning and end of training. Application blank may be had from the United States Public Health Service, Security Administration, Washington, D. C.

2 Frankel E. *Deutsche med. Wchnschr.* 15: 22, 1889.

3 Bardeen C. R. *Bull. Johns Hopkins Hosp.* 7: 137, 1898.

4 Billroth Theodor. *Wien med. Wchnschr.* 17: 705, 1867.

5 Salvioh J. *Archiv. f. path. Anat.* 125: 364, 1891.

6 Vaccarezza R. A. *Comp. rend. Soc. de biol.* 86: 1114, 1922.

1 Faxon N. W. and Churchill E. D. *The Cocoanut Grove Disaster in Boston*. J. A. M. A. 120: 1385, (Dec. 26) 1942.

2 Moulton R. S. *The Cocoanut Grove Night Club Fire*. National Fire Protection Association, Jan. 11, 1943.

# MEDICINE AND THE WAR

*In this section of The Journal each week will appear official notices by the Committee on War Participation of the American Medical Association, announcements by the Surgeon Generals of the Army, Navy and Public Health Service, and other governmental agencies dealing with medicine and the war and such other information and announcements as will be useful to the medical profession*

## ARMY

### EPIDEMIC KERATOCONJUNCTIVITIS

Circular Letter No. 14 of the Office of the Surgeon General is concerned with the treatment of epidemic keratoconjunctivitis. It was issued on January 11 to all medical officers of the United States Army. The suggestions which follow are therefore recommended as routine in the army medical service.

1 The purpose of this circular letter is to bring to the attention of medical officers an inflammatory disease of the eye which has recently been given the descriptive name of epidemic keratoconjunctivitis. It is called also virus conjunctivitis and keratitis maculosa. The disease resembles superficial punctate keratitis, keratitis nummularis and keratitis subepithelialis. Although this disease is not new, having been reported since 1890 in Austria, Germany, India and the Orient, its recent spread is of importance to the Army and to industrial plants engaged in work for the Army.

2 During the summer of 1941 an outbreak of this acute inflammatory eye disease occurred in the Hawaiian Islands among shipyard workers and subsequently spread to members of the armed forces and civilians in the adjacent areas. A spread to the mainland followed in September 1941, the first cases being noted in shipbuilding plants in the San Francisco region. In October 1941 cases were seen in Oregon again among workers in shipyards. The peak of this West Coast epidemic was reached in January 1942. Recently cases have appeared in epidemic proportions in industrial plants in the Eastern United States.

3 The etiology of epidemic keratoconjunctivitis is unknown, although evidence at present points to a filtrable virus as the causative agent. The disease probably is transmitted to susceptible persons by direct and indirect contact, such as touching the eye with a contaminated hand or towel. The presence in the immediate surroundings of noxious gases, fine particles of metal or dust or other substances irritating to the eyes may enhance susceptibility. The incubation period is from five to twelve days with the onset of the majority of cases on or about the eighth day after exposure. The disease is limited to one eye in about 75 per cent of cases. The involvement of the other eye, when it occurs, is usually less severe.

4 The initial symptoms are those of acute follicular conjunctivitis. In many cases the onset is sudden and severe. The conjunctivitis is characterized by 'sandy feeling,' as if a foreign body were present. Examination of the eye at this time discloses an extremely congested and chemotic conjunctiva, rather glassy in appearance, with sometimes concomitant edema of one or both lids, particularly the upper. Petechial or larger conjunctival hemorrhage may occur. The conjunctivitis persists about two weeks. There is no discharge, although a transient pseudomembrane may appear on the palpebral conjunctiva and caruncle. Systemic symptoms composed of headache and malaise occur shortly after the onset of the conjunctivitis in from 25 to 50 per cent of the cases. The headache, a moderately severe, dull, aching pain over the frontal or occipital region lasts two to three days and is apparently unrelieved by analgesics in most cases. It frequently prevents sleep and is often described as a "night pain." The malaise, when it occurs, varies in intensity with the severity of the conjunctivitis in most instances and is described as "not feeling well" or as having an "achy feeling." A preauricular adenitis appears in about 75 per cent of the cases thirty-six to forty-eight hours after the onset of the conjunctivitis. The nodes usually measure 1 to 2 cm in diameter,

are tender and may remain enlarged from one week to several months. A keratitis appears about one week following the first symptoms of the conjunctivitis. This is characterized by sudden pain, photophobia, lacrimation and blepharospasm. Close inspection of the eye at this time reveals several dotlike opacities in the cornea. These gradually become larger and coalesce to form small round opacities from 0.5 to 1.5 mm in diameter. The symptoms due to the onset of the keratitis usually last about one week but in some cases persist for two to six weeks. With the appearance of the keratitis the visual acuity is definitely diminished. Patients sometimes complain of seeing halos around objects. Precision work at this time is almost always impossible. A 20/30 vision is usually regained in some three to six weeks and the ultimate prognosis as to vision is good. The disease is self limited usually lasting from one to three months but sometimes much longer. The corneal opacities do not ulcerate, gradually diminish in size and in most instances finally disappear. In some severe cases, however, damage to the cornea causes permanent impairment of vision.

5 Beal's acute follicular conjunctivitis, inclusion body conjunctivitis and acute trachoma are among the conditions to be considered in the differential diagnosis. There is no way of differentiating Beal's conjunctivitis with certainty early in the course of the disease, but in Beal's conjunctivitis the cornea is never involved and the preauricular adenitis is not pronounced. The diagnosis of both inclusion body conjunctivitis and trachoma can be established by the demonstration of inclusion bodies in the conjunctival scrapings. The preauricular glands are almost never involved in either, and both respond readily to sulfonamide therapy. In addition, the cornea is not involved in inclusion body conjunctivitis and in trachoma exhibits pannus formation. Other types of conjunctivitis to be considered in the differential diagnosis are acute catarrhal conjunctivitis, gonococcal ophthalmia, Parinaud's conjunctivitis, tularemia, tuberculosis lymphogranuloma and streptococcal membranous conjunctivitis.

6 The treatment of keratoconjunctivitis is wholly palliative. Cold compresses afford more relief than does heat. The eyes should not be bandaged. Protection from the light by smoked or darkly tinted glasses is desirable. There is no specific therapy.

7 The early recognition and prevention of spread of this disease in army posts and stations are particularly important because of its high noneffective rate. Precautionary measures which should be carried out consist in: (1) Isolation of the patient during the acute stage of the disease, if practicable. Patients should have no access to towels, soap or washstands used by others. Where a small number of cases occurs, strict isolation is desirable. (2) Careful supervision of patients with irritated eyes, chalazions and traumatic lesions of the eyes which render them more susceptible to keratoconjunctivitis. (3) Advice to the patients that this disease may be transmitted by hands, towels, handkerchiefs and other fomites that have been in contact with the infected eye. (4) Thorough washing of the hands after examination of a suspected patient and before examination of other patients. (5) Sterilization of solutions, eye droppers and instruments used in eye cases. It is particularly important for the responsible medical officer to see that the fourth and fifth precautionary measures just mentioned are observed, since the dispensary can become the focus for the distribution of keratoconjunctivitis to patients who otherwise would not be exposed.

8 It should be noted also that typical cases may be present not only during an epidemic but also during the period preceding an explosive outbreak of the disease. Therefore particular attention should be paid to unusual cases of conjunctivitis that do not fall into any well known categories.

### ASHFORD GENERAL HOSPITAL AT WHITE SULPHUR SPRINGS

The War Department on Sept. 29, 1942, acquired the Greenbrier Hotel, White Sulphur Springs, W. Va., and has designated it as the Ashford General Hospital in honor of the late Col. Bailey K. Ashford of the Medical Corps.

The hospital which ultimately will have a 2,000 bed capacity, will provide all forms of medical and surgical care. The commanding officer is Col. Clyde M. Beck, Medical Corps, and the executive officer Lieut. Col. Sam F. Seeley, Medical Corps, who until recently was executive officer of the Procurement and Assignment Service, War Manpower Commission. While still in process of development, the hospital is already caring for several hundred patients. The staff when complete will represent the best in medicine, surgery and the specialties. The members now on duty are as follows:

Lieut. Col. Daniel C. Elkin, M. C., Whitehead professor of surgery and Surgeon in Chief, Emory University Hospitals, Atlanta, Ga.  
Major James M. Brown, M. C., formerly registrar, Station Hospital, Camp Robinson, Arkansas.

Major Cecil B. Hert, M. C., instructor in otolaryngology, University of Rochester, surgeon to Strong Memorial Hospital, chief bronchoscopist, Rochester General Hospital, Rochester, N. Y.

Major Robert A. Kilduffe, M. C., director, Laboratories, Atlantic City Hospital, city bacteriologist, city of Atlantic City, N. J.

Major R. H. Kuntz, M. C., associate attending pediatrician and chief of Child Endocrine Clinic, Michael Reese Hospital, Chicago.

Major T. W. Maloney, M. C., chief electrocardiographic department, Geneva General Hospital, Geneva, N. Y.

Major John M. Masters, M. C., ophthalmologist, Indiana University Hospitals, Indianapolis.

Major Marsh H. McCall, M. C., clinical instructor in medicine, Cornell University Medical College, associate attending physician, Bellevue Hospital, New York.

Major R. C. Pendergrass, M. C., radiologist, former instructor of radiology, Emory University, director of Americus Tumor Clinic, Atlanta, Ga.

Major John W. Pennock, M. C., associate professor of medicine, Syracuse University Medical School, director, metabolism department, St. Joseph's Hospital, Syracuse, N. Y.

Major George H. Prather, M. C., instructor in genitourinary surgery, Harvard Medical School, visiting urologist, Boston City Hospital, Boston.

Major Barnes Woodhall, M. C., associate professor of surgery, Duke University School of Medicine, Durham, N. C.

Captain M. L. Byrne, M. C., instructor in pathology, University of Louisville Medical School, Louisville, Ky.

Captain Frank L. Bauer, M. C., house officer, Massachusetts General Hospital, fellow, Rockefeller Foundation, Boston.

Captain Jack Chesney, M. C., chief, Tennessee Health Department, Pediatric Clinic, Knoxville, attending pediatrician, Knoxville General Hospital, Knoxville, Tenn.

Capt. Lee J. Croll, M. C., associate attending ophthalmologist, Grace Hospital, Detroit.

Captain W. H. Harken, M. C., assistant in surgery, Harvard Medical School, Boston.

Captain M. H. Harris, M. C., Whitehead Fellow in Surgery, Emory University, Atlanta, Ga.

Capt. John H. Iselin, Jr., M. C., assistant attending physician, First Medical Division, Bellevue Hospital, New York.

Capt. Robert P. Kelly, M. C., assistant in orthopedics, Walter Reed Hospital, residents in orthopedics, Louisville City Hospital, Louisville, Ky.

Capt. Samuel B. Kirkwood, M. C., instructor in obstetrics and maternal health, Harvard Medical School, chief of staff, Florence Crittenton Maternity Hospital, Boston.

Capt. Milton L. Kramer, M. C., instructor in medicine, Cornell University Medical College, associate physician, Beth Israel Hospital and Hospital for Joint Diseases, New York.

Capt. E. N. Pleasants, M. C., chief, Department of Shock Therapy, New Jersey State Hospital, Marlboro, N. J.

1st Lieut. Leonard B. Amstutz, M. C., surgical staff, Lawrence General Hospital, Lawrence, Mass.

1st Lieut. Russel E. Carl, M. C., attending surgeon, Lakeview Memorial Hospital, Stillwater, Minn.

1st Lieut. John B. Claff, M. C., assistant in surgery, Mericordia and Fitzgerald Mercey Hospitals, Philadelphia.

1st Lieut. Fred Cooper, M. C., instructor in surgery and resident surgeon, Emory University School of Medicine, Atlanta, Ga.

1st Lieut. L. T. Corum, M. C., resident in pediatrics, Grady Hospital, Atlanta, Ga.

1st Lieut. H. L. Dorfmann, M. C., associate physician, Gouverneur Hospital, New York, associate physician, Stuyvesant Polyclinic, clinical assistant, chest, Mount Sinai Hospital.

1st Lieut. William H. Galvin, Jr., M. C., resident anesthesiologist, St. Luke's Hospital, New York, chief anesthesiologist, North County Community Hospital, Glen Cove, L. I.

1st Lieut. John J. McGehee, M. C., surgical staff, Hall Chaudron Hospital, Cedartown, Ga., and McCall Hospital, Rome, Ga.

1st Lieut. Joseph Pott, M. C., instructor in medicine, Columbia University College of Physicians and Surgeons, New York.

1st Lieut. Paul Rieth, M. C., resident in orthopedics, Indiana University School of Medicine, Indianapolis.

1st Lieut. Louis M. Rosati, M. C., clinical assistant in surgery, New York Polyclinic and Gouverneur Hospital, New York.

1st Lieut. Leo M. Traub, M. C., resident in psychiatry, Stander University Hospital, San Francisco.

1st Lieut. J. L. Weinberger, M. C., staff physician and resident in psychiatry, Worcester State Hospital, Worcester, Mass.

Bailey Kelley Ashford, to whose record of achievement this hospital will be a monument was born in Washington, D. C., Sept. 18, 1873. His father, as professor of surgery in Georgetown University Medical School at the time of the assassination of President Garfield, was among those called in attendance. Bailey Ashford entered the Army Medical Corps in 1897 and joined the expeditionary forces of the army of occupation sent to Puerto Rico in 1898. When Dr. Ashford was stationed at Ponce in 1899 a hurricane wrought such havoc that for nearly a year the care of nearly 800,000 of the native population was assumed by the army. His hospital wards were filled with pallid and emaciated refugees and he promptly recognized the significance of the eosinophilia present. He found a new species of ova in the feces and recognized their relation to the anemia and malnutrition common to the inhabitants of the islands. On Nov. 24, 1899 he reported in a historic telegram his discovery that the cause of 'Porto Rican anemia' was infestation with an intestinal parasite later to be named *Necator americanus*. When the Superior Board of Health in 1900 issued a pamphlet on 'Porto Rican anemia,' the etiologic significance of uncinariasis was recognized as an important medical discovery. In 1904 the Puerto Rican government provided funds for the study and treatment of anemia and authorized the establishment of the Puerto Rican Anemia Commission.

Colonel Ashford early proposed the establishment of a School of Tropical Medicine in Puerto Rico and in 1936 he established the School of Tropical Medicine of the University of Puerto Rico under the auspices of Columbia University in which he served as professor of mycology and tropical medicine.

Colonel Ashford also carried on an investigation of sprue; he was a member of a commission sent to Brazil to investigate an epidemic finally shown to be a combination of malaria and dengue, and in 1910 was a delegate to the International Congress of Industrial Hygiene and Alimentary Hygiene in Brussels. In 1917 he sailed with the First Division for France and later became chief surgeon of the Sixth Army Corps. After the war he was transferred to the general staff in Washington and was made editor in chief of the Official Medical History of the War. Many honors were awarded him: the Distinguished Service Medal, the Order of St. Michael and St. George of England, the Order of the Nile of Egypt, Doctor of Science from the Universities of Georgetown, Columbia, Egypt and Puerto Rico; these were but a few. On Nov. 1, 1934 his distinguished career ended. His body lies in the military cemetery at San Juan. It is fitting that this great hospital at White Sulphur Springs be named after a great and humble man who spent his life in the service of his fellow men.

### THE TRAINING OF ARMY LABORATORY OFFICERS

Twenty-four army medical officers, captains and first lieutenants comprise the second group to be assigned to the University of Chicago for intensive training in laboratory methods to equip these officers to take charge of laboratories. The University of Chicago student officers are given forty-four hours of instruction a week for twelve weeks in bacteriology, biochemistry, hematology, parasitology, pathology, serology and tropical medicine. The course is under the direction of Dr. R. Wendell Harrison, assistant dean of the Division of Biological Sciences who is assisted by twelve members of the scientific faculty of the university. Similar work in laboratory methods is given at nine other universities.

### LOYOLA HOSPITAL UNIT ON ACTIVE DUTY

About fifty-one members of the faculty of Loyola University School of Medicine, Chicago recently left for New Orleans for several weeks intensive training as members of the staff of U S Army Base Hospital No 108 which is sponsored by the Loyola University School of Medicine and organized under the supervision of Col George T Jordan head of the eye, ear, nose and throat department of the medical school and a veteran of the first world war. Colonel Jordan, who has been in command of the unit for many years has been retired as commanding officer on account of the age limit. The head of the medical section of the 108th Base Hospital is Lieut Col Stanley Fahlstrom and of the surgical section Lieut Col William J Wynafek. The personnel when fully assembled will comprise about 155 doctors and nurses and 500 enlisted men of the medical department. Others who have been assigned to this unit are:

**MAJORS**  
Ellis Bonnell, Chicago Ill  
Herman F DeLeo, Chicago  
Angelo S Geraci, Chicago  
Julius M Glasser, Chicago  
C H Grandstaff, Washington  
D C Dental Corps  
Paul Headland, Chicago  
S L Governale, Chicago  
M M Hipkind, Chicago  
Alfred C Ledoux, Evanston Ill  
R R Martin, Peoria Ill  
Donald Miller, Chicago  
Howard Miller, Peoria Ill  
Benjamin H Neuman, Oak Park Ill  
A V Partipilo, Camp Carson Colo

**CAPTAINS**  
Paul K Anthony, A M C Washington D C  
Peter Birnco, Peoria Ill  
R Norton Bolman, Fort Wayne Ind  
J Morrison Brady, Chicago  
Richard H Callahan, East Chicago Ind  
J P Ciesimo, Chicago  
Arthur Falk, Chicago

Thomas A Howland, Chicago Dental Corps  
Harry J Kazen, Chicago Dental Corps  
Arno Teshin, A M C Washington D C  
Martin J McCarthy, Chicago  
Hugh O'Hare, Corps Ia  
George Perkin, Chicago  
Francis A Reed, Glenview Ill  
Paul Rosenfeld, Chicago  
John W O'Connor, Peoria Ill

**FIRST LIEUTENANTS**  
Joseph A Bertucci, Chicago  
Frank Blair, Chicago Dental Corps  
Donald Boles, Camp Carson Colo  
John B Condon, Chicago  
Robert J Freedman, Chicago  
Charles J Gaul, Camp Carson Colo  
John B Hooley, A M C Washington D C  
Charles F Kramer, Camp Crowder Mo  
Frank W Newell, Chicago  
A C Rini, Chicago  
Rocco V Serritella, Chicago  
William J Tuhie, A M C Washington D C

### MAYO CLINIC PROVIDES TRAINING FOR MILITARY OFFICERS

During the current quarter one hundred and forty medical and dental officers of the Army, Navy, Public Health Service and the Air Forces are assigned through the Surgeon General's Offices and the various service commands for training under the auspices of the Mayo Foundation for Medical Education and Research. The fields in which such training is offered are anesthesiology, aviation medicine, general surgery and surgical specialties, internal medicine and medical specialties, maxillo-facial surgery, neurologic surgery, physical medicine, roentgenology and thoracic surgery. Officers are assigned for periods of training varying from six to twelve weeks.

## CIVILIAN DEFENSE

### DUTIES OF CITIZENS DEFENSE CORPS IN GAS DEFENSE

A program for civilian protection against gas is being rapidly developed by the Medical Division of the Office of Civilian Defense. Courses have been presented for physicians selected from the faculties of medical schools to be trained as instructors in the medical aspects of chemical warfare. Arrangements are now being made for the presentation of courses by these instructors in their own medical schools.

Training for nonmedical personnel is provided in gas specialist courses which since early December have been presented monthly at War Department civilian protection schools. These schools are located at Amherst College, Amherst, Mass.; Purdue University, Lafayette, Ind.; Loyola University, New Orleans; Occidental College, Los Angeles; Stanford University, Palo Alto, Calif.; and the University of Washington, Seattle.

### DEHYDRATED FOODS COOKBOOK

A cookbook dealing exclusively with the preparation of dehydrated foods has been published, the War Department announced on February 4, for the use of army cooks, and will not be available to the public at present. The Quartermaster General of the Quartermaster Corps Subsistence Research Laboratory in Chicago and commercial organizations which have pioneered in the dehydration of foods collaborated in producing the manual, which contains recipes for cooking dehydrated apples, beets, cabbage, carrots, white potatoes, sweet potatoes, rutabagas and eggs, and also recipes for pies, cakes and puddings using dehydrated foods as ingredients. Quartermaster Corps subsistence experts state that dishes prepared according to directions from satisfactory dehydrated foods usually cannot be distinguished from those prepared from fresh materials. Dehydrated foods have decided advantages in that shipping weight of dried products is only a fraction of that of the original food. This is of particular advantage now, when shipping tonnage and space must be conserved.

### ARMY TAKES OVER WILLIAM WIRT WINCHESTER HOSPITAL

The 160 bed William Wirt Winchester Hospital, New Haven, Conn., which was established in 1918 as a tuberculosis hospital, has been leased as an army hospital for the period of the national emergency. The need for an army hospital at this location became imperative with the recent growth of the army air school at Yale University. The William Wirt Winchester Hospital was used by the army during World War I but has been vacant since 1940. Together with the building, which costs about \$1,325,000, is 44 acres of land.

### GRADUATES OF SPECIAL TRAINING COURSE

Fifty-six officers of the Medical Department of the Army graduated at the Medical Field Service School, Carlisle Barracks, Pa., February 5 from a special training course and left immediately for assignments in the medical battalions of infantry divisions now being activated. Thirty-two officers of the class had previously graduated from a basic course at the school, the only service school training Medical Department officers for field duty. Of the fifty-six officers, forty-six hold commissions in the Medical Corps, eight in the Medical Administrative Corps and one each in the Dental and Veterinary Corps. Four of the officers are majors, twenty-five are captains, twenty-two are first lieutenants and five are second lieutenants. New York had the largest number in the class with thirteen and Ohio was second with six. The scope of the course was broad since the officers will range in posts from commanding officers of the battalion to supply officers. Another class arrived February 8 to begin another special training course.

The Gas Protection Service of the U S Citizens Defense Corps has been organized as follows: The Medical Division of the Office of Civilian Defense has a gas protection section responsible for organization and training for gas defense. This section functions through the nine civilian defense regions, which are coterminous with the service commands of the U S Army. Regional gas officers have been designated for several of the coastal regions to supervise and assist the state gas consultants and the senior gas officers of defense councils in the organization of state and local programs. The senior gas officer trains gas reconnaissance agents who serve in each zone of the city. These men are responsible for the identification of the agent, the collection of samples, the prevention of casualties, the delimiting of gassed areas and cooperation with the Emergency Medical Service, the health department and other agencies concerned in protection against gas.



Instructions to members of the U S Citizens Defense Corps on their duties in gas defense have been issued by the U S Office of Civilian Defense in Operations Letter No 104 (Supplement 3 to Operations Letter No 42), dated January 11

#### DUTIES OF EMERGENCY MEDICAL SERVICE

For the Emergency Medical Service the duties are set forth as follows

*Duties Before Gas Attack*—1 Plan with assistance of senior gas officer for the establishment of gas cleansing stations for cleansing gassed patients with other injuries and for cleansing of civilian protection personnel Each hospital of 150 beds or more should be provided with a cleansing station Cleansing stations should be available in the ratio of one per 50 000 of population and should be located at smaller hospitals or casualty stations where 150 bed hospitals are not available in this ratio

2 Recruit, train and assign personnel to gas cleansing stations for cleansing services

3 Provide instruction, in cooperation with the senior gas officer, for general public and civilian protection personnel in self protection and self cleansing (Operations Letter 46)

4 Provide for instruction of physicians in diagnosis and treatment of chemical casualties

5 Assist hospitals in planning for handling of gas casualties

6 Assure adequate distribution of protective clothing and gas masks and other protective equipment to members of mobile medical teams and train personnel in their use

7 Make provision for training drivers of ambulances and sitting case cars in protection of their equipment against liquid gas contamination, inform them of arrangements for vehicle decontamination by Emergency Public Works Service

8 Arrange for the protection from contamination of the equipment used to transport contaminated casualties as far as it is possible

*Duties During Gas Attack*—1 On advice of the senior gas officer and under the orders of the commander, man the gas cleansing stations

2 Advise other services of the U S Citizens Defense Corps in regard to first aid cleansing of their personnel

3 Assign a mobile medical team to gas cleansing stations for first aid

*Duties After Gas Attack*—1 Evaluate the effectiveness of the cleansing procedures which have been used

2 Provide follow-up treatment of patients

3 Prepare inventory of protective equipment available for use in future attacks and obtain additional equipment as necessary

4 Cleanse bodies of the dead to facilitate identification

#### FUNCTIONS OF HEALTH DEPARTMENT

Important functions assigned to the health department in the local program of gas defense are as follows

*Duties Before Gas Attack*—1 Provide for analyses for war gases in samples of food and water These tests may be performed in a local health department if laboratory facilities are adequate In such case it is desirable to utilize the same laboratory facilities for the analysis for war gases of air and other materials Where laboratory facilities other than those of the local health department are more suitable for use in the analysis of war gases, arrangements should be made by the local health department for the analysis of samples of water and food

2 Advise the senior gas officer regarding the nature of instructions to the public concerning precautions to be taken in the event of water supply contamination Such instructions are to be promulgated by the health officer

3 Cooperate with waterworks officials in planning for the protection and decontamination of the water supply

*Duties During Gas Attack*—1 Collect samples of food and water for laboratory analysis if contamination is suspected

2 Inform the public regarding contamination of food and water supplies including recommendations in regard to self protection

*Duties After Gas Attack*—1 Decontaminate, destroy or otherwise provide for the handling and disposal of contaminated food supplies

2 Assist the waterworks in the treatment of contaminated water supplies

3 Advise the senior gas officer in regard to the safety of the public water and food supplies and inform the public regarding contamination of such supplies and methods of dealing with it

4 Obtain reports of analysis of samples of water or food and take appropriate action Save specimens of contaminated water and food for transmission whenever necessary to a Chemical Warfare Service or other laboratory by the senior gas officer

Gas masks are now being distributed to the personnel of the protective services As a guide to local distribution and care of masks, the Office of Civilian Defense issued Operations Letter No 106, January 20 which was published in THE JOURNAL February 6 page 438

#### SIMPLIFICATION OF EMERGENCY MEDICAL SERVICES

The Office of Civilian Defense Washington D C has according to the Washington Evening Star recommended to local defense councils a simplified plan of operating their emergency medical services James M Landis director of the Office of Civilian Defense recommended a reduction in the number of casualty stations for the slightly injured and the abolishing of most first aid posts at the scene of accidents and all first aid parties as such The District of Columbia at that time had seventy eight casualty stations Mr Landis said that the British have found that more lives can be saved if the bombing victims are treated at the scene of the incident only for the arrest of the hemorrhage and the treatment of shock and then only by doctors or nurses or by rescue workers directly under them Many preconceived notions concerning first aid have been dispelled by the experiences of Great Britain under air raid conditions Most of the victims of air raids are severely injured or dead, having been crushed under the debris of demolished buildings and less than one third are slightly injured and can be cared for at the casualty stations, as the severely injured must go to a hospital Under the new plan recommended first aid would be limited to a few simple measures administered at the scene by medical personnel or a rescue team under professional direction

#### CIVIL AIR PATROL WILL TRANSPORT PLASMA IN EMERGENCIES

James M Landis U S director of civilian defense has arranged for the Civil Air Patrol to fly blood plasma supplies into stricken areas in the event of emergencies the Medical Division, Office of Civilian Defense announced in circular Medical Series No 27, February 1

In instances in which it becomes necessary to supplement local stocks of plasma for the treatment of casualties caused by bombing fire tornado or other disaster and other methods of transportation are not available or are inadequate the regional medical officer of civilian defense is instructed to get in touch with the appropriate wing commander of the civil air patrol and request emergency transportation for the plasma Wing commanders have been authorized to accept such requests only from the regional medical officers

These arrangements apply for all states except those located within the jurisdiction of the Western Defense Command the circular states It is understood that in those states the Western Defense Command has sufficient nontactical airplanes available to furnish such transportation

#### CIVILIAN DEFENSE PERSONALS

Dr Hamilton Southworth New York, recently joined the staff of the Medical Division of the Office of Civilian Defense Washington D C, as a member of the scientific development and research section Dr Southworth who has been commissioned in the grade of surgeon in the U S Public Health Service, was expected to go to London to represent the Medical Division as an intelligence officer He is a graduate of Yale University and of Johns Hopkins University Medical School,

Baltimore, and since 1937 has been assistant in medicine at Columbia University College of Physicians and Surgeons, New York, and assistant physician at the Presbyterian Hospital and the New York Neurological Institute

Eugene W Scott, Ph D, research assistant at the Kettering Laboratory of Applied Physiology, University of Cincinnati, has been appointed gas officer in the Medical Division of the Office of Civilian Defense Dr Scott, a graduate of the University of Illinois at Urbana, received his doctorate in 1931 at Cornell University, majoring in organic chemistry, optical chemistry and biochemistry

Amos J Alter, sanitary engineer of the Indiana State Board of Health, Indianapolis, has been commissioned assistant sanitary engineer in the U S Public Health Service Reserve and

assigned to the Medical Division of the Office of Civilian Defense in Washington Mr Alter graduated from Purdue University School of Civil Engineering, Lafayette, Ind, and later did postgraduate work in public health engineering at the University of Michigan, Ann Arbor

Ralph E Tarbett, who has been chief sanitary engineer of the Office of Civilian Defense in Washington since August 1941, has been recalled to the U S Public Health Service by the Surgeon General, where he will assume the direction of the federal facility security program as it relates to domestic water supplies, and sanitary engineer Gordon E McCallum has been designated as the acting chief engineer in his stead Mr McCallum has been an officer of the Public Health Service since 1939

## MISCELLANEOUS

### PROCUREMENT OF SANITARY ENGINEERS

Paul V McNutt, chairman of the War Manpower Commission has taken steps to provide for the effective distribution of sanitary engineers among the Army, Navy Public Health Services and state and municipal agencies To locate and assign such personnel to the war services, Mr McNutt established a committee within the Procurement and Assignment Service for physicians dentists and veterinarians The chairman of the committee is Abel Wolman, professor of sanitary engineering at Johns Hopkins University and chairman of the National Research Council's committee on sanitary engineering This committee was established at the request of the Surgeon Generals of the Army, Navy and Public Health Service

Professor Wolman will sit as a member of the directing board of the Procurement and Assignment Service, the other members of the committee are

Kenneth F Macey secretary professor of epidemiology School of Hygiene and Public Health Johns Hopkins University Baltimore

Harold E Babbitt professor of sanitary engineering University of Illinois Urbana

F C Bishopp assistant chief Bureau of Entomology and Plant Quarantine U S Department of Agriculture

A M Ehlers chief engineer Texas State Board of Health Austin

Gordon M Fair professor of sanitary engineering Harvard University Cambridge Mass

H A Whitaker chief engineer Division of Sanitation Minnesota State Department of Health Minneapolis

J K Hoskins senior sanitary engineer U S Public Health Service Washington D C

Because the National Research Council committee already had considered the difficulties found in the procurement and assignment of sanitary engineers for military and civilian groups in the United States and foreign countries and had begun a canvass to determine the availability of the engineers and the prospective demands for them, Mr McNutt asked its members to serve on the new committee (THE JOURNAL, January 9 p 138)

### NURSES WANTED FOR CIVILIAN AND MILITARY NEEDS

Sixty-five thousand young women must enter schools of nursing between June 30, 1943 and July 1, 1944 if even minimum civilian and military needs of the nation are to be met, Paul V McNutt, Federal Security Administrator, announced on January 14 This quota which exceeds the previous year's quota by 10,000, was reached at a meeting in Washington of the subcommittees on nursing and hospitals of the health and medical committee, Office of Defense Health and Welfare Services Where state laws permit, schools of nursing are urged to accelerate their courses to reduce the usual training period from three years to thirty months, and in some instances even a little shorter time In most cases a college degree subtracts nine months from the course Federal and private scholarships for nursing education are available Details regarding entrance requirements may be secured from the National Committee on Recruitment of Student Nurses, 1790 Broadway, New York In general the following are basic qualifications required of an entrant She must be between 18 and 35 years old, physically fit and have at least a high school education She may be either married or single

### PUBLIC HEALTH UNDER HITLER

DNB of Dec 10, 1942 reports from Lwow the establishment of an institution to protect Europe from the dangers of health which threaten from the east This is a great typhus (flecksieber) research institute which bears the name of Emil von Behring

Besides the governor general Reich Minister Dr Frank and numerous representatives of state, armed forces and party, a large number of scientists from all parts of the reich and representatives of the Italian and Hungarian armed forces were present at the solemn ceremony The governor general announced that the fuhrer had awarded on the occasion of the ceremony the War Merit Cross (first class) to two important pioneers of medical science and research in the general government Dr Robert Kudicke and university assistant Dr Wohlrab, who had earned special merit for their work in combating typhus Prof Dr Blome, as representative of Reich Health Leader Dr Conti, conveyed the latter's greetings and then gave a survey of the origin and combating of epidemics in wartime After thanking the administration and the doctors for the successful work done in the field of health, Prof Dr Blome declared that the Lwow Institute was to be developed into the greatest typhus institute in the whole world At the end of the ceremony those present went round the new research institute, which has already started work

Reports from Riga in DNB of Dec 8 1942 state that efforts are being made to combat typhus, which had its greatest hold in Lithuania and White Russia Last year's outbreak could be kept within bounds, and precautions are being taken to check any fresh outbreak in its initial stage This is being done largely by delousing the population A special medical school has also been founded in Riga and there can be no fear of an epidemic now

According to Bersen of Dec 1, 1942 the scarlet fever epidemic has now reached general hospitals "Our patients from St Joseph's Hospital, who were infected with scarlet fever, have been transferred to the isolation hospital Eight children from Bolbro Children's Home have been removed to Middle fart Hospital because the Odense isolation hospital is full

According to Hvas of Dec 10, 1942 an agreement has been reached between the French and the German authorities regarding the repatriation of sick or wounded French prisoners who have been found unfit for military service for at least a year The repatriation is to be carried out in accordance with the provisions laid down by the Geneva Convention The French prisoners physical state of unfitness has to be decided by a medical commission It is brought to the knowledge of any whom it may concern that the German authorities do not accept individual applications

According to *Medizinische Welt*, Berlin, Oct 31, 1942, in a lecture in Breslau Professor Kathe spoke about food poisoning In spite of strict regulations to prevent poisoning from contaminated food there had been a severe epidemic of meat poisoning, and five deaths had occurred through infections with the bacillus Newport

It is stated in the *Zeitschrift für Parasitenkunde*, Berlin, 1941, in an article on trichinosis by Lehmensick and Sendisaya, that two great epidemics of trichinosis had occurred in the German army, one in Poland and the other in Norway

# ORGANIZATION SECTION

## MEDICAL LEGISLATION

### MEDICAL BILLS IN CONGRESS

*Change in Status*—H R 1749 has been reported to the House, proposing to grant medical and hospital treatment, domiciliary care and burial benefits, now available to veterans of World War I, to any officer, enlisted man or woman, member of the Army Nurse Corps (female) or Navy Nurse Corps (female) employed in the active military or naval service of the United States on or after Dec 7, 1941 and before the termination of the present war

*Bills Introduced*—The President has submitted to the Congress a supplemental estimate of appropriation for the Children's Bureau for the fiscal year 1943 in the amount of \$1,200,000 for grants to states to provide, in addition to similar services otherwise available, medical, nursing and hospital maternity and infant care for wives and infants of enlisted men in the armed forces of the United States of the fourth, fifth, sixth or seventh grades. From the funds recommended, it is contemplated, payments will be made to physicians for obstetric care, hospital and nursing services, and payment for medical care of infants. S 654, introduced by Senator Reynolds, North Carolina, proposes to establish a Chiropody Corps in the United States Army. Appointees will be required, the bill provides, to pass a similar physical examination as provided for the appointment of officers of the Medical Corps and a professional examination to include tests of skill in practical chiropody and proficiency in the usual subjects taught in schools of chiropody. S 668, introduced by Senator Bilbo, Mississippi, and H R 1706, introduced, by request, by Representative Lesinski, Michigan, propose to authorize the Veterans' Administration to provide vocational rehabilitation and assistance in securing suitable employment for service connected disabled veterans. S 662, introduced by Senator Bilbo, Mississippi, would authorize pensions for certain physically or mentally helpless children. S 655, introduced by Senator Thomas, Oklahoma, proposes to establish a United States Medical Academy for the training and instruction of persons in a manner which will best fit them for the performance of service as commissioned officers in the medical branches of the military and naval forces of the United States. H R 1673, introduced by Representative Walter, Pennsylvania, proposes a federal appropriation of \$1,500,000 to construct a veterans' hospital in the eastern part of the state of Pennsylvania for the treatment of general medical and surgical disabilities, the hospital to have a capacity of at least 400 beds. H R 1696, introduced by Representative Reed, New York, proposes to exempt certain religious, charitable, scientific, literary and educational organizations from the requirement of withholding the victory tax. H R 1764, introduced by Representative Green, Florida, proposes to authorize an appropriation of \$10,000,000 to acquire a site and to build thereon a naval hospital in Florida to accommodate 1,000 bed patients. H R 1754, introduced by Representative Miller, Connecticut, proposes to authorize an appropriation of \$350,000 to enlarge the veterans' administration facility at Newington Conn, to increase its capacity to provide accommodation for a total of approximately 500 bed patients.

### STATE MEDICAL LEGISLATION

#### Arkansas

*Bill Introduced*—S 64 to amend the basic science act, proposes that the basic science board must waive examination on recommendation of any of the various boards authorized to issue licenses to practice the healing art or any branch thereof, provided such recommendation specifies that the applicant has passed an examination in the basic sciences before a board authorized to issue licenses to practice the healing art in some other state.

#### California

*Bills Introduced*—S 879, to amend the unemployment insurance act proposes regulations for the establishment of a system of social insurance. S 885, to amend the unemployment insurance act, proposes regulations for the establishment of a system of disability unemployment insurance. A 1079 to amend the unemployment insurance act, proposes the establishment of a system of compulsory health insurance. A 1110, to amend the business and professions code proposes the creation of a board of examiners for chiropody defined as the diagnosis, medical, surgical, mechanical, manipulative and electrical treatment of the human foot, including the nonsurgical treatment of the leg. No chiropodist shall do any amputation or use any anesthetic other than local. A 1171, to amend the business and professions code, proposes the appointment by the board of medical examiners of committees to determine the following: (1) whether an applicant fulfils all the requirements for the certificate for which he is applying, (2) whether an applicant shall be admitted to an examination and the terms and conditions of his admittance, (3) whether a recommendation should be made to the members of the board that the certificate applied for be issued. A 1174, to amend the business and professions code proposes conditions under which a person whose certificate has been revoked or suspended for more than one year may be reinstated. A 1175, to amend the business and professions code proposes that applicants for a license to practice medicine must have received a diploma from an approved school. A 1191 to amend the welfare and institutions code proposes that no person shall maintain an establishment for the mentally ill without having obtained a license from the state department of institutions. A 1499, to amend the labor code, proposes that when an employee is dissatisfied with the medical treatment he is receiving from a physician furnished by the employer he may at the expense of the employer, receive the services of a consulting physician and such other physicians as the consulting physician may designate.

#### Connecticut

*Bills Introduced*—S 461, to amend the workmen's compensation act, proposes to repeal the section authorizing employers to accept waivers from employees with physical defects. Substitute for S 486, to amend the osteopathic law, proposes to extend the scope of osteopathy to entitle an osteopath to use antiseptics, sedatives and narcotics, endocrines, vitamins and vaccination and to perform such diagnostic procedures as are taught in schools of osteopathy approved by the state board of osteopathic registration and examination, provided that no osteopathic physician shall be authorized to compound a prescription for drugs other than the above for internal medication. Substitute for H 313, proposes that no articles having special utility for the prevention of conception shall be sold at retail except in a store under the supervision of a licensed pharmacist, but any person registered for the practice of medicine in Connecticut may prescribe contraceptive devices for a married woman where her life or health would be endangered by further pregnancy. Substitute for H 591 proposes regulations for the establishment of a Connecticut Cash Sickness Compensation Act. H 717 proposes that no doctor shall charge over \$2 for an office call or over \$5 for a house call.

#### Delaware

*Bill Introduced*—H 97 to amend the workmen's compensation act, proposes to authorize an employee to engage a physician or surgeon other than the one furnished by the employer and to receive from the employer the reasonable cost of such services.

**Georgia**

*Bill Introduced*—H 138 proposes to authorize the state board of health to license maternity homes and adopt rules and regulations governing and protecting the standards of service therein and to make rules and regulations concerning the certification of midwives

**Idaho**

*Bill Passed*—H 43 passed the senate on February 5. It proposes that each applicant for a marriage license produce a certificate signed by a licensed physician certifying that the applicant has been thoroughly examined and is not infected with syphilis in a communicable stage. The physician making the examination may not charge more than \$2.

**Indiana**

*Bills Introduced*—S 135 proposes to prohibit school authorities from employing food handlers who are addicted to drugs or who have tuberculosis or syphilis in an infectious stage and to require all school employees to undergo a physical examination for tuberculosis at least once every three years by a duly licensed doctor of medicine. S 177 proposes the creation of a state board of natural therapeutic physicians, the practice of natural therapy being defined as diagnosis and treatment of human ailments as taught in chiropractic, naturopathic and physiotherapy schools. H 317, to amend the vital statistics act, proposes that the state board of medical registration and examination may revoke the license of a physician who has failed to comply with its terms. H 326 proposes to require persons maintaining a nursing or boarding home for aged persons to obtain a license therefor. H 357 proposes the furnishing of necessary medical care to the parents of dependent children. H 393 to amend the medical practice act proposes to eliminate the provision authorizing the attorney general to make use of the injunctive process in enforcing the act. H 413 proposes that every person employed in a place serving food shall secure a certificate from the health officer showing freedom from contagious infectious and communicable diseases and limits the health officer to a fee of \$2 for such certificate and examination. H 440 proposes the following definitions: (1) chiropractic—the science of locating and adjusting the subluxations of the articulations of the human spine and its adjacent tissues; (2) physical therapy—the practice of healing or the administering to and treating of the sick and suffering by means of natural and physical agents; (3) naturopathy—the process or system whereby remedies for disease are discovered and whereby said remedies are applied to the healing of disease without drugs which employs various methods to assist nature in repelling the disease; (4) mechano therapy—the treatment of disease by mechanical means; (5) electrotherapy—the use of electricity for therapeutic purposes and (6) hydrotherapy—the use of water for therapeutic purposes.

*Bills Passed*—S 4 passed the senate on February 6. It proposes the enactment of a law to license and regulate nursing homes. H 66 passed the house on February 8. It proposes the enactment of a law regulating the operation of plants for the cold storage of food in individual lockers. Among other things the bill proposes that all employees of such locker plants shall undergo a semiannual health examination by a physician and requires the employer to keep such health certificates on file at all times.

**Kansas**

*Bills Introduced*—S 112 proposes to authorize the establishment of experimental classes to test the merits of the science of psychophonophysics. S 122 proposes to authorize the release of a person from an insane asylum on the basis of a certificate that he has undergone an operation which has eliminated his carnal tendencies.

**Maine**

*Bills Introduced*—S 175 proposes that the fees of expert witnesses in homicide cases shall be paid by the state. H 259 to amend the act relating to infectious and communicable diseases proposes to require every physician to report all cases of syphilis, gonorrhea, chancroid and lymphogranuloma venereum which come to his knowledge. H 328 proposes among other things, to authorize the state board of registration of medicine

to issue temporary emergency certificates to qualified physicians now licensed to practice in other states. H 632, to amend the premarital examination law, proposes that applications for marriage by a member of the armed forces will be accepted if accompanied by a report of a physical examination by any doctor of the armed forces.

**Maryland**

*Bill Introduced*—H 209, to amend the medical practice act, proposes to authorize the board to grant temporary permits to practice medicine to qualified persons.

*Bill Passed*—S 84 passed the senate on February 3. It proposes to amend the medical practice act by eliminating the proviso that no two courses of medical lectures shall be either begun or completed within the same calendar year. This amendment is apparently for the purpose of enabling graduates of accelerated medical courses to obtain licensure in Maryland.

**Massachusetts**

*Bill Introduced*—H 864 proposes to authorize the department of public welfare to grant licenses for the maintenance of convalescent or nursing homes.

**Michigan**

*Bills Introduced*—S 3 to amend the divorce laws, proposes to authorize the granting of divorces on the ground of insanity. H 99, to amend the chiropractic act proposes to extend the scope of chiropractic to include the diagnosis and treatment of diseases and injuries by the use of air, light, heat, cold, water, electricity, diet, physiotherapy and all necessary hygienic and sanitary measures incident to the care of the body, and to authorize chiropractors to sign death and health certificates and report to the health officer the same as all other persons authorized to do so under the public health laws. No chiropractor, however, shall be entitled to practice medicine or surgery. H 100 proposes that the services and facilities of all state laboratories shall be available to all licensed members of the healing professions without discrimination.

**Minnesota**

*Bill Introduced*—H 273 proposes that physicians in the armed forces shall not be required to renew their annual licenses during the term of such service and shall be exempt from payment of all renewal fees.

*Bill Enacted*—H 160 has become chapter 16 of the Laws of 1943. It requires maternity hospitals to file a written report with the director of social welfare of the birth of any child known or believed to be illegitimate within twenty-four hours after the birth occurs.

**Missouri**

*Bill Introduced*—H 134 proposes that it shall be the duty of every attending or consulting physician having charge of any minor under the age of 6 who is totally deaf or whose hearing is impaired to report that fact to the state superintendent of public schools and furnish such information as the superintendent may request.

*Bill Passed*—H 45 passed the house on February 9. It proposes to amend the marriage law by requiring any person applying for a license to marry to furnish a report of a negative laboratory serologic test for syphilis and an affidavit signed by him or herself that he or she is free from syphilis. If the laboratory test is positive the applicant must present a certificate from a physician licensed to practice in the state of Missouri certifying that the applicant is not infected with syphilis in a communicable stage.

**Montana**

*Bill Introduced*—S 63 proposes to authorize certain institutions of higher learning in Montana to obtain custody of unclaimed human bodies for use in the teaching and demonstration of anatomic science by professional instructors.

**Nebraska**

*Bills Introduced*—L B 243, to amend the chiropractic law proposes to define chiropractic as the science of locating and removing interference with the transmission of nerve energy without the use of medicine or surgery. L B 274, to amend

the medical practice act proposes to eliminate the requirement that no one of the necessary four courses of lectures of eight months each may be given within one year and to provide only that they may not be given concurrently. The purpose of this proposal is apparently to enable graduates of accelerated medical courses to obtain licensure in Nebraska. L. B. 279 to amend the medical practice act, proposes that no licensee shall be required to pay annual renewal fees while in the military service of the United States.

#### New Hampshire

*Bill Introduced*—H. 267, to amend the medical practice act proposes to authorize the board of registration in medicine to issue licenses to practice physiotherapy defined as the treatment of any person by physical means including the use alone or in combination of massage, heat, light, water or electricity, or by any laying on of the hands for the purpose of effecting relief or cure of any injury or physical ailment.

*Bill Passed*—H. 54 passed the house on January 28. The bill proposes the establishment of a state department of health to take over the powers and duties of the state board of health.

#### New Jersey

*Bill Passed*—A. 93 passed the assembly on February 1. The bill proposes to amend the medical practice act by granting an extension of two years within which a licensee must furnish proof of his actually having become a citizen.

#### New Mexico

*Bills Introduced*—H. 65 proposes that all applicants for a marriage license shall file a certificate from a physician and surgeon duly licensed to practice medicine and surgery in the state of New Mexico certifying that the applicants are free from syphilis in a communicable stage. H. 71 proposes the creation of a state board of therapeutic physicians and defines natural therapy as the diagnosis and treatment of human ailments, the manual and mechanical manipulation of the human body, the correction of feet, the use of biochemistry, herbal remedies, cell salts, diet and all material health sciences, and the application of heat, cold, air, water, light, electricity, radiant energy and exercise in the treatment of disease, injury or deformity, and for relaxing muscles, restoring normal circulation and function and regulating body chemistry, physiotherapy, electrotherapy, physiotherapy, hydrotherapy, colorotherapy [sic] and first aid in emergencies.

#### New York

*Bills Introduced*—S. 278 proposes to authorize the state commissioner of health to employ necessary medical and health personnel for rendering services in areas designated by the governor as being emergency health and sanitation areas by virtue of an inadequacy of medical facilities or personnel therein. Compensation to such employed medical personnel may be paid by the state department of health. A. 604 proposes that all railroads and other public carriers shall carry a first aid kit for the convenience of the passengers should an emergency arise. A. 636, to amend the workmen's compensation act, proposes to require an employer to furnish medical care to an employee mentally disabled as the result of an occupational injury.

#### North Carolina

*Bill Introduced*—S. 95 proposes the creation of a board of naturopathic examiners. No definition of naturopathic practice is stated, it being provided only that a naturopath shall not practice any other treatment authorized or provided for by law for the cure and prevention of disease or ailments.

#### North Dakota

*Bill Introduced*—H. 131 proposes the creation of a board of naturopathic examiners and defines naturopathy as the art and science of applied therapy as heretofore or hereafter taught in the recognized schools and colleges of naturopathy, except materia medica and major surgery.

*Bill Passed*—S. 63 passed the senate on February 9. It proposes to prohibit the sale of barbitol except on a written prescription by a doctor of medicine, doctor of dental surgery or doctor of veterinary medicine lawfully practicing his profession in the state.

#### Ohio

*Bills Introduced*—H. 95 to amend the medical practice act proposes certain changes in the causes and procedure for revocation of a license. H. 244 to amend the enabling act relating to the establishment of medical service plans proposes that physicians in the armed forces shall be considered as residing and actively practicing in the county in which they previously resided and proposes further that no certificate, authority or license to operate a medical service plan under the enabling act shall be issued for the duration of the war or within six months thereafter.

#### Oklahoma

*Bills Introduced*—S. 90 to amend the income tax law proposes to authorize taxpayers to deduct expenses for physicians' fees, hospital bills, nurses' fees, ambulance charges and all other medical expenses. H. 222 to amend the medical practice act proposes that the members of the board of examiners must be citizens.

#### Oregon

*Bills Introduced*—S. 119 to amend the workmen's compensation act proposes to redefine occupational injury so as to include occupational diseases peculiar to the trade or occupation in which an employee was engaged and due to causes in excess of the ordinary hazards of employment. H. 193 to amend the law relating to the examination of handicapped children, proposes to authorize eye examinations of such children to be made by qualified and licensed oculists or optometrists. H. 245 proposes to require persons maintaining a hospital for the treatment of persons with mental disorders or mental defects to obtain a license from the state board of health. H. 303 to amend the workmen's compensation act proposes to authorize an injured employee to receive treatment by a Christian science practitioner in lieu of medical treatment unless the employer has elected not to be subject to such provision.

*Bills Passed*—S. 91 passed the senate on February 4. It proposes to amend the osteopathic practice act by requiring osteopaths to register annually. H. 222 passed the house on February 4. It proposes to amend the chiropractic law to require chiropractors at the time of the annual renewal of their licenses to present proof that they have attended a two day educational program conducted by the Oregon chiropractic association.

*Bill Enacted*—H. 32 was approved by the governor on February 2. It repeals the law relating to the office of state bacteriologist who was authorized to make scientific studies and investigations of animal and plant diseases.

#### Pennsylvania

*Bill Introduced*—H. 161 proposes conditions for the compulsory and voluntary sterilization of persons afflicted with any presumably hereditary form of mental deficiency on the certification of qualified physicians. Excepted from the proposal would be sterilizations performed for therapeutic reasons such as tuberculosis, heart disease, tumors or infections.

#### Rhode Island

*Bill Introduced*—S. 42 as amended to amend the basic science law, proposes to exempt from the operation of the act all persons who had on April 27, 1940 already commenced the study of one of the healing arts at an approved school.

#### South Carolina

*Bill Passed*—H. 33 to amend the medical practice act passed the house on January 27 and the senate on January 28. The proposal would remove the existing requirements that no two of the required four full courses of lectures of at least twenty-six weeks may be given in the same year. The purpose of this proposal is apparently to enable graduates of accelerated medical courses to obtain licensure in South Carolina.

#### South Dakota

*Bill Introduced*—H. 84 to amend the workmen's compensation act proposes to add necessary first aid treatment to the services to be furnished by the employer.

*Bill Passed*—H. 32 passed the senate on February 5. It proposes that osteopaths be required to renew their certificates.

to practice annually and to submit evidence, at the time of such renewal, of attendance of at least two days at the annual educational program conducted by the South Dakota state osteopathic association during the preceding year

### Tennessee

**Bills Introduced**—S 460 proposes an enabling act to provide for the organization, operation and regulation of nonprofit corporations desiring to operate a nonprofit hospital service plan. Hospital service and hospital care are defined as including bed, board, use of operating room, ordinary medications, surgical dressings and other routine procedures approved by the state board of health, and general nursing care. S 490, to amend the unemployment compensation act, proposes that the term employment shall not include services performed as an intern. S 506, to amend the pharmacy law, proposes conditions under which a person has been engaged in conducting a drug store for twenty-three successive years may be authorized to compound and fill physicians prescriptions and be licensed as a pharmacist without examination. H 640 proposes the repeal of the existing premarital examination law. H 700, to amend the workmen's compensation law, proposes a list of some fifteen occupational diseases which shall be included within the meaning of injury or personal injury arising out of the course of a person's employment. H 702, to amend the workmen's compensation law, proposes to enlarge the definition of injury and personal injury so as to include such occupational diseases or infections as arise naturally out of such employment or as naturally and unavoidably result from such accidental injury. The present law only covers occupational diseases naturally arising from the injury. H 903 to amend the workmen's compensation act, proposes that the employer shall designate a group of three or more reputable physicians or surgeons from which the injured employee shall have the privilege of selecting the operating surgeon or the attending physician.

**Bills Passed**—H 39 passed the house on February 5. It proposes that hospitals and physicians called on to render aid to persons suffering from any wound or other injury inflicted by means of a knife, pistol, gun or other deadly weapon or suffering from the effects of poison or suffocation shall report the same immediately to the chief of police. H 129 passed the senate on January 28, a bill proposing the creation of a state board of naturopathic examiners. Naturopathy is defined as the prevention, diagnosis and treatment of human injuries, ailments and diseases by means of any one or more of the psychologic, physical or mechanical, chemical or material forces or agencies of nature. H 323 passed the house on February 2. It proposes to authorize a coroner, when requested so to do by the district attorney general, to summon as a witness a surgeon or physician to make an examination of the body of a deceased, including the performing of an autopsy and to give a professional opinion thereon, the fee for which is not to exceed \$25. H 420 passed the house on February 2. It proposes to prohibit the sale or advertisement of articles used for the prevention of conception without a license issued by the state board of pharmacy, except that physicians and medical practitioners regularly licensed to practice medicine or osteopathy in the state of Tennessee would not be prevented from prescribing such articles.

### Texas

**Bill Introduced**—H 274 proposes the creation of a state board of examiners in the basic sciences to examine persons desiring to take an examination for a license to practice the healing art in the subjects of anatomy, physiology, chemistry, bacteriology, pathology and hygiene and public health.

### Utah

**Bill Introduced**—S 100 proposes to make it unlawful for any person to maintain a maternity hospital without having first obtained a license from the state board of health.

**Bill Passed**—H 29 passed the house on January 29. To amend the medical practice act, it proposes to authorize the issuance of two different types of naturopathic licenses, (1) to

practice as a naturopathic physician without the use of drugs and without surgery and (2) to practice as a naturopathic physician and surgeon including obstetrics.

### Vermont

**Bills Introduced**—S 12, to amend the chiropractic law, proposes to require chiropractors to attend a four year, rather than a three year, course of study. H 50, to amend the medical practice act, proposes to repeal the section setting forth the requirements for admission to practice and to substitute therefor an authorization that the board shall make rules and regulations covering requirements for admission to practice medicine and surgery.

**Bill Passed**—H 49 passed the house on February 3. It proposes to authorize the state board of medical registration to issue temporary emergency certificates to physicians licensed outside the state if found qualified to practice in the state during the emergency.

### Washington

**Bill Introduced**—H 136 proposes that hospitals exempt from taxation because of their charitable status shall permit all physicians and surgeons in good standing with the American Medical Association to use their hospital facilities without discrimination.

**Bill Passed**—S 76 passed the senate on February 4. It proposes to exempt members of the armed forces from being required to continue in full force and effect their license to practice a profession in the state. Such may be renewed within six months after an honorable discharge.

### West Virginia

**Bills Introduced**—S 36 proposes the creation of a division of cancer control in the state department of health to administer provisions relating to the diagnosis, treatment and care of persons suffering from cancer, including the conduct of an educational program, the establishment of cancer clinics in general hospitals throughout the state and the furnishing of tissue diagnostic service to all patients. S 71 and H 120 propose the enactment of enabling legislation for the creation of nonprofit hospital service corporations. H 16 to amend the sales tax law, proposes to exempt therefrom the sales of medicines by drug stores on prescriptions signed by a physician.

### Wisconsin

**Bills Introduced**—S 36 proposes to amend the law relating to coroners so as to provide for the appointment of a medical examiner. S 53 proposes to exempt members of the armed forces from being required to maintain a license to practice any profession within the state. It proposes that this license shall be suspended during the active service of such persons and proposes that it may be renewed within six months after his discharge. S 92 proposes to authorize the rendering of necessary nonsurgical hospital or clinic service to persons committed to an insane asylum. A 65, to amend the basic science law, proposes to authorize the issuance of basic science certificates by the state board of examiners in chiropractic.

### Wyoming

**Bills Introduced**—S 9 proposes to authorize any county to create a county health department and to appoint a full time doctor of medicine licensed to practice medicine in Wyoming to serve as county health officer. H 58 proposes to prohibit the operation of a hospital unless it has secured a license issued by the state board of health. H 77 proposes regulations for the compulsory sterilization of inmates of certain state institutions if the inmates have been found to be insane, idiotic, imbecilic, feeble-minded or epileptic and the probable potential parents of socially inadequate offspring.

**Bill Passed**—S 2 passed the house on February 1. It proposes to amend the premarital examination law, proposes (1) to require the test to be made of females as well as males (2) to authorize the required certificate to be executed by a physician duly licensed under the laws of the state of Wyoming and engaged in practice therein.

## MEDICAL ECONOMIC ABSTRACTS

## STATE MATERNITY AND CHILD CARE

The last decade has seen a great increase in the activity of state agencies in supplying medical care to mothers and children. It is not simply that general health services such as public health nursing, education, sanitation and the control of tuberculosis and the venereal diseases has been greatly expanded. During the same period maternal and child health programs have taken on new features and extended old ones.

Maternal and child health care in the various states is distributed among numerous agencies, the most important of which are health departments, welfare, education, labor, state universities and licensing boards. Functions in twelve states are assigned also to other miscellaneous departments.

Education is the principal avenue of approach in the maternal and child health program. This education is directed to the general public and to the mothers and also includes special educational programs for local physicians and dentists. Aid is given in various ways to clinics and other institutions supply medical care. In all, nearly four fifths of the state health departments either supply personnel or financially aid local maternity (antepartum and postpartum) clinics while all but three of them contribute in one way or another to similar facilities for infants and preschool children.

Eligibility for clinic service depends to a large extent on a patient's economic status. While a few states indicate that the service offered is open to all most of them stipulate that only the medically needy—variously defined as "all who cannot provide service by their own resources," referrals from physicians and social workers, people of county hospital level," "all midwife cases," and those with a maximum income of \$20 per week per couple plus \$3.50 per week for each child—are accepted. On the whole economic restrictions for admission to maternity services are more stringent than for admission to services for children.<sup>1</sup>

All state health departments make some health provision for home nursing services for antepartum and postpartum cases, for infants and for preschool children. Only seventeen health departments reported that their medical care programs included attendance at home births. There are thirty-two jurisdictions providing consultant obstetricians to private physicians.

There are few states that now encourage annual examination of all school children. Instead they favor restriction of the number examined with more concentration on correction of defects.

Total expenditures by state governments supplemented by federal aid has increased from \$1,382,400 in 1930 to \$6,172,600 in 1940.

<sup>1</sup> Mountain, Joseph W. and Flook, Evelyn. Maternity Child Health Activities by State Agencies. United States Public Health Service.

## MORTALITY RATES, 1930 TO 1940

While Texas was not admitted to the registration area until 1933, the proportion of the total population included in the death registration area in 1930 was sufficiently large to justify considering the death rates of that area as representative of the entire country. Between 1930 and 1940 the expectation of life at birth of the total population increased from 59.0 to 63.3 years, an increase of 4.3 or 7 per cent. While it has generally been known that the expectation of life at birth has been greatly increased, it has been thought that there was little or no increase during later years. During the last decade however there has been a definite increase in life expectation at all ages starting from about 7 per cent at birth and being from 5 to 6 per cent from 5 to 70 years. There has even been an increase of 2 per cent in the expectation at the age of 80. Some doubt is thrown on these figures because of the inaccuracy of recorded ages in the higher brackets.

A possible side light on the effect of these changes in death rates is given by the fact that if the 1,060,000 white males born in 1940 were exposed to current mortality rates about 614,000 would reach the age of 65, but if the mortality rates of forty years ago prevailed only about 413,000 would reach that age.

While Negro death rates still are higher than those of white persons, the decrease is greater for Negroes than for white persons. The expectation of life at birth increased 3.5 years for white males but 4.4 years for Negro males, the increase for females was 4.3 and 5.7 years respectively.

Large decreases were recorded in the death rates from the principal respiratory causes of death, influenza, pneumonia and tuberculosis. The decline in the death rate from tuberculosis is a continuation of the trend observed during recent decades. The lower rate from pneumonia undoubtedly was the result in part at least, of an increasingly widespread use of serum and drugs in the treatment of this disease. It should be noted however, that the death rate from influenza also decreased very sharply during the past decade. Part of this decrease may be attributed to the fact that although the number of cases of influenza was higher than the average during 1939, the disease was not especially fatal so that the death rate remained relatively low.

While the maternal death rate had shown no decline in the birth registration area previous to 1930 (which was at least partially due to changes in the area itself) during the past decade this rate declined 48 per cent among white mothers and 34 per cent among nonwhite mothers. In 1940 the two rates were 3.2 and 7.7 per thousand live births respectively.<sup>1</sup>

<sup>1</sup> Dorn, Harold F. Changes in Mortality Rates 1930 to 1940. Pub Health Rep 57: 1858 (Dec 4) 1942.

## WOMAN'S AUXILIARY

## Arizona

The Auxiliary to the Maricopa County Medical Society held a luncheon, recently, at the Arizona Club. The guest speaker was Cavett Robert and his subject "Victory Has a Price Tag." Mrs. Harlan P. Mills, president of the Auxiliary to the Arizona State Medical Society, welcomed the U. S. Army medical officers, wives and stressed the importance of Red Cross work throughout the state.

## California

Orange County held a public relations meeting at the home of Mrs. Harry G. Huffman. Mr. Ben H. Read, executive secretary of the Public Health League of California, and Mrs. Walter Egan Foole addressed the meeting.

Members of the Auxiliary to the San Mateo County Medical Society, under the leadership of Mrs. J. Garwood Bridgman, have made sheets for the civilian defense emergency station and handled the canteen work for the San Mateo blood bank. Several auxiliary members were directly responsible for organizing the San Mateo County blood bank.

The Solano County medical auxiliary, with a membership of only thirteen, has done outstanding work in establishing and

operating the Vallejo civilian blood bank. Under the leadership of Mrs. Brownlee Perkins, this auxiliary with the assistance of the Medical Society Nurses' Association and prominent members from the community, has financed and operated this blood bank for six months. During April 1942 one thousand persons willing to give blood were signed up by members of the auxiliary.

## Pennsylvania

The Huntingdon auxiliary met at the home of Dr. and Mrs. William A. Doebele. Following luncheon, Mrs. F. H. Crumpacker, a missionary from China, gave a talk on her work in that country. Mrs. Crumpacker stressed mostly the poverty and disease prevalent in China. She said that "The atrocities committed by the Japanese are beyond description."

The Jefferson auxiliary met at the Elks' Club in Punxsutawney. Mrs. Lewis R. McCauley, president, presided. The auxiliary voted to sponsor a mobile unit for blood donors to secure blood for the Pittsburgh blood bank. Mrs. John A. Tushim, district councilor, discussed the Medical Benevolence Fund. The auxiliary held a bridge tea in December and contributed the proceeds to the fund.



## Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST SUCH AS RELATE TO SOCIETY ACTIVITIES NEW HOSPITALS EDUCATION AND PUBLIC HEALTH)

### CALIFORNIA

**Epidemic Cerebrospinal Meningitis**—For the first time since 1929 the reported incidence of cerebrospinal meningitis during 1942 approached epidemic status in San Francisco. During the year 1942 there were 32 cases reported with nine deaths as compared with the preceding four years when the average of reported cases per year was 6. The last major epidemic in San Francisco was in 1929 when there were 88 cases reported with eighty one deaths. The history of cerebrospinal fever has indicated that there are periods of high incidence recurring at fairly long intervals. Increased reporting continues into 1943. During the month of January there were 16 cases reported to the department of public health of the city and county of San Francisco of which 2 were listed as nonlocal. Among the 16 cases there were two deaths. Twelve of the patients were male and 4 female. The age incidence showed that 4 were in the group under 5 years, 5 in the group 5 to 20 years, 6 over 20 years and 1 in which the age was not stated. Fifteen of the patients were treated in hospitals and 1 patient was treated at home. As to occupation 5 of the patients were listed as in the armed forces and 4 reported as shipyard workers. A release from the department of public health states that at the time of this reporting in February the reported incidence appears to be continuing.

### COLORADO

**Annual Registration Due Before March 1**—Licensure of the State Board of Medical Examiners of Colorado is required by law to register annually before March 1 with the secretary-treasurer of the board and to pay a fee of \$2 if a resident of Colorado or \$10 if a nonresident. Failure to pay this fee within the time stated automatically suspends the right of a licensee to practice while delinquent. If he nevertheless continues to practice he is subject to the penalties provided by law for practicing medicine without a license. Failure to pay this fee for three consecutive years results in the automatic cancellation of a delinquent practitioner's license to practice.

### DISTRICT OF COLUMBIA

**Lecture on Tropical Medicine**—Col. Richard P. Strong, professor emeritus of tropical medicine, Harvard Medical School, Boston, and now director of tropical and military medicine, Army Medical School, gave a lecture in the Smith-Reed-Russell series, February 3, at the George Washington University School of Medicine. His subject was Tropical Diseases and the War. The Smith-Reed-Russell Society is composed of honor students in the school of medicine and honorary members elected to the society for outstanding achievement.

**Personal**—Dr. Edgar A. Bocock, medical superintendent of Gallinger Municipal Hospital, was presented with a number of gifts Dec. 15, 1942, to commemorate his fifteenth anniversary as head of the hospital.—William E. Leahy, LI, M. D., director of the Selective Service System for the District of Columbia, was recently awarded the Distinguished Service Medal for 1942 by the Cosmopolitan Club. The award is made annually to the citizen who has performed the most unselfish service in the community during the year. Mr. Leahy was a member of the legal counsel that appeared in behalf of the Medical Society of the District of Columbia in the recent trial.—Dr. Winfred Overholser was recently named honorary president of the District of Columbia Occupational Therapy Association.

### ILLINOIS

**New Central Unit for Typhoid Carriers in Mental Hospitals**—Freud Cottage was recently opened at Manteno State Hospital, Manteno, for the exclusive care and treatment of typhoid carriers in mental hospitals and according to the *Welfare Bulletin* is the only unit of its kind in the world. At present there are about 141 carriers accommodated in the new building which is an old ward unit converted into the new Freud Cottage. One wing in Freud Cottage has subdivisions to provide for isolation of typhoid carriers suffering from

additional complicating infections, tuberculosis, pneumonia and other contagious diseases. There is a 10 bed ward for special research in the cure of typhoid carriers and 2 and 4 bed wards to provide for special behavior problems and mental conditions requiring separate care. The entire project stemmed from the typhoid epidemic at the Manteno State Hospital in 1939, when an intensive epidemiologic study with special reference to the source of infection was carried out. The emergency recommendation for a feces and urine survey of all patients in all the mental institutions resulted in the isolation of still other typhoid carriers. Freud Cottage is the fulfillment of a decision by the state departments of health and public welfare to centralize all these patients. Men and women patients are now cared for in Freud Cottage but it is later expected to open another unit to be known as Prince Cottage, which will be used for men patients only, thus carrying out the original plan of complete segregation.

### CHICAGO

**Annual Meeting of Heart Association**—Dr. Arno B. Luckhardt, professor of physiology, University of Chicago School of Medicine, will be the guest speaker at the annual meeting of the Chicago Heart Association at Huyler's Restaurant, February 25. His subject will be "Highlights and Shadows in the Discovery of General Anesthesia."

**Personal**—Dr. Russell D. Herrold has been elected secretary-treasurer of the Chicago Urological Society to succeed Dr. Irving J. Shapiro, who has gone into active service with the navy.—Lyle B. Fildes, Ph.D., formerly of the National Institute of Health, Bethesda, Md., was recently appointed associate professor of bacteriology at Northwestern University Dental School.

**Dr. Kreuscher Retires as Chief Surgeon of Steel Corporation**—Dr. Philip Kreuscher, clinical professor of orthopedic surgery at Loyola University Medical School from 1919 to 1932 and assistant professor of surgery, Northwestern University Medical School since 1932, has retired as chief surgeon of the Chicago District Carnegie Illinois Steel Corporation, to devote his entire time to his private interests. He had held the position since 1937. Dr. Kreuscher was also medical director for the Industrial Commission of Illinois from 1932 to 1936. He has been succeeded at the steel corporation by Dr. Richard J. Bennett, Jr., who since Jan. 1, 1937, has been associate chief surgeon. Dr. Bennett graduated at Temple University School of Medicine, Philadelphia, in 1927.

**Lee Memorial Lecture in Chemistry**—Karl Paul Link, Ph.D., professor of biochemistry, University of Wisconsin, Madison, will deliver the Edward C. Lee Memorial Lecture in chemistry in the Kent Chemical Laboratory, University of Chicago, February 25. His address will be entitled "From the Haystack to the Clinic via Communitarian Chemistry" and will be an illustrated description of the application of chemistry to a practical problem in agriculture evidencing a new series of 4-hydroxy coumarins which alter the coagulability of blood. The lecture was established in honor of Edward C. Lee, Ph.D., an alumnus of the University of Chicago who died shortly after receiving his degree. His wife who established the lecture in 1940 is an alumna of the university.

### INDIANA

**Silver Star Awarded to Physician**—Capt. William I. Edwards, New Albany, army medical corps, now with the American forces somewhere in New Guinea, has been given a Silver Star for heroic action. According to the state medical journal, Captain Edwards was on duty at an American field hospital removing a piece of shrapnel from an Australian soldier when Jap bombers attacked. He continued to operate and when the enemy had gone the patient pointed to a machine gun bullet wound he suffered during the attack and suggested that Captain Edwards perform another operation which he did. The journal stated.

**State Board Modifies Regulations**—The Indiana State Board of Medical Registration and Examination in January modified some of its regulations in an endeavor to help meet the urgent problems created by the induction of a large number of physicians into the armed forces. Heretofore only one examination has been conducted each year in June but under the revised schedule an examination will be held approximately every eight months, permitting recent graduates to enter practice or to enlist in military medical units several months sooner than would have been possible under the single examination a year program which had been in effect since the creation of the board. The board held an examination in

January and the next will be in September. A modified regulation has been announced for the licensing of applicants who are graduates of foreign medical schools providing that the repetition of the senior year's work shall be required of graduates of schools located outside the United States and its possessions excepting for the duration of the present war the possessor of a medical diploma representing the full prescribed medical course in a Canadian medical school recognized by the Indiana state examining board. Previous to the modification, graduates of all schools outside the United States and its territorial possessions were required to repeat their senior year's work in an American medical school before they were eligible to take the Indiana license examination. In a further effort to cooperate with the demands of the emergency the practical examination required of reciprocal applicants from states that require a like examination has been waived for the duration. Under the modification, applicants of other states may be granted reciprocal licensure in about two weeks when practical examinations are not required. With practical examinations it generally had required about three months for an out of state physician to obtain an Indiana license. The requirement of one year of practice in the state from which the applicant reciprocates was also suspended for the duration.

### KENTUCKY

**Lectures on Tropical Medicine**—On January 26 Dr Harold W. Brown, dean of the school of public health, University of North Carolina, Chapel Hill, and professor of public health at Duke University, Durham, gave two lectures on tropical medicine at the University of Louisville School of Medicine on 'Malaria' and 'Dysentery.' On January 27 Dr M. Ruiz Castaneda of the department of public health of Mexico and professor of the National School of Medicine discussed 'Typhus.' The lectures were made possible by the National Research Council.

**State Owned Maternity Hospital Dedicated**—The Oneida Hospital for Mothers and Babies of the Mountains was recently dedicated, marking the formal opening of the first maternity hospital in the United States owned by a state and operated by a state department of health. The hospital was opened as the Oneida Mountain Hospital in 1928, but in 1936 Dr C. Adeline McConville, Brooklyn, who established it, offered the building and grounds to the state department of health for use in any way in which it might see fit. In 1941 negotiations were concluded conveying the unit to the commonwealth of Kentucky. Governor Johnson allocated funds to the state department of health for the necessary repairs and improvements and the U. S. Children's Bureau made available an annual appropriation of \$20,000 for its support. The hospital is operated as a unit of the Clay County health department in cooperation with the state department of health and its service program carried out under a plan developed cooperatively by the state department and the U. S. Public Health Service. Patients not able to pay for services are admitted free. Pay patients are charged according to their means with a minimum of 50 cents a day and a maximum of \$2.50 a day for hospital accommodations. Physicians in private practice are permitted to bring their patients to the hospital for delivery and are entitled at all times to the consultation services of the resident obstetrician. Dr Henry H. Caffee, Oneida, is the obstetrician and medical director and the director of the division of maternal and child health of the state department of health serves as maternal and child health supervisor of the hospital. The hospital has been in operation since December 1941. In the last six months it has had a continuing average of 12 patients with a peak load of 21. Principal speakers at the recent dedication included Drs Arthur T. McCormack, Louisville state health officer; Edwin F. Daily, Children's Bureau, U. S. Department of Labor, Washington, D. C. who was instrumental in establishing the project; Governor Johnson and Dr McConville. The *Bulletin* of the state department of health for January was dedicated to a historical review of the undertaking.

### MINNESOTA

**Chiropractor Loses Basic Science Certificate on Abortion Charge**—Henry Wuerzinger, Minneapolis, pleaded guilty at the district court of Hennepin County to practicing medicine without a license. He was sentenced to one year in the county jail but was placed on probation for three years on the condition that he surrender for cancellation his basic science certificate and chiropractic license, turn his medical and surgical equipment over to the Minneapolis General Hospital and return a promissory note in the sum of \$75 to the patient who was the principal in the alleged abortion. Wuerzinger was arrested on Oct. 8, 1942 following an investigation of his activities by the Women's Bureau of the Minneapolis Police Department

and a representative of the Minnesota State Board of Medical Examiners. It was revealed during the investigation that Wuerzinger had performed a criminal operation on a 22-year-old unmarried girl. The patient stated that Wuerzinger charged her \$125 in cash and in addition demanded a promissory note of \$75 dated July 1 and payable in fifteen days. He had been in similar trouble in 1935.

### NEBRASKA

**Eleventh Annual Assembly Will Be Held**—The Omaha Mid West Clinical Society has decided to hold its 1943 assembly at the Hotel Paxton, Omaha, October 25-29.

**Personal**—Dr. James K. Newman, Omaha, observed his ninety-fourth birthday on January 5.—Dr. Fred P. Beuten, formerly of Rapid City, S. D., has been appointed director of the Hall-Adams Health Unit.

**Officers of State Medical Board**—Dr. Lark G. John, Grand Island, is president of the state board of examiners in medicine, according to an announcement concerning changes in the board. Dr. Ernest T. Manning, Omaha, is vice president and Dr. George W. Covey, Lincoln, secretary.

**Society News**—The Omaha Douglas County Medical Society was addressed in Omaha recently by Drs. James Dewey Bisgard on 'Surgical Treatment of Esophageal Diverticula,' Willis E. Brown on 'Complications with Intrauterine Pessaries,' and John L. Gedgoud on 'Virus Pneumonia.'

**Serologic Tests of Employees in Industry**—The Omaha-Douglas County Medical Society has approved a plan for large scale serologic testing of employees in industry in and around Omaha. When the plans are completed the society will participate by helping to obtain blood from hundreds of employees in the many plants and indirectly wherever possible to encourage those of the group whom they know as patients to submit to the test.

### NEW YORK

**Graduate Lectures**—Dr. Clayton W. Greene, Buffalo, will speak before the Madison County Medical Society in Oneida, February 23, on 'Renal Lesions Simulating Other Maladies.' This lecture is the second of two arranged by Dr. Greene under the auspices of the state medical society as postgraduate instruction on the treatment of common diseases. Dr. Maxwell Lockie, Buffalo, gave the first lecture, February 11, on 'The Management of Arthritis, Acute and Chronic.'

### New York City

**Vesalius Celebration**—The section of historical and cultural medicine of the New York Academy of Medicine sponsored a Vesalius Celebration on January 13 to honor the quadricentenary of the publication of 'De Humani Corporis Fabrica (1543).' Papers were delivered by Drs. Arturo Castiglioni, Baltimore, on 'Andreas Vesalius, Prince of the Medical School in Padua,' and Henry E. Sigerist, Baltimore, 'The Position of Vesalius in the History of Medicine.' An exhibit of books of Andreas Vesalius from the library of the academy was a feature of the meeting.

**Personal**—Dr. John L. Rice, formerly city commissioner of health, has been appointed a consultant to Lederle Laboratories.—Miss Max J. H. Rossbach is the new director of child care for the American Women's Voluntary Services in New York.—Dr. Donald D. Van Slyke, of the Rockefeller Institute for Medical Research, department of the hospital has recently been elected an honorary member of the Kungliga Vetenskaps-Societeten (Royal Society of Sciences) of Uppsala, Sweden.—Paul D. Miller, attorney, has been elected president of the Goodwill Industries, a social service organization for the employment and rehabilitation of physically handicapped persons.

**New Health Committee for Community Service**—Albert G. Milbank, New York, attorney and president of the Milbank Memorial Fund, on February 3 was appointed chairman of a new health committee of the Community Service Society of New York to study the society's program for the control of preventable diseases in New York. The new committee will reexamine the health objectives of the Community Service Society in the light of recently acquired medical and scientific knowledge and initiate steps to adjust the organization's health and medical activities to rapidly changing conditions. Other members of the new committee include Dr. George Baehr, medical director, U. S. Public Health Service Reserve chief medical officer, Office of Civilian Defense; Dr. Frank G. Boudreau, Charles C. Burlingham, LL.D., Homer Falks, LL.D., Dr. James Alexander Miller, Paul B. Burrill and Bayard F. Pope.

**Ninth Institute on the Exceptional Child**—"The Outlook for the Exceptional Child in Postwar America" is the theme of the ninth Institute on the Exceptional Child to be held at the school of education auditorium, New York University, February 23. The institute is held annually under the auspices of the Child Research Clinic of the Woods Schools, Langhorne, Pa., but this year is being held also in collaboration with the school of education of New York University. Among the speakers will be

Herbert B. Bruner, Ph.D., "The Responsibility of the States to the Exceptional Child";  
Charlotte E. Grave, Ph.D., Langhorne, "The Responsibility of Private Enterprise for the Care of the Exceptional Child in Postwar America";  
Dr. Irving Edward Liss, "The Outlook in Medicine for the Care of the Exceptional Child in Postwar America";  
Dr. Marion E. Kenworthy, "What the Psychiatric Field Can Do for the Exceptional Child in Postwar America";  
Francis M. Garver, Ph.D., Philadelphia, "What is the Outlook in Education for the Exceptional Child in Postwar America?";  
Mrs. Sidonie Matsner Gruenberg, "The Responsibility of the Parent to the Exceptional Child";  
Dr. George G. Deaver, "What is the Vocational Outlook for the Exceptional Child in Postwar America?";  
Edward C. Lindeman, B.S., "Creating Public Understanding for Providing Effective Care of Exceptional Children in Postwar America".

## NORTH CAROLINA

**New Academy of Public Health**—The North Carolina Academy of Public Health was organized at a recent meeting at the state laboratory of hygiene, Raleigh, according to the *Health Bulletin* of the state board of health. The objectives of the new organization, which is said to be the first of its kind in the United States, are the cultivation of the science of public health, the advancement of the character and honor of the public health profession, the elevation of the standard of education of all public health workers and the promotion of public health and the extension of its benefits to all people. Officers of the new group include Dr. George M. Cooper, Raleigh, assistant state health officer and director of the division of health education, crippled children's work, and maternal and child health service; president, Finest A. Branch, D.D.S., Raleigh, director of the division of oral hygiene, vice president, and Mrs. Annie B. Edwards, secretary to Dr. Carl V. Reynolds, Raleigh, state health officer, secretary and treasurer. The establishment of the new academy of public health was interesting in view of the recent designation of the North Carolina School of Public Health as a center for training of students in public health education from all parts of the United States in a cooperative program between the W. K. Kellogg Foundation and the United States Public Health Service (*The Journal*, February 13, p. 525).

## OHIO

**Medical Officer Cited for Heroic Action**—Lieut. John Robert Schmidt, Cincinnati, M.C., U.S. Naval Reserve, has been cited by the U.S. Navy for heroically carrying out his duties while under fire in the battle of the Midway. According to the state medical journal, Lieutenant Schmidt was also recently mentioned in press dispatches from "somewhere in the South Pacific" for rendering good medical care under adverse conditions aboard a destroyer to survivors of an aircraft carrier sunk by the Japanese.

**State Meeting Planned as War Conference**—The annual session of the Ohio State Medical Association will be held at the Neil House, Columbus, March 30-31, on the general theme, "Medicine on the Home Front." The afternoon and evening of March 30 will be devoted primarily to business matters and discussions of vital problems arising from the war. A general session will be held the morning of March 31 on "Keeping Them Working," the entire program to be devoted to industrial health. The afternoon session on "Keeping Them Healthy" will cover subjects relating to the health of the civilian population generally under wartime conditions.

**Dr. Rollo Baker Named Acting Dean**—Rollo C. Baker, Ph.D., secretary of the Ohio State University College of Medicine, Columbus, since 1934, has been named acting dean of the college and acting director of the University Hospital. Dr. Baker was temporarily appointed to fill the position made vacant on January 15 by the death of Dr. Leslie L. Bigelow, Columbus. Dr. Bigelow had also been serving under a temporary appointment while Dr. Hardy A. Kemp, Columbus, is absent on military service. The new acting dean has been continuously associated with the university since he enrolled as a freshman in 1911, except for a short leave while he was working toward his doctor of philosophy degree at the University of Chicago, which he received in 1927. He was born in Middlebourne in 1888. He received the bachelor of arts degree in 1915 at Ohio State University, became a graduate

assistant in that year and continued toward a master's degree which was awarded him in 1917. From 1918 to 1921 he was an instructor in anatomy, in 1921-1928 an assistant professor and in 1928-1932 an associate professor, since 1932 he has been a full professor.

## PENNSYLVANIA

**Society News**—Dr. James M. Strang, Pittsburgh, discussed "Use of the Newer Insulins" before the Washington County Medical Society in Washington recently. The Reading Eye, Ear, Nose and Throat Society was addressed, January 20, by Dr. Matthew S. Lerner, Philadelphia, on "Deafness: Whose Responsibility Is It? Is It a Lost Cause? Mode of Treatment?"

## Philadelphia

**College of Pharmacy and Science Begins Accelerated Courses**—Consistent with the wartime policy of eliminating summer vacations in a scheduling of the eight semester curriculum leading to bachelor of science, the Philadelphia College of Pharmacy and Science will start its next freshman class on June 28. Assuming that the acceleration policy, which is a wartime adjustment, will continue operative throughout the eight semesters of the curriculum, the student entering this summer should qualify for graduation in April 1946. For the benefit of the applicants who may qualify for admission this spring and who are desirous of entering on their studies without delay and to complete the curriculum as soon as possible, the college will offer certain freshman courses, namely general chemistry, mathematics (college algebra and trigonometry), German, English composition and mechanical drawing in the spring semester, which begins March 1. These courses will be of collegiate grade and will lead to credits for advanced standing in any one of the four curriculums of pharmacy, chemistry, bacteriology and biology offered by the college.

**Annual Report of Hospital Service**—The Associated Hospital Service of Philadelphia paid hospitals \$2,361,936.06 or 78 per cent of its earned income in 1942 according to *Philadelphia Medicine*. This figure is an increase from \$1,743,586.20 or 76 per cent paid during 1941. Income from subscription fees came to \$3,007,333.56, an increase from \$2,283,987.93 earned the previous year. Balance added to reserves during 1942 was \$285,095.03 or 95 per cent of income bringing the hospital plan's total reserves against epidemics or other contingencies to about \$1,200,000. The previous year, \$271,470.82 or 11.9 per cent of income, was added to reserves. Operating expenses for 1942 totaled \$370,983.11 or 12 per cent of income as compared with \$257,109.41 or 11 per cent in 1941. At the present time about 450,000 subscribers are enrolled in the service through groups formed in seven thousand business firms and industries. More than 100,000 subscribers have been hospitalized during the four years of operation by the organization. Hospital admissions vary from 100 to 200 subscribers daily and 1,800 subscribers are receiving care every day. Newly elected members of the board of directors include Percival J. Loedinger, a trustee of Jefferson Medical College of Philadelphia; Dr. Lucius R. Wilson, medical superintendent of the Hospital of the Protestant Episcopal Church; and Dr. William Bates, president of the Philadelphia County Medical Society.

## RHODE ISLAND

**Society News**—The Providence Medical Association was addressed at its annual meeting, January 4, among others by Drs. Kalel K. Gregory and William A. Horn, Providence, on "Acute Anterior Poliomyelitis—A Review of Essential Features" and "Some Impressions of the Kenny Treatment," respectively. Dr. Meyer Saklad, Providence, addressed the annual meeting of the Memorial Hospital, Pawtucket, November 18, on "Progress in Anesthesia."

**Dr. Gormly Honored by Dental Society**—Dr. Charles F. Gormly, Providence, was presented with the medal of award and accompanying citation of the Rhode Island State Dental Society on January 27 in acknowledgment of many services to the medical and dental professions. Dr. Gormly is president of the state medical society. The award is given to "one who through eminent service has promoted the advancement of dentistry or furthered its public appreciation."

## TENNESSEE

**State Meeting Canceled**—At a meeting of the board of trustees of the Tennessee State Medical Association it was decided to cancel the annual session planned to be held in Nashville, April 13-15. A meeting of the house of delegates of the association will be called sometime in April the exact dates to be announced later.

## WEST VIRGINIA

**Personal**—Dr William C D McCuskey, Wheeling has been appointed a member of the Public Health Council for the term ending June 30 1945 succeeding Dr Albert H Hoge Bluefield

**State Association Will Hold Annual Session**—The seventy-sixth annual meeting of the West Virginia State Medical Association will be held at Charleston, May 17-18 with headquarters at the Daniel Boone Hotel Because of war conditions there will be no formal banquet or ball The pre-convention meeting of the council will be held on Sunday evening May 16 and will be followed by the first session of the house of delegates The second session will be held the following day Full scientific programs will be presented during the two day meeting

## GENERAL

**Meetings Postponed**—The medical section of the American Life Convention will not hold its 1943 meeting which was scheduled to be held in June—The annual meeting of the American Urological Association, which was scheduled to be held at the Hotel Jefferson, St Louis, May 31-June 3 has been canceled

**Snow Medal Awarded to Dr Wilbur**—The William Freeman Snow Medal for distinguished service to humanity was awarded to Dr Ray Lyman Wilbur, chancellor of Stanford University Calif during the annual dinner meeting of the American Social Hygiene Association February 1 The medal was awarded to Dr Wilbur "in recognition of the outstanding work he has done to protect American youth from the ravages of social disease" Dr Wilbur has been president of the American Social Hygiene Association since 1936

**New Publication on Dentistry**—Dr Carl W Waldron Minneapolis has been named editor of the new *Journal of Oral Surgery* to be published by the American Dental Association and L Pierce Anthony, DDS, editor of the *Journal of the American Dental Association* has been named editor in chief Dr Waldron graduated at the University of Toronto Faculty of Medicine in 1911 He received his degree in dentistry at the Royal College of Dental Surgeons in 1913 He has been serving at the University of Minnesota School of Dentistry, Minneapolis, as professor of oral surgery and as professional lecturer in the school of medicine

**Hospital Association Creates Service Bureau**—The American Hospital Association has established a wartime service bureau and named Mr James Russell Clark, Bay Shore, N Y, as director The service bureau is the result of action by the house of delegates of the association at its 1942 meeting in St Louis, October 12-16 It will have headquarters in Washington and was expected to be in operation February 15 The wartime service bureau will be under the supervision of the council on government relations of the association, which Mr Clark will also serve as secretary Mr Clark has for the past seven years been administering the Southside Hospital in Bay Shore The new bureau is for service to the association and the hospital field in general and not to promote legislation

**Method for Determination of Cadmium**—*Industrial Hygiene* reports that a dithizone method for the determination of cadmium has been worked out by Alfred N Setterlund, MS, and Arthur H Krause, BS, Chicago of the Illinois Division of Industrial Hygiene The method is especially applicable to air samples Accurate results may be obtained even in the presence of large quantities of other metals such as zinc, lead and copper Description of the procedure may be obtained in mimeographed form from the Division of Industrial Hygiene Illinois State Department of Public Health 1800 West Fillmore Street Chicago

**Dr Lela Booher Appointed Chief Nutritionist at General Mills**—Lela E Booher, PhD, director of Institute of Nutrition at the Milwaukee Children's Hospital Milwaukee has been appointed chief nutritionist of General Mills Inc, Minneapolis Dr Booher received her PhD degree at Columbia University New York in 1928 She subsequently served as instructor in biochemistry at New York Post-Graduate Medical School research assistant in chemistry at Columbia University, and biochemist at St Lukes Hospital, Cleveland, returning to Columbia as instructor in chemistry where she served from 1930 to 1936 She was chief of foods and nutrition Bureau of Home Economics U S Department of Agriculture, from 1936 to 1941 In 1938 she represented the United States at the Geneva Conference on Nutrition at the League of Nations

**Tips to Save Rubber**—The Bureau of Home Economics, Research Administration, U S Department of Agriculture has recently issued a folder and a set of printed posters to help

in the conservation of rubber 'Take Care of Household Rubber' is the title of the pamphlet which tells in popular style how to make rubber last by right storage by removing spots and by mending with a cold patch or hot patch when a first break appears Single copies of the folder are available free on request from the Office of Information U S Department of Agriculture Washington D C Make Your Rubber Last is the title and theme of the five printed posters which pictorially describe the story of care and repair The posters, 14½ by 20 inches in size are designated for use in class instruction or group meetings They are available from the Superintendent of Documents Government Printing Office Washington D C at 10 cents a set The set is especially helpful to nurses and others who handle supplies for the sick

**Special Society Elections**—Dr E Bishop Mumford Indianapolis was named president-elect of the American Academy of Orthopaedic Surgeons at its annual meeting in Chicago on January 17-20 and Dr Marjorie N Smith Petersen Boston was installed as president Other officers are Drs Fremont A Chandler Chicago treasurer Arthur G Davis Erie Pa vice president Myron O Henry Minneapolis secretary and Edward L Compere Chicago librarian historian—Dr C Lydon Harrell, Norfolk Va, was elected president of the Seaboard Medical Association at its annual meeting in Wilson N C, Dec 1-3, 1942 Vice presidents are Drs Malory A Pittman, Wilson, Horace G Ashburn Norfolk Thomas I Lee, Kingston N C and Oscar R Yates Suffolk Va Dr Clarence P Jones, Newport News Va, was reelected secretary-treasurer The forty-eighth annual meeting of the association will be held at the Hotel Jefferson, Richmond Va, November 30-December 2—Dr Frederic Wertham New York was chosen president of the Association for the Advancement of Psychotherapy at its recent annual meeting Dr Joseph Wilder New York vice president and Dr Emilian A Gutheil New York, secretary Dr Franz M Groedel New York addressed the meeting on "Psychosomatic Relationships in Heart Disease"

**Willard Gibbs Medal Awarded to Dr Elvehjem**—The Chicago Section of the American Chemical Society has awarded its thirty-second Willard Gibbs Medal to Conrad A Elvehjem PhD, professor of biochemistry, University of Wisconsin Madison, according to the *Chemical Bulletin* The medal will be presented formally to Dr Elvehjem during the meeting of the Chicago Section May 20 The medal founded by the late William A Converse, is given in special recognition of eminent work in and original contributions to pure or applied chemistry Dr Elvehjem was born in McFarland Wis in 1901 and received his degree of doctor of philosophy at the University of Wisconsin in 1927 He has been a member of the faculty of the university since 1925, when he became instructor in biochemistry He became assistant professor in 1930 after a year of study at Cambridge University, England, associate professor in 1932 and professor in 1936 He has been a member of the Council on Foods and Nutrition of the American Medical Association since 1942 Dr Elvehjem was awarded the Gibbs Medal for his studies involving trace elements in nutrition, tissue respiration, B vitamins miscellaneous studies in nicotinic acid studies demonstrating that chick dermatitis is due to pantothenic acid deficiency and for studies on the newer members of the vitamin B complex now in progress

**Increase in Catastrophe Fatalities**—The *Statistical Bulletin* of the Metropolitan Life Insurance Company reports that the number of deaths occurring in catastrophes in 1942 totaled approximately 2600, more than two and one half times as many deaths as in 1941 catastrophes The bulletin explains that catastrophes have been designated as those disasters in which the toll is at least 5 lives In 1941 the largest single accident accounted for 37 deaths In 1942 the most tragic accident was the Boston night club fire, in which 488 were killed Two coal mine explosions, one in West Virginia and the other in Colorado, took 56 and 34 lives respectively There were 54 victims in an explosion at an ordnance plant in Illinois Close to 50 persons died when sodium fluoride mistaken for powdered milk, was used in the preparation of food at a mental disease hospital in Oregon A double disaster, the sinking of a tanker and a barge on Lake Erie, took 32 lives The premature explosion of tons of gelatinite at a quarry in Pennsylvania killed 31 men Tornadoes claimed more lives in 1942 than in any of the preceding five years Most disastrous were the tornadoes which took a toll of 111 lives in seven Southern and Midwestern states in March Three series of tornadoes killed more than 100 persons in Oklahoma during the months of April to June It is interesting to note, the bulletin states, that there were many serious catastrophes in 1917 also An explosion in a Pennsylvania munitions plant in April 1917 took 112 lives A copper mine

fire in Montana and coal mine explosions in Colorado and Kentucky took 163, 121 and 62 lives respectively. There were a series of tornadoes toward the end of May of that year which killed 300 persons.

**Noise Abatement Council Announces Achievement Awards for 1943**—Announcement is made of the National Noise Abatement Council Achievement Award competition for 1943. Four awards for outstanding achievement in the elimination of needless noise will be made this year, one in each of four city population groups as follows: group 1 cities of over 500,000 population; group 2 cities of 250,000 to 500,000 population; group 3 cities of 100,000 to 250,000 population; and group 4 cities of less than 100,000 population. The awards will be given to the city in each group submitting on or before July 1, 1943, the most conclusive evidence of outstanding accomplishment during the period June 7, 1942, to June 5, 1943, in the abatement of unnecessary street noise and the control of industrial office and in-the-house noises and in the observance of National Noise Abatement Week, May 30 to June 5, 1943. Emphasized in the council's 1943 antinoise campaign and especially sought in this year's achievement award competition will be evidence of noise abatement activities directed toward the elimination of industrial office and in-the-house noises as a civilian health and welfare measure for the conservation of manpower and to aid war production. The plaque that will be given to each of the winners executed by Rene Paul Chambellan, sculptor, New York, symbolizes the war that is being waged against needless noise. The plaque depicts Aeneas, Trojan warrior hero of Virgil's "Aeneid," overcoming the many-headed monster Cerberus who guarded the gates to Hades. Aeneas, who had gone there seeking counsel from his father, Anchises, as to the future fortunes of his race, is portrayed in the act of hurling bits of drugged food into the jaws of the beast. Thus, according to Virgil's tale, effectively quells Cerberus, who falls asleep. Material submitted as supporting evidence to claims for the awards must be received by the National Noise Abatement Council not later than July 1, 1943, and may consist of any or all of the following:

Newspaper Clipping—New stories, photographs, cartoons, features and editorials.  
Photographs—Of civic and special activities and window and store display.  
Scripts—Of radio announcements and program, other talks and lecture.  
Official Statements—Photostatic or other copies of proclamations and statements issued.  
Posters—Car Card—Samples or photographs with the number and method of distribution.  
Record of Events—Date, name and place—where and when events occurred.  
Statement of Result—Official comment, activity and traffic record, other testimonials.  
Miscellaneous—Any other material or evidence of a supporting nature.

Entries may be made by any city official or department, chamber of commerce, noise abatement committee or council or by any other representative civic group or organization. Material submitted cannot be returned and will become the property of the National Noise Abatement Council. The decisions of the National Noise Abatement Council's Committee on Awards will be final. Address entries to Committee on Awards, National Noise Abatement Council, 9 Rockefeller Plaza, New York.

**Annual Report of the Commonwealth Fund**—According to its twenty-fourth annual report, the Commonwealth Fund expended \$1,937,224 during the year ended Sept. 30, 1942. Of the total, \$416,500 went to war relief, \$343,788 to medical research, \$63,648 to medical education, \$462,203 to rural hospitals, \$236,684 to public health, \$21,678 to health studies, \$117,044 to mental hygiene and \$16,731 to mental hygiene in England. A total of \$58,750 was used for research on problems of war medicine. A third of the undertakings aided during the year have a bearing on specific issues of war medicine. A new grant of \$4,500 to the Long Island College of Medicine enabled the college to invite visiting instructors to participate in its teaching program. Dr. Thomas Addis, professor of medicine at Stanford University School of Medicine, San Francisco, stayed for a six weeks period and members of the Cornell University Medical College assisted in the work in parasitology.

The report reviews the fund's help to projects in this country and England, pointing out that the Child Guidance Council had returned to London from its temporary quarters at Bath, Kay County, Okla., was selected for a second demonstration of county health department activities. Semmole County will receive assistance until July. Support for health department activities was discontinued in Jones County, Miss., and Sumner County, Tenn., and no further demonstrations of this type are contemplated for these states. The experimental subsidy to the East Alabama Health District, in which there was an

advisory staff of specialists for an entire district, ended following the death of Dr. James N. Baker, on whose initiative the plan was launched. An increase was noted of about 8 per cent in the occupancy of the thirteen rural hospitals in eleven states assisted by the fund.

The last three of the fund's fellowships for British students terminated at the end of the last academic year, no further appointments will be made for the duration of the war. However, the fund offered a new group of fellowships to physicians, sanitary officers, technicians or public health nurses chosen in cooperation with medical and health authorities of the Latin American nations and with the advice and assistance of the Pan American Sanitary Bureau. Fifteen of these fellowships went to representatives of Argentina, Brazil, Chile, Costa Rica, Cuba, Guatemala, Honduras, Paraguay and Peru.

A plan to expand the psychiatric service in the department of medicine at the Peter Bent Brigham Hospital, Boston, was discontinued on the death of Dr. Soma Weiss, physician in chief at the hospital and the resignation of Dr. John Romano, the psychiatrist, to become professor of psychiatry at the University of Cincinnati School of Medicine. Additional internships were established at the Payne Whitney Psychiatric Clinic of the New York Hospital to supplement similar assistance at the Henry Phipps Psychiatric Clinic at Johns Hopkins University and the Colorado Psychopathic Hospital. Noteworthy contributions to the bacteriologic control of communicable disease likely to be prevalent in armies have been made through the study of bacterial nutritive requirements at Harvard and the epidemiologic study of poliomyelitis there helped to win general medical support for one preventive measure—the postponement of tonsillectomies beyond the season when paralytic poliomyelitis is most common. At New York Hospital an analysis of hereditary factors in the incidence of rheumatic fever reached the conclusion that the disease follows a predictable pattern of genetic susceptibility.

## CANADA

**Honor Memory of Sir Frederick Banting**—The chancellor and president of the University of Toronto and members of the university staff accompanied Lady Banting to Mount Pleasant Cemetery recently to place a wreath on Sir Frederick's tomb. The occasion marked the fifty-first birthday anniversary of Sir Frederick, co-discoverer of insulin. The *Canadian Medical Association Journal* reports that this may become an annual ceremony.

**Changes in Faculty at University of Alberta**—Dr. John Ross Vant has been named head of the department of obstetrics and gynecology at the University of Alberta Faculty of Medicine, Edmonton, and Dr. Herman O. Baker has been named professor in the department. The announcement that appeared in *The Journal*, Dec. 19, 1942, page 1329, and listed Dr. Vant as professor of obstetrics and gynecology and Dr. Baker as associate professor was taken from the *Canadian Medical Association Journal*, November 1942, page 492.

## FOREIGN

**Planning for Science**—The Association of Scientific Workers in Great Britain organized a conference held on January 30 and 31 on the planning of science in war and peace. Consideration was given to plans of the United States of America and of Russia for the organization of research in the war and postwar periods. Special attention was given also to reconcentration of science after the war.

## Government Services

### Dr. Dyer Heads New Committee for Typhus and Rickettsial Diseases

Dr. Rolla E. Dyer, assistant director of the National Institute of Health, Bethesda, Md., has accepted the chairmanship of a committee of the Pan American Sanitary Bureau for study of typhus and rickettsial diseases. According to *Military Surgeon*, creation of this committee was recommended at the eleventh Pan American Sanitary Conference held at Rio de Janeiro, Brazil, Sept. 7-18, 1942. The particular purpose is to determine the different varieties of typhus virus existing in each country with a view of obtaining better resources for vaccination to study the reservoirs and vectors of virus in each country and to submit the conclusions of these studies to the proper conference.

## Foreign Letters

### LONDON

(From Our Regular Correspondent)

Jan 2, 1943

#### Elaborate New System for the Treatment of Injuries

The Emergency Hospital Service, referred to from time to time in previous letters to THE JOURNAL, was originally intended for the treatment of casualties from air raids and other work in connection with the war. It has now a much larger scope. It has established a large scale orthopedic and fracture treatment service with facilities for rehabilitation. Manual workers in "war industry"—a term widely interpreted to include munition work, shipbuilding and repairing, building and civil engineering, mining, agriculture, fishing, public utility undertakings, shipping and transport—are entitled to treatment. The injury need not have been suffered during employment. This new service is maintained by a series of graded hospitals. In England and Wales there are twenty-one orthopedic centers for complicated cases, sixty fracture departments for cases less complicated but requiring long treatment, two hundred hospitals for short stay cases and fracture clinics for follow-up treatment. The orthopedic centers provide the full continuity of treatment and rehabilitation service including all aspects of specialist treatment from the original resetting of the injury, through physical therapy and remedial exercises and games to complete occupational therapy.

The fracture departments are divided into two classes. Fracture departments of the A class are similar in conception to the orthopedic centers and deal with long stay cases and rehabilitation, but differ in not handling the more complicated cases, which are transferred to those centers and in not including full work shop occupation, though providing occupational therapy of a handicraft type and covering all ordinary massage, exercise and physical therapy. They also provide for full continuity of specialist treatment. Hospitals suited by specialist service and equipment to cooperate in the fracture service are classified as B because their situation in areas vulnerable to air attack is unsuited to the smooth treatment of long stay cases. They are used for short stay cases or ambulant cases.

Provision is made for follow-up treatment after the patient's discharge from the hospital. Orthopedic centers and fracture departments have outpatient services where after-care massage and physical therapy are provided. To fill up gaps and enable service to be given nearer home where possible, use is made of a number of selected clinics and hospitals able to give suitable service on the prescription of the surgeon who originally attended the injury.

#### Claim of Women for Compensation

Attacks from the air on this country have resulted in a large number of civilian casualties, for which the government pays compensation. In the House of Commons Mrs. Tate moved an amendment to the address expressing regret that the same rate of compensation was not paid to women as to men. These pensions were paid from taxation, to which women paid at the same rate as men. Replying for the government Mr. Attlee said that the appeal for equal compensation for civilian war injuries was a strong one. It was based on the principle of equal injury but in this country we had a system based on a different principle, namely the earnings of injured persons. Workmen's compensation was based on this. Compensation for civil defense workers, including compensation for accidents on duty, would ordinarily come under workers compensation. In practice payments were made to men and women in civil defense

on the basis of a maximum of six months' whole time pay. In the services the pay of men and women was different and the compensation differed accordingly. Compensation was not given as an injury allowance; there was a pension for total disability. For civil defense workers and for the uniformed services pensions were the same in the basic grades but differed for men and women. If it was proposed that civil defense workers should be given equality as between the sexes the same would have to be done for the armed forces. A change of such magnitude should not be taken on one afternoon's debate in the House. The government proposed that a select committee should be set up to report on the proposal that civilian women should be compensated equally with civilian men for war injuries on the general principles of compensation and on the levels of remuneration. The question could not be settled on an abstract principle.

In the debate which followed support and opposition did not follow party lines but cut across them. A point was made of the great services rendered by women in this war, which far surpassed those of the last war. The amendment was negatived by 229 votes to 95.

#### American Blinded Soldiers to Be Cared for in St. Dunstan's

At a luncheon given by St. Dunstan's Institute for fighting men blinded in the war the principal guests were Brigadier General Hawley, chief surgeon of the Army of the United States in the European theater of operations and Brigadier R. M. Lutton, director of medical services, Canadian military headquarters. Mr. Ernest Brown, minister of health, said that in the field of medicine and surgery a happy comradeship between the English speaking allies had developed since the war began. The most recent example of Anglo-American cooperation was that St. Dunstan's had just concluded an arrangement under which American soldiers blinded in the war would be cared for in St. Dunstan's Hospital and Training Center while awaiting evacuation and British casualties across the Atlantic would be similarly treated by the Americans. In the early days of the war American doctors came at their own expense and without remuneration to help in our hospitals. When American forces began to reach this country we arranged that they as well as other American nationals needing treatment should be accommodated in our emergency hospitals. In addition the Ministry of Health had handed over to the Americans five new fully equipped hospitals.

#### Age for Calling Up Recruits Lowered

The calling up age of young men for the army has been lowered from 18 years to 17 years and 6 months. But the age of liability for military service remains the same 18 years and also the youngest age for sending men overseas which is 19 years. The object is to provide a longer period of training. The government endeavored to postpone the date of calling up young persons of the minimum age as long as possible, but the manpower situation compelled this new measure. It is held that this war cannot be won with a mass produced army; individual action by the soldier is necessary. It is therefore an advantage to give recruits the longest possible training in this country before they are sent overseas and to make them fit for the strenuous battles they will be called on to face.

#### The Importance of Preventive Medicine

Addressing the Congress of the British Medical Students Association Mr. Ernest Brown, minister of health, said that the air was full of new ideas and new trends but that there was one we should keep constantly in front of us—preventive medicine and positive health. The age long function of the physician was to cure and relieve the sick. But it was right



that the minister of health (not minister of disease) should insist on a second duty—to prevent disease and point the way to positive health. In this second battle the doctors of the future would not be alone. They would form part of a great army of workers—nurses, teachers, engineers and architects—who were anxious to prevent disease and took for their motto "Prevention is better than cure." In their clinical work his audience would try to make a diagnosis at the earliest possible stage and to push back the diagnosis until the first tiny flowering of disease could be detected and nipped in the bud. If they carried this a stage further they would find themselves preventing disease before it had shown itself. Perhaps the greatest handicap in the practice of preventive medicine today is not that we do not know how to prevent many diseases but that the public does not take full advantage of the knowledge we have. A "doctor" originally meant a teacher. We looked to doctors to teach and lead the public so that valuable lives were not lost through ignorance of the means of prevention.

### TEL-AVIV, PALESTINE

(From Our Regular Correspondent)

Dec. 25, 1942

#### Child Mortality in Egypt

From reports of the Research committee organized by the Egyptian Health Department to investigate child mortality rates, it is learned that the average annual births for the last few years have been approximately 650,000 and deaths 430,000, 240,000 of the latter being of children. 110,000 babies under 1 year and 130,000 from 1 to 5 years old. One third of the newborn babies of Egypt die, therefore, before reaching the age of 5, while half of this number die during their first year. This high incidence of mortality tells a sad story of a diseased and suffering childhood.

The average death rates per thousand births are

In the Years	Urban	Rural	The Whole Country
1921-1925	261	130	144
1926-1930	217	138	152
1931-1935	207	147	165
1936	205	150	164
1937	206	149	165

as compared with Austria 81, India 162, Belgium 80, Bulgaria 150, Germany 64, Italy 100, England 58, and Japan 106 in 1937.

The incidence of mortality in rural communities has been growing with the years. The high figures are partly due to the increasing registration of deaths in the villages since the habit of secret interment has decreased, but there may be also an actual increase in the number of deaths owing to the low social and economic standard of the peasantry.

The incidence of child mortality in Egypt has been much higher than in many poorer countries that have a lower cultural standard. These high death rates are caused primarily by hunger, deprivation, ignorance, uninstructed motherhood and too great a number of births especially among destitute families, the results of which are malnutrition, poor housing accommodation, hard labor for women resulting in the deterioration of the body, mind and lung defects, diseases of the stomach and hereditary diseases. To this must be added the ignorance of the midwives and the few maternity and child welfare institutions.

The falling in the number of cases of infant mortality in the cities during the 1936-1940 period was to some extent due to improvement in the general health conditions of the city population and the establishment of infant welfare stations.

### Welfare of Children in Wartime

The medical institution of Hadassah is conducting a network of school luncheons throughout the country. This work was first started in 1923 but in the last few years has developed with great strides. Through these school luncheons the hungry and needy children, selected by the school nurse in the schools and kindergartens subsidized, are given one nourishing meal a day. The meal, which costs 12 mils (5 cents), contains three dishes and is planned in such a way as to provide from 30 to 40 per cent of the daily food requirement of a child 10 years of age.

In seventy-eight of these schools the work is done on an educational basis, i. e., a cooking teacher gives instruction in cooking to rotating groups of 8 to 10 pupils, who under her guidance prepare a daily luncheon for between 150 and 300 of the neediest of their fellow pupils. The cooking teacher also gives instruction in nutrition in the classroom to the seventh and eighth grade pupils. In the year 1940-1941 this work was conducted in 5 towns and 47 settlements in Palestine. There also exists a central kitchen in each of the two main towns (Jerusalem and Tel Aviv) sending out 3,000 and 1,200 meals respectively to different schools. From school kitchens where cooking teachers are employed meals are also sent out to neighboring schools without cooking teachers. In this way a total of 248 schools (of which 78 were with cooking teachers) and 52 kindergartens were reached.

The number of children fed in all these institutions was 25,385 and the total number of workers engaged in the project was 308. The total yearly budget involved was nearly £75,000, of which about £25,000 was contributed by Hadassah, the Women's Zionist Organization of America and £10,000 by the General Council (Vaad Leumi) of the Jewish Community of Palestine out of the government grant while the remaining budget of about £40,000 was covered by contributions of the Tel-Aviv municipality, local councils, local feeding committees and parents' committees, as well as by children's payments for meals.

### Vaccination Against Jericho Boil (Aleppo Boil)

The Palestine Potash Company Limited, and Kupat Holim (Palestine Jewish Workmen's Sick Fund) have worked long in their search for means of combating the Jericho boil. Thanks to the keen interest and assistance given by Professor Adler of the Hebrew University a vaccine has been provided and all the workers of the potash plant have been inoculated by the Kupat Holim physician Dr. Katzenellenbogen. The results of this inoculation were described by Dr. Katzenellenbogen in the 1942 issue of the Hebrew medical journal *Haretsua*.

It was decided to inoculate a number of noninfected recent arrivals and noninfected residents with living virus. Material used for inoculation consisted both of cultures of *Leishmania tropica* on Loeffler-serum agar isolated from a local case and *Leishman-Donovan* bodies of the same strain from the spleens of infected Syrian hamsters. The animals were infected by inoculating cultures directly into the spleen as described by Adler and Ashbel (*Ann. Trop. Med.* 34:207 [Dec.] 1940). Inoculations were made on the anterior surface of the thigh about 10 cm above the knee, 0.2 cc in the case of culture and 0.05 cc of emulsion in the case of *Leishman-Donovan* bodies were injected intradermally. A total of 167 persons were inoculated, 82 with *Leishman-Donovan* bodies and 85 with cultures, 152 cases were observed for a period of six to ten months.

The incubation period varied from less than two weeks to more than two months. In 7 cases lesions appeared both on the site of inoculation and on remote sites (the neck, face and arms) and it is believed that in these cases the inoculation



was made during the incubation period of natural infection. Reinfection succeeded in 1 case out of 13 tested. With the exception of the 7 cases in which inoculation was done during the inoculation period of natural infection none of the incubated cases showed any lesion apart from the experimental sore on the left thigh. Twenty cases were tested by intradermal inoculation of 100 000 dead flagellates shortly after Leishman-Donovan bodies were found in the experimental lesions. In 18 a positive reaction was observed within forty-eight hours. Ten cases were similarly tested during the incubation period and in all of them the reaction was negative. The effects of vaccination are indisputable, and all persons entering hyperendemic centers and noninfected residents should be vaccinated preferably shortly after the termination of the sandfly season. The inoculation of some persons during the incubation period of a natural infection is inevitable, but they are none the worse for an additional sore in an unexposed part and all other persons are spared unsightly scars in exposed parts. It was also noted that Leishman-Donovan bodies from the spleens of infected hamsters produced only local cutaneous lesions in human beings without any evidence of visceral involvement.

### BRAZIL

(From Our Regular Correspondent)

Jan 9, 1943

#### Inoculation of Killed BCG Vaccine for the Early Diagnosis of Tuberculosis in Infants

As previously reported in *THE JOURNAL*, Dr Alindo de Assis of the Viscondessa de Moraes Tuberculosis Institute of Rio de Janeiro has been carrying out extensive studies on the pathogenicity of the BCG vaccine and on the human conditions described by Saye, Saenz, Sayago and others as "infratuberculin allergy," a state closely related to the so called latent allergy of tuberculous guinea pigs, after Willis. These scientific investigations promise to have practical significance in the near future. In a paper in collaboration with Dr Alvimar de Carvalho of the same institute (*THE JOURNAL* Nov 28, 1942, p 1053) Dr de Assis reported his attempts to establish the foundation of a standard technique to ascertain the condition of infratuberculin allergy in man. He pointed out the behavior of the skin of normal children, i.e. without tuberculosis when inoculated with 0.1 mg of BCG vaccine killed by heating at 65 C. In a new paper Dr de Assis gives an account of the results of the study of the apparently anallergic reactions in 8 children, as they did not react at first to the highest dose of tuberculin (10 mg) intradermally. Nevertheless, further observation of the patients demonstrated that in reality they all harbored virulent tubercle bacilli at the time they first were tested with tuberculin. In all these children the classic allergy was in course of preparation, but the use of the killed BCG vaccine had as a consequence the disclosure of this preparatory condition, rapidly going over all the stages of the so called preallergic period and immediately betraying the existence of a virulent infection. The new work of Dr de Assis is quite different from several contributions previously reported in the medical literature because it has the essential character of revealing the initial stages of the allergic impregnation during the course of the tuberculous infection, and not the mere disclosure of the residual vestiges of an extinguished infection.

The 8 children, whose ages varied from 1 to 7 years, were first submitted to the tuberculin diagnostic test and found anallergic and then received intradermally 0.1 mg of killed BCG vaccine. During the subsequent period they were carefully studied by means of clinical bacteriologic, radiographic and allergic examinations. Contrary to what happens in non-tuberculosis infected children Dr de Assis's patients showed precocious and intense nodular reactions at the place of the

BCG inoculations. During the first two weeks all these nodular foci had a diameter of more than 5 mm and some of them also at this early stage presented caseation. In 3 of the cases the nodular reactions were related to the tuberculin type considerably increasing during forty-eight to ninety-six hours then decreasing and later increasing again. Moreover in 4 cases postvaccinal tuberculin allergy appeared within eight days, as characterizes the Willis-Save phenomenon. In 4 of the remaining cases this tuberculin veering occurred late, but its features of intensity and duration together with other factors for the study of each case were sufficient to prove that the interpretation had to be the same as in the other 4 cases. As in individuals in early infancy without any history of manifest tuberculous disease or history of BCG immunization the nodular and tuberculin Willis-Save reactions have been considered as revealing virulent tuberculosis eventually in the preallergic period. In 4 cases the inoculation of the gastric washings in guinea pigs has proved that the hypothesis was correct. In the remaining 4 the study of the successive roentgenograms the clinical symptoms and the home investigations as well as the features of tuberculin allergy, proved also that the existence of virulent tuberculous infection was practically a certainty.

In conclusion, Dr de Assis's work proves that during the course of the tuberculosis primary infection of infancy, the tuberculin allergy of the skin is established progressively through a preallergic period the presence of which had not previously been demonstrated. The intradermal inoculation of dead bodies of the tubercle bacillus (0.1 mg of BCG vaccine killed by heating) in children who are in the preallergic period is accompanied by specific and characteristic reactions that permit the recognition of the preexistence of a virulent tuberculous infection before the appearance of cutaneous allergy and consequently of the x-ray signs and the local and general clinical symptoms.

#### Association of Thiamine and Riboflavin to Stimulate Growth

Dr Moura Campos, professor of physiology at the University of São Paulo is carrying out a series of investigations on the vitamin content of Brazilian foods and on the practical importance of the different vitamins. In a recent paper he reported his work showing that thiamine and riboflavin act in association to help in the utilization of the food material by stimulation of the appetite and increase of the food assimilation. Dr Campos's experiments have shown that the presence of thiamine is necessary to the utilization of riboflavin. Thiamine alone cannot maintain the growing capacity. Mandioquinha (*Chaerophyllum bulbosum*) has riboflavin but does not contain thiamine. Goiaba (*Psidium guajava*) presents both thiamine and riboflavin. These foodstuffs produced clear positive and negative results in the experiments the growth of the rats being maintained well when the animals were fed on the latter fruit alone.

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## Marriages

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JULIAN PATTERSON HARDY Newala, Ala, to Miss Marion Frances Doughty of Tuscaloosa recently.

ORVILLE PATTON STONE to Miss Hazel Louise Woodcock both of New Orleans December 18.

ROBERT DENNEY SANDERS Victoria, Texas, to Miss Helen Mathias in Houston February 6.

VINCENT I THACKER Dothan, Ala, to Miss Nettie M Smith of Troy, November 24.

FRANK J CERNY Berwyn, Ill, to Miss Viola McNeel in Chicago, November 8.

DALF A ROLD to Miss Mary Louise Stropes, both of Chicago, December 23.

## Deaths

**Hermann Johannes Boldt** \* White Plains N. Y., University of the City of New York Medical Department, New York, 1879, formerly a pharmacist, emeritus professor of gynecology at the New York Post-Graduate Medical School, where he had been professor of gynecology from 1891 to 1917, consulting gynecologist to the New York Post Graduate Medical School and Hospital, Stuyvesant Polyclinic, St. Vincent's, Beth Israel and Union hospitals, member of the Southern Surgical Association, one of the founders, formerly a member of the board of governors and fellow of the American College of Surgeons, honorary member of the American Gynecological Society, the American Gynecologic Club, Gynecological Society of Great Britain and the Westchester Surgical Society, member of the National Society of Sciences, New York Academy of Sciences, Association of Military Surgeons of the United States, New York Academy of Medicine and Royal Society of Medicine, London, extensive investigator into physiologic action of cocaine and gynecologic pathology, inventor of an operating table for abdominal surgery which won a medal at the Paris exposition in 1900 and also a modern examining table for office work, aged 86, died accidentally, January 12, in a hotel at St. Petersburg, Fla. of fumes from a small heater.

**William Launcelot Brown** \* El Paso Texas, Rush Medical College Chicago 1896, an Affiliate Fellow of the American Medical Association and in 1911 a member of its House of Delegates, fellow of the American College of Surgeons, honorary life president of the Southwestern Medical Association of which he was a founder many years ago, served as chief surgeon of the El Paso and Southwestern Railroad and later consulting surgeon of the Southern Pacific Railway System, aged 69, on the staff of the Hotel Dieu, Sisters' Hospital, where he died December 28, of shock and hypostatic pneumonia caused by a fractured rib from an accidental fall.

**James Lindsay Andrews**, Memphis, Tenn., Memphis Hospital Medical College 1895, member of the Tennessee State Medical Association, past president of the Memphis and Shelby County Medical Association, served as surgeon on a British transport during the Boer War and was a major in the medical corps of the U. S. Army during World War I, formerly professor of obstetrics at his alma mater, at one time president of the city health department, in 1922 became medical director of the Columbian Mutual Life Insurance Company, aged 67, died January 10, in the Baptist Memorial Hospital of cerebral embolus.

**William Lloyd James** \* Newark N. J., University of Pennsylvania School of Medicine, Philadelphia 1921, specialist certified by the American Board of Urology, Inc., member of the American Urological Association, fellow of the American College of Surgeons, assistant urologist, Newark City Hospital, the Babies' Hospital, Coit Memorial and the Presbyterian Hospital, chief genitourinary clinic, Newark City Dispensary, attending urologist, St. Mary's Hospital, Passaic, aged 46, chief of the genitourinary clinic and assistant urologist to the Newark Memorial Hospital where he died, January 10, of uremia.

**Robert Earl Watkins** \* Belmar N. J., Jefferson Medical College of Philadelphia, 1917, served in the U. S. Navy during World War I, past president and treasurer of the Monmouth County Medical Society, served as a member of the board of education of Belmar, school physician for Wall township and Spring Lake Heights, a member of the board of governors of Allenwood (N. J.) Sanatorium and Monmouth County Hospital for Tuberculosis, aged 51, on the staff of the Pitkin Memorial Hospital, Neptune, where he died December 23, of multiple sarcoma.

**Edward Lieurance**, Warm Springs, Mont., Medico-Chirurgical College of Kansas City, Mo., 1903, past president and charter member of the Mount Powell Tri-County Medical Society, member of the Montana State Medical Association, veteran of the Spanish-American War and World War I, served for many years as medical officer of Crow Indian Reservation, assistant superintendent of the Montana State Hospital for thirteen years, and a member of the resident staff since 1924, aged 63, died, January 2, of chronic diabetes and acute pyelonephritis.

**William P. Adamson** \* Tampa, Fla., University of Georgia Medical Department, Augusta, 1900, member of the House of Delegates of the American Medical Association in 1929, in 1920 president of the Florida Medical Association and in 1911 presi-

dent of the Hillsborough County Medical Society, recently a member of the district number 7 state welfare board and district draft appeal board, chairman of the health service committee of the chamber of commerce of Tampa, aged 68, died, January 3, of acute coronary thrombosis.

**David Andrew** \* Salt Lake City, Jefferson Medical College of Philadelphia, 1910, consultant in gynecologic surgery on the staff of the Dr. W. H. Groves Latter Day Saints Hospital, where he had served in various capacities, aged 65, died, December 25, of coronary occlusion.

**William Woodard Applewhite**, Brassfield, Miss., Memphis (Tenn.) Hospital Medical College, 1888, aged 84, died December 21, at a hospital in Hattiesburg of chronic valvular heart disease and chronic nephritis.

**Samuel Barris** \* Long Beach N. Y., Baltimore University School of Medicine 1900, aged 73, died, December 11, in the Park East Hospital, New York, of cerebral hemorrhage.

**James P. Blake**, Harrison, Maine, Medical School of Maine, Portland, 1892, member of the Maine Medical Association and in June 1942 was presented with the association's gold medal in recognition of his fifty years in the practice of medicine, aged 77, died, December 8, in a hospital at Portland of carcinoma of the colon.

**Walter Boone** \* Griffey, S. C., University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore 1919, formerly county health officer, served during World War I, aged 49, died, January 1, of a self-inflicted bullet wound.

**Adda T. Hedges Brady**, Sierra Madre, Calif., Cleveland University of Medicine and Surgery, 1897, aged 82, died, December 24, of cerebral hemorrhage.

**Joseph William Browning**, Exeter, Ont., Canada, Victoria University Medical Department, Coburg, 1867, aged 99, died, December 20.

**Joseph Carlucci**, Tuckahoe, N. Y., New York University Medical College, New York 1897, at one time served as physician for the Monroe County Penitentiary at Rochester, aged 73, died, December 10, in St. John's Riverside Hospital, Yonkers.

**Bedau A. Cole**, Thorp, Wis., Hahnemann Medical College and Hospital, Chicago 1883, aged 85, died, December 15, of cerebral hemorrhage.

**Charles Thomas Crance** \* North Tonawanda, N. Y., University of Buffalo School of Medicine, 1900, fellow of the American College of Surgeons, formerly city physician, aged 64, died December 26, in the Buffalo (N. Y.) General Hospital of bronchopneumonia.

**Herbert Hazeltine Frothingham**, Long Beach, Calif., Chicago Medical College 1885, for many years a practitioner in Chicago where he was at one time a demonstrator and lecturer in anatomy at his alma mater, served during World War I, aged 80, died January 7, in St. Mary's Long Beach Hospital of bronchopneumonia.

**Edwin Forrest James**, Springfield, Mo., Beaumont Hospital Medical College, St. Louis 1895, also a pharmacist, member of the Missouri State Medical Association, past president of the Greene County Medical Society, served as a captain in the medical corps of the U. S. Army during World War I, at one time city health officer, aged 72, died, December 18, in the Burge Hospital of cerebral hemorrhage.

**Jesse Isaac Jones** \* Manchester, Iowa, Ohio State University College of Homeopathic Medicine, Columbus, 1920, past president of the Delaware County Medical Society, served in the medical corps of the U. S. Army during World War I, medical superintendent and part owner of the Jones Clark Hospital, aged 49, died suddenly, December 28, of coronary occlusion.

**John Marion Langsdale** \* Kansas City, Mo., Missouri Medical College, St. Louis, 1878, at one time served as coroner of Jackson County and as city physician of Kansas City, formerly lecturer on genitourinary surgery at the University Medical College of Kansas City, aged 86, died, December 22, in the Wesley Hospital of coronary occlusion.

**George Washington Lawhorn**, Columbia, Mo., University of Missouri School of Medicine, Columbia, 1883, Bellevue Hospital Medical College, New York, 1884, aged 80, died, December 24, of arteriosclerosis.

**Herbert Everett Long**, San Francisco, University of California Medical School, San Francisco 1912, aged 56, died December 29, in the Franklin Hospital of acute coronary occlusion.

**Frank Samuel Lovering**, Moultonboro, N H Dartmouth Medical School Hanover 1884 member of the New Hampshire Medical Society school physician and for many years a member of the local school board, was chairman of the town welfare board aged 81, died, December 25, in the Huggins Hospital, Wolfeboro of empyema of the gallbladder

**Albert L McClard**, Newark, Ark (licensed in Arkansas in 1903), aged 75, died, December 14, of pneumonia

**Charles M Mickle**, Texas, Ga, Medical College of Alabama, Mobile 1890 served as vice president and a director in the Bank of Heard County, at one time county commissioner and state senator, aged 76, died, November 9 of nephritis and senile gangrene

**Walter McNab Miller**, Columbia Mo, Cooper Medical College, San Francisco, 1895 member of the Missouri State Medical Association at one time professor of pathology and bacteriology at the University of Missouri School of Medicine served as secretary of the Missouri State Tuberculosis Society and of the State Tuberculosis Sanatorium board formerly pathologist to the Parker Memorial Hospital, aged 83 died December 13, in Kansas City

**John Franklin Myers** Ⓢ Sodus, N Y, College of Physicians and Surgeons New York, 1887, for twenty-seven years a member of the board of education of Sodus, founder and owner of the J F Myers Hospital aged 79, died, December 25, of coronary thrombosis

**James Slaughter Norton**, Sayreton Ala, Vanderbilt University School of Medicine, Nashville Tenn, 1908, member of the Medical Association of the State of Alabama, for many years physician for the Republic Steel Company aged 59, died December 27, in Birmingham of angina pectoris

**C W Oliver**, Jonesboro, Ark (licensed in Arkansas in 1903) aged 74 died December 16, in St Bernards Hospital of paralysis agitans

**Ermin Anthony Pautler** Ⓢ Red Bud, Ill St Louis University School of Medicine, 1926, on the staff of St Clements Hospital aged 41 died, January 3, in St Mary's Hospital St Louis, of hypertensive cardiovascular disease

**Eber Reeves**, Oberlin, Kan Central Medical College of St Joseph, Mo 1905 aged 63 died November 7 of diabetes mellitus and tuberculosis of the skin

**Harry Kelchner Reynolds**, Brooklyn University and Bellevue Hospital Medical College, New York, 1900, member of the Medical Society of the State of New York formerly on the staff of the Prospect Heights Hospital and on the courtesy staff of the Brooklyn Hospital, aged 57, died, December 29 of cerebral thrombosis

**Albert Henry Rondeau**, Winnipeg Man Canada Manitoba Medical College Winnipeg, 1905 aged 61 died December 11, in the Winnipeg General Hospital of pneumonia and hypertension

**John Henry Rorke** Ⓢ Reading Pa University of Pennsylvania Department of Medicine Philadelphia, 1901, fellow of the American College of Surgeons served during World War I formerly served as county coroner and as city councilman for many years a member of the staff of St Joseph Hospital, since 1933 a member of the board of trustees of Albright College, aged 64, died, December 27 of coronary occlusion

**David Rose**, Sebastian Fla Victoria University Medical Department Coburg Ont, Canada, 1882 member of the Florida Medical Association, for many years served as local registrar for vital statistics in his district aged 88 died, December 5 in the Indian River Hospital Vero Beach, of senility

**Arthur Sylvester Ruland**, Syracuse N Y Syracuse University College of Medicine 1894 member of the Medical Society of the State of New York for many years a member of the staff of the Crouse-Irving Hospital served as a captain in the medical corps of the U S Army during World War I aged 74 died, December 23 of cerebral hemorrhage

**Charles H Rupprecht**, Calumet Mich Michigan College of Medicine and Surgery Detroit 1895 member of the Michigan State Medical Society, member of the staff of the Calumet

Public Hospital Laurium aged 73 died December 8 of carcinoma of the large intestine

**Leslie Tanguary Rumsiselle**, Washington D C College of Physicians and Surgeons Baltimore, 1913 member of the Medical Society of the District of Columbia served as a major in the medical corps of the U S Army during World War I aged 54 died December 26 of carcinoma

**Aaron Leidy Ruth**, Conshohocken Pa University of Pennsylvania School of Medicine Philadelphia 1912 member of the Medical Society of the State of Pennsylvania served during World War I a trustee of the Norristown (Pa) State Hospital aged 56 on the staff of the Lankenau Hospital Philadelphia where he died, December 24 of cerebral thrombosis

**Harry Bayliss Stokes** Ⓢ Omaha University of Michigan Medical School Ann Arbor 1929 member of the American Academy of Ophthalmology and Otolaryngology specialist certified by the American Board of Otolaryngology major in the medical corps Army of the United States stationed for a short time at Fitzsimons General Hospital Denver aged 38 was killed in action in the North African area January 2

**Harry Eugene Teasley** Ⓢ Robinson Ill Tulane University of Louisiana School of Medicine New Orleans 1928 formerly instructor in bacteriology and pathology at the Emory University (Ga) School of Medicine and instructor in bacteriology at the University of Colorado School of Medicine Denver appointed a major in the medical corps of the Army of the United States Oct 27 1942, aged 40 died November 22 near Orlando Fla of heart disease

**Cecil Judson Vaughn**, Luverne Min University of Louisville (Ky) School of Medicine 1930 member of the Medical Association of the State of Alabama at one time health officer of Holmes County Miss aged 36 died December 31 in the Newell and Newell Sanitarium Chattanooga Tenn of poisoning by mercury bichloride

**John Armstead Winstead**, Raleigh N C North Carolina Medical College Charlotte, 1914 specialist certified by the American Board of Pediatrics, Inc served as a captain in the medical corps of the U S Army during World War I for many years on the staff of the Park View Hospital Rocky Mount since Oct 16 1940 had been on the staff of the North Carolina State Board of Health as senior examining physician division of industrial hygiene aged 53 died December 25 of coronary occlusion

**Robert James Wiseman**, Lewiston Maine Medical School of Maine Portland 1903 member of the Maine Medical Association also a druggist served as mayor of Lewiston for many years aged 71 on the staff of St Mary's General Hospital where he died, November 20 of lymphosarcoma

#### KILLED IN ACTION



HARRY BAYLISS STOKES  
Major, M C A U S 1904 1943

#### DIED WHILE IN MILITARY SERVICE

**Maurice Anthony Bisson**, St Albans Vt University of Vermont College of Medicine Burlington 1933, member of the Vermont State Medical Society, fellow of the American College of Surgeons surgeon on the staff of St Albans Hospital was called to active duty as a captain in the medical corps of the Army of the United States on July 27 1942, aged 33 died January 1, in Fort Devens, Ayer Mass, of myeloid sarcoma with metastasis

**Joseph Dillon Jr**, Sacramento Calif Columbia University College of Physicians and Surgeons, New York, 1932 member of the California Medical Association, lieutenant in the medical corps of the U S Naval Reserve began active duty March 18, 1942, aged 36, died, December 6 of heart disease while at sea

**A Edgar Wrightman Jr**, Portland Ore University of Oregon Medical School, Portland 1931 began active duty in June 1942 as a first lieutenant in the medical corps of the Army of the United States, aged 37 died in December in an airplane accident at Tampa Fla

## Bureau of Investigation

### MISBRANDED PRODUCTS

#### Abstracts of Notices of Judgment Issued by the Food and Drug Administration of the United States Department of Agriculture

[EDITORIAL NOTE—These Notices of Judgment are issued under the Food, Drug and Cosmetic Act and in cases in which they refer to drugs and devices they are designated D D N J and foods, F N J. The abstracts that follow are given in the briefest possible form: (1) the name of the product, (2) the name of the manufacturer, shipper or consigner, (3) the date of shipment, (4) the composition, (5) the type of nostrum, (6) the reason for the charge of misbranding and (7) the date of issuance of the Notice of Judgment—which is considerably later than the date of the seizure of the product and somewhat later than the conclusion of the case by the Food and Drug Administration.]

**Black Tablets for Kidneys Bladder and Ureters**—W B Goebel trading as Botanical Medicine Company Kannapolis N C. Shipped between June 7 and 10 1940. Composition compounds of magnesium and aluminum cubes copuh methyl salicylate and sugar. Misbranded because falsely represented on label to be efficacious for the conditions suggested by the name of the product whereas they were not.—[D D N J I D C 426 September 1942]

**Catawbas Bu Q Ju Diuretic**—W B Goebel trading as Botanical Medicine Company Kannapolis N C. Shipped between June 7 and 10 1940. Composition essentially sugar alcohol and water with extracts of plant drugs including cubeb and peppermint. Misbranded because claim on label aids the elimination of the toxic poisonous substances was false and misleading.—[D D N J I D C 426 September 1942]

**Catawbas Pep A Man Tonic Laxative**—W B Goebel trading as Botanical Medicine Company Kannapolis N C. Shipped between June 7 and 10 1940. Composition extracts of plant drugs including a laxative drug alone and strychnine sulfate. Misbranded because of false and misleading representations on the label that it possessed tonic properties and the restorative vitalizing and invigorating properties implied in the name Pep A Man.—[D D N J I D C 426 September 1942]

**Digesto Pep**—Smith Brothers Drug Company Greensboro N C. Shipped Dec 10 1940. Composition alkaline compounds including a bismuth compound and digestive. Misbranded because its name and the terms used such as aids digestion and intended for use in correcting conditions associated with sluggish digestion were false and misleading since the product was not a digestant of the various constituents of food could not be depended on to produce pep or aid digestion and correct sluggish digestions. Further misbranded because label statements keep in step with Digesto Pep and go smiling thru thousands do were false and misleading, since the product could not be depended on to fulfill the implied promises.—[D D N J I D C 446 September 1942]

**Pine Orum Compound**—John C Schaffer trading as Pine Orum Chemical Company New Augusta Miss. Shipped Feb 23 1940. Composition a medium heavy oil with a strong pine oil odor consisting essentially of a pine tar distillate containing sulfur or sulfur compounds and a small amount of water. Misbranded because of false and misleading statements on bottle label representing that the product was an efficacious treatment for coughs colds pneumonia headache indigestion worms burns infections blood poisoning tonsillitis pyorrhea rheumatism old chronic sores athlete's foot hemorrhoids and dandruff among other things would stop the flow of blood and when used in the bath would have medicinal properties further misbranded because package did not conspicuously show name and place of business of manufacturer picker or distributor nor did label accurately state quantity of contents or common or usual name of each active ingredient or give directions for external use for which it was intended.—[D D N J I D C 439 September 1942]

**Vitaphore**—Vitaphore Appliances Inc South Bend Ind. Shipped April 27 1940. Composition an electrical device so constructed as to apply vibration and heat to the body. Falsely represented to improve the complexion rebuild health rejuvenate remedy headaches neuritis scars skin diseases varicose veins asthma catarrh falling hair pyorrhea female disorders and a good many other things.—[D D N J I D C 393 March 1942]

**Vitaphosphates**—Physicians Drug and Supply Company Philadelphia. Shipped between April 16 and 30 1940. Composition less than 50 U S P units of vitamin B<sub>1</sub> per fluid ounce whereas label falsely represented a content of 400 U S P units of this vitamin per fluid ounce hence adulterated and misbranded.—[D D N J I D C 462 September 1942]

**Youngs (Dr) Pilomont**—F E Young and Company Chicago. Shipped between May 10 and June 10 1940. Composition essentially petrolatum (99.15 per cent) with phenol (0.73 per cent) and extracts of drugs including a mydriatic drug such as belladonna. Misbranded because falsely represented on label to promote healing of hemorrhoids and in conjunction with Dr Youngs Rectal Dilators (which were declared misbranded in this same case) to be an effective treatment for rectal irritation and itching and bleeding hemorrhoids.—[D D N J I D C 335 March 1942]

## Medical Examinations and Licensure

### COMING EXAMINATIONS AND MEETINGS

#### NATIONAL BOARD OF MEDICAL EXAMINERS EXAMINING BOARDS IN SPECIALTIES

Examinations of the National Board of Medical Examiners and Examining Boards in Specialties were published in THE JOURNAL Feb 13 page 539

#### BOARDS OF MEDICAL EXAMINERS

ALABAMA Montgomery June 15 16 Sec Dr B F Austin, 519 Dexter Ave Montgomery  
ARIZONA Phoenix April 6 7 Sec Dr J H Patterson 876 Security Building Phoenix  
ARKANSAS \* Medical Little Rock June 3 4 Sec Dr D I Owens, Harrison Electric Little Rock June 3 4 Sec Dr C H Young 1115 Main St Little Rock  
CALIFORNIA Los Angeles March 8 11 Sec, Dr C B Pinkham 1020 N St Sacramento  
COLORADO \* Denver April 7 9 Endorsement Denver April 6 Final date for filing application is March 20 Sec Dr J B Davis 831 Republic Building Denver  
CONNECTICUT \* Hartford March 9 10 Endorsement Hartford March 23 Sec to the Board Dr Creighton Barker 258 Church St New Haven Homeopathic Derby March 9 10 Sec Dr J H Evans 1488 Chapel St New Haven  
DELAWARE Dover July 13 15 Sec Medical Council of Delaware, Dr Joseph S McDaniel 229 S State St Dover  
DISTRICT OF COLUMBIA \* Washington May 10 11 Sec Commission on Licensure Dr George C Ruhland 6150 F Municipal Bldg Washington  
FLORIDA Jacksonville June 21 22 Sec Dr William M Rowlett, Box 786 Tampa  
GEORGIA Atlanta March 23 24 Sec State Examining Boards Mr R C Coleman 111 State Capitol Atlanta  
IDAHO Boise July 13 Director Bureau of Occupational Licenses Mrs Leola D Hunter 355 State Capitol Building Boise  
ILLINOIS Chicago April 6 8 Superintendent of Registration Department of Registration and Education Mr Philip M Harmon Springfield  
INDIANA Indianapolis Sept 14 16 Sec Board of Medical Registration & Licensure Dr W C Moore 301 State House Indianapolis  
IOWA Iowa City Feb 22 24 Dir Division of Licensure and Registration Mr H W Grefe Capitol Bldg Des Moines  
KANSAS Kansas City May 19 20 Sec Board of Medical Registration and Examination Dr J I Hays 905 N Seventh St Kansas City  
KENTUCKY Louisville March 2 4 Sec State Board of Health Dr A T McCormick 620 S Third St Louisville  
LOUISIANA New Orleans March 11 13 Sec Dr R B Harrison 1507 Hibernia Bank Bldg New Orleans  
MAINE Portland March 9 10 Sec Board of Registration in Medicine Dr Adam L Lighton 192 State St Portland  
MARYLAND \* Medical Baltimore March 23 26 Sec Dr J T O'Mara 1215 Cathedral St Baltimore Homeopathic Baltimore June 15 16 Sec Dr J A Evans 612 W 40th St Baltimore  
MASSACHUSETTS Boston March 9 12 Sec Board of Registration in Medicine Dr H Q Cullupe 413 F State House Boston  
MICHIGAN Ann Arbor and Detroit June 11 13 Sec Board of Registration in Medicine Dr J Earl McIntyre 100 W Allegan St Lansing  
MINNESOTA Minneapolis March 22 24 Sec Dr J F DuBois, 230 Lowry Medical Arts Bldg Minneapolis  
MISSOURI St Louis March 23 25 Sec State Board of Health Dr James Stewart State Capitol Bldg Jefferson City  
MONTANA Helena April 6 7 Sec Dr Otto G Klein First National Bank Bldg Helena  
NEW HAMPSHIRE Concord March 11 12 Sec Board of Registration in Medicine Dr Deering C Smith State House Concord  
NEW JERSEY Trenton June 15 16 Sec Dr E S Hallinger 28 W State St Trenton  
NEW MEXICO \* Santa Fe April 12 13 Sec Dr I e Grand Ward 135 Sena Plaza Santa Fe  
NORTH CAROLINA Raleigh June 14 18 Sec Dr W D James Hamlet  
NORTH DAKOTA Grand Forks July 6 9 Sec Dr G M Williamson 4 1/2 S Third St Grand Forks  
OHIO Columbus March 16 19 Endorsement Columbus April 6 Sec Dr H M Platter 21 W Broad St Columbus  
OKLAHOMA \* Oklahoma City May 10 Sec Dr J D Osborn Jr Frederick  
RHODE ISLAND \* Providence April 12 Chief Division of Examiners Mr Thomas B Casey 366 State Office Bldg Providence  
SOUTH CAROLINA Columbia March 23 24 Sec Dr A Farle Booser 505 Saluda Ave Columbia  
SOUTH DAKOTA \* Pierre July 20 Dir Medical Licensure State Board of Health Dr J F D Cook Pierre  
TENNESSEE Memphis & Nashville March 24 27 Sec Dr H W Qualls 130 Madison Ave Memphis  
UTAH Salt Lake City June Dir Department of Registration Mr G V Billings 324 State Capitol Bldg Salt Lake City  
VERMONT Burlington March 25 27 Sec Dr F J Jawless Richford  
VIRGINIA Richmond March 24 27 Sec Dr J W Preston 30 1/2 Franklin Rd Roanoke  
WEST VIRGINIA Charleston March 1 3 Commissioner Public Health Council Dr C F McClintic State Capitol Charleston  
WISCONSIN \* Milwaukee March 30 April 1 Sec Dr H W Shuttler 425 F Wisconsin Ave Milwaukee

\* Basic Science Certificate required

#### BOARDS OF EXAMINERS IN THE BASIC SCIENCES

ARIZONA Tucson March 16 Sec, Dr R L Nugent Science Hall University of Arizona Tucson  
COLORADO Denver March 10 11 Sec Dr E B Starks 1459 Ogden St Denver

DISTRICT OF COLUMBIA Washington April 19 20 Sec. Commission on Licensure Dr George C Ruhland 6150 E Municipal Bldg Washington

FLORIDA DeLard June 9 Sec Dr J F Conn John B Stet on University DeLard

IOWA Des Moines April 13 Dir Division of Licensure & Registration Mr H W Grefe Capitol Bldg Des Moines

MINNESOTA Minneapolis April 67 Dr J C McKinley 126 Milard Hall Univ of Minnesota Minneapolis

OKLAHOMA Oklahoma City May Sec Dr Oscar C Newman Shattuck

SOUTH DAKOTA Aberdeen June 45 Sec Dr G M Evans Bank on Wisconsin Madison April 3 Prof Robert N Bauer 152 W Wisconsin Ave Milwaukee

### Oklahoma Reciprocity Report

The Oklahoma State Board of Medical Examiners reports 19 physicians licensed to practice medicine by reciprocity and 1 physician so licensed on endorsement of credentials of the National Board of Medical Examiners from June 8 through Dec 31, 1942. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad	Reciprocity with
Northwestern University Medical School	(1942)		Kansas
State University of Iowa College of Medicine (1914) (1925)	(1905)		Iowa
University of Kansas School of Medicine	(1930)		Kansas
University of Louisville School of Medicine (1940)	(1941)		Kentucky
Tulane University of Louisiana School of Medicine	(1932)		Louisiana
Johns Hopkins University School of Medicine	(1921)		Maryland
Ohio State University College of Medicine	(1923)		Ohio
Starling Medical College	(1892)		Ohio
University of Cincinnati College of Medicine	(1936)		Ohio
Western Reserve University School of Medicine	(1934)		Ohio
Meharry Medical College	(1941)		Tennessee
Baylor University College of Medicine (1930)	(1931)		Texas
University of Texas School of Medicine (1924)	(1930)		Texas
McGill University Faculty of Medicine	(1937)		Kentucky

School	LICENSED BY ENDORSEMENT	Year Grad
Tulane University of Louisiana School of Medicine	(1941)	

### District of Columbia November Report

The District of Columbia Board of Examiners in Medicine and Osteopathy reports the written examination for medical licensure held at Washington, Nov 9-10, 1942. The examination covered 9 subjects and included 60 questions. An average of 75 per cent was required to pass. Eight candidates were examined, all of whom passed. The following schools were represented:

School	PASSED	Year Grad	Number Passed
George Washington University School of Medicine	(1935)		1
Georgetown University School of Medicine	(1940)		1
Johns Hopkins University School of Medicine	(1929)		1
Columbia University College of Physicians and Surgeons	(1938)		1
University of Pennsylvania School of Medicine	(1941)		1
Medical College of Virginia	(1941)		1
McGill University Faculty of Medicine	(1941)		1
Osteopath*			1

\* Examined in surgery only

### Vermont June Report

The Vermont State Board of Medical Examiners reports the written examination for medical licensure held at Burlington, June 16, 1942. The examination covered 12 subjects and included 90 questions. An average of 75 per cent was required to pass. Twenty candidates were examined, 19 of whom passed and 1 failed. The following schools were represented:

School	PASSED	Year Grad	Number Passed
Syracuse University College of Medicine	(1942)*		1
University of Rochester School of Med and Dentistry	(1940)		1
University of Vermont College of Medicine (1942-16)*	(1941)*		17

School	FAILED	Year Grad	Number Failed
Johns Hopkins University School of Medicine	(1917)		1

Ten physicians were licensed to practice medicine by endorsement from February through October 1942. The following schools were represented:

School	LICENSED BY ENDORSEMENT	Year Grad	Endorsement of
Yale University School of Medicine	(1910)		New York
State University of Iowa College of Medicine	(1929)		Iowa
Johns Hopkins University School of Medicine	(1930)		Connecticut
Harvard Medical School	(1904)		Mass
Tufts College Medical School (1930)	(1939)		Nat Board
Cornell University Medical College	(1923)		Nat Board
Woman's Medical College of Pennsylvania	(1941)		Penn
University of Vermont College of Medicine	(1941)		Nat Board
University of Edinburgh Faculty of Medicine	(1900)		N Carolina

\* Licenses have not been issued

## Miscellany

### MEDICAL STANDARDS FOR PHYSICIANS IN THE SCHOOLS PROPOSED BY THE AMERICAN ACADEMY OF PEDIATRICS

In 1937 the Committee on School Health of the American Academy of Pediatrics proposed five principles to guide in the development of medical services for public schools. Last year the committee reemphasized the second principle which was concerned with medical standards and the maintenance of quality of service. We quoted from one of the principles of the American Medical Association: "The responsibility for the character of medical service must be borne by the medical profession and declared. The advice which is given to parents, pupils or school staff should meet the best medical standards."

While the soundness of these principles has not been questioned, a neglect of medical standards has been almost characteristic of school service until very recently, and still too many places allow the responsibility for the character of medical service to be borne by lay administrators. Organization plans generally provide no way of being sure that the school administrator's decisions will be made with the benefit of a full understanding of medical problems.

If the schools are to make a more effective use of their strategic position to educate parents and children to use curative and preventive medical services intelligently, then the great professions of education and medicine must work together in a common cause. Some plan of administration is necessary for educational matters to be guided by educators and for medical policies to be determined by physicians. There must be a plan that avoids decisions made on administrative convenience only rather than on professional principles.

#### ORGANIZATION PLANS

As the physician in the schools may receive his direction from the health department, the education department or a combination of the two departments, we should consider how each type of organization may be planned to conform to our medical principles.

1. The administrator of a school health service under a health department should provide for a medical administrator to give direction and leadership in interpreting medical standards. With civil service or other plans for a merit system, the qualifications of personnel must be decided according to a sound interpretation of needs. Either through the board of health or through a special medical advisory committee, the executive should have the support and advice of real medical leadership. From the education department, he should also have such an organization plan as will provide at all times for ready consultation and leadership of the educational staff.

2. If the administration is under the education department, there is often a problem of obtaining a medical executive for the smaller school systems unless a full time medical executive can be arranged to serve several school districts or for the medium sized school systems unless the executive can be combined with the medical staff part of the service on a full time basis. In either case, a medical advisory board is needed to safeguard professional qualifications and conditions of employment for the medical staff. A board for determining essential broad policies is an accepted and well tried plan to safeguard the public welfare by providing advice, support and control of the executive.

3. When the school health service is administered under joint control of the health and education departments, the need for a medical executive can usually be supplied through the health department's contribution, or by a special medical administrator responsible to a joint board. The joint board from both departments should direct or advise the medical staff. Sound public service demands that the public always have the benefit of the recognized channels of organized medicine for determining medical standards. If these standards are to be applied for the selection of medical personnel and for determining the conditions of employment for physicians, then an organization plan must provide the means for interpreting how the standards may best meet the needs of an individual situation.

## PROFESSIONAL QUALIFICATIONS

There is, therefore, need for two kinds of professional standards for medical personnel

- 1 For medical administrator
- 2 For staff physician

The medical administrator should meet in addition to basic pediatric training standards of training and experience in public health administration and education, and the staff physician should meet qualifications in clinical and preventive pediatrics

While full time medical personnel is recommended for administrative positions the requirement of full time for staff positions is likely to discriminate against the more competent, ambitious and well qualified clinicians because the more competent physicians are not likely to be willing to give up the rewards available to them through private practice. Until the pay for staff positions can be made very much more inviting the most competent physicians will be available for staff positions only on a part time basis

As far as qualified physicians are available preference should be given to those physicians who meet the following qualifications in the order named

- 1 Specialist certified by the American Board of Pediatrics
- 2 Fellow of the American Academy of Pediatrics or qualifications meeting academy requirements
- 3 Alumnus of hospital registered by the American Medical Association and with residency fellowship in pediatrics
- 4 Alumnus of hospital registered by the American Medical Association which included service of one year in pediatrics where there is an approved residency or fellowship in pediatrics (Communicable diseases included in pediatrics)
- 5 Alumnus of hospital registered by the American Medical Association (one and one half year internship and an appointment in pediatrics to a registered hospital, including outpatient department or hospital appointment)
- 6 Part time specialty in pediatrics with pediatric appointment in registered hospital

## Bureau of Legal Medicine and Legislation

### MEDICOLEGAL ABSTRACTS

**Medical Practice Acts Indispensability of Record of Board as Evidence in Appeal Proceeding from Revocation Order**—The petitioner's license as a drugless practitioner was revoked with the proviso that if he would sign a stipulation to refrain from the use of all advertising except the use of the words "drugless practitioner" on his professional card his license would be restored and he would be placed on five years probation. The petitioner sought a writ of mandamus to compel the respondent board of medical examiners to restore his license. The trial judge suggested that a transcript of the proceedings had before the board should be introduced in evidence by the petitioner, but the petitioner refused to produce the transcript on the ground that he was entitled to a trial de novo without reference to the evidence produced before the board. The trial judge held that the introduction of such transcript was a jurisdictional prerequisite, that in its absence no other evidence could be presented, and denied the petition for mandamus. From this ruling the petitioner appealed to the district court of appeal, first district division 1 California.

The petitioner contended that when a practitioner has had his license revoked by an administrative board exercising state-wide functions and seeks by mandamus to have such license restored he is entitled to a trial de novo in the literal sense and that the evidence introduced before the administrative board is incompetent for any purpose. The board contended on the other hand that on the trial of the mandate proceedings the record of the board's proceedings must be introduced as a condition precedent to the further exercise of jurisdiction and that the only additional evidence authorized is subsequently discovered evidence or evidence improperly excluded by the board.

In the opinion of the appellate court, neither contention was entirely sound. A petitioner in a mandamus proceeding of this kind is entitled to a trial de novo in which the trial court must exercise an independent judgment on the facts, the petitioner is not limited to the record made before the board but may introduce additional evidence. But the board's record is legal, competent evidence so as to be admissible over the objections of one of the litigants. Such record, however, is not indispensable evidence so as to justify the trial court in refusing to proceed unless the petitioner produces it. If the record is produced by either it must be admitted but if neither produces it a trial court has no power to compel its production or to refuse to proceed unless introduced.

The petitioner next contended that even though no evidence was introduced, the allegations of the petition for mandate and the answer and return thereto demonstrate, as a matter of law, that no offense warranting discipline was committed by him. The complaint filed before the board charged that the petitioner (1) used the prefix "Dr" in a window sign in connection with his name without otherwise indicating the type of certificate possessed by him and that the petitioner did not hold a physician's and surgeon's certificate, and (2) that he used the letters "N D" as a suffix to his name in a window sign, which indicated that he was entitled to practice naturopathy but that at the time he was not licensed to practice naturopathy. A section of the Business and Professions Code provides: "Unless a person licensed and authorized under this chapter or any preceding medical practice act to use the title 'doctor' or the letters or prefix 'Dr' hold a physician's and surgeon's certificate the use of this title or these letters or prefix without further indicating the type of certificate he holds, constitutes unprofessional conduct within the meaning of this chapter." The constitutionality of statutes requiring all practitioners except physicians and surgeons to indicate the type of certificate held in connection with the use of the title "Doctor" or "Dr" is not open to question, said the court. There is a reasonable ground for such distinction. In common parlance the term "doctor" is customarily used to refer to physicians and surgeons. The legislature was justified in believing that the use of such title by others without descriptive designation would tend to indicate to the public that the user is a physician or surgeon. The court therefore ruled against the petitioner's contention that this provision in the California law was unconstitutional class legislation.

With respect to the charge that the petitioner used the letters "N D" as a suffix to his name in a window sign it was admitted that his license as a drugless practitioner authorized him to treat diseases, injuries, deformities or other physical or mental conditions without the use of drugs or what are known as medical preparations and without in any manner severing or penetrating any of the tissues of human beings except the severing of the umbilical cord. It was clear to the court that naturopathy is a form of drugless practice within the statutory definition quoted. If the petitioner possessed the degree of doctor of naturopathy, as he alleged there was no violation of the Business and Professions Code in the use of the letters "N D." Whether or not he possessed the degree, however, was a question of fact to be determined by the trial court.

Because the trial court erroneously refused to proceed unless the board's record was produced by the petitioner and because of the existence of certain factual situations which required a determination by the trial court the judgment in favor of the board was reversed.—*Darc v. Board of Medical Examiners of State of California* 127 P (2d) 977 (Calif 1942)

## Society Proceedings

### COMING MEETINGS

American Orthopedic Association New York Feb 22-24 Dr Norville C. L. Mar 149 East 73d St. New York Secretary  
Conference of State and Provincial Health Authorities of North America Washington D. C. March 22-25 Dr A. J. Cheslev 469 State Office Bldg. St. Paul Secretary  
Ohio State Medical Association Columbus March 30-31 Mr Charles S. Nelson 79 East State St. Columbus Executive Secretary  
Florida Medical Association Jacksonville April 15-16 Dr Shaler Richardson 111 West Adams St. Jacksonville Secretary

## Current Medical Literature

### AMERICAN

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Titles marked with an asterisk (\*) are abstracted below.

### Alabama State Medical Assn Journal, Montgomery 12 161-192 (Dec) 1942

- Safety in Intestinal Surgery T B Hubbard Montgomery—p 161  
Urinary Concretions I Observations on Laboratory Examinations of Urinary Stones L C Posey Birmingham—p 163  
Clinical Evaluation of Erythrocyte Sedimentation Rate R McBurney Tuscaloosa—p 166  
Rapid Treatment of Early Syphilis with Multiple Injections of Mapharsen Five Day Treatment C W Shropshire Birmingham—p 170  
Some Recent Advances in Diagnosis and Treatment of Tuberculosis E J Teagarden Decatur—p 173  
Previously Undescribed Allergic Keratitis Report of Cases N E Miles Birmingham—p 176

### American J Digestive Diseases, Fort Wayne, Ind 9 399-434 (Dec) 1942

- Varices of Gallbladder Associated with Mucosal Cyst Report of Case M Feldman J E Goodman and T Weinberg Baltimore—p 399  
\*Critical Analysis of 938 Gastroscopy Examinations R J F Renshaw G E Clark Jr and J R Forsythe Cleveland—p 401  
Gastric Atrophy in Far Advanced Pulmonary Tuberculosis Complicated by Intestinal Tuberculosis L L Hardt M Weissman and J S Coulter Chicago—p 404  
Gastric Mucosal Changes of Tuberculosis D C Browne G McHardy and C Wilen New Orleans—p 407  
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Secretion of Water as Component of Gastric Acid Secretion H W Davenport Philadelphia—p 416  
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Studies on Colon Irritation III Bulk of Feces O Wozasek and F Steigmann Chicago—p 423  
Serum Diastase Determinations During Artificially Produced Intra duodenal Pressure Against Head of Pancreas Preliminary Report S G Castiglano Philadelphia—p 425  
Pancreatitis in Acute and Chronic Alcoholism F Clark New York—p 428

**Analysis of Gastroscopies**—Analysis of 938 consecutive unselected gastroscopies of 842 patients by Renshaw and his associates demonstrated that in 217 the method was of major value in establishing the diagnosis when all other examinations were negative or indeterminate. Gastroscopy was of minor additional value in 566 cases in that it did not alter the major diagnosis, treatment and prognosis. For the most part the minor contribution was confirmatory for roentgen study. In the remaining cases its major limitation was that in some the roentgenologist reported either a definite or suspected lesion but the area in question could not be seen by the gastroscopist. In a few not only could the area in question not be seen but also other large areas or the major part of the stomach could not be satisfactorily visualized. In others the examination could not be completed because of spasm of the esophagus, acute angulation of the esophagus or angulation of the instrument beyond its useful range. The amount of distress suffered by the patient was but a minor limitation compared to the amount of distress of the average patient after an Ewald test meal. For comparing these two dissimilar complementary or supplementary but not competitive methods 170 cases were selected that had been followed long enough to establish the diagnosis at operation or at necropsy. Only the first gastroscopy and roentgenoscopy made at comparable times were considered. Both methods agreed in 109 of the 170 cases, both were wrong in 9 and both were indeterminate in 14. Roentgenoscopy was correct and gastroscopy indeterminate in 15 while gastroscopy was correct

and roentgenoscopy indeterminate in 23. The fact that one method may be indeterminate while the other may establish the diagnosis further emphasizes the fact that the methods are complementary and that often both methods are required for a complete and comprehensive diagnostic investigation.

### American Journal of Diseases of Children, Chicago 64 963-1158 (Dec) 1942

- \*Prolonged Use of Sulfonamide Compound in Prevention of Rheumatic Recrudescences in Children Evaluation Based on Four Year Study on Sixty Four Children Arvid E Hansen R V Platon and P F Dwan Minneapolis—p 963  
Coconut Water Clinical and Experimental Study F S Prader and E Fernandez and O Calderin Havana Cuba—p 97  
Creatinuria in Infancy and in Childhood II Creatinuria of Premature Infants Eleanor Marple New York—p 996  
Attempts to Produce Absorption of Poliomyelitis Virus by Peripheral Nerves in Vitro J A Toomey Linda A Tischer and W S Takie Cleveland—p 1008  
Possibility of Artificial Sensitization to Tuberculin M I Levine and Margaret F Sackett New York—p 1014  
Early Infantile Diffuse Sclerosis of Brain (Krabbe Type) Report of Two Cases with Review of Literature C A Jervu Thell N Y—p 1055  
Contraction of Aorta in Childhood Review of Literature and Report of Three Cases P H Rhodes and E Durbin Denver—p 107

**Rheumatic Recrudescences**—Of the 64 children given sulfanilamide (or sulfathiazole or sulfadiazine in a few cases) for four seasons from October into June for the prevention of a recurrence of rheumatic fever only 2 received the drug for all four seasons, 5 for three seasons, 9 for two seasons and 37 for one season. Hansen, Platon and Dwan found the age, sex, socioeconomic status, number of attacks of rheumatic fever and degree of cardiac involvement comparable in 32 control subjects. All the children studied were between 3 and 16 years of age. Only 2 of the 53 treated with sulfanilamide experienced a rheumatic flare up and in 1 this occurred within six days of starting chemotherapy. On the other hand 17 of the 32 control children had a total of twenty one rheumatic recrudescences. In 5 these recurrences were moderately severe in 7 mild and in 6 they were choreic. In addition the trend in degree of cardiac involvement, size of the heart and functional classification were more favorable in the treated children. There appeared to be no difference in the number of infections of the upper respiratory tract in the two groups. The treated patients gained as well as the control patients and from a clinical point of view tended to be in better condition. Improvement, though suggestive in the electrocardiographic tracings of several patients could not be attributed to the effects of the drug alone. Although the series is small, the results of chemotherapy were consistent and when interpreted in the light of the results of other investigators they appear to justify further similar study, especially when the disease is one of the major causes of disability and death in children of school age in the temperate zone. Every child so treated should be under the constant care of a physician.

### American Journal of Physiology, Baltimore 138 1-190 (Dec) 1942 Partial Index

- Efficacy of Adrenal Cortical Extract and of Paredrine in Prevention of Experimental Shock Following Venous Occlusion of a Limb I H Shleser and R Asher Chicago—p 1  
Distribution of Lactic Acid in Human Blood D C Decker and J D Rosenbaum New Haven Conn—p 7  
Relation Between Pulmonary Ventilation and Oxygen Consumption After Exercise J M Barman F Corio and M F Moreira Boston—p 16  
Metabolic Effect of Local Ischemia During Muscular Exercise J M Barman M I Moreira and F Corio Boston—p 20  
Influence of Ricket and of Healing of Rickets on Mechanical Properties of Tibias of Rats A A Schiller H C Struck and C I Reel Chicago—p 27  
Effect of Meat and Meat Fraction on Intestine of Depancreatized and Pancreatic Duct Ligated Dog Flume P Ralli and S H Rubin New York—p 42  
Cardiovascular Effects of Experimental Insomnia F Henry Berkeley Calif—p 65  
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Metabolism of Asphyxiated Spinal Cord A van Harreveld and D B Tyler Pasadena Calif—p 140  
Experimental Study of Tourniquet as Method for Inducing Circulatory Failure in Dog W W Swingle J W Remington W Kleinberg A A Drill and W J Everole Princeton N J—p 156



## American Review of Tuberculosis, New York

46 587-716 (Dec) 1942

- Studies of Mycobacteria with Electron Microscope M B Rosenblatt E F Fullam and A E Gessler New York—p 587
- Enzymes as Factors in Resistance to Tuberculosis B Gerstl and R Tennant New Haven Conn—p 600
- Experimental Pulmonary Tuberculosis in Dog F D Gunn J J Sheehy Charlotte A Colwell and M A Mills Chicago—p 612
- Gastric Lavage in Healthy Adolescents Bacteriologic Study of Fasting Gastric Contents for Tubercle Bacilli C Floyd H A Novick and C G Page Boston—p 622
- Atypical Findings on Animal Inoculation S E Franco and J Gurevitch Jerusalem Palestine—p 625
- \*Pneumothorax Treatment Subsequent History of Tuberculous Patients After Their Selection for Pneumothorax W H Morris Wallingford Conn—p 628
- \*Ambulatory Pneumothorax Results of Ten Years Experience T Tice, Chicago—p 639
- \*Extrapleural Pneumothorax Late Results P Geary Plainfield N J—p 646
- Pneumothorax Cases Treated at the Clinic D R Hastings and B Behn Minneapolis—p 656
- Treatment of Postoperative Pulmonary Complications from Point of View of the Surgeon J Alexander Ann Arbor Mich—p 664
- Id Internist H M Riggins New York—p 666
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- Id Bronchoscopist I H Clerf Philadelphia—p 675
- Id Nurse Alice Love Manning Ray Brook N Y—p 676
- Tuberculosis in England During War J B McDougall Maudstone England—p 677
- Arytenoid Extrusion with Roentgenologic Studies W C Voorsanger San Francisco—p 684
- Brownings Meteoropathologic Observations in Tuberculosis W T Petersen Chicago—p 690

**Pneumothorax Treatment**—Between 1921 and 1939, 770 patients were selected for pneumothorax treatment. The treatment of 157 was rated as unsuccessful and discontinued in less than three months, 243 were not adequately traced, as they left the sanatorium for various reasons and had their pneumothorax carried on elsewhere. Treatment of the remaining 370 was carried on at the sanatorium and after discharge at the ex-patient clinic for an average of five and a half years after pneumothorax was discontinued. Of these 370 patients Morris states, 245 are able to work full time, 23 part time, 27 are still being treated and 75 have died since collapse was instituted. The ineffectiveness of collapse, a moderate contralateral lesion at the onset, a massive effusion and empyema, a severe contralateral spread of the lesion during collapse and the necessity of discontinuing pneumothorax in less than two years influenced the end result unfavorably. At the time of reexpansion the cavity of 96.3 per cent was closed and the sputum of 89.6 per cent was negative. The anatomic end results in the reexpanded lung, were excellent in 235 very good in 162, fair in 32, poor in 253 and non-expandable in 29 per cent. Relapse in either the collapsed or the contralateral lung occurred in 35, of these patients less than one third died. The most unfavorable complication of pneumothorax was the development of a large effusion this occurred in 29 per cent of the patients and appreciably increased the chances of an unfavorable outcome. In one fourth of these patients with large effusions empyema developed, and almost one half of the latter patients died. The total mortality from empyema was 35 per cent and the incidence 71 per cent. Pneumothorax in spite of its hazards is still a valuable method of treating properly selected patients, especially those whose disease is rapidly progressing in spite of bed rest.

**Ambulatory Pneumothorax**—Tice discusses results of pneumothorax in 4,810 of 6,481 tuberculous patients (treated during the ten years preceding July 1941) who had ambulant care, in 2,586 it was combined with sanatorium care. The disease of only 5 per cent was in the minimal stage and of the rest it was moderately or far advanced, the sputum of 73 per cent was positive when treatment was started, and cavitation was present in 60 per cent. At the time of the report 60 per cent were living, 25 per cent were dead and 15 per cent could not be traced. Excluding the patients who died, 21 per cent gained 5 to 10 pounds (23 to 45 Kg), 20 per cent 10 to 20 pounds (45 to 9 Kg) and 15 per cent gained 20 or more pounds. The weight of 32 per cent remained stationary and that of 12 per cent decreased. Excluding nonemployables, such as housewives, students and children, 41 per cent of the patients given ambulatory pneumothorax were employed at the time of the report. Another 13 per cent were physically employable but apparently, unable or unwilling to find work. It may be

well to consider the possibility of ambulant pneumothorax as a rehabilitative measure. Of the 2,224 treated exclusively in the clinics, 53 per cent were living at the time of the report as against 56 per cent of those receiving sanatorium treatment exclusively. Of the patients receiving both institution and clinic treatment 73 per cent were living at the time of the report. The disease of 31 per cent of the 2,800 patients with reexpanded lungs is classified as arrested, of 20 per cent as apparently arrested, of 7 per cent as quiescent, of 21 per cent as improved and of 21 per cent as unimproved. Of the 2,000 patients still under collapse treatment, 90 per cent are classed as improved and 10 per cent as unimproved. The influence of the initial diagnosis on the end results is shown by the following figures. Of 5,500 known cases, 96 per cent with minimal disease were living as against 81 per cent of those with moderately and 63 per cent of those with far advanced disease. These results clearly indicate the value of collapse therapy in early tuberculosis. Considering pneumothorax with or without ancillary measures, thoracoplasty combined with other procedures gave the best results, 74 per cent living against 60 per cent living for pneumothorax alone, 56 per cent for pneumothorax and the phrenic operation combined and 45 per cent for phrenectomy alone. The results balanced against the time elapsing since treatment were considered satisfactory.

**Extrapleural Pneumothorax**—During 1938 and 1939, 75 patients were subjected to extrapleural pneumothorax. Geary's report deals with the results after an average postoperative period of slightly more than forty months. The early results were reasonably good, but as the postoperative period increased so did the complications. The most serious was infection of the established extrapleural pneumothorax space which often developed late. It was present in 37.3 per cent of the patients. The operation is as dangerous as thoracoplasty, while the obliteration of an unsatisfactory extrapleural pneumothorax space by thoracoplasty is more dangerous at times than a thoracoplasty as a first operation. The space was abandoned in 2 cases because the pneumothorax was no longer thought necessary. There is little tendency toward reexpansion of a lung that has been collapsed by prolonged extrapleural pneumothorax. Routine conversion of the pneumothorax spaces into olothorax has not been adopted. Because of the operative risk the frequency of complication and uncertain end results, extrapleural pneumothorax is unsatisfactory.

## Annals of Internal Medicine, Lancaster, Pa

17 891-1064 (Dec) 1942

- Modern Views on Treatment and Prevention of Hookworm Disease J Andrews Atlanta Ga—p 891
- Myeloid Hyperplasia and Metaplasia Induced by Extracts of Urine from Patients with Myelogenous Leukemia R W Henle J T Wear, D R Weir and I A Rose Cleveland—p 902
- \*Sulfadiazine Further Clinical Studies of Its Efficacy and Toxic Effects in 460 Patients M Imlund O J Peterson and R A Goodwin Jr Boston—p 920
- Control of Hyperglycemia of Obese Diabetics by Weight Reduction I H Newburgh Ann Arbor Mich—p 935
- \*Clinical Significance and Treatment of Pyuria W F Braasch Rochester Minn—p 943
- High Fluid Intake in Management of Edema Especially Cardiac Edema I Details and Basis of Regimen F R Schlemm Great Falls Mont—p 952
- \*Orientation of Treatment in Thrombophlebitis Phlebothrombosis and Pulmonary Embolism J A Evans Boston—p 970
- \*Intracutaneous Inoculation of Poliovirus in Monkeys and Its Detection in Their Stools J D Trask and J R Paul New Haven Conn—p 975
- The Army's New Frontiers in Tropical Medicine J S Simmon Washington D C—p 979
- Consideration of Factor of Change in Animal Organism W deB MacNider Chapel Hill N C—p 989

**Sulfadiazine**—Imlund and his associates used sulfadiazine at the Boston City Hospital in 460 cases of streptococcal, staphylococcal and gonococcal infections, the bacterial meningitides and infections of the urinary tract. Usually sulfadiazine was used only if other sulfonamides had not already been given, and treatment was continued when toxic effects resulted from other sulfonamides and further chemotherapy was necessary. Sulfadiazine may be accepted as the drug of choice in hemolytic streptococcus infection and in the various acute bacterial meningitides. In acute gonococcal and staphylococcal infections and in the acute infections of the urinary tract the efficacy of sulfadiazine in most cases is probably similar to that of sulfathiazole,

but because of its lower toxicity sulfadiazine is probably the drug of choice, particularly when therapy is to be prolonged. The authors' results and those of others seem to justify the claim that sulfadiazine is the drug of choice for initiating chemotherapy in acute pulmonary infections and for continuing treatment when the causative organism is the pneumococcus, the streptococcus and probably also the staphylococcus and Friedlander's bacillus. Toxic effects attributable to sulfadiazine are relatively few and mild. The comparatively frequent complications of the urinary tract warrant the control of its dose in relation to fluid intake and output, particularly for old persons, patients with hypertension and every patient with a probable impairment of renal function. The occurrence of agranulocytosis in 1 patient after prolonged therapy suggests that, despite the infrequency of this complication, it must be looked for in all patients treated with sulfadiazine for two weeks or more. Early recognition and prompt withdrawal of the drug will probably avert death. 'Sensitization' was not observed in any of the 21 patients who received a second or third course of sulfadiazine. However, its possibility has not been excluded. Erysipelas was reactivated on early readministration of sulfadiazine to 1 patient. Other rashes and febrile reactions, known to occur when the drug is given after a brief interval, have not appeared.

**Clinical Significance and Treatment of Pyuria.**—The following data are given by Braasch in his summary of the clinical significance and treatment of pyuria. Pus cells in the voided urine of a female patient have little or no clinical significance. In such instances a catheter specimen of urine is necessary. Pus cells in the voided urine of the male patient are of greater clinical value, particularly if they are in evidence after the two glass test. It is of equal importance to determine the type of bacteria present in the urine. Intelligent treatment of pyuria is dependent on a knowledge of its bacteriologic aspects. Bacillary infection from colon bacilli or *Aerobacter aerogenes* is usually found. If mixed infection is present it is most often caused by colon bacilli with *Streptococcus fecalis*. Unless this fact is recognized, chemotherapy may fail. Renal tuberculosis which resists chemotherapy is a frequent cause of pyuria. Recently the symptoms and severity of this infection have become milder and its recognition often is difficult. Pyuria may be coincident with lesions in other organs, such as acute cholecystitis. Urinary infection as a rule does not interfere with operation, but a search should be made for the cause of the pyuria. A careful search for foci of infection and their removal are always necessary. Pyuria or a history of previous urinary infection occurring with hypertension demands a complete urologic investigation. In the presence of pyuria important clinical data can be obtained by such simple tests as the making of roentgenograms and excretory urograms. Intelligent chemotherapy depends on identification of bacteria. Persistent pyuria, in spite of indicated chemotherapy, usually is caused by some underlying pathologic lesion in the urinary tract which requires careful treatment.

**Thrombophlebitis, Phlebothrombosis and Pulmonary Embolism.**—As deep phlebothrombosis of the femoral or calf venous plexuses is a source of pulmonary embolism, Evans suggests that, if the patient is more than 50, section of the femoral vein should be seriously considered. If such patients have already suffered a warning embolism, ligation and section of the femoral vein or of the external iliac vein is indicated. Phlebothrombosis in the pelvic veins is a dangerous source of pulmonary embolism. Prolonging the clotting time by heparin or dicumarol or both prevents propagation of a clot in the pulmonary artery should embolism occur. In phlegmasia alba dolens, early lumbar sympathetic procaine block is best, although surprisingly good results have been obtained in chronic cases. There is relatively little danger of pulmonary embolism in typical 'milk leg'. Thrombophlebitis migrans, thrombophlebitis of the upper extremities and the thrombophlebitis of Buerger's disease rarely cause pulmonary embolism. However, propagation of the clot into the deep veins of the leg must be watched for in phlebitis migrans. Isolation of an involved segment of vein by ligation may be necessary. Compression bandages, rest (off the feet but not in bed) and sulfathiazole are of value. Heparin or dicumarol may be needed to stay the progress of the clot in thrombophlebitis in the upper extremities.

**Intracutaneous Inoculation of Poliomyelitis Virus.**—Trask and Paul collected stools from 9 monkeys and 1 chimpanzee previously inoculated intracutaneously with poliomyelitis virus. The animals were placed in cages according to the four or five species and were observed for signs of experimental poliomyelitis. Stools were collected daily from each cage and weekly pools were tested for the virus. Fourteen of the post-inoculation tests were negative and three were positive. The virus was detected in the first postinoculation week in the pooled stools of 2 green monkeys and in the chimpanzee's stools collected during the first and second postinoculation weeks. The most severe poliomyelitic infection occurred among the cynomolgus and marmoset monkeys. Green monkeys had typical mild paralytic poliomyelitis. The mildest infection appeared in the chimpanzee. The authors believe that their detection of the virus of poliomyelitis in feces is the first study of its kind to be reported.

## Archives of Internal Medicine, Chicago

70 919-1106 (Dec.) 1942

- Polycythemia Vera. Report of Case. R. Fitz, B. S. Walker and C. F. Branch. Boston—p. 919.  
Clearance of Diodrast, Phenolsulfonphthalein and Inulin in Hypertension and in Nephritis. T. Findley, J. C. Edwards, Etta Clinton and H. I. White. St. Louis—p. 935.  
\*Critical Statistical Analysis of Data on Renal Function in Grouped Subjects with Essential Hypertension. J. W. Dalton and F. K. Nuzum. Santa Barbara, Calif.—p. 948.  
Effect of Uleer on Acidity and Neutralizing Ability in Duodenal Bulb. J. E. Berk, M. E. Rehfuess and J. E. Thomas. Philadelphia—p. 959.  
Mercurial and Anthine Diuretics in Chronic Congestive Heart Failure. Comparative Survey. J. I. Goodman, J. F. Corsaro and R. Stave. Cleveland—p. 975.  
\*Hypertensive Vasodepressor Carotid Sinus Reflex. L. H. Sigler. Brooklyn—p. 983.  
\*Roentgen Ray Treatment of Hyperthyroidism. M. H. Soley and R. S. Stone. San Francisco—p. 1002.  
Review of Neuropsychiatry for 1942. S. Cobb. Boston—p. 1017.  
Obesity. L. H. Newburgh. Ann Arbor, Mich.—p. 1033.

**Renal Function and Hypertension.**—Dalton and Nuzum demonstrate that in spite of apparently small differences from normal a significant reduction exists in the ability of the kidneys of patients with essential hypertension to concentrate urine and to excrete phenolsulfonphthalein. This reduction is demonstrated only when the data on hypertensive and on normal persons are considered collectively for the respective groups instead of as individual comparisons. The age of the normal or hypertensive person or the duration of the disease has no effect on the renal function. An increase in the severity of the disease indicated by a rise in diastolic pressure is accompanied by a reduction of renal function. Alkaline diets apparently delay the excretion of fluids.

**Vasodepressor Carotid Sinus Reflex.**—Sigler studied the vasodepressor effect of the carotid sinus reflex of 700 ambulatory patients and he determined the frequency and the severity of this reflex in the two sexes at various ages and at various levels of blood pressure. Most of them presented evidence of cardiovascular disease, but many were free from such disease. The patients were divided into four groups: those with a blood pressure of less than 150 systolic and 90 diastolic and those with a systolic pressure from 151 to 175, 176 to 200 and more than 200 with a respective diastolic pressure from 91 to 105, 105 to 125 and more than 125. Roughly, 88 per cent of the 447 male patients and 82 per cent of the 253 female patients showed a drop in pressure. If a drop of less than 10 mm is considered of insufficient significance the response is reduced to about 78 per cent for the male and 71 per cent for the female patients. The response occurred more frequently and was more pronounced in older persons. Also the higher the blood pressure the more frequent and decided was the response. A drop was more frequent in the systolic than in the diastolic pressure. A drop in pressure often occurred in patients without cardioinhibition but was more frequent in those who also showed cardioinhibition. The frequency and the degree of vasodepression were roughly the same in those with and those without cardioinhibition. In many there was a definite difference in the response to stimulation on the two sides. The amount of stimulation required to produce the maximal response varied from person to person and with the position of the patient. The data point to an inherent instability in the vasomotor system in persons who

show a decided vasodepression induced by the carotid sinus reflex. The seat of this instability is either in the medullary synapses or in the vasomotor terminals of the vascular tree. Arteriosclerosis is possibly one of its underlying predisposing causes, especially as the reflex is most prevalent under circumstances in which arteriosclerosis is apt to occur that is, in a man of advanced age with pronounced hypertension.

**Hyperthyroidism**—To determine whether or not subtotal destruction of the thyroid could be achieved with roentgen therapy and what dosage would be required, Soley and Stone irradiated the thyroid area of 43 hyperthyroid patients. Routinely the patients received 150 roentgens to each lobe of the thyroid every day for six days, thus 900 roentgens was administered to each lobe. During the same period the patients received 150 roentgens every second day to the thymus region. The study was begun in 1935 and ended in September 1940. Of the 43 patients 31 had toxic diffuse goiter and 12 toxic nodular goiter; of the latter, 7 had had an operation, 2 had what might be called nodular involution and 3 had toxic nodular goiter not previously treated. Thirty patients of the series had not been treated surgically and 13 had recurrences after operation. The average fall in the basal metabolic rate was 35.7 per cent for the 37 patients who were either 'cured' or improved. Twenty-five patients may be called 'cured' that is they were free from signs or symptoms of hyperthyroidism (with the exception of residual exophthalmos), 8 were definitely improved and would probably have been called 'cured' by many workers, 3 were inadequately followed and 1 was treated in preparation for operation. If this last patient the 2 who were treated in the hope of relieving their hyperthyroidism before they died of congestive heart failure and the 3 who were inadequately followed are eliminated the results show that of the remaining 37 patients 25 were cured, 8 were decidedly improved and 4 not improved. Twenty-two of the patients received iodine and 21 did not in conjunction with the roentgen therapy. The cure or improvement occurred in an average time of eight and seven tenths months from the onset of treatment. Complications consisted of tracheitis and esophagitis in 15 patients. To avoid these complications radiation is now given through one port anteriorly.

### Archives of Otolaryngology, Chicago

36 773 978 (Dec.) 1942

- \*Tracheotomy in Case of Acute Obstructive Nondiphtheritic Infections of Larynx, Trachea and Bronchi: General Study with Analysis of 126 Consecutive Cases Occurring During the Past Decade. A. H. Neffson. New York—p. 773.
- Embryologic Observations Bearing on Problem of Otosclerosis. T. H. East. Madison, Wis.—p. 816.
- A Relation of Nerve Deafness and Retinitis Pigmentosa. I. H. McGovern. Danville, Va.—p. 827.
- Reaction of Mucous Membranes to Five per Cent Solution of Sodium Sulfathiazole. I. C. Hummelt. Pasadena, Calif.—p. 837.
- Microscopic Examination of Human Labyrinth from Patients Exposed to Loud Noises. Dorothy Wolff. St. Louis—p. 843.
- Influence of Vitamin C on Antihistamine Action of Various Drugs: Effect of Bronchial Reactions to Ephedrine, Pheniramine, Benzedrine and Calcium as Studied by Microscopic Observation. S. I. Ruskin. New York—p. 853.
- Simple Method of Measuring Percentage of Capacity for Hearing Speech: Fundamental Factor in Setting Up Standard. L. P. Fowler. New York—p. 874.
- Stapes Fissula Ante Fenestram and Associated Structures in Man. III. From Embryos 67 to 50 Mm. in Length. I. W. Cawdwell and B. J. Anson. Chicago—p. 891.
- Retention of Lustachian Tube to Chronic Progressive Deafness. R. M. Decker. Pasadena, Calif.—p. 926.

**Tracheotomy in Laryngotracheobronchitis**—During the period from 1931 to 1940 1360 cases of nondiphtheritic infectious obstruction of the larynx, trachea and bronchi were observed in the Willard Parker Hospital. Intubation in addition to aspiration, was required to relieve the obstruction in 121 and tracheotomy in 126, while 1,113 were treated by nonsurgical measures. Neffson points out that during the first seven years the incidence of tracheotomy increased from 53 per cent to 19.4 per cent in the last three years. During this time the incidence of intubation scarcely varied—87 to 9.4 per cent—but the mortality rate dropped from 43 to 28 per cent respectively during the seven and three years. From the various arguments of otolaryngologists, pediatricians, statisticians and discussions, Neffson believes that if specially trained residents are

available intubation in properly selected cases is the method of choice. If the patient is given an opportunity to fight the acute infection before he is compelled to cope with the added burden of an operative procedure and an alien respiratory physiology, his chances of recovery are increased. When ideal conditions for intubation do not exist, tracheotomy is to be preferred. A high incidence of *Staphylococcus aureus* infection has been observed during the last three years. It is probable that this organism is a secondary invader in a primary virus infection. The use of sulfathiazole or sulfadiazine is recommended if chemotherapy is resorted to before the infecting organism has been identified. Intubation is not the single important factor in prolonged cannulation. It is due also to the dense infiltration of the subglottic tissues, the formation of occasional strictures and webs which do not necessarily result from the intubation, the occurrence of prevertebral edema with compression of the trachea and tracheal stenosis around the wound. Of 153 patients who survived intubation, tracheotomy or both 51 were seen from one to ten years later and the 21 who had been intubated showed no vocal alterations as to quality, pitch and intensity. Likewise there was no change in the voice of the 4 children who had had a tracheotomy. One of the 26 persons who had had intubation and tracheotomy was moderately hoarse and 1 extremely hoarse, the rest showed no changes. Eleven of the 51 patients had had repeated attacks of mild croup.

### Journal-Lancet, Minneapolis

62 389 418 (Nov.) 1942

- Consideration of Clinical and Public Health Aspects of Trichinosis. W. H. Wright. Bethesda, Md.—p. 389.
- Carotid Observations in Duodenal Ulcer. J. B. Carey and R. S. Miller. Minneapolis—p. 394.
- Incoordination and Penitence Due to Anxiety. S. Blanton. New York—p. 398.
- Incidence of Tuberculosis in Negroes of College Age. H. M. Payne. Washington, D. C.—p. 400.
- War Injuries of the Chest. I. I. Terrill. Deer Lake, Mont.—p. 403.
- Emergency Treatment of Fracture. S. K. Maxemmer. Minneapolis—p. 406.
- Treatment of Anterior Iodomyelitis. J. D. B. Calloway. Minneapolis—p. 411.

### New York State Journal of Medicine, New York

42 2271-2364 (Dec. 15) 1942

- Prevention and Treatment of Inoperative Pulmonary Complications. C. E. Ficker. New York—p. 2293.
- Medical Aspects of Diabetic Surgery. H. I. Root. Boston—p. 2306.
- Symptomatic Diagnosis of Sympatric Diabetes. J. Felton. New York—p. 2303.
- Sulfonamide Therapy in Dermatology: Observations in 261 Cases at Bellevue Hospital. M. J. Costello, A. M. Rubinstein and S. E. Landy. New York—p. 2309.

### Public Health Reports, Washington, D. C.

57 1791-1842 (Nov. 27) 1942

- Diagnosis of Health Services in Structure of State Government. VII. Maternity Child Health Activities by State Agencies. J. W. Mountain and Evelyn Hook—p. 1791.
- \*Superficial Vascularization of Cornea: Result of Riboflavin Therapy. H. R. Sandstead—p. 1821.

**Superficial Vascularization of Cornea**—Sandstead discusses the prevalence of superficial vascularization of the cornea in groups of school children, youths and adults of various sizes and the effect that riboflavin therapy had on the condition. The 366 persons examined were residents of Hagerstown, Md. or its immediate vicinity. Fifty-two of those examined were given riboflavin. From 80 to 95 per cent of a group had some degree of corneal invasion by capillaries. Corneal invasion was relatively more frequent and more severe among the older groups of persons. Of the pre-school children 67 per cent had no more than two quadrants of the National Youth Administration youths 17 per cent had only two quadrants affected and among the older group the figure was 30 per cent. The corneal vascularization of 15 older subjects who had received 615 to 1,630 mg. of riboflavin during at least sixty days was not significantly different from that of 15 control persons of similar age. Likewise the therapeutic effect was similar in the 11 parochial school children given 5 mg. of riboflavin daily for forty-nine days and the 11 controls. It appears doubtful that superficial corneal vascularization is a diagnostic sign of riboflavin deficiency.

## FOREIGN

An asterisk (\*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

**British Journal of Dermatology and Syphilis, London**

54 283-312 (Nov.) 1942

Skin Manifestations of Meningococcal Infection G. B. Mitchell Heggs—p. 283

**British Medical Journal, London**

2 567-596 (Nov. 14) 1942

\*The Health of the Doctor A. H. Gosse—p. 567

\*Clinical Significance of Rh Factor K. E. Boorman, B. E. Dodd and P. L. Molison—p. 569

Optimal Proportions of Antigen and Antibody in Tests for Rh Antibodies G. L. Taylor, R. R. Race, Aileen M. Prior and Elizabeth W. Ikin—p. 572

Physical Treatment of Acute War Neuroses. Some Clinical Observations W. Sargent—p. 574

Night Vision in the Army B. W. Rycroft—p. 576

Bagassosis. Further Notes of Four Cases J. A. Gillison and F. Taylor—p. 577

**Health of the Doctor**—Gosse discusses the amount of ill health and its various causes among 8,884 medical men from 25 to 65 years of age. The year 1938 was chosen for a detailed analysis, as it was the last prewar year and there was no epidemic. The ill health of the doctor is divided into those diseases which cause death and those which disable him from following any part of his professional work for at least seven days. The mortality of the doctors increased in each decade. As each man is exposed to the annual death rate for his decade for ten years before he passes into the next decade, his risk for each decade must be ten times the annual risk. In other words 3 out of 4 doctors live to be 65. There were forty-one deaths among the 8,884 men. To determine the causes of early death among doctors the author, in addition to the year 1938, also took the year 1939 and up to May 1940 so as to get a hundred consecutive deaths among the 8,884 doctors. The causes were cardiovascular degeneration in 17, malignant growths in 15, pneumonia (pleurisy) in 12, coronary thrombosis in 10, hemiplegia in 9, suicide misadventure and accident in 12, pulmonary tuberculosis in 4, disease of the right side of the heart in 3, congenital aneurysm in 2, various infections in 11 and the rest 1 each from aortic aneurysm and prostatic blood and ulcerative (duodenal) disorders. During 1938 1,620 of the 8,884 doctors were ill for more than a week, a total of 10,982 weeks. Of the 1,620, registered medical practitioners certified 351 as suffering from respiratory infections, 276 from influenza, 100 from accidents and less than 100 each from inflammation of connective tissue, anxiety state, fibrositis, appendicitis and infections of the hand, less than 50 each from disorders of the special senses, peptic ulcer, disorders of the central nervous system, degenerative cardiovascular disease, pyelitis, cystitis and pneumonia, less than 20 each from pulmonary tuberculosis, renal disease, gallbladder, jaundice, mumps, asthma, coronary thrombosis, rheumatic and osteoarthritis, acute rheumatism, insanity, colitis, malignant growths and pleurisy, less than 10 each from auricular fibrillation, measles, scarlet fever, diphtheria, prostaticitis, chickenpox, ischio-rectal abscess, angina pectoris, glandular fever, erysipelas, gout, whooping cough, diabetes, hyperthyroidism, valvular heart disease, undulant fever, thyroid disease and typhoid, and 156 from unclassified causes. As a check on these figures the amount of sickness among 100 consecutive doctors who had reached the age of 65 was investigated. They had been under observation for an average of thirty and three-fourths years and had suffered 3,314 weeks of illness—that is, an average of seven and five tenths days every year from the age of 35 to 65. Seven of these 100 doctors did not have a week's continuous illness during their working lives. That coronary thrombosis is the doctor's disease is challenged by the author. He found that the parental history as to cardiovascular degeneration was the same for 37 doctors in whom coronary thrombosis developed as for a control group of 37 who were still working at the age of 65, both of which groups were passed as fit at 30. The parental history for pulmonary tuberculosis was the same for 37 doctors in whom pulmonary tuberculosis developed as for a control group of 37 still working at the age of 65, both of which groups also were passed as fit at 30.

**Clinical Significance of Rh Factor**—In every case of erythroblastosis that Boorman and his associates examined the serum of the mother contained an immune agglutinin which was incompatible with the infant's erythrocytes. In 44 of 48 cases the agglutinin was anti Rh. In the remaining 4 it was either anti A or B. Because of this latter observation it is considered that the anti A and B agglutinins are capable of destroying the erythrocytes in a certain number of infants and thus of being the main causative factor of the erythroblastosis in some instances. The finding of weak Rh antibodies in the serum of the mothers of some babies with physiologic jaundice supports the idea that there is no clearcut distinction from the clinical point of view between mild and severe jaundice of the newborn. At present if serologic tests are used to aid the diagnosis of doubtful cases of erythroblastosis, compatibility of the mother's serum with the infant's erythrocytes may be regarded as a strong point against the diagnosis, provided the mother's serum is examined by a sensitive technique seven to twenty-one days after delivery. On the other hand if the mother's erythrocytes are Rh negative and her serum contains anti Rh agglutinin, the diagnosis is strongly supported. A change in the method of selecting blood donors is urgently needed particularly in the transfusing of recently delivered women and whenever there is any suggestion that the infant is affected with erythroblastosis or when there is a history of the previous birth of jaundiced or unexplained stillborn babies. At the same time the present method of testing for compatibility between the bloods of donor and recipient must be modified. Every blood bank should establish a panel of group O Rh negative donors.

**Lancet, London**

2 563-590 (Nov. 14) 1942

Juvenile Rheumatism: Its Problems R. Miller—p. 561

\*Sulfonamide Sensitization D. Erskine—p. 568

Ascorbic Acid in Meals at British Restaurants and School Canteens R. G. Booth, G. A. Jamie, J. R. Marrack, W. W. Payne and I. Woke—p. 569

Shock: Treatment by Direct Action on Vegetative Nerve Centers I. Erskine—p. 572

Treatment of Pulmonary Tuberculosis by Lung Puncture C. R. Tivallie—p. 573

Absorption and Excretion of Oxalate J. F. Barrett—p. 574

**Sulfonamide Sensitization**—Erskine recommends that whenever possible small doses of the sulfonamides be used in some chronic infections so as to desensitize the patient especially as the drugs are used for so many common illnesses and the fact that a patient in whom a sensitivity of this type develops may remain allergic for a long time. Sometimes the first tablet given months later may provoke an immediate return of a dermatitis with general symptoms and these reactions may occasionally be of an alarming nature. Delayed reactions have not been observed when desensitization was undertaken at the time of the reaction. If chemotherapy is restricted whenever possible, to seven days or less the incidence of allergic sensitivity is considerably reduced. Sensitivity almost invariably appears between the eighth and tenth days of treatment and depends more on the factor of time than on the total dose employed. Occasionally delayed reactions appear up to forty-eight hours after chemotherapy has been stopped so that administration for more than six days makes sensitivity a possibility. Absorption from local applications as well as oral or parenteral administration may lead to sensitization phenomena. Desensitization should be undertaken immediately if eighth day 'allergic' sensitization is encountered. The drug should be withheld if Werner's test indicates drug retention. In photosensitization the drug may be safely continued if further exposure to sunlight is avoided.

**Tubercle, London**

23 195-214 (Sept.) 1942

Hemimechanics and Sedimentation Rate R. B. Whittington and A. K. Miller—p. 195

\*Clinical Trial of Tubercle Endotoxin in Pulmonary Tuberculosis W. G. Bridges—p. 203

**'Tubercle Endotoxin' in Pulmonary Tuberculosis**—Bridges compared the effect of endotoxin in 100 cases of pleuropulmonary tuberculosis with an equal number of cases under identical conditions and given the same treatment but no endotoxin. The drug used was tubercle endotoxin, prepared

according to Grasset's formula by a British manufacturing chemical firm "a preparation of the tubercle bacillus from which the toxicity has been eliminated" During the first week two doses of 0.05 cc at an interval of three days were given subcutaneously Thereafter two weekly doses were given, every week the dose was increased by 0.1 cc until two doses of 0.5 cc were given in one week, then one dose of 1 cc fortnightly for a further two months, making a total period of six months of treatment From the data obtained, tubercle endotoxin had no influence on the course of tuberculosis of the adult type in this country There was, seemingly a possible but unproved comparative benefit to patients treated by artificial pneumothorax and to those with bilateral disease but this possibility carries no weight, owing to an insufficient number of patients and other factors

### Schweizerische medizinische Wochenschrift, Basel

72 805 832 (July 25) 1942

- Treatment of Dysmenorrhea and Its Causes A Labhardt—p 805  
 \*Eosinophilic Pulmonary Infiltration Pathologic Anatomy and Pathogenesis H von Meyenburg—p 809  
 Voice and Speech of Cretins R Juchinger—p 811  
 \*Relation Between Sugar Absorption and Phosphate Metabolism in Rickets L Laszt and J Dalla Torre—p 817  
 \*Modification of Whooping Cough by High Altitude Flights or Low Pressure Chamber P Lauener and F Maeder—p 819  
 Asthma and Histamine Therapy A Dudan—p 821

**Eosinophilic Pulmonary Infiltration**—According to von Meyenburg transient pulmonary infiltration with eosinophils, first described by Löffler in 1932, is a benign disorder The author reviews postmortem observations on 4 patients 3 of whom died as the result of military accidents and a fourth of a traumatic tetanus of short duration The first man died following a gunshot wound which had caused hemorrhage from a torn renal artery The right lung contained two dense, airless foci the size of a plum and a cherry respectively These were believed to be ordinary bronchopneumonic foci Since the man had been healthy, it was supposed that he had had a mild influenza and that the dense pulmonary foci represented a residue of nonabsorbed inflammatory virus It was disclosed that four weeks before the man had had a mild influenza without pulmonary symptoms Microscopic study of the pulmonary tissue revealed a large number of eosinophils while examination of other organs revealed eosinophilia of blood and bone marrow In 2 of the other 3 cases ascariids were discovered in the intestine Two of the 4 patients had bronchitis and bronchiolitis these 2 patients had bronchopneumonia, the others had lobar pneumonia The author believes that these cases present an anatomic substrate of a transient pulmonary infiltration with eosinophils, though he is not able to furnish proof of its transient nature The pathogenesis or rather the route of development is not always the same Evidence is presented that there is not only a bronchogenic but also a hematogenic development and that eosinophilic infiltrates occur not only in the lungs but also in other organs There is evidence of a possible relationship between epididymitis and pulmonary infiltration His studies furnish no evidence of bacteriologic nature Possible etiologic significance of animal parasites is admitted The author concludes that eosinophilic pulmonary infiltration is an inflammatory allergic reaction to various antigens which may enter the body by various routes

**Sugar Absorption and Phosphate Metabolism in Rickets**—Laszt and Dalla Torre state that, although rickets has long been recognized as a vitamin deficiency disease, knowledge of the rachitic metabolic processes and of the effect of vitamin D on it is still inadequate As the chief disorders in rickets they mention disturbances in the ossification in the intestinal absorption and in the intermediate metabolism They cite observations which indicate that in rickets a change in the composition of serum is more important than disturbances of the bony system The inorganic phosphate content is greatly reduced in rachitic serum, and it is assumed that the phosphate cannot be absorbed from the gastrointestinal tract The authors had observed earlier that carbohydrates during absorption from the small intestine exert a specific stimulus on the phosphate secretion This secreted phosphate causes the selective absorption of monosaccharides If the retroabsorption of the secreted

phosphate is inhibited, the selective sugar absorption ceases Thus, if the phosphate absorption is disturbed, this would have to be evident in the sugar absorption The authors investigated this on rats 1 They were able to prove that in rachitic rats the absorption of phosphates from the small intestine is inhibited 2 There exists an inhibition of reabsorption of the phosphate secreted in the intestine during the sugar absorption 3 The slow reabsorption of the secreted phosphate causes an inhibition of the sugar absorption 4 Calcium chloride and calcium lactate absorption exert no stimulus on the secretion of phosphate 5 The conclusion is reached that vitamin D acts as a transformer of phosphate in that it transforms free phosphate to sugar The rachitic metabolic disturbances are ascribed to the deficiency of this transformation in the organism

**Treatment of Whooping Cough by High Altitude Flights**—Lauener and Maeder review observations on 244 infants and children and on 12 adults who were subjected to high altitude flights in the course of the convulsive stage of whooping cough The duration of the flights was usually ninety minutes and about half of this period (forty minutes) was spent at altitudes of from 3500 to 4000 meters The majority of the flights took place in the forenoon The weather conditions were not always favorable for the flights Rapid sliding flights from high altitudes were avoided because they produced pain in the organ of hearing The children showed practically no fear or anxiety in the plane The majority of infants and young children began to sleep at altitudes over 2000 to 2500 meters and awakened only on landing The authors think that this is due to oxygen deficiency together with the monotonous noise of the motors Nausea or vomiting appeared in about 30 per cent of the children and adults but no vomiting was seen in infants A critical evaluation of the 250 cases on which data are available reveals that in 69 (27.6 per cent) the high altitude flight produced no effect whatever in 5 children there was exacerbation In the other 181 noticeable and striking effects were observed In 57 (22.5 per cent) the flight was effective either immediately or within two or three days in 80 more (32 per cent) the cure was not so rapid nevertheless a considerable improvement was observed within a comparatively short time In about 55 per cent the effects were quite favorable In the remaining 44 (17.6 per cent) the effect was not striking, although not entirely negative Twenty four were taken by automobile to an altitude of 3450 meters and remained there for three hours 16 of the 24 showed a slight to noticeable improvement after this trip but in some the improvement was only temporary The authors review observations on 65 patients who were treated in the low pressure chamber with an average stay of sixty minutes Rapid cure was obtained in 31 per cent improvement in 50 per cent no betterment in 16 per cent and exacerbation in 3 per cent The authors conclude that high altitude flights as well as the low pressure chamber exert a favorable effect on whooping cough The low pressure chamber has the advantage that it is independent of weather conditions

### Pediatrica Pratica, São Paulo

13 1-98 (January-February) 1942 Partial Index

- First Week of Life of Premature Infants R Kohn V—p 5  
 Necessity of Treatment of Caries of Temporary Teeth A Campos de Oliveira—p 21

**First Week of Life of Premature Infants**—Kohn V observed 4,680 infants who were born at a maternity hospital during the years 1938 1939 and 1940 There were 585 premature infants (12.5 per cent), 48 per cent were born of unmarried mothers Syphilis played an important role in the pathogenesis of prematurity, which was more frequent in multiparas than in primiparas Proper care and administration of testosterone propionate improved the vitality of the premature infants The rate of mortality in this group was 18.6 per cent Obstetric manipulations increase the rate of mortality Congenital syphilis intracranial hemorrhage and congenital weakness are the main causes These may be favorably influenced by intensification of the crusade against syphilis protection of unmarried pregnant women by placing them in better social and economic conditions and by an increase in the number of medical and social centers for free medical care

## Book Notices

**Urological Diseases of Pregnancy** By E. Granville Crabtree, M.D., Urologist to the Boston Lying In Hospital, Boston. With a signed chapter by George C. Prather, M.D., Assistant Urologist to the Boston Lying In Hospital. Cloth. Price \$6.50. Pp. 472 with 159 illustrations. Boston: Little, Brown & Company, 1942.

This exceptionally complete treatise on the urologic diseases of pregnancy shows a wide experience in the urinary complications in gravid women and an extraordinary familiarity with the work of others in the field. There is a scope which is unusual in a volume devoted to a subject which superficially does not seem to have as many facets as the author most effectively discovers and describes. Most urologists at large hospitals which have active maternity services have come face to face with most of the problems which this volume recites but few have taken the profound interest in them or have acquainted themselves with the many changes affecting the gravid and parturient woman in relation to the urinary tract and other systems of the body. The large bibliography represents only those contributions which have been carefully analyzed and those of some value in clarifying the entire subject.

The importance of hormonal influence in pregnancy is stressed and the statement that "when this glandular response is abnormal, pathological changes are inevitable" is noteworthy. There are a few illustrative quotations which may be cited. "The response of the human body to pregnancy influences seems to follow a fairly constant pattern certainly so far as the urinary tract is concerned. While the composite curve is true to the form mentioned there are individuals in whom there is apparently no change whatever in the urinary channels during pregnancy. No explanation has been offered as to why one individual seems to respond to pregnancy more than another."

Chapter 6 is devoted to the effect of pregnancy on anomalous and preexisting pathologic conditions of the urinary tract. Here is considered solitary kidney, abnormal mobility of the kidney and malposed kidney. The subject is thoroughly covered. In chapter 9, besides other interesting data, the experimental work showing the effect of pregnancy hormones on the isolated ureter is abstracted. Chapter 12 contains a thorough exposition of infections of the urinary tract and comprises fifty-three pages. Chapter 14 is devoted to the treatment of urinary tract infections, and a mature evaluation of the various drugs in vogue is given. Again a few quotations may be cited. "In the low acidification therapy the diet which is tolerated by most pregnant women is not adequate for the cure of the infection. There is little to commend the ketogenic diet in comparison with other available antiseptics. Quoting Krueger and Scribner (1941), 'Theoretically, uncomplicated infections of the urinary tract should offer potentialities for the application of the phage therapy. They are usually well localized processes and the tissues involved are readily accessible, so that almost any desired amount of phage can be brought in contact with them. Nevertheless, there is little in the published results to suggest that phage therapy has any significant superiority over the common chemotherapeutic approaches.'"

Other subjects are equally well described in subsequent chapters. In chapter 21 the subject of fluid balance in pregnancy and the puerperium should be of great interest to the urologist from a mechanical point of view in relation to residual urine and retention after delivery because "he should not treat a patient to her disadvantage through lack of knowledge of the fundamentals of fluid behavior in relation to gestation. It has been shown that the percentage of output of water in normal pregnancy indicates a progressively decreasing ability to handle fluids with a moderate rise near term."

Chapter 34 deals essentially with renal insufficiency from blood transfusion. This subject also is of great importance because often the need for blood replacement in postdelivery cases is urgent and the amount of blood required may be a large percentage of the blood volume of the patient at the time of transfusion.

In general this volume which is attractively printed and illustrated, may be considered a milestone in urologic literature in that nearly five hundred pages is devoted to a subject which heretofore has been but lightly touched on in most books on urology. Its value to the obstetrician will be as great as to the urologist.

**Revelation of Childbirth: The Principles and Practice of Natural Childbirth** By Grantly Dick Read, M.A., M.D. Cloth. Price 11s. 1p. 20.- London: William Heinemann Medical Books Ltd. 1941.

Ten years ago the author published a monograph entitled 'Natural Childbirth' which created considerable discussion. The present volume elaborates the author's aims and methods and presents a record of some of his clinical results. The thesis expounded is that human reproduction is a normal natural biologic process. Pregnancy and labor should be conducted in this light so that they remain natural and unassisted. The pain associated with uterine contractions is the result of fear engendered by generations of ignorance, misconception and false teaching. We do not fear facts but doubts and uncertainties. The fear of parturition has become the great disturber of the neuromuscular mechanism of labor. Pain is caused by tension; tension is caused by fear. Tension leads to cervical dystocia.

If one accepts the theory that pregnancy and labor is a normal physiologic process which should be devoid of pain and that pain is the result of fear, then the management of normal pregnancy and labor should include the elimination of fear. The author accomplishes this objective by education. His antepartum care includes the usual safeguards for the prevention of the hazards of childbirth and in addition a serious attempt is made to influence the mind of the patient. All efforts are directed toward impressing the pregnant woman to regard labor as a normal uneventful biologic process devoid of pain, discomfort and other pitfalls. Anxiety is removed by a careful explanation of all the facts which enter into a normal pregnancy and subsequent labor. Each antepartum visit drives home the fact that reproduction is normal and therefore uneventful. As an adjunct to this peace of mind which the healthy mother should develop she is taught to relax. Systematic exercises promoting physical relaxation is introduced at four or five months and continued to term.

Labor is conducted as naturally as possible. During the second stage the patient has access to an inhalation anesthetic which she can use at will but she rarely resorts to it. Thus, some analgesia is offered to her but her education is so complete that labor is an uneventful process. The pains that are associated with the final completion of the dilatation of the cervix are probably traumatic and should be relieved by firm rubbing or hard pressure on the sacrum. The relative anesthesia of the perineum which makes it possible for the author to repair superficial tears without anesthesia is probably due to the trauma to which the perineum has been subjected and not as the author would have one believe, the result of the excited state which the patient has achieved at the birth of the baby. Anesthesia is reserved for the abnormal or surgical delivery, in which real physical pain is due to laceration, excessive stretching and tension of the birth canal.

This small volume should be read by every obstetrician and student of the physiology of reproduction. No one can deny that emotional influences play a profound role in pregnancy and labor. It is true that pregnancy and parturition have become a pathologic state in the eyes of most physicians comparable to a major disease. It is equally true that few women in our large maternities deliver naturally. However, pain relief is here to stay even though the perfect analgesic agent has not been found. The author's argument that 'anesthesia in cultural labor is given primarily to satiate the escape demand of fear' will not deter the ever increasing widespread use of analgesia and anesthesia. In spite of the conversion of a physiologic function into a pathologic state pregnancy and labor have become increasingly safer for mother and baby. The hazards of childbirth are rapidly disappearing. Our women are restored to normal mental and physical vigor thereby often cheating them of extensive gynecologic reconstruction or a lifetime of invalidism. The spirit of the crusader is discernible in the declaration of the author: "When as a lonely wanderer I first



set out to investigate the emotional influence of pregnancy and parturition it was the paradox of pain in a biological design that urged me on. For a year my professional life hung in the balance as pregnant women hurried by my door as scolded cats but in spite of all it is more satisfying to be nobody with something than somebody with nothing. This spirit should be admired.

The author dedicates this monograph to the late Joseph B. De Lee a fellow crusader in the interests of safer motherhood, for his kindly interest in his work and his personal friendliness and appreciation.

**Constitution and Disease. Applied Constitutional Pathology.** By Julius Bauer, M.D. Professor of Clinical Medicine, College of Medical Physicians, Los Angeles. Cloth. Price \$3.50. 1 p. 208 with 11 illustrations. New York: Grune & Stratton, 1942.

The rapid advances in chemotherapy have brought a shift in the relative importance of those extrinsic pathologic factors, particularly infectious diseases which until recently have held the center of the stage in producing human misery and death. For somewhat obvious reasons medical curriculums in this country have lagged in presenting the constitutional or hereditary factors involved in human pathology. This work by a prominent European clinician for many years professor of medicine at the University of Vienna is therefore particularly timely. Dr. Bauer states in his preface: "This little book may stimulate medical thinking and critical sense in evaluating old and new actual and apparent facts in medicine. It may help to promote good judgment and common sense in practicing medicine and in digesting current medical literature as well. It should be considered as a supplement to the routine medical curriculum. By virtue of these objectives it may contribute to the ultimate aim of medicine: to help the sick or to Trudon used to say, to cure sometimes, to relieve often, to comfort always."

The author has drawn freely from his own clinical experience and from the medical literature in presenting facts illustrating the human hereditary complex. He has wisely avoided giving detailed family pedigrees, has emphasized the fact that predispositions often have an important hereditary background though the modus operandi of specific genetic factors may at present be unknown and has stressed the importance of a knowledge of heredity in the etiology of disease even where this knowledge cannot at present be used in treatment. In chapter III on constitutional biologic inferiority of organs and tissues much evidence is presented on the hereditary nature of defects, actual and latent involving specific organs and tissues. Chapters IV and V treat respectively the endocrine and nervous systems in their integrating roles and the interplay between these and the genetic constitution, the sum total of the genes and the phenotypic constitution, the human body and its component organs. The discussion is at points needlessly involved but the main thesis that the hereditary complex is primary and that endocrine and nervous relationships are secondary is sound. Chapter VI presents a critical evaluation of constitutional types and chapter VII deals with some major diseases with chiefly constitutional etiology. The inheritance of diabetes mellitus, obesity, constitutional hypertension, diseases of the hemopoietic system, peptic ulcer and cancer are discussed. A short concluding chapter touches on principles of treatment, nonspecific therapy and pitfalls and errors, particularly in endocrine diagnosis and therapy.

From the genetic standpoint the book is for the most part accurate. The author has correctly emphasized the importance of the study of uniovular twins, the pleiotropic or multiple effects of certain specific hereditary units or genes, and the variety of expression of given genes and gene combinations in different genetic (constitutional) and environmental (including therapeutic) backgrounds. The reviewer would criticize his interpretation of certain syndromes as due to linked genes rather than to the pleiotropic action of one gene in different genotypes and his ambiguous and unorthodox use of the terms dominant and recessive in connection with sex determination. The wise use of psychotherapy and the consideration of the constitutional background of the patient in diagnosis and treatment are stressed. This book will prove valuable to all who are interested in human biology and pathology but is recommended particularly to young practitioners and medical students. An extensive bibliography is included.

**Do hipertireoidismo e seu tratamento.** Por Ulysses Iemos Torres. Livre docente de Clínica Médica da Escola Paulista de Medicina, São Paulo. 1º edição. 1 p. 342 with 13 illustrations. São Paulo: Empresa gráfica da Revista dos tribunais, Ltda., 1942.

The subject matter is arranged in sixteen short chapters. To each chapter is appended a selected bibliography and each reference is specifically quoted in the text. In the first four chapters the author reviews the embryology, histology and chemistry of the thyroid gland. The essential facts as we know them are briefly and clearly presented. One chapter gives a summary of the relations of the vitamins to thyroid function and reflects the popularity of the subject rather than any specific relation to thyroid disease. The next ten chapters are devoted to a discussion of hyperthyroidism, its general etiology, varied symptomatology, pathology and classification of types of the disease. Fifteen clinical reports are given in detail to illustrate these types and stages of the disease. Separate chapters are devoted to toxic adenoma and iodine hyperthyroidism. Typical clinical reports of such cases are included. The region around São Paulo is one of the world's important districts of endemic goiter, and both toxic adenoma and iodine hyperthyroidism are more common in endemic goiter districts. The author thinks that the distinction between toxic adenoma and toxic diffuse goiter is justified and should be attempted in every case despite the general accuracy of Wolff's dictum that "goiter plus symptoms equals adenoma and symptoms plus goiter equals Graves disease [toxic diffuse goiter]". The final chapter deals briefly but clearly with medical and surgical treatment. The author points out that the type and stage of the disease, also the social and economic condition of the patient must be taken into consideration in deciding on the best treatment. Certain types such as toxic adenoma or cases complicated by fibrillation or diabetes require operation at the first opportunity. Early or mild cases of toxic diffuse goiter should be treated in the first instance medically with rest, sedatives, vitamins, hormone preparations (estrogens and insulin mainly), iodine, bromine and quinine. He devotes several pages to a review of Kazakoy's polyglandular hypothyroid treatment. Surgical treatment has the advantage of providing immediate relief in properly selected and prepared cases. This monograph is a well balanced, conservative summary of the subject and should serve a highly useful purpose for physicians who are familiar with the Portuguese language and who require more than the brief account in textbooks.

**Practical Survey of Chemistry and Metabolism of the Skin.** By Morris Markowitz, M.D., Associate in Dermatology and Syphilology, Graduate School of Medicine, University of Pennsylvania, Philadelphia. Philadelphia: E. B. Saunders, 1942. Price \$3.00. 1 p. 196. Philadelphia: Blakiston Company, 1942.

The purpose of the author is to give to the student and practitioner of medicine a general survey of fundamental facts necessary for a better understanding of dermatology. In a concise and well organized presentation divided into part I on the chemistry of the skin, part II hematology, part III blood chemistry and part IV vitamins in dermatoses we are given a better conception of the close relationship between internal medicine and related cutaneous manifestations. In spite of its small size the author has succeeded in covering an enormous amount of territory. For those who wish more complete information a well selected bibliography is found at the end of each section. The worth of the book could be improved by the addition of a few illustrations, especially where cellular pathology is concerned. Also closer attention to proofreading would eliminate several errors. The author is to be congratulated on giving so much in so few pages and strengthening the pattern of dermatologic thought which is attempting to place diagnosis on a firm basis of physiochemical changes rather than on long Latin words and phrases. The book is highly recommended.

**Recent Advances in Obstetrics and Gynecology.** By Aleck W. Bourne, M.A., M.B., B.Ch., Obstetric Surgeon to St. Mary's Hospital, London, and Leslie H. Williams, M.D., M.S., F.R.C.S., Obstetric Surgeon to Outpatients, St. Mary's Hospital. Fifth edition. Cloth. Price \$5.00. 1 p. 313 with 72 illustrations. Philadelphia: Blakiston Company, 1942.

Most significant in the discussions in this volume are the chapters on sex hormones, ovarian tumors and the uses of recent gynecology in obstetrics. Especially worth while is the discussion on cancer and the excellent results now achieved by early diagnosis and proper treatment. Special emphasis is placed on the development of postpartum care to a status resembling that of antepartum care.



## Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT HOWEVER REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS BUT THESE WILL BE OMITTED ON REQUEST.

### GENETICS OF HUMAN CANCER

*To the Editor*—What is the present opinion as to heredity in the transmission of cancer from parent to offspring? Is it a dominant mendelian characteristic? Is there any evidence besides that of rats that this tendency is inherited? If so do the same kinds of cancers occur in the progeny as in their forebears? Does this heredity factor vary in different types of cancer? What recommendation would you give to a person contemplating matrimony with a person one of whose parents has been a victim of cancer?

Lieutenant M C A U S

**ANSWER**—The genetics of human cancer are too unknown, too complicated, to discuss dogmatically at the present time. Certainly some rare malignant growths, as for example malignant glioma of the retina or the less malignant neurofibromatosis, have a strong hereditary background. But for the common types of carcinoma the evidence is for the most part not clear as to just what influence heredity has, and for that matter the genetic pattern of cancer in mice and rats is far from clear, with nongenetic factors coming into play in some of them. Certainly multiple polyposis of the colon with its common malignant change is a familial disease at least in some instances, but to say that carcinoma of the colon is ordinarily on a hereditary basis would be going much too far. There is some statistical evidence that cancer of different organs tends to occur more frequently in persons with relatives with cancer in the same organs than in those with no such relatives, but the evidence is slight indeed and certainly shows no pronounced influence of heredity in the production of cancer. As to recommendations concerning matrimony with a family history of cancer, there should be no hesitation in the case of a person who has had one parent a victim of cancer, unless the cancer was one of those rare cases of glioma of the retina, neurofibromatosis or one of the few other neoplasms with a strong hereditary background. If there has been cancer in both sides of the family involving the same or equivalent organs, consultation with some one familiar with the genetics of cancer is to be recommended.

### DYSCHONDROPLASIA

*To the Editor*—I have a patient with dyschondroplasia. Is there any treatment that may be of benefit? The parents will allow the child to be placed in an institution for research purposes.

J. Lewis Fretz, M.D., Seattle

**ANSWER**—There is no treatment for dyschondroplasia which offers any hope of improving the condition. Both vitamins in varying amounts and mixtures and preparations of the glands of internal secretion have been used without any definite evidence of benefit. This is a condition which is probably due to a primary germ cell defect and as such offers little hope of improvement as the result of therapy. One of the Shriner hospitals for crippled children or an orthopedic service in connection with one of the medical schools would probably be willing to accept this child for care.

### BREAST NURSING AND GALACTAGOGUES

*To the Editor*—A woman aged 41 had her first baby recently, but she does not have enough milk for the baby. What is the best preparation to give the mother to stimulate the secretion of milk? What about vitamin B complex or glandular preparations?

M.D. Oklahoma

**ANSWER**—Specific galactagogues, whether in the form of food or of drugs, are no longer advocated. Heredity is an important factor; the ability to nurse is commonly transmitted from mother to daughter. The nervous or mental condition of the mother is an important factor in her ability to nurse. Plenty of rest, calm environment and moderate exercise are advisable. A well balanced diet containing about 1 quart of milk daily and total fluids of 2 quarts is advisable. The real stimulus to milk secretion is thorough emptying of the breast. If the baby fails to empty the breast, this should be done by manual expression or a breast pump.

### PROBABLE RENAL COLIC FROM STONE AND DIAPHRAGMATIC PLEURISY

*To the Editor*—On July 13, 1942, a laparotomy was performed on a man aged 34. Early symptoms at the onset of his illness two days earlier were suggestive of the urinary tract with pain in the right costovertebral angle referred down around the flank with extension to the back of the penis. He had dysuria with frequency but the urine appeared clear amber even though it contained 5 red blood cells per high power field. The urine was otherwise negative. The white blood count was 8,800. When the abdomen became rigid on the second day operation was performed. The appendix was long, fibrosed and not acutely inflamed. The left and right kidney were fused on the right side with the right kidney pelvis facing outward and backward to the right side. A retrograde pyelogram showed that the left ureter entered the bladder on the usual left side and extended upward across the midline to the left kidney fused to the lower pole of the right kidney. This kidney pelvis faced normally to the midline. There was only slight hydronephrosis of the right (upper) kidney pelvis. The appendix was removed but severe tenderness remained over the large kidney mass. The postoperative temperature ranged from 99 to 101 F. until the tenth day at which time the tenderness had completely subsided. On his first day out of bed the patient suffered from a severe continuous pain in the left costovertebral angle not relieved by morphine. The chest was clear, the gastrointestinal tract was normal, the patient voided small amounts of normal urine every forty-five minutes. The urinalysis showed a trace of albumin, an occasional white blood cell and a rare red blood cell. The left costovertebral angle was not tender. The pain began to subside after three days but was still evident to the patient two weeks later as a soreness. With the onset of this pain the temperature ranged from 101 to 103 F. The patient was discharged from the hospital on the twenty-first day after operation and two days after a retrograde pyelogram was done. About four or five days after this a severe left costovertebral angle pain developed and the patient began to have occasional deep involuntary respiratory inspirations that would begin with a yawning action. These occurred only two or three times each day while the patient was in the hospital but after he was home they increased in frequency until they occurred as many times as eight in one hour. These were more prone to occur when the patient was sitting. He had no control over them whatever and said that he would start to yawn and would then get a feeling as if some one was giving him artificial respiration only the reflex muscle action was always inspiratory. There was never a succession of such involuntary acts. Between the fifth and sixth week after operation these involuntary inspirations began to occur more frequently on walking. During the sixth week he had more dyspnea on walking up a flight of steps than he had had before and certainly more than his inactivity would produce. During the seventh and eighth weeks both the dyspnea and the involuntary inspirations began to diminish and become less frequent. Now these involuntary inspirations occur only two or three times each week. I would be interested in getting an opinion on these involuntary inspiratory spasms and also some idea as to the cause of the severe left costovertebral pain while in the hospital since there is no kidney in that area on this patient. He is not of a neurotic nature. He is a steel welder.

M.D. Pennsylvania

**ANSWER**—This is an interesting presentation but unfortunately does not give all the information one would like to have in order to make a definite diagnosis. However there are several points that stand out clearly and forcefully. In the first place the original attack that the patient had can be called a renal colic due to stone. The inference that the patient had a renal colic due to stone is based on the sudden onset of pain in the right costovertebral angle referred to the back of the penis associated with dysuria and frequency and the presence of red blood cells in the urine. The white blood count was 8,000 which is compatible with renal colic. The retrograde pyelogram disclosed a slight hydronephrosis of the right kidney pelvis. The patient was operated on and an appendectomy was performed. The reason for this is not clear from the evidence presented and from the symptoms mentioned. At operation the appendix was found to be not acutely inflamed. Following the operation the patient had a temperature that varied from 99 to 101 F. which was associated with frequency of urination, about 100 red blood cells and white blood cells in the urine. This is compatible with an acute pyelitis following the operation. This part of the query seems perfectly clear.

With regard to the respiratory inspirations that began with a yawning action associated with dyspnea on walking up a flight of stairs, this sounds without a physical examination and without more evidence like an attack of diaphragmatic pleurisy. Another possibility to consider is the fact that the patient may have had a little hiccup but nothing is said about this.

The third point raised is the presence of left costovertebral pain while in the hospital. The correspondent wishes an explanation since there is no kidney in this area. The left costovertebral pain may well be explained on the basis of a diaphragmatic pleurisy or intercostal neuralgia or neuritis or perhaps something in the spinal cord itself. It is exceedingly difficult to venture an opinion on the latter subject. It is noted that the correspondent states that the patient is not of a neurotic nature. This does not appear to be a neurosis in any sense of the word.

## DISPOSAL OF OLD X RAY FILM

**To the Editor**—I am interested in a way to dispose of old x ray films. Can you please suggest a method? Is there a collector for such films? I am a doctor's secretary and have been asked to dispose of some old films. I am under the impression that the chemicals coating the film are of some value in these days of conservation. Gertrude Fischer New York

**ANSWER**—Old x-ray films can be readily sold for scrap, and the price paid per pound is fairly high at the present time. There are numerous jobbers in every city who will purchase the films, and the local chamber of commerce can be of help in making the selection of the best buyer. The classified section of the telephone directory may give a list of buyers, but usually the roentgenologist's mail contains numerous advertising letters and postal cards from individuals anxious to purchase scrap film. One should be careful to check the weight of the films and should obtain several quotations before selling.

## SUBSTITUTES FOR RUBBING ALCOHOL

**To the Editor**—The recent withdrawal of rubbing alcohol from sale except on the prescription of a licensed physician has brought up the question as to whether there is any solution that might be substituted for alcohol for that purpose. Can you tell me where I can obtain any information on this subject? William R. Dorr, M.D. Phoenix Ariz

**ANSWER**—Isopropyl alcohol as included in the following formula has been used as a substitute for ethyl alcohol as a back lotion: isopropyl alcohol 25 cc, glycerin 10 cc, acetic acid 4 per cent 2.5 cc and sufficient water to make 100 cc. Coloring and perfume may be added. A number of noninjurious emollient cream type body lotions and nongreasy skin oils that can be used as a substitute for rubbing alcohol are offered by several of the reputable pharmaceutical manufacturers.

## SLEEP DISTURBANCES OF INFANCY AND CHILDHOOD

**To the Editor**—Many parents complain that their child will not sleep at night, the child otherwise acts perfectly normal with no crying, fever or vomiting but just refuses to sleep. Many will say that the child sleeps little during the day. I have carefully checked these children and found nothing essentially wrong, the increasing of the formula and the addition of sedatives have been of little value. I should appreciate your suggestions as to how to combat this problem.

Joseph A. Concella M.D. Chester Pa

**ANSWER**—There is a considerable variation in the sleep needs of infants and children. Many children require large amounts of sleep, while many others are perfectly happy and healthy on limited hours of sleep. There is no fixed number of hours that an infant must sleep.

Disturbances of sleep during the early months of life are usually due to physical causes such as hunger, colic, soiled diaper, the pain or itching of ammoniacal dermatitis or over-distention. Parental agitation also has an adverse influence on sleep during early infancy.

After the sixth month psychological factors become more important. Sleep disturbances have their origin in a generally improper attitude toward the child and are rarely isolated symptoms. Other behavior problems are usually associated.

The best prophylactic against sleeping difficulties is a regular schedule rigidly adhered to. There should be no irregularity in the hour of retiring. Attention should be given to the following features. The habit of going to bed quietly should be established at an early age. There should be no rough, boisterous or exciting play late in the afternoon or early evening and no loud radio programs or undue excitement before bedtime. It is desirable to have a preparatory quiet period before attempting to go to sleep. The hour before bedtime should be a calm and happy one. No punishment should be meted out just before or at bedtime. Going to bed should mark the end of activity. Once a child has gone to bed, all bids for attention, as requests to go to the toilet, for water, to kiss goodnight again, should be ignored. The parent should not remain with the child until he has gone to sleep. If possible the infant or child should sleep alone in a room in which the temperature, ventilation and humidity are properly regulated. He should not be too hot or too cold. The room should be sufficiently isolated so that sounds from other rooms will not readily be heard, but it should not be necessary for adults to tiptoe about the house, as the infant must become accustomed to sleeping through a moderate amount of noise.

A warm beverage or a warm bath just before bedtime often helps to relax the child. However, once an undesirable sleeping routine has been established, the only method of cure is to allow the child to cry himself to sleep for a week or more if necessary. Each night he will cry for a shorter period until finally peaceful sleep ensues.

## EPILEPSY ASSOCIATED WITH MENSTRUATION

**To the Editor**—A married woman aged 29 has frequent petit mal like seizures in which she loses consciousness for a second or two, drops what she is holding and jerks her hands a little. This is about all that occurs as I have seen several of them. She was perfectly normal until catamenia at 12 years, when the attacks began to occur with each menstrual period never missing one. In the interim she was quite well and free from attacks. On several occasions during a period she has had grand mal attacks and recently has had quite a few petit mal seizures between periods. The periods are scanty, lasting only three or four days but otherwise are normal. At 14 years an air encephalogram was done by a well known neurosurgeon (now deceased), which apparently revealed no pathologic condition and gave no relief although he suggested doing some sort of brain surgery from an occipital approach (decompression?). During her one pregnancy she was entirely free from attacks which returned three weeks after the delivery. Her physical examination other than for moderate obesity is entirely normal. There are no signs of increased intracranial pressure or meningeal irritation. All laboratory work including blood counts, urinalysis, blood sugar and basal metabolic rate is normal. The patient has been told by doctors that a bilateral oophorectomy will cure the trouble and she wants me to do this as she has had no relief from either phenobarbital or phenytoin sodium in adequate amounts. The effect on her nervous system is already considerable. Assuming the results of a lumbar puncture which I shall do in a few days are negative do you think the possibilities of a cure justify an oophorectomy? Have you any other therapeutic means to suggest? If oophorectomy has been done in similar cases, what has been the result? M.D. Washington

**ANSWER**—Rarely are a patient's seizures so definitely related to the menstrual function. Nevertheless there is no reason to believe that oophorectomy would lessen her seizures, and the operation undoubtedly would increase her physical and psychologic problems of adjustment. This operation apparently has not been reported in recent years. Older case reports are unconvincing (Ashe J S. *Dublin J M Sc* 4 142 [May 20] 1920. Everke, C. *Monatschr f Geburtsh u Gynak* 61 256 [Jan] 1923). Spratling, in his book published in 1904, stated that he observed improvement in 2 of 9 patients operated on. Even in patients with migraine, in which condition cessation of attacks at the time of menopause is the rule, artificial menopause is usually without benefit. Therefore oophorectomy is no more indicated than is occipital decompression, suggested fifteen years ago, designed to provide a freer flow of blood from the brain. The experimental use of theelin or other estrogenic substances would be preferable to the use of the knife. An electroencephalogram would be helpful in judging the severity of the case. If this examination should confirm the clinical diagnosis of petit mal, there is a good chance that these attacks will gradually disappear spontaneously. For the grand mal, a combination of phenytoin sodium, to the limit of tolerance, and of phenobarbital may be used.

## AMPHETAMINE INHALATIONS AND CORONARY OCCLUSION

**To the Editor**—In *Queries and Minor Notes* in *The Journal* Sept 26 1942 page 325 there was an inquiry regarding the advisability of using amphetamine for a patient with a recent coronary occlusion. In answer to the inquiry it was stated that the consultant to whom the question was referred had observed no instances in which amphetamine appeared to have any effect on the coronary vessels, and it was stated that the drug might be used safely for inhalation by patients who had had a coronary occlusion. In view of these statements, I should like to call attention to the experience of 1 of my patients. This man had allergic rhinitis and had acquired the habit of using the amphetamine inhaler frequently. On Feb 16 1942 he purchased a new tube of this material and used it at intervals of a few minutes throughout the afternoon and evening. He felt bad and had a sense of 'heaviness' throughout his body when he retired at 10 30 p.m. About 2 a.m. he was suddenly awakened by a sense of oppression in the precordium and great pounding of his heart. These symptoms lasted several minutes. After they were over, he was extremely weak and noticed tingling in his arms particularly the left. The next day he was quite short of breath and again had tingling in his arms with even slight exertion. He did not consult me until two weeks later but during this interval he was constantly short of breath and had numbness and tingling in the arms on the slightest exertion. An electrocardiogram taken at that time revealed normal mechanism, regular rhythm and a T wave poorly deflected in all leads. No formal diagnosis was made but it was suggested that this picture might be the result of debilitating disease, asthenia from any cause, obesity or the like. He was kept in bed several weeks and the symptoms described disappeared. The electrocardiograms taken after the rest period showed some changes from the previous electrocardiogram. The rate was 80 instead of 72 and the T wave was poorly deflected in all leads. R<sub>1</sub> was short and the configuration of S<sub>1</sub> suggested a coronary occlusion. These electrocardiograms were interpreted as not normal but not entirely characteristic of coronary occlusion. Although the symptoms were not in every way typical of the onset the conclusion is that this patient had a coronary thrombosis. Whether the amphetamine inhalation had anything to do with precipitating the occlusion is difficult to determine at this time. The patient himself feels definitely that it had.

Paul S. Rhoads M.D. Evanston Ill

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## EDUCATION AND THE WAR

EDWARD C ELLIOTT, LL D

Chief Professional and Technical Training  
War Manpower Commission

WASHINGTON, D C

Certainly any thorough discussion of education and the war would require more time than has been allotted to the present speaker and more patience than is possessed by the present listeners. Consequently I and also you must be content with a brief and sketchy interpretation of the educational scene as I have observed it, particularly during the past six or eight months. My attention will be focused on the portions of the scene that have a war relation to the institutions ordinarily classified as higher institutions—colleges, universities and professional and technical schools.

Since the days when the dark clouds of war began to gather on the national horizon, American schools from the lowest to the highest have exhibited an energetic anxiety to give conclusive proof of their loyal usefulness as instruments for the increase of the national might demanded for victory. Teachers and students, day by day, have stood fast, as minute men, ready to respond instantly. There is not a community anywhere in the country that is not indebted to its schools for giving new reality to the lessons of public service. Every program designed to arouse and to unify the people has turned to schools for help, and that help has been given without stint.

Today all the people are being matriculated in the College for War. The struggle for human freedom has packed the words labor, learning and liberty with new meanings. These meanings constitute the assigned lessons for millions, and these lessons are not easy. We who thought of ourselves as an educated nation now realize the essential difficulties of educating the educated, of educating for war those who have long been habituated to the ways of peace, of training those concerned with self interest so that they become more concerned with the survival of the ideals of the nation.

For the first time we of the United States are faced by the grim facts of the scarcity of the things needed for the victorious battle. We now know as never before, that our resources of nature and of manpower are limited and that these resources must be mobilized with skill and foresight and allotted with yet more skill and more foresight. New rules must be accepted and practiced if we are to escape famines—famine of metals, of munitions, of machines, of money, of medicine, of food and of fuel, and above all famine of trained manpower. Teaching has become a critical

war occupation. The teacher in areas of war technology has become as necessary as tanks and torpedoes.

My connection with the War Manpower Commission began last June. Then I assumed responsibility for what was known as the Division of Technical Employment and Training. This division, according to a particular administrative order, was charged with the following special duties:

- 1 To review the organization and operations of the Engineering, Science and Management War Training Program of the Office of Education to insure effective utilization of the higher, technical and professional institutions for the training of personnel needed for the armed forces, for essential industrial and agricultural production and for governmental services.

- 2 To direct the activities of the National Roster of Scientific and Specialized Personnel through the head of that office to insure the proper discharge of responsibilities for the development of information as to the qualifications and availability of professional and technical workers for the armed forces, war industries and governmental war activities.

- 3 To direct the activities of the Office of Procurement and Assignment through the head of that office to insure proper discharge of responsibilities for the recruitment of physicians, dentists and veterinarians for the armed forces and for essential civilian purposes.

- 4 To be responsible for the coordination of the work of the various agencies and offices under his jurisdiction and for the elimination of any duplication.

- 5 To recommend to the director of operations, for execution in various regions, such action as may be necessary to secure adequate training, classification, employment transfer and placement of professional and technical workers.

- 6 To establish effective working relations with the regional offices of the War Manpower Commission so as properly to advise and to counsel the regional manpower directors on specific problems in their regions relating to the training and employment of professional and technical workers.

- 7 To assemble current information as to the functions, programs and activities of the several administrative divisions of the War Manpower Commission having relationship to the training and employment of professional and technical workers, consulting with the heads of such divisions to arrive at a common understanding of the scope of activities of each division.

- 8 To establish and maintain effective relations with other governmental agencies concerned with the training and employment of professional and technical personnel essential for the national war effort to promote general acceptance of the program and policies of the War Manpower Commission.

9 To establish and maintain such relations with the higher educational institutions, and with the associations representing those institutions as will increase their usefulness to the national war effort

Truly a heavy requisition for a staff which most of the time consisted of myself and one clerical assistant. Whatever the limitations of accomplishment it has been my principal duty to be concerned with the training and the supply of professional and technical personnel. Modern warfare makes heavy and heavier demands on these sections of our manpower. We know that we have an insufficient supply of physicians, of engineers, of chemists, of physicists, of scientific research workers and of other specialized technologists requiring prolonged training. What proportion of this supply shall be allotted to the armed forces, to the war industries and to the maintenance of essential governmental and civilian activities? What plans shall be followed to step up the production of these critically important workers?

At best it must be admitted that we have proceeded in an uncertain, catch as catch can fashion. If the war is not to be too prolonged, we shall muddle through. On the other hand, if the war is to continue for three, four, five years, then we may be self convicted of short sightedness for not devising formulas for a better balance of supply and needs and for not insuring a continuous flow of trained men and women for the essential service of a nation at war.

Two months ago the War Manpower Commission effected certain internal reorganizations and reallocations of responsibilities. The activities of the commission were divided among five bureaus—Selective Service, Placement, Program Planning and Control, Training, and Labor Utilization. Thus the division with which I have been connected became the Division of Professional and Technical Training within the Bureau of Training. All matters relating to employment were assigned to the Bureau of Placement. To this bureau went the National Roster of Scientific and Specialized Personnel and the Procurement and Assignment Service.

Here may I digress for a moment and express the rare personal satisfaction I have had from working with Dr. Frank Lahey and his associates on the directing board of the Procurement and Assignment Service with Commander Lapham and with that dynamic stimulator of the minds and actions of men, Dr. Morris Fishbein. From these lamps of medicine my own feeble candles have been kept lighted. I have been permitted to see something of the mighty strength of the professions of medicine and dentistry and to have a new understanding of their problems and their lacks.

At the present time the Division of Professional and Technical Training is chiefly concerned with the following:

1 Serving as a liaison for the War Manpower Commission with the War and Navy departments, with special emphasis on the utilization of the colleges, universities and technical schools for the several forms of special training needed by the armed forces. During recent weeks three members of the staff of the division have acted as members of the joint committee, representing the Army, Navy and War Manpower Commission, established for the selection of nonfederal educational institutions to be used by the Army and Navy in connection with the specialized training pro-

grams. It is estimated that these programs will involve the training of approximately 300,000 young men during the coming year.

2 Promoting ways and means for increased attention to training through higher educational institutions in the various professional and technical fields—engineering, medicine, physics, pharmacy, chemistry, mathematics, nursing, teaching—with special reference to the needs of war industries and of essential civilian activities. This has emphasized the importance of knowing far more accurately than at present the quality and quantity of these needs. At the present time surveys of these needs are under way by governmental agencies and by industrial and professional organizations.

3 Continuing the organization and stimulating the activities of consultative committees representing the various professional and technical groups. These committees are concerned with maintaining the supply of trained personnel for the direct as well as for the indirect needs of the war effort. This has meant that considerable attention has been devoted, and continues to be devoted, to the formulation of policies for the deferment, under the Selective Service System, of students in the fields of critical scarcity.

May I append to this crude and wholly inadequate sketch a brief observation or two as to the future, immediate and remote.

Twenty or more years ago I was led to call attention to what I characterized as the struggle then going on in the world for the possession of the minds and the ability of youth. It was my conclusion that the group, the class, the nation succeeding in gaining control of the most of the best of its youth would control the fate of civilization. The happenings throughout the world during the past two decades—especially in Europe—furnish tragic evidence of the outcome of this struggle. Time and circumstance do not permit discussion of this phenomenon in the life of modern mankind. Nevertheless, it is relevant to my subject to call passing attention of the present day struggle for youth going on in our midst. This promises to lead to decisions of far reaching importance as the nation strives to mobilize its full battle strength.

At its meeting on July 29, 1942 the War Manpower Commission considered at length the place of the colleges and universities of the country in the manpower problem. A special committee was appointed to examine into this matter. The report of this committee was presented to, and approved by, the Commission on August 19. This must be regarded as a declaration of national policy as to the youth now in our higher educational institutions and to the youth who will be in these institutions during the period of the war.

In view of the problems presented to all of the so-called professions, it is well to be reminded of one significant position of this declaration of policy.

"All able bodied male students are destined for the armed forces. The responsibility for determining the specific training for such students is a function of the Army and Navy."

Under the inexorable demands of the battle fronts this policy is now being implemented. The effect of such implementation on national life and efficiency may be only roughly forecast. Without question the impact will be painfully felt by all professions. Whence will flow the stream of trained men and women essential for the maintenance of life back of the armed forces? I

leave this question as one which is yet unanswered but must be answered if we are to escape disasters of our own making

Eight months of experience in Washington have impressed on me the tremendous difficulties in the formulation and application of plans for the best use of education for the purposes of the war. Not the least of these difficulties is the lack of agreement among those who speak and act for education. Education too often does not appreciate the inescapable requirements of global war, and those seeking to fulfil the requisitions of war are not inclined to recognize the limitations and contributions of education. However, in spite of confusions, delays, mistakes and the conflict of prejudices, there is today much encouraging evidence that the rightful place of education in the war power pattern of the nation is becoming clearer. Meanwhile men of sense and responsibility must assume the trying task of arbitrating between those who persist in seeing education in peace time terms and the extremists—and, believe me, there are many of these—who would close all the institutions of higher education for the duration.

In the making of the decision, it must never be forgotten that the American youth involved represent our chief hope of attaining peace in the world—a peace that will never again find the nation unprepared for war, as it was twenty-five years ago and once more on Dec 7, 1941—a peace with power to maintain peace among men and nations. Such I consider to be the great task of education and the war.

## PREMEDICAL AND MEDICAL EDUCATION AS RELATED TO THE UNITED STATES ARMY

BRIGADIER GENERAL JOE N DALTON

Assistant Chief of Staff for Personnel Services of Supply  
WASHINGTON, D C

An invitation to address the Annual Congress on Medical Education and Licensure is a privilege laymen do not ordinarily receive. Consequently, as I reviewed the program and noted the qualifications of the speakers the thought occurred that perhaps I was invited as an antidote. I accepted the invitation with the belief that I could help the members of the congress understand some of the Army's educational problems and the hope that the Army might thus receive still further aid from the medical profession.

My father practiced medicine and surgery in Winston-Salem, N C, for many years, and if you will accept my deep respect—my affection—for your profession as a substitute for medical training, we can perhaps find more common ground and more mutual interests than might first be supposed.

Our goals are similar, although the fields in which we work are different. Physicians were the original trained personnel managers, and a physician's interest in his patient transcends the specific treatment he administers. As assistant chief of staff for personnel of the Services of Supply, my responsibilities as well as my interests are primarily with respect to people—how they can best be

used in the Army—people as individuals—groups of people—what is best for the man at any given moment and what fits best into the long range picture.

We have yet another common group in that physicians were among the first to realize that education is a continuous process. It does not stop at any age nor does it end on the receipt of any academic degree. Physicians, therefore, possibly to a greater extent than any other professional group are vitally interested in the Army's specialized training plans to provide trained skilled men to meet Army needs.

I followed the customary educational lines of a man interested in the Army as a career. I thought my formal contacts with education had ended after receipt of a degree from Virginia Military Institute and additional work at the University of the South and the various Army schools which I attended. Within the past few months, however, I have found myself in the center of as interesting and as important a series of educational problems as have ever developed in this country.

It became possible to develop a long range, sound program for the utilization of educational facilities when Congress lowered the draft age to 18. It became apparent, also, that the Army would have to assure itself of an uninterrupted flow of the kinds of specialists which had been provided by colleges and universities. The Secretary of War assigned the responsibility for the development and operation of Army plans for maintaining the flow of these specialists to General Somervell, commanding general of the Services of Supply, and my immediate superior. As a result, an Army Specialized Training Division has been created under my supervision, and I have appointed Colonel Herman Beukema, formerly head of the Department of Economics Government and History at the United States Military Academy, director of the new division.

The Secretary of War stated the objective as follows:

The objective of the plan is to meet the need of the Army for specialized, technical training of soldiers on active duty for certain Army tasks for which its own training facilities are insufficient in extent or character. To that end the Army will contract with selected colleges and universities for the use of their facilities and faculties in effecting such training of selected soldiers in courses prescribed by the Army. This plan will enable the Army to make selections for this training of qualified young men on a broad democratic basis without regard to financial resources.

Army needs include soldiers trained as physicians, dentists, veterinarians, engineers, physicists, mathematicians and experts in rare languages.

In every field with which the Army is concerned we have called on civilian educational experts for counsel as to curriculums and as to methods of selecting men to be assigned to this program. In the case of the medical profession General Magee and his staff are guiding our work and selecting civilians with whom consultations are held. We recognize that the physicians must be satisfied with the training the men in medicine receive and I assure you that there is no thought in our minds of shortcutting any of the essentials of medical education. We do expect of course that every possible means will be used to compress the periods involved in training.

The Army specialized training program must provide men trained in two broad fields—medical including dentistry and veterinary medicine, and technical, including engineering, physics, chemistry and psychology.

In the medical program, the training is for a degree, as there is no such thing as a partially trained physician. The high standards required by the medical profession must be maintained.

In the technical program the training is not for a degree but is pointed to what might be called Army requirement standards. The technical program has been compressed by increasing the work load and by eliminating work in subjects not required for performance of the Army tasks for which the men are being trained.

Soldiers assigned to the Army specialized training program will be on active duty as members of a unit located at a college or university. They will be under the direction of a commandant, who will be responsible for discipline and control. They will be in uniform, and they will receive the pay and allowances of enlisted men as provided by Army regulations. Housing, feeding, instruction and other services will be provided by contract between the institution and the Army.

These soldiers will rise at 6:30, and from then until taps at 10:30 that night, their day will be as rigorous as it was during the basic military training period. A typical week will include twenty-four hours of academic classroom work, including laboratory periods, and twenty-four hours of supervised study time. In addition there will be six hours a week of supervised physical conditioning and about five hours a week of military instruction, which will consist of lectures, orientation work, morning formations and some drill. Neither the physical nor the military instruction will require outside preparation. Their purposes are to maintain the physical condition of the men and to refresh their minds on military subjects and information. There will be sufficient free time provided each day for personal affairs, and the men will be off duty from late afternoon on Saturday until the Sunday evening meal.

The Army program is based on a series of twelve week terms. This decision was reached after study and consultation with civilian educators because it is the shortest period in which satisfactory curriculums can be prescribed, and therefore the most flexible time period which the Army can use.

In addition to the Army need for a flexible program from the standpoint of variations in curriculums, there is an even greater Army need with respect to starting dates of the various specialized training programs. To be specific, some colleges will be asked to initiate programs on March 1, others on April 1, still others on May 1, and so on. Only in this way can men be assigned to colleges for Army specialized training as they become available through replacement training centers and induction centers. The alternative is the loss of valuable men who should be working under this program, but who, if they cannot be assigned promptly to an institution, are assigned to troop duty or overseas service. This does not mean, of course, that any one institution will be expected to take new units for training more frequently than quarterly, although some institutions have already demonstrated the practicability of taking more frequent assignments of soldiers.

The twelve week terms are combined into a basic program and a series of advanced programs.

The basic program consists of three twelve week terms or a total of approximately nine calendar months. For the most part, all men entering at the basic level

will undergo the same instruction during the first of the basic terms. In the second and third terms, variations begin to occur, depending on the interests and abilities of the respective men. A typical curriculum will require about two thirds of the contact academic hours in mathematics, physics, chemistry and other sciences, and the remaining one third will be devoted to history, English and geography.

Men who qualify for advanced work will at the conclusion of the basic program be routed into specialized fields.

Here again the work is in twelve week terms, but the number of such terms is dependent on the field in which the soldier is working and varies accordingly.

The problems involved in selecting the institutions which will provide this academic training are most important, and a joint board consisting of three representatives of the Army, three of the Navy and three of the War Manpower Commission is working on them. The board's problems are to determine the best possible use of educational facilities and to minimize overlapping and overconcentration in any one institution or in any one area. Wherever possible, only one of the services will be located at an institution, in order to avoid administrative difficulties. We do not know at this time how many institutions will be used, but we do expect to start with the best institutions in each field and work outward from that nucleus, with due consideration to geographic questions.

How, then, does this program differ in the case of medicine?

The premedical program runs five terms, or sixty-four weeks of elapsed time, as compared with the three term basic technical program. The curriculum calls for the following work, which has been translated into semester hours: mathematics, 8, physics, 8, chemistry, 18, zoology, 12, history, English and geography, 15, and other selected subjects, such as languages, sociology and psychology, 25. This is a total of 86 semester hours.

Premedical students will be housed in the same manner as other soldiers in the basic training program, will be subject to the same discipline and will undergo the same amount of military training and physical conditioning.

The medical program calls for the same number of semesters of work as medical standards now require. The compression here is one of eliminating long vacations and limiting furlough time to about four weeks in each calendar year.

Medical curriculums are unchanged. Each school will continue to establish its own curriculums.

Medical men assigned to this program will be selected in about the same manner as medical students have been selected all along—from the premedical group. School authorities will be requested to do the selection job under the general supervision of the Army, as these men are, after all, soldiers.

Military training will be reduced to one hour a week, and physical conditioning will be left largely to the men to work out for themselves. Wherever possible, the men will be housed and messed similarly to other men assigned to the Army specialized training program. When this is not possible, commutation allowances will be granted and the men will make their own arrangements for board and room.



It is planned that on graduation men will be commissioned as first lieutenants and then placed on inactive status so that they may complete a year of internship or residency.

One of the most important questions is obviously the one of selection of men. Where are they coming from? How will they be selected and assigned?

Let us assume that we shall be able to meet the problems of the transition period in a satisfactory manner and confine the discussion at this time to the long range picture, beginning with a young man graduating from high school and being inducted in the Army shortly after his eighteenth birthday.

While this soldier is undergoing his basic military training he will be under close observation by his superiors and in addition will be given tests to indicate his capacities and potentialities. These tests will be devised according to customary testing practices, which, of course, involve aid and assistance from people of such specialized fields as medicine.

Military training records, academic records and testing scores of all men who attain a score of 110 or higher on the Army general classification test will be coordinated by screening and selection boards. These boards will review the various records and, after a personal interview with each candidate, will recommend appropriate action. Men of sufficient maturity who meet all other qualifications will be directed to officer candidate schools. Those who are potentially good officer material but who need maturity and those who also need further academic training will be assigned to the Army specialized training program.

Throughout the program there will be constant screening of all soldiers working under it. Screening boards will be established at each institution where an Army specialized training unit is located, and at the end of each term men who are qualified will be continued in the next highest level of the program until their work has been completed. At that time they will be recommended to officer candidate schools.

Some men will be qualified for officer candidate schools at the conclusion of the basic program. Some men, unfortunately, will fail to attain required minimum standards and will be returned to troop duty. Some men will qualify academically but will fail to meet other Army standards. They will be returned to troops as enlisted men.

It is obvious that we shall need not only counsel but active assistance from members of the medical profession in all screening and selection processes of the medical program. We also need the help of your profession in the screening and selection processes in the other phases of the Army specialized training program. Some physicians will be asked to become members of the selection and screening boards at replacement training centers and others will have the same request made with respect to units at specific institutions. The Army knows what it needs, and among those needs are the wholehearted support and assistance of the members of the medical profession throughout. This we know we shall receive.

I earlier touched on the point that education is a continuous process, and in these few minutes I have tried to start your education with respect to the Army specialized training program. Now you must educate us so that the medical profession and the Army can together fill the Army's medical needs.

## MEDICAL EDUCATION AND THE PROCUREMENT AND ASSIGNMENT SERVICE

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MINNEAPOLIS

The Procurement and Assignment Service, which might now be called the medical division of the War Manpower Commission, is the agency of the federal government responsible during the war for the allocation of physicians, dentists and veterinarians to meet the needs of both the armed forces and the civilian population. Obviously, one of the major concerns of such an agency must be with the medical, dental and veterinary schools, which serve as the only source of supply for additions to and replacements within these professions.

The importance of maintaining and, if possible, of increasing the supply of physicians was recognized at the beginning of the program of national mobilization and military training. The medical schools responded promptly to this need by recommending through their national association that the graduation of physicians be accelerated by the discontinuance of vacations and that medical schools increase their enrolments as much as their facilities would permit without prejudice to the quality of medical education. Recently, they have gone still further in shortening the over-all period of medical training by recommending that medical schools reduce their requirements for admission from three or four years to two years of premedical college work.

### MAINTENANCE OF ADEQUATE TEACHING FACILITIES

Since our involvement in the war, medical schools have released many of their faculty members for service, in many instances highly specialized service, with the armed forces. At the same time, they have assigned other members of their staffs to work on war research. The medical schools have done all this promptly and willingly, in spite of the fact that they are faced with their heaviest teaching responsibilities in history.

The concern of the Procurement and Assignment Service with this recruitment from medical faculties is to assure the retention of adequate teaching staffs for the conduct of a sound program of medical education during the war. To accomplish this, each medical school has been requested periodically to appraise its teaching faculty, marking as "available" those members who could be released for service with the armed forces but listing as "essential" those who constitute the minimum staff necessary to conduct a sound teaching program.

Analysis of the medical school lists of "essential teachers" for the current academic year shows that, to July 1, 1942, 21 per cent of the physicians on medical school faculties were in Army or Navy service, as compared with 12 per cent of all physicians in the United States. In addition, the medical schools listed as "available" 25 per cent of the physicians of military age remaining on their staffs.

Some schools appear to have been overly zealous in releasing members of their faculties and to have retained insufficient staffs for the instruction of their students. The result can only be a sacrifice in the quality of the training of the medical students in these institutions.



Other schools have been more conservative and should be able to release additional physicians in 1943 toward meeting the quotas of medical officers needed for service with the armed forces.

Occasionally one hears the opinion expressed that medical teaching during the war might be done by practitioners who are over military age or are physically disqualified for military service. Such suggestions reveal a failure to realize that medical teaching has become very much of a specialty and that in many schools younger men not only carry most of the teaching load but are the most effective teachers. Before the war considerably more than half of the physicians teaching in medical schools were under 45, and on the average these men were devoting more time to teaching than were their older colleagues. Furthermore, most practitioners are too busy these days to assume much, if any, more teaching responsibilities. It is essential, therefore, that some of the effective younger teachers who are devoting all or a large part of their time to teaching be retained on the faculties of the medical schools. It is here that they can render their most valuable war service.

The lists of "essential teachers" as submitted by the medical schools are reviewed by the Medical Education Committee and the Allocations Committee of the Procurement and Assignment Service. The opinions of these committees in regard to the lists are then transmitted to the chairmen of the respective state committees of the Procurement and Assignment Service, who are responsible for making decisions as to availability or essentiality of the individual physicians in their states. Appeals from the decisions of state committees may be made by the dean of the school or by the physician concerned to the corps area committee or even to the Directing Board of the Procurement and Assignment Service. As already stated, the objective of this service is to retain adequate teaching staffs for the medical schools, but to do so without withholding from military service more than a minimum number of men who are physically qualified for such service.

#### MEDICAL STUDENTS

An adequate and uninterrupted supply of qualified medical students is obviously necessary if there is to be a continuing output of competent physicians from the medical schools. The procedures which have been followed up to the present time to enable medical and premedical students to continue their training are too familiar to need review. However, the lowering of the draft age to 18 years and the proposal of the Army and Navy to place selected medical and premedical students on active duty to continue their medical education have introduced new problems.

Dr. Edward C. Elliott and Brig. Gen. Joe N. Dalton have outlined the general plans for the proposed Army-Navy specialized training program. As citizens, taxpayers, parents and educators, we are interested in this entire program, but it is the medical aspects of it which concern us most deeply. The Directing Board of the Procurement and Assignment Service has questioned the advisability and the necessity of this program for medical students but, since it appears that they are to be included, there is nothing to be gained by further debating the point.

As the program is planned, some medical students will be on active duty in the Army and some in the Navy, and some, including the women and those who

are physically disqualified for military service, will continue as civilians on their own financial resources.

In order that there may be places for these students in medical schools after the Army-Navy specialized training program is operative, the Procurement and Assignment Service has recommended that 20 per cent of the places in medical school classes be reserved for students who are not included in the proposed Army-Navy programs. It has recommended also that, after the armed forces have secured their necessary replacements from the medical school graduates, the additional physically fit men in this group be commissioned and assigned to replace older men now in the service, who could then be released from active duty to return to the care of the civilian population.

It is from this group, together with the women and those physically disqualified for military service, that physicians to fill essential positions in civilian life, including war industries, will have to come. However, students who are not subject to military service and are paying for their own education are free agents to practice where they will. Possibly the creation of a War Manpower Commission Corps which would include these students and obligate them to accept assignments to practice where needed during the war would be worthy of consideration.

The plan provides that the medical course proper will be continued on an accelerated basis without change except for the addition of a few hours a week of military instruction.

The proposal concerning the premedical course is more disturbing. For a number of years, all but a small percentage of medical students have had three or four years of premedical training. Several months ago, the deans of medical colleges at their annual meeting voted to recommend that for the duration of the war all schools reduce their entrance requirements to two years of college work. The resolution embodying this recommendation stated, however, that "it is the judgment of the Association of American Medical Colleges that students cannot be prepared adequately to meet the modern requirements of medical education with less than this minimum preparation."

In spite of this, it is proposed that the premedical training under the Army specialized training program be limited to five terms of twelve weeks each. This is less than two college years. I sincerely hope that this will be adjusted to provide at least the two years of premedical education which is the minimum that has been required by the medical schools for almost half a century and is also the minimum required by many states for medical licensure. Even though the courses prerequisite for the study of medicine can be crowded into a shorter period, the students will be lacking in the intellectual maturity, the broader educational background and the judgment so important for this study.

A compensating element in this program is the fact that for a large proportion of students accepted by medical schools there will doubtless be an interval of three to six months between the time of their completion of the prescribed five terms of premedical work and their actual admission to medical school. It is probable that the students who have enlisted in the Army will be assigned during this interval for basic military training or for service in an Army general hospital. Either service will provide valuable experience as well as a desirable short respite from their studies before they embark on the accelerated medical course.

There are many details and questions concerning this program which have not yet been worked out, or to which the solutions are not yet available. In early December, when these training programs were first announced, there was still the important question as to how desirable and qualified premedical students could be kept in school instead of being inducted by the Selective Service System before the proposed specialized training program could be established. The Directing Board of the Procurement and Assignment Service recommended to the War Manpower Commission that Selective Service direct the deferment of premedical students in good standing until the proposed specialized training program becomes operative. This order was contained in Selective Service Bulletin 41 dated Dec 14, 1942, which authorized deferment until June 1943 for premedical students who have had one or more years of college work. It has been recommended also that Selective Service provide for the deferment of any student accepted for admission to an approved medical school, provided such deferment does not exceed two years. On this recommendation national headquarters has as yet made no release.

In addition, the Adjutant General has ordered that premedical students who are inducted by Selective Service be assigned back to college to continue their training on an inactive status until the end of the term or semester.

On several occasions, the situation of premedical students and their selection for assignment to the proposed specialized training program was considered in joint conference by the Directing Board of the Procurement and Assignment Service with representatives of the Surgeon General of the Army, of the Surgeon General of the Navy and of the Selective Service System and, as a result of these conferences, the Directing Board of the Procurement and Assignment Service recommended that accredited medical, dental and veterinary medical schools give consideration to the early acceptance of qualified premedical, predental and preveterinary students for the classes of the calendar year 1944 as well as 1943.

This recommendation stated that students so accepted should be clearly qualified and desirable for training in these professional fields. After acceptance, students who are not in an Army or Navy reserve corps should be recommended for deferment to their Selective Service boards, and these recommendations carried to appeal boards if necessary. Such deferments should be only for the limited period until the proposed specialized training program becomes operative. Vacancies in these classes after the advance selections should be filled at a later date.

At a subsequent meeting, the following supplement was added to this recommendation:

That medical schools proceed with the selection of clearly qualified students for the classes of 1944, but that this be done with the definite understanding that these acceptances are tentative and subject to the approval of the Army or the Navy for those students who may be assigned for training in conformity with contracts which may be entered into between these services and the respective schools.

Students who are accepted for medical schools in accordance with these recommendations will be in a favorable position for deferment by Selective Service irrespective of their year in college. And indication by the medical schools that certain students are acceptable for admission will provide helpful information to the

Army and Navy boards which will be responsible for selecting students to continue their premedical training in the proposed specialized training program. In this manner, the medical schools will be rendering a valuable assistance in the selection of premedical students for the Army-Navy training programs and will have a voice in the selection of their classes for 1944.

Once the proposed Army-Navy specialized training program becomes operative, advance selections will no longer be necessary. In fact, final selection could then be well postponed until the last quarter or semester of the premedical program. The recommendation for advance selection of outstanding students is to safeguard the supply of qualified premedical students during this transition period.

#### INTERNS AND RESIDENTS

The Procurement and Assignment Service is concerned with hospital internships and residencies both because the internship is an important part of medical training and because certain resident physicians are essential for the clinical instruction of medical students and for the proper care of patients in certain hospitals. With hospital residents, as with the faculty of medical schools, the problem is to release as many as possible for service with the armed forces and still retain the minimum number essential for the proper functioning of the institution. Concerning interns and residents for 1943, the Directing Board of the Procurement and Assignment Service has issued the following statement:

*Interns*—Graduates of medical schools who hold commissions in the Army or Navy will be allowed twelve months' deferment of active duty for the completion of an internship. This makes it necessary that internships begin immediately on graduation. Medical school graduates who are deferred by Selective Service may, under the Selective Service regulations, have their deferments continued through one year of internship. Medical school graduates who on account of sex, physical defects or other causes are not subject to induction or likely to be reclassified by Selective Service are not officially restricted as to the length of internships which they may serve but they too have a responsibility to make themselves available as early as possible for civilian services which contribute to the war effort.

*Residents and Fellows*—Interns who have already had a year of hospital service must be considered as residents for the duration of the war. Although the Army and Navy appreciate the importance of graduate training in the various specialties of medical practice, they do not feel that they can at the present time defer calling interns to active duty in order that they may continue specialized training in civilian hospitals. Therefore the only justification for the continuation of residencies and fellowships during the war is that they are essential for the provision of adequate medical care for the hospital patients or for the clinical training of medical students. In view of this situation, there are several principles that must be followed in the selection of hospital residents or clinical fellows for 1943.

First, the minimum number of residencies with which each hospital can function must be determined. For 1942 the Directing Board of the Procurement and Assignment Service stated that in general this number should be less than 50 per cent of the number of residents that these hospitals had before the war. For 1943 this number must be reduced still more.

Second, having determined the minimum number of residents that are essential, these should be selected from the following groups in order:

1. Physicians who for physical or other reasons cannot qualify for service with the Army or the Navy.

2. Present interns or residents who are deferred by Selective Service. Preference in this group should be given to those who have been deferred in class IV-F and class III-A or III-B and maintain a bona fide family relationship with wife and/or children.

3 Present interns who hold commissions in the Army or Navy. No requests for deferment of individuals in this group should be made until the possibilities of filling minimum essential residencies from individuals in groups 1 and 2 have been exhausted. It is impossible at the present time to give assurance that interns who hold commissions will be deferred. The Surgeon General of the Army and the Surgeon General of the Navy have assured the Procurement and Assignment Service of all possible cooperation in meeting this situation. On the other hand the urgent need for medical officers in this age group and the necessity of securing the authorization of the War and Navy departments to hold men with commissions in an inactive status beyond one year of internship make it imperative that hospitals make every possible effort to fill essential residencies and fellowships without depending on interns who hold commissions or those who might be subject to induction by Selective Service.

On January 28, in response to the joint request of the Procurement and Assignment Service and the Surgeon General of the Army, the Secretary of War sent the following memorandum to the chairman of the War Manpower Commission:

I agree with you as to the desirability of maintaining essential residencies in civilian hospitals, and securing consent to deferment for not to exceed an additional twelve months, of certain essential physicians who are already commissioned in the Army, subject to the following: (a) Each request for deferment will be handled as an individual case. (b) The residency for which the officer concerned is desired must be declared by the Procurement and Assignment Service for Physicians, Dentists and Veterinarians as being essential. (c) Each request for deferment will include a certificate from the authorities of the hospital concerned to the effect that effort has been made to obtain a physician who has not been obligated for the military service.

The Surgeon General of the Navy has authority to grant similar deferment of active duty to interns who hold commissions in the Navy.

In view of this authorization, superintendents of teaching and of large charity hospitals which are accredited for residency training may present to the chairman of their respective Procurement and Assignment Service state committees requests for the postponement of active duty for a limited number of interns or residents who hold commissions in accordance with the conditions stated.

Each such request will be considered as a special case by the Surgeon General. Action will be based on the certification by the hospital superintendent as to the essentiality of the position and the impossibility of filling it with a resident who does not hold a commission in the Army or Navy, and on the recommendations of the state and corps area chairmen and the central office of the Procurement and Assignment Service. No definite figure has been set for the number of such deferments, but it is essential that requests be limited to situations which are truly critical and which cannot be filled by physicians who have not been commissioned in the armed forces.

#### CONCLUSION

I want to assure you that the Directing Board of the Procurement and Assignment Service is deeply appreciative of the invaluable contribution that the medical schools of the country are making to the war effort and to pledge the cooperation of Procurement and Assignment Service to the medical schools in their efforts to maintain an effective program of medical education during the war.

## MEDICINE AND THE WAR

COLONEL GEORGE F LULL

MEDICAL CORPS, UNITED STATES ARMY

A year has passed since the last meeting here in Chicago, and many changes have occurred. In December 1941 the personnel in the Medical Department of the Army consisted of 11,384 in the Medical Corps, 3,117 in the Dental Corps, 700 in the Veterinary Corps, 226 in the Sanitary Corps and 1,441 in the Medical Administrative Corps. Those were dark days. The Army was being built up rapidly, and the Medical Department was not keeping up. In fact, in May of last year we were under strength 7,000 Medical Corps officers.

Early in the spring it was realized that something had to be done in order to secure medical officers. Precedence was broken, recruiting boards were set up in each state and physicians were actually commissioned on the spot. Conditions started to improve in June, and when 1942 came to a close we had 35,594 medical officers on duty, only a little more than 3,000 under our total requirements. Dental and veterinary requirements had been met, the Sanitary Corps was still somewhat undermanned and the Medical Administrative Corps, although below strength, was being augmented at the rate of as high as 1,250 a month. At the present time about 900 Medical Administrative Corps officers are being commissioned from officer candidate schools each month.

The Army continues to grow, and an adequate medical service must be provided. This will take more medical officers, but due regard must be given to the home front and the civil population must receive adequate medical care.

The American soldier at present is receiving the highest type of medical care. Hospital commanders who visit the Office of the Surgeon General usually tell me what a fine staff they have and thank me for showing them the special favor of selecting men of such high type for their commands. When six or seven say the same thing in a few days, one realizes that the cross section of personnel supplied must be good, but of course, credit is taken for showing personal interest in the particular unit.

Since the last meeting many men have gone overseas, both toward the east and toward the west, and medical personnel in adequate numbers have accompanied all troops. Some of this personnel have gone to places where there has been great activity, and others have accompanied troops to places where there has been no action. Only a short time ago I received a letter from the wife of a medical officer in which she criticized the Surgeon General for the treatment shown her husband. She said that he had been sent to a small island in the Pacific where there had been no fighting to date, that it was a shame he had to stay there and take care of a lot of healthy soldiers and that he was losing his surgical technic. Should this island be attacked, however, a man who knows surgical technic will be sorely needed, and some one must be on hand to take care of the casualties as soon after they occur as possible.

Young medical officers entering the service object to being assigned to tactical units and think that anything they learn that is not purely medical is a sheer waste of

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time. The medical officer with a tactical unit is first, last and always a physician. He has to learn a little about a lot of strange subjects. He is first of all, the family physician to his unit. He must be expert in first aid and have a well rounded knowledge of sanitation and preventive medicine and know emergency surgery. In order to keep as many men on the firing line as possible he must exercise excellent judgment in the selection of patients for hospitalization. He must recognize infectious diseases early in order to prevent their spread. He is the most important link in the chain along which the wounded soldier travels.

A recent article written by an American physician with the British said relative to the qualifications of a medical officer in the forward area:

He should know the design and fitting to vehicles of water tanks, navigation by map and compass, how to light a primus stove in the wind, what to do if the lights fail in an operating tent, how to keep sick men warm in cool weather, what to do and say if the gasoline tank is filled with water, the technique to be adopted if when operating the enemy pays an unexpected visit, how to get out of a mine field into which you have unsuspectingly crept, etc.

The action in the present war is different from that in all previous wars in that it is more fluid, that is the movement is faster and changes take place with lightning rapidity. The writer quoted stated that the first knowledge of the enemy's presence may be the explosion of an antitank shell. The movement of dressing stations and other installations must be accomplished in a few minutes. In the last war the patient was taken back to the doctor, but now the doctor has to be taken to his patient. It is the patient who receives adequate early treatment who gets well. The man who gets back to a general hospital in the rear usually lives.

There have been developments since the last war which have saved hundreds of lives. Among these are the sulfonamide compounds, the utilization of blood plasma and tetanus toxoid immunization. Bullets and high explosive shells continue to kill and maim and although techniques of treatment change the fundamental principles remain the same. One of these principles I will repeat and that is to give the wounded man the proper treatment as soon as possible after he is wounded.

The proper employment of specialists is a question that comes up at any meeting and is probably of more interest to this group than to most. Not all medical specialists are being employed in their specialties. I know. However, a great deal of conscientious effort has been given to seeing that they are placed where the government will get the greatest good out of their services.

The secretary of one of the specialty boards recently wrote me that forty-two men in Army uniform appeared at the last examination. Each man was questioned about his duties, and all but two were working in the special field he was being examined in. Remember that one of the criteria in classification of specialists is certification by the board, and none of these men had been certified at the time of their assignment.

The Surgeon General welcomes information from the boards and from the colleges as to men who seem to be improperly cast in the present conflict. Be sure of your information, however, as sometimes we receive word which, on investigation, is not entirely correct. This fact was brought home to me recently when I ordered an officer's station changed at the suggestion of an outstanding American specialist. When the order was issued the specialist called me on the telephone and said that the officer had found out it was at his suggestion

and soundly berated him for his interference, saying that whoever had told about his being misused was not familiar with the true facts in the case. Fortunately, I was able to revoke the order by spending nearly an hour making long distance telephone calls.

Certain types of specialists are present in greater numbers in the Army than others. The percentages closely parallel those in civil life, as shown by a comparison with statistics of the American Medical Association. For this reason it is much easier to assign some specialists than others. The rosters received from various stations are constantly being checked to find qualified men as these men are needed for new units.

Since the last war the relative number of specialists has greatly increased and through the American boards and other agencies we are able to evaluate them. That is, if the officer is certified we take it for granted that he is qualified in his field. If he is not certified but is qualified, it is much more difficult to evaluate him.

There is another matter concerning which justifiable complaint has been heard and that is the formation of hospital units which have been kept on a training status for long periods and not used functionally. In a war of the present type this is bound to happen. Units are assembled for shipment to certain theaters and the tactical situation changes so that they are not sent. Priorities in the matter of shipping also have part in controlling this matter. The officers assigned to these units can be trained in a relatively short period while the training of the enlisted men takes much longer. We are now attempting to utilize in a professional capacity all medical officers of numbered hospital units at stations not too far distant from the unit's assembly point and leave only a small overhead with the unit to train and administer it. We feel that it is not proper to withdraw from civil life physicians whose services cannot be utilized except that we must have a reserve pool from which we can draw officers not only for original assignment but for loss replacements. The civilian physician cannot start to function as a medical officer the day he puts on a uniform. Though he is well qualified as a physician there are many things for him to learn of an administrative nature especially if he is to be the head of a service or section in a hospital or if he is to be assigned to a tactical unit.

In the first week of 1943 we changed the course at the Medical Field Service School from one month to six weeks. A new class enters every two weeks and continues until the course is completed. This means that three classes are conducted at the same time and the graduates are available for assignment every two weeks. It is highly advantageous to the individual as well as to the service for him to take this course as soon as he is commissioned. Unfortunately it will be impossible to send all newly commissioned officers as we have such a large backlog of officers already on duty who have not had the course.

There are at present fifteen courses in various professional subjects being given at civil institutions. These courses last for varying periods but most of them are of three or four months' duration. They are popular but many deserving officers have not been sent to them because they could not be spared from their present duties. They will be available for later courses. These courses are not intended to make specialists out of the officers but are in the nature of special instruction along lines which will improve the officer who already has some background for the particular type of work.

There is a demand for a certain number of women physicians for duty with the Women's Auxiliary Army Corps. Such physicians are hired as contract surgeons and sent to the WAAC training center at Fort Des Moines, Iowa. After a period of training they are given commissions in the WAAC. Apparently few women desire this type of work, as less than a dozen qualified physicians have applied although publicity has been widely distributed.

As medical educators you are no doubt interested in the status of the resident physician. At a recent meeting with the Procurement and Assignment Service it was estimated that next year there would be needed 2,800 residents in various institutions. This is a pronounced reduction from the present number. They will be chosen primarily from the following groups: (1) women physicians, (2) men physicians who are physically disqualified for military or naval service, (3) men physicians who do not hold commissions but are in class 3A, (4) alien physicians and (5) in limited numbers physicians who hold commissions but who may be deferred for an additional year before entering the service. The first four groups should be sufficient to furnish most of the needs.

Last month's data as to the status of residents were obtained by the American Medical Association from various hospitals. There were 648 replies received from 780 questionnaires with the following figures revealed: total residents 3,872, those with Army Navy or Public Health commissions 273,<sup>1</sup> those who have applied for commissions 332, and those without military or naval status 3,267. Of these, 707 have been rejected physically and 472 are women. There remains available if physically qualified 2,088.

If we are to defer men who already have commissions, we will have to get some of the 2,088, and we have no claim to any of them.

Brig Gen Joseph N Dalton spoke about the Army's specialized training program. Arrangements have been made to have a representative of the Surgeon General assigned to Col Herman Beukema's office to handle the problems of premedical and medical education. This program, as far as we can see, will make some radical changes in premedical education but will interfere little with medical education as it is practiced at present. Every one hopes that the war will be brought to a successful termination before the program has had a chance to run for many years.

When you hear from a disgruntled officer please evaluate his statements before you form an opinion of the entire medical service of the Army. Remember that there are 35,000 physicians in the Army, all of whom are looking forward to one thing only, the successful termination of the war. Many are doing things they do not want to do but these things must be done. Also remember that there are a lot of medical officers satisfied with their temporary jobs, and most of these do not write to you.

In this brief statement I have touched on a few of the important problems facing us at this time. There are many more I have failed to mention. The solution to many of these problems has been and will be in your hands. You have been so willing to cooperate with us in the past that I feel the future is assured and we may be proud of American medicine's part in this gigantic struggle.

<sup>1</sup> A sample of one hundred of those who claim army commissions shows only forty three actually commissioned.

## OBSERVATIONS ON THE PREVENTION AND MANAGEMENT OF PEPTIC ULCER

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When one approaches the problem of peptic ulcer one is confronted with a bewildering mass of data concerning its pathogenesis, diagnosis and treatment. Since preventive and effective treatment depends on a knowledge of the cause of ulcer, it is of interest to consider at once the factors apparently involved in its incidence and its production.

### INCIDENCE IN MILITARY AND CIVILIAN POPULATIONS

From many quarters today come reports of the increasing incidence of peptic ulcer since the beginning of the war.<sup>1</sup> This is true in European countries as well as in America, especially in the military forces. Whether ulcer is actually affecting an increasing number of persons or whether it is being recognized in persons not previously suspected of having it will depend on a critical analysis of the situation after the war is over. It has been suggested that the large scale physical examination of draftees has brought to light an unsuspected prevalence of ulcer and that most of the men in the Army found to have ulcer had it before admission. In Germany an increase in the incidence of peptic ulcer is said to have been progressive since the World War, the increase is attributed in part to improved methods of diagnosis and especially the more extensive use of x-ray examinations. In many instances it has been obvious that ulcer symptoms appearing after admission to military service have been due to activation of old ulcers from the added stress and strain of army life. In this connection, however, there is scarcely a single factor mentioned as a possible cause of ulcer or ulcer aggravation that cannot be refuted by contradictory findings. For instance in the British army<sup>1</sup> overexertion and army rations are emphasized, while in the British navy<sup>2</sup> the rations and the steady diminution of active manual work as a result of the increasing number of mechanized and motorized units is held at fault. In many reports lack of proper nourishment is stressed while in others voracious overeating after heavy exercise is considered responsible. In the civilian population attention may have been drawn more frequently to the presence of ulcer because people at large have been rendered stomach conscious by increasingly high pressure salesmanship via press and radio for all kinds of remedies, diet fads, alkalization and vitamin essentials.

Both in the military and civilian populations, duodenal ulcer has shown an apparently greater increase

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<sup>1</sup> Payne R T and Newman Charles. Interim Report on Dyspepsia in the Army. Brit M J 2 819 (Dec 14) 1940. Graham J G and Kerr J D O. Digestive Diseases in the Forces. ibid 1 473 (March 29) 1941. Rothe H. Zunahme der Magen und Zwölffingerdarm geschwüre im Kriege? Deutsche med Wchnschr 67 810 (July 25) 1941. Tidy H L, Newman C E, Scadding J G, Hurst Arthur, Hartfall S J and Payne R T. Dyspepsia in the Forces. Brit M J 1 529 (April 5) 1941. Hurst Arthur. Digestive Diseases in Soldiers. Am J Digest Dis 8 321 (Sept) 1941. Incidence of Peptic Ulcer. Brit M J 1 530 (April 5) 1941. Brockbank William. The Dyspeptic Soldier. Lancet 1 39 (Jan 10) 1942.

<sup>2</sup> Allison R S and Thomas A R. Peptic Ulcer in the Royal Navy. Symptoms and Pathology. Lancet 1 565 (May 3) 1941. Allison R S. Peptic Ulcer in the Royal Navy. Etiology. ibid 1 596 (May 10) 1941.

than gastric ulcer and as might be suspected, chiefly in males. In connection with these observations it is of the utmost importance to determine exactly on what basis they are made. Certainly the diagnosis of ulcer cannot be made on the history alone, though this is most important, and indirect x-ray evidence is not reliable. Therefore it is required that the diagnosis should not be made unless positive x-ray evidence of the ulcer accompanies a positive history or proof of the lesion is secured at operation or autopsy. If one would accept only positive x-ray evidence secured under the most favorable conditions and only by skilled observers, duodenal ulcer would not appear to be on the increase in the civilian population, judging from the experience of E. P. Pendergrass. He reports in a personal communication that in 1940 1,000 cases of stomach and duodenum were studied in the University of Pennsylvania Hospital. In this series 19 cases of gastric ulcer were found and 94 cases of duodenal ulcer. In 1941 1,343 cases were studied in which 27 cases of gastric ulcer were found and 92 cases of duodenal ulcer. Actually, in these studies there was no change in the number of cases of gastric ulcer but there were 24 per cent less cases of duodenal ulcer. The statistics of the first world war show that gastric ulcer was diagnosed in the United States forces almost three times more frequently than duodenal ulcer, at the present time in civilian and military groups approximately the same ratio, but exactly reversed, is being reported. Definite reasons for this should be available and I believe will be when this subject is more critically investigated. One of the reasons for instance, for the present figures may be that duodenal ulcer makes itself more often clinically manifest than gastric ulcer. This is suggested by Madelung,<sup>3</sup> who showed in a study of 10,000 autopsies that, in 17.8 per cent of cases, ulcers or scars of ulcers were found, of these 70 per cent were in the stomach and only 30 per cent in the duodenum.

A number of factors having a common influence in the military and the civilian population have been mentioned as predisposing causes of the increase in ulcer. Among these is the part played by anxiety, grief and worry over loved ones, which is of course, equal in military and civilian groups. Another is the disruption of the usual routine of life, which has been reported as much in civilians by defense industries and activities as among the soldiers by military activities. Irregularity and haste in eating, rather than the quality of food, are properly condemned, especially in the urban groups who, incidentally are affected more by ulcer than those in the country. Seasonal peaks in ulcer incidence have been attributed to lower vitamin intake and increased respiratory tract infections.<sup>4</sup> Not long ago Alsted,<sup>5</sup> in a thorough study of the increase in ulcer in Denmark, concluded that no one factor could be held responsible as in all probability the constant and continuous changes in social and living conditions are all involved. According to Alsted, the incidence of dyspepsia has increased with the increased tempo of life. He comments somewhat sadly that, in spite of advances in the social sciences, there is less security today than in the past. He believes the definite improvement in dietetics has

been largely offset by the adoption of all kinds of fads and that our primitive instinct for selection of food has been lost and we are at the mercy of the sometimes brilliant but occasionally erratic and misleading conclusions of the human mind.

After all is said and done, it must be admitted that only time and a carefully balanced analysis of all the facts will provide the true story concerning ulcer in the armed forces. There would seem to be nothing unusual in the fact that a young man, probably of sedentary habits, who is suddenly transferred from civilian to military life, with the change of diet and habits that the latter requires, develops a type of dyspepsia that may simulate ulcer. Furthermore, much depends on the roentgenologist and the medical officer making the diagnosis of ulcer. The heightened interest of certain examiners and the impatient indifference of others when dealing with "dyspepsia" require on the part of those responsible great stability of judgment in evaluating the data on this subject. The number and variety of factors that can constitute a considerable source of error in diagnosis is so great that at the present time it would be well to withhold any convictions in the matter.

#### INCREASE IN CONSUMPTION OF TOBACCO

Perhaps the one factor in both military and civilian groups that is most consistently mentioned in association with ulcer especially since the beginning of the war, is the increased incidence of smoking. Major Crampton<sup>6</sup> of the United States Army has recently emphasized that cigaret consumption was more than doubled in the United States during the first world war years 1916-1919, rising from 25 billion to 53 billion annually. The increase in consumption of tobacco in the Army in that period was nearly three times as great as in the general population, the result as he says of the increased tension of camp life and war consciousness. Crampton informs us that cigaret smoking has enormously increased since the last war, the consumption now being eight times as great as in 1916, and that there was a 12 per cent increase in cigaret consumption in the four months ended in April 1941 as compared with the corresponding months of 1940. The probable significance of this may be appreciated when one realizes that in 1930, as reported by Bastedo, 123 billion cigarettes were manufactured, i. e. 1,500 a year for every American man, woman and child over 14 years of age. Emphasis is given to these exceedingly important observations on cigaret smoking because of the increasing suspicion of the relationship it bears to ulcer.

Ulcer develops notoriously more frequently in a certain type of individual—an autonomically unstable, excitable, energetic individual—one who appears to possess an ulcer diathesis, as it is called by virtue either of heredity or of environment but chiefly the former. It is true that different individuals may react differently to tobacco, and even different parts of the same individual may react differently than other parts. It is generally recognized, however, that "nicotine primarily and energetically affects the autonomic nervous system" and all candidates for ulcer have a susceptible autonomic nervous system.

Tobacco, furthermore is admitted to affect the circulation especially the vasomotor tone of the arteries,

<sup>3</sup> Madelung W. Häufigkeit und Folgezustände von Magen und Duodenalgeschwüren. *Ztschr. f. klin. Med.* 136: 727, 1939.

<sup>4</sup> Crohn B. B. and Schwartzman Gregory. Ulcer Recurrence Attributed to Upper Respiratory Tract Infection. *Am. J. Digest. Dis.* 4: 705 (Jan.) 1938.

<sup>5</sup> Alsted Gunnar. Studies on the Changing Incidence of Peptic Ulcer of the Stomach and Duodenum. London: Oxford University Press, 1939.

<sup>6</sup> Crampton C. W. The Cigarette the Soldier and the Physician. Fundamental Factors of the Problem. *Mil. Surgeon* 89: 1 (July) 1941.



veins and capillaries. It is probable that through such a mechanism Mosinger and Bonifaci<sup>8</sup> produced both acute and chronic round ulcer in guinea pigs by the injection of nicotine. Recent investigations have demonstrated anew the importance of disturbances of the circulation, especially those of a functional nature, in the pathogenesis of ulcer.<sup>9</sup> Tobacco is recognized as a cause of hyperacidity. Rosenblum<sup>10</sup> has shown that cigaret smoking in the fasting state produces a significant increase in the free and total acidity of the gastric juice as well as a considerable increase in the volume of the juice in patients with duodenal ulcer. Schnedorf and Ivy,<sup>11</sup> as a result of their investigations, cautioned persons with ulcer against the undesirable effects of straining their tolerance to tobacco, their findings indicating that smoking might aid in producing ulcer or in aggravating existing ulcer. The effect of tobacco on secretion in conjunction with its effect on the vascular system, justly places it under suspicion as a factor in the cause and chronicity of ulcer. In the German army the authorities are so convinced of the etiologic importance of smoking that efforts to regulate the habit have been made, punitive measures under some circumstances being enforced. An exhaustive treatise by Lickint<sup>7</sup> on the effect of tobacco on the human body has recently been published.

#### INFLUENCE OF CIRCULATORY CONDITIONS

Reference has been made to the influence of circulatory conditions as a cause of ulcer. No attempt will be made to discuss this theory of ulcer production in detail. The idea is not new. Virchow, of course was the first to involve the vascular system in the cause of ulcer. He believed that ulcer resulted from thrombosis and embolism in the smaller gastric vessels. Since then a number of writers have maintained that disturbances of the blood supply to the stomach were of primary importance in the etiology of ulcer. Recent investigations demonstrate that an abnormal blood supply, especially the result of recurrent or persistent vasomotor spasm, may lead to impoverishment of the mucosa with ischemia, erosion and eventual ulceration. The work of Nedzel,<sup>12</sup> Berg,<sup>13</sup> Riggs and her collaborators,<sup>14</sup> Griffith and myself<sup>9</sup> supports such a contention which is based particularly on the peculiar vascular characteristics of the vascular bed of the stomach and its rich vasomotor innervation, both of which predispose it to local deficiencies in blood supply. Some writers have mentioned the possibility of a disturbance of gastric nerve supply in the etiology of ulcer, a hypothesis postulated many years ago by Grote,<sup>15</sup> who believed that the actual pathologic factor was not the increased secretion of acid so much as an increased sensibility of the gastric

nerves. The observations of Nothhaas<sup>16</sup> in respect to this are interesting, in that not all the vasoneurotic suffer from ulcer, but all ulcer patients exhibit the typical capillary change of vasoneurosis, the latter being attributed to a constitutional deficiency of the vascular system.

#### CORROSIVE ACTION OF ACID

As a result of recent physiologic investigations the conclusion is reached that the corrosive action of the acid gastric juice and the proteolytic effect of pepsin are the major factors in the cause and persistence of ulcer.<sup>17</sup> That an impasse seems to have been reached concerning the role of acid is suggested by the fact that the acid corrosion theory of ulcer production is probably the oldest of all theories, and it should be obvious by now that the problem of pathogenesis is destined to make little further progress in this respect. It is encouraging, therefore, that thought is being given to the cause of the hypersecretion itself, especially whether it may be of central origin and dependent on neurogenic and psychogenic influences. Meyer and others<sup>18</sup> make the highly interesting comment with regard to acidity and ulcer "that hyperacidity in cases of duodenal ulcer is preceded by hypoauidity, and that hyperacidity may be caused by an unknown factor or by the ulcer, and not vice versa, as is generally believed." In Thompson's "Practical Medicine" published in 1903 it is stated that hyperacidity is the rule in ulcer and it is believed it may be caused by the ulcer.<sup>1</sup>

Nothing seems to afford more promise of throwing light on this aspect of ulcer than the study of the influence of the midbrain. Recognition must be given to the position which psychosomatic medicine is assuming today, and in peptic ulcer, particularly, analysis along this line would appear to be reasonable and fruitful.<sup>19</sup> Intimation of the importance of the midbrain in the life cycle of ulcer is afforded by the pathologic studies of Boles and Riggs,<sup>20</sup> in which ulcer was shown to be associated with and presumably due to lesions of this structure.

In view of all the intriguing experimental study given to the pathogenesis of ulcer, especially by such brilliant students of the subject as Ivy, Mann and Dragstedt, it would be without reason to deny that acid plays an important part, but that it plays the primary and major role reflects an attitude that bears questioning. Adherence to such a doctrine explains, I believe, why the medical treatment of ulcer until a few years ago had not materially changed in twenty or more years and why the surgeons in the same period have completely reversed themselves concerning its surgical management. It was only a few years ago that Balfour,<sup>21</sup>

7 Lickint F. *Tabak und Organismus* in *Handbuch der gesamten Tabakkunde* Stuttgart Marquardt & Cie 1939.

8 Mosinger M. and Bonifaci P. *Sur les lésions ulcéreuses gastriques aiguës et chroniques consécutives à l'administration unique ou répétée de nicotine* *Compt rend Soc de biol* 131: 380 (1939).

9 Boles R. S. *Observations on Disturbances of Circulation as the Cause of Peptic Ulcer* in Frank Howard Lahey Birthday Volume Springfield Ill. Charles C. Thomas Publisher pp 85 and 92. Boles R. S. Riggs, Helena E. and Griffiths J. O. *Role of Circulation in Production of Peptic Ulcer* *Am J Digest Dis* 6: 632 (Nov.) 1939.

10 Rosenblum Harold. *Cigaret Smoking Its Effect on Volume and Acidity of Gastric Juice with Particular Reference to Duodenal Ulcer* *California & West Med* 49: 191 (Sept.) 1938.

11 Schnedorf J. G. and Ivy A. C. *Effect of Tobacco Smoking on the Alimentary Tract* *J A M A* 112: 898 (March 11) 1939.

12 Nedzel A. J. *Vascular Spasm in Experimental Gastric Ulcer* *Arch Path* 26: 988 (Nov.) 1938.

13 Berg Max. *Experimental Studies on the Production of Peptic Ulcers by Vasomotor Alterations (Pitricus Epiode)* *Am J Digest Dis* 78: (Feb.) 1940.

14 Riggs Helena E. Reinhold J. G. Boles R. S. and Shore P. S. *Qualitative Circulatory Deficiencies Observed in Peptic Ulcer. I. Chemical Composition of the Blood* *Am J Digest Dis* 8: 383 (Oct.) 1941.

15 Grote cited by Rothe<sup>2</sup>

16 Nothhaas R. *Das Problem der Genese des Magen und Duodenalgeschwures* *Klin Wchnschr* 20: 637 (June 21) 1941.

17 Dragstedt L. R. *Pathogenesis of Gastroduodenal Ulcer* *Arch Surg* 44: 438 (March) 1942. Schiffrin M. J. and Ivy A. C. *Physiology of Gastric Secretion Particularly as Related to the Ulcer Problem* *ibid* 44: 399 (March) 1942.

18 Necheles Heinrich and Maskin M. H. *Studies on Constitution and Peptic Ulcer. I. Appetite Secretion in Normal Persons and in Ulcer Patients* *Am J Digest Dis* 3: 90 (April) 1936. Necheles H. Maskin M. H. and Meyer Jacob. *Studies on Constitution and Peptic Ulcer. II. The Dermographic Time of Peptic Ulcer Patients and Normal Subjects* *ibid* 3: 92 (April) 1936. Meyer Jacob Maskin M. H. and Necheles Heinrich. *Studies on Constitution and Ulcer. III. Gastric Secretion in Healthy Members of Ulcer Families* *ibid* 3: 474 (Sept.) 1936. Necheles Heinrich and Levitsky, Philip. *Studies on Constitution and Peptic Ulcer. IV. Salivary Secretion Test in Peptic Ulcer Patients and Normal Subjects* *J Lab and Clin Med* 22: 624 (March) 1937.

19 Mittelman Bela and Wolff H. G. *Emotions and Gastro-Duodenal Function. Experimental Studies on Patients with Gastritis Duodenitis and Peptic Ulcer* *Psychosomat Med* 4: 4 (Jan.) 1942.

20 Boles R. S. and Riggs Helena E. *Neurogenic Factors in Production of Acute Gastric Ulcer* *J A M A* 115: 1771 (Nov. 23) 1940.

21 Balfour D. C. *The Case Against Gastroenterostomy* *J A M A* 83: 603 (Aug. 23) 1924.



truly a great surgeon made the statement that "there is no operation more useful than gastroenterostomy in cases of duodenal ulcer, except in carefully selected cases. The operation in suitable cases can be depended on to give excellent and permanent results in more than 90 per cent of cases." In 1926 Moynihan, another brilliant surgeon expressed the opinion that no operation in surgery had produced more striking or swifter results than gastroenterostomy. Today it is quite a different matter—only the carefully selected case is considered suitable for gastroenterostomy, and partial gastrectomy which but a short time ago was violently opposed by the American surgeon, is being accepted with growing enthusiasm. In a recent editorial in THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION—Wangensteen is reported as emphasizing that the most important criterion of an acceptable operation, speaking of duodenal ulcer, is that it reduce gastric acidity effectually, and that he feels that the three quarter resection meets these demands. The editorial goes on to say that the only known manner in which the secretion of acid may be diminished effectually is by sacrificing a liberal portion of the gastric mucosa. In the case of gastric ulcer, Walters is reported as saying that proper surgical treatment has been followed by excellent results and in his experience, recurrence has not taken place when one-half the stomach has been removed. The operative risk of resection, according to the editorial should not exceed 5 per cent, and in the hands of skilled surgeons should be less than that. While one greatly hesitates to question the opinion of the leading surgeons of today in this matter it is but natural to compare their enthusiasm and conviction to that of equally capable surgeons of but a few years ago, who held directly opposite opinions, notwithstanding that in the meantime the objective they both sought namely, a reduction in gastric acidity, is still shrouded in almost as much mystery as it was in the earlier days. Let it not be forgotten, furthermore, that peptic ulcer occurs in persons with a low acid secretion—that they heal in the presence of normal and increased degrees of acidity—and that they do not develop in many persons with decided hypersecretion.

#### MEDICAL AND SURGICAL TREATMENT

That the patient is fortunately getting the break in this startling reversal of opinion is a matter of comfort as the better surgical minds agree that the uncomplicated duodenal ulcer is better left to the inventions of the internist. Even he in many cases, as well as the surgeon, is still doggedly determined to treat hyperacidity rather than ulcer, but despite this I am sure that all of us will agree that the use of any one of twenty-four substances so far recommended for gastric acidity, or the injunctions to go off on a hunting trip or the granting of a suppressed desire has less potentiality for harm than the actual removal of three fourths of one's stomach.

Allen<sup>23</sup> states in a recent article that "duodenal ulcer is primarily a medical problem and that approximately 80 per cent of patients with this lesion respond to conservative measures." In the Lahey Clinic<sup>24</sup> only 8 per cent of 3,285 duodenal ulcers were submitted to

surgery, whereas 23 per cent of 249 gastric ulcers were operated on. More gastric ulcers come to operation because of the greater hazard of cancer. In the Mayo Clinic<sup>25</sup> 60 per cent of gastric ulcers are treated surgically, obviously because of the fact that malignancy of such ulcers was found in 8 to 10 per cent of cases. Partial gastrectomy is the operation of choice because the chance of malignancy is greater than the chance of postoperative fatality, the chance of the former being approximately 10 per cent, while that of the latter was 3.9 per cent in 1940. In the case of gastric ulcer decision to operate should depend somewhat on the location of the lesion. The Mayo Clinic reports that malignancy was found in 10 per cent of lesser curvature ulcers while 65 per cent of the prepyloric ulcers and all of the greater curvature ulcers were malignant. In older persons, the larger the ulcer, even on the lesser curvature the greater the chance of malignancy. Great caution is necessary in any decision concerning malignancy because, as Eusterman has said, malignant gastric ulcer may successfully mimic a benign lesion, and Sara Jordan<sup>26</sup> advises us that "neither the size of the ulcer nor the age of the patient nor the presence of normal acid or hyperchlorhydria should lessen our suspicion of carcinoma."

To me it has always been remarkable, in this matter of differential diagnosis between a benign and a malignant gastric lesion how much dependence is placed on objective findings, particularly x-ray findings, and how little on the clinical subjective symptoms, which are infinitely less likely to lead one astray. In my experience a suspected or demonstrable lesion of the stomach in a middle aged or elderly person, with persistent anorexia, a low or absent acidity, a mild or increasing anemia and failing weight and strength is invariably malignant regardless of the x-ray interpretations. On the other hand a good appetite, a normal or increased acidity, a normal or especially a high hemoglobin and red cell count indicate that the lesion is benign. Of the subjective symptoms the one I have found that least often fails in differential diagnosis is the state of the appetite, a good appetite, though the patient may be afraid to eat, because of eventual discomfort, means a benign lesion. Persistent anorexia means malignancy, other things being suggestive.

#### IMPORTANT FACTORS IN PRODUCTION OF ULCER

The prevention and management of peptic ulcer, in view of the bewildering mass of data I have touched on and to which I have but briefly referred would appear to be a despairing assignment were it not for the fact that certain ideas persistently emerge from the maze of theories surrounding the problem. I shall enumerate those that I believe are of importance in explaining the development of ulcer and on which effective treatment must be based.

1 Only a certain type of individual will produce an ulcer. It is a type with a suggestive physiologic, psychologic and anatomic pattern. It is probable that the pattern is fashioned by a certain qualitative type of autonomic nervous system.<sup>27</sup> As a rule, these indi-

<sup>22</sup> Gastroduodenal Ulcer editorial J A M A 118 1452 (April 25) 1942

<sup>23</sup> Allen A W Surgical Treatment of Duodenal Ulcer Arch Surg 44 501 (March) 1942

<sup>24</sup> Lahey F H Experiences with Gastrectomy, Total and Subtotal in Surgical Practice of the Lahey Clinic Boston Massachusetts Philadelphia, W B Saunders Company 1941 p 213

<sup>25</sup> Gray H K Walters Waltman and Priestley I T Report of Surgery of Stomach and Duodenum for 1940 Proc Staff Meet Mayo Clin 16 721 (Nov 12) 1941

<sup>26</sup> Jordan Sara M The Problems of Peptic Ulcer S Clin North America 21 665 (June) 1941

<sup>27</sup> Draper George The Emotional Component of the Ulcer Susceptible Constitution Ann Int Med 16 633 (April) 1942 Cannon W B The Influence of Emotional States on the Function of the Alimentary Canal Am J M Sc 137 480 1909 Necheles Maskin Meyer and Levitsky<sup>13</sup>

individuals have energetic effective personalities and they live in a constant state of excitement, anxiety, fear or some other emotional ferment. In some, with little external evidence of instability, outward calm may hide inner chaos.

2 The peculiar quality of the autonomic nervous system referred to is susceptible to influences that favor ulcer production. These influences bring about alterations in the blood supply to the stomach and duodenum that diminish the vitality of the mucosa of these structures. Secondly, the affected mucosa becomes subject to the corrosive action of acid gastric juice. Acid and pepsin are essential factors in the development of ulcer, but the mechanism of their production is imperfectly understood, certainly any attempt that is made to control their secretion should take into consideration the part played by the midbrain and various systemic disturbances.

3 Tobacco in an ulcer susceptible individual appears to be a consistent factor in the cause of ulcer and is of major influence in the prevention of healing and in the recurrence of the lesion.

4 Respiratory tract infections, such as chronic infections as are found in the gallbladder and appendix, and gastritis apparently predispose to ulcer.

5 As far as eating habits are concerned a greater risk of ulcer comes from hurried and intemperate eating rather than from the quality of the food eaten. Long intervals between meals and eating when fatigued, worried or angry are almost certain to invite ulcer. One would be surprised what can be eaten when in a happy frame of mind.<sup>1</sup>

6 Anaphylaxis in certain individuals may explain ulcer production.

#### TREATMENT

In the prevention and medical management of ulcer, it is obvious that all persons but especially the ulcer susceptible type, should avoid as far as possible the influences I have mentioned. Such persons should be advised to forego such destructive emotional extravagances as fear, anxiety, anger and ordinary perverseness. They should feel free to eat what agrees with them but avoid eating it when fatigued or in a bad state of mind. Generally speaking, alcohol and other irritants to the stomach should be used, if at all, in great moderation. They should restrict their use of tobacco to not more than six cigarettes daily and should not smoke these on an empty stomach. They should rest after eating when possible and not subject their nervous system to the effects of too great application of the mind and too little manual activity.

I believe the complications of perforation and hemorrhage are largely preventable. They usually occur in persons who will not observe the general precautions I have outlined—who have overloaded their stomachs or have subjected themselves to unusual physical effort—or who have experienced some unusually severe psychic or emotional trauma. Justification for the latter statement is afforded by the important observations of Stewart and Winsor<sup>28</sup> in England. They noted a statistically significant increase of perforated ulcers in the first two months of heavy air raids (September and October 1940) over the entire period for 1937-1940. The large majority (93 per cent) occurred in men and mostly between 50 and 60 years of age. The

same authors noted a considerable increase in deaths from peptic ulcer, the increase in the second year of the war being 28 per cent for men and 22 per cent for women.

Considering the precautions that must be observed to prevent a healed ulcer from breaking down it would seem highly inadvisable for the military authorities to accept any one for military service who has ever had a history of proved peptic ulcer or massive hemorrhage or to keep in military service any one in whom a peptic ulcer has been demonstrated by an experienced roentgenologist or at operation. If such individuals must be kept in service, provision for small frequent feedings should be made.

If an ulcer is so active that it is seriously interfering with the work and comfort of an individual, bed rest for two to three weeks is desirable. The diet must be adjusted to the circumstances, in any case being of a bland, palatable nature and taken in not less than six feedings daily in moderate quantities. In no case should it be too greatly restricted in variety or for too long a time. Psychologic as well as physical reasons dictate the necessity for this. The diet should be devised for the patient and not for the ulcer. Specifically a lack of vitamin C and protein content has been noted in ulcer cases and in balancing the diet adequate provision should be made for these essentials.<sup>14</sup>

Of medicines, but few are required. Appropriate doses of bromides, phenobarbital, belladonna and one of the colloidal aluminum substances or the various alkaline antacids usually are all that are temporarily necessary to control pylorospasm and hyperacidity. In some cases nocturnal secretion must be controlled by means of an all night drip of milk or neutralizing solution. In other cases it is sufficient to awaken the patient once or twice during the night by means of an alarm clock to take some nourishment or an antacid. Sufficient evidence especially of an experimental nature has accumulated to justify consideration of urogastone<sup>29</sup> and enterogastrone<sup>30</sup> in the treatment of ulcer, as they do depress secretion and inhibit motility. Needless to say these are but the general principles of a medical regimen and modification of them would be necessary to suit individual cases.

Finally are the indications for surgery and the operation itself. The generally accepted indications for surgery are perforation, recurrent hemorrhages, especially in persons past middle life, obstruction that is not relieved within a short time by a medical regimen, inability to relieve acute symptoms and, in the case of gastric ulcer, any suspicion that malignancy may be present. In other words, complications, intractability or a suspicion of malignancy should afford the only grounds for operation.

Failure to relieve symptoms usually connotes an intractable ulcer. Before one advises operation, however, for a so-called intractable ulcer, it should be thoroughly understood that it is the ulcer and not the patient that is intractable. Poor results will follow in the latter case as surely as in the former. Intractability of a patient is not going to be corrected by any surgical operation yet devised to my knowledge, and, if persuasion or anything else can correct it, it were better to try it before rather than after operation. Lowering mortality records is all very good, but serious consideration must likewise

<sup>29</sup> Gray J. S. Present Status of Urogastone. *Am J Digest Dis* 8: 365 (Oct.) 1941.

<sup>30</sup> Quigley J. P. Enterogastrone. Significant Steps in Development of the Present Conceptions. *Am J Digest Dis* 8: 363 (Oct.) 1941.

<sup>28</sup> Stewart D. N. and Winsor D. M. Incidence of Perforated Peptic Ulcer. *Lancet* 1: 259 (Feb. 28) 1942.

be given to the future welfare of the patient. So in advising surgery, the temperament of the individual must come in for as exacting consideration as his physical status. "Jitterbugs" are poor subjects for surgery. As the general practitioner frequently has the deciding voice concerning operation, he should inform himself of "the trends of good surgical experience" and of the prospects of a "cure" for his patient and he should know that a "cure" is based in large measure on the temperament and the cooperation of the patient as well as on the judgment and ability of the surgeon. Both the physician and the surgeon should make a more serious effort to prevent complications. I believe such efforts carry more promise of success than does the surgical treatment for the complication.

As for the type of operation it is being accepted that conservative surgical procedure, such as gastroenterostomy and pyloroplasty, are no longer justified as routine operations for gastric or duodenal ulcer.<sup>1</sup> While the arguments for wide resections are reasonably sound—and the mortality rate in the hands of the best surgeons is invitingly low—and the immediate prospects for the patient relatively good—the annoying thought obtrudes itself that eventually nature will compensate for the loss of three fourths of the stomach by enabling the remaining fourth to take up the function of the removed portion and who knows but the cause of acidity for which the operation was done, will be upon us again! In fact just that has already occurred. The surgeon who is unfortunate enough to have a patient develop a jejunal ulcer following subtotal resection of his stomach may never see or hear from that patient again. His follow-up statistics, therefore, to carry significance, should take into consideration all "absentees." That jejunal ulcers are going to occur after partial gastrectomy as they did after gastroenterostomy, though perhaps not so often, depending on how much of the stomach is removed, is a matter I believe more and longer follow-up studies will reveal. Within two weeks I have encountered 2 cases of jejunal ulcer, 1 having perforated, following partial gastrectomy for duodenal ulcer. Lahey<sup>31</sup> reports he has had seven proved postoperative jejunal ulcers in a series of 137 consecutive subtotal gastrectomies. I would plead therefore for a more critical comprehensive analysis over a long term period of all ulcer cases with especial consideration given to the variations that occur in the life cycle of ulcer, whether it is medically or surgically treated, before too positive opinions are expressed in favor of one or the other.

#### SUMMARY

To summarize this question of surgery, then, I would recommend that operation only be considered in selected, complicated cases of ulcer. With growing enlightenment on the pathogenesis of ulcer it might be well to reconsider the virtues of conservative surgery.

While at the present time there would seem to be no satisfactory alternative to radical surgery, in complicated cases let it be done with the definite understanding that elimination of acidity is not the last word in the treatment of ulcer, and that patients with ulcer, as surely as those with diabetes, tuberculosis or pernicious anemia, are candidates for future trouble unless physicians and surgeons remember that the disease may be arrested but not cured!<sup>1</sup>

Rittenhouse Plaza

#### ABSTRACT OF DISCUSSION

DR. SARA M. JORDAN, Boston. Among the many important points which Dr. Boles stresses none is more important than the question of when the ulcer is to be medically treated and when it is to be surgically treated. This involves a consideration of the etiology of the ulcer. Dr. Boles has in recent years shown us some data on the effect of the midbrain on alterations of circulation in the stomach, which to my mind are synchronous with the spasm which occurs in the stomach and which, when talking about acid, one has in the back of one's mind as part of the picture. It is a question not only of treating acid but of treating spasm. When we say we treat acid and treat spasm, we really mean we are treating the ulcer by combating acid and by combating spasm. Dr. Boles warns us that perhaps we are sometimes talking about intractable ulcer when we really mean an intractable patient. That is true but I think he will agree that when a patient has been intractable long enough the ulcer often becomes intractable. This is especially true when the ulcer is located on the posterior wall of the duodenum or the posterior wall of the stomach, and the penetration of the ulcer involves the pancreas, with the resultant pain. Dr. Boles's admonition is useful when surgical resection of the stomach looks so easy in skilled hands and when the results are so good and when the risk is so low. The surgeon may often be easily induced by the internist who has become weary of trying to manage the patient to perform the operation when perhaps it is not really necessary. The person who is emotionally tense and often the one who is well controlled externally is the one who needs the best psychiatric guidance when he has an ulcer diathesis. One of the things we must remember in dealing with gastric ulcer is to be sure that the ulcer has fulfilled all the criteria which are so well established for the permanent healing of ulcer, namely the disappearance of the x-ray defect of symptoms and of occult blood, and, in the judging of the disappearance of the x-ray defect, the complete assurance that there is absolutely nothing left of that x-ray defect not even the slightest bit of induration in the stomach wall. It is believed now that any gastric ulcer which recurs should be regarded as at the present or in the future, a malignant lesion. We have in our department a group of patients whom we saw perhaps ten years ago, with hyperchlorhydria and with pyloric spasm and evidences of duodenal change and whom we have been successful in keeping under our care and who have not developed ulcer. In another small group, in which we were not able to control the diet and habits, an ulcer has developed. I think it is not out of the realm of possibility to try to prevent ulcer.

DR. FRANK H. LAHEY, Boston. I feel strongly about this question of prevention. There is not any doubt in my mind that if one could frighten people before they are faced with a catastrophe and get them to adjust their habits—smoking, eating, drinking and working habits—so that they would devote the same serious attention to their alteration at that stage as they will after they have had two or three hemorrhages, then I think probably one could do a great deal as relates to the prophylaxis of ulcer. Apparently it is a human attribute not to accept an ulcer as really serious until there have been two or three hemorrhages that threaten fatality or the patient has had pyloric obstruction or perforation. No one today, I think, can defend primary surgery in the treatment of ulcer. All our ulcer patients come to us only as medical failures. They represent the intractable posterior wall ulcers. We in surgery see many anterior wall ulcers in the course of cholecystectomies and other operations represented then only as scars but they are the interperitoneal ulcers that in this anterior position can fold themselves in. The posterior wall ulcers are of course, mechanically the same problem as the calloused, chronic varicose ulcer above the ankle—it is fibrosed, it has lymph stasis, it has venous stasis, it lacks oxygen and it is mechanically unable to fold itself in—and so that type of ulcer is our major problem. I wish it were possible to improve our figures in gastric cancer; they are so bad, so many patients come so late. There is certainly one thing that I would like to preach as a result of experience and that is that it is the duty of the medical men and the gastroenterologist to follow carefully and to accept the responsibility for following those patients with low gastric acids and any question of a lesion by x-rays. It is in the patient with low

<sup>31</sup> Lahey, F. H. Indication for Gastric Resection. *Am J Digest Dis* 8:180 (May) 1941.

gastric acids that one should be sure that he does not place the responsibility for return check-up examinations on the patient but that the doctors take it. It is this group with low gastric acids and anacidity who have lesions that are debatable. We agree that we have never seen a benign ulcerating lesion on the greater curvature, we agree about the dangers of prepyloric lesions. But there are certain patients with prepyloric spasms who require exploratory operation to be certain that they do not have cancer. In some of these cases the simulation of a malignant condition is so great that one cannot safely say, even with a gastroscope, that it is not malignant. Gastroenterostomy should not be routinely applied, because it leads to high incidence of gastroduodenal ulcer. It is equally bad for every patient to have a subtotal gastrectomy. I would infinitely rather do a somewhat unsatisfactory operation on a bad risk patient such as gastroenterostomy and have him alive and have him take his risk of 16 per cent of gastroduodenal ulcer than submit him to an undue risk of subtotal gastrectomy.

DR. HIRSHMAN I. GOLDSTEIN, Camden N. J. Dr. Boles mentioned the great increase in cigaret smoking since the first world war. Millions of women, some of whom now also serve with our army and navy, smoke a great many cigarets, and I wonder if gastric disturbances, including gastroduodenal ulcer, will increase among women during this present crisis. May I ask the author how he would correct or attempt to cure the "ulcer diathesis" which he finds so important a factor in ulcer etiology. Ancient writers knew of the relation of disturbances of the brain and mind to the occurrence and aggravation of gastritis and ulcer of the stomach—Diocles (fourth century B. C.), Galen (130-200 A. D.), Fabricius Hildanus (1560-1634), Rhodius (1587-1659), Jean Fernel (1497-1558), Jean Riolan (1539-1605), Joannes Heurnius (van Heurne 1543-1601), Capivaccius (died 1589) and others. Galen (On Prognostics chapter XI) recites how he treated Emperor Marcus Aurelius (121-180 A. D.) for his aggravated stomach trouble and "indigestion after his battles. Galen also quotes Diocles (fourth century B. C.) under "De Melancholia" (in *De Locis Affectis* Paris 1513, book III, chapter VI), giving a complete and accurate description of ulcer symptomatology and its relation to mental disturbances. As to modern medical management of ulcer it is no different than in the time of Celsus (35 B. C.-27 A. D.). Celsus gave a special soft smooth diet without acid or acrid substances, and light wine to be not too hot or too cold. Paul of Aegina (625-690 A. D.) Sexapion (ninth century), Jean Fernel (1497-1558), J. Varandæus (died 1617), Joannes Scultetus (1595-1645) and others treated ulcer of the stomach, as we do today, with terra sigillata (kaolin or aluminum silicate) and other preparations to protect the erosions and ulcerations. Paul, thirteen hundred years ago (book III, section 37) discussed "Affections of the Stomach," as did Macellus Empiricus (379-460? A. D.) Orbasius (325-403 A. D.), and Aëtius Amidenus (502-575 A. D.) before him, and he gave terra sigillata (aluminum silicate), Samian earth, Lemman earth and milk and starch to protect the eroded and ulcerated gastric mucous membrane. Scultetus (1622) says this treatment stimulates the healing of ulcer of the stomach by protecting it, just like wax put on an inflamed foot. Time does not permit more than mention of the names of Rhazes (860-932), Hally Abbas (930?-994), Avicenna (980-1036), Albucasis (1013-1106), Avenzoar (1070-1161), Averrhoës (1126-1198) and Franciscus de Piedmont (1265?-1319) in this connection.

DR. RUSSELL S. BOLES, Philadelphia. I did not state that the preoperative study is vitally important, and no doubt Dr. Lahey, being the competent surgeon that he is, would acknowledge that his successes are somewhat due to the competent preoperative study that his patients get under Dr. Jordan and in the gastroenterologic clinic. I agree with Dr. Jordan and in the different measures of combating acidity except for pyloric gastric resection. I think that is an unjustifiably radical step for combating acidity. As far as the congenitally intractable patient is concerned I can't conceive of any operation helping him. He is going to continue to be intractable and therefore to continue having trouble, no matter what kind of operation he has. Dr. Lahey drew attention to cases with adhesions to the pancreas, which explain some of the intractable ulcers. I agree that there should be no question in any of our minds that we

do have to resort to radical measures for the correction of such complications. Dr. Jordan questioned some of the symptoms that I emphasized in my paper, and I want again to emphasize that in my experience they are symptoms of early malignancy. We are not usually in doubt about the symptoms of late, well established, lesions but I still maintain that a persistently poor appetite is not necessarily a symptom of late cancer. Dr. Jordan raised the question of operating for recurrent gastric ulcers and mentioned that they are the ones that, in a certain percentage of cases in her experience, are going to be malignant. I should like to ask her in turn why, if such ulcers are malignant, do they heal? I don't understand how a malignant ulcer is going to heal and then recur again and maybe again and again. The medical failures are pretty desperate cases that have to be met with and I am in sympathy with them, but I cannot altogether feel that a gastric resection is all we can do. When that is all that is left for Dr. Lahey, that is one thing, but I disapprove of the tendency of many other surgeons to do radical operations when there are plenty of both preventive and medical measures left. I found the slides presented by Dr. Goldstein interesting. He asked how we are going to relieve the ulcer diathesis. I don't think we have any better way of doing that than he has. All we can do for those patients is to relieve the factors that we know do seem to precipitate ulcer. He mentioned children and asked why children get ulcers when they are under no strain. There are lots of children who are under strain, with their problem parents and many other things. I could give plenty of reasons why some children get ulcers.

## MOTILITY OF THE HUMAN COLON

### THE NORMAL PATTERN, DYSKINESIA AND THE EFFECT OF DRUGS

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H. F. ADLER, Ph.D.

AND

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"Constipation," diarrhea, distention and colic are common complaints which may result from temporary or prolonged alterations of the normal pattern of the colon. Yet there seems to be a paucity of knowledge regarding the motor activity of the human colon and much divergence of opinion regarding its response to stimulating and "antispasmodic" drugs.

Alvarez,<sup>1</sup> in summarizing our knowledge, says "The colon is a sluggish organ with few and slow movements. The movements of the haustra are very slow. A few times a day there are 'mass movements' which carry material usually from the transverse colon over into the sigmoid region. Much of the progress of material in it seems to be due to the pressure exerted by new material coming down from above."

The concept that material from above exerts a sort of "plunger" effect on material below is due primarily to the inadequacy of the x-ray method for studying colonic motility. The x-ray method provides an outline of the colon and yields precise information regarding rapid movements in the colon such as occur in "mass movements" and defecation. The method rarely reveals those movements which are responsible for transporting material for short distances, and it does not reveal in a qualitative and quantitative manner the correlation or

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<sup>1</sup> Alvarez, W. C. An Introduction to Gastro-Enterology. New York: Paul B. Hoeber, Inc., 1940.

lack of correlation between the different types of motility present simultaneously in adjacent segments of the colon. This explains why Todd,<sup>2</sup> regardless of his extensive studies, "could not see how material moved forward from the cecum to the ascending colon." Because his observations were so extensive, he did observe contractions which at times affected one segment after another in the transverse colon. We shall emphasize later the importance of the segmental activity observed by Todd.

The variable effect of drugs on the human colon is enigmatic unless one knows that different types of motility exist in different segments and that the type of motility conditions the response. It will be seen that some drugs affect propulsive motility, others affect tone and nonpropulsive motility, and others appear to act by improving the coordination between segments.

#### METHODS

The introduction of the tandem balloon method<sup>3</sup> for the study of motility has revealed that (a) the activity in different segments varies, (b) to obtain propulsion of contents the activity of adjacent segments must be coordinated, (c) to comprehend a complete picture of the motility repeated continuous records of several hours' duration must be made and (d) two or more segments must be studied simultaneously. Also with the tandem balloon method it is possible to determine when the motor activity of one segment is propagated to an adjacent segment.

To measure the propulsive force of a contraction we constructed special apparatus.<sup>4</sup> The use of this apparatus and the passage of contents from a colostomy yield direct evidence of propulsive activity.

Preliminary experiments were performed on trained, unanesthetized dogs.<sup>4</sup> The results guided our experiments on the human colon. Four human subjects with colostomies were studied mornings and afternoons for eight months. The rectum and lower sigmoid of each had been removed six to eighteen months previously and the subjects were in excellent condition. Patients were studied an hour after breakfast when the colon and sigmoid were empty and again after a standard luncheon. We started with a three balloon system which was discontinued, because occasionally after drugs which stimulated propulsion the balloons were tied into a knot, rendering their removal hazardous. We then used one or two balloons. Our results on human beings pertain only to the descending colon, from the splenic flexure downward to the colostomy.

#### RESULTS

**Control Studies**—In order to obtain quantitative and qualitative control studies of the motility of the human subjects continuous records were made during seventy periods of at least one hundred and fifty minutes each. Additional control periods were interspaced during the drug experiments. Control records of from twenty to thirty minutes were obtained before the drugs were administered. Under usual conditions contents were not discharged from the colostomy. Unless these patients had diarrhea they expelled no further contents after the early morning enema.

**Amount of Motility**—Control records revealed that there are periods of quiescence and activity in the human<sup>5</sup> and canine<sup>3</sup> colon. The activity of the segments varies, but at times all segments are quiet. About 50 per cent of the time there is motor activity, of which only 10 per cent is propulsive, the remaining activity is local, segmental and nonpropulsive with varying degrees of tone.<sup>6</sup>

**Coordination of Segments**—After many records were observed it became evident that adjacent segments had to manifest coordination before a propulsive wave in one segment could "pass" to an adjacent segment. Sometimes a propulsive wave would start in one segment, and the type of motility in the adjacent segment would be modified. Then the propulsive wave would appear in the adjacent segment. At other times a propulsive wave would start and the motility of the distal segment would not be modified. This indicated either that the propulsive wave was very local or that the distal segment was not integrated so as to receive the propulsive wave.

**Colonic Dyskinesia**—These facts suggested that stasis could occur if a segment could not "receive" a propulsive wave. Furthermore, when a strong propulsive wave occurred in one segment and the distal segment was manifesting nonpropulsive activity on considerable tone, the subject felt tension or a cramplike pain. The subjects frequently complained of cramps when a strong propulsive wave occurred in the proximal segment and failed to pass to the distal segment. A cramp did not occur if the propulsive wave passed to the distal segment and contents were expelled. In cases of diarrhea, liquid contents could pass through a hypertonic segment.

These observations suggest that some propulsive waves are confined normally to a segment of about 5 cm in length. Other propulsive waves travel from one segment to a more distal segment and cause definite propulsion of contents. If the distal segment manifests rapid, rhythmic, nonpropulsive activity on considerable tone, it usually does not accept a propulsive wave. X-ray examination would detect this condition only by accident or, if the fluoroscope should be used for from ten to twenty minutes. "Constipation" could be the only symptom. However, if the distal segment manifests rapid, rhythmic, nonpropulsive activity on considerable tone, and then a relatively vigorous propulsive wave occurs in the cephalad segment, symptoms of distress may occur. However, the incompatibility of the wave type is not so common a cause of tension and pain as is the relative intensity of the propulsive wave in the cephalad segment and the degree of tone of the distal adjacent segment.

We use the expression colonic dyskinesia to indicate that ill motion between adjacent or successive segments of the colon which functionally produces sufficient obstruction to the propulsion of contents to produce stasis and symptoms of tension and pain. Or, as Alvarez might say, colonic dyskinesia represents a type of disturbance of the normal gradient of the colon. We believe the ill motion is due to an extrinsic or intrinsic disturbance of coordination. It is obvious that a saline cathartic by liquefying the contents might provide temporary relief but would have no effect on the underlying condition, it might aggravate the condition.

<sup>2</sup> Todd T W. Behavior Patterns of the Alimentary Tract, Baltimore: Williams & Wilkins Company 1930.

<sup>3</sup> Templeton R D and Lawson H. Studies in the Motor Activity of the Large Intestine. I. Normal Motility in the Dog Recorded by the Tandem Balloon Method. *Am J Physiol* 96: 667 (March) 1931.

<sup>4</sup> Adler H F and Templeton R D. Correlation of Transportation and Activity in the Dog's Colon. *Am J Physiol* 128: 514 (Feb) 1940.

<sup>5</sup> Adler H F, Atkinson A J and Ivy, A C. A Study of the Motility of the Human Colon. An Explanation of Dysynergia of the Colon or of the Unstable Colon. *Am J Digest Dis* 8: 197 (June) 1941.

## STIMULATING DRUGS

We have previously reported in detail our observations on the effect of certain drugs which stimulate the propulsive activity of the human colon.<sup>6</sup> For completeness it is appropriate to review the more important observations.

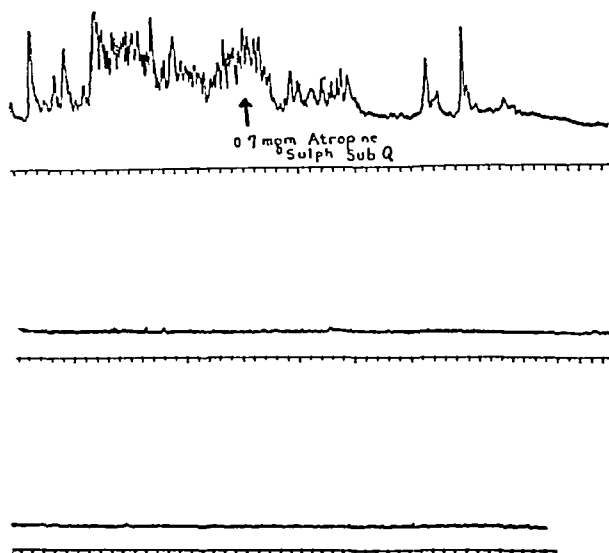


Fig. 1—Complete cessation of motility in the human descending colon for ninety minutes after the subcutaneous injection of 0.7 mg of atropine sulfate.

Solution of posterior pituitary (2 units intramuscularly) increased the propulsive motility of the colon in all our subjects. The response occurred after a latent period of a few minutes and occasionally lasted as long as twenty minutes. Prostigmine methylsulfate (0.25 to 0.50 mg intramuscularly) increased both the propulsive and the nonpropulsive activity. The response occurred usually in twenty minutes and lasted one to two hours. This response was most striking. Ergotamine tartrate (0.25 mg intramuscularly) had no definite effect, 0.35 mg intravenously in our dogs caused increased propulsion and defecation occasionally. It was found, however, that 0.25 mg of ergotamine would potentiate the action of prostigmine in human beings. Because of these observations, it was believed that a combination of solution of posterior pituitary, prostigmine methylsulfate and ergotamine tartrate would produce a prompt and sustained increase in motility. Accordingly, solution of posterior pituitary (1.25 units), prostigmine methylsulfate (0.25 mg) and ergotamine tartrate (0.25 mg) were injected at the same time intramuscularly. Propulsive motility occurred promptly in response to the solution of posterior pituitary and the tone and propulsive motility of the colon were augmented for six to eight hours. Contents were expelled throughout the entire day, indicating that the propulsive motility of the small intestine had also increased. The pulse and blood pressure tested at intervals were not changed and the patients did not complain of side reactions at any time.

## "ANTISPASMODICS"

Opium, belladonna and their derivatives have been used for years as so-called antispasmodics. More recently "spasmalgin," "benzedrine," "octin," "syn-

tropan" and "trasentin" have been introduced. We have studied the effect of all these drugs on the human colon some more intensively than others.

**Morphine Sulfate**—Much evidence<sup>7</sup> has proved that morphine has no motility inhibiting action on the human colon. We used morphine sulfate to induce hypertonus of the dog's colon as a method for the assay of various alleged antispasmodics.

The hypodermic injection of 8 mg of morphine sulfate increases the nonpropulsive motility and tone of the human colon (i.e., the part we studied). The hypertonus may persist without any evidence of propulsive motility for several hours depending on the dose. In 3 instances our subjects reported with diarrhea. After collecting the discharge for a period 8 mg of morphine sulfate was administered. The discharge ceased with the disappearance of propulsive waves. Similar effects have been observed in a patient with an ileostomy.<sup>7</sup> Morphine obviously tends to constipate because it decreases or abolishes propulsive activity. It may relieve the pain in colon colic by central action, and possibly by altering motility from a propulsive to a nonpropulsive type.

The use of the multiple balloon technique reveals why some investigators have reported that morphine relaxes the colon. In our studies a decrease in tone in the presence of rapid, rhythmic waves occurred in one of the segments under observation in nine out of thirty-three tests. In other segments the tone was increased.

No so-called antispasmodic that we have used dramatically inhibits the hypertonus induced by morphine.

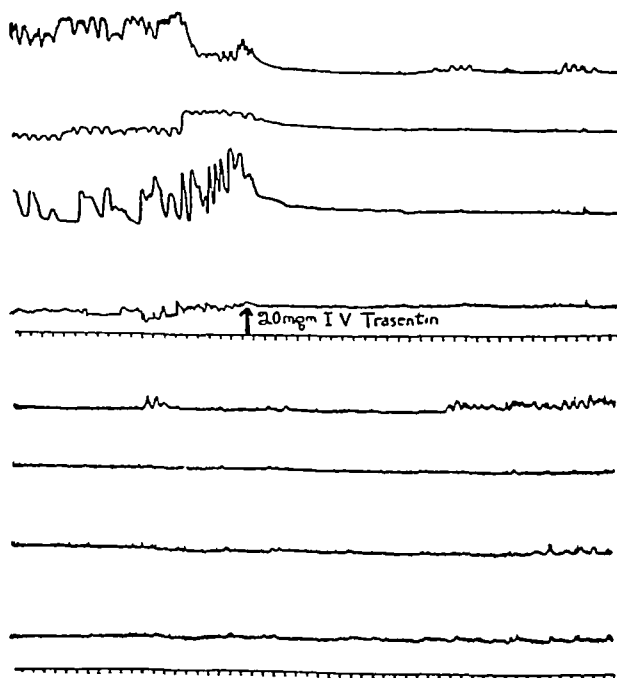


Fig. 2—Complete cessation of motility of the canine colon for eighty minutes after 20 mg of trasentin intravenously.

unless given intravenously (dog) in relatively large doses. If morphine hypertonus is similar to the hypertonus and spasm which occur in diseases of the colon it is not surprising that physicians are searching for a uniformly potent antispasmodic.

6 Adler H F, Atkinson A J and Ivy A C. Supplementary and Synergistic Action of Stimulating Drugs on the Motility of the Human Colon. *Surg. Gynec. & Obst.* 74: 809 (April) 1942.

7 Adler H F, Atkinson A J and Ivy A C. The Effect of Morphine and Dilaudid on the Ileum and of Morphine, Dilaudid and Atropine on the Colon of Man. *Arch. Int. Med.* 69: 974 (June) 1942.



**Atropine Sulfate**—Atropine sulfate was administered to our human subjects in doses (0.75 to 0.8 mg) just sufficient to cause some dryness of the mouth. Smaller doses have no definite effect. In 5 instances the spontaneous motility was completely abolished for one to two hours (fig 1). In three tests, the amplitude of

*Quantitative Data Pertaining to the Action of Antispasmodics  
Studied on the Human Colon  
(Experiment on Four Men)*

Number of Tests	Drug Used	Average Total Motility * 30 Minute Periods			Average Propulsive Motility † 30 Minute Periods		
		1	2	3	1	2	3
10	Control	31	57	30	13	10.5	7.5
31	Morphine sulfate, 8 to 16 mg intramuscularly	87	91	89.4	11	2.4	3.8
10	Atropine sulfate, 0.7 and 0.8 mg intramuscularly	14	27.6	38.5	1.8	3.2	7.6
6	Morphine 8 mg. and atropine 0.7 mg intramuscularly	14	27.6	38.4	2.0	1.8	2.3
16	Trasentin 0.7 mg. intra- muscularly	5	39.5	46	11.2	11	11
17	Trasentin tablet 7 mg. orally	6	41	41.4	11	10.4	9.4
10	Amphetamine sulfate 10 mg intramuscularly	38.8	48.9	48.7	10.6	9.8	7.8
12	Amphetamine sulfate 10 mg orally	39	39.4	48.5	11.3	11.3	8.7
10	Oetlin 100 mg intra- muscularly	35.5	35.5	47.6	10	9.6	10.6
14	Oetlin 150/300 mg orally	30.6	33	31.6	13.8	13.8	10.8
10	Spasmalgin orally	34.5	36.5	34.5	8.8	3.6	4.0
10	Syntropen 10-20 mg. intra- muscularly	30.6	40	47	13.1	14.5	9.8

\* Total motility time in percentage that the colon is active per 30 minute period of experimental time

† Propulsive motility expressed in percentage of total motility

the contractions was diminished and the periods of quiescence were increased. In two the nonpropulsive motility was unaffected but propulsive motility did not occur. These effects were of course, analyzed by comparison with control motility records.

It has been shown that atropine has some antagonistic effect on the increase in tone and nonpropulsive motility induced by morphine in the dog's colon. Only six experiments of this nature were done on our human subjects because morphine must be given with caution, and the results were identical with those obtained on the dog. A combination of atropine sulfate (0.7 mg) and morphine sulfate (8 mg) was injected intramuscularly. Propulsive motility was abolished for two hours and tone and nonpropulsive motility were partially antagonized. This is shown in the accompanying table.

The combination of papaverine hydrochloride  $\frac{1}{3}$  gram (0.02 Gm), pantopon  $\frac{1}{2}$  grain (0.01 Gm) and sulfuric acid ester of atropine  $\frac{1}{60}$  grain (0.006 Gm) has been referred to as "spasmalgin." We used it because these drugs are supposed to have antispasmodic action. The aforementioned dose was given orally to our subjects. From forty to sixty minutes later the tone and nonpropulsive motility were increased, and propulsive motility disappeared in nine of twelve experiments for a period of seventy minutes. The action of "spasmalgin" has been reported previously in similar experiments.<sup>8</sup>

We have not studied the effect of papaverine and pantopon separately on the human colon. Bargen and Jackman,<sup>9</sup> using the single balloon technique, report that pantopon acts much like morphine and that papaverine hydrochloride usually but not always causes a decrease in tone.

<sup>8</sup> Pantopon is a preparation containing the hydrochlorides of the alkaloids of opium, principally morphine.

<sup>9</sup> Bargen, J. A. and Jackman, R. J. The Influence of Papaverine on Muscular Tone of the Intestinal Tract. *Surg., Gynec. & Obst.* 68: 749 (April) 1939.

**Amphetamine Sulfate** ("benzedrine")—Amphetamine sulfate has been used in the management of colonic distress as an antispasmodic,<sup>10</sup> supposedly to stimulate sympathetic nerve endings and thereby inhibit the colon. We gave 10 mg orally or intramuscularly and did not give larger doses that might disturb sleep. The pulse rate of all subjects was increased.

The effect on colonic motility was not definite. In all of twenty-two experiments the quantity of both propulsive and nonpropulsive motility was not altered. In eight of the twenty-two experiments there seemed to be some depression of the tone and amplitude of the contraction, in seven the coordination of the motility between segments, compared to control records, appeared to be improved, but not decisively, in the remaining seven no effect was discernible. No definite quantitative effect was recorded.

In other studies in which we have administered the same amount of amphetamine sulfate some subjects have reported a "call to stool" when central stimulation by the drug became definite. This might be due to the central effects of the drug, though it is possible that the qualitative improvement in the coordination between segments facilitated passage of contents to the rectum.

**Diphenylacetyl-Diethylaminoethanol Hydrochloride** ("Trasentin")—This synthetic alkaloid with an atropine-like action was studied intensively. When given intravenously to the dog it counteracted morphine-induced hypertonus better than any drug we have used to date except atropine. This is compatible with the theory that it acts directly on smooth muscle.

**Canine Experiments**—In fifteen experiments 10 to 50 mg of the drug was given intravenously to our trained dogs with colostomy. The propulsive and nonpropulsive spontaneous motility were depressed or abolished for as long as eighty minutes (fig 2). The records of the tandem balloons showed that the distal

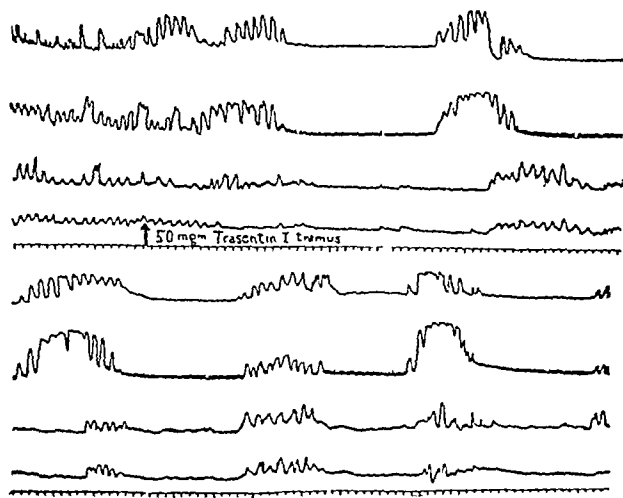


Fig 3—Periodicity and improvement in coordination of segments of the colon in the dog after 50 mg of trasentin intramuscularly

colon usually is depressed longer than the proximal colon. Atropine sulfate has a similar differential action.<sup>11</sup>

<sup>10</sup> Ritvo, Max. Drugs and Roentgen Examination of Action of Mecholyl, Physostigmine and Benzedrine in Overcoming Sluggishness and Spasm. *Am J Roentgenol* 36: 868 (Dec) 1936. Rosenberg, D. H. Arens, R. A. Marcus, Philip and Necheles, Heinrich. Benzedrine Sulfate: Its Limitations in the Treatment of Spastic Colon and a Pharmacologic Study of Its Effects on the Gastrointestinal Tract. *J A M A* 110: 1994 (June 11) 1938.

<sup>11</sup> Adler, H. F. and Ivy, A. C. Morphine-Atropine Antagonism on Colon Motility in the Dog. *J Pharmacol & Exper Therap* 70: 454 (Dec) 1940.



## STIMULATING DRUGS

We have previously reported in detail our observations on the effect of certain drugs which stimulate the propulsive activity of the human colon.<sup>6</sup> For completeness it is appropriate to review the more important observations

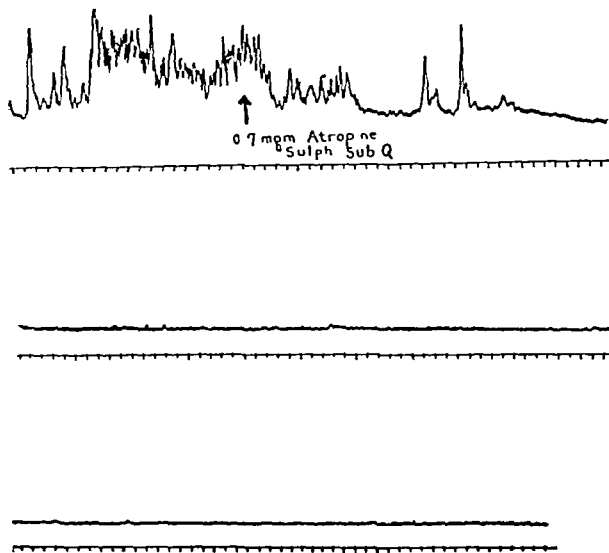


Fig 1—Complete cessation of motility in the human descending colon for ninety minutes after the subcutaneous injection of 0.7 mg of atropine sulfate

Solution of posterior pituitary (2 units intramuscularly) increased the propulsive motility of the colon in all our subjects. The response occurred after a latent period of a few minutes and occasionally lasted as long as twenty minutes. Prostigmine methylsulfate (0.25 to 0.50 mg intramuscularly) increased both the propulsive and the nonpropulsive activity. The response occurred usually in twenty minutes and lasted one to two hours. This response was most striking. Ergotamine tartrate (0.25 mg intramuscularly) had no definite effect, 0.35 mg intravenously in our dogs caused increased propulsion and defecation occasionally. It was found, however, that 0.25 mg of ergotamine would potentiate the action of prostigmine in human beings. Because of these observations, it was believed that a combination of solution of posterior pituitary, prostigmine methylsulfate and ergotamine tartrate would produce a prompt and sustained increase in motility. Accordingly, solution of posterior pituitary (1.25 units), prostigmine methylsulfate (0.25 mg) and ergotamine tartrate (0.25 mg) were injected at the same time intramuscularly. Propulsive motility occurred promptly in response to the solution of posterior pituitary and the tone and propulsive motility of the colon were augmented for six to eight hours. Contents were expelled throughout the entire day, indicating that the propulsive motility of the small intestine had also increased. The pulse and blood pressure tested at intervals were not changed, and the patients did not complain of side reactions at any time.

## "ANTISPASMODICS"

Opium, belladonna and their derivatives have been used for years as so-called antispasmodics. More recently "spasmalgin," "benzedrine," "octin" "sin-

tropan" and "trasentin" have been introduced. We have studied the effect of all these drugs on the human colon, some more intensively than others.

**Morphine Sulfate**—Much evidence<sup>7</sup> has proved that morphine has no motility inhibiting action on the human colon. We used morphine sulfate to induce hypertonus of the dog's colon as a method for the assay of various alleged antispasmodics.

The hypodermic injection of 8 mg of morphine sulfate increases the nonpropulsive motility and tone of the human colon (in the part we studied). The hypertonus may persist without any evidence of propulsive motility for several hours, depending on the dose. In 3 instances our subjects reported with diarrhea. After collecting the discharge for a period 8 mg of morphine sulfate was administered. The discharge ceased with the disappearance of propulsive waves. Similar effects have been observed in a patient with an ileostomy.<sup>8</sup> Morphine obviously tends to constipate because it decreases or abolishes propulsive activity. It may relieve the pain in colon colic by central action, and possibly by altering motility from a propulsive to a nonpropulsive type.

The use of the multiple balloon technic reveals why some investigators have reported that morphine relaxes the colon. In our studies a decrease in tone in the presence of rapid, rhythmic waves occurred in one of the segments under observation in nine out of thirty-three tests. In other segments the tone was increased.

No so-called antispasmodic that we have used dramatically inhibits the hypertonus induced by morphine.

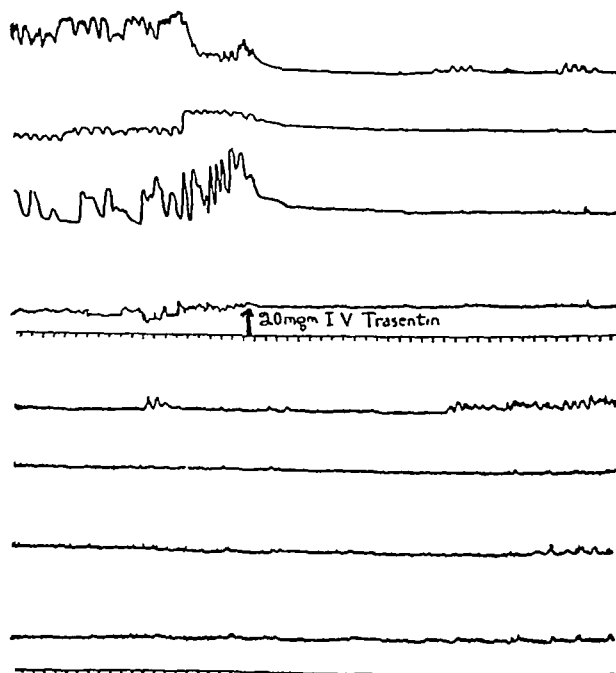


Fig 2—Complete cessation of motility of the canine colon for eighty minutes after 20 mg of trasentin intravenously

unless given intravenously (dog) in relatively large doses. If morphine hypertonus is similar to the hypertonus and spasm which occur in diseases of the colon it is not surprising that physicians are searching for a uniformly potent antispasmodic.

6. Adler H. F., Atkin A. J. and Ivy A. C. Supplementary and Synergistic Action of Stimulating Drugs on the Motility of the Human Colon. *Surg. Gynec. & Obst.* 74: 809 (April) 1942.

7. Adler H. F., Atkinson A. J. and Ivy A. C. The Effect of Morphine and Dilaudid on the Ileum and of Morphine, Dilaudid and Atropine on the Colon of Man. *Arch. Int. Med.* 69: 974 (June) 1942.

**Atropine Sulfate**—Atropine sulfate was administered to our human subjects in doses (0.75 to 0.8 mg.) just sufficient to cause some dryness of the mouth. Smaller doses have no definite effect. In 5 instances the spontaneous motility was completely abolished for one to two hours (fig 1). In three tests, the amplitude of

Quantitative Data Pertaining to the Action of Antispasmodics Studied on the Human Colon (Experiment on Four Men)

Number of Tests	Drug Used	Average Total Motility * 50 Minute Periods			Average Propulsive Motility † 50 Minute Periods		
		1	2	3	1	2	3
70	Control	31	27	30	11	10.5	7.5
33	Morphine sulfate 8 to 10 mg. intramuscularly	87	91	89.4	31	24	38
10	Atropine sulfate 0.7 and 0.8 mg. intramuscularly	74	27.6	38.5	28	3.2	7.6
6	Morphine 8 mg. and atropine 0.7 mg. intramuscularly	64	69.3	68.4	2.0	1.8	2.3
16	Trasentin 50-75 mg. intramuscularly	38	7.5	39.5	9.6	11.2	11
17	Trasentin tablets 75-150 mg. orally	36	41.5	41.4	12	10.4	9.4
10	Amphetamine sulfate 10 mg. intramuscularly	30.8	45.9	48.5	10.6	9.8	7.8
12	Amphetamine sulfate 10 mg. orally	39	33.4	48.5	12.5	12.5	8.7
13	Oefin 100 mg. intramuscularly	58.5	57.5	47.6	10	9.6	10.6
14	Oefin 150/300 mg. orally	30.6	36	37.6	13.6	13.8	10.8
12	Spasmalgin orally	54.5	86.5	84.5	8.5	3.6	4.0
10	Syntropan 10-20 mg. intramuscularly	37.6	49	47	13.3	14.5	9.8

\* Total motility time in percentage that the colon is active per 50 minute period of experimental time

† Propulsive motility expressed in percentage of total motility

the contractions was diminished and the periods of quiescence were increased. In two the nonpropulsive motility was unaffected but propulsive motility did not occur. These effects were, of course, analyzed by comparison with control motility records.

It has been shown that atropine has some antagonistic effect on the increase in tone and nonpropulsive motility induced by morphine in the dog's colon. Only six experiments of this nature were done on our human subjects because morphine must be given with caution, and the results were identical with those obtained on the dog. A combination of atropine sulfate (0.7 mg.) and morphine sulfate (8 mg.) was injected intramuscularly. Propulsive motility was abolished for two hours and tone and nonpropulsive motility were partially antagonized. This is shown in the accompanying table.

The combination of papaverine hydrochloride  $\frac{1}{2}$  gram (0.02 Gm.), pantopon<sup>8</sup>  $\frac{1}{8}$  grain (0.01 Gm.) and sulfuric acid ester of atropine  $\frac{1}{60}$  grain (0.006 Gm.) has been referred to as "spasmalgin." We used it because these drugs are supposed to have antispasmodic action. The aforementioned dose was given orally to our subjects. From forty to sixty minutes later the tone and nonpropulsive motility were increased, and propulsive motility disappeared in nine of twelve experiments for a period of seventy minutes. The action of "spasmalgin" has been reported previously in similar experiments.<sup>9</sup>

We have not studied the effect of papaverine and pantopon separately on the human colon. Bargen and Jackman,<sup>9</sup> using the single balloon technique, report that pantopon acts much like morphine and that papaverine hydrochloride usually but not always causes a decrease in tone.

<sup>8</sup> Pantopon is a preparation containing the hydrochlorides of the alkaloids of opium principally morphine.

<sup>9</sup> Bargen J. A. and Jackman R. J. The Influence of Papaverine on Muscular Tone of the Intestinal Tract. Surg. Gynec. & Obst. 68: 749 (April) 1939.

**Amphetamine Sulfate** ("benzedrine")—Amphetamine sulfate has been used in the management of colonic distress as an antispasmodic,<sup>10</sup> supposedly to stimulate sympathetic nerve endings and thereby inhibit the colon. We gave 10 mg. orally or intramuscularly and did not give larger doses that might disturb sleep. The pulse rate of all subjects was increased.

The effect on colonic motility was not definite. In all of twenty-two experiments the quantity of both propulsive and nonpropulsive motility was not altered. In eight of the twenty-two experiments there seemed to be some depression of the tone and amplitude of the contraction, in seven the coordination of the motility between segments, compared to control records, appeared to be improved, but not decisively, in the remaining seven no effect was discernible. No definite quantitative effect was recorded.

In other studies in which we have administered the same amount of amphetamine sulfate, some subjects have reported a "call to stool" when central stimulation by the drug became definite. This might be due to the central effects of the drug, though it is possible that the qualitative improvement in the coordination between segments facilitated passage of contents to the rectum.

**Diphenylacetyl-Diethylaminoethanol Hydrochloride** ("Trasentin")—This synthetic alkaloid with an atropine-like action was studied intensively. When given intravenously to the dog it counteracted morphine-induced hypertonus better than any drug we have used to date except atropine. This is compatible with the theory that it acts directly on smooth muscle.

**Canine Experiments**—In fifteen experiments 10 to 50 mg. of the drug was given intravenously to our trained dogs with colostomy. The propulsive and nonpropulsive spontaneous motility were depressed or abolished for as long as eighty minutes (fig 2). The records of the tandem balloons showed that the distal

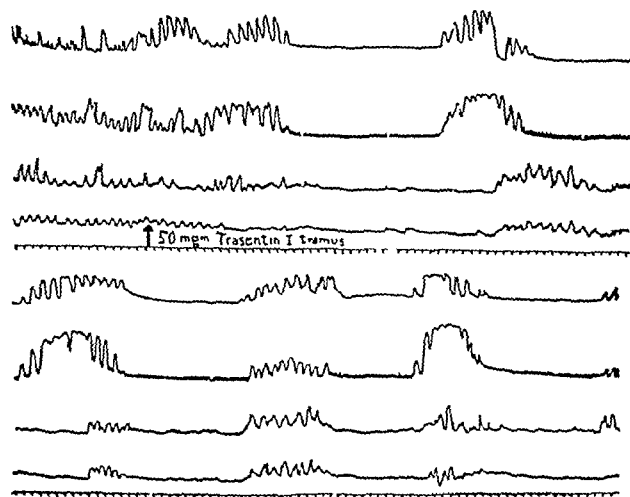


Fig. 3—Periodicity and improvement in coordination of segments of the colon in the dog after 50 mg of trasentin intramuscularly.

colon usually is depressed longer than the proximal colon. Atropine sulfate has a similar differential action.<sup>11</sup>

<sup>10</sup> Ritto, Max. Drugs and Roentgen Examination of Action of Mecholyl, Physostigmine and Benzedrine in Overcoming Sluggishness and Spasm. Am. J. Roentgenol. 36: 868 (Dec.) 1936. Rosenberg, D. H. Arens, R. A. Marcus, Philip and Necheles, Heinrich. Benzedrine Sulfate: Its Limitations in the Treatment of Spastic Colon and a Pharmacologic Study of Its Effects on the Gastrointestinal Tract. J. A. M. A. 110: 1994 (June 11) 1938.

<sup>11</sup> Adler, H. F. and Ivy, A. C. Morphine-Atropine Antagonism on Colon Motility in the Dog. J. Pharmacol. & Exper. Therap. 70: 454 (Dec.) 1940.

In nine experiments hypertonus of the colon was induced by intramuscular administration of 16 mg of morphine sulfate. Intravenous injection of 25 mg of "trasentin" immediately depressed motility and tonus for a period of about twenty minutes. The intravenous injection of "trasentin" was usually not toxic to the dog. It was slightly toxic when given with morphine sulfate, as was indicated by salivation, apprehension and an increase in pulse rate. Unfortunately when as much as 200 mg of "trasentin" was administered intramuscularly (twenty experiments) it had no effect on the hypertonus induced by morphine.

The effect of 50 to 200 mg of "trasentin" intramuscularly on the spontaneous motility of the colon was then studied in twenty experiments. The total motility of the colon was decreased approximately 15 per cent, which is less than that usually resulting after 1 mg of atropine sulfate. However, the doses of "trasentin" used had a very definite effect on the quality of motility. The periods of activity of the various segments became more uniform and the coordination between different segments was definitely improved. The propagation of a wave of activity from one segment to the next now occurred in sequence (fig 3) more frequently than under normal conditions. In this connection, Spier, Neuwelt and Necheles<sup>12</sup> observed that "trasentin" only partially depressed the motility of the alimentary tract and in so doing seemed to restore the normal gradient.

**Human Experiments** In the 4 human subjects thirty-three experiments were performed in which 50 to 75 mg of "trasentin" was given intramuscularly or 75 to 225 mg orally. The route of administration in the dosages used made no significant difference in the results. In ten of the tests a 35 per cent decrease in total motility occurred (fig 4) in fifteen, or 14 per cent, and in the remainder with the smaller doses no decrease occurred. In every test but five the quality of motility was definitely influenced. The motility became more periodic, the periods of activity being separated by periods of quiescence. As in the canine tests, the coordination between segments was improved.

In 3 instances the drug was given orally when the patients reported with diarrhea and cramps. The balloons were inserted, a control record was made and the drug administered. One patient received 75 mg, the motility became more regular and the cramps were relieved. The same response occurred in the 2 other patients who had been given 225 mg, this dose, however caused a gradual decrease in the tone of the colon in both subjects (fig 5).



Fig 4—Complete cessation of motility of the human colon after 150 mg of trasentin orally.

It was observed that after an oral dose of 225 mg the subject sometimes complained of a burning sensation in the epigastrium. In 2 instances, morphine sulfate was given four hours after "trasentin" (225 mg). The patients became apprehensive, their pulse rate increased, and they complained of slight malaise. This

we interpreted as being due to "morphine-trasentin" incompatibility,<sup>13</sup> mentioned in the case of the dog. For this reason we could not determine in man the effect of "trasentin" on the hypertonus of the colon induced by morphine. We believe it is important to remember that morphine sulfate and "trasentin" should not be used in close sequence clinically.

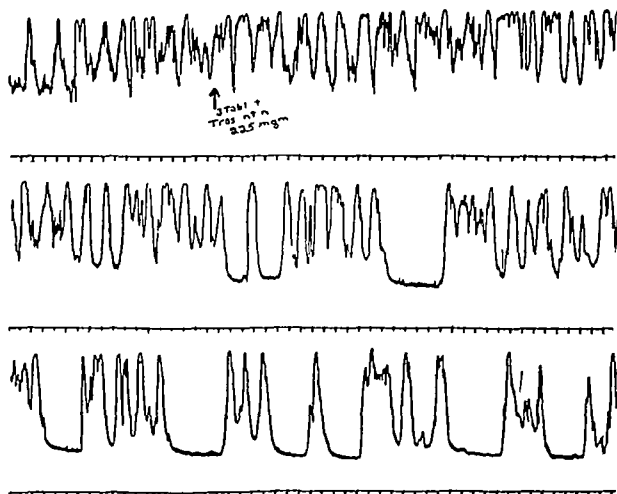


Fig 5—Reduction in the quantity of motility and tone and a return toward periodicity in a segment of the descending portion of the human colon after 225 mg of trasentin orally. In the upper tracing the tone is high and the movements relatively rapid a type of motility that is not conducive to propulsion when present in two adjacent segments.

**Methyloctenylamine Hydrochloride ("Octin")**—This drug was administered to our 4 human subjects in the doses shown in the table. The drug did not alter the normal control pattern of motility in our subjects within two hours. In 1 instance after being given 2 tablets (300 mg) the patient reported increased propulsion of colon contents.

**Syntropan**—This drug was administered intramuscularly in doses of 10 or 20 mg in ten experiments. No effect was discernible in our records (table). This was not anticipated because the drug has a spasmolytic action on the isolated rabbit's intestine. However, this drug has peculiar pharmacologic properties. It has an oxytocic action on the intact uterus of the guinea pig, rat and dog.

#### COMMENT

Our observations show that it is important to consider the quality as well as the quantity of motility in the study of the human colon. It is important, we believe, to distinguish between the two functional types, namely the propulsive and the nonpropulsive motility. The knowledge that different types of motility may occur in adjacent segments of the colon and that the type of motility in adjacent segments influences the extent of travel of a propulsive wave aids in the comprehension of colonic dyskinesia and its consequences. It seems to be apparent from our records that the existence of a normal gradient in the colon depends on the existence of coordination between the various functional segments of the colon. The more intimate nature of the coordinating mechanism is uncertain.

Atropine sulfate and "trasentin" were clearly the best depressants of spontaneous colonic motility among the drugs studied. In the doses used atropine sulfate (0.8 mg intramuscularly) produced a more decided

12 Spier Ernst Neuwelt Frank and Necheles Heinrich Clinical Study of a New Synthetic Spasmolytic Drug Diphenylacetyl Diethyl aminoethanol Am J Digest Dis 6 387 (Aug) 1939

13 Van Duzen R C Slaughter Donald and Winter I C The Effect of Trasentin and Morphine on the Urinary Bladder of the Unanesthetized Dog J Urol 44 667 (Nov) 1940

depression than did "trasentin" (75 mg intramuscularly). Although "trasentin" did not abolish motility as a rule, it did improve the coordination between segments and established a gradient or type of motor pattern conducive to propulsion. Atropine sulfate may be found to have the same action if graded doses are employed. But it should be noted that the larger doses of atropine sulfate depress both propulsive and non-propulsive motility.

Our results on the effect of atropine sulfate and "trasentin" in therapeutic doses on the hypertonus of the dog's colon induced by morphine provide an explanation of why these drugs are not uniformly successful in the management of colonic colic. If the hypertonus in the colon or one of its functional segments is too great, these drugs in ordinary therapeutic doses, which do not give rise to objectionable side effects, will have little or no effect. Ideally we need a drug which specifically antagonizes the hypertonic segments without altering the normal segments. This may be asking for the impossible. At least we should like to have a drug which in nontoxic doses counteracts morphine induced hypertonus to a greater extent than atropine sulfate and "trasentin" do.

Our results demonstrate that before it is claimed that a drug depresses colonic motility in man the drug should be studied on patients with a colostomy, using preferably a two balloon system. At least such a study should be conducted on the trained colostomized dog, since the results on isolated segments of intestine are apparently unreliable. It also is our belief that a drug should be assayed several times on the same and different subjects, the effect of one or two administrations may lead to erroneous interpretations. However, drugs which do not paralyze the intestine may be useful clinically. Such drugs may affect the mechanism, causing the dyskinesia without significantly affecting normal mechanisms.

#### SUMMARY

The normal pattern of the motility of the human colon has been studied in a series of 4 men with a colostomy by repeated experiments over a relatively long period. We have attempted to explain how an alteration of the normal pattern, by influences which affect the coordination between segments, may produce "constipation" and symptoms of tension and colic. The effect of various drugs on the propulsive and non-propulsive motility was studied. Simultaneous injection of solution of posterior pituitary (125 units), prostigmine methylsulfate (0.25 mg) and ergotamine tartrate (0.25 mg) was found to cause a prompt and prolonged increase in the propulsive motility of the human colon without side reactions. Morphine sulfate (8 to 16 mg) is not an antispasmodic in the sense that all motility is inhibited. It increases the tone and non-propulsive motility and definitely decreases or abolishes the propulsive motility. Of the various "antispasmodic" drugs studied, atropine sulfate and "trasentin" proved to be the most potent depressants. Atropine sulfate (0.7 to 0.8 mg intramuscularly) may abolish all spontaneous motility of the colon for a brief period, whereas "trasentin" (50 to 75 mg intramuscularly) is less likely to do so. "Trasentin" may depress nonintegrated motility in such a manner that propulsion is favored and a normal gradient established. The effect of these drugs is more striking on the distal than on the proximal colon of the dog. The ideal "spasmolytic" drug for the colon has yet to be discovered.

303 East Chicago Avenue

#### ABSTRACT OF DISCUSSION

DR WALTER C. ALVAREZ, Rochester, Minn. When these studies were published, I wrote Dr. Atkinson to tell him how valuable I thought they were. It seemed to me that they threw light on the problem of the patient who says that his distress is due to the fact that gas does not move onward. I have long suspected that in these cases the contractions are localized and are not propulsive and wavelike. A man can swallow a lot of air and pass it through the bowel without any distress, while the gas which forms after the eating of some food to which he is allergic seems to stay in one place and will cause pain for an hour or more. I was interested in the authors' discovery that in different persons there are different patterns of colonic activity with different ratios of the comfortable wavelike contractions to the uncomfortable, nonprogressive contractions. I suspect that persons with a sensitive bowel and a tendency to mucous colics have more of the nonprogressive contractions. Years ago I found that any poison, such as nicotine or anoxemia, which injures the synaptic nervous mechanism in the intestine wipes out the propulsive type of wave and leaves what I call a systolic type of contraction of many parts of the intestine at one time. It seemed to me that the systolic type of contraction might well cause pain. I am pleased to see that in a pharmacologic study some attention is now being paid to the influence of drugs on the two types of waves. I have always felt that our knowledge of the pharmacology of the intestine would never advance until research workers noted particularly the action of drugs in producing the propulsive type of contraction.

DR J. P. QUIGLEY, Cleveland. The report by Dr. Atkinson and his associates represents a serious, painstaking investigation of three intestinal problems: (1) the fundamental physiologic motility of the colon, (2) the deviations from the normal which occur in dyskinesia and so forth, and (3) the action of drugs on this normal and abnormal motility. The pharmacologic results can be generally accepted as reported. They constitute a valuable contribution, and the value will be augmented if subsequent investigations demonstrate that the abnormal colon responds in a manner similar to the normal. Certainly there is reason to anticipate that the combination of solution of posterior pituitary, physostigmine and ergotamine found so effective in augmenting colonic propulsion should be effective in relieving the distressing distention from intestinal gas which plagues the individual who ascends to a high altitude. The proposed interpretation of the results is so important that one might wish that the differentiation between propulsive and nonpropulsive motility was made by a direct method involving the measurement of the rate at which something was transported through each portion of the colon. Especially adapted types of roentgen or multiple bolus studies may be suggested. Accurate determinations of the pressure gradients at adjacent segments of the bowel would also be desirable. To attempt this differentiation by any indirect method such as balloon studies is less satisfactory, since it involves many loopholes.

DR JAMES W. WILTSIE, Binghamton, N. Y. I wish to show two slides illustrating mass movement in the colon. The roentgenograms in this case were taken by a small portable machine of 15 milliamperes power. The exposure time was eight seconds. I discovered, incidentally, that short time exposures produced the effect of actual motion. Several patterns of transport movement are found to occur in the colon. Originally this case was one of fecal impaction in the cecum and ascending colon. Seven irrigations were required to clear the colon of this impaction. The first slide is that of a barium sulfate enema introduced immediately after the seventh irrigation. The exposure was made two or three minutes after introduction of the enema. Within this brief period the barium sulfate had reached the cecum and was being returned. The cecum is fixed by adhesions. The left half of the transverse colon shows a double shadow, the central denser portion indicating the diameter of this segment at the beginning of the eight second exposure, the lighter outer portion the diameter at the end of the exposure. The streaked appearance of the shadow in the right half of the transverse colon indicates barium in motion. My interpretation of this film is that active dilatation in the left half of the transverse colon is sucking the enema from the proximal por-

tion of the colon as the initial phase of a definite transport movement caudad. Since statements have frequently appeared in the literature to the effect that it is impossible to pass a colon tube beyond the rectosigmoid juncture I wish to show several slides (of different patients) in refutation of this erroneous belief. Slide 3 shows beyond the possibility of successful contradiction that the tube has been passed as far as the hepatic flexure. Slide 4 shows the tip of the tube in the upper portion of the ascending colon. Slide 5 was taken after the tube had been in place at least fifteen minutes and indicates an attempt of the colon to expel it as indicated by the large pelvic loop recession of the tube from the midtransverse colon to the splenic flexure and by a loop coiled in the rectum representing the expelled portion.

DR. A. J. ATKINSON, Chicago: Atropine and traserin were clearly the best depressants of spontaneous colonic motility among the drugs studied. Intramuscular injection of  $1\frac{1}{4}$  units of solution of posterior pituitary with 0.25 mg. of prostigmine and 0.25 mg. of ergotamine produced a prompt and sustained increase in motility without any undesirable side effects. I have used this combination of drugs successfully in cases presenting megacolon and other conditions of colonic stasis. The work reported is not just another drug study on the human colon; it is an attempt to correlate in a practical manner the knowledge that has been gained in the laboratory with various clinical problems.

## PLATED OSTEOPERIOSTEAL GRAFT

EARL D. McBRIDE, M.D.

Assistant Professor of Orthopedic Surgery, Oklahoma University School of Medicine  
OKLAHOMA CITY

The osteogenic virtues of the osteoperiosteal graft are unquestioned. This type of graft has been of secondary importance chiefly because it lacks the stabilizing rigidity of the cortical graft. Also, there is less confidence in the thinner graft for fear that it will not provide a preponderance of osteogenic material.

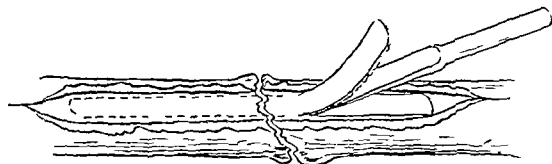


Fig. 1—Preparation of the host bed. The periosteum is incised and elevated sufficiently for the cortex to be flattened uniformly to the size of the graft. Intervening fibrous tissue and callus are not excised or disturbed except as absolutely necessary to restore alignment.

However, it has been found that if the osteoperiosteal graft is compressed firmly to a freshened bed on the ununited fragments, resulting osteogenesis compares favorably with that of a full thickness graft, and the simpler surgical procedure permits its application in situations in which the more extensive bone sawing excisions would be contraindicated.

Phemister and Harkins<sup>1</sup> and Delangeniere and Lewin<sup>2</sup> have described the advantages of the osteoperiosteal graft as a procedure in which they used ligatures and muscle pressure for fixation. The remarkable advances in the use of metallic fixation since the introduction of vitallium and especially hardened steel

together with the use of the sulfonamide compounds, have brought about many liberties in bone surgery not heretofore considered prudent or feasible. These two agents used with the osteoperiosteal graft make possible

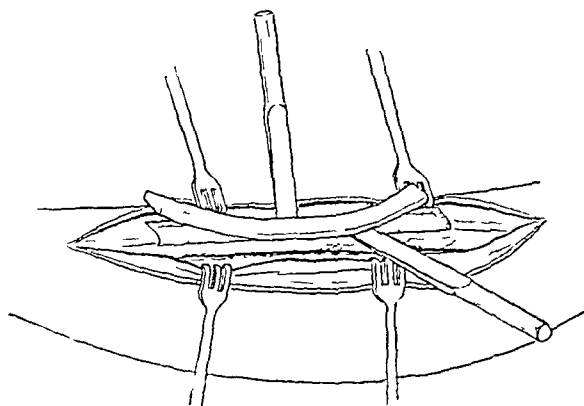


Fig. 2—Excision of graft. Removal of osteoperiosteal graft  $\frac{1}{8}$  inch thick from the crest of the tibia by retracting the muscles from the lateral margin of the tibia and starting the chisel or bone saw transversely  $\frac{1}{8}$  inch below the crest. The graft is first outlined on the anterior surface of the tibia but is cut laterally from the crest rather than being chiseled out lengthwise as is usually done. This is to prevent curling up of the graft and to insure uniform thickness.

the treatment of nonunion in instances in which the typical cortical graft could not be considered.

When the osteoperiosteal graft is squarely covered by a smooth flat vitallium plate and gently but firmly squeezed to its bed on the bone fragments by the usual screw fixation, neither absorption nor necrosis occurs as one might think. On the contrary, such overlying support is a protection from erosive influences, and the firm contact of the graft to its host bed provides the necessary basis for plastic coalescence, just as compression by sponge pressure stabilizes the skin graft to create coherence. Such compactness of covered pressure and sealing-in effect lessens the exposure of the graft substance to attack by the processes of absorption and promotes the permeation of budding vessels and proliferating osteogenic cells.

### INDICATIONS

1 *Use in the Presence of Chronically Infected Tissue*—When chronically infected tissue is present the use of such a method, together with the sulfonamide compounds, offers possibilities of using the bone graft in cases in which a more extensive operation of cortical graft would meet disaster.

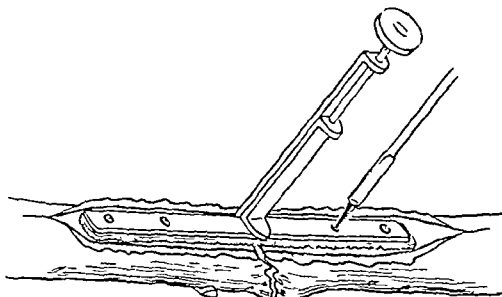


Fig. 3—Plating of graft on fragments. Application of the metal plate directly on top of the graft in the customary method. The graft can be tied to the plate by catgut previous to application, since there is a tendency for the graft to slip about under the plate while the drill holes are being made.

2 *Delayed Union*—In cases of delayed union the more simple procedure of a plated osteoperiosteal graft is justified at an earlier date than one would resort to

Read before the Section on Orthopedic Surgery at the Ninety Third Annual Session of the American Medical Association, Atlantic City, N. J., June 10, 1942.

1. Phemister D. B. and Harkins H. N. Simplified Technique—Onlay Graft for Old Ununited Fractures in Acceptable Conditions. J. A. M. A. 109:501-506 (Nov. 6) 1937. Phemister D. B. Split Grafts in the Treatment of Delayed and Nonunion of Fractures. Surg. Gynec. & Obst. 52:376-381 (Feb. 2A) 1931.

2. Delangeniere Henri and Lewin Philip. A General Method of Repairing Loss of Bony Substance and of Reconstructing Bones by Osteoperiosteal Grafts Taken from the Tibia. Surg. Gynec. & Obst. 30:441-447 (May) 1920.

with the greater traumatism of a full thickness graft. Thus, instead of waiting and splinting over a period of months, during which adjacent joints become stiffened and tissues atrophied, an osteoperiosteal graft can be plated onto the fragments and passive motion begun in a few weeks with full confidence in the security of the fragments.

**3 Use as Sliding Graft in Tibia**—In nonunion of the tibia the graft more often may be taken from the upper or lower fragment of the same leg, since atrophy or weakness in the graft material is not so great a factor with the use of the metal plate for internal fixation.

**4 Nonunion with Loss of Substance**—In most cases in which there is considerable loss of bone substance one of the classic bone graft methods should be used

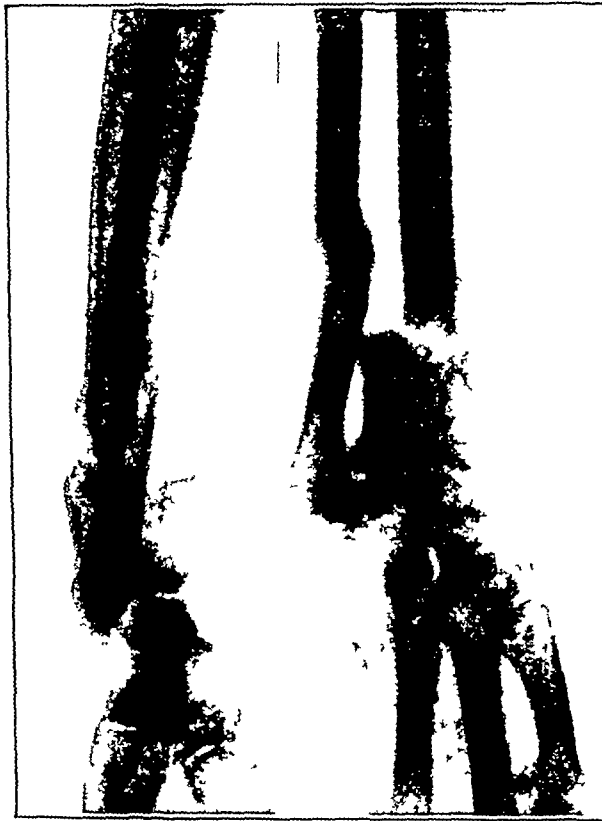


Fig 4 (case 12 in table)—Before and after application of plated osteoperiosteal graft. This was a severely mutilated hand with persistent sinuses still poorly healed at the time of operation. There was considerable loss of substance. A bone graft made it possible to obtain movement in the ankylosed wrist.

However, the plated osteoperiosteal graft has proved very efficient in a number of instances in which the intervening fibrous space was not more than 1 inch.

#### TECHNIC

The anesthetic should be general. In compound fractures preoperative preparation should include attention to chronic scars, sinuses or ulcerations. Hot fomentations, local application of antiseptics and elevation of the part in bed may be necessary for several days prior to the operation. The incision for exposure of the ununited fragments should avoid scar tissue or healed sinuses as widely as possible. The graft is best taken from the tibia. In a previously infected field, when the graft is taken from one of the fragments of the tibia, there should be two carefully separated incisions. The graft should be taken first to prevent contamination

or the instrumentation should be divided, one for each field. The graft is cut very thin and accurately with a saw and a thin osteotome. The graft should be slightly larger than the plate in length and width.



Fig 5 (case 12 in table)—Three months after operation showing consolidation of the ununited fracture.



Fig 6—Photomicrographic section cut crosswise of osteoperiosteal graft and its bed after removal of the vitallium plate from its surface. Area A is the layer of fibrous tissue originally the periosteum of the graft. Area B is the bone tissue of the host bed. Note the microscopic spear of ingrowth into the fibrous structure. New vessels have formed a cytogenetic relation between the new tissue introduced and the bone tissue in the neighborhood.

The manner of taking the graft is important in that the graft should be cut in uniform thickness. Instead of chipping it endwise with a chisel placed on the flat sur-

face of the tibia, it is preferable to retract the muscles from the lateral margin of the tibia and start the chisel or bone saw about  $\frac{1}{16}$  inch below the crest. By being cut transversely at this depth, parallel with the anterior surface of the tibia, the graft remains flat and does not curl up. Previous to cutting the bone laterally, one should make an outline of the size of the graft on the anterior surface with the osteotome, driving it  $\frac{1}{16}$  inch in depth (fig. 2).

#### PREPARATION OF HOST BED

The extent of readjustment of the fragments depends entirely on the nature of the malunion or deformity. The periosteum of the fragments should be carefully elevated and conserved. If at all possible, the intervening fibrous tissue and callus should not be excised or

an inflammatory reaction is likely to occur, the wound is dusted and all raw surfaces are rubbed with a half and half mixture of powdered sulfathiazole and sulfanilamide.

The retracted periosteum of the host fragments is brought as evenly as possible up over the slightly extended edges of the graft and even over the plate as much as possible in order to seal in and protect the graft. Plaster immobilization is applied. In four to six weeks regeneration of bone, in addition to the sustaining adequacy of the metal plate, affords passive and active motions in uncomplicated cases. The plate need not be removed after union, unless indicated because of irritation.

This method has been used in a series of 17 cases, 15 of which are analyzed in the accompanying table.

Plated Osteoperiosteal Bone Grafts Analysis of Cases

Fractures	Age	Duration from Date of Fracture	Date Grafted	Condition of Local Field	Passive Motion Begun	Mobility and Function	Complications	Plate Removed	End Result
1 J. C. R* compound comminuted left tibia and fibula middle 3d	49	10 mos	10/25/40	Healed sinus in 3 mos 1 bone loss	8 wks	6 mos	None	No	Good union
2 C. M. compound comminuted right tibia lower 3d	39	8 mos	11/10/39	Osteo scars sinuses	12 wks	6 mos	Persistent sinus	10 mos	Good union
3 P. C. K. comminuted tibia and fibula lower 3d	41	5 mo	3/12/41	Good	5 wks	4 mos	None	No	Good union
4 I. H. B. compound comminuted tibia and fibula lower 3d	62	2 mos	9/6/40	Mild drainage	2s wks	9 mos	Union slow slight drainage	No	Good union
5 K. B. compound comminuted left tibia upper 3d	46	20 mos	1/19/40	Chr osteo	16 wks	5 mos	Chronic osteo	No	Good union
6 A. M. comminuted right tibia and fibula lower 3d	39	2 mo	3/26/40	Good	24 wks	8 mos	Infection and slough	4 mos	Good union
7 D. V. H. comminuted right tibia lower 3d	30	2 mos	11/2/40	Good	6 wks	3 mos	No	10 mo	Good union
8 F. A. B. compound comminuted right tibia and fibula lower end	30	6 mos	6/20/41	Scars	6 wks	5 mos	No	8 mos	Good union
9 D. McF. compound comminuted right tibia lower 3d	21	3 yrs	1/30/40	Scars and sinus	6 wks	5 mos	Persistent sinus	9 mos	Good union
10 R. R. G. comminuted lower end radius	34	5 mos	9/9/41	Good	6 wks	3 mos	None	No	Good union
11 L. A. A. compound right ulna middle 3d	14	7½ mos	6/7/40	Good	4 wks	5 wks	None	No	Good union
12 I. C. J. mutilated radius and ulna lower end	27	8 mos	3/18/41	Severe scar 1 loss of bone and sinuses	12 wks	4 mos	Persistent sinuses	7 mos	Good union
13 J. P. comminuted left radius and ulna junction upper and middle 3d	33	11 mos	9/19/39	Good	7 wks	3 mos	None	No	Good union
14 F. F. compound comminuted right radius and ulna middle 3d	32	3 mos	1/23/42	Rough scar			None	No	Good union
15 D. A. mid-shaft radius and ulna right	23	5 wks	1/6/42	Rough scars	4 wks		None	No	Good union

disturbed. Local trauma should be as mild as possible, especially when chronically infected scar tissue prevails (fig. 1). Burrows<sup>3</sup> and others have shown that resection or freshening of the bone ends in bone grafting is not necessary. With the periosteum retracted the surface of the cortex of both fragments is evenly flattened as a receptive bed for the graft. The graft is then spanned across the fibrous gap between the fragments and smoothly fitted to its bed. In the tibia, the graft is plated preferably to the lateral aspect of the bone. Good muscle covering should be sought in other bones. The metal plate should be of a solid rectangular form and of smooth surface. It is clamped directly on top of the graft, fixing it with screws in the conventional manner to compress evenly and gently the underlying transplant to its bed (fig. 3). In compound fractures when

Union was obtained in all cases. Osteogenesis as followed by x-ray examination, compared favorably in rapidity and quality with that which might have been expected with a full thickness graft. The intermediary tissue between the ununited fragments ossified with favorable rapidity, and it seemed unnecessary to remove it as is commonly practiced.

In case 6 the plate was removed at four months because of slough, but the graft remained uniformly adherent, and firm union of the fragments was obtained. In cases 1 and 5 there was  $\frac{3}{4}$  inch to 1 inch loss of bone substance. The intervening fibrous tissue was not removed but osteogenesis developed throughout the gap, with progressive firmness. In case 8 the lower fragments of the tibia were severely comminuted into the ankle joint with very little firm bone to which the plate could be anchored. Case 12 presented a mutilated hand with severe scar tissue and 1 inch loss

<sup>3</sup> Burrows H. G. Treatment of Ununited Fractures by Bone Graft Without Resection of the Bone Ends. *Proc Roy Soc Med* 33: 157-160 (Dec.) 1939.



of bone in the lower end of the radius. Union was successful even though persistent sinuses were present.

Examination of the grafted region after removal of the plate has revealed bony union of the graft to its bed. The surface under the plate has been found to be living fibrous tissue of periosteal consistency.

Microscopic study of a section taken transversely through the graft and cortex of the fragment shows that the graft becomes adherent to the host bone with new vessels forming a cytogenetic relation between the new tissue introduced and the bone tissue in the neighborhood.

#### SUMMARY AND CONCLUSIONS

The advantages of a plated osteoperiosteal graft are

- 1 The metal plate is very dependable
- 2 The simpler procedure is more often justified in delayed union
- 3 There is less violent trauma by bone sawing in obtaining and fitting the graft
- 4 There is less bulk to cover up than in full thickness grafts
- 5 It affords an earlier grafting operation on compound fractures with old scars and sinuses
- 6 It renders earlier passive motion
- 7 When reduction of the fragments is not necessary, the intermediary callus need not be removed
- 8 Resulting osteogenesis compares favorably with that obtained with the full thickness graft

605 North West Tenth Street

#### ABSTRACT OF DISCUSSION

DR. LEO S. LUCAS, Portland, Ore. The importance of retaining the periosteum on the bone graft is still a controversial point. In operating on dogs and using otogenous grafts with the periosteum retained, and others in which the periosteum was removed, Pollock concluded that no advantage is gained by the retention of the periosteum in bone grafting operations. It was his opinion that removal of the periosteum from the graft results in the production of a more active periosteum from the surrounding connective tissue and that the scarification of the surface in the removal of the periosteum liberated osteoblasts from the graft itself. It is my feeling that the most important factor is the preservation with as little trauma as possible of the periosteum at and surrounding the fragments to be grafted. Where possible, all soft tissues should be left intact in order to preserve the blood supply that is so important in the process of repair. I agree with Dr. McBride that, unless it is absolutely necessary to redress the fragments in order to obtain proper alignment, the fibrous tissue between the ends of the bone should not be disturbed, and this applies to any type of bone grafting procedure used. The ossification of these tissues is rapid during osteogenesis. Because of the difficulty of properly securing osteoperiosteal grafts, many of us have felt that the massive onlay or inlay grafts were superior. While the osteoperiosteal method may be sufficient to produce the necessary osteogenic material, this type of graft has been difficult to apply with proper fixation of the fragments, which is so important in the healing of an ununited fracture. Dr. McBride has shown the feasibility of using the graft to better advantage, insuring excellent fixation to the affected parts and the possibility of using it in early cases in which the more extensive procedures might be accomplished with more risk. It offers a method that has been successful in his hands, is comparatively simple in application and conforms to good surgical principles.

DR. REXFORD L. DIVELEY, Kansas City, Mo. We are indebted to Dr. McBride for this most interesting presentation. I can commend to you his exhibit in the Scientific Exhibit in which he has most of the presented cases illustrated with plates. I was not impressed in the study of this exhibit with

the fact that the periosteal graft is entirely responsible for the union or the osteogenesis. I was impressed however, with the fact that the union takes place as the result of the fixation. Therefore it is my feeling having seen many grafts being held by band and by wire and by other metallic pressure, that the massive onlay, or the massive inlay osteoperiosteal graft, carefully and firmly held by two or four metallic screws of the vitallium type, will not only give fixation but will also give certainly a great deal more osteogenesis than will the periosteal graft which is being hugged or crushed by a plate.

DR. EARL D. McBRIDE, Oklahoma City. I purposely left out of this paper the various discussions that I knew might arise with regard to periosteum versus bone in osteogenesis. It is an old subject and we have heard it discussed many times. I agree with Dr. Diveley that the immobilization is an essential factor in this method. In the interim of different cases I have used a plate without the graft in two or three instances. I am impressed that they do not produce the same results as when I use the osteoperiosteal graft. As a matter of fact I operated again in 1 case and used the osteoperiosteal graft because of failure of union. Consequently it is immaterial to me whether the improvement is due to the fixation or to the osteoperiosteal graft. There is 1 case in the exhibit in which I show that the graft has been fixed with screws alone and the result is just as good as when I used the metal plate over the graft. So there is no argument in that respect. The point that I made about this entire discussion is that with the metal plate for fixation, which is absolutely dependable and which is not subject to absorption as is the cortical graft together with the sulfonamide drugs which we now have enables us to secure union in some of these chronically infected compound fractures that otherwise would be kept in a plaster or other immobilization for months and months. Now we can proceed to take the risk of surgery in nonunion of old compound fractures, with the confidence that we have the fragments fixed and that we can get the patient to respond to function much earlier. That holds true with delayed union. We usually put on casts and wait two or three months then put on another cast, thinking that perhaps the forearm bone or humerus would finally unite and we would wake up finally to find a stiff elbow or stiff fingers. Now, with a good fixation of the osteoperiosteal graft under the plate I am able to remove immobilization much sooner with a better function of the elbow and fingers. So I have developed full confidence in this method and thought it worth while to present the method for your consideration just from these certain points of view and have purposely omitted arguments regarding the various controversies of bone graft versus periosteum and healing of bone tissue.

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**More or Less Continuously Bored**—The mode of life of the majority of American women married to men of average or better than average incomes is more deleterious to their physical and functional well-being than any except the extreme degrees of privation and drudgery. In the first place they have so little to do that they are more or less continuously bored. Boredom leads to restlessness, restlessness to mental and nervous hypertension which expresses itself in functional neuroses, irritability, introspection and the expenditure of a tremendous excess of nervous energy in the performance of any physical or mental task. All of this leads to nervous fatigue and neurasthenia. The average woman who has driven her children to school, planned the day's menu, instructed her servants and repaired some trifling damage to her wardrobe must go to bed after lunch and rest before engaging in the arduous task of an afternoon at the bridge table. Knowing the exhaustion which attends the performance of such things she feels that she cannot survive the exertion attendant on a game of golf or tennis, a swim, or a ride on horseback. As a result her muscles become flabby, fat accumulates, the general tonus is reduced to a minimum, the functional activities of the body are impaired and functional neuroses reign unopposed.—Cooke Willard R. *Essentials of Gynecology*, Philadelphia, J. B. Lippincott Company, 1943.

# THE PLACENTAL TRANSMISSION OF PROTECTIVE ANTIBODIES AGAINST WHOOPING COUGH

BY INOCULATION OF THE PREGNANT MOTHER

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AND

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NEW YORK

Whooping cough is the dread contagious disease of infancy. During the first two years of life it is the cause of more deaths than measles, diphtheria, poliomyelitis and scarlet fever combined.<sup>1</sup> Against the latter diseases the baby usually is born with a passive immunity transmitted by the mother through the placenta.<sup>2</sup> Since this is a passive immunity it endures for only approximately six months. Such does not seem to be the case with whooping cough.

Pediatricists not infrequently encounter cases of whooping cough in early infancy. The figures on the incidence of whooping cough in the infant vary from 8 to 18 per cent of the total incidence of whooping cough at all ages.<sup>3</sup> This is clinical evidence of the frequent lack of immunity in the newborn.<sup>4</sup> At present there are few data on the humoral immunity of the average adult against whooping cough. This is explainable because it is only in the last few years that proper immunologic tests for whooping cough have been devised. Without proper and sufficient data as to the immunity of the adult female immunity of the newborn baby against whooping cough in respect both to frequency and to degree can be only conjectured. Thus Holt and McIntosh<sup>5</sup> state that natural susceptibility to whooping cough seems to be equal at all ages and little or no immunity is conveyed in utero, regardless of whether or not the mother is immune. Some believe that natural immunity to pertussis does not exist and that no natural immunity is transmitted from mother to child.<sup>6</sup> On the other hand, Knoepfelmacher,<sup>6</sup> in Pfandl and Schlossmann's system, states that a congenital immunity to whooping cough can be accepted derived from previous pertussis of the mother. Sauer<sup>1</sup> speaks

little of this subject in Brennemann's System of Pediatrics except for quoting Bordet as believing in transient congenital immunity. It seems that there is no unanimity of opinion on this subject.

The human placenta is of the hemochorionic type in which a single layer of chorionic and endothelial cells separates the fetal from the maternal blood.<sup>7</sup> To all intents and purposes, there is here a semipermeable membrane obeying the physicochemical laws of semipermeable membranes.<sup>8</sup> The size of the molecules determines what passes across and what fails to pass the placental barrier.<sup>9</sup> In general, antibodies and not antigens are able to filter through from the mother's blood to the baby's blood.<sup>9</sup> Thus it has been demonstrated that the titer of diphtheria antitoxin is approximately the same in the mother's blood, the cord blood and the placental blood.<sup>10</sup> The same holds true of the other antitoxins such as tetanus.<sup>11</sup> It is well known that the blood group of the baby may not be well established for several weeks because of the passage of the mother's blood agglutinins into the fetal blood.<sup>12</sup> Immunity against scarlet fever, measles and poliomyelitis for the first half of the infant's life is conferred on the baby through the antibodies of the mother's blood by way of the placenta. The newborn baby has also been shown to have, at least in many instances, antistreptolysins,<sup>13</sup> antistaphylococci and other bacterial antibodies similarly passively transmitted by the mother.<sup>14</sup> The same probably holds true of antibodies against all organisms which are already preformed in the mother's blood during pregnancy.<sup>15</sup>

According to Needham, antigens as a class unlike antibodies, do not pass through the placental barrier. There are certain exceptions, however, for typhoid, malaria, pneumonia<sup>16</sup> and rheumatic fever, among other diseases,<sup>17</sup> have been described in newborn babies. In these instances we are dealing with a disease process which probably alters the capillaries on both sides of the placenta effecting an abnormal exchange. Ratner

7 Windle F. The Physiology of the Fetus Philadelphia W. B. Saunders Company 1940. Needham.<sup>9</sup>

8 Pommerenke W. T. Placental Interchange. I. On the Concentration of Certain Nitrogenous Substances in the Blood Before and After Passing Through the Placenta. J. Clin. Investigation 15: 485 (Sept.) 1936. Thompson H. E. Jr. and Pommerenke W. T. Placental Interchange. II. Comparison of Total Base Concentration of the Fetal and Maternal Blood at Parturition. Ibid. 17: 609 (Sept.) 1938. Pohl H. A. Flexner L. B. and Gelhorn A. The Transfer of Radioactive Sodium Across the Placenta of the Goat. Am. J. Physiol. 134: 388 (Sept.) 1941. Speert H. The Passage of Sulfanilamide Through the Human Placenta. Bull. Johns Hopkins Hosp. 63: 337 (Nov.) 1938. Pack G. T. and Barker D. The Placental Transmission of Insulin from Fetus to Mother. Am. J. Physiol. 90: 466 1929. Jones O. P. Transmission of Antianemic Principle Across the Placenta and Its Influence on Embryonic Erythropoiesis. Arch. Int. Med. 68: 476 (Sept.) 1941. Needham.<sup>9</sup>

9 Needham Joseph. Chemical Embryology. London Cambridge University Press 1931. vol. 3.

10 McKhann C. F. and Chu F. T. von Groer and Kassowitz.<sup>2</sup> Karelitz and Greenwald.

11 Ten Broeck Carl and Bauer J. H. The Transmission of Tetanus Through the Placenta. Proc. Soc. Exper. Biol. & Med. 20: 399 1923.

12 Smith C. H. Iso Agglutinins in the Newborn with Special Reference to Their Placental Transmission. Am. J. Dis. Child. 36: 54 (July) 1928. Wiener A. S. and Silverman J. I. Permeability of the Human Placenta to Antibodies. J. Exper. Med. 71: 21 (Jan.) 1940.

13 Lippard V. W. and Wheeler, G. W. Placental Transmission of Antistaphylococci and Antistreptolysins. Am. J. Dis. Child. 59: 61 (Jan.) 1936. Gordon J. E. and Janney J. H. Antistreptolysin Content of the Sera of Normal Infants and Children. J. Pediat. 18: 587 (May) 1941.

14 Toomey J. A. Agglutinins in Mother's Blood, Baby's Blood, Mother's Milk and Placental Blood. Am. J. Dis. Child. 47: 21 (March) 1934. Levine Philip, Katzin E. M. and Burnham Lynn. Isoimmunization in Pregnancy. Its Possible Bearing on the Etiology of Erythroblastosis Fetalis. J. A. M. A. 116: 825 (March 1) 1941.

15 Rodolfo A. A Study on the Permeability of the Placenta of the Rabbit to Antibodies. J. Exper. Zool. 68: 215 (July 5) 1934. Park W. H. and Williams A. W. Pathogenic Organisms Philadelphia Lea & Febiger 1933. pp. 316 318. John B. Placental Transmission of Hypersensitiveness to Ascaris Lumbricoidea Actively Induced in a Pregnant Woman. Am. J. Dis. Child. 57: 1067 (May) 1939. Needham.<sup>9</sup>

16 Holt and McIntosh.<sup>5</sup> Zinsser Enders and Fothergill.<sup>3</sup> von Reuss.<sup>4</sup> 17 Shuman H. H. Variella in the Newborn. Am. J. Dis. Child. 58: 564 (Sept.) 1939.

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The social service department and the nurses of the hospital aided in this investigation with willing cooperation and untiring efforts.

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1 Sauer L. W. Whooping Cough in Brennemann J. Practice of Pediatrics Hagerstown Md. W. F. Prior Company Inc. 1941 vol. 2, chap. 34. Bulletin of the Department of Health of New York City 1940. Dublin L. and Spiegelman M. The Control of Disease and Death in Infancy and Childhood. Rec. Am. Inst. Actuaries June 1941 vol. 30. no. 61.

2 McKhann C. F. and Chu F. T. Antibodies in Placental Extracts. I. Infect. Dis. 52: 268 (March) 1933. von Groer F. and Kassowitz K. Studien über die normale Diphtherieimmunität des Menschen. Ztschr. f. Immunitätsforsch. u. exper. Therap. 22: 405 23: 108 1914. Karelitz S. and Greenwald C. K. Comparison of Maternal Circulating Blood Immunity with that of Placental Fluid. Proc. Soc. Exper. Biol. & Med. 32: 1362 (May) 1935. Bourquin H. A Study on Permeability of the Placenta. I. Permeability to Agglutinins Hemolysins Diphtheria Antitoxin and Diastase. Am. J. Physiol. 59: 122 1922.

3 Holt L. E. and McIntosh Rustin. Holt's Diseases of Infancy and Childhood ed. 11. New York D. Appleton Century Company Inc. 1941. pp. 1164 1165. Top F. H. Handbook of Communicable Diseases. St. Louis C. V. Mosby Company 1941. pp. 323 326. Sauer.<sup>1</sup> Zinsser Enders and Fothergill.<sup>3</sup> Knoepfelmacher.<sup>6</sup>

4 von Reuss A. Diseases of the Newborn. New York William Wood & Company 1921. p. 486. Sauer.<sup>1</sup> Holt and McIntosh.<sup>5</sup> Zinsser Enders and Fothergill.<sup>3</sup> Knoepfelmacher.<sup>6</sup> Top.<sup>2</sup>

5 Zinsser Hans Enders J. F. and Fothergill L. D. Immunity Principles and Application in Medicine and Public Health. New York The Macmillan Company 1939.

6 Knoepfelmacher Wilhelm Pfandl M. and Schlossmann A. Whooping Cough in Diseases of Infants and Children translated by M. G. Peterman ed. 4 Philadelphia J. B. Lippincott Company 1935 vol. 3, pp. 327 329.

and his colleagues<sup>18</sup> however, have presented evidence that allergenic antigens can traverse the normal placental membrane and actively induce antibody production. It may be possible then for the antigen in the mother's blood to be transmitted to the fetal blood in which event active immunity will result as well as passive immunity.

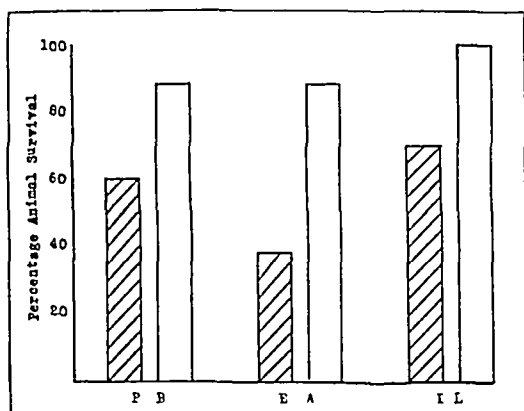


Chart 1—Showing close correlation of protective titers. The baby's titer is higher in each instance. The shaded column indicates the mother's protective antibodies and the unshaded column the baby's protective antibodies.

As shown earlier, whooping cough in infants is accompanied by a high mortality.<sup>19</sup> It is for this reason—this apparent lack of immunity of any nature against whooping cough—that efforts have previously been made actively to immunize young infants, but the results have been disappointing, for immunity did not result from inoculations with the Sauer vaccine in young infants in the dosage of 80 billion, beginning at 1 month to 2 months of age.<sup>20</sup> The young infant apparently has not the capacity to form antibodies against the whooping cough bacillus antigens. In fact, the most modern opinion is that the very young infant is a poor antibody producer against all antigens.<sup>21</sup> Young infants inoculated with the Sauer vaccine, unlike older infants similarly inoculated, contracted whooping cough on exposure as frequently as those uninoculated. Since active immunity has not been successful in these young infants at this most dangerous age period for whooping cough, the idea came to one of us (P.C.) to create active immunity in the pregnant mother in the last trimester of pregnancy, hoping that the antibodies so formed would pass the placental barrier and induce passive immunity in the baby.

Our idea was to inoculate the pregnant mother with a potent pertussis bacillus vaccine in the fifth or sixth month of pregnancy. The vaccine we chose is one prepared by Mishulow of the New York Laboratories, which has proved potency and which we have used in previous work with satisfactory results.<sup>22</sup> Our plan was to administer the vaccine at intervals of two weeks

for six injections, totaling 150 billion organisms. This timing was chosen because it was shown by Mishulow and Wilkes and their associates<sup>23</sup> that the highest titer of protective antibodies was found in the blood of vaccinated children approximately two months after vaccination. In order to minimize reactions, the first dose was 10 billion, the second 20 billion and the other four doses 30 billion, given subcutaneously in one or both arms. In many instances the full dose of 150 billion organisms was not administered either because of the tardy initial presentation of the pregnant mother or because absence from the clinic threw off the timing of our injections, which were aimed to terminate a month or two before the expected date of delivery. At times deliveries occurred earlier than the calculated date, upsetting our time table, but delivery beyond the expected date had little effect on the results.

The reactions of the inoculated mothers were less severe than those obtained when children are inoculated with the Sauer vaccine. Elevation of temperature was encountered only twice in our first hundred cases. Soreness and tenderness in the inoculated area was a feature in almost every case. A persisting lump, sometimes for days, was a common occurrence. There were times when the arms were so sore that the woman could not use them for two or three days. The local reactions were very similar to those generally encountered in children, but the systemic reactions were less frequent and far less noticeable. There were no abscesses and no persistent nodules. It was apparent to us that the inoculations had no effect on the pregnancy or delivery. There were no premature births or postpartum complications which could be attributed to the inoculations. The babies thrived and did as well in the hospital as did the babies of uninoculated mothers serving as a control series.

Before the injections were begun 10 cc of blood was taken for the titration of antibodies, which also served the purpose of a control measure. These data will be included in a separate article by Mishulow and her co-workers. At the time of delivery 10 to 15 cc of blood was taken from the mother and the umbilical

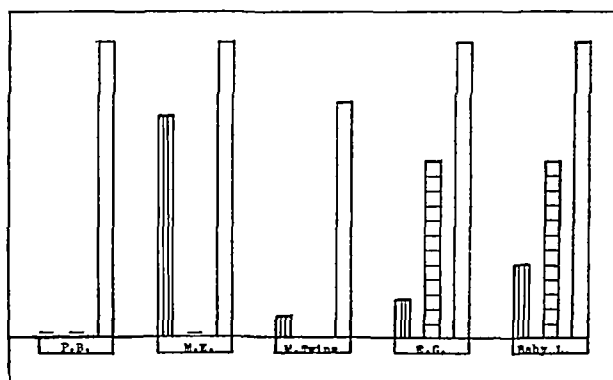


Chart 2—Illustrating lack of correlation of protective antibodies with agglutinins and complement fixation. Equivalent heights for agglutination 1/200 is indicated by vertical shading; complement fixation 0.01 cc. by horizontal shading and protective antibodies 100 per cent by unshaded column.

cord, which represents the baby's blood. These bloods were titrated for immune bodies. At intervals of six to nine months equal amounts were to be taken from mother and baby for a retitration of immune bodies to enable us to study the duration of any immunity.

18 Ratner B, Jackson H C and Gruel L H. Transmission of Protein Hypersensitiveness from Mother to Offspring. V. Active Sensitization in Utero. *J Immunol* 14: 303 (Nov.) 1927.

19 Sauer L W. Bulletin of the Department of Health of New York City. 1 Holt and McIntosh. 3 Zinsser E, Enders and Fothergill. 4 Knoepfelmacher. 5 Top.

20 Sauer L W. The Age Factor in the Active Immunization Against Whooping Cough. *Am J Path* 17: 719 (Sept.) 1941. Municipal Control of Whooping Cough. Department of Health Circular 155. State of Illinois. March 1, 1941.

21 Sabin A. Constitutional Barriers to the Involvement of the Nervous System by Certain Viruses with Special Reference to the Role of Nutrition. *J Pediatr* 19: 596 (Nov.) 1941. Mishulow Lucy. Personal communication to the author. Bennholdt.

22 Lapin J H, Cohen Philip and Weichsel Manfred. Prophylactic Vaccination Against Whooping Cough. *Arch Pediatr* 56: 590 (Sept.) 1939. Cohen Philip, Weichsel Manfred and Lapin J H. A Comparative Study of Therapeutic Agents in Whooping Cough. *J Pediatr* 16: 30 (Jan.) 1940.

23 Mishulow Lucy and others. Stimulation of Pertussis Protective Antibodies by Vaccination. *Am J Dis Child* 62: 1205 (Dec.) 1941.

actively or passively induced. A group of unimmunized mothers and their babies were similarly bled and their blood quantitated for the same immune bodies. These served as a control group.

The specific immune bodies studied in this investigation were agglutinins, complement fixing antibodies

TABLE 1—Study of Immunity of Mothers Before Vaccination Against Whooping Cough

Name	Date 1941	Age	History of Whooping Cough	Agglutination	Complement Fixation	Mouse Protection Survived	per Cent
H R	3/27	30		0	0	0/9	0
D B	4/1	27		20	0	3/6	50
P B	4/8	32	Negative	0	0	0/8	0
M E	4/16	23	Negative	0	0	2/10	20
I G	1/1	24	Negative	0	>0.02	1/8	12.5
E G	5/22	29	Negative	0	0	1/10	10
A M	5/14	33	Negative	0	0	0/10	0
I S	4/1	27	Negative	0	0	0/6	0
A T	3/27	20	Negative	0	0	10/10	100
P B	5/1	24	Positive	0	0	9/10	90
R W	5/14	26	Negative	75	0.02	4/10	40
S K	4/1	27	?	0	<0.01	0/10	0
R W	5/13	24		0	>0.02	2/9	22.2
F A	5/13	19	Positive	0	0	0/6	0
R M	5/27	19	Negative	50	0	0/9	0
C S	1/22	22	?	0	0	1/9	11
L O	1/26	25		0	0	1/9	11
M S	6/10	29	Negative	0	0	4/7	57
C B	6/20	22	Positive	50	0	5/9	55.5
V S	6/4	32	Negative	0	0	7/10	70
C K	5/21	31	?	0	0	6/9	66.6
H L	5/21	22	?	0	0	3/9	33.3
F A	5/21	23		0	0	0/8	0
F B	6/17	22	Negative	0	0	1/10	10
M V	5/20	33	?	0	0	4/9	44.4
S S	7/3	36	Negative	0	0	0/10	0
I L	5/29	30	?	0	0	0/9	0
D W	6/19	26		0	0	0/10	0
V S	5/28	30		0	0	1/9	11

determine the presence of another infection, in the event of such a finding the mouse was eliminated from the calculations. In all mice that were inoculated with the culture H pertussis was recovered from the heart's blood in the first four days of the test unless the plates were contaminated by other organisms that invaded the blood post mortem when the mice died during the night.

The agglutination results were recorded in terms of the highest dilution of the serum that showed distinctly visible clumps. Indistinct or no agglutination in 1:10 dilution of the serum was recorded as negative. Complement fixation was recorded in terms of the smallest amount of the serum that gave complement fixation under standard conditions. Incomplete or no fixation in 0.02 cc of the serum was recorded as negative.

Because agglutinins and complement fixing antibodies are not necessarily correlated with immunity,<sup>26</sup> special attention was given to the study of protective antibodies. Investigation of other tests which have been used to appraise immunity in whooping cough, such as cutaneous tests,<sup>27</sup> opsonophagocytosis studies,<sup>28</sup> the antitoxin content of the serum<sup>29</sup> and the protection of mice by the serum against a multiple lethal dose of live

TABLE 3—Pertussis Antibodies in Infants of Unvaccinated Mothers—Tested at Birth

Case	Name	Bled	Mother's History of Pertussis in Childhood	Agglutination	Complement Fixation	Result	
						Mouse Protection Survived	Protected per Cent
1	Baby F	2/28/42	Positive	0	0	2/6*	?
2	Baby L	2/27/42	Positive	0	0	3/10	50
3	Baby W	2/28/42	Positive	0	0	1/10	0
4	Baby C	3/1/42	Negative	0	0	3/10	30
5	Baby G	2/27/42	Doubtful	0	0	0/10	0
6	Baby Q	2/27/42	Negative	0	0	0/9	0

\* One mouse ill at the end of the test.

whooping cough bacilli inoculated into the respiratory tract,<sup>30</sup> led us to choose the mouse protection test as the most searching and convincing available.<sup>31</sup> This test is similar to the testing of antipneumococcus and antimeningococcus serums in mice which have been inoculated intraperitoneally with live pneumococci or meningococci.

Agglutination tests were recorded in a figure which indicated the dilution of the serum that yielded distinct clumps. The figure under the column of complement

- 26 Schwartzman Gregory. Personal communication to the authors.  
Mishulow Klein Liss and Leifer.  
27 Weichsel Manfred Rubin H J Cohen Philip and Lapin J H. Intracutaneous Tests with Pertussis Toxin and Complement Fixation Tests in Whooping Cough. Am J Dis Child 60:862 (Oct) 1940.  
28 Kendrick P Gibbs J and Sprick M. The Opsonocytaphagocytic Test in the Study of Pertussis. J Infect Dis 60:302 (May June) 1937.  
Bradford W L and Slavin B. The Opsonocytaphagocytic Reaction of the Blood in Pertussis. J Clin Investigation 16:825 (Sept) 1937.  
29 Flosdorf E W Bondi A and Dozois T F. Studies with Pertussis Antigens of the Toxin and Reaction to Other Cellular Components from the Several Phases. J Immunol 42:133 (Oct) 1941.  
Flosdorf E W McGuinness A C Kimball H C and Armstrong J G. Studies with H Pertussis Preparation and Assay of Hyperimmune Serum. J Pediatr 19:638 (Nov) 1941.  
Evans D G and Maitland H B. Failure of Whooping Cough Sera to Neutralize Pertussis Toxin. J Path & Bact 48:465 (March) 1939.  
30 Bradford W L. Experimental Infection in the Mouse by Intratracheal Inoculation with H Pertussis. Am J Path 14:377 (May) 1938.  
Burnet F M and Timmins C. Experimental Infection with H Pertussis in the Mouse by Intranasal Inoculation. Brit J Exper Path 18:83 (April) 1937.  
31 Silverthorne Nelles. Experimental Infection with H Pertussis and Protection Tests in Mice. Canad J Pub Health 29:233 (May) 1938.  
Miller J J Jr and Silverberg R J. Pertussis Vaccines. The Effect of Washing and the Use of Mouse Protection Tests. J Infect Dis 65:16 (July Aug) 1939.  
Mishulow Klein Liss and Leifer.  
Powell and Jameson.

and protective antibodies. The laboratory tests were carried out by Miss Mishulow and her assistants at the New York City department of health. Her method of testing for these antibodies was the same she used in her studies of the immunologic response in cases of pertussis and in vaccinated children.<sup>32</sup>

In the test for protective antibodies groups of mice were inoculated with 0.2 cc of the serum intramuscularly nineteen to twenty hours previous to the intraperitoneal injection of a multiple killing dose of virulent Hemophilus pertussis suspended in 1 cc of 4 per cent mucin. At each test similar groups of mice were inoculated with a known positive serum and with the test doses of the culture without serum; these served

TABLE 2—Study of Immunity of Unvaccinated Mothers and Infants at Time of Delivery

Vac- cine	Whoop- ing	Dose	Cough	Age	Tested	Agglutination	Complement Fixation	Mouse Protection Survived	Per Cent
0	Neg	22			Mother on delivery	0	0	1/8	12.5
					Baby at birth	0	0	2/9	22.2
	Neg	22			Mother on delivery	0	0	0/8	0
					Baby at birth	0	0	0/5	0
	Neg	19			Mother on delivery	0	0	0/10	0
					Baby at birth	0	0	0/10	0

as controls on the validity of the test. The serum was considered positive for protective antibodies when 30 per cent or more of the mice survived the seven to eight days. All mice that died during the period of observation were examined post mortem in order to

24 The laboratory immunologic studies were entirely performed for us by Miss Mishulow and her co-workers at the New York City Bureau of Laboratories by permission of Dr. Ralph Muckenfuss.

25 Mishulow Lucy Klein I F Liss Mildred M and Leifer Lillian. Protection of Mice Against H Pertussis by Serum Comparison of Protection with Agglutination. J Immunol 37:17 (July) 1939.  
Mishulow and others.

fixation indicates the amount of serum needed to produce a 4 plus complement fixation reaction. If 0.02 cc of serum or less was needed, the test was considered positive. In the mouse protection tests in almost every case 10 mice were used for each test, but owing to unforeseen and inevitable incidental fatalities this number was at times reduced. If the amount of serum was

control combinations. The unvaccinated mothers and their babies showed no agglutinins or complement fixing antibodies and little or no protective antibodies against whooping cough. As additional control cases, the cord blood of 6 babies of unimmunized mothers were examined for the same antibodies but their mothers' bloods were not similarly studied. Three of these

TABLE 4—Placental Transmission of Pertussis Antibodies to the Newborn

Lab No	Name	Age	Vaccine Dose Billion <sup>a</sup>	Tested			Result			
				Date	Specimen Taken on Day of Delivery	Period After Vaccination	Agglutination	Mouse Protection		
								Complement Fixation	Survived	Protected per Cent
C 1	H R	30	90	6/ 1/41	Mother	1½ wks	550	0 000	8/10	80
				6/ 1/41	Infant		75	0 01	10/10	100
C 2	D B	27	100	7/ 1/41	Mother	2 wks	600	0 000	8/ 9	88.8
				7/ 1/41	Infant		800	0 004	10/10	100
C 3	P B	31	150	8/10/41	Mother	7½ wks	0	0 02	6/10	60
				8/10/41	Infant		0	0	8/ 9	88.8
C 5	M E	2	100	8/ 1/41	Mother	5 wks	150	0	8/ 8	100
				8/ 1/41	Infant		1 000	0	6/ 6	100
C 6	F G	24	100	7/21/41	Mother	6½ wks	75	0 000	8/10	80
				7/21/41	Infant		75	0	8/ 9	88.8
C 9	E C	20	170	7/21/41	Mother	4 wks	25	0 02	9/ 9	100
				7/21/41	Infant		37	0 01	7/ 7	100
C 10	A M	20	90	7/ 3/41	Mother	1 wk	900	0 02	7/ 9	77.7
				7/ 3/41	Infant 1		0	0	8/10	80
				7/ 3/41	Infant 2		25	0	7/ 8	87.5
C 14	I S	21	150	7/30/41	Mother	6 wks	75	0	6/ 9	66.6
				7/ 9/41	Infant		100	0	5/ 8	62.5
C 15	A T	30	120	6/30/41	Mother	2½ wks	350	0 02	10/10	100
				6/30/41	Infant		150	0 000	9/10	90
C 18	P B	24	150	8/14/41	Mother	5 wks	700	0 007	8/ 9	88.8
				8/10/41	Infant		200	0 004	9/10	90
C 19	R W	26	120	8/ 6/41	Mother	1 wk	300	0 007	10/10	100
				8/ 6/41	Infant		8 000+	0 005	5/ 6	83.3
C 20	S K	37	120	8/ 7/41	Mother	4 wks	30	0 01	8/ 9	88.8
				8/ 7/41	Infant		0	0 01	9/10	90
C 21	R W	24	150	8/31/41	Mother	4½ wks	250	0 02	8/ 8	100
				8/31/41	Infant		150	0 01	8/10	80
C 23	E A	19	150	8/25/41	Mother	5 wks	450	0 01	3/ 8	37.5
				8/25/41	Infant		500	0 005	8/ 9	88.8
C 26	R M	19	120	9/ 2/41	Mother	5 wks	600	0 02	7/ 8	87.5
				9/ 2/41	Infant		700	0 008	10/10	100
C 30	G S	22	150	9/11/41	Mother	4 wks	900	0 007	7/ 9	77.7
				9/11/41	Infant		900	0 005	8/ 8	100
C 32	M S	29	150	9/14/41	Mother	3½ wks	600	0 006	10/10	100
				9/14/41	Infant		300	0 005	10/10	100
C 33	G B	22	100	9/24/41	Mother	3 wks	900	0 02	9/10	90
				9/24/41	Infant		600	0 007	7/ 7	100
C 34	V S	32	100	9/17/41	Mother	5 wks	800	0 006	6/ 7	85.5
				9/17/41	Infant		400	0 003	5/ 5	100
C 35	C K	31	140	9/17/41	Mother	7 wks	300	0 01	9/10	90
				9/17/41	Infant		100	0 01	N T †	
C 36	H L	22	150	9/17/41	Mother	6 wks	250	0 01	7/ 9	77.7
				9/17/41	Infant		0	0 01	N T	
C 37	F A	2	100	9/29/41	Mother	3½ wks	200	0	8/10	80
				9/29/41	Infant		25	0 02	8/10	80
C 38	E B	22	100	9/24/41	Mother	4 wks	200	0 02	8/ 8	100
				9/24/41	Infant		0	0 01	9/10	90
C 39	M V	33	170	9/22/41	Mother	10 wks	800	0 02	10/10	100
				9/22/41	Infant		800	0 000	10/10	100
C 40	S S	2	120	9/25/41	Mother	4 wks	25	0	8/ 8	100
				9/25/41	Infant		25	0	10/10	100
C 41	I L	32	100	10/ 7/41	Mother*	8½ wks	50	0 02	7/10	70
				8/23/41	Infant		50	0 02	6/ 6	100
C 42	D W	20	170	9/ 4/41	Mother	4 wks	25	0	6/10	60
				9/ 4/41	Infant		50	0	7/10	70
C 43	A S	30	100	10/ 9/41	Mother*	9 wks	100	0	4/10	40
				9/20/41	Infant		25	0 02	5/10	50
C 44	Mrs W	33			Mother		6 400	0 000	8/ 8	100
					Infant		9 000	0 01	10/10	100

\* This woman was tested after delivery

† N T = not tested insufficient serum

inadequate 5 or more mice were employed. The results of these tests are reported in a fractional form; thus 0/9 indicates that 9 animals were used and none survived. 8/10 indicates that 8 out of 10 animals survived. The numerator of the fraction signifies the number of animals that survived and the denominator signifies the number of animals that were used.

Our intention was to use 10 unimmunized women and their infants as control cases. Unfortunately a wave of incidental infection killed most of the animals used for this purpose so that we were left with only three

mothers gave a history of whooping cough in their childhood and the other 3 had a doubtful or negative history of previous pertussis. Of these 6 babies 1 had a fair amount of protective antibodies, 1 had a good titer of such antibodies and 1 had questionable protection. All these bloods revealed no agglutinins or complement fixing antibodies. Thus of 9 babies of unimmunized mothers, 2 or 3 showed some degree of protective antibodies (none with a really high titer) and none of their serums showed the presence of the other antibodies tested for.

We consider protection excellent when the great majority of the mice are protected by the serum. We consider protection good when close to half of the animals are saved by serum. Protection is fair when 30 per cent of the animals survive. Twenty-nine women have thus far been selected for the immunologic studies from a group of 167 women inoculated with the vaccine in doses from 80 to 150 billion. By these standards of immunity of 29 cases 27 showed a very high titer, all definitely positive results. Of 27 babies tested, including 1 set of twins, the titers were equally high. In the case of E. A. and P. B., the babies had a higher titer than the mother. The babies' figures seemed to indicate a slightly higher titer than the mothers'. This may or may not be significant.

The agglutination and complement fixation reactions did not exactly correspond with the titers of protective antibodies. Thus the serums of 8 subjects were poor in the former antibodies yet yielded high protection. The twin babies who had high protective antibodies, had little or none of the other antibodies tested. This is in keeping with previous work done on this subject.<sup>20</sup>

The tests were performed at intervals of from one to eight weeks after vaccination. We have some patients with an even longer interval after the last inoculation, but their serums have not yet been studied. The length of the interval seemed to make no difference in the height of immune bodies of the mother and the newborn baby. Whether it will affect the duration and the persistence of the antibodies is a matter for future study. The same probably holds true of the dosage. Although almost all of our patients were vaccinated with 120 to 150 billion organisms some were vaccinated with only 80 to 90 billion. One woman vaccinated with 80 billion and 2 with 90 billion yielded as high a protective titer as those inoculated with the larger doses. Whether these antibodies will persist as long as in those cases in which the smaller dosage was given is questionable. The ages of our group of women varied from 19 to 36 years of age. The age factor and multiparity seemed not to play a role in the production of immune bodies. The previous history of whooping cough seemed not to play a role in the production of antibodies. Only 3 of the 29 women were sure that they had whooping cough, about a third were doubtful. There was no correlation between their initial titer of antibodies and the antibodies formed by vaccination. There was no difference in the data of this group and of the group who were certain that they had never had whooping cough.

#### RESULTS AND COMMENT

As far back as 1879 attempts have been made to immunize a newborn baby by inoculation of the pregnant mother against a specific disease.<sup>22</sup> In the case of syphilis, the inoculation of the pregnant mother to prevent or cure congenital syphilis is a universal measure.<sup>23</sup> Lichty, Slavin and Bradford<sup>24</sup> attempted, as they put it, to increase resistance against pertussis in newborn infants by immunizing the mother during pregnancy. They confessed their failure. An analysis of the data revealed the following facts. The injections were given at two week intervals in the last six weeks of pregnancy. The total dose administered was

20 to 25 billion. Thus the dose was inadequate and too late for antibody formation which reaches its climax between one and two months after the last inoculation. The test for immunity which they employed, cytophagocytosis of the blood, has distinct limitations and has been abandoned by them in favor of mouse tests.<sup>25</sup> Their figures showed no increase in cytophagocytosis of the inoculated mother's blood. Granting the validity of the test, they found no increased immunity in the mother, so that there were no antibodies transferable to the baby through the placenta. In rabbits it has been proved as in babies, that the very young rabbit could not be immunized against pertussis,<sup>26</sup> but by the inoculation of pregnant rabbits antibodies were formed which were transmitted to the newborn rabbit.<sup>27</sup> This would seem to be the animal counterpart and confirmation of our work.

In a recent article it was found with the opsonocytophagic test,<sup>28</sup> that there was a correlation in the opsonizing power of mothers and their infants. This has previously been suggested by Bradford and Slavin,<sup>25</sup> yet Kendrick, Gibbs and Sprick,<sup>28</sup> with the same test, reported that the blood of newborn infants has virtually no phagocytic powers and is not correlated with the mother's reactions. Rambar and his co-workers<sup>29</sup> found that in a large series of premature infants there is a strong reaction up to 2 months of age and then a decline, suggesting a placental transfer of circulating antibodies against whooping cough. Our work is more in agreement with the latter findings. We have found that when a mother has a definite titer of antibodies against whooping cough she transmits it to the baby in about the same titer. This was true of 100 per cent of our series after the mothers had been inoculated with a sizeable dose of vaccine during the last trimester of pregnancy.

Mishulow and her co-workers<sup>30</sup> found that 15.2 per cent of children and adults who had a negative history of pertussis had pertussis protective antibodies. They also found in a study of the preimmunization bleedings of women who were studied in this investigation that 31.2 per cent of them had these antibodies before they were vaccinated.<sup>40</sup> If we can assume, as would seem likely from our investigations, that these antibodies are transmitted from the pregnant adult to the baby, a definite proportion of babies may be born with some immunity against whooping cough. In the few cases that we have studied we have found on two or three occasions protective antibodies in the cord blood, but more investigations are needed to establish percentage incidence. In the meantime, it may be conservative to assume that a small percentage of babies, perhaps 15 per cent to 25 per cent, are born with passive immunity of uncertain duration but that the great majority have no protection against whooping cough. This fits in well with known clinical facts. Sauer's<sup>1</sup> and Top's<sup>3</sup> studies point to no great difference in susceptibility between the younger and the older infants if vaccination has not been performed. This is an important point, for the high mortality in the susceptible infants, which is a

32 Burchhardt A. E. Zur intrauterinen Vaccination. *Deutsches Arch f. Klin. Med.* 24: 506, 1879.

33 Snyder F. F. and Speert H. The Placental Transmission of Neoglycophenamine in Relation to the Stage of Pregnancy, with Special Reference to the Prenatal Treatment of Syphilis. *Am. J. Obst. & Gynec.* 36: 579 (Oct.) 1938.

34 Lichty J. A., Slavin B. and Bradford W. L. An Attempt to Increase Resistance to Pertussis in Newborn Infants by Immunizing Their Mothers During Pregnancy. *J. Clin. Investigation* 17: 613 (Sept.) 1938.

35 Bradford W. L., Scherp H. W. and Brooks A. M. Effect of Refined Antipertussis Rabbit Serum on the Humoral Antibody Titer in Pertussis. *Am. J. Dis. Child* 62: 492 (Sept.) 1941.

36 Mishulow L. B. *Bennholdt* 27.

37 Bennholdt Thomsen C. Das Verhalten eines gegen das Bordet Gengou Bacillus spezifischen Amboceptors bei Mutter und Kind. *Ztschr. f. Kinderh.* 57: 532, 1934.

38 Rambar A. C., Howell Katherine, Denenholz E. J., Goldman Morris and Standard Roberta. Studies in Immunity to Pertussis. An Evaluation of Pertussis Vaccination by Clinical Means and by the Opsonocytophagic Test. *J. A. M. A.* 117: 79 (July 12) 1941.

39 Mishulow Lucy and others. *Am. J. Dis. Child* to be published.

40 Mishulow Lucy and others. to be published.

common pediatric experience, was the fact which led us to attempt our prophylactic measure. The need for the protection of the infant against this dread disease is therefore nearly as great as was anticipated.

Recently a similar investigation was performed with diphtheria immunization.<sup>41</sup> Diphtheria lends itself readily to such studies because techniques are available for the titration of antitoxin in the blood and there is a good cutaneous test as an index of immunity, namely the Schick test. With such methods past studies of diphtheria have shown a high correlation between the antitoxin content of the bloods of the mothers and their babies.<sup>42</sup> Such studies have revealed also that in large cities close to 90 per cent of mothers are immune to diphtheria as are their babies.<sup>43</sup> Yet in the recent Chicago study of this subject more than 50 per cent of mothers at term were found to be Schick positive and to have an antitoxin content of blood inadequate to constitute an effective immunity against diphtheria. Because of this, the pregnant mothers were inoculated with diphtheria toxoid in the latter part of pregnancy. There resulted a close correlation between the increased antitoxin titer of the mother's blood, the cord blood and the infant's blood. If this work is verified by further studies, previous estimates of diphtheria immunity in the newborn will have to be revised and measures taken to protect the newborn baby against diphtheria. In a discussion of this paper, mention was made of the great need for a similar project to confer protection on the newborn baby against dangerous whooping cough. Since our work was already in progress, this was an interesting statement to us.

Does the presence of a high titer of protective antibodies in serum signify definite immunity in the human being against whooping cough? While this question cannot be categorically answered in the affirmative, there is much evidence to make this a logical assumption. The convalescent from whooping cough, in most instances, has a serum rich in protective antibodies.<sup>44</sup> After proper immunization with vaccines the serum becomes rich in protective antibodies.<sup>45</sup> It has been demonstrated that this hyperimmune serum as well as convalescent serum is of great value in preventing whooping cough in unimmunized contacts<sup>46</sup> and is even of great aid if employed in suitable doses in the treatment of whooping cough itself.<sup>47</sup> Small amounts of such serums are remarkably effective in protecting animals against what is otherwise an overwhelmingly fatal infection from live pertussis bacilli injected intraperitoneally.<sup>48</sup> There is ample evidence in the literature

now that individuals inoculated with suitable doses of a proper vaccine have a high degree of immunity against whooping cough.<sup>49</sup> Correlated with this immunity is the presence of protective antibodies in the blood of the vaccinated individuals.<sup>50</sup> These facts all point to the conclusion that protective antibodies, if not the sole mechanism of immunity against whooping cough, are a reliable index of immunity. The question can be answered finally only by a follow-up study of the fate of infants and children, vaccinated and unvaccinated, with and without protective antibodies when actually exposed to intimate contact with whooping cough. We are doing this now, but this is an investigation which will take years and large numbers of cases before an unequivocal answer can be obtained.

What is the nature of this immunity and how long will it last? Judging by the close correlation of the titers between mothers and babies, this transplacental immunity is most likely of a passive nature. On the other hand, the higher titer in a few babies may indicate a passage of antigen conferring added active immunity on the baby. It must be recalled that there have been several instances in the literature of antigens passing the placental barrier.<sup>51</sup> This is not merely an academic question, for passive immunity will be of short duration—from a few weeks to a few months—while active immunity will last for a much longer time. In addition, boosting doses, which has proved to be a successful technique,<sup>52</sup> is more apt to be of value if the immunity has an active factor. Thus, if one finds that at 6 months of age the baby is rapidly losing his immunity, a further injection of 30 billion bacilli can be given and the dose repeated every six months or yearly. This work we have already begun.

#### CONCLUSIONS

1 Since whooping cough is such a serious disease in young infants, an attempt was made to immunize newborn babies by vaccinating the pregnant mother with a whooping cough vaccine in the last trimester of pregnancy.

2 In this we have been successful, judging by the presence of immune bodies.

3 The total dose we advise is 150 billion, given at intervals of two weeks beginning at the sixth month of pregnancy. The last injection is to be given six weeks to two months before term.

4 The systemic reactions after vaccination were few and not severe. The local reactions were common, at times very painful, not serious and sometimes lasted as long as a few days.

5 There were no discernible effects on the course of pregnancy, on delivery or on the baby. There were no miscarriages or premature births that could be attributed to the procedure.

6 In 29 instances immunologic studies were performed on the serums of babies and mothers after

41 Liebling J, Youmans G P and Schmitz H F. Occurrence of Diphtheria Antitoxin in Human Pregnant Mother, Newborn Infant and Placenta. *Am J Obst & Gynec* 41: 641 (April) 1941.

42 McKhann and Chu<sup>2</sup>, von Groer and Kassowitz<sup>2</sup>, Karelitz and Greenwald<sup>2</sup>, Bourquin<sup>2</sup>, Needham<sup>9</sup>.

43 Schick Bela. Personal communication to the authors. von Groer and Kassowitz<sup>2</sup>.

44 Powell, H M and Jameson W A. Further Studies on the Immunology of H Pertussis. *J Immunol* 32: 153 (Feb) 1937. Mishulow Klein Liss and Leifer<sup>2</sup>.

45 Lapin J H. Immunity to Whooping Cough as Judged by Skin Test in Rabbits. *J Pediat* 20: 161 (Feb) 1942. footnote 50. Mishulow and others (footnotes 23 and 40). Bradford Scherp and Brooks<sup>25</sup>. Silverthorne (footnotes 31 and 48).

46 Cohen Philip and Lapin J H. Prophylaxis Against Whooping Cough in Exposed Children with Special Reference to Serum. *J Pediat* 15: 78 (July) 1939. Kendrick P. A Note on the Use of Reinforced Convalescent or Hyperimmune Serum for Passive Immunization of Infants Exposed to Pertussis. *J Pediat* 9: 118 (July) 1936. McGuiness A C, Bradford W L and Armstrong J G. The Production and Use of Hyperimmune Human Whooping Cough Serum. *J Pediat* 16: 21 (Jan) 1940. Roundtable Discussion on Whooping Cough. *J Pediat* 20: 244 (Feb) 1942.

47 Cohen Weichsel and Lapin<sup>22</sup>, McGuiness Bradford and Armstrong<sup>10</sup>. Roundtable Discussion on Whooping Cough<sup>46</sup>.

48 Silverthorne Nelles. Whooping Cough I Vaccine and Serum Protection Experiments. *J Pediat* 20: 1 (Jan) 1942. footnote 31. Mishulow Klein Liss and Leifer<sup>2</sup>, Powell and Jameson<sup>44</sup>, Miller and Silverberg<sup>21</sup>, Bradford Scherp and Brooks<sup>25</sup>.

49 Singer Brooks Charlotte. Pertussis Prophylaxis. Controlled Study. *J A M A* 114: 1734 (May 4) 1940. Sauer L W. Whooping Cough. New Phases of Work on Immunization and Prophylaxis. *ibid* 112: 305 (Jan 28) 1939. Silverthorne Nelles and Fraser, D T. Whooping Cough. *Canad M A J* 38: 556 (June) 1938. Kendrick P and Eldering G. A Study in Active Immunization Against Pertussis. *Am J Hyg Sect B* 29: 133 (May) 1939. Roundtable Discussion on Whooping Cough<sup>46</sup>.

50 Lapin J H. Combined Immunization of Infant Against Diphtheria Tetanus and Whooping Cough. *Am J Dis Child* 66: 22 (Jan) 1942. Mishulow Klein Liss and Leifer<sup>2</sup>, Silverthorne (footnotes 31 and 48), Powell and Jameson<sup>44</sup>, Bradford Scherp and Brooks<sup>25</sup>, Mishulow and others<sup>40</sup>, McGuiness Bradford and Armstrong<sup>46</sup>.

51 Denenholz E J and Rambar A C. Rheumatic Fever in the Newborn Infant. *Am J Dis Child* 61: 1044 (May) 1941. Shuman<sup>1</sup>, Ratner Jackson and Gruhl<sup>13</sup>.

52 Wu J and Chu F T. Effect of Stimulating Dose of Pertussis Vaccination in Children Previously Immunized. *Proc Soc Exper Biol & Med* 38: 693 (June) 1938. Lapin J H. The Stimulating Dose in Whooping Cough. *J Pediat* 20: 18 (Jan) 1942.



vaccination, with particular emphasis on mouse protection tests

7 In every case the protective titer was raised to a very high level, which was almost quantitatively transmitted to the baby

8 We have reason to believe from this evidence that these babies were born with immunity against whooping cough

9 Further studies are being made as to the duration and persistence of these antibodies in both babies and mothers

10 A small control series of 9 babies of uninoculated mothers were studied immunologically. None revealed agglutinins or complement fixing antibodies, but 2 or perhaps 3 yielded a fair titer of protective antibodies

11 There is, then, some evidence that a definite percentage, perhaps between 15 and 25, of babies may be born with some immunity against whooping cough

12 A biologic follow-up is being carried out to correlate the exposure to and the incidence of whooping cough in the inoculated group as compared with an equally large uninoculated group

1175 Park Avenue—993 Park Avenue

#### ABSTRACT OF DISCUSSION

DR. SAMUEL J. SCADRON, New York. Our idea was to inoculate the pregnant mother with a potent pertussis bacillus vaccine in the fifth or sixth month of pregnancy. I want to say a word with regard to the effect of this vaccine on the pregnant mother. We have studied only 29 cases immunologically but we have inoculated 167 mothers. In other words, we immunized 167 mothers. There were 90 multiparas and 77 primiparas. The average dose injected was 120 to 150 billion. Previous history of whooping cough in our patients was unknown to 15. A hundred had whooping cough in early childhood. There were 37 positive histories and 15 were doubtful. The types of delivery were not affected by the pertussis vaccine. We had 2 cases of toxemia, which I did not attribute to the injection of the vaccine. I myself watched these cases ante partum and during the postpartum period and found that the vaccine was absolutely innocuous. But the mothers were protected against whooping cough, and this most likely had a beneficial effect on the babies.

DR. WILLIAM L. BRADFORD, Rochester, N. Y. Several years ago I was interested in the placental transmission of antibodies in pertussis as tested by the opsonocytaphagic reaction of the blood. It was observed that in certain newborn infants a high titer existed. When this was true the mother almost always possessed a high titer likewise. Dr. Lichty and Mrs. Slavin were generally able to increase the titer of the baby by injecting the pregnant mother with vaccine during the last trimester of pregnancy. This work was not extended because it did not seem at the time, to be of practicable application. By using the mouse protective method, Drs. Cohen and Scadron apparently have obtained equally good or better results, suggesting that the opsonocytaphagic reaction and the mouse protective antibody may give comparable results as methods of testing humoral immunity to pertussis.

DR. PHILIP COHEN, New York. Owing to limitation of time, I could not go into the presumptive proofs that the protective antibodies in the serums which were induced by inoculation of the pregnant mother conferred immunity. I did mention some of the evidence which Dr. Bradford just presented and some additional evidence in the literature wherein protective antibodies, if not the chief factor in immunity, is a reliable index of immunity in the newborn baby and in any one who has those protective antibodies. I might add that 29 cases are not a small group to be studied because the number of mice we used in these tests amounted to at least 2,000. At least 30 mice are required for each case, so that the technic is prodigious. Dr. Muckenfuss and Miss Mishulow did this work, without which nothing could have been accomplished.

## REPAIR OF TRAUMATIC GAPS IN NERVES

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BALTIMORE

The requirements for functional regeneration of divided nerves are complex and exacting. This is at once evident when it is realized that under the most favorable conditions of repair, by means of primary suture of accurately approximated stumps, the original function of the nerve is never completely restored. The many problems and clinical difficulties involved in connection with nerve injuries have been the subject of numerous investigations and publications, almost two thousand being cited by Pollock and Davis.<sup>1</sup> Quite recently the experimental data and theoretical considerations on the long investigated problems of nerve regeneration have been reviewed critically and extensively by Young.<sup>2</sup> Since an understanding of the complex series of processes which accompany unaided regeneration of severed nerves is basic for any consideration of methods of closure of gaps too wide to be bridged by the unassisted normal process, a brief summary of some of the essential details, as now understood, may be helpful at this point.

1 Physical union between the separated stumps is accomplished, when the gap is not too great, by proliferating Schwann cells, most of which grow out from the distal stump, and by fibroblastic tissue. The parallel orientation of the elongated Schwann cells and fibroblasts in the union scar is of importance in controlling the direction of growth of fibers regenerating from the central stump, since these fibers may otherwise be lost in futile outgrowth into the collagenous tissue surrounding the nerve. If for any reason the fibroblastic tissue predominates in the union scar or interrupts the continuity of the bands of Schwann cells, such a connective tissue scar as it hardens may form a serious barrier to the regenerating nerve fibers.

2 Although the peripheral stump is capable of receiving new fibers for at least as long as seventeen months after injury, and the central stump retains the power to send out new fibers for much longer periods, the formation of a favorable union scar is prejudiced by delay in approximation of the stumps because of reduced outgrowth of Schwann cells from the cut surfaces, so that fibrous tissue predominates in the union scar.<sup>3</sup> This is one strong indication for primary or early repair as well as the probability that too long a delay in reinnervation of the end organs, especially in muscles, may permit irreversible regressive changes to occur in these end organs.<sup>4</sup>

3 The union scar must supply a full caliber bed of proliferating Schwann cells through which a majority of the regenerating fibers of the central stump, and their branches, may pass to the distal stump. This newly formed bed must allow as much cross sectional space as occurs in the distal stump to permit increase in caliber of the newly formed fibers and their myelination. The "maturation" of the regenerating fibers

Supported by a grant from the National Foundation for Infantile Paralysis.

From the Poliomylitis Laboratory, Department of Epidemiology, Johns Hopkins University.

<sup>1</sup> Pollock, L. J. and Davis, Loyal. *Peripheral Nerve Injuries*. New York: Paul B. Hoeber, 1933.

<sup>2</sup> Young, J. Z. *Functional Repair of Nervous Tissue*. *Physiol. Rev.* 22: 318-374 (Oct.) 1942.

<sup>3</sup> Holmes, W. and Young, J. Z. *Nerve Regeneration After Immediate and Delayed Suture*. *J. Anat.* 77: 63-96, 1942.

<sup>4</sup> Tower, S. S. *The Reaction of Muscle to Denervation*. *Physiol. Rev.* 19: 148 (Jan.) 1939.

appears to be as important for return of functions as the successful attainment of proper end organs by these fibers.<sup>5</sup> It is likely that proper vascularization of the tissue bridging the gap between the stumps is also of importance.

The repair of traumatic gaps which cannot be closed in spite of mobilization of the nerve, rerouting, or articular movement is now attempted by means of stretching operations in two or three stages, nerve crossing, or nerve transplantation. Without discussing the advantages or disadvantages of these methods, it is proposed to describe a new method designed to make possible a simple primary or secondary repair of large nerves by means of a single stage operation.

#### METHOD

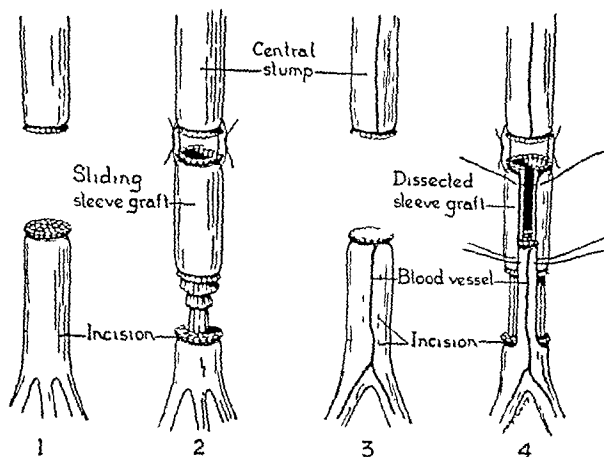
The stumps of the injured nerve are freed from scar tissue, and the ends prepared as for end to end suture. After mobilization of the stumps as much as possible, a cylindric segment of the distal stump, embodying the nerve sheath and the underlying outer bundles of nerve fibers, and somewhat longer than the gap to be bridged, is prepared and moved proximally into apposition with the central stump. The sleeve-like extension from the peripheral stump can be prepared in two ways, the choice being determined by circumstance. It can sometimes be freed distally by a circular incision in the peripheral stump which severs only the outer nerve sheath and peripheral bundles and then pulled proximally along the central core of the distal stump (figs 1 and 2). However, when the inner sheaths of the nerve offer too much resistance to such a "sliding sleeve extension," the sleeve-like extension can be dissected free from the inner core of nerve bundles, following the line of incision shown in figure 3, and moved proximally into apposition with the central stump as shown in figure 4. With this procedure it is possible to avoid severing the main blood vessel in the sheath of the peripheral stump.

With the sliding sleeve extension, sutures need be placed only at the line of apposition with the central stump, in the manner of end to end suture, the calibers of the sleeve extension and of the central stump being comparable. The absence of a distal suture line, such as occurs with ordinary grafts of nerves, is an advantage of obvious importance.

Sutures in the case of the dissected sleeve extension are placed as shown in figure 4. Fixation to the core of the distal stump can be obtained by suturing sheaths only, if the dissected sleeve has been made sufficiently long. In this case, as with the sliding sleeve extension, the central end of the core of the distal stump is protected from invading collagenous tissue by the enveloping sleeve of nerve tissue.

The advantages of the sleeve extension methods, which have been used successfully in experiments in rhesus monkeys, are: 1 Uncomfortable postures of limbs, as in nerve stretching operations, are avoided. Also avoided is the risk of overstretching the nerve with possible intraneural vascular interference or retrograde injury to fibers.<sup>6</sup> 2 No other nerve is deprived of function as in the case of nerve crossing or nerve autotransplant operations. 3 The repair procedure is confined to the site of the nerve injury. 4 Except for the junction with the normal central stump, which is

soon crossed by regenerating fibers, there is no place where invading fibrous tissue can form a transverse barrier to outgrowing nerve fibers. In the case of transplant operations, for example, the distal union scar may require later resection to permit fibers which have regenerated to this point to pass into the distal stump.<sup>7</sup> 5 In autocable transplant operations involving the preparation of segments of a normal cutaneous nerve in the form of a bundle which is sutured to the proximal and distal stumps of the injured nerve of the same patient, the outer fibrous sheath of each segment of transplanted nerve becomes incorporated in the substance of the repaired nerve, and this fibrous tissue may scarify to the extent of becoming rigid and preventing adequate enlargement and maturation of newly formed fibers within. In the case of the sleeve extension operations, excessive fibrous tissue is not incorporated into the interior of the repaired segment of nerve. 6 If repair by means of sleeve extension is done without too great delay after injury, the proliferative activity of the Schwann cells in the distal stump is utilized not only to accomplish union with the central stump but also to create a new and favorable



1 Large peripheral nerve with traumatic gap irreducible by tension rerouting or postural shortening. 2 Same with gap closed by means of sliding sleeve extension from distal stump. 3 Nerve with gap, showing line of incision for preparation of dissected sleeve extension. 4 Gap shown in 3 closed by means of dissected sleeve extension. Both types of operation are completed by contact approximation of sleeve graft with central stump and the placing of additional sutures through the sheaths at the plane of junction as in end to end suture.

bed for regenerating fibers within the cavity of the cylindric sleeve extension. The filling of this cavity with longitudinal columns of Schwann cells, along which regenerating fibers grow readily, compensates, as will be shown, for the initial deficiency of nerve substance within the sleeve extension. Moreover, the cavity of the sleeve extension is protected from invasion by fibrous tissue. Similarly, columns of Schwann cells migrate around the exposed core of the distal stump from the cut surfaces of nerve fascicles and increase the effective caliber of the nerve in this region.

When a delay of several months has occurred preceding operation for repair, a sleeve extension can be prepared in similar fashion from the proximal stump, after resection of the neuroma, since the distal stump at this time may be of stiffer consistency and its Schwann cells may have reduced proliferative potencies.

The defects or difficulties of the sleeve extension operations, theoretical or real, are as follows: 1 The caliber of the distal stump is reduced by the preparation

5 Gutmann E, Gutmann L, Medawar P B and Young J Z. The Rate of Regeneration of Nerve. *J Exper Biol* 19 1444 (May) 1942.

6 Stookey Byron. Surgical and Mechanical Treatment of Peripheral Nerves, Philadelphia W B Saunders Company, 1922.

7 Davis Loyal and Cleveland D A. Experimental Studies in Nerve Transplants. *Ann Surg* 99 271 283 (Feb) 1934.

of the sleeve extension. As just pointed out, this is partly compensated for by Schwann cell proliferation, so as to allow for an adequate bed for most of the regenerating fibers. 2 The preparation of the sleeve extension may be complicated by branching of the distal stump in the course of the sleeve segment. If the branches are small they may be severed close to the main trunk and sutured to the nearest point of the exposed core of the distal stump after the gap in the parent trunk has been closed. If the branches are large it may be advisable to prepare the sleeve extension from the central stump. It is also possible to close the gap by using sleeve extensions from both the proximal and distal stumps. 3 The organization of the empty fiber sheaths of the distal stump is disrupted by the sleeve extension operations. It is obvious that this is no more serious than in transplant operations and is less serious than in nerve crossing. Whether functional recovery is seriously prejudiced thereby is unlikely, and in any case this point can be settled only by the results of practical experience.

#### EXPERIMENTS

Experiments with the method described on the large nerves of the extremities of rhesus monkeys are in progress and will be described in detail when completed. The primary criterion of adequate repair is considered to be the return of movements which cannot be replaced by the action of uninvolved synergistic muscles. At the time of writing several animals have shown good, and still continuing, recovery of lost digital movements three to four months after resection of 2 cm of tibial or peroneal nerves, in the midfemoral region, followed by sleeve extension repair. Seven tibial nerves and two peroneal nerves are included in this series. Similarly, earliest recovery of finger movements following median or radial nerve resection and repair in the midhumeral region, has occurred after five to six months in single cases. In the case of the radial and peroneal nerves the control nerves on the opposite side, in which a resected 2 cm segment was sutured to the proximal and distal stumps in the original position, have shown recovery at about the same time. Observations are being continued.

Microscopic study of the tibial nerve of a control animal killed two months after sleeve extension repair of a 3 cm defect with the sleeve prepared from the proximal stump has revealed that a great number of newly regenerated fibers had already traversed the zone of repair and had entered the distal stump, into which some fibers had penetrated for a distance of 17 mm, or a total distance of regeneration of about 47 mm. The sleeve extension was filled with loose schwannian tissue, well vascularized and conducting regenerating fibers. The exposed core of the central stump, from which the sleeve extension had been prepared, had increased in caliber, partly by condensation of connective tissue surrounding it. This connective tissue contained many parallel bundles of apparently vigorously regenerating fibers, which had already entered the neural tissue of the sleeve extension. The histologic picture of the region of repair, which grossly at autopsy appeared as a smooth, fusiform swelling of the tibial nerve not densely adherent to surrounding tissues, indicated that the region of repair had gained substance, effective as a bed for regenerating fibers, from both proliferated Schwann cells and from endoneurial and perineurial tissue. All these tissues can

apparently adapt effectively in the maintenance of regenerating axons and in the eventual formation of a new nerve.

#### SUMMARY

A method described for the closure of irreducible traumatic gaps in nerves in a single operation, utilizing only the tissue of the injured nerve, may be of value in the repair, preferably early, of certain cases of injury to large nerves. The principle may also have application when used in combination with other methods of closing gaps, such as mobilization, rerouting or postural shortening and subsequent stretching. Early results of experiments in rhesus monkeys indicate that initial functional recovery with this method occurs at about the same time as recovery in nerves repaired with full thickness autografts. The degree of functional recovery finally attainable with this method remains to be determined.

1901 East Madison Street

### SUBDURAL HEMATOMA AND EFFUSION AS A RESULT OF BLAST INJURIES

#### FIRST PRELIMINARY REPORT

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Our purpose in this report is to bring forth a compilation of war injuries which differs from trauma sustained in civilian life. This condition could be overlooked and the individual patient relegated to chronic invalidism or discharge from service with a diagnosis of a functional disorder, such as psychoneurosis or war neurosis.

Subdural hematoma is not an uncommon complication of craniocerebral trauma usually the result of a direct blow to the skull, varying in degree of intensity. It has been shown that the hematoma occurs following the rupture of small veins, either between the layers of the dura or between the inner surface of the dura and the arachnoid.

Because of the poor absorptive action due to a scanty blood supply to these membranes, the hematomas seldom disappear spontaneously. The blood contained in the subdural effusion or hematomatous mass undergoes chemical disintegration, giving rise to an entrapped liquid of higher protein content than is found elsewhere in the head. In an effort to correct this condition cerebrospinal fluid is drawn from the subarachnoid space by osmosis, and the size of this fluid mass, gradually enlarged, produces a progression of symptoms. A liquid type of lesion has been referred to as subdural hydroma because, at operation, very little old blood is encountered, instead there is an escape of large amounts of xanthochromic fluid. The protein content of this fluid is higher than cerebrospinal fluid, which is indicative of stasis.

From the Neuropsychiatric and Neurosurgical Services U S Naval Hospital Oakland Calif

This article has been released for publication by the Division of Publications of the Bureau of Medicine and Surgery of the U S Navy. The opinions and views set forth in this article are those of the writers and are not to be considered as reflecting the policies of the Navy Department.

We have observed a number of blast injuries sustained in action. They are the result of injury by a nearby exploding bomb on ship or land or may be the result of a concussion wave subsequent to a sinking ship or a depth bomb while the patient is in the water.

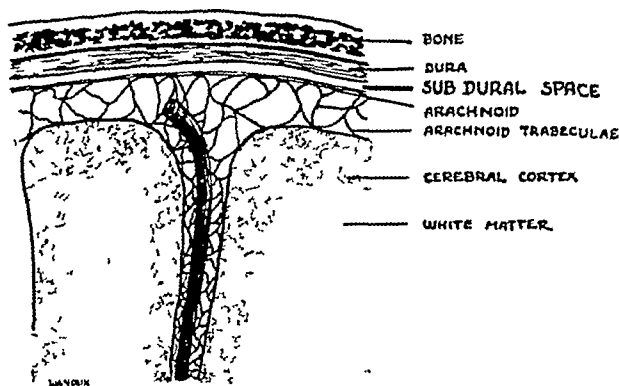
Examination of the fatal cases at autopsy reveals multiple hemorrhages throughout the body, varying from petechiae to frank bleeding.

It is our opinion that in some instances in which there is no direct blow a severe concussion from a bomb explosion at variable distance away will lead to either a small subdural hemorrhage or a sudden rent in the arachnoid, permitting a temporary escape of the cerebrospinal fluid into the subdural space. It is felt that the arachnoid eventually effects a closure in the tear. The mass increases in size because of osmosis due to the increased protein content of the entrapped fluid, which may be mixed with small amounts of blood.

The patients present a history of exposure to severe concussion, loss of consciousness for a period varying from a few minutes to several days, persistent headaches, memory loss and irritability. It is seldom that many positive neurologic signs are present, and what few are evident are not pronounced. The most common findings are a slight facial palsy, a transient hemiparesis and occasionally a transient change in reflexes.

The most pronounced symptoms are persistent headaches, usually generalized (increased on exertion and often nocturnal), a history of coma, syncope or convulsions which did not exist prior to the blast and a definite departure from a stable personality. Further studies from the psychiatric point of view are presented in the second preliminary report.<sup>1</sup>

The number of cases reported is small, but they are presented in the hope that there will be a more widespread recognition of this entity. There have been cases of bilateral effusion of small amounts of old blood and several ounces of xanthochromic fluid that we have chosen to call a subdural effusion in contrast to a true subdural hematoma, which is characterized by an



accumulation of a large amount of blood. In only 1 case did both conditions occur: there was a large hematoma over the right cerebrum and 3 ounces of xanthochromic fluid on the left.

When such a lesion is suspected after a careful history has been obtained, thorough neurologic and psychiatric study will indicate the necessity for pneumo-

encephalography. If a hematoma or effusion is present in the subdural space, a characteristic filling defect is observed over the cerebrum with an occasional distortion of the ventricular system.

It is noted that in performing encephalography the total protein content of the cerebrospinal fluid is increased.

TABLE 1—Results of First Shipley-Hartford Retreat Test

	Score	Mental Age
Vocabulary	32	17.6
Abstractions <sup>a</sup>	28	16.7
Total	60	17.1
Conceptual quotient 88 Interpretation: In the direction of intellectual impairment		

TABLE 2—Results of Second Shipley-Hartford Retreat Test

	Score	Mental Age
Vocabulary	30	17.0
Abstractions <sup>a</sup>	40	20.5
Total	70	18.8
Conceptual quotient 120 Interpretation: Superior intelligence, no intellectual impairment		

#### REPORT OF CASE

R. T. G., private first class, aged 24, on active duty against enemy forces, on Sept. 27, 1942, was thrown to the ground by a nearby shell explosion. He was dazed, had difficulty in returning to his landing boat and remembered nothing for two days.

Following this period, severe generalized headache was present and became progressively worse with exertion. The cephalalgia was of such intensity that it would awaken him at night. He complained of vertigo and loss of memory.

General and neurologic examinations were negative. The blood pressure was 130/80 mm of mercury, the pulse rate being 72. Roentgenograms of the skull were negative. On the Otis self-administering test of mental ability, higher examination, form B, he scored 59, intelligence quotient 117. The results of the Shipley-Hartford Retreat test of intellectual impairment are given in table 1.

Although these results were not conclusively abnormal, it was considered that there was a discrepancy between the Otis and Shipley tests and the clinical impression of the patient's original ability. It was concluded that there was a superior intelligence with evidence of intellectual dysfunction exclusive of the frontal lobes.

The persistent headaches and psychiatric findings led to a suspicion of a subdural lesion, and on November 27 pneumoencephalographic study was performed under tribromethanol in amylene hydrate anesthesia. The cerebrospinal fluid was under pressure of 200 mm of water. One hundred and twenty cc of this fluid was replaced with an equal amount of air.

The total protein of the fluid was 30 mg per hundred cubic centimeters, the cell count was 4 and the Kahn reaction was negative. The colloidal gold curve was negative.

Roentgenograms indicated a filling defect over the left lower parietotemporal area and were significant of a space-occupying lesion.

On December 7, under tribromethanol in amylene hydrate anesthesia, a perforator opening was made into the left superior temporal bone and a large subdural effusion was removed. The postoperative condition was uneventful and there has been a definite improvement in all his symptoms.

The Shipley-Hartford Retreat test was given on December 17 with the results presented in table 2.

<sup>1</sup> Abbott W. D., Due F. O. and Nosik W. A. Subdural Hematoma and Effusion as a Result of Blast Injuries. Diagnosis by Psychiatric Examination. J. A. M. A. to be published in the next issue.

## OPERATIVE TECHNIC

Tribromethanol in amylene hydrate is administered rectally thirty minutes before surgical operation. A small incision is made over the indicated superior temporal area and a perforator opening is placed in the skull. The dura is tense and often bluish. When this is incised there is an escape of several ounces of either old blood or xanthochromic fluid. A small rubber catheter is placed over the temporal lobe and led out through the incision.

Closure is effected in layers with interrupted cotton sutures. If a bilateral defect is noted in the encephalogram a similar procedure is carried out on the opposite side. One hour after the patient leaves the operating room a lumbar spinal drainage of 30 cc of cerebrospinal fluid is performed with the dressing removed. Air is aspirated through the rubber catheter by negative pressure into the subdural space. The head dressing is replaced and the patient is taken to the x-ray room where postoperative roentgenograms reveal the size of the preexisting lesion. This follows the technic described by Woods and Kahn<sup>2</sup> to prevent postoperative adhesions.

The drain is removed the next day and the sutures within forty-eight hours.

The patient is up on the third day and returns to duty in six to eight weeks.

There have been no operative fatalities in the group operated on and most patients will be returned to duty. There have been 10 cases, 5 of which were bilateral. Seven patients had subdural effusions and in 2 instances subdural hematomas occurred.

## SUMMARY

There is a group of patients suffering from the concussion effect of a nearby shell, bomb or underwater explosion who develop an accumulation of fluid in the subdural space. The chief complaints are headache, minor neurologic findings, and pronounced change in personality. Recognition and removal of either a subdural hematoma or an effusion will relieve these symptoms.

<sup>2</sup> Woods W W and Kahn E A. Subdural Air Surgery. 12: 471-481 (Sept.) 1942.

**The Medical Adjective**—A good example of the overworked medical adjective is marked, which is used to express so many qualities as to have become almost meaningless. It replaces great, copious, abundant, large, tangible, evident, perceptible, clear, unmistakable, decided, pronounced and others. In many cases its effect is purely emotional and has the same significance as the word 'bloody' in other fraternities. The word 'definite' has come to have a special meaning in our hands the reverse of its content in general use. When a doctor says 'there was enlargement of the spleen' we cannot misunderstand him when he says 'there was definite enlargement of the spleen' he introduces an element of doubt, almost as if he was surprised at the finding and perhaps not quite sure of it. In any case he had added nothing to his description and, if he uses the phrase to three of his colleagues, one will believe that the spleen was considerably enlarged, another that the enlargement was slight while the third, with perhaps greater insight will assume the size of the organ to be within normal limits. The essence of professional description is to convey the same meaning to all who read or listen, if this be so then the word 'definite' and its objectionable partner 'very' might well be omitted from medical idiom.—The Decay of Medical Language, editorial, *New Zealand M J* 41: 235 (Dec.) 1942.

## Clinical Notes, Suggestions and New Instruments

### A METHOD FOR INTRODUCING SULFANILAMIDE INTO THE PERITONEAL CAVITY

MAJOR ROBERT A WISE  
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The value of sulfanilamide in the peritoneal cavity in intra-peritoneal infection is well established. It is particularly important to place the crystals at the site of severest infection at which the highest concentration is desirable.

The site of severest infection is usually the point of greatest contamination, which in cases of perforated retrocecal or pelvic appendicitis, may be high in the right lumbar gutter or low in the pelvis. Unfortunately, it may be difficult or impossible to deposit the crystals at the desired point in patients operated on through a McBurney incision.

The introduction of the crystals high in the right lumbar gutter or low in the pelvis presents a mechanical problem which can be simply solved by the following procedure.

## PROCEDURE

The gauze packing in a cigaret drain is pulled back from one end for a distance of 2 inches and sulfanilamide crystals are poured into this end of the drain. A sponge forceps is applied to the open end of the drain below the sulfanilamide holding the crystals in place (fig 1). After the drain has been inserted into the desired location, the forceps is removed. The crystals leave the end of the drain and are dispersed in the adjacent tissue. By this one maneuver sulfanilamide has been introduced to the point of greatest infection and a drain has also been placed to this site (fig 2).

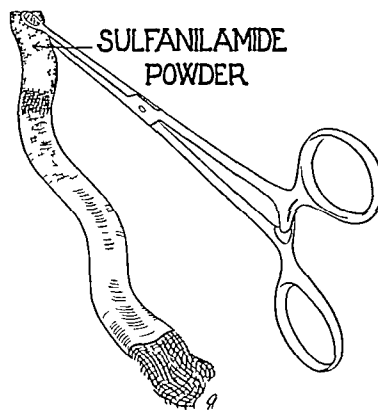


Fig 1—Showing cigaret drain with gauze packing pulled back and sulfanilamide crystals in the end of the drain. Sponge forceps holds crystals in place and assists in introducing drain into the desired location.

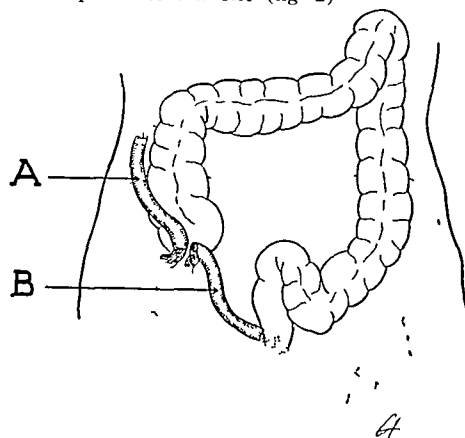


Fig 2—A drain with sulfanilamide crystals high in the right lumbar gutter B drain with sulfanilamide crystals low in the pelvis.

Additional sulfanilamide is placed, in the usual manner, in that part of the peritoneal cavity directly exposed by the incision.

From the Surgical Service, Walter Reed General Hospital, Washington, D C.

Released for publication by the War Department Manuscript Board which assumes no responsibility other than censorship for the contents of this article.

## TWO ADDITIONAL CASES OF TRAUMATIC WINGED SCAPULA OCCURRING IN THE ARMED FORCES

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MEDICAL CORPS ARMY OF THE UNITED STATES  
AND

MAJOR WILLIAM T MARTIN  
MEDICAL CORPS, ARMY OF THE UNITED STATES

In a recent issue of THE JOURNAL Ifield and Holder<sup>1</sup> reported a case of traumatic paralysis of the serratus anterior muscle seen in their service at Camp Callan, California. The winged scapula in their patient resulted from trauma incidental to carrying a full knapsack. Two cases of paralysis of the serratus anterior muscle were seen at the Station Hospital, Langley Field, Virginia, in September. Because of the rarity of this condition and the unusual cause of these 2 cases, the findings seemed important enough to record in the medical literature.

CASE 1—Private W Q, aged 26, admitted to the Station Hospital Sept 24, 1942, complained of a recurrent dislocation of his left shoulder on lifting heavy objects. He gave a history of having his left shoulder slip "out of place" when he lifted a garbage can on Sept 16, 1942 while working with

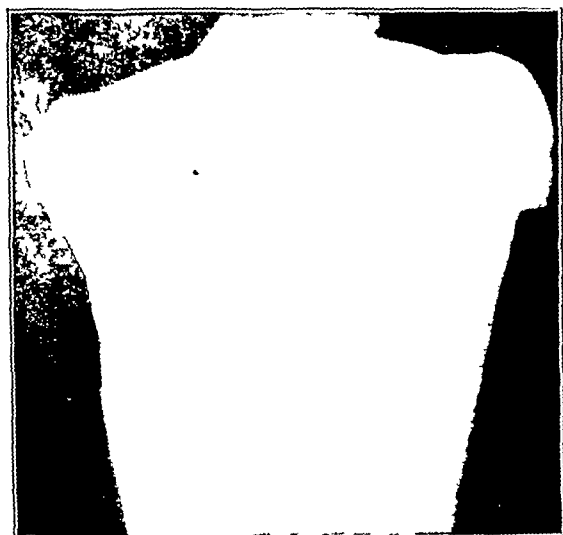


Fig 1 (case 1)—Winging of left scapula.

a prison detail. Although right handed, he attempted to lift with his left hand. As he elevated the weight to shoulder height he experienced a burning sensation over the coracoid process radiating to the tip of the scapula. At the same time he felt his shoulder "slip out of place." He was relieved of heavy duty for one week, but when he attempted further lifting the shoulder repeatedly "slipped out of place." On September 25 severe pain developed in his left arm and neck and he was hospitalized. On admission he presented the classic picture of winging of the scapula on forward and lateral elevation of the left arm with no limitation of motion in or about the shoulder joint. Muscle and neurologic examinations were essentially negative except for an isolated paralysis of the serratus anterior muscle. The rest of the admission work-up was noncontributory. Treatment consisted of an application of heat to the shoulder with the arm supported in a sling. The patient was hospitalized for three months before sufficient power returned to his serratus anterior muscle to enable him to fix his scapula.

CASE 2—Sgt T E C, aged 20, was admitted to the hospital Sept 3 1942 after an automobile accident in which his car was overturned and crushed under a Pullman car. The patient was pinned for two hours in the front seat of his car in an

inverted position with his left arm jammed against the door and most of his body weight resting on his left shoulder. When extricated from the wreck, he was hospitalized and found to be suffering from multiple bruises of both hips and the left flank, fractures of the transverse processes of the second and third lumbar vertebrae and complete musculospiral



Fig 2 (case 1)—Oblique view of winged scapula showing lower division of trapezius to be unaffected.



Fig 3 (case 2)—Winging of left scapula.

paralysis of the left extremity, in addition to winging of the left scapula. Examination of the shoulder revealed winging on forward and lateral elevation of the shoulder, with the left arm farther from the midplane than the right on complete elevation. It was possible to assist in complete elevation by thrusting forward and upward on the angle of the scapula.

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<sup>1</sup> Ifield F W and Holder H G. Winged Scapula. Case Occurring in Soldier from Knapsack. J A M A 120 448 (Oct 10) 1942.

There was complete paralysis of the serratus anterior muscle and lower division of the trapezius with an asymmetrical rounding of the posterior axillary fold as the chest was viewed



Fig. 4 (case 2)—Scapula immobilized in an elevated position by means of body cast with elbow cradle



Fig. 5 (case 2)—Anterior view showing detail of body cast

from the front. Under conservative management the musculospiral palsy cleared up within a week's time but the serratus paralysis continued, and it was felt necessary to place the

muscle at complete rest by elevating the scapula and fixing it to the posterior wall of the chest. To secure this immobilization, a body cast was applied with a padded cradle for the left elbow. The cradle exerted a continuous upward thrust on the left shoulder, elevating and fixing the scapula and placing the serratus at rest in a relaxed position. With the application of the cast and the institution of heat and massage to the shoulder the patient soon noticed greater strength and continued to regain muscle power. He remained in the hospital seventy-two days before his muscle power was strong enough to allow him to return to duty.

Many explanations have been offered to account for traumatic winging of the scapula. In all, a violent contusion or stretching of the nerve causes sufficient dissociation of continuity of the fibers to account for a paralysis which has, at best, a guarded prognosis. The nerve arises from the posterior roots of the fifth, sixth and seventh cervical nerves and courses through the scalenus medius muscle, uniting within or on the surface



Fig. 6—Detailed view of padded elbow cradle

of the muscle, where it is relatively exposed for a short distance. In the first case, a contraction of the scalenus medius muscle in fixing the chest cage incidental to forceful lifting damaged the nerve. By contracting, the scalenus may have immobilized the nerve, causing it to be stretched as the shoulder completed its arc against resistance. In the second case the palsy resulted from prolonged pressure against the shoulder. The mechanism of pressure on the clavicle is not clear because the nerve is protected by the axillary nerve and brachial plexus as it courses behind the clavicle. Perhaps, in the second case as well, the scalenus, contracting to support the chest, pinched the nerve long enough to cause a palsy.

The exact mechanism of the disorder in the 2 cases of traumatic paralysis of the serratus anterior muscle here presented is not clear. That the mere lifting of a heavy object or the wearing of a full pack can give rise to prolonged or permanent disability should arouse the interest of all entrusted with the care of the armed forces. We make no claims for originality in presenting the detailed pictures of a simple and expedient immobilization cast. In addition to immobilization, heat and massage are the best means of promoting return of muscle power.



## Special Article

### HANDBOOK OF NUTRITION XXIII

#### MEDICAL EVALUATION OF NUTRITIONAL STATUS

H D KRUSE, MD

NEW YORK

(Concluded from page 591)

*These special articles on foods and nutrition have been prepared under the auspices of the Council on Foods and Nutrition. The opinions expressed are those of the authors and do not necessarily reflect the opinion of the Council. These articles will be published later as a Handbook of Nutrition.—Ed*

#### STATES OF AVITAMINOSIS

From the concept of deficiency states it may be seen that an avitaminosis includes all forms, degrees and stages. Under this classification the classic deficiency disease, as originally described, represents the severe acute state. Such a term as latent or subclinical state, which has been objectionable to some investigators, is no longer necessary. It is seen to be a broad state comprising the mild acute and mild chronic conditions. It is preferable to use the more specific designation corresponding to the actual condition. The severe chronic state has had no previous designation.

The concept also explained the various courses in the pathogenesis of these states. Whereas the description thus far has indicated that any one of the several states exists alone, actually conditions are often more complex. Through the usual vicissitudes, particularly over years, the process usually changes in velocity, intensity and even direction. To mention one or two more common of the various eventualities, an acute subsides into a chronic process, or a mild or severe chronic state, once established, constitutes a base on which is superimposed a mild or severe acute process. Undoubtedly in the outbreaks of classic deficiency diseases the severe acute form is very frequently engrafted on a preexisting mild or severe chronic base. But these do not represent all the possible changes in rate, stage and intensity which a process may undergo. It may have a very variable and tortuous course. As a result, a mild or severe acute process in any stage may be seen with a mild or severe chronic form in any stage. These combined states add to the number of categories which must be borne in mind. Thus a deficiency disease may exist in any one of the following states: mild acute, severe acute, mild chronic, severe chronic, as well as mild or severe acute superimposed on mild or severe chronic, each in a particular stage. It cannot be overemphasized that the combined states are very prevalent, perhaps the most prevalent.

Scattered observations in the literature on deficiency diseases are in accord with one or another point in the concept. In addition to the reports already cited on the mild acute state, others have taken cognizance of the chronic state. In describing various forms of rickets, Eliot and Park<sup>61</sup> mentioned early mild, florid and mild chronic. Their description of the course of these respective states may be interpreted in terms of intensity and time.

Furthermore, the literature records the characteristic difference between the acute and chronic forms in response to treatment. Eliot and Park<sup>62</sup> remark that in one form of rickets the complete cure is slow. It has also been noted that in treatment of polyneuritis in animals, the acute fulminating type disappeared very speedily in a few days, the chronic type very slowly, in fact, only after many months.<sup>63</sup>

A few investigators have mentioned a chronic state of pellagra in contradistinction to the more dramatic acute form.<sup>64</sup> Some changes in the tongue in pellagra have been described erroneously as part of the acute process, whereas they were really chronic in nature.<sup>65</sup> In scurvy produced in animals, Tozer<sup>66</sup> differentiated the chronic from the acute form on a time basis. She stated that the chronic form varies in severity according to the degree of deprivation of vitamin C. Using a different terminology to express intensity, she described mild and severe degrees for both the acute and chronic forms. Recognizing these various states, Hojer<sup>67</sup> employed still another nomenclature. Ferrario<sup>68</sup> and Boyle<sup>69</sup> also produced acute and chronic scurvy in guinea pigs. Similar observations have been reported on experimental athiaminosis.<sup>70</sup>

The severe acute state is the form on which almost all clinical attention to deficiency diseases has hitherto been focused. Historically this form, presenting a grave problem, was the first to be recognized, consequently the recorded knowledge on its symptoms, signs and pathology predominate in the literature. Similarly in experimental work, where the objective was to demonstrate the existence of new vitamins or to assay foods, animals were suddenly shifted from an optimum natural to a deficient "purified" diet in which every trace of an essential had been as far as possible removed. Naturally the severe acute form of deficiency ensued. A few investigators have given attention to the mild acute state.

62 Eliot Martha M and Park E A Rickets in Brennemann's Practice of Pediatrics Hagerstown W F Prior Company, Inc 1938, vol 1, chapter 36, p 65

63 Vedder E B Beriberi New York William Wood & Co 1913 chapter 10 pp 208 209

64 Titus S C Oratio de Pellagrae Morbi inter Insubriae Austriae Agricolae Grassantis Pathologia Viteburg 1792 65 Strambio Gaetano Dissertazioni di Gaetano Strambio sulla Pellagra Milan Gio Battista Bianchi 1794 diss 2 pp 103 105 Lalesque F A De la pellagre des Landes Bull Acad Roy de Med 1 440-442 1836 Morelli Carlo La Pellagra nei Suoi Rapporti Medici e Sociali Florence Murate and Monaco Giorgio Franz 1856 chapter 2 p 57

65 Soler Luigi Osservazioni Medico Pratiche Che Formano la Storia Esatta di una Particolare Malattia Chiamata Pellagra in Cui Si Espongono I Veri Caratteri le Differenze le Cause ed il Metodo Giudicato il Più Utile per Curarla Venice Andrea Fogherini 1791 p 10 Costallat A Etologie et prophylaxie de la pellagre ed 2 Paris J B Bailliere et Fils 1868 chapter 3 p 148 Lombroso Cesare Trattato Profilattico e Clinico della Pellagra Turin Fratelli Bocca 1892 part 3 chapter 1 pp 214 224 Lussana 42

66 Tozer Frances Mary On the Histological Diagnosis of Experimental Scurvy Biochem J 12 445 447 1918

67 Hojer J Axel Studies in Scurvy Acta paediat 3 (supp) 7 278 1924

68 Ferrario Carlos V La avitaminosis C experimental en el cobayo y las lesiones dentales y del parodonto Rev Odont 29 206 224 (April) 1941 La avitaminosis C experimental en el cobayo y las lesiones dentales y del parodonto II Escorbuto Cronico ibid 29 273 284 (May) 333 349 (June) 1941

69 Boyle Paul E Experimental Scurvy in Guinea Pigs and Its Relation to Diffuse Alveolar Atrophy in Human Subjects Harvard Dent Rec 11 59 (July) 1937 Boyle P E Bessey O A and Wolbach S B Experimental Alveolar Bone Atrophy Produced by Ascorbic Acid Deficiency and Its Relation to Pyorrhea Alveolaris Proc Soc Exper Biol & Med 36 733 735 1937 Boyle Paul E Effect of Various Dietary Deficiencies on the Periodontal Tissues of the Guinea Pig and of Man J A Dent A 28 1788 1793 (Nov) 1941

70 Prickett, C O Salmon W D, and Schrader G A Histopathology of the Peripheral Nerves in Acute and Chronic Vitamin B<sub>1</sub> Deficiency in the Rat Am J Path 15 251 259 (March) 1939 Swank R L Avian Thiamine Deficiency. A Correlation of the Pathology and Clinical Behavior J Exper Med 71 683 702 (May) 1940 Swank R L and Bessey O A Avian Thiamine Deficiency. 3 Characteristic Symptoms and Their Pathogenesis J Nutrition 22 77-89 (July 10) 1941

61 Eliot Martha M and Park E A Rickets in Brennemann's Practice of Pediatrics Hagerstown W F Prior Company, Inc 1938 vol 1, chapter 36 pp 62 65 87 92 94

In the past the chronic state of deficiency diseases has received only sporadic and scant notice. Paradoxically, however, chronic manifestations have been frequently seen but their relation to nutrition was not recognized. The mild chronic state has been undetected or neglected. Generally the mild acute, mild and severe chronic states, the most common states among the population, have not been recognized and differentiated. The very prevalent combination acute with chronic has not been fully appreciated as such and the constituent forms have not been distinguished and separated.

Since the chronic state of deficiency diseases has not been commonly recognized, it is worth while to mention some of its characteristics. Its essence is time. For persons this is age. The longer persons live, the more chance they have to incur changes and to have them develop to an advanced state. Consequently chronic changes are seen with greater frequency and in the latest stages with increasing age. I have noted this in avitaminosis A, ariboflavinosis, aniacinosis and avitaminosis C.

In the past these chronic alterations have been called senile changes with the implication that senility causes them. But senility per se is not responsible for them. That has never been a satisfactory explanation. Not all elderly persons show the changes. On the other hand, they occur in children.<sup>71</sup> Time not senility, is the essential point. And time does not start the changes, it simply is a dimension over which they progress. They are specific avitaminoses in a state of chronicity, due usually to dietary deficiencies running over a period of years. Their prevalence and severity vary with the number and degree of deficient diets and therefore with the economic level. Most important of all they are reversible, yielding slowly but completely to appropriate therapy.

This rate of response is another characteristic peculiar to the chronic process. Whereas acute changes respond with considerable promptness, chronic changes recede very slowly. In acute changes we are accustomed to expect improvement with dramatic rapidity. Actually, some of rapidity is more apparent than real. For one thing it is a relative matter, the more pronounced the acute, the more spectacular is a given degree of improvement. Often removal of late signs constitutes supposed rapid cure of an acute deficiency. Obviously this is far from complete cure. But it is mainly because the relief of symptoms, the first event, is so prompt as to be striking. If judged solely by freedom from symptoms, the therapeutic response of an acute process is rapid. But when judged by complete restoration of all tissue changes, as seen by the biomicroscope, response in the acute condition is not quite so spectacularly quick as it is reputed. Nevertheless, response is infinitely more rapid in the acute than in the chronic state.

#### METHODS OF APPRAISAL

With this concept of the various states in mind, it is appropriate to consider the various new methods that have been proposed for use in appraising nutritional status. They comprise biochemical, microbiologic, biophysical (most of which are functional), special clinical and morphologic, including biomicroscopic. At once

it should be stated that they pertain to different aspects of deficiency diseases and yield dissimilar kinds of information.

Most of the biochemical methods are designed to determine the concentration of the vitamins in the blood and urine. One kind of method is based on the reaction of a vitamin to yield a colored or fluorescent substance which, under suitable conditions of intensity and stability, may be estimated. Another kind depends on the reaction of a vitamin with a dye which is carried partially or entirely to completion so that the residual color or end point, respectively, may be determined. For each reaction there are usually several methods, differing only in the size and preparation of the sample and means of estimating the concentration of the vitamin. These reactions are rendered quantitative by colorimetry, fluorimetry and titrimetry, and objective by spectrophotometry or photoelectrometry.

Microbiologic methods depend on the failure of a particular micro-organism to grow in the absence of a specific vitamin. The concentration of the essential is assayed by the degree to which it stimulates growth. Or it is measured by its accelerating action on a biologic process such as fermentation.

For information bearing on the state of nutrition with respect to an essential the biochemical and microbiologic methods may be applied in four ways. The concentration of the vitamin in blood is determined on specimens collected before breakfast. For a vitamin that is excreted in the urine, the amount there may be ascertained from one or more specimens collected after an interval of several hours from the last meal or from a twenty-four hour sample. In general, low values for the vitamin in either instance point to a recent diet deficient in the essential. Other procedures comprise measuring the response to a test dose of the vitamin by determining either its absorption from the blood or its excretion in the urine. Here for both blood and urine the methods differ in the amount of vitamin administered, the number of samples to be taken and the time of drawing them. Usually the blood technic includes initial or pretest, peak and subsequent basal determinations. Most of the excretory methods restricted to the collection of one or a few specimens are designed to cover the period of maximum response, some call for a twenty-four hour sample. These urinary response procedures are the saturation, tolerance or load tests. Low values by the procedures involving response to a test dose indicate not only that the previous dietary intake has been deficient but also that the reservoirs are depleted. These several procedures yield information of different character because they bear on such different aspects as transport, storage, utilization and excretion of the vitamin.

Two of the vitamins also occur in the blood as constituents of coenzymes. Hence concentration of that is also determined by the foregoing types of methods. Also chemical methods are used to determine the accumulation of metabolites in the blood or to detect the presence of an abnormal pigment in the urine as the result of a vitamin deficiency.

Among the biochemical methods on blood, the formation of a blue color when vitamin A is treated with a chloroform solution of antimony trichloride<sup>72</sup> provides

<sup>71</sup> Since it was obviously inappropriate to apply the term senile changes to children the equally unsuitable name presenile changes was used.

<sup>72</sup> Carr, F. H. and Price, E. A. Colour Reactions Attributed to Vitamin A. *Biochem. J.* **20**: 497-501, 1926.

the means for determining vitamin A concentration.<sup>73</sup> Oxidation of thiamine to thiochrome and measurement of the intensity of the latter's fluorescence<sup>74</sup> forms the basis of estimating the thiamine level.<sup>75</sup> Another method for detecting avitaminosis B<sub>1</sub> depends on the increase in values for bisulfite binding substances<sup>76</sup> or pyruvic acid<sup>77</sup> signifying failure in decarboxylation from deficiency in thiamine.

The level of cocarboxylase (thiamine diphosphate ester or thiamine pyrophosphate, which functions as a coenzyme or carboxylase in conversion of pyruvic acid into carbon dioxide and acetaldehyde) may be determined in three ways: differential solubility of thiochrome and thiochrome pyrophosphate,<sup>78</sup> enzymatic conversion of cocarboxylase into thiamine<sup>79</sup> or manometric determination of the carbon dioxide released during an enzymatic process in which pyruvate is the substrate.<sup>80</sup> Goodhart and Sinclair<sup>81</sup> have pointed out that estimation of thiamine or cocarboxylase in whole blood is not a reliable means of detecting possible deficiency of thiamine. They regard lowered concentration of thiamine in the plasma as furnishing more trustworthy evidence.

For determination of nicotinic acid or nicotinamide in the blood, the reaction of these substances with an aromatic amine and cyanogen bromide<sup>82</sup> provides several methods.<sup>83</sup>

A number of chemical methods have been devised for assaying ascorbic acid in the blood,<sup>84</sup> most of them based on the reduction of 2,6-dichlorophenol-indophenol,<sup>85</sup> a few of methylene blue.<sup>86</sup> The application of these methods in various procedures has already been reviewed.<sup>87</sup>

Methods for determining calcium,<sup>88</sup> phosphorus and phosphatase<sup>89</sup> levels are well known. Disturbances in these components are associated with rickets.

Plasma or serum proteins may be determined by a convenient colorimetric method.<sup>90</sup> The significance of alterations in these blood constituents, particularly albumin, has been described at length.<sup>91</sup>

Nutritional anemia due to iron deficiency is microcytic and hypochromic in type. Although microcytosis may occur alone, diminution in hemoglobin concentration of the blood is usually an early sign. In the comprehensive examination in private practice or the hospital, a complete hematologic examination is desirable. But in surveys on a large scale the objectives and possible results must be weighed against the limitations in time and personnel and the magnitude of the work. It is doubtful that it would be justifiable to conduct a thousand blood counts when only a few will yield low values. Rather, determination of hemoglobin concentration would seem to be sufficient for most surveys.

73 Lanzing J C. De bepaling van het vitamine A-en het carotin oisengehalte in 1 cc en 2 cc bloed. *Geneesk tijdschr Nederland Indie* 78 3135 3144 (1938). Kumble M S. The Photocolorimetric Determination of Vitamin A and Carotene in Human Plasma. *J Lab & Clin Med* 24 1055 1065 (1939). May C D, Blackfan K D, McCrory J T, and Allen F H, Jr. Clinical Studies of Vitamin A in Infants and in Children. *Am J Dis Child* 59 1167 1184 (June) 1940.

74 Jansen B C P. A Chemical Determination of Aneurin by the Thiochrome Reaction. *Rec d trav chim d Pays Bas* 55 1046 1052 (Nov. 15) 1936. Quantitative Bestimmung von Aneurin. *Ztschr f Vitaminforsch* 7 239 244 (1938).

75 Westenbrink H G K. and Jansen B C P. Determination of Cocarboxylase and Aneurin by the Thiochrome Method. 1. 2. *Acta brevica Neerland physiol* 8 119 120 (1938). Widenbauer F, Huhn O, and Düsselhoff V. Ueber den Vitamin B<sub>1</sub> Gehalt des Blutes. *Zentralbl f inn Med* 60 113 118 (Feb. 11) 1939. Ritsert K. Die Aneurinbestimmung in kleinen Blutmengen nach dem Thiochromverfahren. *Klin Wchnsch* 18 852 854 (June 17) 1939. Ueber eine einfache Methode zur quantitativen Bestimmung der Cocarboxylase in Blut und Geweben nach dem Thiochromverfahren. *ibid* 18 1370 1372 (Oct. 21) 1939.

76 Clift F P. and Cook R P. A Method of Determination of Some Biologically Important Aldehydes and Ketones with Special Reference to Pyruvic Acid and Methylglyoxal. *Biochem J* 26 1788 1799, 1932. Wilkins R W. Weiss Soma and Taylor F H L. The Effect and Rate of Removal of Pyruvic Acid Administered to Normal Persons and to Patients With and Without 'Vitamin B Deficiency.' *Ann Int Med* 12 938 950 (Jan.) 1939. Wortis Herman Goodhart R S. and Bueding Ernest. Cocarboxylase, Pyruvic Acid and Bisulfite Binding Substances in Children. *Am J Dis Child* 61 226 230 (Feb.) 1941.

77 Peters R A. and Thompson R H S. Pyruvic Acid as an Intermediary Metabolite in the Brain Tissue of Avitaminous and Normal Pigeons. *Biochem J* 28 916 925 (1934). Lu G D. Studies on the Metabolism of Pyruvic Acid in Normal and Vitamin B<sub>1</sub> Deficient States. I. A Rapid Specific and Sensitive Method for the Estimation of Blood Pyruvate. *ibid* 33 249 254 (Feb.) 1939. Studies on the Metabolism of Pyruvic Acid in Normal and Vitamin B<sub>1</sub> Deficient States. II. Blood Pyruvate Levels in the Rat Pigeon Rabbit and Man. *ibid* 33 774 778 (May) 1939. Wortis Goodhart and Bueding.

78 Westenbrink and Jansen.

79 Ritsert K. Ueber eine einfache Methode zur quantitativen Bestimmung der Cocarboxylase in Blut und Geweben nach dem Thiochromverfahren. Widenbauer F. Ueber den Cocarboxylase Gehalt des menschlichen Blutes. *Klin Wchnsch* 18 1392 1394 (Oct. 28) 1939.

80 Goodhart, R S. and Sinclair H M. The Estimation of Cocarboxylase (Vitamin B<sub>1</sub> Diphosphate Ester) in Blood. *Biochem J* 33 1099 1108 (July) 1939. Deficiency of Vitamin B<sub>1</sub> in Man as Determined by the Blood Cocarboxylase. *J Biol Chem* 132 11 21 (Jan.) 1940. Goodhart Robert A. Reevaluation of the Method Described by Goodhart and Sinclair for the Determination of Blood Cocarboxylase Values. *ibid* 135 77 84 (Aug.) 1940. Schlutz F W. and Knott Elizabeth M. Cocarboxylase Content of Blood of Infants and of Children. *Am J Dis Child* 61 231 236 (Feb.) 1941. Wortis Goodhart and Bueding.

81 Goodhart and Sinclair. The Estimation of Cocarboxylase (Vitamin B<sub>1</sub> Diphosphate Ester) in Blood.

82 Swaminathan M. A Chemical Method for the Estimation of Nicotinic Acid in Biological Materials. *Indian J Med Res* 26 427 434 (Oct.) 1938. Bandier L. and Hald J. A Colorimetric Reaction for the Quantitative Estimation of Nicotinic Acid. *Biochem J* 33 264 271 (Feb.) 1939.

83 Ritsert K. Zur quantitativen Nicotinsäure und Nicotinamide Bestimmung im Harn im Gewebe und im Blut. *Klin Wchnsch* 18 934 936 (July 8) 1939. Pearson P B. The Nicotinic Acid Content of the Blood of Mammals. *J Biol Chem* 129 491-494 (Aug.) 1939. Euler H. and Schlenk F. Nicotinamide und Coenzyme im Blut. *Klin Wchnsch* 18 1109 1111 (Aug. 19) 1939.

84 Farmer C J. and Abt A F. Ascorbic Acid Content of Blood. *Proc Soc Exper Biol & Med* 32 1625 1629 (June) 1935. Abt A F. Farmer C J. and Epstein I M. Normal Ascorbic (Ascorbic) Acid Determinations in Blood Plasma and Their Relationship to Capillary Resistance. *J Pediatr* 8 119 (Jan.) 1936. Farmer C J. and Abt, A F. Titration of Plasma Ascorbic Acid as a Test for Latent Avitaminosis C. *Nutrition The Newer Diagnostic Methods. Proceedings of the Round Table on Nutrition and Public Health Sixteenth Annual Conference of the Milbank Memorial Fund* March 29 31 1938. pp 114 130. Determination of Reduced Ascorbic Acid in Small Amounts of Blood. *Proc Soc Exper Biol & Med* 34 146 150 (March) 1936. Farmer C J. Vitamin C Analysis in Relation to Clinical Problems. *Quart Bull Northwestern University Medical School* 14 220 235 (Nov. 4) 1940. Mindlin R L. and Butler A M. The Determination of Ascorbic Acid in Plasma. A Macro method and Micro method. *J Biol Chem* 122 675 686 (Feb.) 1935.

85 Dorothy G. and Kantorovitz Myron. Medical Evaluation of Nutritional Status. VI. An Analysis of Sources of Errors in the Photometric Macromethod of Determining Ascorbic Acid in Plasma. *Milbank Memorial Fund Quart* 20 178 206 (April) 1942. Kruse 85 Tillmans J. Hirsch P. and Hirsch W. Das Reduktionsvermögen pflanzlicher Lebensmittel und eine Beziehung zum Vitamin C. I. Der reduzierende Stoff des Citronen-äther. *Ztschr f Unter d Lebensm* 63 121 (Jan.) 1932.

86 Lund Helge and Lieck Herbert. Quantitative Bestimmung von Ascorbinsäure im Blutserum. *Klin Wchnsch* 16 555 557 (April 17) 1937. Widenbauer F. and Schneider E. Die Bestimmung von reduzierter und oxidiert Ascorbinsäure im Blutplasma. *ibid* 17 1694 1695 (Nov. 26) 1938. Zimmermann Wilhelm. Studie über die photometrische Vitamin C Bestimmung mit der Methylenblau-methode. *ibid* 17 1728 1731 (Dec. 3) 1938. Lund Helge and Trier Erik.

2. Eine neue Mikro-Methylenblau-methode zur quantitativen Bestimmung der Ascorbinsäure im Blutserum. *ibid* 18 80 82 (Jan. 21) 1939.

87 Smith S L. Human Requirements of Vitamin C. *J A M A* 111 1753 1764 (Nov. 5) 1938.

88 Clark E P. and Collip J B. Tisdall Method for Determination of Blood Serum Calcium with Suggested Modification. *J Biol Chem* 63 461 464 (March) 1925.

89 Bodansky Aaron. Notes on the Determination of Serum Inorganic Phosphate and Serum Phosphatase Activity. *J Biol Chem* 120 167 175 (Aug.) 1937. Notes on the Determination of Serum Inorganic Phosphate and Serum Phosphatase Activity. *Am J Clin Path Technical Supplement* 7 51 59 (Sept.) 1937. Fiske C H. and Subbarow Y. Colorimetric Determination of Phosphorus. *J Biol Chem* 66 375 400 (Dec.) 1925.

90 Kingsley G R. The Determination of Serum Total Protein Albumin and Globulin by the Buret Reaction. *J Biol Chem* 131 197 200 (Nov.) 1939. A Rapid Method for the Separation of Serum Albumin and Globulin. *ibid* 133 731 735 (May) 1940. The Direct Buret Method for the Determination of Serum Proteins. Simplification and Improvements Applied to Photoelectric and Visual Colorimetry to be published. Robinson H W. and Hogden Corinne G. The Buret Reaction in the Determination of Serum Proteins. I. A Study of the Conditions Necessary for the Production of a Stable Color Which Bears a Quantitative Relationship to the Protein Concentration. *J Biol Chem* 125 707 725 (Sept.) 1940. II. Measurements Made by a Duboscq Colorimeter Compared with Values Obtained by the Kjeldahl Procedure. *ibid* 125 727 731 (Sept.) 1940.

91 Boumans J B. The Diagnosis of Nutritional Edema with Particular Reference to the Determination of Plasma Proteins and Consideration of Their Behavior Nutrition. *The Newer Diagnostic Methods. Proceedings of the Round Table on Nutrition and Public Health New York Milbank Memorial Fund* 1938. pp 166 173.

The results from surveys demonstrate the usefulness and adequacy of this single procedure.<sup>92</sup>

Here is a technic known for a long time but too often neglected or conducted by instruments capable of revealing only wide abnormalities and yielding such errors that they could not reveal slight deviations or reported in terms of variable standards,<sup>93</sup> with variable allowance for normal range. Osgood<sup>94</sup> has admonished that "all hemoglobin estimations should be reported in grams per hundred cubic centimeters and the method used should be stated. Otherwise the great variation (138 to 173) in the number of grams of hemoglobin taken as 100 per cent in different methods and the enormous differences in the accuracy of the methods will make correct interpretation of the results impossible."

Furthermore, in view of indications from other deficiency diseases, perhaps more consideration should be given to slight or marginal changes in hemoglobin concentration. Some agreement on standards, recognition that one level as a standard will not suffice for all ages<sup>95</sup> and perhaps narrowing of the present wide range accepted as normal are items in need of consideration. Moreover, to remove errors inherent in most instruments, the method should be performed whenever possible on a photoelectric colorimeter.

For assaying the vitamins in urine, the biochemical methods are based mostly on the same reactions as in blood. In the estimation of thiamine the thiochrome<sup>96</sup> or diazotized P-ammoaceto-phenone reactions is utilized. Riboflavin excreted as uroflavin is measured by

a fluorometric method.<sup>98</sup> Nicotinic acid derivatives may be determined by their reaction with cyanogen bromide in the presence of a suitable amine.<sup>99</sup> Another method for detecting aniacinosis depends on the appearance of a fluorescent substance.<sup>100</sup> Several methods for determination of vitamin C, based on the reduction of 2,6-dichlorophenolindophenol<sup>101</sup> or methylene blue,<sup>102</sup> vary in technical points and procedures for appraising the state of vitamin C nutrition. A very complete literature on this has been reviewed.<sup>97</sup>

Of the microbiologic methods on blood, the estimation of thiamine concentration<sup>103</sup> was based on the necessity of this substance for growth of the fungus *Phycomyces blakesleanus*.<sup>104</sup> That thiamine was found to increase the rate of fermentation<sup>105</sup> was utilized in another type of method.<sup>106</sup> The indispensability of riboflavin for lactic acid bacteria<sup>107</sup> led to a method for determining the concentration of this vitamin in blood by use of *Lactobacillus casei*.<sup>108</sup> Factor V, a growth factor for

92 Abbott O D and Ahmann C F. Nutritional Anemia and Its Prevention. Bull. 32b. University of Florida Agricultural Experiment Station. 1938. Iron Deficiency in Anemia in Children. Am. J. Dis. Child. 58: 811-816 (Oct.) 1939. Mackay H M M and Good fellow L. Nutritional Anemia in Infancy with Special Reference to Iron Deficiency. Medical Research Council Special Report Series No. 15. London: His Majesty's Stationery Office. 1931.

93 Haden R L. Principles of Hematology. Philadelphia: Lea & Febiger. 1939. chapter 4, p. 58.

94 Osgood E E. A Textbook of Laboratory Diagnosis, ed. 3, Philadelphia: Blakiston Company. 1940. chapter 6, p. 177.

95 Wehl Dorothy G. Medical Evaluation of Nutritional Status. III. Hemoglobin and Erythrocyte Values for Adolescents in High Income Families. Milbank Memorial Fund Quart. 19: 45-71 (Jan.) 1941.

96 Westenbrink H G K and Goudsmit J. Determination of Aneurin (Vitamin B<sub>1</sub>) by the Thiochrome Reaction. Rec. trav. chim. d. Pays Bas. 56: 803-810. 1937. Chemical Method for Determination of Vitamin B<sub>1</sub> in Urine. Nederl. tijdschr. v. geneesk. 81: 2632-2639 (June 5) 1937. Karrer W. Zur Bestimmung von Vitamin B<sub>1</sub> im menschlichen Harn. Helvet. chim. Acta. 20: 1147-1155 (Nov. 5) 1937. Widenbauer F, Huhn I and Becker G. Chemischer Nachweis und Ausscheidung von Vitamin B<sub>1</sub> im Harn. Ztschr. f. ges. exper. Med. 101: 178-186. 1937. Ritsert K. Zur Aneurinbestimmung im Harn nach der Jassenschen Thiochrommethode. Deutsche med. Wchnschr. 64: 481-484 (April 1) 1938. Jolliffe Norman, Goodhart Robert, Gennis J and Ching J K. The Experimental Production of Vitamin B<sub>1</sub> Deficiency in Normal Subjects. The Dependence of the Urinary Excretion of Thiamine on the Dietary Intake of Vitamin B<sub>1</sub>. Am. J. Med. Sc. 198: 198-211 (Aug.) 1939. Widenbauer F, Huhn O and Ellinger R. Ueber die Vitamin B<sub>1</sub> Bestimmung im Harn. Ztschr. f. d. ges. exper. Med. 105: 138-144. 1939. Hennessy D J and Cerecedo L R. The Determination of Free and Phosphorylated Thiamine by a Modified Thiochrome Assay. J. Am. Chem. Soc. 61: 179-183 (Jan.) 1939. Ferree J W and Carden G A. A Procedure for the Routine Determination of Vitamin B<sub>1</sub> in Urine. J. Lab. Clin. Med. 25: 1320-1324 (Sept.) 1940. Carden, G A, Province W D and Ferree J W. Clinical Experiences with the Measurement of the Urinary Excretion of Vitamin B<sub>1</sub>. Proc. Soc. Exper. Biol. & Med. 45: 15 (Oct.) 1940. Wang Y L and Harris L J. Methods for Assessing the Level of Nutrition of the Human Subject. Estimation of Vitamin B<sub>1</sub> in Urine by the Thiochrome Test. Biochem. J. 33: 1356-1369 (Aug.) 1939. Wang Y L and Yudkin John. Assessment of the Level of Nutrition. Urinary Excretion of Aneurin at Varying Levels of Intake. Biochem. J. 34: 343-352 (March) 1940. Nijjar V A and Holt L E Jr. Studies in Thiamine Excretion. Bull. Johns Hopkins Hosp. 67: 107-124 (Aug.) 1940.

97 Prebluda H J and McCollum E V. A Chemical Reagent for Thiamine. J. Biol. Chem. 127: 495-503 (Feb.) 1939. Melnick David and Field Henry Jr. Chemical Determination. Stability and Form of Thiamine in Urine. ibid. 130: 97-107 (Sept.) 1939. Melnick David, Field Henry Jr. and Robinson W D. A Quantitative Chemical Study of the Urinary Excretion of Thiamine by Normal Individuals. J. Nutrition. 18: 593-610 (Dec.) 1939. Robinson W D, Melnick David and Field Henry Jr. Urinary Excretion of Thiamine in Clinical Cases and the Value of Such Analyses in the Diagnosis of Thiamine Deficiency. J. Clin. Investigation. 19: 399-408 (March) 1940.

98 Ferree J W. The Urinary Excretion of Riboflavin. J. Clin. Investigation. 19: 251-256 (Jan.) 1940.

99 Swaminathan M. Urinary Excretion of Nicotinic Acid. Indian J. Med. Res. 27: 417-428 (Oct.) 1939. Bandier E. Quantitative Estimation of Nicotinic Acid in Urine. Biochem. J. 33: 1787-1793 (Nov.) 1939. Harris L J and Raymond W D. Assessment of the Level of Nutrition. A Method for the Estimation of Nicotinic Acid in Urine. Biochem. J. 33: 2037-2051 (Dec.) 1939. Rosenblum L A and Jolliffe Norman. Application to Urine of Bandier and Hold's Method for Determination of Nicotinic Acid. J. Biol. Chem. 134: 137-141 (June) 1940. Melnick David and Field Henry Jr. Determination of Nicotinic Acid in Biological Materials by Means of Photoelectric Colorimetry. ibid. 134: 116 (June) 1940. Melnick David, Robinson W D and Field Henry Jr. Influence of the Excretion of Other Pyridine Compounds upon the Interpretation of the Urinary Nicotinic Acid Values. ibid. 136: 131-144 (Oct.) 1940. Urinary Excretion of Nicotinic Acid and Its Derivatives by Normal Individuals. ibid. 136: 145-156 (Oct.) 1940. Perlzweig W A, Levy E D and Sarett H P. Nicotinic Acid Derivatives in Human Urine and Their Determination. ibid. 136: 729-745 (Dec.) 1940. Perlzweig W A, Sarett H P and Margolis L H. A Test for Nicotinic Acid Deficiency in Man. J. A. M. A. 118: 28-30 (Jan. 3) 1942. Ritsert K. Euler and Schlenk.<sup>98</sup>

100 Nijjar V A and Wood R W. Presence of a Hitherto Unrecognized Nicotinic Acid Derivative in Human Urine. Proc. Soc. Exper. Biol. & Med. 44: 386-390 (June) 1940.

101 Harris L J, Ray S N and Ward A. The Excretion of Vitamin C in Human Urine and Its Dependence on the Dietary Intake. Biochem. J. 27: 2011-2015. 1933. Harris L J and Ray, S N. Diagnosis of Vitamin C Subnutrition by Urine Analysis with a Note on the Antiscorbutic Value of Human Milk. Lancet. 1: 71-77 (Jan. 12) 1935. Abbasy M A, Harris L J, Ray S N and Marrack J R. Diagnosis of Vitamin C Subnutrition by Urine Analysis. Quantitative Data. ibid. 2: 1399-1405 (Dec. 21) 1935. Harris L J, Abbasy M A, Yudkin John, and Kelly Simon. Vitamins in Human Nutrition. Vitamin C Reserves of Subjects of the Voluntary Hospital. Clin. ibid. 1: 1488-1490 (June 22) 1936. Evelyn K A, Malloy Helga T and Rosen Charles. The Determination of Ascorbic Acid in Urine with the Photoelectric Colorimeter. J. Biol. Chem. 126: 645-654 (Dec.) 1938. Bessey O A. A Method for the Determination of Small Quantities of Ascorbic Acid and Dehydroascorbic Acid in Turbid and Colored Solutions in the Presence of Other Reducing Substances. ibid. 126: 771-784 (Dec.) 1938.

102 Lund H. Eine quantitative und spezifische Methode zur Ascorbinsäuretitration im Harn und zur Bestimmung des Schwellenwertes. Klin. Wchnschr. 16: 1085-1087 (July 31) 1937.

103 Meiklejohn A P. The Estimation of Vitamin B<sub>1</sub> in Blood by a Modification of Schopfer's Test. Biochem. J. 31: 1441-1451 (Sept.) 1937. Rowlands E N and Wilkinson J F. The Clinical Significance and Estimation of Blood Vitamin B<sub>1</sub>. Brit. M. J. 2: 878-883 (Oct. 29) 1938. Sinclair H M. The Estimation of Vitamin B<sub>1</sub> in Blood. Biochem. J. 32: 2183-2199 (Dec.) 1938. The Estimation of Vitamin B<sub>1</sub> in Blood. II. A Further Modification of Meiklejohn's Method. ibid. 33: 2027-2036 (Dec.) 1939.

104 Schopfer W H. Recherches sur l'emploi possible d'un végétal pour la vitamine B<sub>1</sub>. Essai d'étalonnage. Bull. Soc. chim. biol. 17: 1097-1109 (July-Aug.) 1935. Etude sur les facteurs de croissance. Action de la vitamine cristallisée B<sub>1</sub> et de l'extrait de germe de blé sur Rhizopus et d'autres Mucorinees. Ztschr. f. Vitaminforsch. 4: 187-206 (July) 1935.

105 Schultz A, Atkin L and Frey C N. A Fermentation Test for Vitamin B<sub>1</sub>. J. Am. Chem. Soc. 59: 948-949 (May) 1937.

106 Atkin Lawrence, Schultz A S and Frey C N. Ultra-microdetermination of Thiamine by the Fermentation Method. J. Biol. Chem. 129: 471-476 (Aug.) 1939. Goodhart Robert. The Thiamine Content of Human Blood and Urine as Determined by the Fermentation Method. J. Clin. Investigation. 20: 625-630 (Nov.) 1941.

107 Orla-Jensen S, Otte N C and Snoglyjaer Agnete. The Vitamin and Nitrogen Requirements of the Lactic Acid Bacteria. Copenhagen. Levin & Munksgaard. Mem. Acad. Roy. Sci. Lett. Denc. mark. 6: 1-52. 1936.

108 Snell E E and Strong F M. A Microbiological Assay for Riboflavin. Indust. & Engin. Chem. Anal. Ed. 11: 346-350 (June) 1939. Strong F M, Feeney R E, Moore Barbara and Parsons Helen T. The Riboflavin Content of Blood and Urine. J. Biol. Chem. 137: 363-372 (Jan.) 1941. Axelrod A E, Spies T D and Elvehjem C A. Riboflavin Content of Blood and Muscle in Normal and in Malnourished Humans. Proc. Soc. Exper. Biol. & Med. 46: 146-149 (Jan.) 1941.

Hemophilus parainfluenzae, has been shown to be replaceable by two coenzymes (cozymase or codehydrogenase) which contain nicotinamide. Hence this micro-organism has been used to measure the cozymase content of the blood.<sup>109</sup> But it is stated that determination of coenzyme I offers little diagnostic information in borderline cases of deficiency disease.<sup>110</sup> The fermentation test has been used in determining the thiamine content of urine.<sup>111</sup> Riboflavin in the urine has been estimated by bacterial assay with *L. casei*.<sup>112</sup> With dog's urine the growth of *Bacterium paratyphosum* and *H. parainfluenzae* has been used to assay the content of nicotinic acid<sup>113</sup> and factor V respectively.<sup>114</sup>

In an attempt to simplify the method of estimating tissue saturation with vitamin C, Rotter<sup>115</sup> introduced the intradermal test whereby a small amount of dichlorophenol-indophenol dye is injected beneath the skin and the fading time is recorded. The validity and reliability of the test have been questioned, principally because its values do not correspond with plasma levels of vitamin C.<sup>116</sup> Recently this skin test was found to be more closely related to the urinary excretion test for saturation with vitamin C.<sup>117</sup>

Biophysical methods have been designed to elicit under stress and to measure by special instruments functional or structural impairments attributed to avitaminoses. Methods for detection of visual dysadaptation to darkness were in use long before they were proposed as a means of recognizing early avitaminosis A.<sup>118</sup> Following Fridericia and Holm's

experimental production of night blindness in rats on an A-deficient diet,<sup>119</sup> Jeans suggested that dysadaptation be used as an index of avitaminosis A.<sup>120</sup> Several instruments for measuring dark adaptation have been devised.<sup>121</sup> These instruments have been shown to have technical faults and the test itself has been criticized on its subjectivity, lack of fixed threshold and standards.<sup>122</sup> The extensive literature on the subject has been presented.<sup>123</sup> Furthermore, under actual field conditions in three surveys the most recent models gave disappointing results, since a single measurement of the visual threshold was found not to be a reliable indicator of mild avitaminosis A.<sup>124</sup> The fault seems to lie not in the instruments or in their ability to detect dysadaptation but in the inference that dysadaptation appears as a sign of early or mild avitaminosis A. The latter inference has been questioned.<sup>125</sup>

Measurement of capillary resistance to pressure, another biophysical method, has been applied in appraising vitamin C status. Like dysadaptation, capillary fragility was originally described in association with a variety of pathologic states.<sup>126</sup> In 1914 Hess described tests with positive pressure showing impaired capillary resistance in scorbutic infants.<sup>126</sup> Using the same procedure and counting petechiae, Gothlin suggested that capillary resistance or fragility be used as a measure of vitamin C status.<sup>127</sup> Meanwhile, a method for measuring capillary fragility by application of negative pressure had been developed and used in many diseases,

119 Fridericia L. S. and Holm E. Experimental Contribution to the Study of the Relation Between Night Blindness and Malnutrition. Influence of Deficiency of Fat Soluble A Vitamin in the Diet on the Visual Purple in the Eyes of Rats. *Am J Physiol* **73** 63 78, 1925

120 Jeans and Zentmire<sup>61</sup>

121 Jeans P. C., Blanchard E. L. and Satterthwaite F. E. Dark Adaptation and Vitamin A. Further Studies with the Biophotometer. *J. Pediatr* **18** 170 194 (Feb.) 1941. Hecht Selig and Shlaer, S. Adaptometer for Measuring Human Dark Adaptation. *J. Optic Soc. America* **28** 269 275 (July) 1938. Feldman J. B. Practice of Dark Adaptation (review). *Arch. Ophthalmol.* **19** 882 901 (June) 1938. The Use of the Photometer in Detecting Latent Avitaminosis A. Nutrition. The Newer Diagnostic Methods. Proceedings of the Round Table on Nutrition and Public Health. Sixteenth Annual Conference of the Milbank Memorial Fund (March 29 31) 1938. pp. 63 75. Sloan Louise L. Instruments and Techniques for the Clinical Testing of Light Sense. I. Review of the Recent Literature. *Arch. Ophthalmol.* **21** 913 934 (June) 1939. II. Control of Fixation in the Dark Adapted Eye. *ibid.* **22** 226 232 (Aug.) 1939. III. An Apparatus for Studying Regional Differences in Light Sense. *ibid.* **22** 233 251 (Aug.) 1939. Pett L. B. Vitamin A Deficiency. Its Prevalence and Importance as Shown by a New Test. *J. Lab. & Clin. Med.* **25** 149 160 (Nov.) 1939. Pett L. B., and Lipkind M. K. Factors Affecting the Pett Visual Test for Vitamin A Deficiency. *Canad. J. Res. (B)* **19** 99 108 (April) 1941. Wald George A. Portable Visual Adaptometer. *J. Optic Soc. America* **31** 235 238 (March) 1941. Jeans and Zentmire<sup>61</sup>. Hecht<sup>61</sup>

122 Snelling, C. E. A Study of the Birch Hirschfeld Photometric Test for Vitamin A Deficiency. *J. Pediatr* **9** 655 661 (Nov.) 1936. Palmer C. E. and Blumberg Harold. The Use of a Dark Adaptation Technic (Biophotometer) in the Measurement of Vitamin A Deficiency in Children. *Pub. Health Rep.* **52** 1403 1418 (Oct. 8) 1937. Palmer C. E. The Dark Adaptation Test for Vitamin A Deficiency. *Am. J. Pub. Health* **28** 309 315 (March) 1938. Hunt Eleanor P. and Palmer C. E. Medical Evaluation of Nutritional Status. II. Measurement of Visual Dark Adaptation with the Adaptometer, Milbank Memorial Fund Quart. **18** 403 424 (Oct.) 1940.

123 Hunt and Hayden<sup>62</sup>

124 Steven David and Wald, George. Vitamin A Deficiency. A Field Study in Newfoundland and Labrador. *J. Nutrition* **21** 461 476 (May) 1941. Yarbrough M. E. and Dunn W. J. Dark Adaptometer and Blood Vitamin A Measurements in a North Carolina Nutrition Survey. *J. Nutrition* **22** 597 607 (July) 1941. Hunt and Hayden<sup>62</sup>

125 Koch C. Ein Beitrag zur Purpura bei Kindern. *Jahrb. f. Kinderh. u. physisch. Erzieh.* **30** 403 408, 1889 1890. Rumpel T. Aerztlicher Verein in Hamburg. Sitzung vom 15 Juni 1909. München med. Wchnschr. **56** 1404 1909. Leede C. Hautblutungen durch Stauung hervorgerufen als diagnostisches Hilfsmittel beim Scharlach. *ibid.* **58** 293 295 (Feb.) 1911. Zur Beurteilung des Rumpel Leedeschen Scharlachaphanomens. *ibid.* **58** 1673 1674 (Aug.) 1911. Lewis Thomas and Harmer I. M. Rupture of Minute Vessels in Skin and Disruptions of Cutaneous Haemorrhages and Other Skin Eruptions. *Heart* **13** 337 355 (Dec.) 1926.

126 Hess A. F. Survey—Past and Present. Philadelphia J. B. Lippincott Company. 1920. chapter 7. p. 212. Hess and Fish<sup>63</sup>

127 Gothlin G. F. Outline of a Method for the Determination of the Strength of the Skin Capillaries and the Indirect Estimation of the Individual Vitamin C Standard. *J. Lab. & Clin. Med.* **18** 484 490 (Feb.) 1933. A Method of Establishing the Vitamin C Standard and Requirement of Physically Healthy Individuals<sup>64</sup>

109 Kohn H. I. The Concentration of Coenzyme-like Substance in Blood Following the Administration of Nicotinic Acid to Normal Individuals and Pellagrics. *Biochem. J.* **32** 2075 2083 (Dec.) 1938. Vilter R. W., Vilter Sue P., and Spies, T. D. Relationship Between Nicotinic Acid and a Codehydrogenase (Cozymase) in Blood of Pellagrics and Normal Persons. *J. A. M. A.* **112** 420 422 (Feb. 4) 1939. Determination of the Codehydrogenases I and II (Cozymase) in the Blood of Diabetics in Severe Acidosis. *Am. J. M. Sc.* **197** 322 326 (March) 1939. von Euler, V., and Schlenk I. Nicotinsäureamid und Cozymase im Blut. *Klin. Wchnschr.* **18** 1109 1111 (Aug. 19) 1939. Kohn H. I. and Bernheim F. The Blood V Factor (Coenzyme) Level in Normal and Pathological Subjects, *J. Clin. Investigation* **18** 585 591 (Sept.) 1939. Axelrod Gordon and Elvehjem<sup>110</sup>

110 Axelrod A. F., Gordon E. S., and Elvehjem C. A. The Relationship of the Dietary Intake of Nicotinic Acid to the Coenzyme I Content of Blood. *Am. J. M. Sc.* **199** 697 705 (May) 1940.

111 Schultz A. S. Light R. F. and Frey C. N. Vitamin B<sub>1</sub> Metabolism in Man. Excretion of B<sub>1</sub> in Urine and Feces. *Proc. Soc. Exper. Biol. & Med.* **38** 404 406 (April) 1938. Schultz A. S., Atkin Lawrence, and Frey C. N. A Method for the Determination of Thiamine and Certain of Its Metabolic Products in Urine. *J. Biol. Chem.* **136** 713 717 (Dec.) 1940. Pollack Herbert, Ellenberg Max and Dolger, Henry. Clinical Studies on Vitamin B<sub>1</sub> Excretion Determined by the Fermentation Method. *Arch. Int. Med.* **67** 793 804 (April) 1941. Goodhart<sup>108</sup>

112 Fraser H. I., Topping N. H. and Isbell Harris. The Bacterial Assay of Riboflavin in the Urine and Tissues of Normal and Depleted Dogs and Rats. *Pub. Health Rep.* **55** 280 289 (Feb. 16) 1940. Isbell Harris, Woolley J. G. and Fraser H. I. The Inhibiting Effect of Urea on the Microbiological Assay of Riboflavin. *ibid.* **56** 282 285 (Feb. 14) 1941. Sebrell W. H. Jr. Butler, R. E., Woolley J. G. and Isbell Harris. Human Riboflavin Requirements Estimated by Urinary Excretion of Subjects on Controlled Intake. *ibid.* **56** 510 519 (March 14) 1941. Axelrod, A. E., Spies T. D., Elvehjem C. A. and Axelrod, Velma. A Study of Urinary Riboflavin Excretion in Man. *J. Clin. Investigation* **20** 229 232 (March) 1941.

113 Fraser H. I., Topping N. H. and Sebrell W. H. Jr. The Assay of Urine in Canine Blacktongue by the Use of *Shigella Paratyphosum* (Sonne). *Pub. Health Rep.* **53** 1836 1842 (Oct. 14) 1938.

114 Pittman Margaret and Fraser H. I. The Determination of V Factor in the Urine and Tissues of Normal Dogs and of Dogs with Blacktongue by the Use of *Hemophilus Parainfluenzae*. *Pub. Health Rep.* **55** 915 925 (May 24) 1940.

115 Rotter H. Determination of Vitamin C in the Living Organism, *Nature* **139** 717 (April 24) 1937. Portnoy, Benjamin and Wilkinson J. I. Intradermal Test for Vitamin C Deficiency. *Brit. M. J.* **1** 328 329 (Feb. 12) 1938.

116 Poncher H. G. and Stubenrauch C. H. Jr. Intradermal Dye Test for Vitamin C Deficiency. *J. A. M. A.* **111** 302 304 (July 23) 1938. Jetter W. W. Correlation Between Blood Ascorbic Acid and the Dichlorophenol Indophenol Intradermal Test. *Proc. Soc. Exper. Biol. & Med.* **39** 169 171 (Oct.) 1938. Poulsen E. and Lieck H. Undersegelser over H. Rotter's Intracutane Paa Mennesker Til Paavising af Vitamin C. *Ugeskr. f. Læger* **101** 206 208 1939.

117 Banerjee Sachchidananda and Guha B. C. The Intradermal Test as an Index of Vitamin C Nutrition. *Indian M. Gaz.* **75** 468 473 (Aug.) 1940.

118 Birch Hirschfeld, A. Ueber Nachtblindheit im Kriege. *Arch. f. Ophth.* **92** 273 340 1917. Weitere Untersuchungen über Nachtblindheit im Kriege. *Ztschr. f. Augenheilk.* **38** 57 89 1917. Adams Dorothy. Dark Adaptation. A Review of the Literature. Medical Research Council Special Report Series No. 127. London His Majesty's Stationery Office, 1929.

but not with reference to vitamin C undernutrition<sup>178</sup>. Later it was adapted to appraising vitamin C status<sup>129</sup>.

Several investigators have found no correlation between the values for capillary resistance and the plasma concentration or urinary excretion of ascorbic acid<sup>140</sup>. More important, the method yielded a high degree of variation in values. Its limitations have been fully discussed<sup>141</sup>. It is useful for recognizing somewhat severe acute scurvy. But it does not detect early or mild avitaminosis C, for capillary fragility does not appear in this state<sup>142</sup>.

For many years tests of neuromuscular response to galvanic stimulation were employed in clinical medicine. Although the method was first applied to adults,<sup>143</sup> its use was soon limited to the diagnosis of "latent" tetany in infants and children<sup>144</sup>. It indicated, therefore, disturbances in calcium or vitamin D, or both. Its wide variability in older children and adolescents and the availability of methods for determining the content of calcium in the blood led to almost complete abandonment of the neuromuscular method.

Morphologic methods include the x-rays, the microscope and the biomicroscope with simple inspection for definite lesions. New aids in the recognition of slight changes in the skeleton in early scurvy by x-ray examination have been furnished<sup>145</sup>. At the same time it has been pointed out that subperiosteal hemorrhages in infantile scurvy may not be visualized on the roentgenogram until administration of vitamin C induces deposition of calcium salts in the periosteum<sup>146</sup>.

According to Eliot and Park<sup>147</sup> "the x-rays give more accurate information concerning the existence of active or healing rickets than physical examination, but for early diagnosis they have limitations." Furthermore, it has been shown that there may be conflict of opinion as to the presence or absence of evidence of rickets in individual films<sup>148</sup>.

By differential staining and microscopic examination the demonstration of keratinized epithelial cells in the scrapings from the corner, the nose and the mouth, and in secretions from the trachea, bronchi, kidneys and vagina has been proposed as confirmatory diagnosis.

tic evidence in suspected cases of avitaminosis A<sup>149</sup>. It will be noted this procedure was not asserted to be a means of early detection.

Gross and biomicroscopic examination of the conjunctiva, ocular limbus, tongue and gums reveals all forms, degrees and stages of avitaminosis A, ariboflavinosis, aniacinosis and avitaminosis C respectively<sup>138</sup>. In each specific tissue site selected for observation the pathologic process not only appears early but persists and changes in correspondence with the course of the avitaminosis. Furthermore, the site is readily accessible to observation. Although very much may usually be seen grossly in moderate and severe states, the biomicroscope is exceedingly sensitive in revealing the very early and slight tissue changes. It allows low grade states, whether prolonged or not, to be detected. In fact, it is essential for observation of these states. The slighter the change and the closer it approaches perfection, the more the microscope is needed. From this examination, status is expressed for both acute and chronic processes, each in terms of stage and degree.

#### CHOICE OF METHODS

Which kind of method is best? The answer depends on the purpose for which the method is to be used. The outstanding objective is the appraisal of nutritional status in the population, to be conducted in schools, industry, business organizations, private practice, hospitals, public health centers and fields surveys. Certain requirements inherent in this objective must be met. The test for a particular deficiency disease should be simple, easy, quick and reliable. Preferably it should be objective rather than subjective. Practical considerations require that it be feasible. The tests for individual deficiencies should be adaptable to combination in a system of examination which retains all the qualities enumerated. Furthermore, such a system should not require too many instruments or large personnel. When one instrument can be used for several tests there is a distinct advantage. The system must also be applicable to all ages, adults as well as children. No age group should be overlooked. It should be noted that many methods in the past applied exclusively to children. Malnutrition in adults has been a neglected subject. Important as is nutrition in the growth period, it is equally important in the later decades. Recognition of the chronic state gives emphasis to this statement. Finally, in order to characterize malnutrition it is essential not only to detect the occurrence but also to establish the status of each deficiency disease. It is particularly important that the system of evaluation should be effective in detecting the states in which deficiency diseases actually exist most frequently in the population. Most of the deficiency states in this country are chronic, in all degrees and with or without an accompanying mild or severe acute process<sup>150</sup>. Hence the system should permit detection of all forms, stages and degrees.

The several kinds of tests vary in meeting these requirements. Biochemical and microbiologic methods on blood, despite their usefulness and essentiality for many purposes, have disadvantages for application in surveys. They are laborious, are time consuming and require a laboratory with trained personnel. Unfortu-

118 Hecht A. I. Experimentell klinische Untersuchungen über Hautentzündungen im Kindesalter. *Jahrb. f. Kinderh.* 65: 113-131, 1907.  
119 Frontali Gino. I Capillari nel Bambino. Studi sull'Aspetto Microscopico sulla Resistenza sulla Permeabilità e sulla Pressione Capillare nel Vivente. *Arch. di pat. e clin. med.* 6: 190 (March) 1927; di Silva Mello A. Die Wandresistenz der Blutkapillaren (Eine einfache klinische Methode zu ihrer genauen Messung). *München med. Wchnschr.* 76: 1717-1718 (Oct. 11) 1929. Cutter I. S. and Marquardt G. H. Studies in Capillary Fragility. *Proc. Soc. Exper. Biol. & Med.* 28: 113-115 (Nov.) 1930. Cutter I. S. and John on C. A. Studies on Capillary Fragility. A Device for Study of Capillary Hemorrhage. *J. A. M. A.* 105: 505-506 (Aug. 17) 1935.

129 Daldorf Gilbert. A Sensitive Test for Subclinical Scurvy in Man. *Am. J. Dis. Child.* 46: 794-802 (Oct.) 1933. Schultz M. P. Studies of Ascorbic Acid and Rheumatic Fever. II. Test of Prophylactic and Therapeutic Action of Ascorbic Acid. *J. Clin. Investigation* 15: 385-391 (July) 1936.

130 Abt A. F., Farmer C. J. and Epstein I. M. Normal Ceutamic (A corbic) Acid Determinations in Blood Plasma and Their Relationship to Capillary Resistance. *J. Pediatr.* 8: 119 (Jan.) 1936. Anderson C. K., Hawley Estelle L. and Stephens D. J. Capillary Fragility and Vitamin C. *Proc. Soc. Exper. Biol. & Med.* 34: 778-782, 1936. Liebmann James, Wortis Herman and Wortis Ethel. Note on the Lack of Correlation of Capillary Fragility with Vitamin C Content of Blood, Spinal Fluid and Urine. *Am. J. M. Sc.* 196: 388-392 (Sept.) 1938.

131 Gethlin G. F. When Is Capillary Fragility a Sign of Vitamin C Subnutrition in Man? *Lancet* 2: 703-705 (Sept. 18) 1937. Sloan K. A. A Comparison of Methods for Detecting and Grading Subclinical Scurvy. *J. Lab. & Clin. Med.* 23: 1015-1026 (July) 1938.

132 Erb W. Zur Lehre von der Tetanie nebst Bemerkungen über die Prüfung der electrischen Freigbarkeit motorischen Nerven. *Arch. f. Psychiat. u. Nervenkrankh.* 4: 271-316, 1874.

133 Holmes I. B. The Reliability of the Electrical Diagnosis of Tetany with Especial Consideration of the Electrical Value Found in Normal Children. *Am. J. Dis. Child.* 12: 129 (July) 1916.

134 Nelson W. E., Doughty W. M. and Mitchell A. G. Roentgenographic Utilization of Subperiosteal Hemorrhage in Infantile Scurvy. *J. A. M. A.* 101: 1417 (July 1) 1933.

135 Eliot Martha M. and Park E. A. Rickets in Brenne mann's Practice of Pediatrics. Hagerstown Md., W. F. Prior Company, Inc. 1928, vol. 1, chapter 36, p. 92.

136 Cooley T. B. and Reynolds L. The Interpretation of X-Ray Films in the Diagnosis of Rickets. *J. Pediatr.* 10: 743-747 (June) 1937.

137 Blackfan K. D. and Wolbach S. B. Vitamin A Deficiency in Infants. A Clinical and Pathological Study. *J. Pediatr.* 3: 679-706 (Nov.) 1933.

138 Kruse footnotes 55, 57 and 58. Kruse Sydenstricker Sebrell and Cleckley. Sydenstricker Sebrell Cleckley and Kruse<sup>150</sup>.

139 Kruse H. D. Unpublished observations.



nately too, as a means of appraising nutrition they have very narrow limitations beyond which they are misleading.

In the evolution and recession of an avitaminosis, the change in concentration of a vitamin in the blood and the alteration in tissue state are not synchronous. They are on different time schedules. Blood is the labile transport system. If in the initial attack the tissue were normal and the blood value were low, such a value would be significant. But practically this condition is the least frequent in the general population, indeed relatively unprevalent, and would be found mostly in infants and preschool children. With widespread prevalence of avitaminoses, particularly in the chronic form, and their establishment early in life in most persons, a perfect state in the tissue is relatively infrequent. It should not be forgotten, furthermore, that the biomicroscopic examination of tissue is sensitive in detecting the very early and mild tissue changes, indeed all states. Hence the blood method as a primary screen for the appraisal of vitamin C status has in reality a very limited range of application.

Once chronic changes have appeared—and this is the common eventuality and the most prevalent state—the blood values may be unreliable. The chronic process in the tissue recedes exceedingly slowly, almost infinitesimally, on any sustained improvement in diet and only very slowly under persistent therapy. In contrast, values on the concentration of a vitamin in the blood reflect very sensitively the recent dietary habits<sup>140</sup> as well as other conditioning factors. They may change not only with season<sup>141</sup> but also within shorter periods, they may fluctuate. Blood values rise rapidly in reflecting changes in improved intake, such as from seasonal or occasional dietary improvement, but with no noticeable effect in the chronic process in the tissue. A sustained satisfactory blood level resulting from adoption of a satisfactory diet or taking of low potency maintenance tablets, now so popular, is not accompanied by any appreciable improvement in an existing severe chronic pathologic condition in the tissue. Potent therapy will produce maximum blood levels and entirely restore bodily saturation in several weeks but will completely repair the slightest chronic tissue lesion only in months. Here a high blood level will be maintained over the many months while the tissue lesion is receding but is, of course, still abnormal. Temporarily or consistently, therefore, the blood values may, under these several circumstances, be moderate or high without demonstrable recession in the existing chronic lesion. In any of these instances the blood value would indicate a satisfactory nutritional status while the tissue would be pathologic. Manifestly, appraisal from the blood value alone would be entirely misleading.

It should be clear that there is no necessary high correlation between data derived by different methods on the same deficiency disease. They provide information on different aspects and states of the disorder. Unfortunately, this fact has not been appreciated. Rather, it has been thought that various methods applied to the same deficiency disease should yield similar data. On this basis it has become the practice to test the validity of a method by comparing its results with blood values. This procedure is entirely unsound. When it is remembered that blood values shift rapidly

and may fluctuate intermittently, while tissue changes very slowly, there should be no expectation of identical results.

An example demonstrating these points is particularly revealing. With the development of accurate methods for determining the concentration of ascorbic acid in blood and urine analyses have been conducted on these fluids, after a fasting period or a test dose, as a means of appraising vitamin C status. There has been a strong trend toward general acceptance of the results from these procedures as the true index of bodily status with respect to vitamin C. Indeed, the reliability of other methods of appraisal has been gaged by comparison with blood values as the criterion. Yet Greenberg, Rinehart and Phatak<sup>142</sup> cautioned:

"the estimation of the reduced plasma ascorbic acid is only a measure of the immediate nutritive or metabolic level relative to vitamin C and is dependent on recent dietary habits to a large degree. Although it is an index of the vitamin C nutrition at the time of the test, in a single case a low level does not imply tissue injury or scurvy (either clinical or subclinical). The latter results from the operation of suboptimal or low metabolic levels over some period of time. Conversely a good or high level would not indicate that deficiency had not operated to produce tissue injury in the past."

In line with this statement Crane and Woods<sup>143</sup> studying an acute outbreak of scurvy in children by comparing gingival condition with ascorbic acid concentration in plasma both in the autumn and in the following spring, found that 7 of 17 children with consistently high ascorbic acid values on both occasions had gingival inflammation at one or the other examination while 14 of 25 children with inflammation of at least six months' duration had high values on one or the other occasion. A similar comparison of ascorbic acid values with the states of the gingival lesions which I<sup>58</sup> conducted in a low income group, with a more sensitive method of detecting and more rigid criteria of rating pathologic conditions in the gums, revealed an even less constant relationship. These results, far from demonstrating that the blood level is a trustworthy criterion for comparison of other methods, show that it has serious restrictions as a method for appraising vitamin C status. Determination of the excretory level and bodily saturation tests, whether from serial analyses on blood or on urine, also have these limitations.

In several hands, routine examination by the biophysical methods has failed completely to detect early or even moderately intense avitaminosis<sup>144</sup>. Either the disturbances, e.g. dysadaptation and petechiae are not pronounced enough in their early stages to be detected or they are late manifestations.

The limitations of the blood, urine and biophysical methods for evaluation of nutritional status do not discredit them. Used appropriately each kind of method has value. Each has its place, each presents information on a different aspect of nutrition. The numerous articles in the literature describing studies by blood and urine methods attest their utility. For following the quick reflection of dietary habits in the body for secondary screening of persons without avitaminotic tissue changes, for specific metabolic studies, the blood or

140 Milam and Wilkin.<sup>40</sup>  
141 Trier, A. E. Serumascorbinsyrens Aarstidsvariation. Ugesk. f. Læger. 100: 10-14 (Jan. 6) 1938.

142 Greenberg, L. D., Rinehart, J. F. and Phatak, V. M. Studies on Reduced Ascorbic Acid Content of the Blood Plasma. Proc. Soc. Exper. Biol. & Med. 35: 135-139 (Oct.) 1936.  
143 Steven and Wald.<sup>14</sup> Yarbrough and Dann.<sup>14</sup> Hunt and Hyden.<sup>22</sup> Kruse.<sup>1</sup>



urine technic is the method of election. Similarly, for studying disadaptation and night blindness the adaptometer is the proper instrument.

The methods which embody gross and biomicroscopic examination of specific tissues for characteristic morphologic changes—the eyes for avitaminosis A and riboflavinosis the gums for avitaminosis C and the tongue for aminosis—meet most requirements for appraising nutritional status. Particularly they permit both the acute and chronic forms of tissue change in any stage and degree to be detected. True, if the tissue is normal it is possible that the blood values may be low. This situation however is the least frequent in the general population. Such a circumstance would be encountered most often in infants and preschool children. But the biomicroscopic system as a primary screen is so sensitive in detecting the very early or mild form that routine blood values as a secondary screen would add information in only a comparatively small number of instances.

There are still some gaps in the several systems for appraising nutrition. Despite the lack of a few tests there are now enough for application. Considering the rapid progress in this field, it is to be expected that before long the systems will be rounded out.

#### PREVALENCE OF MALNUTRITION

Obviously the recorded prevalence of malnutrition depends on the concept, criteria and means of recognizing it. In the past it has been judged by physical measurements or by presence of assorted gross signs, including those of the severe acute type of deficiency disease. Neither method has revealed any considerable prevalence of malnutrition. It is very misleading to rely on them for evidence on the amount of malnutrition. Simple inspection is not sufficiently sensitive to detect mild deficiency states, whether acute or chronic. Most of the chronic changes, even when severe, have not been recognized as specific characteristics of deficiency diseases. These conditions constitute the largest part of malnutrition.

Already the gross and biomicroscopic methods of examining tissue have yielded results indicating a high prevalence of deficiency states.<sup>139</sup> Even in high economic groups there are few people in absolutely perfect nutrition. Yet these results are not surprising. Very few persons have consistently followed throughout life a diet satisfactory in all essentials, escaped the many other causes contributing to a deficiency state or had complete recovery from any impairment of their nutrition. The older the person the more opportunity he has had for some dietary lapse or adverse influence. Then too the standard of perfection in the tissue is very exacting. And the biomicroscopic method is so sensitive that it is capable of detecting slight abnormalities. From all these considerations, the high prevalence of deficiency diseases is not unexpected.

Taken by and large most of the malnutrition is chronic, with or without mild acute, some of it is mild but much is rather severe.<sup>139</sup> This condition too is understandable. Often faulty diets persist for many years.

Some broad generalizations can be drawn about the several states in relation to factors affecting them. Like prevalence, the status of a deficiency disease is influenced by economic level, geographic region and age as well as by lesser environmental factors. Of these three it may be seen that the first two are indexes of the number, nature and degree of dietary deficiencies.

Age is again the time factor. In the lower economic groups, deficiency diseases tend to be more numerous, more severe and more advanced than in the higher economic groups. In geographic regions where a particular deficiency disease is endemic the severe acute form is common, in other regions it is rarely seen. In the latter it is mostly in the chronic form. At younger ages deficiency diseases are likely to be less prevalent and mostly in the mild acute or beginning chronic state, at older ages they are apt to be more frequent and largely in the chronic form.

These influences are not invariable, absolute or completely decisive. Economic level and geographic region are far from perfect correlates of deficient diets, and age does not initiate a deficiency disease. Nor are these influences of equal weight. Perhaps the most influential is economic level. But many persons in the higher economic groups do have severe deficiencies, while some in the lower miraculously escape. Only a small proportion of persons in an endemic region come down with a severe acute deficiency disease, almost all of these are in the low income group. As for the influence of age, adults may be normal, whereas children, particularly if they are from low income families, may exhibit a chronic process. We have seen numerous children from 8 to 11 years old and in low economic groups with chronic changes similar to those most frequent in the middle age group.

It is apparent that there is much malnutrition, most of it chronic in character. If we wish to be coldly scientific we can join the skeptic in asking: What of it? What is the justification for the expense and work in examining persons and treating the marginally malnourished? It is appropriate to raise the question whether the mild and chronic forms of malnutrition have any significance. Increasing evidence indicates that they have immediate and that they may also be found to have long range effects.

For one thing troublesome symptoms occurring in these mild and chronic forms of malnutrition and their disappearance under treatment may be noted objectively. In riboflavinosis, photophobia and lacrimation are frequently noted during the biomicroscopic examination.<sup>140</sup> Psychic manifestations have been observed in mild atherosis.<sup>141</sup> Doubtless, disturbing symptoms will be found in the mild stages of other deficiency diseases. Some are real handicaps. How much these symptoms dull the edge of health and lower performance in daily activities can now only be conjectured. In many instances, only after the symptoms have disappeared is their previous presence appreciated. Relief from such symptoms is no small benefit. The extent to which improvement is reflected in such activities as work remains to be demonstrated. In any event relief from symptoms may be regarded as one justification for the diagnosis and specific treatment of these mild and chronic states.

#### INFLUENCE ON MORBIDITY

Moreover, there are many strong intimations, short of proof, that malnutrition has a contributory or determining role in the occurrence of other diseases. This is the much debated question of the influence of nutritional status on morbidity. Up to now the lack of methods has made it difficult to supplant debate by demonstration on whether, or to what extent, impaired nutrition may play a part as a predisposing factor in

<sup>144</sup> William R. D. Mason, H. L. Wilder, R. M. and Smith, B. F. Observations on Induced Thiamine (Vitamin B<sub>1</sub>) Deficiency in Man. Arch. Int. Med. 66:785-799 (Oct.) 1940.

parasitic diseases, such as tuberculosis, and whether satisfactory nutrition may aid in building up natural resistance against such diseases. With the present availability of methods, this very promising and hopeful vista may be explored. However, we must not look for too much from nutrition, we must not expect it to confer absolute protection against disease. Other circumstances, of course, exert their influence. Rather, let us say that nutrition at most may be one factor affecting the probability of disease occurring. If that should be demonstrated it would be sufficiently important to warrant evaluation of nutritional status as a routine procedure.

## Council on Pharmacy and Chemistry

### NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

AUSTIN E SMITH, M.D., Secretary

**ASCORBIC ACID, U.S.P.** (See New and Nonofficial Remedies, 1942, p. 564)

The following dosage form has been accepted:

**PITMAN-MOORE COMPANY, INDIANAPOLIS**

Tablets Ascorbic Acid 50 mg

**DIETHYLSTILBESTROL** (See THE JOURNAL, June 20, 1942, p. 635)

The following dosage forms have been accepted:

**GEORGE A. BREON & COMPANY, INC., KANSAS CITY, MO**

Ampuls Diethylstilbestrol in Oil, 0.5 mg per cc 1 cc in vegetable oil

Ampuls Diethylstilbestrol in Oil, 1.0 mg per cc 1 cc in vegetable oil

Suppositories Diethylstilbestrol 0.5 mg

Tablets Diethylstilbestrol 0.2 mg, 0.5 mg and 1.0 mg

**FREDERICK STEARNS & COMPANY, DETROIT**

Tablets Diethylstilbestrol 0.1 mg, 0.5 mg and 1.0 mg

**MENADIONE** (See New and Nonofficial Remedies 1942, p. 584)

The following dosage forms have been accepted:

**E. R. SQUIBB & SONS, NEW YORK**

Thyloquinone (Crystals) bulk

Ampuls Thyloquinone in Oil (Intramuscular), 2 mg per cc 1 cc. Each cubic centimeter contains 2 mg of thyloquinone dissolved in corn oil.

Capsules Thyloquinone in Oil (Oral). Each brown gelatin capsule contains 1 mg of thyloquinone dissolved in corn oil.

Tablets Thyloquinone 1 mg

**NICOTINIC ACID AMIDE** (See New and Nonofficial Remedies, 1942, p. 562)

The following dosage form has been accepted:

**THE UPJOHN COMPANY, KALAMAZOO, MICH**

Sterile Solution Nicotinic Acid Amide 100 mg, 2 cc

**RIBOFLAVIN** (See New and Nonofficial Remedies, 1942, p. 559)

The following dosage forms have been accepted:

**ABBOTT LABORATORIES, NORTH CHICAGO, ILL**

Capsules Riboflavin 1 mg

Tablets Riboflavin 1 mg

**SULFANILAMIDE** (See New and Nonofficial Remedies, 1942, p. 142)

The following additional dosage form has been accepted:

**E. R. SQUIBB & SONS, NEW BRUNSWICK, N. J.**

Ampul Sulfanilamide (Crystals) 1 gm

## Council on Foods and Nutrition

### ACCEPTED FOODS

THE FOLLOWING ADDITIONAL FOODS HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON FOODS OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO ACCEPTED FOODS.

FRANKLIN C. BING, Secretary

**FATS AND OILS** (See Accepted Foods, 1939, p. 30)

**Wilson & Co. Inc., Chicago**

**WILSON'S CERTIFIED OLEOMARGARINE AND WILSON'S SAVORY OLEO MARGARINE FROM VEGETABLE SOURCES WITH VITAMIN A ADDED**, an oleomargarine consisting of partially hardened cottonseed oil, cottonseed oil cultured skimmed milk salt emulsifier (manufactured by the firm consisting of diglyceride with minor amounts of monoglycerides, triglycerides and fatty acids) plus vitamin A concentrate in oil.

*Analysis* (submitted by manufacturer)—Moisture 15.1% fat 80.5% ash 3.11% protein 0.55% total carbohydrates 0.74% sodium chloride 3.0%

*Calories*—7.3 per gram 207 per ounce

*Vitamins*—The firm has supplied evidence that this product furnishes at least 9,000 U.S.P. units of vitamin A per pound.

**Wilson & Co. Inc., Chicago**

**WILSON'S CERTIFIED OLEOMARGARINE AND WILSON'S SAVORY OLEO MARGARINE FROM ANIMAL SOURCES WITH VITAMIN A ADDED**, an oleomargarine consisting of oleo oil, oleo stock, cottonseed oil, neutral lard salt cultured skimmed milk emulsifier (manufactured by the firm consisting of diglyceride with minor amounts of monoglycerides, triglycerides and fatty acids) plus vitamin A concentrate in oil.

*Analysis* (submitted by manufacturer)—Moisture 15.1% fat 80.5% ash 3.11% protein 0.55% total carbohydrates 0.74% sodium chloride 3.0%

*Calories*—7.3 per gram 207 per ounce

*Vitamins*—The firm has furnished evidence that the product supplies at least 9,000 U.S.P. units of vitamin A per pound.

**FOODS FOR SPECIAL DIETETIC PURPOSES** (See Accepted Foods, 1939, p. 295)

**Chicago Dietetic Supply House Inc., Chicago (distributor)**

**CELLU GREEN LIMA BEANS**, canned green lima beans, packed in water without added sugar or salt.

*Analysis* (submitted by distributor)—Moisture 77.4% sucrose 1.6% starch 9.55% crude fiber 1.17% undetermined carbohydrates etc. (by difference) 4.8% ether extract (crude fat) 0.19% protein (N x 6.25) 4.67% ash 0.6%

*Calories*—0.85 per gram, 24 per ounce

**FRUIT JUICES INCLUDING TOMATO JUICE** (See Accepted Foods, 1939, p. 48)

**Domino Canning Association, Bradenton, Fla.**

**DOMINO AND SUNSEAL BRANDS OF BLENDED FLORIDA ORANGE AND GRAPEFRUIT JUICE (SUGAR ADDED)**, a mixture of Florida orange and grapefruit juices (sweetened).

*Analysis* (submitted by manufacturer)—Moisture 87.8% total solids 12.2% ash 0.5% fat (ether extract) 0.1% protein (N x 6.25) 0.5% crude fiber 0.1% carbohydrates other than crude fiber but including citric acid (by difference) 11.0% sucrose 1.5% reducing sugar (as invert) 8.3% acid (as anhydrous citric) 1.1%

*Calories*—0.47 per gram 13.3 per ounce

*Vitamins*—Vitamin C (by titration with 2,6-dichlorophenolindophenol) 36.2 mg per hundred grams

**PREPARATIONS USED IN THE FEEDING OF INFANTS** (See Accepted Foods, 1939, p. 156)

**Gerber Products Company, Fremont, Mich.**

**GERBER'S JUNIOR FOODS—APPLE PRUNE TAPIOCA PUDDING**, a canned cooked mixture of fresh apples, prunes, fresh whole milk, sugar, tapioca, cream (0.5%) and salt.

*Analysis* (submitted by manufacturer)—Moisture 73.2% ash 0.4% fat 1.0% protein (N x 6.25) 0.2% crude fiber 0.8% carbohydrates (by difference) 24.3% calcium 0.012% phosphorus 0.012% iron 0.0014%

*Calories*—1.07 per gram 30.4 per ounce

*Vitamins* (Reports of assays furnished by firm 1942)—Vitamin A 240 I.U. per hundred grams, ascorbic acid 0.3 mg per hundred grams

**Paley Sachs Food Company, Houston, Texas**

**MRS. PALEY'S BABY FOODS BRAND—STRAINED BEEF LIVER**, a strained mixture of beef liver, water and salt.

*Analysis* (submitted by manufacturer)—Moisture 76.0% total solids 24.0% ash (mineral matter including salt) 1.4% fat 3.6% protein 14.2% total carbohydrate (by difference) 4.9% iron 0.005%, phosphorus 0.097% calcium 0.003%

*Calories*—1.0 per gram 29.3 per ounce

*Vitamins*—(Chemical assays submitted by firm)—Each hundred grams furnishes 6,500 international units of vitamin A and 0.035 mg of thiamine.

# THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY FEBRUARY 27 1943

## ANNUAL CONGRESS ON MEDICAL EDUCATION AND LICENSURE

The thirty-ninth Annual Congress on Medical Education and Licensure sponsored by the Council on Medical Education and Hospitals of the American Medical Association was one of the most successful ever assembled. Indeed the results establish the necessity of the assembly in wartime. Elsewhere in this issue appears the contribution made to the congress by Pres. Edward C. Elliott, chief of the division of professional and technical employment and training in the War Manpower Commission, the statement of Brig. Gen. Joe A. Dalton, assistant chief of staff for personnel of the United States Army, describing plans for premedical and medical education as related to the United States Army, the contribution of Dr. Harold S. Diehl of the directing board of the Procurement and Assignment Service for Physicians, Dentists and Veterinarians concerning medical education as related to the procurement and assignment of physicians, and finally a report by Col. George F. Lull, chief of the personnel division of the United States Army Medical Corps, on the utilization of physicians by the Army. Here are the answers to most of the questions which have been disturbing members of the medical profession in recent months.

President Elliott indicates the nature of the problems which confront the War Manpower Commission and emphasizes the fact that education as well as every other aspect of our lives must appreciate the inescapable requirements of global war. Brigadier General Dalton gives in detail an analysis of the premedical and medical programs, the methods by which students will be selected, the curriculums that they will follow, the emoluments that they will receive, the nature of the internship and many other facts about this procedure. Dr. Harold S. Diehl indicates some of the questions which continue to concern educators in medicine. His paper will no doubt bring these questions clearly before the authorities responsible for the ultimate functioning of the program

and enable them to act promptly in making every adjustment possible.

Colonel Lull has had one of the most difficult positions in the entire war effort, at least as far as medicine is concerned. The fact that the Army Medical Department had more than 35,000 medical officers on duty at the end of 1942 is an indication of the tremendous task that has been successfully accomplished. His citation of actual communications received from physicians in the service and his explanations of the duties which physicians in the armed forces must fulfill should answer many of the questions which continue to come to all those engaged in meeting the demands for personnel. The use of specialists in the armed forces, the formation of hospital units, the changing curriculum of the Medical Field Service School, the graduate courses now being developed, the use of women physicians and the provision of residents for hospitals are some of the problems which he analyzes and explains. It would be well if all could bear in mind one of his concluding statements:

When you hear from a disgruntled officer please evaluate his statements before you form an opinion of the entire medical service of the Army. Also remember that there are a lot of medical officers satisfied with their temporary jobs, and most of these do not write to you.

Among other problems discussed at this congress were graduate education and the war and medical licensure. The Surgeon General of the Navy, Rear Admiral Ross T. McIntire, gave a graphic account of the medical services in the South Pacific, and Surgeon General Thomas Parran provided a forecast of some of the medical problems of the postwar period. These additional contributions will be reflected in forthcoming issues of THE JOURNAL.

In his opening statement for the congress, Dr. Ray Lyman Wilbur, chairman of the Council on Medical Education and Hospitals, said in part:

We must all recognize the difficulty of holding our eager American youths at the risk of prolonged medical study when there are other and quicker ways of getting into the fight. So far we seem to have enough premedical students of quality to carry forward this year in our medical schools. The importance of medical training must be pointed out and the definite assignment by the Army and Navy of chosen men to medical schools must be put into effect. To run short of good doctors would be a calamity of the first magnitude. New methods of financing hospital care, new procedures under the auspices of the medical profession for medical care are constantly appearing. These with the changes in normal life due to the war are putting new responsibilities on every physician in the land. Modern science applied to human living has done more for our comfort and safety in the last fifty years than in all of the ages preceding. We must enter on our share in the war with the firm resolve to give all that medicine offers, but with an even firmer resolve not to lose what we have won in the battle against disease and ignorance. Whatever the calls on us, we must see that medicine advances during the war and that it goes back at least to our highest level of achievement when the bombs stop dropping.

American medicine has performed remarkably in meeting the demands placed on it for the war effort. The officials of the government and officers of the armed

forces who have been charged with the task of providing for medical care have been sympathetic to the needs of medical education and of civilian medical practice. The accomplishment of the Council on Medical Education and Hospitals in providing at this congress statements from authoritative sources as to present plans and changes contemplated for the future in medical education and in medical practice merits the appreciation particularly of medical educators, since it stabilizes definitely a situation full in recent months of apprehensions and doubts.

### IMMERSION BLAST INJURIES

The mechanism of the effects of blast in water is that of a single wave of pressure, the reflected wave from the sea bottom being of little importance. The pressure wave in water travels at the same speed as it does at first in air. However, the rate of fall of pressure is much slower than in air and varies directly with the distance, hence pressure effects will be expected over much greater distance. Williams<sup>1</sup> in his Hunterian Lecture, pointed out that the human body has roughly the same density as water. When the pressure wave impinges on the water there will be no reflection but the force will be transmitted through the tissues without displacement just as if the body were so much water. However, when the transmitted force encounters a cavity in the body containing air for example the lungs, the static wave of pressure will change into a wave of kinetic energy in the layers of tissue lining that cavity and a disruptive effect will occur. This apparently explains why the lungs and other gas filled cavities in the body are particularly susceptible to damage from the pressure wave, even though the body itself may not be deeply immersed.

Cameron and his associates<sup>2</sup> subjected goats, monkeys and dogs to the explosion of a 320 pound charge of trinitrotoluene suspended at 48 feet in water of 90 feet. The animals were buoyed up by inflated rubber tires round their necks and were secured to a line at various intervals. Studies of pathologic changes in animals thus exposed revealed severe pulmonary hemorrhages and interstitial emphysema, sometimes hemorrhage in the wall of the alimentary tract, occasionally hemorrhage in the epicardium, spleen, kidneys and ductless glands. Little damage was produced in the soft structures of the body wall and the bones.

Effects of immersion blast on man are also discussed in a symposium published in the January issue of the *United States Naval Medical Bulletin*. Observations on 35 patients treated at a naval hospital form the basis

for the report. According to Lieutenant Commander Palma and Lieutenant Uldall<sup>3</sup> the severity of the symptoms depended on the distance of the men from the source of the explosion and on their own relative position in the water, whether horizontal or perpendicular, facing the blast or with their backs turned. From ten to forty-five minutes after the explosion the ones that were facing the blast or swimming in the prone position began to develop abdominal symptoms varying in degree from mild intermittent cramps to severe continuous abdominal pain. Several vomited and developed diarrhea. Many had hemoptysis lasting from twelve to twenty-four hours. The group that had their backs toward the blast or who were swimming in the supine position developed similar abdominal symptoms but to lesser degree, and their signs and symptoms were principally in the chest. Of the entire group only 14 had signs and symptoms of severe injury, the signs being chiefly those of shock and peritonitis. Physical signs in the chest were more often absent than present, but roentgenograms revealed in all but 1 case slight to moderate areas of increased density at one or both bases. Treatment was symptomatic and expectant, with the employment of sulfadiazine. In this group 6 recovered completely without an operation, 2 are recovering without an operation, 2 are recovering after surgical interventions and 4 died. Postmortem observations by Lieutenant Commander Ecklund<sup>4</sup> in the 4 fatal cases revealed severe intra-abdominal lesions in each instance without any external evidence of injury. Sections from lungs showed extensive hemorrhage into the alveoli and rupture of the alveolar walls. Much the same observations were made by Cameron and his associates in their animal experiments. From these observations it appears that the principal seat of trauma in atmospheric blast is in the thoracic cavity, whereas the predominating injuries in immersion blast are abdominal.

Neurologic observations were, under the circumstances limited and unsatisfactory, and microscopic studies of the central nervous system were not made. Lieutenant Hamlin<sup>5</sup> suggests in his discussion that a blast wave of sufficient magnitude may be transmitted to the spinal canal and thence to the cranial cavity, setting up a convection force in the cephalad direction through the spinal fluid and possibly the neuroaxis itself, which may be analogous to the phenomenon of cerebral acceleration that follows a blow to the head. Such a mechanism could damage the supporting vessels of the leptomeninges, giving rise to subarachnoid hemorrhage and neurologic symptoms.

More complete knowledge of the extent and mechanism of the lesions caused by immersion blast injuries

3 Palma Joseph and Uldall J J. Immersion Blast Injuries. U S Nav M Bull 41 3 (Jan) 1943.

4 Ecklund A M. The Pathology of Immersion Blast Injuries. U S Nav M Bull 41 19 (Jan) 1943.

5 Hamlin H. Neurological Observations on Immersion Blast Injuries. U S Nav M Bull 41 26 (Jan) 1943.

1 Williams E R P. Blast Effects in Warfare. Brit J Surg 30 38 (July) 1942.

2 Cameron G R, Short R H D and Wakeley C P G. Pathological Changes Produced in Animals by Depth Charges. Brit J Surg 30 49 (July) 1942.

will be forthcoming from more thorough postmortem observations, preferably from immediately fatal cases, and from animal experiments. Such experimental studies are now in progress.

### RESENSITIZATION OF SULFONAMIDE FAST BACTERIA

Encouraging new facts point toward successful therapeutic control of sulfonamide fast infections. Under certain test tube conditions or as a result of unsuccessful sulfonamide therapy numerous pathogenic bacteria acquire a tolerance or resistance to one or more of the sulfonamide compounds. They become able to multiply normally in the presence of the usual bacteriostatic concentration of these agents. Sulfonamide fast infections often do not yield to many times the usually successful therapeutic dose of sulfanilamide, sulfadiazine or sulfathiazole. Generally this acquired sulfonamide fastness is believed to be due to increased production by the organisms of sulfonamide inhibitors. This theory is in line with the fact<sup>1</sup> that bacterial extracts often contain a proliferative coenzyme ("P factor") which may be present in sufficient amounts to neutralize the bacteriostatic effects of sulfonamide compounds. Numerous known chemical substances also function as antisulfonamides, prominent among them being methionine and p-aminobenzoic acid.<sup>2</sup>

If increase in this P factor is the sole explanation of acquired sulfonamide fastness a logical method of overcoming this fastness would be to use some substance that would neutralize, inhibit or otherwise overcome the growth promoting action of this factor. Tsuchiya, Tenenberg and others<sup>3</sup> of the Department of Bacteriology, University of Minnesota, found in early studies that the antisulfonamide action of methionine or of p-aminobenzoic acid can be overcome by the use of urea. In itself the inhibiting concentration of urea did not have demonstrable effect on the rate of bacterial growth. Tsuchiya and his colleagues<sup>4</sup> have now tested whether or not similar concentrations of urea would have the same effect on sulfonamide resistant micro-organisms (P factor).

Three sulfonamide fast strains of *Staphylococcus aureus* were tested. One of these had been made sulfonamide fast in vitro and the two other strains were isolated from clinical cases which had failed to respond to prolonged sulfathiazole therapy. Using Gladstone's<sup>5</sup> basal synthetic medium they found that addition of 60 mg of sodium sulfathiazole per hundred cubic centimeters did not have bacteriostatic effect on these three refractory strains. Inhibition of the normal

growth rate was not seen when from 125 to 175 per cent of urea was added to the synthetic medium. A combination of 60 mg of sodium sulfathiazole per hundred cubic centimeters and from 125 to 175 per cent of urea, however, often reduced the growth rate to one one-hundredth and at times to one one-thousandth of normal. Whatever may be the ultimate explanation of the nature of sulfonamide fastness, use of this urea-sulfonamide combination overcomes that fastness and renders the organisms resuscceptible to sulfonamide bacteriostasis.

In evaluating their results it must be emphasized that thus far their "urea resensitization" has been demonstrated only for one sulfonamide compound, for one microbic species (*Staphylococcus aureus*) and only when it is grown in a relatively simple synthetic medium. There is no assurance of a similar synergic action with other sulfonamide compounds, other microbic species or on organisms suspended in serum, exudate or other body fluids. In vivo tests have not thus far been reported. Nevertheless the newly described combined action of urea and sulfathiazole is a discovery of basic clinical interest since it introduces a new concept in chemotherapy. The practical applications may in time be extended to numerous micro-organisms now considered refractory to sulfonamide drugs. The promised clinical report<sup>6</sup> of the first practical applications of the new urea-sulfathiazole combination to human cases will be awaited with interest.

### Current Comment

#### MEDICAL ACTIVITIES OF COMMON- WEALTH FUND IN 1942

Current support of the Commonwealth Fund<sup>1</sup> in medical research is chiefly directed toward work which promises direct usefulness to war medicine, to investigations which offer significant contributions to the physiologic bases of medicine and to those which rest on long continued consecutive observation that cannot be interrupted without letting partly won facts slip out of reach. In medical education the special interest of the fund has been to help medical schools to make the most of the facilities at hand without gross enlargement of departmental budgets or capital outlay. Services on the borderline between psychiatry and pediatrics and the provision of opportunities for training in psychiatry continue to be the principal contributions of the fund toward the promotion and maintenance of mental health in this country. In addition, the fund cooperated in public health studies and has continued its rural hospital programs. The disbursements of the fund in these fields of medical interest in 1941-1942 exceeded \$1,200,000.

1 Green H N. *Brit J Exper Path* **21** 38 (Feb) 1940  
2 Dubos R J. *Ann Rev Biochem* **11** 659 1942  
3 Tenenberg D J, Tsuchiya H M, Clark W G and Strakosch E A. *Proc Soc Exper Biol & Med* **50** 262 **51** 245 1942  
4 Tsuchiya H M, Tenenberg D J, Strakosch E A and Clark W G. *Proc Soc Exper Biol & Med* **51** 245 (Nov) 1942  
5 Gladstone G P. *Brit J Exper Path* **20** 189 (April) 1939

6 Strakosch E A and Clark W G. *Minnesota Med* to be published

1 The Commonwealth Fund. Twenty Fourth Annual Report of the General Director. Sept 30 1942. New York. January 1943.

## DURATION OF IMMUNITY FOLLOWING YELLOW FEVER VACCINATION

Since 1937 it has been possible to employ relatively safe vaccination against yellow fever by means of attenuated yellow fever virus unaccompanied by immune serum. This resulted from the development of a modified strain of virus (17D) which no longer produced either the visceral lesions of yellow fever or fatal encephalitis in rhesus monkeys. The duration of immunity following infection with 17D virus, however, previously had been studied on only a small scale and for periods not exceeding three years. Now Fox and Cabral<sup>1</sup> report large scale observations on the duration of immunity to yellow fever after vaccination with 17D virus over a four year period as determined by mouse protection tests. The persons included in their study all belonged to one or another of several well defined vaccination groups. Altogether 926 persons were studied, the total being composed of several large groups vaccinated at various intervals over this four year period. Recently collected serums and serums collected from the same persons soon after vaccination were examined for their protective action in mice and the results were compared. Some inconsistencies were observed. The evidence indicated that these variations were not due to previously unrecognized differences in the antigenicity of the 17D sub-strains concerned but rather to the different age compositions of the vaccination groups. Thus, only 4 (2 per cent) serums collected four years after vaccination from groups chiefly composed of adults failed to show some indication of protective action. In contrast, 36 (nearly 10 per cent) of serums collected two and three years after vaccination from groups largely composed of young persons were without protective power. Those serums which did not show protective action in the routine tests were reexamined by a more sensitive technic by which means detectable antibodies were revealed in 86 (61.8 per cent) of the 139 serums reexamined. These observations suggest that serologically demonstrable immunity against yellow fever induced by living 17D virus may completely disappear in some cases. Fox and Cabral also considered the significance of the low degrees of serologic immunity and showed that such low level immunity probably is sufficient to prevent reinfection with the 17D strain to which, in spite of its lack of virulence, man is highly susceptible. Finally, their observations on the duration of immunity following vaccination are of special significance with regard to the systematic prophylaxis of yellow fever. Thus vaccination of an adult population with a virus of established antigenicity results in the persistence of an immune state which is clearly satisfactory from the group standpoint for at least four years and probably longer. In children after vaccination the level of protective antibody does not rise as high as in adults and tends to fall more rapidly. As these investigators point out, whether or not the immunity of children conferred by vaccination is relatively

lower in degree and whether therefore the vaccination needs to be repeated after a shorter interval remains to be determined. Meanwhile this evidence of the reasonably persisting immunity from vaccination to yellow fever in adults is extremely welcome.

## FITTING HANDICAPPED WORKERS TO JOBS

Industry, which in normal times has been loath to employ the handicapped worker, is now recognizing that many handicapped persons may be as efficient as those with full physical equipment and may be safer workers if they can be properly placed, trained and supervised. *Manpower Review*,<sup>1</sup> a publication of the War Manpower Commission, has recently considered the use of handicapped persons in industry as an aid to the war effort. The fitting of a handicapped person to his job demands that there be a breakdown of the requirements for all jobs in specific relationship to the exact procedures required, such as the degree of skill and strength demanded and working conditions which surround the job. Dovetailing with the detailed job analysis there must be an equally detailed analysis of the capability of the worker. When these frameworks of information have been established, adaptation of the handicapped person to the job becomes relatively simple. Adaptations of machinery may be made, such as shifting hand or foot levers so that they can be used by workmen with missing hands or feet. From Germany comes a report concerning measuring devices which use variations in tonal qualities of sound, such as a bell to enable blind workers to "read" the instrument. Persons unable to stand or walk much may be placed in sedentary jobs to which all material is brought and from which finished products are taken away by other workers or conveyors. A sample job analysis sheet indicates the demands for walking, standing, sitting, climbing, crawling, stooping, kneeling, lifting, pulling, pushing using one foot, using two feet, using one hand, using two hands, using fingers, seeing, talking, hearing and working speed for such industrial operations as operating presses, gage and weight machines, hardening furnaces, inspection jobs, molders, loaders and the like and also classifies these jobs according to such working conditions as outside, inside, hot, cold, humid, wet, dry, dusty, fumes, noisy, dirty. A tabulation of the estimated number of persons with various types of impairment by types of preemployment service needed indicated 901,000 with hearing impairment, 337,000 blind in one or both eyes, 1,849,000 with orthopedic impairment, 1,186,000 with hernia, 976,000 with hemorrhoids and more than 11,000,000 with chronic diseases. This list was based on an estimate by the United States Public Health Service. The latent manpower in these handicapped workers can be significant in the war effort. The physician, particularly the industrial surgeon, management and labor can cooperate in the constructive utilization of this vast potential reserve.

1. Fox, J. P. and Cabral, A. S. The Duration of Immunity Following Vaccination with the 17D Strain of Yellow Fever Virus. *Am. J. Hyg.* 37: 95 (Jan.) 1943.

1. *Manpower Review*, January 1943. War Manpower Commission, Washington, D. C. (circulated to War Manpower Commission officials only).

# MEDICINE AND THE WAR

*In this section of The Journal each week will appear official notices by the Committee on War Participation of the American Medical Association announcements by the Surgeon Generals of the Army, Navy and Public Health Service and other governmental agencies dealing with medicine and the war and such other information and announcements as will be useful to the medical profession*

## ARMY

### THE TREATMENT OF BURNS

Circular Letter No 15 of the Office of the Surgeon General is concerned with the treatment of burns. It was issued on January 11 to all medical officers of the United States Army. The suggestions which follow are therefore recommended as routine in the army medical service.

1 *General*—Burns as discussed in this paragraph include all cases with damage of the skin and underlying tissues due to heat, chemicals or electricity.

2 *Fundamentals of Treatment*—(a) The prevention and control of shock is the primary consideration in the management of every burn.

(b) Proper prophylactic measures against pyogenic infection, tetanus and gas gangrene should be taken. Satisfactory end results that is, minimal scar formation largely depend on the avoidance of pyogenic infection. The moist surfaces of burns provide ideal conditions for bacterial growth and it is therefore of paramount importance to employ, if possible, strict aseptic technique in operating on and dressing burns.

(c) Measures should be taken to relieve pain.

3 *Treatment*—(a) *General* (1) Proper steps for the prevention or treatment of shock should be instituted. In the presence of extensive burns quantities of plasma up to 12 units may be required during the first twenty-four hours. It is available concentrated normal human serum albumin in appropriate amounts may be used likewise. Transfusion of fresh whole blood is often needed to combat the rapidly developing severe anemia which follows extensive burns. When anemia exists whole blood transfusion is particularly indicated as a preliminary to skin grafting. Parenteral fluid replacement other than that attained by means of plasma or whole blood transfusion should be accomplished by means of 5 per cent dextrose in sterile distilled water. The intravenous administration of sodium chloride solution should be reserved for those burn cases in which mineral depletion is pronounced as when great loss of electrolytes occurs as a result of persistent vomiting.

(2) In all cases of moderate to severe burns prophylactic chemotherapy should be administered. Sulfadiazine is the drug of choice (sulfanilamide may be substituted) with an initial dose of 4 Gm (60 grains). Subsequent doses of sulfadiazine should be given only under the direction of a medical officer. It should be kept in mind that although sulfonamide therapy may serve to prevent infection great care must be exercised in employing such therapy in burn cases. The extensive fluid loss and possible kidney damage so common in burn cases increase the danger of renal complications from sulfonamide therapy. Maintenance doses of sulfadiazine should be given in 0.5 Gm (7½ grains) doses every four hours until such time as adequate kidney function can be demonstrated under which circumstance the dosage may be increased to 1 Gm (15 grains) every four hours.

(3) Prophylaxis against tetanus is indicated for all patients with second or third degree burns.

(4) A prophylactic dose of gas bacillus antitoxin may be given at the discretion of the medical officer.

(5) Pain should be relieved by adequate doses of morphine. Pain resulting from an extensive burn can ordinarily be relieved by a dose of ½ grain of morphine. In the presence of pronounced anoxia large doses of morphine are dangerous and under such circumstances the dose should not exceed ¼ grain.

(b) *First Aid or Emergency Treatment of the Burned Area*

(1) The burned surface should be covered with a liberal amount of boric acid ointment or, if this is not available, with petrolatum. The burn should then be covered with strips of a sterile fine mesh gauze (44 mesh gauze bandage is satisfactory). Over this should be added a smooth thick layer of sterile gauze dressing (large or small first aid dressings are especially suitable for this purpose). Finally a gauze or muslin bandage should be firmly applied over the dressings.

(2) Contamination of burned surfaces by organisms from the nose and throat is responsible for most of the more serious infections which subsequently develop. Therefore, to minimize contamination from this source, masking should be practiced by the surgeon and assistants. If masks are not available, mouths should be kept closed.

(3) The prompt administration of plasma, when feasible, constitutes an important element in the emergency treatment of burns.

(c) *Definitive Treatment of the Burned Area* The burned area should be treated as follows: standard operating room technique, if possible, being employed with the patient, as well as all attendants fully masked.

(1) Ether, benzene, lard or other detergents should be used to remove grease, if present. The burned area and then separately the surrounding skin are to be carefully cleansed, using neutral soap and water. Green soap should not be used. Avoid the use of brushes in the cleansing of the burn.

(2) All blisters and loose shreds of epidermis are carefully removed, and this material is saved for bacteriologic study, if feasible. Skin that gives evidence of irreparable damage through its full thickness should be excised (evidence of irreparable damage to deeper layers of skin may not be apparent for several days, and excision in such cases should be done as a secondary procedure). The resulting wound should be handled like any other open surgical wound, primary grafting of skin being carried out if conditions permit. For painful surgical procedures or dressings general anesthesia, preferably obtained by intravenous injection, should be employed.

(3) Burns of surfaces of any portion of the body may be treated with boric acid ointment. After thorough surgical cleansing, the burned area should be covered with a generous application of boric acid ointment. Strips of a fine mesh sterile gauze (44 mesh gauze bandage is satisfactory) should be applied. Over this should be added a smooth thick layer of sterile dressing, this may consist of gauze absorbent cotton, cotton waste or cellulose. The dressings should be held in place by an evenly and firmly applied bandage, stockinet or some form of elastic bandage is more effective than the ordinary roller bandage. The dressing should not be disturbed for ten days unless complications develop. Firm pressure is especially important in the case of burns of the hands and face. Immobilization of the part by splinting should be effected when feasible.

(4) As an alternate method of definitive treatment, burns of all surfaces except those of the hands, face, genitalia and those involving the circumference of an extremity may be treated with tannic acid and silver nitrate. This method however, should not be employed in the instance of burns which are grossly contaminated or in which twelve or more hours have elapsed since the receipt of the burn. A freshly prepared 10 per cent aqueous solution of tannic acid is sprayed over the burned area. This



is followed immediately by spraying the area with a mixture of equal parts of 10 per cent tannic acid and 10 per cent silver nitrate solutions. This mixture should then be sprayed on the burn every half hour until a satisfactory eschar has been formed. Care should be taken to avoid spraying normal skin about the wound. While drying, the burned area may be kept exposed to the air in a heated cradle. After the eschar is dry, it may be covered by a dry sterile dressing. In the absence of infection, the eschar should be allowed to separate spontaneously. If infection develops, the eschar must be removed from the entire infected area, and the latter should then be treated like any other infected wound with the employment of appropriate systemic and local therapy.

(5) Isotonic solution of sodium chloride has been found useful in the treatment of burns involving the face, hands and especially fingers, the flexures and the perineum. It may also be used for the treatment of surface infections following the removal of eschars produced by tannic acid or other agents. Saline solution may be employed in the form of picks or baths.

### SILVER STAR AWARDED TO LIEUTENANT HAVLIK

Lieut. Aloysius J. Havlik, M. C., U. S. Naval Reserve, formerly a practicing physician at Tama, Iowa, was awarded the Silver Star for distinguished service as medical officer aboard a destroyer during the battle north of San Cruz Islands on Oct. 26, 1942. Lieutenant Havlik's wife, who is now at Audubon, Iowa, writes that her husband has been on destroyer service since May 8, 1942. The award was made February 6 by Admiral W. F. Halsey. The citation was as follows:

In the name of the President of the United States, the Commander of the South Pacific Area and South Pacific Force takes pleasure in presenting the Silver Star Medal to Lieutenant Aloysius J. Havlik, Medical Corps, U. S. N. R., "For distinguished service in the line of his profession as Medical Officer aboard a destroyer in action against the enemy during the battle to the northward of Santa Cruz Islands on Oct. 26, 1942. While his ship was being subjected to a determined enemy aerial attack, Lieutenant Havlik with utter disregard for his own personal safety coolly and efficiently sought out and cared for the wounded wherever they might be. His actions were in keeping with the highest traditions of the Naval Service."

### SCHOOL OF MILITARY GOVERNMENT AT CHARLOTTESVILLE

The Army opened a school of military government at the University of Virginia at Charlottesville, May 11, 1942, where officers are trained for future detail with military government and liaison and to assist commanders in foreign fields in their relations with the civilian population. The commandant of the school is Brig. Gen. Cornelius W. Wickersham, a son of the former Attorney General and a graduate of Harvard College of Law School, who practiced law in New York City. General Wickersham served on the Mexican border and during the first world war in France, where he was awarded the Distinguished Service Medal and the French Legion of Honor, and later as chief of staff of the seventy-seventh division organized reserve.

The University of Virginia offered its facilities and the privileges of its library. The school uses lecture rooms in the law school building as well as a building for administration. The first four months' course of study was attended by sixty student officers and the second course by one hundred and fifty student officers, among whom were fifteen medical and sanitary corps officers. Among other members of the faculty of the School of Military Government are Col. Frank H. Hastings, C. A. C., assistant commandant, Major Hardy C. Dillard, A. U. S., director of instruction, and Profs. Arnold Wolfers of Yale, Henry Rowell of Johns Hopkins and Hugh Borton of Columbia, who will assist the permanent faculty. Special lectures have been given by two former judge advocates of the Army, Major Generals Blanton Winship and E. A. Kreger, and by Profs. Charles C. Hyde and Phillip C. Jessup of Colum-

bia, Max Lerner of Williams, W. Y. Elliott of Harvard, N. J. Sytkman of Yale, President Isaiah Bowman of Johns Hopkins and Dr. David A. Lockmiller of Duke. Courses are given in international law, public administration, army organization, military government, liaison functions and duties, and study of the politico-military backgrounds of enemy countries. Another class reported for training on January 9.

### COURSES TO ORIENT MEDICAL OFFICERS FOR THE AIR FORCES

A course is given at the Army Air Forces Officer Training School in Miami Beach, Fla., for the purpose of orienting medical department officers coming from civilian life and to prepare them for duty for the army air forces. This course is similar to the regular officer training school courses given for the air forces and yet varies in some respects to meet the special needs of medical department personnel. The military training given to the medical department officers is the same as that given by the army air forces officers. The academic training is given in subjects peculiar to the medical department. The medical department student officers have composed about one third of the student body of the officer training school since last November and they have frequently taken the military and academic honors. One of the first ten honor students in class 1942-R was Capt. Carl M. Bunnig of Westfield, Mass. The training of the medical officers at the army air forces training school, Miami Beach, is under the supervision of Major Sidney Davidson, M. C.

### COLONEL GILLESPIE AWARDED DISTINGUISHED SERVICE MEDAL

The War Department has announced that Col. James O. Gillespie, M. C., U. S. Army, who was chief of the medical service at the Sternberg General Hospital in Manila at the outbreak of the war, has been awarded the Distinguished Service Medal for developing hospitals on Bataan Peninsula with only "extremely limited personnel and equipment." Colonel Gillespie is said now to be a prisoner of war, held by the Japanese at Camp Tarlac, formerly Camp O'Donnell, some 65 miles north of Manila. In the absence of her husband, the medal was presented to Mrs. Gillespie by the commanding general of the ninth service command. Colonel Gillespie is a native of North Dakota, an honor graduate of the University of Minnesota Medical School and a graduate of the Army Medical School, Washington, D. C. and of the Medical Field Service School at Carlisle Barracks, Pa.

### AVIATION PHYSIOLOGISTS

A class of aviation physiologists graduated at the School of Aviation Medicine in Texas on January 23. The course, which is of several weeks' duration, treats of the effects of lowered barometric pressure, the effect of flight on man, the operation of low pressure chambers, the theory and practical use of oxygen equipment and the conduct of high altitude indoctrination and classification. Among the graduates were the following medical officers: First Lieuts. Kyle T. DeYarman, Morning Sun, Iowa; Bernard B. Grossman, Corpus Christie, Texas; Arch C. Koontz, Woodshoro, Texas; John Meyers, Worcester, Mass.; Louis Miller, Cleveland; Samuel Schwartzberg, San Antonio, Texas; Capt. Vernon C. Kenney, Chagrin Falls, Ohio; and Clarence R. Schmidt, Seattle and Major James H. Hammond, Tulsa, Okla.

### ARMY AIR FORCE MEDICAL DEPARTMENT OFFICERS GRADUATE

Another class of student officers at the Officer Training School for Army Air Force Medical Department Officers graduated on January 9 at Miami Beach, Fla. Medical department officers comprised about one third of the graduating class of more than six hundred officers. Four medical officers were among those who graduated with distinction. The top man of the entire class was First Lieut. Milton Elkin, Boston, and among the ten highest in the class were First Lieuts. Milton L. Berg, Perry; J. Culver and John Homans Jr., all of Boston.

## NAVY

RETIRED NAVAL MEDICAL  
OFFICER COMMENDED

The Navy Department announced on January 24 the award of a letter of commendation to Lieut Comdr Marvin M. Gould M. C., U. S. Navy, retired, for his services in caring for victims of the Cocoanut Grove fire in Boston on Nov. 28, 1942. The citation reads:

The Department has been informed that on the occasion of the fire in the Cocoanut Grove, Boston, Mass., on November 28, 1942, you assumed charge and directed the work of naval medical personnel, not only at the scene of the fire, but also at hospitals and mortuary. Under your direction, medical assistance was given to civilians and to members of all branches of the armed forces with the result that pain and suffering were relieved quickly and effectively and the lives of many saved. For the skill, endurance, tact and devotion to duty displayed on this occasion, you are hereby commended.

Dr. Gould was retired in 1939 and ordered back to active duty in 1940. He graduated from the University of California Medical School in 1916 and is at present assigned to the Boston Navy Yard.

DR. W. B. MacCRACKEN AWARDED  
NAVY CROSS

Dr. William B. MacCracken II of Berkeley, Calif., was recently awarded the Navy Cross by the Commander in Chief of the Pacific Fleet, Admiral Chester W. Nimitz, in the name of the President of the United States. The citation reads as follows:

'For extraordinary heroism and devotion to duty in actual conflict with the enemy as Senior Medical Officer of the landing force of the Marine Raider expedition against the enemy-held island of Makin on Aug. 17-18, 1942. When the first air attack was made, he personally carried many of the wounded to positions of greater safety. His utter lack of concern for personal safety not only enabled him to give early and effective aid to the wounded but served as an inspiration to all. During the first attempt at evacuation his boat overturned, endangering the life of a seriously wounded private, who was unable to help himself. He saved the life of this man by keeping his head above water and swimming ashore with him. After returning to the ship he performed six major operations under the most difficult conditions and succeeded in bringing all his cases back to the base in excellent condition. His courage and devotion to duty are in keeping with the highest traditions of the naval service.'

## CIVILIAN DEFENSE

NEW AIR RAID WARNING  
SIGNAL SYSTEM

As a result of studies made by the War Department in the Office of Civilian Defense, a new system of air raid signals became effective February 17 for the Eastern Defense Command which includes Maine, Vermont, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Delaware, Pennsylvania, Maryland, Virginia, North Carolina, South Carolina, Georgia and Florida east of the Apalachicola River. The remainder of the country is not affected, however, the Office of Civilian Defense, Washington, D. C., recommends that the states between the Eastern Defense Command and the Western Defense Command adopt the new regulations of the Eastern military area.

The principal features of these new regulations are: 1. A preliminary Blue signal consisting of a long steady blast on an air raid siren, horn or whistle, lasting about two minutes and meaning 'Probability of enemy air raid. Enemy planes appear to be headed in your direction. Get ready.' 2. A Red air raid signal consisting of a series of short blasts on air raid horns or whistles or the warbling notes of the siren meaning

## THE NAVY'S WEEKLY NEWS

The Office of the Surgeon General of the Navy began on February 8 the publication of the *Weekly News*, which is designed to be a medium of value to the personnel of the Bureau of Medicine and Surgery of the Navy, and to enhance the functional activity of the bureau by keeping the various divisions and sections abreast of changes, proposals and advances. The effort of all personnel of the Bureau of Medicine and Surgery in making the *Weekly News* the unifying link of the various sections and divisions of the bureau is much desired. The first issue contains a list of the speeches and conferences to be given or attended by members of the bureau, information concerning appointments in the bureau, visitors and the increase in hospital facilities expected during the coming year.

## HOSPITAL CORPS WAVES

The Surgeon General of the Navy has requested from the Bureau of Naval Personnel the procurement of 5,800 Hospital Corps Waves for assignment to continental activities in order to make available for sea duty hospital corpsmen who are now assigned to shore duty. These Wave members of the Navy Hospital Corps are enlisted as apprentice seamen V-10, U. S. Naval Reserve, and then undergo a routine period of indoctrination at Wave schools following which they are advanced to hospital apprentice ratings and transferred to the Naval Medical Center, Bethesda, Md., to the Naval Hospital, San Diego, Calif., or to other naval hospitals for further indoctrination and duty. The first groups of Wave technicians have arrived at San Diego and Bethesda.

In addition thirty-eight Yeomen Waves have been requested for assignment to the Bureau of Medicine and Surgery as replacements of hospital corpsmen and are expected to arrive at the bureau about March 15.

## NAVY HOSPITAL FACILITIES

Existing naval hospitals in the United States and the current construction program will provide about 40,000 beds by June 30. The expansion planned for the year 1944 is 20,000 additional beds in hospitals by acquisition of existing structures such as hotels, by expansion of present hospital facilities and possibly by construction of new naval hospitals at various places. The neuropsychiatric section has recommended additional hospitals for the care and treatment of casualties returning from combat areas and ships, suffering from nervous manifestations in conjunction with fatigue and exhaustive states, according to the *Bureau of Medicine and Surgery Weekly News*.

Enemy planes are practically overhead" 3. A "Blue" signal will always follow each "Red" signal after the immediate danger has passed. The community is thus prepared to return to the "Red" without delay if the enemy raiders return. 4. No audible "All Clear" signal is prescribed. The "All Clear" will be indicated by turning on those street lights which have been off during the "Blue," by public radio announcements and telephone, or other communications with warden posts, and by local police. Further details of this new air raid warning signal system will be found in Operations Letter No. 107 of the Office of Civilian Defense, issued January 28.

EMERGENCY MEDICAL SERVICE  
IN PERRY COUNTY

The Perry County (Ky.) Medical Society, cooperating with the local civilian defense council, has appointed Dr. L. C. Coleman medical auxiliary officer to supervise the emergency medical organization modeled after the plan suggested by the Office of Civilian Defense and comprising eighteen casualty stations, four-

teen of which are in rural parts of the county and four in the cities of Hazard and Lothian. The purpose of the casualty stations is to receive the injured in case of air raid or flood, epidemic, fire or explosion, to treat the less seriously injured and to send to hospitals the more seriously injured. The plan further provides for other local physicians and nurses to report at designated stations in case of a serious emergency.

### COURSE ON MEDICAL ASPECTS OF CHEMICAL WARFARE

The Office of Civilian Defense sponsored at Northwestern University Medical School, Chicago, January 14-16, an instructors' course for civilian physicians on the medical aspects of chemical warfare. Among the many demonstrations and classes was a gas mask drill and a gas chamber exercise conducted at Navy Pier by Capt N H Fritz of the chemical warfare service, sixth service command, and by Lieut John Pabst, U S Navy, respectively. Among the other instructors were officers

from Great Lakes Naval Station, the local office of civilian defense and from Johns Hopkins University School of Medicine, the University of Chicago and Northwestern University.

### NURSING AND THE EMERGENCY MEDICAL SERVICE

The Medical Division of the Office of Civilian Defense is organized along the following functional lines: field casualty service, hospital care, nurse service, blood plasma production and distribution, rescue-first aid, gas defense, sanitary engineering, plant protection and scientific research. The Medical Division recently issued Bulletin No 6 which summarizes the work of the nursing service and of the emergency medical service and that of volunteers in health, medical care and nursing. This bulletin contains also official information concerning the U S Citizens Defense Corps, the U S Citizens Service Corps, the Civilian Defense Auxiliary Group, home water supply precautions, protection against injury from war gases, and insignia, identification and dress for nurses.

## MISCELLANEOUS

### PHYSICAL THERAPY EQUIPMENT UNDER STRICT CONTROL

Physical therapy equipment was placed under strict control, February 16, by the Director General for Operations with the issuance of an order limiting its production and distribution. The order prohibits the manufacture of all types of physical therapy equipment except surgical diathermy units, electric bakers, fever cabinets and other items which it specifically names. The prohibition, however, does not extend to approved purchase orders for the armed services or for Lend-Lease purposes. All manufacturers of physical therapy equipment must file monthly production and shipping schedules on WPB Form PD-774. While the items specifically named are not placed under production limitations, their sale or delivery is subject to strict control and permissible only on purchase orders for the armed services, Lend-Lease, Board of Economic Warfare, hospitals or medical departments of industrial concerns. Items that cannot be manufactured hereafter may be distributed without restriction until present stocks are exhausted. Examples of items of this kind are vibrators, sun lamps and other heat applicators widely distributed through drugstores and similar retail outlets.

The order affects all distributors or dealers handling those items whose delivery is restricted and about twelve large and twenty-five smaller manufacturers of all types of equipment.

### EYE GLASSES AND PRICE REGULATION

Definitions of the extent to which maximum prices are established on services rendered in connection with the examination of eyes for glasses were issued February 13 by the Office of Price Administration, which laid down these rules as controlling:

1 All sales of eye glasses and spectacles are subject to the General Maximum Price Regulation, under which ceilings are the highest prices prevailing in March 1942.

2 The charges to a person for services involving the examination and refraction of eyes are not subject to the General Maximum Price Regulation if the seller is not selling corrective eye glasses or spectacles to that person, either as part of the same transaction or as part of the same general course of dealing.

3 If a seller is rendering to any person services involving the examination and refraction of eyes and he is also selling corrective eye glasses or spectacles to that person either as part of the same transaction or as part of the same general course of dealing, the following rules apply:

(a) If the seller makes a single charge for the sale of both the glasses and the services, the joint sale is subject to the General Maximum Price Regulation.

(b) If the seller makes a separate charge for the sale of the glasses and a separate charge for the sale of the services and during March 1942 he customarily made separate charges, then the charge for the services is not subject to the General Maxi-

mum Price Regulation. The sale of the glasses, however, is subject to the General Maximum Price Regulation.

(c) If the seller makes a separate charge for the sale of the glasses and a separate charge for the sale of the services, but in March 1942 he did not customarily make separate charges, and made a single charge for the services and the glasses, then the sum of the charge for the examination and refraction of eyes plus the charge for the sale of the glasses is subject to the General Maximum Price Regulation and shall not exceed the highest charge made in March 1942 for the same combination of services and glasses. In order to maintain the correct maximum prices on the sale of the eye glasses, the sale of the glasses and the sale of the services shall be treated as a joint sale of the glasses and the services and are subject to the General Maximum Price Regulation.

These rules are embodied in Amendment No 110 to Supplementary Regulation No 14 of the General Maximum Price Regulation, which is effective February 19, 1943.

In view of these rules, OPA stated that a finding on the question of whether these services are professional as the term is used in section 302 (c) of the Emergency Price Control Act is unnecessary.

### MOBILE HOSPITAL UNIT CITED

Adm Chester W Nimitz, Commander in Chief of the U S Pacific Fleet, has awarded a citation for distinguished service at the time of the attack on Pearl Harbor, Dec 7, 1941 to Mobile Hospital Unit No 2 the commanding officer of which when the raid occurred was Capt John H Chambers, M C whose home is in Philadelphia, and the executive officer Capt John M McCants, M C, Fernandina, Fla. This mobile hospital unit (No 2) had been shipped to Hawaii shortly before the Japanese attack on Pearl Harbor and although construction of the unit had not been completed, its staff promptly undertook the care of those wounded in the raid. Operating skilfully and otherwise working for many hours the doctors, nurses and hospital corpsmen attached to the Mobile Hospital Unit No 2 rendered full medical care to the casualties.

### ARMY-NAVY PRODUCTION AWARDS

Merck & Company, Inc. manufacturing chemists at Rahway, N J, were awarded the Army-Navy Production Award, February 9, comprising a flag to be flown above the plant and a lapel pin symbolic of distinguished service to America for every employee in the plant. Among those present at the ceremonies were the Hon Charles Edison, governor of New Jersey, the Hon David Armstrong mavor of Rahway, Lowell Thomas as master of ceremonies, Major Gen James C Magee, Surgeon General, U S Army, Rear Admiral Luther Sheldon Jr, U S Navy, George W Merck, president of the company, and George E Lennox, president of the employees' organization. The printed program also contained a list of hundreds of Merck

employees who are now serving in the armed forces of the United States and the names of two who have been killed in action

The employees of Burroughs Wellcome & Co, manufacturing chemists in Tuckahoe N Y have been presented with the Army-Navy E Award. This worldwide organization produces immense quantities of medicinal preparations and first aid equipment for use of the allies.

The employees of the General Electric X Ray Corporation were presented with the Army Navy E Production Award February 16 at ceremonies held at the Crane Technical High School 2245 West Jackson Boulevard Chicago

### LEND-LEASE AID FOR FRENCH NORTH AFRICA

President Roosevelt on Nov 13 1942 directed that lend-lease aid be extended to people of French North Africa and the first step was the purchase of about \$5 000 000 worth of civilian goods for North Africa. Many times that amount will be procured in coming months to be sent as shipping space becomes available. Among the items to be purchased under this program for North Africa are medical and hospital supplies, sugar, powdered and evaporated milk and cheese, cotton textiles, ready made new and used clothing and shoes, copper sulfate to increase the production of vegetables and fruits for consumption by American troops as well as the inhabitants, coal for transportation and kerosene for lighting. It has since been announced that Ethiopia also will be included in the lend lease program.

Back of the lend lease program is the idea of pooling the resources of the United Nations. South and West Africa are doing much to supply fruits and vegetables to American soldiers in those areas. This system of mutual aid means the building up of a modern transportation system which should be of lasting benefit to the peoples of the Dark Continent.

### AMERICAN-RUSSIAN COMMITTEE

Dr Michael Michailovsky, treasurer of the American Russian Committee for Medical Aid to the U S S R, Inc, 55 West 42d Street New York City, has submitted a financial report of the committee for the period from Aug 18, 1941 to Jan 8 1943, which shows total cash receipts of \$185 091 33 and total disbursements of \$179 619 26 leaving cash in the bank on January 8 of \$5 472 07. Of the total disbursements \$164 075 was turned over to Russian War Relief Inc, for purchase and shipment to the U S S R of medical supplies and surgical instruments. In addition there was \$12 496 47 of miscellaneous receipts making the grand total \$197 587 80. Of the total disbursements by the committee less than 3 per cent or \$5,750 43, was expended for administrative purposes. The president of the American Russian Committee for Medical Aid to U S S R, Inc is Prince Vladimir V Koudasheff and the secretary is Margarita Konenkova.

### PSYCHIATRIST AT WAAC CENTER

Dr Nita M Arnold former Chicago psychiatrist, is a contract surgeon with the rank of first lieutenant at the First WAAC Training Center, Fort Des Moines, Iowa. She is under contract with the Surgeon General of the Army. Dr Arnold was born in Buenos Aires, Argentina in 1898 and graduated at the Friedrich Wilhelms Universität Medizinische Fakultät, Berlin Prussia, in 1930.

### MEDICAL MEETING AT TRUAX FIELD

The staff of the Station Hospital at Truax Field, Madison, Wis held a meeting on February 9 to which members of the Dane County Medical Society and the staff of the Wisconsin General Hospital were invited. The scientific program presented was as follows:

Major Dorrin F Rudnick Control of Venereal Disease in the Army  
Major Herbert D Glick Physical Requirements of the Flier  
Major John Chornyak Psychiatric Problems Seen in the Army  
Major Charles S Higley Primary Atypical Pneumonia in the Army  
Major Bernard B Larsen Common Surgical Conditions Seen in the Army

### LIEUT RUTH STRAUB AWARDED LEGION OF MERIT

Lieut Ruth M Straub of the Army Nurse Corps left her home in Greendale, Wis, in 1939 to be commissioned at Fort Sheridan, Ill, and almost immediately was sent to Manila. On Dec 26, 1941 Lieutenant Straub was sent along with hundreds of patients in a boat to Corregidor, in February she was ordered to Bataan to work in a field hospital in the jungle, and which all nurses were ordered to evacuate in April. Their small boat made the trip to Corregidor just ahead of the Japanese in May. Lieutenant Straub with eleven other army nurses and one navy nurse then boarded a submarine and were returned to the United States by way of Australia. Lieutenant Straub has now been assigned to the Marina Basic Flying School near Tucson, Ariz, after having been awarded the Legion of Merit at Washington, D C.

### PUBLIC HEALTH UNDER HITLER

According to Transocean of Dec 14, 1942 an announcement has been made by well informed scientific quarters in Berlin that the new German methods of combating typhus fever have proved so successful that the mortality rate has now been reduced to about 1 per cent.

New details of the German measures to combat typhus fever were announced at the opening of the great Typhus Research Institute of the German supreme command in Cracow, which has succeeded in producing bacteria in time to be used for prophylactic vaccination. These bacteria, which are kept alive in cans, are now being mass produced by a new technical process and dispatched to the German and allied troops fighting in the East. Hospitals and doctors have thus become entirely independent of fresh bacteria, as they can now use the canned bacteria.

A new method of diagnosing typhus fever has also been worked out. While it used to be necessary to take a sample of blood from the arm of a suspected patient, it is now only necessary to take a pinprick drop of blood from the lobe of the ear. The particular advantage of the new method is that it can be employed rapidly and by any untrained person or by the patient himself.

DAB of Dec 9 1942 states that on all fronts in the occupied territories and in the homeland well known doctors of all branches of medicine are assisting the medical officers serving with the forces and in the military hospitals in an advisory capacity. They guarantee that diagnosis and treatment for the German soldier always conform to the most up to date standards of medical knowledge and research. To discharge their duties properly, these consultant physicians must have opportunities to exchange their experiences gathered under wartime conditions. For this purpose a large number of consultant physicians of all branches of medicine and from all theaters of war recently met at a conference at the Academy for Military Medicine in Berlin. The meeting was called by General Oberstabsarzt Prof Dr Handlser, the head of the medical services of the armed forces. It was the first conference at which all the three services were represented as well as the Waffen-SS, the police and the organizations attached to the armed forces such as the Reich Labor Service and the Organization Todt. Scientists of repute from all these formations took part in the meeting. Among the people who followed the lectures and discussion with interest were the teacher's general commissioner for health and medical services, Obersarzt Prof Dr Brandt, Secretary of State Dr Conti and the medical inspectors of the three services, the Waffen SS, the police and the organizations attached to the forces. All possible problems of medical care for the soldiers were thoroughly discussed during the conference, and every possible attention was paid to the problems of the new winter campaign. Just as much care was devoted to prophylactic measures and to the preservation of health as to the treatment of injuries which cannot always be avoided. New knowledge was made available to the medical officers with the troops at the front and the specialists in the military hospitals so as to enable them to discharge their tasks as comrades of the fighting German soldier. The conference confirmed the feeling of certainty of success and of the victory of the German spirit which by its discoveries and achievements is making constant progress possible in the art of medicine too.

# ORGANIZATION SECTION

## MEDICAL LEGISLATION

### MEDICAL BILLS IN CONGRESS

*Changes in Status*—S 180 has been reported to the Senate with recommendation that it pass, a bill to provide vocational rehabilitation education, training and other services to persons disabled while members of the armed forces, or disabled in war industries or otherwise and to render such persons fit for service in war industries, agriculture or other useful civilian industry. H R 801 has been favorably reported to the House, a bill to provide for the rehabilitation of disabled veterans of the present war.

*Bills Introduced*—S 607, introduced by Senator Kilgore, West Virginia for himself and Senator Pepper, Florida, Senator Murray, Montana, Senator Ball, Minnesota, Senator Capper, Kansas, Senator Green, Rhode Island, Senator Johnson, Colorado, Senator LaFollette, Wisconsin, and Senator Thomas, Utah, proposes to establish an Office of War Mobilization to inventory and mobilize all the economic resources of the United States, including manpower, facilities, materials, technical and scientific knowledge, and natural resources for maximum use in the provision of military and essential civilian needs. An Office of Scientific and Technical Mobilization would be created to effect the full and immediate mobilization of scientific knowledge, techniques and personnel, for the prosecution of war and for making adjustments necessitated by war conditions. S 692, introduced by Senator Downey, California, provides compensation for personnel sustaining disease or injury while performing civilian defense duties. S 699, introduced by Senator Bilbo, Mississippi, provides pensions to peacetime veterans of the Regular Army, Navy, Marine Corps and Coast Guard suffering from arrested tuberculosis contracted while in service. S 702, introduced by Senator Kilgore, West Virginia, provides for the mobilization of the scientific and technical resources of the nation, establishing an Office of Scientific and Technical Mobilization. As used in the bill the term "scientific and technical personnel" means all persons, except physicians and dentists, who have completed any course of study in any college or university in any branch of science or its practical application or who have had not less than an aggregate of six months training or employment in any scientific or technical vocation. S 720, introduced by Senator Johnson, Colorado, and H R 1857, introduced by Representative Sparkman, Alabama, provide that during the present war and six months thereafter there shall be included in the Medical Departments of the Army and Navy such licensed female physicians and surgeons as the Secretary of War and the Secretary of the Navy may consider necessary. Those appointed will be commissioned, the bills propose, in the Army of the United States or the Naval Reserve and will receive the same pay and allowances and be entitled to the same rights, privileges and benefits as members of the Officers' Reserve Corps of the Army and the Naval Reserve of the Navy with the same grade and length of service. Female physicians and surgeons so appointed may be assigned only to duty in hospitals or other stations where female nurses are employed. H J Res 53, introduced by Representative Burdick, North Dakota, proposes that a major joint committee of the Senate and House be set up to take over the whole problem of handling proposed social security legislation. H R 1796 introduced by Representative Cunningham, Iowa, provides that nominal income from personal services may be disregarded in computing payments to be made as old age assistance and aid to the blind under the Social Security Act. H R 1798, introduced by Representative Johnson, Indiana, provides protection against total permanent disability for persons granted national service life insurance. H R 1811, introduced by Representative Maas, Minnesota, proposes an appropriation of \$2,000,000 to expand facilities for the hospitalization of depen-

dents of personnel of the Navy and Marine Corps. The hospitalization of dependents of naval personnel at any naval hospital, the bill provides, will be on a per diem basis and all sums received in payment of such hospital charges will be deposited to the credit of the appropriation or fund for the maintenance and operation of naval hospitals. H R 1825, introduced, by request, by Representative Lesinski, Michigan, provides that all monetary benefits granted to veterans of World War I, and to their widows and dependents, be extended to the veterans of the present war, their widows and dependents. H R 1829, introduced, by request, by Representative Lesinski, Michigan, provides that the Administrator of Veterans' Affairs, within the limits of Veterans' Administration facilities, will be authorized to furnish necessary dental care and treatment to veterans of the present war who are not dishonorably discharged and who are not entitled to similar benefits under any law or veterans' regulation at the present time.

### STATE MEDICAL LEGISLATION

#### Arizona

*Bills Introduced*—H 115 proposes the creation of a board of examiners for manual therapy, defined as a system of treatment wherein the muscles, joints, ligaments or tissues of the human body are moved or exercised by forces applied by the manipulator, assisted or supplemented by voluntary movements, by suggestion and advice, or by such mechanical, thermal, or electrical devices as may be required to facilitate normal movement or function of the joints, ligaments and tissues of the person manipulated. H 146 proposes to require every physician attending a pregnant woman to take a sample of her blood not less than ten days after the first visit and to submit such sample to an approved laboratory for a standard test for syphilis.

#### Arkansas

*Bills Introduced*—H 194 proposes to make it unlawful for any one to use dynamite, nitroglycerin or other form of explosive within 2 miles of any private or public hospital. H 271 proposes to require every person applying for a marriage license to present a certificate signed by a qualified physician licensed to practice medicine and surgery certifying that the applicant is not infected with syphilis in a communicable stage.

#### California

*Bills Introduced*—A 1553 proposes to require all food handlers and domestic servants to obtain a certificate from a licensed physician and surgeon showing freedom from communicable diseases and to renew such certificate every three months. A 1608, to amend the revenue code, proposes to exempt from the sales tax the sale of medicines, tonics and preparations sold as dietary supplements or adjuncts. A 1659 to amend the business and professions code, proposes to require vendors of prophylactics to renew their licenses annually. A 1729, to amend the penal code, proposes to require any person accused of intoxication or a crime involving intoxication to be examined by a licensed physician immediately on his being arrested, the duty of the physician being to determine whether or not the accused was in fact intoxicated. A 1782 proposes the enactment of a new uniform vital statistics act. A 1830, to amend the prenatal examination law, proposes to authorize chiropractors to obtain the required blood specimen. A 1831, to amend the labor code, proposes to authorize injured employees to receive the services of a chiropractor at the expense of the employer. A 1832 to amend the business and professions code, proposes to authorize schools teaching any of the healing arts to establish graduate courses of study in homeopathy, herbology, vitamin therapy, proprietary medicine

and drugs, minor surgery, materia medica, physical therapy, anesthesiology, obstetrics and certain other subjects. Graduates would be granted a degree of "physician" and would be entitled to practice the subjects taught in the graduate courses. A 1833, to amend the business and professions code, proposes to authorize any accredited school of medicine, surgery, osteopathy, chiropractic and any hospital to establish courses of training in nursing, the graduates of such courses to be known as graduate war nurses. A 1841, to amend the premarital examination law, proposes to authorize chiropractors to make the required certificate of exemption from venereal disease.

#### Georgia

*Bills Introduced*—H 135 proposes to require each person applying for a marriage license to furnish a certificate signed by a qualified physician licensed to practice medicine and surgery in any state or United States territory certifying that the applicant is not infected with syphilis in a communicable stage. H 136 proposes to require all licensed physicians attending a pregnant woman to take a sample of blood within thirty days of the first examination and to submit such sample to an approved laboratory for a serologic test for syphilis.

#### Idaho

*Bills Enacted*—H 24 has become chapter 26 of the Laws of 1943. This law requires every licensed physician attending a pregnant woman to take a sample of her blood at the time of the first examination and to submit such sample to a laboratory for a standard serologic test for syphilis. H 43 has become chapter 42 of the Laws of 1943. It provides that each applicant for a marriage license must produce a certificate signed by a licensed physician certifying that the applicant has been thoroughly examined and is not infected with syphilis in a communicable stage. The physician making the examination may not charge more than \$2. H 111 has become chapter 52 of the Laws of 1943. It exempts from the payment of any professional license or renewal fee all persons now holding such a license who are serving in the armed forces of the United States during the term of their military service.

#### Indiana

*Bills Introduced*—H 73 proposes to authorize the suspension of a driver's license on conviction of operating an automobile while under the influence of intoxicating liquor or narcotic drugs. H 294 proposes to authorize the division of public assistance to establish and maintain clinics for the care and treatment of eyes, under the supervision of an ophthalmologist or eye specialist who shall be a doctor of medicine licensed to practice medicine in the state. H 462 proposes, in effect, that physicians' records shall be competent evidence in court if the custodian testifies to the identity and mode of preparation of the record and if the records were made in the regular course of business.

#### Iowa

*Bills Introduced*—S 68 to amend the divorce law, proposes to authorize the granting of a divorce when one of the parties to a marriage has been totally insane for a period of five years and there is no reasonable hope of recovery. S 219 proposes that when a person has been arrested for operating a motor vehicle while intoxicated a sample of such person's blood or urine may, with the consent of the person so charged be taken by a duly licensed physician and subjected to chemical analysis, the results of which analysis shall be receivable in evidence. The fact of refusal by a person to permit a sample of blood or urine to be taken will likewise be admissible in evidence.

#### Kansas

*Bill Introduced*—H 293 to amend the osteopathic practice act proposes to extend the scope of osteopathic practice so as to authorize licentiates to practice as physicians and surgeons of the osteopathic school of medicine which shall include the right to practice operative surgery with instruments, and obstetrics to prescribe and administer narcotics, analgesics, anodynes, anesthetics, antiseptics, antidotes, serums, vaccines and biologicals and to have the same rights as practitioners of other schools

of the healing art with respect to rendering services under the provisions of laws relating to health insurance, workmen's compensation, control of infectious diseases and care of the indigent.

#### Michigan

*Bills Introduced*—S 113, to amend the medical practice act, proposes to authorize the Michigan state board of registration in medicine to suspend in whole or in part the educational requirements prescribed by the act at any time during the state of war now existing between the United States and various other nations. H 166 proposes to authorize the boards of supervisors of certain counties throughout the state to provide group life, health and accident and/or hospitalization insurance for the employees of such counties.

#### Montana

*Bills Introduced*—S 73, to amend the chiropractic law, proposes to extend the scope of chiropractic practice to include physiotherapy, electrotherapy, hydrotherapy, proctology and minor surgery and to require chiropractors to be examined in such subjects. H 118, to amend the medical practice act, proposes, among other things, to authorize the board of medical examiners to prescribe and enforce reciprocity requirements current with changes in standards of the practice of medicine and surgery.

*Bill Passed*—S 97 passed the senate on February 11. It proposes to relieve physicians in the military service of the United States from paying annual license fees during the period of such service.

#### New York

*Bill Introduced*—S 528, to amend the public health law, proposes to require domestic servants to furnish a certificate from a duly licensed and registered physician certifying freedom from tuberculosis and from any venereal disease.

#### Ohio

*Bills Introduced*—H 54 proposes to exempt from the sales tax the sales of prescription medicines. H 78 to amend the medical practice act, proposes that administering to human ills through prayer or spiritual means alone in accordance with the tenets or creed of any religious denomination for a fee or compensation shall not be regarded as practicing medicine. H 112, to amend the osteopathic law, proposes the creation of a state osteopathic examining board to take the place of the existing osteopathic examining committee. H 113, to amend the law relating to municipal hospitals, proposes that in the management and control of municipal hospitals there shall be no discrimination against any physician, or the patient of any physician, who holds a certificate to practice in Ohio, whether it is medicine or surgery, or osteopathy or chiropractic. H 167, to amend the premarital examination law, proposes that when one of the applicants is in the military service of the United States his physical certificate may be signed by a commissioned medical officer of the military service.

#### Oklahoma

*Bills Introduced*—S 98 proposes to authorize a physician legally qualified to practice in the state of Oklahoma to perform a postmortem cesarean section when the physician has reason to believe that the child is viable in the mother. In the performance of such operation, the physician shall not be liable either civilly or criminally even though the operation is performed without the consent or even against the protest of those in whom the law has recognized a legal right of possession of the body of the deceased provided only that the operation is performed in good faith and with due skill and without unnecessary injury or mutilation. H 37 proposes to authorize the state and local health officers to examine arrested persons to determine whether or not they are infected with a venereal disease and if found infected, to quarantine such persons for the purpose of treatment.

#### Pennsylvania

*Bills Introduced*—H 236 proposes that for the duration of the war a minimum of nine months rather than one year internship shall constitute the necessary legal training to qualify for admission to examination for a license to practice medicine.

and surgery in Pennsylvania H 235 proposes to authorize the state board of medical education and licensure to issue temporary certificates to physicians licensed in other states to authorize them to practice medicine and surgery in Pennsylvania for the duration of the present war and six months thereafter

#### South Carolina

*Bill Enacted*—H 33 has become Governor's Act No 11 of the Laws of 1943 This law eliminates from the medical practice act the requirement that no two of the required four full courses of lectures may be given in the same year The purpose of this law is to enable graduates of accelerated medical courses to obtain licensure in South Carolina

#### South Dakota

*Bills Introduced*—S 129, to amend the basic science act, proposes to exempt from the provisions of the act any person acting as an assistant or under the supervision and direction of a person holding a basic science certificate S 186 proposes an appropriation for the purchase and installation of hydrotherapy equipment in the state hospital for the insane H 206 proposes to authorize the sterilization of inmates of the state hospital on recommendation of the superintendent when it is shown that the inmate suffers from certain mental diseases, perversion or diseases of a syphilitic nature and that the person is capable of procreation Provision is also made for the voluntary sterilization of any inmate H 207 proposes to authorize the granting of the writ of habeas corpus to persons having a "psychopathic personality," defined as the existence of such conditions of emotional instability and impulsiveness of behavior and lack of customary standards of good judgment, or failure to appreciate the consequences of his acts or a combination of any such conditions, as to render such person irresponsible for his conduct with respect to sexual matters or in respect to matters relating to acts and conduct of a criminal nature and thereby dangerous to other persons

#### Tennessee

*Bill Introduced*—H 198 proposes to provide for the sterilization of inmates of certain state institutions when it has been determined that procreation by such inmate is inadvisable The determination must be unanimously made by a physician, a psychologist, a sociologist and an officer of the institution in which the inmate is confined

*Bills Enacted*—S 77 has become chapter 44 of Public Acts of 1943 It provides that all persons employed as food handlers must procure a health certificate, including a Wassermann test, signed by a physician licensed to practice in the state of Tennessee, which certificate must be renewed annually S 160 has become chapter 73 of Public Acts of 1943 It provides that every physician who makes a diagnosis of or treats or prescribes for a case of venereal disease, including syphilis, gonorrhea and chancroid, shall report such case immediately to the full time municipal health officer S 300 has become chapter 26, Public Acts of 1943 It authorizes the coroner, when requested so to do by the district attorney, to summon a physician or surgeon to examine a person or to perform an autopsy thereon and to give his professional opinion as to the cause of death The fee of such physician shall be limited to \$25 H 76 has become chapter 92 of the Public Acts of 1943 It provides for the creation of a board of examiners in the basic sciences of anatomy, physiology, chemistry, bacteriology and pathology Exempted from the operation of the act would be osteopaths, chiropractors, if they do not possess, prescribe or administer drugs, as well as dentists, naturopaths, nurses, midwives, optometrists, chiropodists, barbers, cosmeticians, or Christian scientists practicing within the limits of their respective callings

#### Washington

*Bills Introduced*—S 167, to amend the basic science act, proposes that the existing examining committee be dissolved and that a new committee be created to be composed of one member from each school of practice licensed in the state of Washington Under the existing law the members of the examining committee are chosen from the faculty of the University of Washington and Washington State College H 238 proposes to exempt chiropractors from the basic science law

#### West Virginia

*Bill Introduced*—H 230 proposes, among other things, to require every physician who examines or treats a person having syphilis, gonorrhea or chancroid to instruct such person in measures for preventing the spread of the disease and to inform such person of the necessity of taking treatment until cured If the person fails to report for treatment, the physician must make a report of such fact to the local health officer

## WOMAN'S AUXILIARY

#### Florida

The Woman's Auxiliary to the Duval County Medical Society voted a contribution to the WPA Nursery, on recommendation of the philanthropic chairman, Mrs John H Mitchell Plans were made for a supper to be given for service men at the WJAX recreation center Officers of the auxiliary are Mrs J W Hayes president, Mrs E W Veal vice president, Mrs L M Wachtel secretary and Mrs G H Ira treasurer

#### Georgia

The Woman's Auxiliary to the Fifth District Medical Society held its semiannual meeting at the Academy of Medicine on West Peachtree Street in Atlanta Mrs J Harry Rogers, manager, presided Mrs J Lon King of Macon, president of the Woman's Auxiliary to the Medical Association of Georgia, was the honor guest of the evening A program was presented by the medical staff of the Lawson General Hospital

#### Indiana

The Allen County medical auxiliary had Dr L Potter Harshman as its speaker at the Lutheran Hospital His subject was "Psychiatry in the Present Crisis" Mrs Elmer C Singer presented recent legislation

Since January the Woman's Auxiliary to the Orange County Medical Society has had five meetings, supper meetings at the homes of members, at which problems concerning the county

medical society were discussed at the table Members have done more than their share of the war program activities One of its members taught a Home Nursing class The main project for the year was the promotion of a wider circulation of "Hygeia" A survey of all doctors' and dentists' offices, schools, libraries and beauty parlors was made Fifteen subscriptions were obtained

#### Minnesota

The Hennepin County auxiliary has two new projects under way One is the Red Cross dressing group, which, although organized last year, did not function until this year owing to lack of supplies Mrs J P Hiebert is chairman with Mrs J M Hall co-chairman The second activity is the staffing of a War Saving Stamp booth in the Medical Arts lobby with Mrs Hugh Tunstead in charge Both projects are carried on with the cooperation of the dental auxiliary

#### Utah

In December a luncheon was held at the home of Mrs Silas S Smith, president of the auxiliary to the Utah State Medical Association, for officers of the state organization The guest was Mrs Frank N Haggard of San Antonio, Texas, President of the Woman's Auxiliary to the American Medical Association Her message was for the members to give their time and effort in self education to help in the war effort Fifty members were present



## Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

### CALIFORNIA

**Dr King Observes Ninetieth Birthday**—Dr. John C. King, Pasadena, formerly president of the California Medical Association, observed his ninetieth birthday, February 9. Dr. King, who has been in retirement since 1923, graduated at the University of Nashville Medical Department, Nashville, Tenn., in 1874. He had been president of the high school board in Banning for twenty years and was one of the founders of the San Bernardino County Medical Society, serving as its president and earlier of the Riverside County Medical Society and the state board of medical examiners.

**New Virus Diagnostic Unit**—The division of laboratories of the state department of public health recently established a virus diagnostic unit to render assistance to physicians of the state in the diagnosis of certain neurotropic virus diseases, including at present western equine encephalitis and St. Louis encephalitis and probably later lymphocytic choriomeningitis. All health officers, physicians and hospitals wishing assistance or confirmation in the diagnosis of these diseases may send specimens to and obtain containers from the State Department of Public Health, Division of Laboratories, Virus Unit, 1390 University Avenue, Berkeley. A supply of containers will be available at city health departments soon.

**Assistant Medical Director and Superintendent Needed**—The California State Personnel Board on February 9 announced examinations to be held soon for the positions of assistant medical director and superintendent at a mental hospital. The position of assistant medical director has a salary range from \$260 to \$340 a month plus maintenance for self and family. Entrance requirements include possession of a license to practice as a physician and surgeon, graduation from a medical school and three years of medical practice, two years of which shall have been in a mental hospital. The position of superintendent of the mental hospital has a salary range of \$360 to \$440 plus complete maintenance for self and family. Qualifications must include possession of a license to practice as a physician and surgeon, graduation from medical school and five years of medical experience in a mental hospital. Candidates who are successful in the examination must secure a license to practice as a physician and surgeon in California before they can be considered eligible for appointment except that any such candidate who has applied for a California license may be appointed for a period of not more than one year. Official application forms may be obtained from the offices of the state personnel board, 1015 L Street, Sacramento. The final date for filing applications is March 10.

**Langley Porter Clinic Dedicated**—The Langley Porter Clinic at the University of California Medical School, San Francisco, was opened with appropriate ceremonies on February 13. The outpatient department was named in honor of the late Dr. Aaron J. Rosanoff, who at the time of his recent death was director of the state department of institutions and was to a large measure responsible for the building of the Langley Porter Clinic. Mrs. Dora Shaw Heffner, Los Angeles, director of the state department of institutions, presided at the morning session. Among the speakers were:

Dr. Walter L. Treadway, Los Angeles: Memorial to Dr. Aaron J. Rosanoff.

Dr. Glenn E. Myers, Los Angeles: Dr. Aaron J. Rosanoff.

Dr. Fred O. Butler, Eldridge: The Langley Porter Clinic and Its Relationship to the State Department of Institutions.

Dr. Thomas W. Hagerty, Camarillo: The Work of the California State Hospitals in the Prevention and Treatment of Mental Disorders.

Dr. Langley Porter, San Francisco: Potential Contributions of a Psychiatric Hospital in a Total University Setting.

Harry M. Casady, Berkeley: Psychiatry and Social Work.

Mrs. Jean W. MacFarlane, Berkeley: Psychiatry and Clinic Psychology.

Miss Margaret A. Tracy, Berkeley: Psychiatry and Nursing.

Robert G. Sproul, LL.D., president of the University of California, Berkeley, presided at the evening session in Toland Hall at the University of California Hospital, at which speakers all of San Francisco were:

Dr. Francis S. Smith: Psychiatry and Pediatrics.

Dr. William J. Kerr: Psychiatry and General Medicine.

Dr. Howard C. Naffziger: Neurological Surgery and Its Relations.

Dr. Karl M. Bowman: Psychiatry and the Langley Porter Clinic.

The new clinic is a neuropsychiatric unit of the state department of institutions, named in honor of Dr. Langley Porter, dean emeritus and professor of medicine and lecturer in medical history and bibliography emeritus of the medical school.

### DELAWARE

**Society News**—Dr. Harry C. Bacon, Philadelphia, discussed the diagnosis and treatment of common rectal diseases before the Newcastle County Medical Society in Wilmington, January 19. Dr. Edgar R. Miller, Wilmington, addressed the society recently on "The Uses and Limitations of the Electrocardiogram." Dr. John T. Hynes, Wilmington, discussed "Carcinoma of the Cervix" before the society on February 16.

**Deputy State Health Officer Needed**—The Merit System for Personnel Administration in Delaware is accepting applications for the position of deputy state health officer in the state board of health. The salary range for the position is \$3,600 to \$4,200 and applications will be accepted until further notice. The applicant must show graduation from an approved medical school, internship of one year in a hospital approved for internship by the American Medical Association, license to practice medicine and be qualified for licensure in Delaware. The applicant must have had one year in a school of public health of recognized standing prior to or within a period of three years from the date of employment, and at least two years full time paid professional experience in the field of public health. Preference will be given to persons having a degree in public health. The applicant must be not more than 35 years of age when beginning public health work. Additional information may be obtained from Merit System of Personnel Administration, 512 Continental American Life Building, Wilmington.

### ILLINOIS

**Social Hygiene Day**—On February 3 the state department of health and the state department of public welfare jointly sponsored a statewide observance of social hygiene day. This is the first year the welfare department took part in this observance. On February 3 the first of six regional conferences on venereal disease control for public health nurses was held at Joliet. Others were planned for Dixon, Springfield, Champaign, Herrin and Centralia.

**Test Case Ruling Affects Alien Applicants for Examination in Medicine**—In a test case, January 22, Judge John Prystalski, in circuit court, upheld the right of the state department of registration and education to forbid the taking of examinations by persons from European schools, newspapers reported. The decision in effect barred more than 150 graduates of European medical schools from practicing medicine who had applied for permission to take the state examinations in April. The test case covered the ruling of the state board of examination adopted June 2, 1942, which prohibited graduates of medical colleges in continental Europe and graduates of the extramural colleges of Scotland and Ireland who finished after July 1, 1936. Switzerland graduates were excepted. This rule is to be in force until a true evaluation of the colleges referred to may be obtained, at which time such nonaccredited foreign colleges will be required to prove to the department that their courses and equipment are in every way equal to American medical colleges accredited by the department of registration and education. In dismissing the suit, Judge Prystalski is reported to have said that he had no authority to interfere with administrative regulations of the department.

### Chicago

**Ludvig Hektoen Lecture**—Dr. Lloyd F. Craver, New York, will deliver the nineteenth Ludvig Hektoen Lecture of the Frank Billings Foundation on March 26 at the Palmer House under the auspices of the Institute of Medicine of Chicago. Dr. Craver will discuss "The Diagnostic Problems of Early Cancer."

**The Capps Prize**—The Institute of Medicine of Chicago announces that the Joseph A. Capps Prize for Medical Research for 1942 has been awarded to Dr. Mary E. Martin, who graduated at Northwestern University Medical School in 1941 for her investigation on "Distribution of Nerves in the Adult Human Myometrium." The prize is awarded annually to a young graduate of a Chicago medical school for the most meritorious investigation in medicine or in the specialties of medicine.

**Course in Ear, Nose and Throat**—A refresher course in laryngology, rhinology and otology will be held at the University of Illinois College of Medicine, March 22-27. To meet the needs of ear, nose and throat specialists who, under existing conditions are able to devote only a brief period to postgraduate review, study, this didactic and clinical course has been arranged. Registration is limited. The fee for the complete course is \$50. Letters requesting application for registration should include school and year of graduation also details concerning specialty training and experience. Address: Department of Oto-Laryngology, University of Illinois College of Medicine, 1853 West Polk Street.

## INDIANA

**Society Arranges Night Service for Public**—On January 10 a plan of answering emergency night calls was begun by the Indianapolis Medical Society, according to the bulletin of the society. The medical society has an unlisted telephone number (Rt. 4796) which is answered by a member of the society who has volunteered for this service. The members of the society may refer calls to this number when they do not wish to make them. This service is in operation from 8 p. m. until 7 a. m. daily. The calls are made by house officers of the Indianapolis City Hospital. The fee is \$5 for calls inside the city and 25 cents a mile additional charge for calls outside the city. The doctor who answers the telephone asks the person calling who referred them to this number. If the call is received before 11 p. m. the referring doctor is called to verify the fact that he does not wish to make this call. If the call is received after 11 o'clock the doctor is not called until the next morning. If the person calling is unable to pay, he is referred to the Indianapolis City Hospital. Obstetric calls are handled by the Outdoor Obstetrical Service of the city hospital. If in the opinion of the visiting physician the patient needs immediate hospitalization, the patient is sent to a private hospital and it is then the duty of the hospital to call the proper physician from its staff. Patients are always told that this is an emergency service and that no return calls will be made. They are referred to their family doctor or, if they do not have a family doctor, they are given a list of the members of the society who are practicing in their vicinity.

## LOUISIANA

**Changes in Health Officers**—Dr. Abraham Oppenheim Arcadia, director of the Bienville Parish Health Unit, has been appointed in charge of the units in Vermilion and New Iberia parishes.—Dr. Roy A. Kelly, New Roads director of the St. Charles Parish Health Unit, was recently assigned in charge of the Jefferson Davis Health Unit.

**Graduate Medical Assembly**—The seventh annual New Orleans Graduate Medical Assembly will be held at the Roosevelt Hotel, New Orleans, March 15-18. The program will include lectures, clinics, symposiums, clinicopathologic conferences, scientific and technical exhibits, medical motion pictures and round table luncheons. Among the speakers who will discuss one or more papers will be:

Dr. Tinsley R. Harrison, Winston Salem, N. C.  
Dr. Robert J. Crossen, St. Louis  
Dr. James G. Townsend, Bethesda, Md.  
Sister Elizabeth Kenny, Minneapolis  
Lieut. Col. Edgar V. Allen, M. C. Army of the United States  
Dr. Louis Hamman, Baltimore  
Lieut. Col. Roy Glenwood Spurling, M. C. Army of the United States  
Dr. Ralph I. Lloyd, Brooklyn  
Dr. Nicholson J. Eastman, Baltimore  
Dr. Edwin W. Ryerson, Chicago  
Dr. John J. Shea, Memphis  
Dr. Howard T. Karsner, Cleveland  
Dr. Erling S. Platou, Minneapolis  
Dr. Fred J. Hodges, Ann Arbor, Mich.  
Dr. Warren H. Cole, Chicago  
Major Retting Arnold Griswold, M. C. Army of the United States  
Dr. Charles B. Huggins, Chicago

## MASSACHUSETTS

**State Meeting to Be in Boston Instead of Springfield**—The Massachusetts Medical Society will hold its annual session at the Hotel Statler, Boston, May 25-26, instead of at the Hotel Kimball, Springfield, May 18-19.

**Dr. Symonds to Give the Dunham Lectures**—Dr. Charles Putnam Symonds, Air Commodore in the Royal Air Force and consultant in neurology, will deliver three lectures at Harvard Medical School, Boston, under the Edward K. Dunham Lectureship for the Promotion of the Medical Sciences, on "The Human Response to Flying Stress." The separate lectures will be March 10, "The Two Sides of the Problem"; March 11, "The Foundation of Confidence," and March 12, "Air Crew Selection and Maintenance."

**Dr. Landis Named as Professor of Physiology at Harvard**—Dr. Eugene Markley Landis, professor of internal medicine at the University of Virginia Department of Medicine, Charlottesville, has been appointed George Higginson professor of physiology at Harvard Medical School, Boston, filling the vacancy that occurred on the retirement of Dr. Walter B. Cannon, Cambridge. The appointment will be effective July 1. According to the *Harvard Medical Alumni Bulletin*, although Dr. Landis is an internist most of his researches have been essentially physiologic in nature or have concerned basic physiologic principles in medical conditions. In 1926 Dr. Landis graduated at the University of Pennsylvania School of Medicine, Philadelphia, where he was in 1931

associate in medicine and in 1934 assistant professor. He has been professor of medicine at the University of Virginia since 1939. In 1936 he received the John Phillips Memorial Medal of the American College of Physicians.

## MICHIGAN

**New District Health Unit**—Leelanau County has joined with the Grand Traverse county department of health to form a new district organization. Dr. Buell H. Van Leuven, Traverse City, will be in charge. The Grand Traverse unit has functioned since April 1939.

**Koch Trial Opened**—The federal government's trial against Dr. William F. Koch and his brother Louis on charges of violating the Federal Food Drug and Cosmetic Act opened in Detroit January 12. Dr. Koch has long been identified with an alleged cancer cure. The two Kochs are respectively, president and secretary of the Koch Laboratories, Inc., Detroit, promoters of various products including treatments sold for cancer and other conditions. The federal charge is that three preparations of the Koch Laboratories have been shipped from Detroit to other states with false and misleading labels which made representations that could not be justified by facts. The *Detroit Sunday Times*, January 10, reported that a federal trade commission action against the brothers is pending awaiting the outcome of the Food Drug and Cosmetic Act case. Dr. Koch first announced his so-called cancer cure in 1919 the year following his graduation at the Detroit College of Medicine. Later his claims extended to "cures" for allergies and infections. In 1933 he moved to Delray Beach, Fla., and operated a clinic there, while his brother Louis managed the laboratories in Detroit.

**Annual Lecture Marks Dedication of Beaumont Room**—Col. Edgar Erskine Hume, M. C., U. S. Army, Washington, D. C., delivered the twenty-second annual Beaumont Lecture before the Wayne County Medical Society, Detroit, February 15, on "Contributions of U. S. Army Medical Officers to Science." The occasion marked the dedication of the Beaumont Room in the David Whitney House, the headquarters of the county medical society, the official ceremonies preceding the lecture which was delivered at the Art Institute. A portrait of William Beaumont by Deane Keller of the Yale School of Fine Arts, New Haven, Conn., was unveiled at the Art Institute and subsequently placed in the Beaumont Room at the society headquarters. "Beaumont and St. Martin" one of the series of paintings executed by Dean Cornwell, New York, was displayed for the occasion. The Beaumont Room was set aside last year for memorabilia (*THE JOURNAL*, July 25, 1942, p. 1033). The present collection includes contemporary miniatures of Dr. and Mrs. Beaumont made available by Mrs. May Beaumont Brotherton of Green Bay, Wis., and her sister, Mrs. Ruth B. Brown of Iron River and a number of rare medical books including a first edition of "Experiments and Observations on the Gastric Juice and the Physiology of Digestion."

## NEW JERSEY

**Honorary Degrees Conferred**—The New Jersey College of Pharmacy at Rutgers University awarded honorary degrees to the following at graduation exercises in the auditorium of the Mutual Benefit Life Insurance Company on January 6: Dr. Morris Fishbein, Chicago, Editor of *THE JOURNAL*; Dr. Thomas M. Pascall, Newark, chief surgeon of Public Service Corporation and medical consultant of Fidelity Union Trust Company, and Adolph F. Marquer, Newark, pharmacist; George D. Beal, Ph.D., Pittsburgh, recipient of the Remington Medal in 1941 for the greatest contribution to pharmacy during the year, received the honorary degree of doctor of science.

**Dr. Bingham Receives Award**—Dr. Arthur W. Bingham, East Orange chairman of the committee on maternal welfare of the Medical Society of New Jersey for twelve years, was presented with the fourth Dr. Edward J. III Award by the Academy of Medicine of Northern New Jersey. The award is a bronze plaque given to a physician by the academy at such time as it deems it wise who merits it for extraordinary service as a physician and a citizen. It was established by the academy to honor its first president, Dr. Edward J. III, who died last year. Dr. Bingham graduated at Columbia University College of Physicians and Surgeons, New York, in 1896.

**"Sanitation Wardens" Organized**—A new volunteer civilian corps to be known as "Sanitation Wardens" was organized at a meeting of the health committee of the community war services division in Plainfield recently. Sanitation wardens according to the sponsor of the plan, Mr. Andrew J. Krog, health officer of Plainfield, will be allocated to city districts according to the number of eating and drinking estab-

lishments within the confines of a district. They will be deputized to make inspections of establishments where food and drink are sold on the premises for consumption and possibly later for the investigation of sanitation nuisances' generally. The wardens will not have the power to take official action but will report back to the health department from whose office they will operate, they will in effect be junior assistants to paid health inspectors. A regular training course has been devised to include a series of lectures, demonstrations and movies and, as part of the training, volunteers will accompany regular health inspectors during their daily check-ups.

### NEW YORK

**Anatomist Dies**—Charles Howell Ward, Rochester founder of the Charles H. Ward Anatomical Laboratory and pioneer commercial anatomist, died January 18, aged 80. Mr. Ward was a member of the Rochester Dental Society and of the Seventh District group of the New York Dental Society.

**Graduate Lecture**—Dr. Foster Kennedy, New York, will discuss 'Nervous Conditions Associated with Warfare' in Ithaca before the Tompkins County Medical Society on March 16. The lecture is part of a postgraduate program sponsored by the state medical society and the state department of health.

**Survey of Child Care Need**—Authorization has been given to one hundred and eight local war councils in the state to make an immediate canvass in their territories to find out the number of mothers having children under 16 who are engaged in work in war plants and the number of children affected. The work is being carried out at the request of Governor Thomas E. Dewey to lay the ground work for his plan to establish child care centers wherever necessary.

### New York City

**Dr. Hirsh Honored**—On January 28 a dinner was held at the Hotel Savoy-Plaza to honor Dr. A. Bern Hirsh on his retirement as managing editor of the *Journal of the Medical Society of the County of New York*. Dr. Charles Gordon Heyd was toastmaster. Other speakers included Dr. Edward C. Titus and Col. Samuel J. Kopetzky, M. C., U. S. Army, who paid tribute to Dr. Hirsh for establishing the *New York Medical Week* and his service to its successor, the *Journal of the Medical Society of the County of New York*. In 1905 Dr. Hirsh founded the *Weekly Roster and Medical Digest*, now known as *Philadelphia Medicine*, and served as its editor until 1917.

**Health Codes for Day Nurseries**—The city board of health has adopted a new health code for day nurseries which are caring for an increasing number of children as mothers enter industry. The new regulations include an annual physical examination for each staff member, examination of each child when admitted and every six months thereafter, and provision for feeding the children every four hours according to a diet prepared by the health department. The food, milk and kitchen equipment of the nurseries will be strictly inspected. Minimum play, rest and sanitary space, depending on the registration, are prescribed. Each agency also must prove its financial competence to comply with the standards.

**"Arts in Therapy"**—The Museum of Modern Art opened an exhibition to the public on "The Arts in Therapy," February 3. The exhibition will later circulate through the country. Last fall the museum, in cooperation with Artists for Victory, held a competition in which artists and craftsmen all over the nation were asked to submit new designs and objects that might be utilized in art therapy. The twenty-three entries which received prizes of \$500 are included in the display. James Thrall Soby, director of the museum's armed services program, said the "exhibition has been designed to encourage and broaden the use of the various arts and crafts in therapeutic work among disabled and convalescent members of the armed forces." The exhibition has been divided into two sections. The first section comprises objects and projects related to those crafts which have been found of therapeutic and recreational value to patients. In the second section is illustrated the use of drawing, painting and sculpture in therapy conducted from the psychiatric point of view as a means both of diagnosis and of cure. The first or occupational therapy section of the exhibition includes more than a hundred items in the various crafts, such as weaving, woodworking, paper construction, metal work, pottery, toys and similar objects that might be made by physically handicapped men.

**Centennial of Holmes's Paper on Puerperal Fever**—The one hundredth anniversary of the publication by Oliver Wendell Holmes of his paper on "The Contagiousness of Puerperal Fever" was observed at the New York Academy of Medicine, February 19. 'The Family Faces the Future' was the theme of the morning program with the following speakers: Mr. Lawrence K. Frank, chairman of science, National Resources

Planning Board, Dr. Abraham A. Brill, Stanley P. Davies, Ph.D., executive director, Community Service Society of New York, and Dr. Frank Fremont-Smith. The theme of the luncheon conference was "Maternity and the Changing Family Scene" with Louis I. Dublin, Ph.D., chief statistician and third vice president of the Metropolitan Life Insurance Company, Dr. Alan F. Guttmacher, Baltimore, and Miss Hazel Corbin, general director, Maternity Center Association, Inc. There was an afternoon symposium on "Meeting the Problems of Maternity Welfare and Child Health Along Many Fronts" by the following speakers:

Miss Alta E. Dines, Community Service Society of New York;  
Miss Frances Taussig, Federation for the Support of Jewish Philanthropic Societies of New York City;  
Mrs. Sidonie M. Gruenberg, Child Study Association of America, Inc.;  
Mr. D. Kenneth Rose, Planned Parenthood Federation of America, Inc.;  
Dr. Thomas W. Patrick, Jr., New York Urban League, Inc.;  
Dr. Leon Baumgartner, New York City Department of Health;  
Dr. Elizabeth M. Gardiner, Albany, New York State Department of Health.

Mrs. Shepard Kreech, Maternity Center Association, Inc.;  
Dr. Herbert B. Wilcox, New York Academy of Medicine.

At the evening meeting Dr. Arthur Z. Chace, president of the academy, gave the address of welcome and Dr. Richard N. Pierson, chairman of the Holmes Centenary Committee, presided. Dr. Reginald Fitz, Boston, spoke on "My Doctor Holmes" and Dr. Benjamin P. Watson, director of the Sloane Hospital for Women, discussed "Oliver Wendell Holmes—A Century's Vindication of His Work on Puerperal Fever."

### OHIO

**New Heart Station**—The Max Stern Heart Station has been established in Cincinnati through a gift of Mrs. Martha S. Stern in memory of her husband. Approved by the Cincinnati Board of Health, the new station will be conducted under the supervision of a committee appointed by the Heart Council. Dr. Bernice L. G. Wedum, Cincinnati, on the staff of Children's Hospital, has been appointed clinician of the heart station.

**Outbreak of Smallpox**—Six additional cases of smallpox reported to the Ohio State Department of Health for the week ended January 17 brought the total to 27 since the outbreak in December according to the *Columbus Citizen*, January 17. Three of the new cases were reported from Holmes County, where an outbreak occurred in the Amish settlement. The outbreak in Ohio and the one in Pennsylvania (THE JOURNAL, January 2, page 61) were related when it was found that the wife of an Amish minister became ill with the disease following their return from a trip into Pennsylvania, Maryland and Delaware.

**Personal**—Dr. Richard T. Morgan has been appointed coroner of Marion County to succeed his son, Dr. Richard L. Morgan, who has entered military service—Lieut. Comdr. William McKinley Johnston, M. C., on leave from the U. S. Naval Reserve after serving at Guadalcanal, was guest of honor at a dinner in the Akron City Club, January 6—Dr. Alexander S. McCormick, Akron, who recently retired as secretary of the Summit County Medical Society after serving the society in various capacities for twenty-eight years (THE JOURNAL, January 23), was presented with a wrist watch at the January meeting by Dr. James G. Kramer, Akron, the outgoing president—Dr. Hugh J. Means, Columbus, has been promoted to professor of roentgenology in the department of surgery and full time director of the x-ray laboratory in the Starling-Loving University Hospital.

### OKLAHOMA

**Institutes in Wartime Industrial Health**—The Oklahoma State Medical Association and the state department of public health are cooperating in two institutes on wartime industrial health, one to be held in Tulsa at the Mayo Hotel, March 18, and one in Oklahoma City at the Biltmore Hotel, March 19. Dr. Henry C. Weber, Bartlesville, will open the program with a discussion on the "Purposes and Objectives of the Program on Industrial Health of the Oklahoma State Medical Association." Members of the state department of public health will discuss "Technical Assistance of the State Health Department Available to Industry." Among other speakers on the program will be:

J. J. Bloomfield, Bethesda, Md., Industrial Hygiene in War Production;  
Dr. Carl M. Peterson, Chicago, Secretary, Council on Industrial Health;  
American Medical Association, General Relation of Medicine to Industry;  
Dr. Clarence D. Selby, Detroit, Preemployment Examination and Placement;  
Dr. William A. Sawyer, Rochester, N. Y., Conservation of Industry's Manpower;  
Dr. John Albert Key, St. Louis, Medical Legal Phase and Evaluation of Disability;  
A. G. Hewitt, Chicago, Management Looks at Industrial Health;  
Dr. Louis Schwartz, Bethesda, Md., Occupational Diseases and Their Control.

## PENNSYLVANIA

**Society News**—Dr Abraham H Aaron, Buffalo, discussed "Use of Drugs by the General Practitioner" before the Northampton County Medical Society recently—A symposium on the eruptive fevers was conducted before the Westmoreland County Medical Society, March 2, in Greensburg

### Philadelphia

**A Million Persons Vaccinated**—On January 25 the Philadelphia *Enquirer* reported that the total vaccinations in the city's drive to prevent the spread of smallpox had reached more than 1,000,000. A reported total of 102,393 persons had been vaccinated in health centers, emergency stations and schools under the supervision of the city department of health since the program was inaugurated January 2. In addition, private physicians inoculated thousands more in their offices, in industrial plants, in hospitals and among the membership of various organizations. The drive against smallpox started following the outbreak in an Amish settlement in the Kishacoquillas Valley (THE JOURNAL, January 2, p 61)

## VIRGINIA

**Awards for Research in State Hospitals**—To stimulate interest in professional work among the physicians on the staffs of the state hospitals, exclusive of the superintendents, prizes will be given each year for original or meritorious papers, based preferably on observations of patients under the physicians' care. The state hospital board, with the approval of the governor, has arranged to make available \$500 each year for these awards, \$250 for the first award, \$150 for the second, \$75 for the third, and \$25 for an honorarium to some out of state authority who would pass on the relative merit of the papers. The papers may concern either one unusual case or a group of cases. The diseases discussed may be common or ordinary diseases in which careful study of the cases will bring out some new points. The papers need not necessarily deal entirely with the clinical or laboratory features but may cover reclassifications and deductions that have not heretofore been made. The papers should be handed to Dr Hugh C Henry, Richmond, state commissioner of mental hygiene and hospitals, by the first of June of each year and the awards made by the first of October.

## GENERAL

**National Negro Health Week**—National Negro Health Week will be observed throughout the country April 4-11. This year the theme will be "Health on the Home Front—Victory on the War Front."

**Examinations in Ophthalmology**—The American Board of Ophthalmology announces that 1943 examinations will be held in New York, June 4-5, and Chicago, October 8-9. Application blanks may be obtained from the secretary of the board, Dr John Green, 6830 Waterman Avenue, St. Louis.

**Examination of Medical Technologists**—The Registry of Medical Technologists of the American Society of Clinical Pathologists announces that its spring examination will be held April 30, the closing date for the acceptance of applications to be March 10. Additional information may be obtained from Dr Lall G Montgomery, chairman of the board of registry, 2400 University Avenue, Muncie, Ind.

**Officers of Federation of State Boards**—Dr John F Hassig, Kansas City, Kan., secretary of the Kansas Board of Medical Registration and Examination was chosen president-elect of the Federation of State Medical Boards during its annual meeting in Chicago, February 16 and Dr Frank M Fuller, Keokuk, Iowa, chairman of the Iowa Board of Medical Examiners, was inducted into the presidency. Dr Adam P Leighton, Portland, Maine, secretary of the Maine Board of Registration of Medicine, was named vice president and Dr Walter L Biering, Des Moines, state health commissioner of Iowa, was reelected secretary-treasurer.

**Obstetric Examination in Pittsburgh**—The general oral and pathologic examinations (part II) for all candidates will be conducted in Pittsburgh by the entire American Board of Obstetrics and Gynecology from Wednesday, May 19, through Tuesday, May 25. Headquarters will be at the Hotel Schenley for the board and formal notice of the exact time of each candidate's examination will be sent him several weeks in advance of the examination dates. Hotel reservations may be made by writing directly to the hotel. Candidates for reexamination in part II must make written application to the secretary's office not later than April 15. The Office of the Surgeon General of the U S Army has issued instructions

that men in service eligible for board examinations be encouraged to apply and that they may request orders to detached duty for the purpose of taking these examinations whenever possible. Candidates in military or naval service are requested to keep the secretary's office informed of any change in address. Deferment without time penalty under a waiver of the published regulations applying to civilian candidates will be granted if a candidate in service finds it impossible to proceed with the examinations of the board. Applications are now being received for the 1944 examinations. For further information and application blanks address Dr Paul Titus, secretary, 1015 Highland Building, Pittsburgh.

**Americans Do Not Eat Wisely, Says Gallup Poll**—A nationwide survey conducted by the American Institute of Public Opinion to determine how much the average American adult knows about simple nutrition rules revealed that the average American has much to learn about what to eat. The New York Times reported on February 8. A record of the principal foods eaten by representative adults in all states was compared with a list of essential health foods recommended by the Bureau of Home Economics of the Department of Agriculture and other nutrition experts. The following figures represent the number of persons who had none at all of the foods listed as necessary daily in each category:

Fruits and raw greens	tomatoes	citrus fruits or juices	raw cabbage
or salad green	45 per cent	had none	
Eggs	one a day	48 per cent	had none
Milk and cheese	34 per cent	had none	
Vegetables	leafy green or yellow	25 per cent	had none
Meats	meat fish or poultry	12 per cent	had none
Other vegetables	(including potatoes)	or fruit	8 per cent had none
Cereals or bread	whole grain or enriched	3 per cent	had none

Sharp deficiencies in dietary habits were found in income groups. Among geographic sections the South shows a greater deficiency in citrus fruits and raw greens, while the New England and Middle Atlantic area shows greatest deficiency in milk or milk products.

### Tropical Medicine Foundation Seeks to Raise \$100,000

—The American Foundation for Tropical Medicine, Inc., at its annual meeting in New York on January 19, approved plans to secure \$100,000 in gifts to provide for expansion of activities in the current year, including support of graduate departments of tropical medicine at American medical schools, grants for fellowships in tropical medicine, financial aid for exchange of faculty, support of technical journals in the field and support of research by grants in aid. Lieut Col Thomas T Mackie, executive officer, Division of Parasitology and Tropical Medicine, Army Medical School, Washington, D C, was elected president of the foundation. In 1942 he had been replaced as director by Dr Jean A Curran, dean and president of the Long Island College of Medicine, Brooklyn. Dr Willard C Rappleye, New York, was elected vice president, Mr William W Lancaster, New York, treasurer, and Mr Alfred R Crawford assistant to Dr Curran, secretary. An executive committee composed of Dr Curran, Dr Theodore G Klumpp, New York, Colonel Mackie, Dr Henry E Meloney, New York, Dr Rappleye, Mr Lancaster and Mr Crawford was named by the directors to serve for the current year. The directors also elected a medical committee made up of Col Charles F Craig, M C, U S Army, retired, and Ernest Carroll Faust, Ph D, New Orleans, Colonel Mackie, Dr Meloney, Dr Alfred C Reed, San Francisco, Dr George C Shattuck, Boston, and Col Joseph F Siler, M C, U S Army, retired, Washington D C. In addition to those named, the following were elected to membership in the foundation: Gen Hugh S Cumming, U S P H S, Washington, D C; Lieut Col Albert R Dreisbach, M C, U S Army, Washington, D C; Gen George C Dunham, M C, U S Army, Washington, D C; Dr Lester J Evans, New York; Dr Edward G Huber, Newton, Mass.; Dr Edward H Hume, New York; Dr Maxwell E Lapham, New Orleans; and Dr Edward I Salisbury, New York. All correspondence should be addressed to Dr Curran at 350 Henry Street, Brooklyn.

**Health Advisory Council Organized**—The Chamber of Commerce of the United States on February 5 announced the creation of a National Health Advisory Council to consider national health problems in relation to the war program. Dr James S McLester, professor of medicine, University of Alabama School of Medicine, Birmingham, was chosen general chairman of the council. The new council will serve to channel approved technical health information developed by the country's many scientific associations to business organizations and their members throughout the country so there may be brought about a better public understanding and appreciation of medical

science as a means of safeguarding public health to win the war. It will work through the Chamber of Commerce of the United States as a central organization which in turn will work through its membership of trade associations, chambers of commerce and corporations and firms. Membership of the council which will be increased as work progresses has been divided into three groups. Dr. Wilson G. Smillie, New York, is chairman of the community group including:

Dr. Paul D. White, Boston  
Dr. J. Burns Amberson, Jr., New York  
Dr. George W. Kosmat, New York  
Dr. Ernest L. Stebbins, New York  
Mr. Bailey B. Burritt, New York

Henry F. Vaughan, Dr. P. H. Ann Arbor, represented by Nathan Sinai, D. I. H.  
George R. Cowgill, Ph. D., New Haven, Conn.  
Dr. Harry Bakwin, New York  
Dr. Felix J. Underwood, Jackson, Miss.

Dr. Leverett D. Bristol, New York, is chairman of the industrial group, comprising:  
Dr. Harvey Bartle, Philadelphia  
Dr. Anthony J. Lanza, Washington, D. C.  
Dr. John J. Prendergast, Jr., Detroit  
Dr. Loyal A. Shoudy, Bethlehem, Pa.

Dr. William A. Sawyer, Rochester, N. Y.  
Mr. John D. Dorsett, New York  
Philip Drinker, Ch. E., Boston  
Dr. Harry E. Ungerleider, New York  
Dr. John J. Wittmer, New York  
Mr. G. W. Hardy, Chicago

Dr. James E. Paulin, Atlanta, Ga., President Elect of the American Medical Association, is chairman of the individual group, which is composed of:

Dr. Leroy U. Gardner, Saranac Lake, New York  
Dr. George M. Piersol, Philadelphia  
Dr. Russell M. Wilder, Rochester, Minn.  
Dr. Alfred Blalock, Baltimore  
Dr. Joseph C. Doane, Philadelphia

Dr. Louis Hamman, Baltimore  
Dr. Wallace M. Venter, Washington, D. C.  
Miss Marion G. Howell, R. N., New York, represented by Miss Maria Sheahan  
Dr. Arthur F. Chace, New York  
Dr. Harold M. Marvin, New Haven, Conn.

**Accidental Deaths in 1942**—The National Safety Council announces that 93,000 deaths from accidents were reported in 1942 as compared with 101,513 in 1941. Of this group 27,800 were charged to motor vehicles in 1942 as against 39,969 in 1941. Accidental deaths in the home accounted for 30,500 against a similar total for 1941. Occupational accidental deaths totaled 18,500 as against 18,000 the previous year and public accidental deaths (not motor vehicle) totaled 15,500 as against 15,000 in 1941. The saving of 8,500 lives in 1942 as compared with the 1941 total is attributed entirely to a drop of 12,200 in traffic deaths accounted for largely by wartime restrictions on speed and travel. A total of 47,500 workers were killed by accidents in 1942, 18,500 on the job and 29,000 off the job. In addition nonfatal injuries to workers totaled 4,100,000 of which about 1,750,000 were caused by occupational accidents. The all-accident totals include accidental deaths of military personnel not shown separately. Motor vehicle deaths include some which also are shown in other categories, such as occupational and home. Not only was the 1942 accident toll less than for 1941 and for most recent years but the death rate of 66.4 per hundred thousand population was the lowest since 1922 when it was the same. There were 9,300,000 persons injured in accidents last year, approximately the same as in 1941, despite the decrease in deaths. One out of every 14 persons in the United States suffered a disabling injury during the year. The estimated economic loss of \$3,700,000,000 from accidents in 1942 covers both fatal and nonfatal accidents and includes wage losses, medical expense, the overhead costs of insurance and property damage from traffic accidents and fires. Children less than 5 years old were the only age group to show an increase in accidental deaths in 1942. Deaths in this group were up 2 per cent. The school child group (5 to 14 years) had a decrease of 9 per cent in fatalities. Falls brought accidental death to 24,000 persons in 1942, 4 per cent below 1941. Deaths from burns were up 17 per cent in 1942 to a total of 8,900. Even after excluding the Boston night club fire the general trend of fatalities from burns was up approximately 10 per cent. Drownings totaled 7,000, an increase of 1 per cent. As in past years, the bulk of the accident total was made up of one-death accidents. Five fatal accidents occurred in 1942 in the domestic operations of scheduled air carriers. One was in January, two in May, one in October and one in December. Passenger deaths numbered 56 and plane crew deaths 15, making a total of 71. The passenger-mile total was approximately 1,490,000,000 which indicates a passenger rate of 3.8 per hundred million passenger miles. This was 65 per cent above the 1941 rate of 2.3 and was higher than the rates for 1939 or 1938. It was lower, however, than the rate for any earlier year. In 1932 the rate was 15. Railroad accidents caused 4,809 deaths in the first eleven months of 1942,

excluding deaths which occurred more than twenty-four hours after the accident. This was 4 per cent more than the comparable 1941 total of 4,616.

**College of Surgeons Plans War Sessions**—New developments in military and civilian medical and hospital service will be brought to members of the medical profession at large and hospital representatives through a series of twenty war sessions beginning March 1, to be held throughout the United States under the sponsorship of the American College of Surgeons with the cooperation of other medical organizations and the federal medical services. Each war session will consist of an all day program lasting from 9 a. m. to 10 p. m., including luncheon and dinner conferences. There will be eight meetings in each session, four of which will be for the entire assembly and the remainder divided into two meetings each for physicians and for hospital representatives. Subjects will be similar in the different places, but some of the speakers will be changed in the different states and service commands. Nationally known representatives of the United States Army, the United States Navy, the United States Office of Civilian Defense, the United States Procurement and Assignment Service and the United States Public Health Service will address the meetings and will lead discussions in addition to participation by prominent leaders in civilian medical practice and hospital service. The schedule is as follows:

Monday, March 1: Minnesota, North Dakota and South Dakota, Iowa Hotel St. Paul  
Wednesday, March 3: Wisconsin and Illinois, Schroeder Hotel Milwaukee  
Friday, March 5: Indiana, Kentucky and Ohio, Claypool Hotel Indianapolis  
Monday, March 8: Michigan, Statler Hotel Detroit  
Wednesday, March 10: Pennsylvania and West Virginia, the William Penn Litchburgh  
Friday, March 12: New York and Ontario, Statler Hotel Buffalo  
Monday, March 15: Massachusetts, Connecticut, Maine, New Hampshire, Rhode Island and Vermont, Statler Hotel Boston  
Wednesday, March 17: New York City, Delaware and New Jersey, St. George Hotel Brooklyn  
Friday, March 19: Virginia, District of Columbia and Maryland, John Marshall Hotel Richmond  
Monday, March 22: North Carolina and South Carolina, Charlotte Hotel Charlotte  
Wednesday, March 24: Alabama, Florida and Georgia, Tutwiler Hotel Birmingham  
Friday, March 26: Tennessee, Arkansas and Mississippi, Peabody Hotel Memphis  
Monday, March 29: Texas and Louisiana, Rice Hotel Houston  
Thursday, April 1: Kansas, Missouri and Oklahoma, President Hotel Kansas City  
Saturday, April 3: Nebraska and Iowa, Fontenelle Hotel Omaha  
Tuesday, April 6: Colorado, New Mexico and Wyoming, Cosmopolitan Hotel Denver  
Friday, April 9: Utah and Idaho, Utah Hotel Salt Lake City  
Tuesday, April 13: Southern California and Arizona, Biltmore Hotel Los Angeles  
Friday, April 16: Northern California and Nevada, Fairmont Hotel San Francisco  
Tuesday, April 20: Washington, Montana, Oregon and British Columbia, Olympic Hotel Seattle

Dr. Irvin Abell, Louisville, Ky., chairman of the board of regents of the college in announcing the war sessions, said that although participating states and provinces for each meeting have been designated to facilitate arrangements, there will be no geographic restriction on attendance, and those who plan to attend may select the place and time which are most convenient. The American College of Surgeons canceled its 1942 national meeting and is holding in abeyance plans for a clinical congress in 1943 in the meantime offering the regional meeting plan provided by the war sessions to save the time of the doctors and other personnel and to minimize transportation difficulties without sacrificing unduly during wartime the educational and stimulative benefits of medical assemblies.

## CORRECTIONS

**Carcinoma of the Prostate**—In the case reported on page 500 of THE JOURNAL for February 13 the total protein reported as 750 mg per hundred cubic centimeters should read 7,500 mg per hundred cubic centimeters. This very high figure, indicating the degree of "block," makes the response to orchiectomy two weeks after operation even more remarkable.

**Experimental Fibroids and the Antifibromatogenic Action of Steroid Hormones**—In the article by Dr. Alexander Lipschutz in THE JOURNAL, Sept. 19, 1942, "the estrogenic" (p. 172 second column line 25) should read "a gonadal" "estrogenic" (p. 174 first column lines 38 and 39) should read "masculinizing," and "fibromatogenic" (p. 175 first column, line 23) should read "antifibromatogenic."

## Foreign Letters

### LONDON

(From Our Regular Correspondent)

Jan 9, 1943

#### Medical Aid to Russia

The Anglo Soviet Medical Council under the chairmanship of Sir Alfred Webb Johnson, president of the Royal College of Surgeons, has been in existence for a year. Its object is to send to Russia recent medical publications and to make Soviet work accessible here. Complete sets of the *Lancet*, *British Medical Journal*, the *Bulletins of War Medicine*, *Hygiene and Tropical Diseases*, *Proceedings of the Royal Society of Medicine*, *Journal of the Royal Army Medical Corps* and *Journal of Medical Science* have been sent. Recently *Reviews of British War Medicine*, consisting of specially written articles and translated into Russian, was presented to Mrs. Musky, wife of the Russian ambassador. Three thousand copies of it have been printed and sent to Russia. It covers a wide range of subjects, including public health, vitamin therapy, bone surgery, treatment of burns and crushes, blood grouping and the care of stored blood, hospital infections of wounds, sulfonamide and penicillin treatment, treatment of gonorrhea, bacillary and amebic dysentery, typhoid, typhus, malaria, tularemia and venereal lymphogranuloma. A volume on thoracic surgery is in preparation.

Russian articles have been received by the council, mainly through the editor of the *Soviet War News*, and have been published in English medical journals. The Society for Cultural Relations with Russia has handed over books and pamphlets for translation. An appeal was made for translators from the Russian, and replies were received from sixty-six persons, mostly doctors.

#### A National Collection of War Injuries

The valuable collection of pathologic specimens formed in the last great war was destroyed when the Royal College of Surgeons was bombed in 1941. At the request of the War Office and the college, the Medical Research Council has undertaken to replace it by a national collection illustrating injuries of the present war to comprise specimens, pictures, photographs and roentgenograms of lesions produced by missiles, war gas or explosion gas or by secondary missiles, such as fragments of masonry or debris, including crushing injuries, the effects of impact of blast wave in air or water and burns together with the mode of repair, the consequences of infection and the results of treatment. Without the participation of the medical officers in the services such a collection can never become comprehensive. It is hoped that they will take every possible opportunity of contributing. Specimens may be sent to Prof. M. J. Stewart, Pathological Department, University of Leeds or to Professor Hadfield, Hill End Hospital, St. Albans, Herts. As the value of a specimen often depends on the care taken in collection and the preliminary treatment, a leaflet circulated by the War Wounds Committee of the Medical Research Council offering suggestions on fixation and dispatch may be obtained from the Army Medical Department of the War Office.

#### New Element Discovered by English Woman

Not for the first time has a woman taken part in the discovery of a new element. In 1898 salts of radium with the periodic number of 88 were prepared by M. and Mme. Curie of whom an English woman, Dr. Alice Leigh Smith, was a pupil. The wife of a British diplomat, she was the first woman in England to be awarded the degree of D.Sc. in nuclear physics. Under the auspices of the British Empire Cancer Campaign she conducted medical research from 1936 until the outbreak of war and initiated a new method of treating cancer. In July 1940 Dr. Walter Minder, director of the Radium Institute in Berne,

announced the discovery among the disintegration products of radioactive actinium, of extremely minute quantities of helvetium, periodic number 85, with properties allied to those of chlorine, bromine and iodine. The discovery was reported in the British scientific periodical *Nature*, but competent scientists expressed doubt whether the element existed on earth in nature. Subsequently Dr. Leigh-Smith, who was engaged in cancer research in Berne, observed in the behavior of radioactive reagents unaccountable irregularities which suggested the presence of some hitherto unidentified element generated on atomic disintegration. Proof of the discovery of a new element was obtained by the joint work of the two physicists at the Radium Institute, Berne. They have designated it "anglo-helvetium" to denote the collaboration of scientists of the two countries.

#### Medical Benefits to Natives Under British Colonial Rule

The question of the bearing of the Atlantic charter on the future of the British colonies and the effect of any international system which may arise after the war have begun to be discussed. Some recent criticisms of the government of our colonies has given rise to a vigorous defense in the House of Lords by Lord Cranborne, who has been a colonial administrator. He described the great benefits, of which the medical ones are not the least important, which our rule had brought. A comparatively small part of our empire was acquired by war and that generally at the expense of other European powers rather than directly from the natives. These colonies have been held mainly as buttresses of that sea power which had been the principal guaranty of the peace of the world. Much territory in Africa had been occupied for the campaign against the slave trade and one colony in order to make a home for slaves set free.

Describing medical benefits he said that in Malaya in the last thirty-five years we reduced the death rate from 46 to 20 per thousand. We set up there hospitals and welfare centers. We introduced compulsory education for all Malay boys between the ages of 7 and 14 years. We developed the great rubber industries to the benefit not only of ourselves but of the natives and of the world. We transformed the island of Singapore from an unproductive stricken jungle into one of the great ports of the world.

We established medical schools in East and West Africa, Ceylon, Malta and Fiji, which turned out physicians. Nurses and medical auxiliaries also were trained. Important investigations were carried out by our own organizations and by the Rockefeller Foundation. Slowly but steadily the problems of malaria, yellow fever, venereal disease, malnutrition and tuberculosis were being tackled. In remote unhealthy fever-ridden districts members of the colonial medical service were giving their lives for the welfare of the native population. We also promoted social security and established satisfactory labor conditions.

#### Control of Rubber Gloves

For the year 1943 the maximum number of pairs of rubber gloves obtainable by physicians is six, by midwives six, by district nurses not practicing as midwives four and by nurses in private practice two. Physicians can apply for supplementary rations but must give satisfactory reasons. These regulations do not apply to gloves required for work done in hospitals, nursing homes or other institutions or done in extra-domiciliary practice on the behalf of such institutions.

#### The Diagnosis and Treatment of Tuberculosis

The minister of health has had under consideration the question of improved arrangements for improved treatment and early diagnosis of tuberculosis. He has issued a circular to the local health authorities pointing out the importance of providing means for miniature radiography for which transportable equipment will be allocated to them. Arrangements are also



being made by the Ministry of Health for training the necessary staff for operating this new means of diagnosis. Its importance requires that the arrangements for miniature radiography should be standardized.

Financial assistance is to be made available to all persons who suffer loss or diminution of income while undergoing treatment for pulmonary tuberculosis, whether in an institution or at home and who have one or more persons wholly or mainly dependent on them.

#### Antidiphtheria Drive

The Ministry of Health is making a drive to get as many children as possible inoculated against diphtheria. In 685 out of 1,440 local health districts it is reported that 50 per cent or more of the children between the ages of 5 and 15 years have been inoculated. The same result has been achieved for children aged 1 to 5 years in 247 districts. In 80 districts a percentage of 90 or more was attained.

#### Russell John Howard

The death of Russell John Howard has removed a well known surgeon and teacher. Born in 1875 he entered the London Hospital as a student in 1895 and graduated M.B. Lond. with first class honors and a gold medal. Adopting surgery, he took the M.S. with a gold medal and the F.R.C.S. in 1903. In 1908 he was appointed assistant surgeon to the London Hospital. There he became famous for his incisive style of teaching. "What is wrong with this patient?" he would say. When a student began, "Well, sir, it might be—" Russell would reply, "I didn't ask you what it might be. Surely you can have an opinion. I used to be wrong nine times out of ten. Now I'm wrong only seven times out of ten." He wrote a number of successful textbooks: "Practice of Surgery," "Surgical Nursing," "Surgical Emergencies" and "House Surgeon's Vade Mecum." Because of his teaching gifts he was described as an "institution" of the London Hospital, where he exercised a profound influence on many generations of students. After his retirement as surgeon to the hospital under the age limit, he continued to lecture on surgery and surgical nursing.

#### BUENOS AIRES

(From Our Regular Correspondent)

Dec. 25, 1942

#### Aviators' Sickness

In a lecture recently delivered at the National Academy of Medicine of Buenos Aires, Dr. Rene Crouchet discussed the psychologic phenomena of aviators' sickness which are brought about by physiologic phenomena due to the variations of air pressure and of the amount of oxygen in the air, as well as by velocity and rapid acceleration. The body tolerates velocities of acceleration of from 6 to 14 g and even 17 g if acceleration is of short duration (from two to ten seconds). Prolonged velocity, poor hygienic practices, fatigue, overwork and intoxication are the causes of grave disorders. The use of sulfonamide compounds is prohibited. Tonics, especially vitamin A, are indicated to prevent and control physical fatigue and certain visual disorders.

#### Infant Mortality in Colombia

The infant mortality rate in Colombia is high. Death occurs from nutritional disorders the result of insufficient or improper feeding even in infants of large cities. The figures of infant mortality during the first year of life were as follows: 38,561 deaths (30.5 per cent) in 1935, 37,839 in 1936, 39,418 in 1937, 43,809 in 1938, 45,523 in 1939 and 40,956 in 1940. The rate of mortality for children between the ages of 1 and 10 years was as follows: 24,489 children in 1935, 29,648 in 1940 and of figures ranging between the foregoing in the years from 1936 to 1939 with the exception of 1938, when the greatest rate of mortality was observed that is 37,013 deaths.

#### Society Reunions

The second annual reunion of the Argentine Medical Association took place in Cordoba on the first week of December 1942. The speakers were Drs. Raul F. Vaccarezza, Andres R. Arena, Gonzalo Bosch and Jose Belbey. Official topics discussed were "Tuberculosis of Bovine Origin," "Care of the Insane" and "Medical Charlatanism."—The first Cardiologic Week was recently held in the National Academy of Medicine of Buenos Aires. The main topic of discussion was "Cardiac Insufficiency."

#### Prize for Research Work

The Rodolfo Fitte Foundation established a prize of 10,000 Argentine pesos (\$2,500) for the best work on acute anterior poliomyelitis which is presented between January and December 1943. Argentine and Pan American investigators may enter the contest, details of which can be obtained from the president of the Rodolfo Fitte Foundation, Avenida Quinteros 39, Buenos Aires.

#### Medical Societies

The Argentine Society of Proctology of Buenos Aires was recently established. Dr. Carlos Bonifacio Urdondo is the president. The society aims to reunite Argentine proctologists in a specialized group and also to organize a Pan American Society of Proctology and to create postgraduate courses of proctology as a specialty.

#### Personals

Dr. Leo Eloesser, professor of clinical surgery, Stanford University School of Medicine, accepted the invitation of the Argentine medical profession through Dr. Oscar Ivamsevich, dean of the Instituto de Clinica Quirurgica of Buenos Aires, and visited Argentina. He delivered several lectures before the Argentine Medical Association and other medical and surgical societies of Buenos Aires. In some of the lectures the speaker discussed "Treatment of War Fractures."

Dr. Jose Arce recently returned home from the United States where he carried on important studies on organization and functions of blood banks. He will report in detail his observations to our government and will show the advisability of organizing blood banks in the various provinces of Argentina, at least one bank in every province.

#### Deaths

Dr. Jose J. Puente of Buenos Aires, a syphilologist and specialist in venereal diseases and the head of the Department for Prevention of Leprosy, Syphilis and Venereal Diseases of the National Department of Hygiene, recently died in that city.

## Marriages

HOWARD W. SMITH, Woodward, Iowa, to Miss Madeline Rue of Bismarck, N. D., in Des Moines, December 25.

ROBERT CANTRELL FEAMSTER, San Antonio, Texas, to Miss Helen Louise Greer of New Orleans, November 28.

CAREY ADDISON STONE, JR., Crewe, Va., to Miss Cornelia Daniel Preston of Lewisburg, W. Va., January 7.

LE ROY F. CATTERSON, Oskaloosa, Iowa, to Miss Lucile Tindle of Malcom, in Montezuma, December 13.

CHARLES JAMES FRANKEL, University, Va., to Miss Gladys Louise Birmingham of Buena Vista, January 8.

CHARLES HAMILTON REID, JR., Winston-Salem, N. C., to Miss Elizabeth Ray of Chapel Hill, recently.

WILLIAM E. MORROW, Chicago, to Miss Margaret R. Leonard of Monmouth, Ill., December 31.

CLARA Z. JOEL, Richmond, Va., to Corporal Edward Fleisher of Bethlehem, Pa., January 5.

GEORGE R. CRISLER, Winter Park, Fla., to Mrs. Jane Bacher in Miami, recently.



## Deaths

**Wilmer Krusen** \* Media, Pa., Jefferson Medical College of Philadelphia, 1893, president of the Philadelphia College of Pharmacy and Science from 1927 to March 31, 1941, when he retired with the title of president emeritus, in 1902 became professor of gynecology and later emeritus professor of gynecology at the Temple University School of Medicine, in 1913 he was elected a trustee, in 1914 vice president and in 1927 honorary vice president of the university, director of public health from 1916 to 1920 and again from 1924 to 1928, member of the House of Delegates of the American Medical Association in 1917, 1918, 1919 and 1921, served as president of the Medical Club of Philadelphia, the Philadelphia Obstetrical Society, the Philadelphia Clinical Association and a member of the Philadelphia Rotary Club, was director of the Philadelphia Chamber of Commerce, a trustee of the Welfare Federation and a member of the board of county prison inspectors, had been director and vice president of the Public Charities Association of Pennsylvania, a member of the College of Physicians of Philadelphia, a fellow of the American College of Surgeons, served as gynecologist at the Samaritan and Garretson hospitals, a member of the board of trustees of the Philadelphia State Hospital, associated with the Jefferson, Temple University, City, Philadelphia General and Municipal hospitals, formerly a member of the advisory council of the Henry Phipps Institute, in 1916 received the honorary degree of doctor of laws from the University of Pittsburgh, the honorary degree of doctor of science was awarded to him by Temple University in 1927 and by Franklin and Marshall College, Lancaster, Pa., in 1933, in 1934 received the honorary degree of master of arts in medicine from the Hahnemann Medical College and Hospital, aged 73, died, February 9, of coronary infarction.

**Lee Hollister Ferguson** \* Cleveland, Columbia University College of Physicians and Surgeons, New York, 1917, director of student health service at Western Reserve University, where he was formerly demonstrator and clinical instructor in medicine, instructor in medicine at his alma mater from 1918 to 1920, research assistant department of preventive medicine and hygiene, Harvard University, Boston, 1920-1921, had for several years been assistant supervisor of health education in the public schools of Cleveland, member of the National Tuberculosis Association, the Anti-Tuberculosis Association of Cuyahoga County, the American Association of College Health Services and the Cleveland Academy of Medicine fellow of the American Public Health Association, a member of the board of trustees of the Cleveland Child Health Association, aged 57, died January 27, in the Leonard C. Hanna House, University Hospitals, of Hodgkin's disease with terminal pneumonia.

**Frank E. Detling** \* Los Angeles, Northwestern University Medical School, Chicago, 1901, associate clinical professor of surgery, University of Southern California School of Medicine, specialist certified by the American Board of Otolaryngology, member of the American Academy of Ophthalmology and Otolaryngology and the Pacific Coast Oto-Ophthalmological Society, fellow of the American College of Surgeons, past president of the Los Angeles Eye and Ear Society and chairman of the eye and ear section of the California Medical Association formerly otolaryngologist to the Graves Dispensary, attending and consulting otolaryngologist to the Children's Hospital and for many years senior otolaryngologist to the Los Angeles County Hospital, aged 66, died, December 25, of carcinoma of the stomach.

**Charles Briggs Crittenden**, Louisville, Ky., Vanderbilt University School of Medicine, Nashville, Tenn., 1912 member of the Kentucky State Medical Association, served as director of the division of maternal and child hygiene of the state department of health of Kentucky, formerly registrar of vital statistics and commissioner of the department of public health of Tennessee, formerly health commissioner of Chattanooga, Tenn., and Wilkes-Barre, Pa., had been health director of rural study of the American Public Health Association, past president of the Pennsylvania Public Health Association, at one time director of the Kirby Memorial Health Center, Wilkes-Barre, aged 54, died, January 15, of coronary occlusion.

**Donald Da Costa Shira**, La Rue, Ohio, Ohio State University College of Medicine, Columbus, 1914 member of the Ohio State Medical Association, during World War I served as a captain in the medical corps of the U. S. Army served as health commissioner for Summit County from 1920 to 1922 and as director of health for the city of Akron from 1922 to 1927, at one time had been assistant secretary and medical

adviser of the Ohio Public Health Association, for many years medical editor of *Ohio Public Health*, aged 55, died, December 30, of coronary occlusion.

**Arthur Kehew Day**, Concord, N. H., Harvard Medical School, Boston, 1889, member of the New Hampshire Medical Society which in 1940 awarded him a fifty year membership gold medal, during the Spanish-American War served in the U. S. Army as a first lieutenant and assistant surgeon, for a number of years was school physician of Concord, for twenty-five years served as attending physician at the Margaret Pillsbury General Hospital, formerly U. S. Pension Examining Surgeon for Merrimack County, aged 80, died, December 31, of coronary thrombosis.

**Charles Louis Ahner**, Chicago, Bennett Medical College, Chicago, 1913, member of the Illinois State Medical Society, aged 75, died, January 10, in Kenilworth, Ill., of arteriosclerosis and myocarditis.

**Theophilus Powell Allen** \* New York, Columbia University College of Physicians and Surgeons, New York, 1923, member of the National Gastroenterological Association served during World War I, aged 46, associate attending physician, department of medicine, St. Luke's Hospital, where he died, January 27, of rheumatic heart disease.

**David Tarwater Austin**, Sarasota, Fla., Memphis (Tenn.) Hospital Medical College, 1911, captain in the medical reserve corps of the U. S. Army not on active duty served overseas during World War I, aged 65, died, December 31, of myocarditis.

**Alexander Aloysius Backiel**, Chicago Heights, Ill., Chicago Medical School, 1928 member of the Illinois State Medical Society, aged 43, on the staff of the Southtown Hospital, Chicago, where he died, February 1, of transverse myelitis.

**Hinton Miller Belflower**, Sycamore Ga., Atlanta College of Physicians and Surgeons, 1911, member of the Medical Association of Georgia served as a member of the county board of education, aged 65, died, December 3, of cerebral hemorrhage.

**Arthur Birt**, Halifax, N. S. Canada, M.B., C.M. 1887 and M.D. 1898, University of Edinburgh Faculty of Medicine, Scotland, spent his earlier years of practice on the staff of an English mental hospital and as a ship's surgeon died, November 19, in Wolfville of chronic subdural hematoma.

**James R. Boring**, Canton, Ga., Atlanta College of Physicians and Surgeons, 1899, member of the Medical Association of Georgia, had recently been an examiner for the Cherokee County Selective Service System and served in the same capacity for the draft board during World War I for twelve years served on the board of education of Canton, aged 64 died recently of acute coronary occlusion.

**Clemens Bossard**, Wauwatosa Wis., Hahnemann Medical College and Hospital, Chicago, 1885, aged 80, died, January 6, of coronary disease.

**John Hammond Bradshaw**, Orange, N. J., College of Physicians and Surgeons, New York, 1884 member of the Medical Society of New Jersey, fellow of the American College of Surgeons, consulting surgeon to the Orange Memorial Hospital, Orange and the Jersey City Hospital, Jersey City, in 1941 the Essex County Medical Society presented him with a scroll of appreciation for practicing medicine for fifty years or more, aged 82 was found dead, January 20, of illuminating gas poisoning self administered.

**William Branower** \* New York, Columbia University College of Physicians and Surgeons, New York, 1904 specialist certified by the American Board of Anesthesiology, Inc. member and in 1917 president of the American Society of Anesthetists, Inc. member of the American Association for Thoracic Surgery, aged 61 attending anesthesiologist to the Mount Sinai Hospital where he died January 17, of coronary thrombosis.

**William Charles Bristow** \* Emhouse Texas (licensed in Texas by years of practice), past president of the Navarro County Medical Society, aged 68, died January 6, in the Navarro Clinic Hospital, Corsicana, of heart disease.

**Ruth Gudrun Brogger**, Orange, N. J., Syracuse University College of Medicine 1941, served as an intern at the Syracuse University Medical Center aged 34 died, December 28, in the Hospital of St. Barnabas and for Women and Children Newark of acute leukemia.

**George Edwin Brown**, Hackensack, N. J., College of Physicians and Surgeons, New York, 1875 formerly physician for the county's penal institutions and for the city board of health, aged 90, died December 31, of arteriosclerosis.

**Lewis Allen Buchman** \* Canton, Ohio, University of Wooster Medical Department, Cleveland, 1903 for many years

chief of surgery at the Aultman Hospital, where he was president of the medical staff in 1939, served also as lecturer in the hospital's school of nursing, past president of the Canton Medical Society, fellow of the American College of Surgeons, served as a captain in the medical corps of the U. S. Army during World War I, aged 67, died, January 6, of Parkinson's disease.

**Lyman Ambrose Burnside**, Marshall, Ill., College of Physicians and Surgeons of Chicago School of Medicine of the University of Illinois, 1905, served during World War I at one time associated with the U. S. Public Health Service and the Veterans Administration, aged 63, died recently in Biloxi, Miss., of heart disease.

**Noah Arthur Burr**, Higganum, Conn., Yale University School of Medicine, New Haven, 1901, member of the Connecticut State Medical Society, at one time school physician in Manchester, formerly health officer of Haddam, aged 67, died, January 9, of cerebral hemorrhage.

**Benjamin Charles Deeley**, Pasadena, Calif., University of Wooster Medical Department, Cleveland, 1908, member of the Ohio State Medical Association, aged 58, died, November 29, of cerebral hemorrhage due to arteriosclerosis.

**James Lawrence Devlin**, New York, Queen's University Faculty of Medicine, Kingston, Ont., Canada, 1899, member of the Medical Society of the State of New York, formerly chief examiner of lunacy in New York City, member on the staff of the Murray Hill Hospital, served as physician for the Richmond County Jail, aged 65, died, January 11, in the Muhlenberg Hospital, Plainfield, N. J., of coronary thrombosis.

**Joseph Francis Duane**, Peoria, Ill., Rush Medical College, Chicago, 1903, member and at one time vice president of the American Academy of Ophthalmology and Otolaryngology, member of the staff of St. Francis Hospital, aged 62, died, January 21, of primary diffuse generalized amyloidosis.

**Marion Alexander Duncan**, Chanute, Kan., Medical College of Indiana, Indianapolis, 1891, aged 87, died, January 10, of cerebral hemorrhage.

**Frank Hamilton Dunklin**, Gallatin, Tenn., University of Tennessee Medical Department, Nashville, 1886, aged 79, died, January 2, of heart disease and chronic nephritis.

**Darius Edrington**, Avery, Texas, Memphis (Tenn.) Hospital Medical College, 1906, member of the State Medical Association of Texas, served as a first lieutenant in the medical corps of the U. S. Army at Camp Lee, Virginia, during World War I, for twenty years served as president of the school board, aged 60, died, November 20, of craniorenal hypertensive disease.

**Moosha Berkowitz Freid**, New Rochelle, N. Y., University of the City of New York Medical Department, 1895, member of the Medical Society of the State of New York, at one time attending physician at the Lebanon Hospital, New York, aged 78, died, January 21, of carcinoma of the intestine.

**Sheridan C. Griffith**, Worthington, Ohio, National Normal University College of Medicine, Lebanon, 1893, aged 76, died, January 8, in the Stirling Loving University Hospital, Columbus, of uremia.

**Francis Royal Hendricks**, Ventura, Calif., Jefferson Medical College of Philadelphia, 1924, served as physician for the Associated Oil Company in Ventura, aged 44, chief of the Foster Memorial Hospital, where he died, December 27, of coronary thrombosis.

**Retta Gifford Kilborn**, Toronto, Ont., Canada, Trinity Medical College, Toronto, 1891, for many years served as a medical missionary to China under the Women's Mission Board of the Methodist Church, professor emeritus of pediatrics in the faculty of medicine, West China Union University, and superintendent of the Hospital for Women and Children in Chengtu, Szechwan, China, aged 78, died, December 1.

**Thomas Jackson Pennington**, Nacogdoches, Texas, National University of Arts and Sciences Medical Department, St. Louis, 1917, member of the State Medical Association of Texas, county health officer on the staff of the City Memorial Hospital, aged 57, died suddenly, December 26, of heart disease.

**John Thomas Phillips**, Long Beach, Calif., Rush Medical College, Chicago, 1897, formerly local physician for the Great Northern Railroad, and president of the Security State Bank at Newport, Wash., aged 71, died, December 6, of carcinoma.

**Francis Marion Pitts**, Des Moines, Iowa, Keokuk Medical College, 1891, aged 75, died, December 21, of diabetes mellitus.

**Frederick Judd Rathbun**, New Windsor, Ill., Rush Medical College, Chicago, 1913, aged 55, died, January 29,

in the Galesburg (Ill.) Hospital of cerebral hemorrhage and arteriosclerosis.

**Charles John Reynolds**, Buffalo, Niagara University Medical Department, Buffalo, 1890, member of the American Society of Anesthetists, Inc., aged 77, served on the staff of the Millard Fillmore Hospital, where he died, January 11, of carcinoma of the liver.

**Benjamin Travis Robinson**, New Augusta, Miss., Medical Department of Tulane University of Louisiana, New Orleans, 1906, member of the Mississippi State Medical Association, from 1926 to 1932 director of the Perry County Health Department and part time health officer from 1932 to 1938, served during World War I, president of the South Mississippi Medical Society in 1940, aged 63, died, December 2, of a cerebral hemorrhage.

**Linn L. Roebuck**, Marion, Ohio, Starling Medical College, Columbus, 1894, on the staff of the Marion City Hospital, aged 69, died, January 14, of coronary thrombosis.

**Frank Charles Sarazin**, Superior, Wis., Chicago Medical College, 1888, on the staffs of St. Mary's and St. Francis hospitals, aged 76, died, December 17, of coronary thrombosis.

**Martin John Sauter**, Newport, Ky., Eclectic Medical College, Cincinnati, 1916, member of the Kentucky State Medical Association, served as coroner of Campbell County for many years, served during World War I, aged 50, died, January 2, in Lakewood, Ohio, of coronary disease.

**James M. Talcott**, Omaha, State University of Iowa College of Medicine, Iowa City, 1896, served as chief probation and parole officer for the federal government for eight years, at one time located at Crofton, Neb., and in 1909 was elected to the state legislature and remained as representative from his district for several years, aged 70, died, November 19, of heart disease.

**James Richard Tarrant**, Birmingham, Ala., Medical College of Alabama, Mobile, 1887, aged 81, died, December 16, of coronary occlusion and generalized sclerosis.

**William Franklin Temple**, Boston, Harvard Medical School, Boston, 1911, member of the Massachusetts Medical Society, past president of the Boston Society of Anesthetists, served on the staff of the Massachusetts Women's Hospital, aged 55, died, December 25, at his home in East Pembroke, of an acute kidney obstruction.

**Edward K. Wolfe**, Palouse, Wash., Physio Medical College of Indiana, Indianapolis, 1898, past president of the Whitman County Medical Society, for many years health officer, aged 72, died, December 4, in St. Ignace Hospital, Colfax, of uremia and diverticulitis of the colon.

#### DIED WHILE IN MILITARY SERVICE

**Pashupati Joseph Sarma**, Chicago, Hahnemann Medical College and Hospital, Chicago, 1916, served as associate professor of surgery at the University of Illinois College of Medicine, formerly associate in surgery at the Loyola University School of Medicine, where he was instructor from 1927 to 1929 and assistant in surgery from 1924 to 1927, specialist certified by the American Board of Surgery, fellow of the American College of Surgeons, on the staffs of the Ravenswood and Cook County hospitals, served during World War I, was called to active duty, March 10, 1941, as chief of the surgical service at the Station Hospital, Camp Berkeley, Texas, with rank of lieutenant colonel and later was promoted to the rank of colonel in the medical corps of the Army of the United States, aged 49, died, January 21, in Fort Sam Houston, Texas, of coronary arteriosclerosis.

**Benjamin R. Roman**, New York, University and Bellevue Hospital Medical College, New York, 1929, specialist certified by the American Board of Pediatrics, Inc., on the staffs of the Park West Hospital and the New York Polyclinic Medical School and Hospital, began active duty as a captain in the medical corps of the Army of the United States, Nov. 9, 1942, aged 37, died, January 16, at Modesto, Calif., in an automobile accident.

**Henry Fischer Standerwick Jr.**, New York, Columbia University College of Physicians and Surgeons, New York, 1940, in August 1942 began active duty as a first lieutenant in the medical corps of the Army of the United States, attached to Company B, 81st Armored Medical Battalion, 11th Armored Division, Camp Polk, La., where he died, January 5, of encephalitis, aged 28.

## Bureau of Investigation

### MISBRANDED PRODUCTS

#### Abstracts of Notices of Judgment Issued by the Food and Drug Administration of the United States Department of Agriculture

[EDITORIAL NOTE—These Notices of Judgment are issued under the Food, Drug and Cosmetic Act and in cases in which they refer to drugs and devices they are designated D D N J and foods, F N J. The abstracts that follow are given in the briefest possible form: (1) the name of the product, (2) the name of the manufacturer, shipper or consigner, (3) the date of shipment, (4) the composition, (5) the type of nostrum, (6) the reason for the charge of misbranding and (7) the date of issuance of the Notice of Judgment—which is considerably later than the date of the seizure of the product and somewhat later than the conclusion of the case by the Food and Drug Administration.]

**El Panel Cuban Honey**—Albert H. Hoffman trading as Hoffman Health Products Tampa, Fla. Shipped Oct. 14, 1939. Composition ordinary honey. Misbranded because of false representations on label that this was a "wonder honey" in that it differed materially from ordinary honey, that it contained minerals that would help build bones, muscle and tissue, materially in excess of the amount of such minerals in ordinary honey, that it would supply the elements valuable in ailments resulting from mineral deficiencies in amounts materially in excess of those contained in ordinary honey, that it possessed proportionately high amounts of potassium, sodium, calcium, magnesium, iron, phosphorus, chlorine, sulfur, silicon and undetermined minerals that it had value as a food, body builder and constructive nutritional factor, materially in excess of that found in ordinary honey, and that it contained minerals and other nutritional elements lacking in other honeys, whereas it did not differ materially from the ordinary product. Further misbranded because of false and misleading label statements that it possessed efficacy as a dietary supplement in the treatment of sinus, coughs, asthma, hay fever, constipation, stomach ulcers and digestive elements and as a general tonic and body builder, that it had natural healing properties, was of greater value to both children and adults who are anemic, have poor appetite and other symptoms of run-down condition, that it would alkalize, vitalize and uphold the body and in preventing respiratory ailments and build resistance would help remove mucus and be a boon to raw and inflamed respiratory tracts, that it would benefit bowel and colon trouble by helping to change the intestinal flora, that it contained a pollen which would counteract the pollen which causes hay fever, that it would benefit stomach disorders such as ulcers and among other things would be a tonic, body builder and weight increaser.—[D D N J F D C 483 September 1942]

**Hain Becomax Capsules**—International Vitamin Corporation, Brooklyn. Shipped Dec. 9, 1940. Adulterated because strength differed from and quality fell below that which it was represented to possess, namely, "each capsule contains B<sub>1</sub>—100 International (200 Sherman) Units, whereas it contained not more than 60 U. S. P. units of vitamin B<sub>1</sub> per capsule (or an equal amount of international units). Misbranded for the same reason. Product was also charged to be adulterated and misbranded under the provisions of the law applicable to foods as reported in F N J No. 2821.—[D D N J F D C 476 September 1942]

**Klorseptie Oil**—Howard D. Dry, trading as High Chemical Company, Philadelphia. Shipped between Jan. 12 and Feb. 14, 1940. Composition essentially a semiviscous oil having the odor of eucalyptus and containing an organic chloride but no free chlorine. Misbranded because label statement "Klorseptie Oil is a chlorinated topical dressing containing approximately 25% chlorine" was misleading since product contained no free chlorine. Further misbranded because of false and misleading label claim "Useful as a topical dressing in burns, infected wounds, both superficial and deep, Otitis Media and skin lesions" since the product would not be efficacious for such purposes.—[D D N J F D C 468 September 1942]

**Klorseptie Ointment**—Howard D. Dry, trading as High Chemical Company, Philadelphia. Shipped between Jan. 12 and Feb. 14, 1940. Composition an amber-colored salve with a eucalyptus odor but no free chlorine. Misbranded because label falsely represented that it would be useful in treating wounds, lacerations, abrasions, burns and wherever a topical dressing is indicated.—[D D N J F D C 468 September 1942]

**Kurex Diabetic Tonic**—Richard F. Hillgrove and Walter P. Weihe trading as Kurex Hillgrove Laboratories, Inc., Cincinnati. Shipped Sept. 26, 1940. Composition essentially water, alcohol, reducing sugars and plant extracts including emodin-bearing drugs and a trace of unidentified alkaloids. Misbranded because label did not bear common or usual name of each active ingredient and kind, quantity and proportion of alcohol. Further misbranded because of label representations that it would be efficacious in treating diabetes, enable a diabetic patient to eliminate the taking of insulin, was helpful in the treatment of blindness caused by diabetes, would heal ulcerated feet and legs caused by diabetes, would

be efficacious in treating run-down conditions and other ailments contracted by poor living circumstances, was a systemic tonic and would be efficacious in the treatment of many ailments common to bad blood and other conditions such as rheumatism and those caused by kidney disorders and would restore loss of appetite and improve the nervous condition and general health.—[D D N J F D C 485 September 1942]

**Lawrence Mack's Laxrid**—Lawrence Mack, Inc., Detroit. Shipped Jan. 6, 1941. Composition essentially epsom salt, Glauber's salt, sodium bicarbonate, tartaric acid, citric acid and small amounts of sodium phosphate, potassium and sodium chlorides, saccharin and peppermint oil. Misbranded because directions for use on label were not suitable for a laxative and because claim on package and in circular of report of alleged laboratory test to the effect that examination had shown the product to be entirely free from any of the poisonous and harmful substances listed below gave the false impression that the product contained nothing deleterious. Further misbranded because statements in accompanying booklet entitled "How I Reduced" represented that use of Laxrid would "do away with excess weight, effect permanent reduction, relieve constipation, remove heaviness of body and bloated sluggish feeling, relieve gas and acids and enable the user to get up full of vim, vigor and vitality".—[D D N J F D C 447 September 1942]

**Mineralvita**—Mineralvita Sales Company, Toledo, Ohio. Shipped between Feb. 1 and 3, 1941. Composition essentially sodium sulfate (13 per cent) and slaked lime (89 per cent) with only inconsequential traces of if any manganese, peptonite, lithium carbonate, calcium phosphate, manganese sulfate, dipotassium phosphate, didium phosphate, lithium bromide, magnesium glycerophosphate, ferric phosphate and magnesium chloride. Adulterated because label falsely represented that the minerals in the latter group were present in consequential amounts and that if the product were taken in the recommended dosage in connection with regular meals it would furnish young and old their daily requirement of minerals and that Mineralvita had been scientifically blended with the minerals found in the human system and then treated by a form of electrolysis which prepared them for assimilation into the blood stream. Misbranded for the foregoing reasons and because label claim as to mentioned minerals treated by electrolysis was false and misleading since it did not reveal that any treatment by electrolysis to which the water may have been subjected had not affected its composition or quality in any manner. Further misbranded because name "Mineralvita" and statement on shipping case label "Manufactured from nature's minerals to promote health and strength" were false and misleading since the product did not contain life minerals, was not manufactured from natural minerals and could not be depended on to promote health and strength.—[D D N J F D C 472 September 1942]

**Nu Vig Dr. Laxative Tonic**—W. B. Goebel trading as Botanical Medicine Company, Minneapolis, N. C. Shipped between June 7 and 10, 1940. Composition plant material including cloves, capicum, an emodin-bearing drug such as senna and a bitter principle such as gentian, with sulfur, sodium sulfate, magnesium carbonate and sodium bicarbonate. Misbranded because the label claim that the product was a tonic was false and misleading in representing that this mixture would restore vigor and supply new vigor.—[D D N J F D C 426 September 1942]

**Petrodine**—Howard D. Dry, trading as High Chemical Company, Philadelphia. Prepared only by Iodine Products Co., Philadelphia, Pa. Shipped between Jan. 12 and Feb. 14, 1940. Composition only one ingredient reported, 0.09 gram of elementary iodine per fluid ounce, whereas label declared presence of 0.2 gram of this substance, hence misbranded. Adulterated because strength differed from and quality or purity fell below the amount of elementary iodine represented on the label.—[D D N J F D C 468 September 1942]

**R. M. Dietary Supplements Vitamin A and D**—River Mouser, Los Angeles. Shipped Nov. 2, 1940. Adulterated because its strength differed from and its quality fell below that which it was represented to possess, namely, 3,140 international units of vitamin A and 314 international units of vitamin D per tablet, whereas it contained not more than respectively only 30 and 150 international units of these vitamins. Misbranded for the same reason. Further misbranded because container was so filled as to be misleading. Also misbranded and adulterated under provisions of the law applicable to foods as reported in F N J No. 2549.—[D D N J F D C 477 September 1942]

**Rux Compound (Regular and Strengthened)**—Williams S. L. K. Laboratories, Milwaukee. Shipped July 26, 1940. Composition "Regular" essentially sodium potassium and strontium salts of salicylic, benzoic and acetic acid and extracts of plant drugs including quinine with saccharin and water, the total amount of salicylic acid being 21.1 grams per fluid ounce. Strengthened—essentially the same ingredients, salicylic acid being present in the amount of 32.8 grams per fluid ounce. The compounds were misbranded because of false label representations for their efficacy for pronounced pain and for relief of muscular pain and congestion.—[D D N J F D C 454 September 1942]

**Vi An Tablets**—Vegetates, Inc., Los Angeles. Shipped Nov. 29, 1940. Adulterated because its strength differed from and quality fell below that which it was represented to possess, namely, 1250 international units of vitamin A and 125 international units of vitamin D, whereas biologic assay showed that they contained respectively only 40 and 60 units of these vitamins. Misbranded because of false and misleading label statement "Four tablets a day furnish 1000 I. U. Vitamin A, 5000 I. U. Vitamin D, 100 I. U. Vitamin E" and adulterated under the provisions of the law applicable to food as reported in F N J No. 2822.—[D D N J F D C 478 September 1942]

## Correspondence

### POSTOPERATIVE PULMONARY EMBOLISM AFTER THIGH AMPUTATION

*To the Editor*—The statistics published by Veal in the January 23 issue of *THE JOURNAL* relative to the frequency of pulmonary embolism following thigh amputations are enhanced in value by comparison with the results of other workers in this field.

Over a period of fourteen years I have either personally performed or supervised 132 supracondylar amputations of the thigh, 32 for arteriosclerotic gangrene, 81 for diabetic gangrene, 9 for embolic gangrene and 4 for thromboangitis obliterans. Of this group there have been seven sudden deaths either within forty-eight hours following operation or within a week, a percentage of 5. In none of these cases was ligation of the femoral vein performed. This is in strong contrast to Veal's percentage of 42.1 without ligation and 17.5 with ligation. Of the seven deaths in my series, the diagnosis between coronary artery thrombosis and pulmonary embolism was not clearcut nor was the diagnosis made at autopsy.

It is my belief that postoperative pulmonary embolism in thigh amputations can be minimized by getting the patient out of bed as soon after the operation as feasible. In my cases the very next day is usually the time for getting these patients up in a wheel chair. I believe also that the avoidance of the use of a tourniquet in the performance of the operation is another factor in preventing postoperative embolism.

SAUL S. SAMUELS, M.D., New York

### CONTINUOUS CAUDAL ANALGESIA IN OBSTETRICS

*To the Editor*—Any advancement in the field of childbirth pain relief is highly welcomed and should receive prompt and due recognition. There are sufficient disadvantages and contraindications to the method, as indicated in the article of Gready and Hesselstine (*THE JOURNAL*, January 23). To those listed by them can be added the following, several of which have been observed in our clinic at Indiana University. It is exclusively a hospital procedure and therefore restricted to 60 per cent of laboring women. The necessity for a competent attendant further restricts the use of the method. The method is rather technical—at least the insertion of the caudal needle must be done by one specially trained—either the obstetrician or a resident. There is an undesirably high percentage of failures. Hingson and Edwards report 11 per cent necessitating discontinuance of the method or supplementing other anesthesia. Such contraindications as hypotension, hypertension, placenta previa, local infection about the hiatus, hysteria and apprehensiveness are to be observed.

The use of a nylon urethral catheter as employed by Manalan appears to afford certain advantages over the use of the needle. It is less likely to break, it eliminates the danger of piercing the dura. It can be passed higher if the curve of the sacral canal is exaggerated and it allows the patient more freedom in turning and lying on the back (Manalan, *S. A. Caudal Block Anesthesia in Obstetrics*, *Indiana M. J.* 35:564 [Oct.] 1942). There is a risk of vasomotor or shock reaction (Gready and Hesselstine, page 229, report such an accident in a case of hypertensive toxemia). The bladder urge is lost, urine escapes during contractions from pressure of the advancing part or has to be removed by catheter.

In all fairness, despite these objections, the several important advantages of continuous caudal analgesia should be enumerated. Labor is painless and comfortable, the patient feeling sufficiently

at ease to enjoy reading and normal sleep. The patient retains all her faculties and has a normal toleration for fluids and food both during and immediately after labor. The method may be employed throughout labor. Labor is shortened. The method provides ideal safety for the infant, particularly the premature (narcotics and sedatives are eliminated, and the need for resuscitation is greatly minimized, probably the most important contribution of the method). There is unusual relaxation of the perineal musculature, lessening resistance to the advancing head and facilitating forceps delivery and breech extraction. There is no need for supplementary anesthesia for manual delivery or repair work. Uterine bleeding is diminished. Molding of the fetal head is almost negligible. Postdelivery complications appear to be reduced. At laparotomy the peritoneum is desensitized.

As long as a method of analgesia is applicable only to the minority of laboring women (those in hospitals having competent attendants) and must be administered by specially trained individuals, that method cannot be accepted as "the last word in obstetric analgesia."

This expression has been prompted in behalf of the average woman laboring in an average hospital and attended by an average attendant. It is predictable that the use of caudal analgesia as an obstetric relief will be limited eventually to selected cases conducted by extra competent hands.

C. O. MCCORMICK, M.D., Indianapolis

### SINUS BRADYCARDIA

*To the Editor*—Relative to the significant communication on sinus bradycardia by Dr. Paul D. White (*THE JOURNAL*, Oct. 24, 1942, p. 642) it may be of interest to report briefly my experiences in the examinations of approximately 36,000 men aged 18 to 45 at this station.

Sinus bradycardia below 50 was observed in relatively few instances. A rate of 44 was the lowest noted, occurring in 2 men. 1 was an athlete (professional boxer), the other was not. The majority of the examinees exhibiting sinus bradycardia below 50 were either athletes or men engaged in strenuous activity. Many well known athletes examined at this station, including Al Hostak, former World's middleweight boxing champion, George Athans, Olympic diver from Canada, and college football players, revealed no sinus bradycardia. The absence of sinus bradycardia under 40 in 36,000 consecutive men would seem to indicate that sinus bradycardia of such pronounced degree is a rarity. However, it is possible that the nervous tension resulting from the induction examination was in part responsible for the absence in our examinees of the extreme degrees of sinus bradycardia to which White has drawn attention.

MORRIS WILBURNE, First Lieutenant, M. C., A. U. S.  
Cardiologist, Examining Board, U. S. Army Examining and Induction Station, Tacoma, Wash.

### "OCHRONOSIS OF THE SCLERA"

*To the Editor*—I should like to call attention to the discussion of an article on page 1282 in the Dec. 19, 1942 issue entitled "Ochrochosis of the Sclera and Cornea Complicating Alkaptonuria. The Literature, Report of Four Cases." In closing the discussion Dr. Smith stated that "Sealock, Gladston [sic] and Steele have suggested that the continued high intake of vitamin C in early life may prevent the deposition of melanotic pigment in later years." We endeavored in the quoted article to express clearly the fact that our work had completely failed to suggest that vitamin C had any effect on the inborn error of metabolism known as alkaptonuria. We wished only to point

out that our studies did not necessarily preclude this possibility. Our statement is as follows: "It should be pointed out that the large doses of ascorbic acid were without visible effect on the ochronosis exhibited by the individual. However, these results do not preclude the possibility of a continued high intake of the vitamin in early life preventing the deposition of melanotic pigment in later years."

J. MURRAY STEFF, M.D.,  
Welfare Island, New York

## Medical Examinations and Licensure

### COMING EXAMINATIONS AND MEETINGS

#### BOARDS OF MEDICAL EXAMINERS BOARDS OF EXAMINERS IN THE BASIC SCIENCES

Examinations of boards of medical examiners and boards of examiners in the basic sciences were published in THE JOURNAL Feb 20, page 618

#### NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS Parts I and II Various centers March 13 Exec Sec Mr Everett S Elwood 225 S Fifteenth St Philadelphia

#### EXAMINING BOARDS IN SPECIALTIES

AMERICAN BOARD OF ANESTHESIOLOGY Oral Part II Chicago June 67 Final date for filing application is 90 days prior to date of examination Sec Dr P. M. Wood 745 Fifth Ave New York

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY Oral Part II Pittsburgh May 1925 Sec Dr Paul Titus 1015 Highland Bldg Pittsburgh

AMERICAN BOARD OF OPHTHALMOLOGY Oral Parts I and II New York June 45 Chicago Oct 89 Final date for filing application is March 1 Sec Dr John Green 6830 Writeman Ave St Louis

AMERICAN BOARD OF OTOLARYNGOLOGY Oral New York June 35 Final date for filing application is March 1 Sec Dr Deim M Lierle 1500 Medical Arts Bldg Omaha Neb

AMERICAN BOARD OF PEDIATRICS Written Locally Oct 8 Oral New York Nov 20 21 Final date for filing applications is Aug 1 Starting July 1 1943 Group I will be abolished Sec Dr C A Aldrich 707 Fullerton Ave Chicago

AMERICAN BOARD OF PSYCHIATRY & NEUROLOGY Various centers April or May Final date for filing application is March 1 Sec Dr Walter Freeman 1028 Connecticut Ave NW Washington D C

AMERICAN BOARD OF SURGERY Written Part I March 25 Sec Dr J Stewart Rodman 225 S Fifteenth St, Philadelphia

### Indiana June Report

The Indiana State Board of Medical Registration and Examination reports the written examination for medical licensure held at Indianapolis, June 16-18, 1942. The examination covered 15 subjects and included 100 questions. An average of 75 per cent was required to pass. One hundred and twenty-eight candidates were examined, all of whom passed. The following schools were represented:

School	PASSED	Year Grad	Number Passed
College of Medical Evangelists		(1942)	1
Loyola University School of Medicine		(1942 3)	3
Northwestern University Medical School		(1942 2)	2
Rush Medical College		(1941)	1
University of Chicago, The School of Medicine		(1937),	2
(1942)			
Indiana University School of Medicine		(1942 105)	105
State University of Iowa College of Medicine		(1939)	1
University of Minnesota Medical School		(1929),	3
(1933) (1941)			1
University of Oregon Medical School		(1941)	1
Jefferson Medical College of Philadelphia		(1941 2)	2
Friedrich Wilhelms Universität Medizinische Fakultät Berlin		(1920)	1
Regia Università degli Studi di Roma Facoltà di Medicina e Chirurgia		(1936)	1
Universität Bern Medizinische Fakultät		(1937)	1
Otopaths*			4

\* Examined in surgery only

### Nebraska November Report

The Nebraska State Board of Medical Examiners reports the written examination for medical licensure held at Lincoln, Nov 23 25, 1942. Three candidates were examined, all of whom passed. The following schools were represented:

School	PASSED	Year Grad	Number Passed
Johns Hopkins University School of Medicine		(1939)	1
University of Nebraska College of Medicine		(1942)	1
Medizinische Fakultät der Universität Wien		(1937)	1

## Bureau of Legal Medicine and Legislation

### MEDICOLEGAL ABSTRACTS

**Malpractice Use of Allegedly Insufficiently Diluted Sodium Hydroxide in Allergy Test**—The plaintiff was suffering from asthma and went to the Sutter Hospital, owned and operated by the appellant, the Sutter Medical Service Company, hereinafter referred to as the hospital corporation. She was received by a receptionist, who "took her history," required her to pay \$26.50 to the hospital cashier, apparently for prospective treatment, and referred her to Dr. Morgan, who was employed on a monthly salary as a resident physician in the hospital. Morgan, after examining her and a roentgenogram he had had taken, sent her to a technician in the hospital building for an allergy test. The technician scraped the plaintiff's left arm in twenty-four places and dropped a solution on each abrasion, which caused a sharp, intense burning sensation concerning which the plaintiff immediately complained as the solution touched each abrasion, but the technician nevertheless continued to apply the solution until it had been applied to each abrasion. A different powder was then applied to each abrasion. The arm swelled up and became very red and painful. The technician then scraped the right arm and applied different liquids, each from a small phial, to the abrasions on that arm, but there was no sensation of burning and no untoward developments in that arm from the procedures. The left arm continued to pain and burn and the plaintiff demanded that something be done for the left arm to prevent possible infection from her coat sleeve. Dr. Morgan was then called in and directed the technician to bandage the arm, which she did, and the plaintiff left the hospital. The plaintiff could sleep but little that night because of the burning pain in her left arm. The next morning the left arm was swollen and the abrasions thereon were all "kind of greenish and [there was] pus in these openings." The plaintiff returned to the hospital and was examined by Dr. Morgan and by Dr. Jacobs, the president of the hospital corporation. On Jacob's advice the plaintiff was admitted to and treated free of cost in the hospital. After two or three days when the patient seems to have been discharged the swelling and pain in the left arm subsided, but the abrasions "were red and yellow and green." Apparently as a permanent condition, there now are small scars on the left arm where the abrasions had been which become red when the plaintiff is warm or when she is not feeling well. Alleging that her injuries were due to negligent treatment, the plaintiff eventually sued the hospital corporation and Drs. Jacobs and Morgan. From a judgment for \$3,750 rendered against the hospital corporation alone, the hospital corporation appealed to the district court of appeal, first district, division 2, California.

A group of physicians, denominated, according to the appellant hospital corporation, as the "Sutter Hospital Group of Doctors," all of whom it was alleged were employees of Jacobs, the president of the hospital corporation, had offices on the first floor of the building occupied by the hospital. While the hospital and the group of physicians had a common bank account and a common bookkeeping system the hospital corporation contended that the physicians operated entirely independently of the hospital, the physicians in the group being all employed by Jacobs and the group paying rent to the hospital corporation for office space occupied by it and being paid for their services from receipts of the group by checks in the common bank account. The hospital corporation contended, therefore, that since the negligence, if any, that occasioned the injuries to the plaintiff was that of the technician, an employee, so it alleged, of the group of physicians and not an employee of the hospital, the hospital corporation could not be liable and that liability, if any necessarily rested on Dr. Jacobs as employer of the technician. Since there had been a judgment for Jacobs and Morgan, the result of the contention of the hospital corporation, if sustained, would have been to leave the patient without remedy. The court however, doubted the truth of the contention of the hospital corporation as to the actual arrangement between the hospital and the group of physicians con-

cerned Dr Morgan said the court testified that he was employed at a monthly salary by Dr Jacobs as a resident physician at the Sutter Hospital, that at the time of his employment Jacobs said nothing to him about the group of physicians and spoke only of his taking a position as resident physician and that he knew nothing about the group of physicians until the day that he was called to the witness stand. However all this may be we do not find it necessary to inquire further into the intricacies of the relationship between the hospital corporation and the group of doctors here involved because we are satisfied that the verdict and judgment against the hospital corporation can well be rested on the doctrine of estoppel. From the facts here present the jury was entitled to find that the plaintiff relying on appearances for which the hospital corporation was responsible believed that she was contracting for medical services with the hospital corporation to be rendered by it or its agents and servants. Consequently the jury would be justified in finding that the hospital corporation was estopped to deny that the technician in giving the allergy test was its employee.

The hospital corporation apparently contended that since it could not legally practice medicine it could not be liable for the negligence of any of its servants attempting to practice medicine on its behalf. The fact said the court that the hospital corporation could not lawfully practice medicine does not avail it in an action instituted against it for the negligent act of its servants undertaking to practice medicine on behalf of the corporation. The medical service corporation either did contract or led the patient to believe that it was contracting with her for medical services. As was said in *Hannon v. Snigel Cooper Co.* 167 N. Y. 244 60 N. E. 597.

The public health law by section 164 makes it a misdemeanor for any person to practice or to hold himself out to the public as practicing dentistry without being licensed to practice as such and it would seem that the action of the defendant in attempting to carry on the business of dentistry was illegal and ultra vires. But though it was beyond the corporate powers of the defendant to engage in the business this does not relieve it from the torts of its servant committed therein and the unanimous affirmance of the appellate division is conclusive to the effect that it either practiced dentistry or held it out as practicing dentistry.

The hospital corporation next contended that if it were held liable on the theory of estoppel to deny that the technician was its employee the verdict in favor of Dr Jacobs is fatally inconsistent with the verdict against the hospital corporation in view of the testimony of Jacobs and the technician that the technician was Dr Jacobs employee. In support of this proposition the hospital corporation probably relied on *Bradley v. Rosenthal* 154 Cal. 420 97 P. 875 which held that where master and servant are jointly sued for the alleged negligence of the servant alone which the master did not direct and in which he did not participate a verdict in favor of the servant relieves the principal of responsibility and may be availed of by the principal for that purpose. But answered the appellate court, this case does not fall into that pattern. Here the act of negligence was that of the technician and not of Jacobs and if Jacobs and the hospital corporation were liable they were both liable under the doctrine of respondent superior. The hospital corporation's liability was in no sense dependent on any act of Jacobs and vice versa. The technician was not a party defendant and was not exonerated by the jury. The rule applying to joint feorsors generally is that judgment in favor of one joint tortfeasor is not a bar to a recovery against the other. The court accordingly concluded that the judgment in favor of Jacobs cannot be taken advantage of by the hospital corporation on this appeal. The same result in any event, said the court can be as well reached in another fashion. If the hospital corporation is estopped to deny that the technician was its employee in administering the tests to the plaintiff it would seem to be equally estopped to assert against the plaintiff that Jacobs was the employer of the technician.

The hospital corporation contended next apparently, that the verdict against the hospital corporation must necessarily have been based on negligence on the part of the technician which negligence finds no support in the evidence. The technician testified that the liquid she applied to the abrasions on the

plaintiff's left arm, which was apparently the cause of the resulting injuries, was tenth normal sodium hydroxide solution which is admittedly standard for such tests. However, an expert witness produced by the plaintiff testified that such a solution is not harmful to the human body, but that sodium hydroxide is a caustic and in stronger solution will destroy the tissues. He testified further that very seldom does a reaction result from an allergy test in less than an hour and very seldom does any severe reaction from the skin scratch test of the kind made on the plaintiff's left arm occur and that as a result of the performance of the test a slight burning might result, but definitely there would not result an intense burning. Another medical witness testifying for the hospital corporation stated that if a strong solution of sodium hydroxide was placed on a scratch pruritus would be manifest in "ten seconds at the most, maybe before," but that there would be no pain from a tenth normal solution. This evidence, said the court, is ample, if believed by the jury, to support a finding that some corrosive liquid was applied to the plaintiff's left arm resulting in the injuries which she suffered.

The judgment in favor of the patient was accordingly affirmed.—*Hedlund v. Sutter Medical Service Co.*, 121 P. (2d) 878 (Calif. 1942).

**Drunkenness Admissibility of Evidence of Blood Test**—The plaintiff's husband, a policeman, died as the result of an automobile accident. In a subsequent suit by the plaintiff for a writ of mandate to require the defendant city to make an order allowing her a pension because of the death of her husband it appeared that at the time of the accident the deceased was under the influence of intoxicating liquor. From a judgment denying the pension the plaintiff appealed to the district court of appeal, second district, division 2, California.

Among other things the plaintiff contended that the trial court committed prejudicial error in receiving in evidence the opinion of certain doctors that the deceased was, at the time of his death under the influence of an intoxicating beverage. These opinions were based solely on the results of tests made of the blood of the deceased taken from him after his death. But, said the court, the opinions of qualified medical doctors as to whether or not an individual is intoxicated predicated on the percentage of alcohol in the individual's blood, although not conclusive are admissible when there is a proper showing that the blood tests have been properly conducted. (*State v. Dignud*, 50 Ariz. 276 72 P. (2d) 435; *Kuroski v. Actina Life Ins. Co.* 234 Wis. 394 291 N. W. 384; *Commonwealth v. Capalbo* 308 Mass. 376 32 N. E. (2d) 225 1 A. M. A. 119 583 [June 13] 1942). In the present case since no objection was made that a preliminary foundation had not been laid for the admission of the testimony of the qualified physicians, the trial court properly permitted them to testify that in their opinion the decedent was intoxicated at the time of his death since an analysis of his blood disclosed that it contained 0.28 per cent ethanol. Other contentions of the plaintiff were likewise overruled and the judgment in favor of the city was therefore affirmed.—*Laurence v. City of Los Angeles* 127 P. (2d) 931 (Calif. 1942).

## Society Proceedings

### COMING MEETINGS

- Alabama Medical Association of the State of Birmingham April 20-22 Dr. Dougherty Cannon 519 Dexter Ave. Montgomery Secretary
- American Association of Anatomists Montreal Can. April 21-23 Dr. Francis H. Swift Box 3701 Durham N. C. Secretary
- Arkansas Medical Society Little Rock April 19-20 Dr. W. R. Brooksher 602 Garrison Ave. Fort Smith Secretary
- Conference of State and Provincial Health Authorities of North America Washington D. C. March 22-25 Dr. A. T. Chelev 469 State Office Bldg. St. Paul Secretary
- Florida Medical Association Jacksonville April 15-16 Dr. Shaler Rich 111 West Adams St. Jacksonville Secretary
- Missouri State Medical Association St. Louis April 18-20 Mr. Raymond McIntyre 634 North Grand Blvd. St. Louis Executive Secretary
- Ohio State Medical Association Columbus March 30-31 Mr. Charles S. Nelson 79 East State St. Columbus Executive Secretary



## Current Medical Literature

### AMERICAN

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Titles marked with an asterisk (\*) are abstracted below.

### American Journal of Surgery, New York

58 313-464 (Dec) 1942

- \*Keloids: Review of Literature and Report of Eighty Cases. J Garb New York and M J Stone Stamford Conn.—p 315
- Treatment of Blood Stream Infections with Hemorradiation. Case Reports. V K Hancock Seattle.—p 336
- Primary Brain Tumor. Follow Up Study of 179 Cases. T W Botsford Boston.—p 345
- \*Comparative Study of Local Burn Treatments. J E Hamilton Louisville Ky.—p 350
- Syndrome of Acute Appendicitis. Frequency of Other Conditions Responsible for Symptoms. A Rosenberg New York.—p 365
- Intestinal Anastomosis. Description of New Technic. H I Goodman New York.—p 368
- \*Use of Sulfaguandine as Intestinal Antiseptic. J O Veta and Elizabeth Simon Stevenson New York.—p 377
- Five Years of Gallbladder Surgery in General Hospital. Review of 337 Consecutive Gallbladder Operations. Carmine Russo Jamaica N Y.—p 388
- Five Years of Gallbladder Disease at Autopsy in General Hospital. Review of 2450 Consecutive Routine Autopsies. Carmine Russo and A Angrist Jamaica N Y.—p 398
- Imponderables in Genitourinary Carcinoma. B S Burringer New York.—p 404
- Suture Dressing Anchor. J L Magrath Upper Darby Pa.—p 407
- Abdominoperineal Operations for Rectal and Recto sigmoid Cancer. New Modification of Miles Technic for Difficult Dissections. G E Binkley New York.—p 410

**Keloids**—The 80 cases of keloid that Garb and Stone report were treated in private practice and at the New York Post-Graduate Hospital from 1929 to 1940. The literature is reviewed to facilitate discussion of the theory and therapy of keloids. Hormone stimulation appears to be the main or the important contributing cause of keloid formation. The fact that the keloids of 23 of 67 patients whose ages were given occurred in the second decade and 12 per cent of keloids followed acne vulgaris also point to hormone stimulation. This view is further supported by the resolution or absence of keloids after the menopause and by their rarity in the aged, possibly the result of the diminution or disappearance of the male or female sex hormone. While keloids have distinctive, usually easily recognized, features there are numerous instances in which a differential diagnosis has to be made between keloids and hypertrophic scars, sarcoids, scleroderma, fibroma and paraffinomas. Epulis, some tumors of the throat, lung, stomach or ovaries and even esthiomene and rectal strictures are considered by many investigators as forms of keloidal growths. Primary union of a wound does not prevent the formation of keloids. Roentgen or radium treatment before or soon after excision of a keloid does not prevent its recurrence. A keloid of sufficient size should be first excised, wound healing hastened and x-rays or radium used at the first sign of recurrence. Among the authors' patients 2 are of particular interest: a girl of 18 whose hundreds of keloids did not respond to any form of therapy and a woman of 49 with extensive keloidal growths for fifteen years in whom deep ulcers and hyperkeratotic areas developed.

**Treatment of Burns**—Since October 1939 Hamilton has compared the efficiency of foille (a thick, soapy water in-oil mildly antiseptic emulsion), cod liver oil, cod liver oil ointment, tannic acid with and without silver nitrate and 3 per cent sulfadiazine in 8 per cent triethanolamine in a large charity hospital

with inadequate nursing care and lacking in ideal facilities for treating burns. Such conditions are likely to prevail in military hospitals in wartime. The series discussed consists of one hundred and ninety-nine burns in 192 hospitalized patients. Seven bilaterally similar burns were dressed with a different agent on either side. Thirty-eight of the 192 patients died. There is some slight excuse for this appalling figure: nursing care was inadequate; there were no facilities for isolation and/or special care; the amount of plasma available was greatly inadequate for 10 and moderately so for 6 patients; the burns of 6 patients involved 50 per cent of the total surface of the body and a number of patients were in the extremes of age or were suffering from serious organic disease. The postmortem examination of 12 revealed generalized congestion of viscera, especially of the lungs, intestine, adrenals and spleen. The liver was the organ most frequently and seriously deranged. From the mortality and survival rates foille, tannic acid and sulfadiazine were about equally effective in the saving of life. The burns treated with cod liver oil were too few and too small for the efficacy of this compound to be evaluated. Foille has been criticized on the grounds of the possible toxicity of its phenol content, but the author's impression and the mortality and survival statistics do not substantiate this criticism. Regarding the sloughing stage of third degree burns it appears that burns treated with foille rid themselves of slough sooner than those dressed with other agents. Also with foille there was a significant reduction of healing time of the third degree burns over that with tanning or by the sulfadiazine spray. The second degree burns healed slightly earlier with leatherizing treatment than did those treated with foille. Foille appeared superior to the control agent in the 7 patients with bilaterally comparable burns who were treated simultaneously with two different agents. The sulfadiazine spray seemed to be somewhat more bactericidal than the other agents at least for *Streptococcus hemolyticus*. In respect to relief of pain no pronounced difference between the agents was revealed although tannic acid was somewhat superior and cod liver oil somewhat inferior. The end results are difficult to evaluate, but it appeared that the healing of the deeper burns, especially of the face, hands and flexures was somewhat less painful and that there was less tendency toward contracture when they were treated with foille than when they were treated with other agents.

**Sulfaguandine**—Veta and Stevenson used sulfaguandine as an intestinal antiseptic in treating 20 women and 7 men between 31 and 72 years of age. They present a method of determining the presence of the drug in the feces. The administration of sulfaguandine definitely reduced the coliform organisms in the intestine of 18 of the 27 patients. When ulcerative intestinal lesions were present a significant reduction in the coliform organisms was not obtained by sulfaguandine. This limits the beneficial results that could be expected. Its use altered the blood picture in only 1 of the 27 patients. Nevertheless it is advisable to check the blood counts of those receiving the compound in order to detect the occasional patient whose hemopoietic system is sensitive to it. The other 26 patients showed no other significant toxic reactions. Sulfaguandine by depressing the coliform bacteria interferes with the synthesis or absorption of vitamin K by some patients. Crystalluria with subsequent formation of concretions might be considered a hazard but this complication can be overcome by an adequate fluid intake. Sulfaguandine is not the ideal chemotherapeutic agent for intestinal antiseptics. A sulfonamide which would destroy all the intestinal bacteria and still have the slow absorption and low toxicity of sulfaguandine is the desired drug. The studies on absorption and excretion of the compound reveal that there is a decided variation in the amount of compound absorbed by each individual patient. However, unlike other sulfonamide compounds, sulfaguandine is relatively poorly absorbed from the gastrointestinal tract and thus it remains in the intestine in a sufficiently high concentration and acts as a local chemotherapeutic agent. The portion (mean average 14.2 per cent) of the compound that is absorbed is rapidly eliminated in the urine and high blood concentrations are not usually found.



## Annals of Surgery, Philadelphia

116 801-970 (Dec) 1942

- \*Carcinoma of Breast I Results of Treatment C D Haagensen and A P Stout New York—p 801
- Lymphedema of Arm Following Radical Mastectomy for Carcinoma of Breast New Operation for Its Control S Standard New York—p 816
- Extradural Hemorrhage in Anterior Cranial Fossa S W Gros and N Savitsky New York—p 821
- \*Massive Rupture of Liver L S Pilcher Newton Mass—p 827
- Temporary Occlusion of Portal Vein and Hepatic Artery Report of Successful Suture of Incised Portal Vein Within Liver W W Babcock Philadelphia—p 833
- Postmortem Peritoneo copy Means of Learning Peritoneo copy J S Chaffee Cleveland—p 843
- Role of Infection in Pathogenesis of Liver Necrosis in Hyperthyroidism W C Sealy Durham N C—p 851
- Cruveilhier Baumgarten Syndrome (Splenomegaly Portal Hypertension and Patent Umbilical Vein) Case Report H L Valk and S F Horne Winston Salem N C—p 860
- Duodenal Tumor of Unusual Character R T Shuckelford A M Fisher and W B Frior Baltimore—p 864
- Volvulus of Cecum Report of Four Cases L P River and F A Reed Chicago—p 874
- Leiomyosarcoma of Uterus M C Wheelock and S Warren Boston—p 882
- Lesions Common to Lesions of Astragalus R W Lewis New York—p 891
- Posterior Pituitary Extract in Anesthesiology B A Greene Brooklyn—p 898
- Regional Ileitis L Ginzburg and J H Garlock New York—p 906
- Increasing Usefulness of Devine Colostomy in Left Colon and Rectal Surgery C G Heyd New York—p 913
- Metabolic Studies in Patients with Cancer of Gastrointestinal Tract VII Influence of Gastric Surgery on Chemical Composition of Liver J Ariel G T Pack and C P Rhoads New York—p 924

**Carcinoma of Breast**—Haagensen and Stout discuss the data from a punch card method utilizing a summary sheet listing some 700 different items found in the study of the mammary cancer of 1,040 women with proved or presumed carcinoma of the breast coming to the Presbyterian Hospital in 1915 to 1934. Of these, 986 were accepted for study and detailed unit records. The fact that in 66 per cent an unsuspected carcinoma was discovered during a routine physical examination is striking proof of the value of a careful and complete physical examination of every patient. Only 16 per cent of the patients sought medical aid because of pain in the breast. The cancers of 876 of 986 women were relatively operable and of 640 absolutely operable. In 236 a radical operation was not done because of constitutional inoperability, the extent of the carcinoma, death refusal or primary erroneous diagnosis in 10. Of the 640 primary cases treated by radical mastectomy, 599 were followed until death or for a minimum of five years. The term 'five year clinical cure' is used to designate the group of patients in whom no further evidence of cancer developed during the five postoperative years. Twenty patients died at operation, 41 were lost track of before the five years were up, 13 died of unknown causes and 12 of intercurrent disease during the five years. 290 died because of their disease, while 33 with recurrence and 231 without recurrence are alive five years after operation. A local recurrence developed in 146 and metastasis in 316 within five years of the operation. The earlier the patients came for treatment the better was their chance of clinical cure. The clinical cure rate of those in whom the disease was limited to the breast was approximately three times as high as of those in whom it extended to the axillary lymph nodes. The frequency of local recurrence appears to be similarly related to axillary involvement. Only from the knowledge obtained from an accumulation of actual measurement of the axillary nodes can one hope to become more expert in his judgment of axillary involvement. Preoperative radiation is not given to patients with operable carcinoma of the breast. Postoperative prophylactic radiation has not appeared to have had any demonstrable value. Palliative irradiation for recurrent disease has been of the greatest value in controlling pain due to bone metastasis and in clearing up small local recurrences in the operative field. When persistent pain develops in the back, pelvis or legs of a patient who has had a radical mastectomy for carcinoma irradiation is begun at once, even though roentgenograms fail to reveal any definite lesion of the bone. During the years covered by the present report there was an

increasing tendency of the staff surgeons to lengthen the operative time and to increase the extent of the dissection. The evidence suggests that these more radical operations gave better results.

**Massive Rupture of Liver**—Pilcher believes that his patient is the fourth to recover from massive rupture of the liver complicated by a triple rupture of the right kidney. The massive rupture was satisfactorily repaired with only three interrupted No. 2 chromic sutures. There was little postoperative oozing. This shows that when lacerated liver tissue is accurately approximated the ruptured bile sinuses and blood vessels heal rapidly. The danger of infection when bile sinuses are opened is well known and it would undoubtedly be safer to assume that infection will be present and give sulfonamides (sulfanilamide locally and sulfadiazine by mouth or parenterally) from the beginning. The use of large gauze packs is at best a crude and primitive form of treatment and, although they may at times be a necessary life saving procedure, they must frequently be considered as a confession of lack of surgical judgment. As this case illustrates some phases of surgery on the liver should not be considered hopeless.

**Hepatic Necrosis**—With definite experimental evidence of the responsible factors of acute hepatic lesions in hyperthyroidism Sealy studied the 8 necropsy cases collected by the department of pathology of the Duke Hospital to determine whether hepatic necrosis existed in acute hyperthyroid reactions and, if it did, what its relation was to other factors. Seven of the patients died from an acute hyperthyroid reaction and 1 as a result of a pulmonary embolus on the fourteenth postoperative day. Evidence of acute pathologic changes of significant proportions was seen in the liver of 3 of the 8 patients. The structural alterations of 2 consisted in decided focal necrosis and fatty degeneration. The acute changes in 2 were complicated by moderate passive congestion and in 1 in addition to these changes well defined periportal scarring and polymorphonuclear and lymphocytic cellular infiltration were seen. The areas of necrosis were focal and could be separated from the slight changes resulting from passive congestion. One of the 3 patients was apparently well prepared for operation and had no clinical evidence of cardiac failure but passive congestion was present, even though death occurred only nine and a half hours after operation. Extensive central fatty change, associated probably with passive congestion, was present in his liver. The acute changes in the livers of the remaining 5 patients were insignificant. As to chronic lesions, such as periportal scarring they were significant in 4 of the 8 and in 4 the damage was slight or absent. In 1 of the latter hyperthyroidism had been present for two years and in 3 only for six months. This seems to be significant, a similar relationship of the duration of the toxicity with the degree of chronic change has been observed by Beaver and Pemberton.

## Journal of Immunology, Baltimore

45 157-236 (Nov) 1942

- Demonstration of Pneumococcus Antigen in Tissues by Use of Fluorescent Antibody A H Coons H J Creech R N Jones Boston and E Berliner Cambridge Mass—p 159
- Effect of Separate Inoculation of Serum and Virus on Protection Test in Vaccinia R H Green and R F Parker Cleveland—p 171
- Molecular Kinetic Analyses and Serologic Specificities of Polysaccharides Isolated from Filtrates of Human Tubercle Bacillus and Related Species D M Tennent and D W Watson Madison Wis—p 179
- Agglutination by Anti Hog Cholera Hyperimmune Serums of Antigen Obtained from Spinal Fluid of Pigs Infected with Hog Cholera and Adsorbed on Bacillus Prodigiosus A J Weil Pearl River N J—p 187
- Specificity of Antibody Response of Human Beings to Strains of Influenza Virus H L Bodily and M D Eaton Berkeley Calif—p 193
- Monovalent and Polyvalent Serums in Treatment of Pneumococcal Infections G F Forster E H Noblitt and E N Gilman Chicago—p 205
- Type Specific Agglutinin Response of Infants and Children with Pneumococcal Pneumonias M Finland and H I Shuman Boston with technical assistance of Mildred W Barnes—p 215
- In Vitro Titration of Horse Serums Containing Both Vibrio Septique and Perfringens Antitoxin W L Koerber and E Altire-Werber New Brunswick N J—p 223
- Blood Group Factors in Blood Organs and Secretions of Primates A S Wiener P B Candela and L J Goss New York—p 229

**Journal of Lab and Clinical Medicine, St Louis**

28 255-380 (Dec) 1942

- Epinephrine and Ephedrine Analogues and Their Clinical Assay W T Baughman R M Perkins and V J Derbes Richmond Va—p 255
- Effect of Testosterone Propionate in Treatment of Arteriosclerosis Obliterans H Zurrow, G Saland C Klein and S Goldman New York—p 269
- \*Study of Normal Cardiac Response to Water Below Body Temperature with Special Reference to Submersion Syndrome W W Tuttle and Joyce L Templin Iowa City—p 271
- \*Etiology and Serum Treatment of Persistent Epidemic and Postoperative Hiccup E C Rosenow Rochester, Minn—p 277
- Circulating Time in Human Being and in Dog as Affected by Fasting and by Meals I M Reingold I Neuwelt and H Necheles Chicago—p 289
- \*Recurrent Attacks of Pneumococcal Pneumonia Treated with Sulfonamides L Schwartz H F Flippin and J H Clark Philadelphia—p 294
- Erythrocyte Sedimentation Rate Determinations on Normal Youths C F Roche D G Stannus and E M Isberg, Miami Beach Fla—p 297
- Papillary Lymphoid Cystadenoma Report of Four Cases H Peck Hines Ill—p 299
- Significance of Electrocardiogram with Prominent S Waves in Leads 1 2 and 3 M Wilburne and R Langendorf Chicago—p 303
- Electrolyte and Water Exchange Between Skeletal Muscle "Available (Thiocyanate) Fluid" and Plasma in Dog Following Administration of Desoxycorticosterone Acetate D M Harkness E Muntwyler F R Mautz Cleveland and R C Mellors Baltimore—p 307

**Normal Cardiac Response**—The effect on the heart from submersion incident to swimming in 68 college women was studied by Tuttle and Templin. In 7 there was no decrease in heart rate. On the average, the decrease in the 61 was 13 beats per minute, which is practically the same as that reported for men. The extent of the decrease varied directly with the resting pulse rate. There were two possible explanations for the abnormal response of the 7 girls who failed to respond normally to submersion in water: lack of psychologic (emotional) adjustment, that is, they were afraid, and lack of physiologic adjustment. When emotional factors are controlled, failure to experience a significant drop in pulse rate during submersion in water below body temperature indicates sensitivity to the water. "Submersion syndrome" is suggested for the conditions that prevent a normal adjustment to submersion in water.

**Epidemic and Postoperative Hiccup**—The study of the epidemiologic characteristics, etiology and serum treatment of persistent epidemic hiccup has been extended by Rosenow to that of persistent postoperative hiccup. The cases studied culturally and those in which serum was used in treatment were seen chiefly at the Mayo Clinic. Persistent hiccup occurred in unusual numbers throughout the spring and autumn of the years of this study (1927 to 1941). It was related to mild outbreaks of respiratory infection. It usually occurred in men from 17 to 82 years of age. The data from laboratory studies (isolation of the spasm producing type of streptococcus from the nasopharynx, milk supplies and outdoor air during epidemic prevalence of hiccup and certain respiratory infections and from the air of rooms occupied by persons having persistent hiccup) indicate that the incidence of epidemic and postoperative hiccup is increased when streptococci normally present in throats of persons and in nature generally acquire spasm producing properties or virulence. Persistent epidemic and postoperative hiccup are considered to be forms of mild myoclonic encephalitis. The inciting agent is a streptococcus (*Streptococcus singultus*) closely related to the streptococcus of epidemic encephalitis. Antistreptococcus serum for epidemic encephalitis is curative in persistent hiccup.

**Pneumococcal Pneumonia Treated with Sulfonamides**—Schwartz and his collaborators compare the therapeutic effectiveness and toxicity of the sulfonamides in the treatment of recurrent pneumococcal pneumonia in 24 patients. The time interval between readmissions (1 patient was readmitted twice) ranged from four to ninety-two weeks, with an average of thirty-seven weeks. Typable pneumococci were found in the sputum or blood stream of 35. The same pneumococcus type was the causative agent of subsequent attacks in only 4 patients. There were two deaths among the twenty-five subsequent admissions, both of patients with type III pneumonia. The first attack of 17 patients was treated with sulfapyridine and the result was good in 13 and fair in 4, and good in 4 and fair in 3 of the 7 treated with sulfathiazole. For the subsequent

attacks the figures for sulfapyridine are 8 and 1 (and 1 patient died), for sulfathiazole they are 8 and 1, and for sulfadiazine they are 4 and 1. The third attack of the 1 patient who died was treated with sulfapyridine. The drugs appear just as effective for subsequent attacks as for the initial one. There was no evidence suggesting that the repeated use of a sulfonamide increased the incidence or severity of drug toxicity. Vomiting and microscopic hematuria were the only toxic reactions worth mentioning.

**Kansas Medical Society Journal, Topeka**

43 477-510 (Dec) 1942

- Fundamentals of Psychiatry III Mental Hygiene W C Menninger Topeka—p 477
- Sulfathiazole R H Forney Topeka—p 482
- Shawnee County Medical Care Plan R W Callahan Topeka—p 483

**Michigan State Medical Society Journal, Lansing**

41 1013-1090 (Dec) 1942

- Response of Tumors to Radiation S Warren Boston—p 1039
- Child Guidance Program of Michigan Hospital Commission F F Tallman Lansing—p 1041
- Nodular Symmetrical Lipomatosis Review of Literature and Report of Case J C Foshee and J B Wilkes Grand Rapids—p 1043
- Establishment of Michigan Board of Health E E Kleinschmidt Chicago—p 1046
- \*Mediastinal Glands in Undulant Fever W S Martin Ludington—p 1051
- Acute Laryngotracheobronchitis W P Work San Francisco—p 1052
- Trigeminal Teratoma of Sacrum N Huene Traverse City—p 1056
- Rupture of Heart Report of Two Cases and Postmortem Findings V W Jensen Shelby—p 1057
- Lipomatous Replacement of Left Gastrocnemius and Soleus Muscles Subsequent to Muscle Atrophy Report of Case H M Weaver and M E Muun Detroit—p 1060

**Mediastinal Glands in Undulant Fever**—In an attempt to explain the pathologic changes that cause the dry, irritable and nonproductive cough in undulant fever, Martin presents histories of 3 of 6 patients with this type of cough. In all 6 the roentgenogram revealed moderate and decided enlargement of the mediastinal nodes. In 3 of them the agglutination was never positive, but in the other 3 it was conclusive.

**New England Journal of Medicine, Boston**

227 727-770 (Nov 12) 1942

- Cholangiographic Artefacts Resembling Common Duct Stones H M Clute and K B Lawrence Boston—p 727
- \*Hemolytic Streptococcus Bacteremia Report of Thirteen Cases with Special Reference to Serologic Groups of Etiologic Organisms L A Rantz and W M Kirby San Francisco—p 730
- Phonocardiographic Studies in a Case of Paroxysmal Tachycardia H Weyler and C C Dustin Providence R I—p 733
- Orthopedic Surgery G W Van Gorder Boston—p 737

227 771-812 (Nov 19) 1942

- Sequelae of War Head Injuries D Denny Brown Boston—p 771
- Acute Perforation of Ulcers of Stomach and Duodenum H Ulfelder and A W Allen, Boston—p 780
- Paroxysmal Tachycardia in Pregnancy H Weyler and C C Dustin Providence R I—p 785
- Governor's Address R O Blood Concord N H—p 787
- Pharmacology and Pharmacotherapy H B Friedgood Boston—p 788

227 813-856 (Nov 26) 1942

- Sequelae of War Head Injuries (concluded) D Denny Brown Boston—p 813
- Myeloid Metaplasia of Spleen with Acute Hemolytic Anemia Report of Case H H Brewster and O J Wollenman Jr Boston—p 822
- Dural Constricting Ring with Cervical Protruded Intervertebral Disk Report of Case W G Haynes Fort Devens Mass—p 825
- Diagnostic Value of Serial Measurements of Albuminuria in Ambulatory Patients H A Derow Boston—p 827
- Cancer I T Nathanson Boston—p 830

**Hemolytic Streptococcus Bacteremia**—Rantz and Kirby point out that other than group A hemolytic streptococci are frequently the cause of serious infection in man. In only 6 of the 13 consecutive cases of hemolytic streptococcus bacteremia observed by them in Stanford University Hospitals were group A organisms the etiologic agents. In 4 the hemolytic streptococci were of group B, in 1 of group C, in 1 of group D and for 1 the data are not given. On sulfonamide therapy 2 patients recovered and 2 died. The favorable effect of sulfadiazine in 1 of them with pneumonia and suppurative arthritis complicating chronic lymphatic leukemia was most remarkable. Two patients

with group B infection were treated with sulfapyridine, in 1 postoperative meningitis appeared to be subsiding at the time therapy was instituted and in 1 with puerperal sepsis sulfanilamide was without effect, but a change to sulfapyridine was followed by prompt recovery. One patient with group C infection recovered after sulfadiazine therapy in spite of aplastic anemia with agranulocytosis. The drugs of the sulfonamide group have been demonstrated in a previous study to be without effect in group D infection. Evidence suggests that sulfanilamide may not be of value in serious group B infection. The determination of the serologic group of the streptococcus is chemotherapeutically of definite importance.

### New Jersey Medical Society Journal, Trenton

39 615 676 (Dec.) 1942

Acute Abdomen in Infancy H. A. Murray Newark —p. 617  
Public Health in Wartime R. C. Williams New York —p. 619

### Oklahoma State Medical Assn Jour, Oklahoma City

35 499-544 (Dec.) 1942

Functional Cardiovascular Disorders Including Soldier's Heart G. Herrmann Galveston Texas —p. 499  
Atypical Pneumonia S. Goodman Tulsa —p. 504  
Weight Gain of Pregnancy J. L. Duer Woodward —p. 509

### Public Health Reports, Washington, D. C.

57 1843-1882 (Dec. 4) 1942

Incidence of Cancer in Philadelphia Pa. 1938 H. J. Sommers —p. 1843  
Changes in Mortality Rates 1930 to 1940 H. F. Dorn —p. 1858  
Ixodes Baergi New Species of Tick from Arkansas (Acarina: Ixodidae) R. A. Cooley and G. M. Kohls —p. 1869

### Radiology, Syracuse, N. Y.

39 513 646 (Nov.) 1942

The Cyclotron A. Nuclear Transformer P. C. Aebersold Berkeley Calif. —p. 513  
Use of Radioactive Tracers in Biology and Medicine J. G. Hamilton Berkeley Calif. —p. 541  
\*Therapeutic Use of Artificially Produced Radioactive Substances. Radio-phosphorus Radiostrontium Radioiodine with Special Reference to Leukemia and Allied Diseases B. V. A. Low Beer J. H. Lawrence and R. S. Stone Berkeley Calif. —p. 573  
\*Further Experiences in Treatment of Lymphosarcoma with Radioactive Phosphorus J. M. Kenney and L. F. Craver New York —p. 598  
\*Treatment of Cancer with Fast Neutrons R. S. Stone and J. C. Larkin Jr. San Francisco —p. 608  
Effects of X Rays and Neutrons on Mouse Lymphoma Chromosomes in Different Stages of Nuclear Cycle A. Marshak Berkeley Calif. —p. 621

**Therapeutic Use of Radioactive Substances**—Low-Ber and his associates review the physical and biologic background of internal radiation therapy. The distribution and metabolism of radioactive phosphorus in animal and in human tissue indicate its therapeutic value for certain diseases particularly chronic leukemia and polycythemia vera. The therapeutic effect of a millicurie of radiophosphorus is not to be expected to be comparable to a millicurie of radon. The internal use of radiating agents such as radiophosphorus, requires a new orientation of the concept of the distribution of radiation in the body. A means of calculating the "radiation level" in the body of a patient on any day after either one or multiple doses of radio-phosphorus is described, and although it does not account for the selective distribution of the radiating agent and cannot be exactly accurate for any single patient, owing to different rates of elimination, it does provide a more satisfactory means of approximating the active amount of radiation at any given time than do dose and the time of administration. The determination of the "radiation level" is of greater value with small, frequently repeated doses than when single doses are used at long intervals. Small fractionated doses seem justified for the following reasons: 1. By keeping a fairly constant, though low, level of radiation in the body for a considerable time, more cells are likely to be affected during their most sensitive period. 2. As actively growing cells take up a greater proportion of phosphorus than "resting" cells, a continuous supply of radioactive phosphorus is more likely to result in the radioactive atoms getting into dividing cells. It is too soon to compare the results of infrequent single with fractionated radiophosphorus treatment and also with other methods, but some remark-

able and some unsatisfactory responses have been obtained with varying dose methods in chronic myelogenous leukemia, chronic lymphatic leukemia and lymphosarcoma. Until end results justify frequent small doses, this technic cannot be advocated as the method of choice. The treatment of polycythemia vera differs from that of the three aforementioned diseases in that the aim is to influence the erythropoietic tissue adversely instead of trying to "protect" it. A higher level of radiation is required. Many complete remissions have been produced. Patients with Hodgkin's disease have not had as satisfactory responses as those with lymphosarcoma. Multiple myeloma and widespread metastasis from carcinoma have proved resistant, even though a few satisfactory palliative results have been obtained. The use of other radioactive elements (strontium, iodine, element 85 and phosphorus in chromium phosphate) is proving their value in some conditions. The use of radioactive elements in various compounds which might localize in certain tissues is an unexplored field with great potentialities.

**Treatment of Lymphosarcoma with Radioactive Phosphorus**—The results of radioactive phosphorus therapy in 22 unselected patients with lymphosarcoma have been carefully studied and analyzed by Kenney and Craver. Ten, or 46 per cent, of the 22 patients are living, 4 of them have had complete remissions and have had no recurrence for three to twelve months, 2 have had recurrences which were controlled by additional therapy, in 3 the disease has regressed 75 per cent and in 1 about 50 per cent. Six of the 10 living patients have had previous roentgen therapy, which had controlled the disease completely in 3 and partially in 3. Of the 12 patients who died 10 were never benefited by isotope therapy. Eleven received roentgen therapy without effect subsequent to the radioactive phosphorus. Five of these had had roentgen therapy prior to treatment with radioactive phosphorus with partial control in 2 and no control in 3. The disease of 5 was clinically classified as leukosarcoma, the acute phase of lymphosarcoma. The period of remission, which is still unbroken in the successfully treated patients, has been longer in 2 patients than after previously administered courses of roentgen therapy. In 5 of these patients the remissions have been longer than the average of six to nine and a half months given by Medinger and Craver for roentgen treated patients. A tentative method, based on the differential absorption ratio, for selecting patients suitable for radioactive phosphorus therapy and for determining whether to use it as a primary or secondary method is outlined. From the results, it appears that the therapy should be used primarily or secondarily for virtually all cases of lymphosarcoma.

**Treatment of Cancer with Fast Neutrons**—Between December 1939 and Sept. 15, 1941 Stone and Larkin treated the cancers of 120 patients pronounced incurable by surgical or roentgen measures with the 60 inch cyclotron producing neutrons with 16 million electric volts of energy. The anatomic distribution of the lesions was the tongue 18, prostate 18, skin and lip 13, floor of the mouth and alveolar ridge 13, breast 11, larynx and pyriform sinus 9, stomach and intestine 9, buccal mucosa 5, brain 4, nasopharynx 3, parotid 3, esophagus 2 and miscellaneous 12. Only 1 patient had a small localized tumor, 31 had lesions with definite local extension without metastasis, 34 had advanced primary lesions and metastasis and 49 had recurrences, usually after previous roentgen or radium treatments. Of the 120 patients 61 had died by Oct. 15, 1941. The encouraging facts are that, of those who were alive on Oct. 15, 1941, 9 had survived almost one year, 3 for twelve to fifteen months and 10 for more than fifteen months. Sixteen of those who survived had cancer of the prostate—a disease that does not always cause rapid death even if untreated. Of the 61 patients who died 26 did so either because their tumors were uncontrolled or because irradiation brought about conditions incompatible with life, and 31 had a gross tumor at the time of death in the region treated. Twenty-nine of the 41 patients with cancer of the mouth or throat had persistent ulceration at the time of death. At the end of treatment about 17 per cent of them showed complete regression and about 48 per cent showed partial regression of the tumor. After trials of various technics, it was concluded that 70 to 75 neutrons, as measured in the authors' laboratory, given to a single field with no cross fire on alternate days, was best. As judged by the minimal

threshold skin reaction, 1 neutron was found to be equal to 6 roentgens. As judged by the cutaneous reaction occurring about the neck and face, about 700 neutrons to a single field and 500 neutrons to two opposite fields administered in about twenty-six days produce an epidermitis which heals satisfactorily. The data demonstrate that cancer can be favorably influenced by neutron therapy and that normal tissue recovers from specific exposures. Therefore it should now be permissible to treat small cancerous lesions, which are more likely to be "cured" than the extensive ones. Further studies must establish the methods best suited to neutron therapy.

### Review of Gastroenterology, New York

9 393 466 (Nov-Dec) 1942

- Traumatogenic Peptic Ulcer R H Fowler Newark N J—p 393  
Gastroscopic Diagnosis of Ulcerative Lesions of Stomach D T Bonham Hempstead, N Y—p 404  
Pernicious Anemia Alternating with Polycythemia (Polycythemia) H I Goldstein Camden N J—p 406  
Role of Gram Positive Diplococcus and Other Pathogens in Stagnant Colon M Smith, Miami Fla—p 411  
Roentgenologic Demonstration of Duodenal Bulb Without Use of Contrast Mediums M Feldman Baltimore—p 422  
Probable Left Upper Quadrant Appendicitis Due to Partial Nonrotation of Colon Case J Lichstein Philadelphia—p 424  
Sulfanilamide and Appendicitis H Reich, Newark N J—p 427  
Surgical Treatment of Gallbladder Disease J F Erdmann New York—p 429  
Amebic Hepatitis and Hepatic Abscess A Ochsenr M DeBakey R Kleinsasser and E DeBakey New Orleans—p 438  
Liver Dysfunction in Peptic Ulcer L M Morrison Philadelphia—p 448

### Texas State Journal of Medicine, Fort Worth

38 475 528 (Dec) 1942

- Heart Disease in Texas Public Health Aspects G R Herrmann G M Decherd and A Ruskin Galveston—p 483  
Endocrine Aspects of Recurrent and Threatening Abortion E C Hamblen Durham N C—p 488  
Hypertension with Special Reference to Role of Kidney L G Rowntree Washington D C—p 490  
Injuries to Knee Joint S A Collom Jr, Texarkana—p 499  
Multiple Myomectomy M W Sherwood and T Speed Temple—p 503  
Present Status of Intervertebral Disk Problem F K Bradford Pensacola Fla—p 507  
Diagnosis and Treatment of Foot Deformities in Children B Carrell Dallas—p 509  
\*Results of Treatment of Acne Vulgaris by X Rays and Other Physical Methods L M Smith El Paso—p 512

**Treatment of Acne Vulgaris**—One hundred and thirty of the 169 patients with acne vulgaris that Smith treated with 75 roentgens once a week obtained a final satisfactory result. Also the condition of 23 patients was definitely improved and that of 16 was slightly or not improved. As many factors influence acne vulgaris, attention to them is important in the successful treatment of the disease. Of the several forms of physical therapy used for hastening cure, irradiation is of most value. It is important that sufficient treatment (twelve or more exposures) be given to prevent relapse, overtreatment must be avoided. Roentgen therapy is the least favorable for early cases. Of 100 patients more than 16 years of age, receiving twelve or more treatments of 75 roentgens each, 89 per cent obtained satisfactory results. This percentage could probably be increased if proper cooperation of all patients could be obtained and appropriate follow-up treatment given. Ultraviolet radiation is sometimes of temporary benefit. It is most useful as a desquamating agent between or after courses of roentgen therapy. Mild freezing with carbon dioxide slush is worth trying if roentgen therapy is not advisable, and as a later desquamating agent. Ultraviolet therapy should not be used concurrently with roentgen therapy.

### Wisconsin Medical Journal, Madison

41 1067-1166 (Dec) 1942

- Modern Bone Graft Surgery C C Schneider Milwaukee—p 1081  
Wartime Amputations Value of End Bearing Stumps in Lower Extremity R I Harris Toronto Canada—p 1086  
Use of Spool Cotton as Suture Material J M King Milwaukee—p 1090  
Ocular Evidence of Head Trauma F E Burch St Paul—p 1092  
Injuries to Abdominal Wall and Contents M A McGarty La Crosse—p 1097  
Lest We Forget J H Skavlem Cincinnati—p 1100

### FOREIGN

An asterisk (\*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

### British Journal of Experimental Pathology, London

23 221-276 (Oct) 1942

- Effect of Some Substances Influencing Cell Activity on Growth of Rous No 1 Sarcoma J G Carr—p 221  
Studies on Effect of Carcinogenic Hydrocarbons on Production of Anti-hormones C Hoch Ligeti—p 228  
Production of Hypertension in Rabbits by Intrarenal Injection of Kieselguhr White B G Maegraith and F J Maclean—p 239  
Electrical Changes in Wounds and Inflamed Tissues. Part I Bioelectric Potentials of Cutaneous Wounds in Rats H Burrows J Iball and E M F Roe—p 253  
Correlation of In Vitro and In Vivo Drug Action Through Specific Antagonists Sulfanilamide and P Aminobenzoate H McIlwain—p 265  
Study of Mitotic Activity of Normal Human Bone Marrow J Japart—p 272

### British Medical Journal, London

2 597-626 (Nov 21) 1942

- Typhus Group of Fevers Classification Laboratory Diagnosis Prophylactic Inoculation and Specific Serum Treatment A Felix—p 597  
\*Circumcorneal Injection as Sign of Riboflavin Deficiency in Man Account of Three Cases of Ariboflavinosis H Scarborough—p 601  
Sulfonamides Used Locally Their Absorption from Serous Cavities and Wounds in Man F Hawking and A H Hunt—p 604  
Spontaneous Annular Detachment of Cervix During Labor M D Westernman—p 606

**Circumcorneal Injection and Ariboflavinosis**—Among 204 persons between 12 and 69 years of age seen in the outpatient department from October 1941 to March 1942, when the nutritional deficiency might be expected to be at its peak, Scarborough observed that 70 had circumcorneal injection. This sign occurred with relatively greater frequency among the older patients. 43 of 63 persons older than 50 were so affected. The observation of Sydenstricker and his co-workers that circumcorneal injection occurs in ariboflavinosis has been confirmed, but a form of the condition exists even in subjects presenting evidence of frank vitamin deficiency disease which cannot be attributed to a deficiency of riboflavin, as it is not cured by the administration of the vitamin. The latter observation no doubt accounts for the relatively high incidence of circumcorneal injection observed. Although circumcorneal injection may be an early stigma of ariboflavinosis it cannot be so considered unless it is supported also by the presence of cheilosis, glossitis, dermatitis and ocular symptoms or by slit lamp examination of the cornea. Certain of the subjects manifest a requirement for riboflavin which, for reasons unknown, is unusually large. Clinically, the circumcorneal injection differs in no material way from that described by Sydenstricker in frank ariboflavinosis.

### Lancet, London

2 591-632 (Nov 21) 1942

- Selection of Army Personnel Development of the Directorate of Selection of Personnel C S Meyers—p 591  
\*Treatment of Bacillary Dysentery in the Middle East J W Paulley—p 592  
Anterior and Posterior Fossa Cerebral Tumors Clinical Study of 122 Cases G J Dixon and G FitzGerald—p 595  
\*Scabies and Intelligence K Mellanby A L Northedge and C C Johnson—p 596  
Diagnosis and Treatment of Sciatic Pain M G Good—p 597

**Treatment of Bacillary Dysentery**—At a recent medical conference in the Middle East it was agreed that it is better to do nothing at all for patients with bacillary dysentery than to give them salines which dehydrate an already dehydrated patient. Paulley's results among a large group of patients treated last year on "do nothing plus fluids" lines were at least as good as those obtained at the same time with patients given saline solution. The tendency of most patients to get better anyway is disturbing because if the disease is mild (which form has predominated this year) it leads to complacency. The results of five types of treatment are compared. There were no failures among 43 patients treated with sulfapyridine at one hospital and among 30 at another hospital. Of 25 given sulfaguanidine 2 had to be given sulfapyridine and 3 others gave a poor response. The treatment of 60 patients with saline solu-

tion was prolonged (of 1 for sixty-five and of 11 for more than twenty days), but the final result was recovery, in a few severe and chronic infections sulfaguanidine was used. Of 15 treated with kaolin 2 required sulfapyridine. The average time in bed for the five groups of patients was approximately four and a fourth, five, five and a third, twelve and a half and six days. In the treatment of an isolated and severe epidemic of Shiga dysentery in one camp both sulfapyridine and sulfaguanidine were efficacious, but the period of therapy was generally longer than it was for the bacillary dysentery. As there were no cases of dysentery in this or an adjacent camp for three months, the cause of the outbreak was possibly a carrier in a draft of 70 men who had arrived from India about seven days before the dysentery began. The number of stools was reduced and the blood and mucus in them disappeared more rapidly among patients treated with sulfapyridine than among those on sulfaguanidine. Also patients on sulfapyridine became afebrile within twenty-four hours as compared to four or five days for sulfaguanidine. Sulfonamide treatment brings about a rapid recovery, solid food can be taken early, convalescence is short and discomfort is quickly curtailed. The disadvantage is crystallization in the renal tubules with anuria. In the Middle East supply and cost must also be considered, but from the military and civil aspect this is outweighed by the shortened period of ineffectiveness. Treatment should be begun before the disease has spread or become chronic.

**Scabies and Intelligence**—Mellanby and his co-workers assessed the intelligence of several hundred patients with scabies. The results indicated that the men with scabies were mentally an approximately normal sample from the army. There was nothing to suggest that the group contained an abnormally high proportion of men of low grade intelligence. There was no significant difference in intelligence between men who reported themselves sick, those who were detected at routine inspections, those with few or with many parasites or those with or without secondary infection.

### Medical Journal of Australia, Sydney

2 371-392 (Oct. 24) 1942

- \*Investigations of Influenza Epidemic in Military Camps in Victoria May 1942. F. M. Burnet, W. I. B. Beveridge, Diana R. Bull and Ellen Clark—p. 371.  
Some Surgical Experience in the Middle East. N. Robinson—p. 376.

2 393-412 (Oct. 31) 1942

- Suggestions Critical of and Alternative to Outline of a Possible Salaried Medical Service as Set Out in the Report of the National Health and Medical Research Council 1942. A. E. Brown—p. 393.  
Photoretinitis in Antiaircraft Lookouts. J. Flynn—p. 400.

2 413-432 (Nov. 7) 1942

- Infectious Mononucleosis. Problem in Diagnosis. T. E. Hester Spark—p. 413.

**Influenza Epidemic in Military Camps in Victoria**—Typical virus influenza occurred in Victoria and in the military camps near Melbourne in May 1942. Burnet and his co-workers tried to establish whether this epidemic was true virus influenza and, if so, to determine the type of virus. Virus was readily isolated by the amniotic method and produced decided temperature responses in ferrets. Patients with typical symptoms showed a sharp rise in antibody in the fortnight following the illness. The only anomalous feature was the season at which the epidemic appeared. Unusually cold wet weather in addition to camp conditions may have been wholly or partly responsible for this change. Serologic studies only confirmed the relatively homogeneous character of the epidemic in only 1 subject with typical symptoms was the rise insignificant. Comparison with an unselected camp population confirms the general finding that susceptibility to influenza is significantly correlated with an initially low antibody level, however, a relatively high antibody level is no guaranty of immunity. It is the authors' impression that nonspecific inhibition by serum protein plays an important part in determining the initial titer of a given subject and that specific antibody inhibition is superimposed on this nonspecific effect. This aspect must be clarified before the significance of detailed serologic studies on specimens of serum by Hirst's method can be discussed or determined.

### Annales Pædiatrici, Basel

159 1-56 (July) 1942 Partial Index

- \*Clinical Picture of Interstitial Plasma Cell Pneumonia in Infant. E. Hug—p. 2.  
Relation Between Enuresis and Epileptic Crises in Children. M. Schachter—p. 19.  
Nutritional Metabolic and Digestive Disturbances in Children with Malaria. A. Eckstein—p. 25.

**Interstitial Plasma Cell Pneumonia in Infants**—Hug believes that plasma cell pneumonia is a distinct entity. He reviews histories of 8 instances observed in his clinic, all of them in premature infants. Four of these died and were subjected to a necropsy. The author suggests that this type of pneumonia is probably not caused by infection but is due to improper method of nursing. The condition develops as a result of repeated aspirations of small amounts of food because of careless feeding technique of premature infants who are difficult to feed. This opinion is supported by the postmortem status described by Roulet, who found that the microscopic picture of this type of pneumonia greatly resembles that of aspiration pneumonia. He believes that the increase in the interstitial tissue and its dense infiltration with plasma cells are manifestations of a reaction on part of the lung to a substance consisting, as milk does, chiefly of protein and fat. The close relationship of plasma cells to protein decomposition is well known.

### Archivos Americanos de Medicina, Buenos Aires

18 64-81 (Oct. 1) 1942 Partial Index

- Traumatic Luxation of Hip in Children. L. Velasco Blanco and E. M. Echegaray—p. 64.  
Sulfonamide Therapy in Ophthalmologic Disorders in Childhood. B. V. Re—p. 71.  
\*Case of Fatal Intoxication by Sulfanilamide and Sodium Sulfate. A. F. Parodi and T. R. Loti—p. 75.

**Fatal Intoxication by Sulfanilamide and Sodium Sulfate**—Parodi and For's patient was a woman aged 31 who complained of malaise, coryza, sore throat and cough. A physician diagnosed her disorder as influenza and prescribed sulfanilamide, of which she took 2 Gm. on the day of the consultation. In the evening of the same day the woman took a purgative dose of sodium sulfate. On the following morning she exhibited severe dyspnea, cyanosis and stupor. Oliguria had existed since the night before. She was hospitalized at 11:30 a. m. in a comatose condition and died at 4:30 p. m. The circulatory, respiratory and hematologic symptoms were the result of a severe anoxemia caused by the combination of sulfanilamide with sodium sulfate, which led to the formation of sulfinmethemoglobin. Paton and Eaton reported in 1937 that the simultaneous administration of azosulfamide and the sulfates of sodium or magnesium and purgatives produce grave intoxications. According to Parodi and For the therapeutic procedures recommended include intravenous injection of methylene blue, oxygen therapy and blood transfusion. In their case death ensued before a transfusion could be carried out. Chilean authors did not see any advantage from the use of nicotinic acid as recommended by Gmty. The authors stress that sulfanilamide is incompatible with a number of other drugs, such as gold, arsenic, bismuth, sulfur compounds, particularly purgatives, antipyrine and aminopyrine. Alcohol should be abstained from during the use of sulfanilamide in order to avoid cerebral symptoms. Hepatic and renal functions should be determined before and during this medication. The blood is to be watched for the appearance of anemia or agranulocytosis, and the blood and urine concentration of the drug should be determined.

### Boletín Clínico, Medellín

8 57-108 (March-April) 1942 Partial Index

- Remarks Regarding Functional Pathology. J. M. Restrepo—p. 57.  
Etiopathogenesis and Treatment of Gastrointestinal Ulcer. R. Uribe Vélez—p. 78.  
\*False Jaundice. Cutaneous Xanthochromia Caused by Hypercarotenemia. J. Yepes Cadavid—p. 103.  
Chronic Appendicitis and Benign Traumatic Diverticulitis. C. García Mayorca—p. 105.

**False Jaundice**—According to Yepes Cadavid, cutaneous xanthochromia results from abuse of a vegetarian diet sometimes employed to obtain a laxative action. Excessive intake of foods such as carrots, green vegetables, papaya and sapodilla causes an overflow of the hepatic carotene storage and this

results in a pseudoicteric appearance of the skin. This pigmentation frequently remains localized on the palms of the hands and feet but may involve all of the skin. The author cites 2 women, aged 48 and 18, who had eaten excessive quantities of papaya to relieve constipation. Both patients developed a generalized pigmentation, but their conjunctivas were clear and the urine was free from bilirubin pigments. The coloration was of an orange or saffron shade and was especially evident over the neck. Mild xanthochromia was present in the sublingual mucosa. The causal agent of this disorder is the yellow coloring matter carotene, of which certain plants contain abundant amounts. The liver transforms this provitamin into vitamin A by means of a ferment. Large amounts of carotene in the food exceed the capacity of the liver to utilize it, and hypercarotenemia results. Hypercarotenemia may develop in the absence of alimentary excess of carotene as a result of hepatic insufficiency which impairs the metabolism of this pigment. Carotene exists in the blood from birth in quantities that increase somewhat with age. Under normal conditions the carotene content varies between 0.3 and 0.7 mg per liter. In patients with xanthochromia it reaches up to 3 mg per liter. *Cutaneous xanthochromia* of hypercarotenemia is a benign transitory disorder which improves with the suppression or limitation of carotenophorus foods and the stimulation of liver by injectable liver extracts.

### Revista Clinica de S. Paulo, São Paulo

12 1-30 (July) 1942 Partial Index

\*Aneurysm of Peripheral Arteries in Course of Subacute Bacterial Endocarditis. M. R. Castex, E. S. Mazzei and A. Lavarello—p. 1  
Physiopathology of Yellow Body. F. Bergamini—p. 8

**Aneurysm of Peripheral Arteries**—Castex and his collaborators report 2 cases of aneurysm of peripheral arteries in the course of a subacute bacterial endocarditis. The incidence of aneurysm in subacute bacterial endocarditis is greater in patients of the ages between 20 and 40 than in the young and the old. It involves peripheral arteries as a rule. It may be multiple and may appear in one or all of the extremities. *Streptococcus viridans* alone or with other bacteria is the organism more frequently identified in the walls of the aneurysm. The aneurysm appears suddenly and is usually very painful. True subacute peripheral aneurysm of endocarditis is circumscribed and limited. Frequently it ruptures spontaneously and produces either a diffuse or a false aneurysm. A large hematoma about the ruptured aneurysm is the most obvious anatomic sign of a false aneurysm. The microscopic changes are variable. They may show local inflammation, endothelial obliteration of the vasa vasorum and ischemic necrosis of the arterial wall or blood infiltration of the arterial walls, which is an equivalent of a local suppuration. Peripheral arterial aneurysm is of diagnostic value in recognition of a subacute bacterial endocarditis. The fatal course of endocarditis is not the result of the aneurysm. The treatment of the aneurysm consists of a compressing bandage to control the pain. The surgical treatment consists of ligation of the artery or of extirpation of the aneurysmal segment. It is indicated in cases of intractable pain and threatened rupture.

### Revista Clinica Española, Madrid

6 1-64 (July 15) 1942 Partial Index

Anomalies of Pigmentation. L. Mompalao—p. 1  
\*Glomus Tumors. A. Ley and R. Roca de Viñals—p. 7  
Fractures of Upper End of Radius. L. Sierra Cano and F. Lopez Areal—p. 12  
Pathogenesis, Symptomatology and Treatment of Mongoloid Oligophrenia. J. de Moragas—p. 20  
Glomus Tumor with Microscopic Aspects of Glomangioma. M. D. Adame y Romero—p. 35  
\*Adamantinoma of Nose. P. de Juan and E. Oliva—p. 37  
Intestinal Obstruction Caused by Cicatricial Stenosis. Sequela of Strangulated Femoral Hernia. F. Ioscortales—p. 42  
Treatment of Myocardial Infarct of Coronary Insufficiency. J. Lopez Brenes—p. 44

**Glomus Tumors**—Ley and Roca de Viñals describe 2 cases of glomus tumor. The first patient, a man aged 50, had a small nodule on the outer aspect of the forearm. The nodule grew slowly. In the last months it had caused extremely pain-

ful crises. The pain radiated into the arm and the shoulder and at times involved the whole left side of the body, producing a sort of hemiparesis which persisted for several seconds. The nodule, the size of a grain of rice, was adherent to the skin. It was diagnosed as glomus tumor and was removed. The pain ceased after extirpation and did not recur. The second patient was a girl aged 18. The condition was atypical in symptoms and localization. This patient complained of paroxysmal pains in the right hand. For several months previous to her seeking medical aid the pain had become more severe with greatest intensity in the ring finger. The pain was accompanied by tumefaction, cyanosis and loss of power. Neurologic examination revealed the syndrome of Claude Bernard-Horner. On the basis of a tentative diagnosis of polyarthritis of the chronic inflammatory type, combined administration of salicylate and sulfanilamides was tried, but without effect. Fever therapy likewise failed. Roentgenograms of the hand revealed a cystic formation in the first phalanx of the right ring finger. On removal the growth appeared as a round bluish red tumor measuring about 9 mm. It was lodged almost completely in the bone. It was designated as a *glomus tumor* on the basis of microscopic examination. The pain ceased immediately after the operation and did not recur. Intraosseous location of a glomus tumor is exceptional. Association with the Bernard-Horner syndrome is interesting. It was reported by Barre in a case of subungual glomus tumor. It is suggested that the syndrome is due to abnormal stimulus resulting from hyperplasia of the peripheral neuromyoarterial organ provoking by reflex action inhibition of the cervical sympathetic, this in turn confirming the importance of the role of the "cutaneous glomus" in the regulation of the peripheral circulation.

**Adamantinoma of Nose**—According to de Juan and Oliva adamantinomas which originate from the epithelial remains of the enamel organ usually develop in the maxilla, particularly the lower one. Literature contains reports of other localizations of this type of tumor, such as tibia, sella turcica, hypophysis, sphenoid, ovary, pharynx and parotid. There appears to be no record of an adamantinoma located on the tip of the nose. The authors' patient was a woman aged 81, who developed an adamantinoma of the tip of the nose, which rapidly grew from the size of a grain to that of a hazelnut. The growth was excised at its pedicle, and the resulting wound cicatrized completely in the course of eight days.

### Semana Medica, Buenos Aires

49 881-940 (Oct 15) 1942 Partial Index

Clinical Aspects of Venous Pulse. T. Padilla—p. 881  
\*Syndrome of Ehlers-Danlos. A. Roca, G. J. Lioacono and E. Mundet—p. 887  
Chronic Intestinal Invagination by Lymphoma of Terminal Portion of Ileum. Cure by Operation of Barker. A. Casaubon, M. C. Rocca and F. M. Trostbach—p. 894  
Preparation of Convalescent Serums. J. Moran—p. 898  
Obsessive Syndrome and Rabies. J. F. Capelli—p. 906  
Surgical Hydrocele. J. Irazu—p. 911  
Unilateral Absence of Uterine Adnexa. D. Berdeal Avila—p. 915  
\*Cure of Wounds with Glass Dressings. F. P. Giordano—p. 928

**Syndrome of Ehlers-Danlos**—Roca and his associates report 2 cases of Ehlers-Danlos syndrome in two brothers aged 26 and 23 respectively. The disorder is a rare dystrophy, frequently congenital and hereditary and almost always familial which involves mesenchymal tissues and is characterized by abnormal elasticity and vulnerability of the skin, articular looseness and formation of cicatrized molluscoid pseudotumors. It was described in 1890 by Ehlers, while Danlos added to its knowledge in 1908. It may appear in either sex but seems to have a predilection for the male. The prominent symptoms are hyperelasticity of the skin, articular looseness, molluscoid tumors resulting from the abnormal vulnerability of the skin and a tendency to hemorrhages. In the 2 cases photographs demonstrate the great elasticity of the skin particularly in the region of the elbow. Biopsy specimens of the skin in this region disclosed an abundance of elastic fibers and of collagenous tissue and lymphoplasmocytic infiltration particularly at the papillary



and deep boundaries of the dermis and around the vessels. The syndrome is to be differentiated from cutis laxa, chronic atrophic dermatitis, elastic pseudoxanthoma, juvenile xanthoma, Recklinghausen's disease, chronic atrophic dermatitis of Pick-Hersheimer and geromorphism of Souanet and Charcot. The syndrome persists throughout life, but the hyperelasticity of the skin and joints tends to decrease in the course of years.

**Cure of Wounds with Glass Dressings**—Giordano experimented with glass dressings intended to put the wound at rest and to permit of a continuous supervision of the healing process. The glass dressings are concave plates applied over the wound and fastened with adhesive strips. The dressings have small openings on the sides for ventilation. They represent a saving in material and diminution of pain for the patient. The dressings are advantageous in postoperative wounds and particularly in wounds that heal by secondary intention.

### Klinicheskaya Meditsina, Moscow

19 1-96 (No. 9) 1941

- Role of Internist in Military Medicine E. I. Smirnov—p. 3  
 Attacks of Accelerated Cardiac Activity and Their Clinical Significance A. M. Sigal—p. 11  
 \*New Methods in Surgical Therapy of Cardiac Ischemia B. P. Kirillov—p. 40  
 \*Dynamic Changes of Electrocardiogram After Heart Wounds D. F. Presnyakov—p. 51  
 \*Cure of Agranulocytosis by Transfusion of Blood from Leukemic Patient I. M. Rybakov—p. 70

**Surgical Therapy of Cardiac Ischemia**—Kirillov maintains that an artificial collateral blood supply may be provided for the heart and that it develops especially well in those cases in which there is a physiologic need, that is, in cases of impaired cardiac circulation. After creation of a collateral blood supply the ligation of the coronary arteries does not interfere with cardiac function of experimental animals. While other tissues, such as the large pectoral muscle and the lung, have been used as sources of collateral circulation, Kirillov considers the omentum most satisfactory for this purpose. Anastomoses between the heart and omentum develop within two to three weeks and are not obliterated later (as demonstrated in experiments prolonged for more than a year). The newly formed anastomoses appear in the form of fine capillaries uniting the arterial network of the omentum with the vascular system of the heart. It is not necessary to suture the omentum to the heart. After preliminary scarification of the epicardium the omental tissue is brought into close proximity to it. If the epicardium is left intact the adhesions which develop may not extend along the entire surface of contact between the omentum and the heart. In addition to serving as a source of collateral blood supply the omental tissue may serve as an anastomotic bridge across which the blood can flow from the normal part of the heart to the part with impaired circulation. The simplicity of the author's technique guarantees a low postoperative mortality. Instead of the transdiaphragmatic route used by O. Shaughnessy, Kirillov pulls the omentum through a subcutaneous tunnel above the ribs. In man this operation can be performed without opening the pleura. The time required is no more than twenty-five to thirty minutes. While at present artificial vascularization of the heart is largely confined to experimental animals, Kirillov believes that it will soon become an accepted procedure in surgical practice.

**Electrocardiogram in Heart Wounds**—Presnyakov presents a table summarizing the electrocardiographic findings in various types of heart wound as recorded in the literature. He reports a case of knife wound of the right ventricle in which an electrocardiogram was obtained soon after the injury and was repeated daily for a long period. The most pronounced characteristic was a considerable displacement of the ST segment. With a few exceptions the electrocardiographic changes resembled those observed in myocardial infarction of the anterior wall. The author attributes these differences from the typical electrocardiogram of infarction to the fact that in this case the large branches of the coronary vessels were not involved in the injury. Electrocardiography in cases of heart wounds is a

valuable aid in diagnosis and localization. It may also facilitate topical diagnosis of myocardial lesions in various diseases, especially in infarction.

**Transfusion of Leukemic Blood in Agranulocytosis**—Rybakov reports the case of a 36 year old man who was admitted to the hospital with symptoms of extreme weakness, sore throat and fever. Because of a history of malaria and the presence of malarial parasites in the blood, tropical malaria was at first considered as a diagnostic possibility. But the granulocytopenia (93 per cent) and necrotic foci in the oral cavity led to the recognition of a disease of the agranulocytic type possibly exacerbated by malaria. Transfusion of leukemic blood was decided on and antimalarial therapy was postponed. A patient with chronic myeloid leukemia in a state of remission after roentgenotherapy was selected as donor. His leukocytic count was about 30,000, with 25 per cent embryonic forms. He was of the same blood group as the patient with agranulocytosis. Within four days after the transfusion, the blood picture had gradually returned to normal with an increased number of leukocytes and 58 per cent of neutrophils. The temperature remained normal from the third day on. Within five or six days the necrotic foci in the oral cavity were covered with healthy granulation tissue, the mucous membranes resumed their normal color and the bad odor and profuse salivation disappeared. After a course of antimalarial therapy the patient was discharged fully recovered.

### Voprosy Neyrokhirurgii, Moscow

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- Certain Peculiarities of Craniocerebral Gunshot Wounds in Present War as Observed in Hospital Practice V. A. Gusynin—p. 5  
 Late Primary and Secondary Treatment of Craniocerebral Wound A. Arendt—p. 11  
 \*Papilledema in Craniocerebral Gunshot Wounds A. N. Murzin—p. 47  
 \*Role of Histamine in Therapy of Various Forms of Pain Associated with Gunshot Wounds of the Peripheral Nervous System I. I. Rusetskii—p. 70

**Papilledema in Craniocerebral Gunshot Wounds**—Murzin observed edema of the optic disk in 60 per cent of all cases of craniocerebral wounds. This symptom is significant in diagnosis, since it indicates a progressive intracranial hypertension possibly requiring immediate surgical intervention. Infection of the wound or an infectious process developing as a result of foreign bodies (metal or bone fragments) in the brain are the chief causes of papilledema. Gunshot wounds of the parietal and occipital region are more frequently associated with choked disk than are injuries of the frontal lobe. Since papilledema rarely occurs in cranial wounds without penetration of the dura it may aid in differential diagnosis of the type of wound. Murzin suggests that the term "edema of the optic nerve" be used in cases in which it is difficult to differentiate between congestive and inflammatory manifestations.

**Histamine for Pain from Gunshot Wounds of Peripheral Nerves**—Rusetskii injected intracutaneously 2 to 3 drops of a 1:1,000 solution of histamine hydrochloride in 60 cases of peripheral nerve injuries associated with painful syndromes. In the majority of cases there was a temporary analgesic effect lasting from three to six hours. Preservation of some degree of sensitivity in the area of injection was a prerequisite for this therapeutic action. Histamine injections at a distance from the painful zones had no effect. When the injections were repeated at frequent intervals the analgesic effect became weaker and of shorter duration. Less concentrated solutions of histamine proved ineffective. In pain syndromes associated with vascular spasm, histamine injections not only relieved the pain but produced a prolonged dilatation of the cutaneous capillaries of the painful zone. The mechanism of the analgesic action of histamine is dependent on neurohumoral reactions developing in the organism. There is no inhibition or weakening of sense perceptions. The painful area of the skin responds to sensory stimuli in the same way as before the injection. Rusetskii emphasizes the need of further research on the problem of relief of pain connected with peripheral nerve injuries, in view of the frequency of this type of injury in war.



## Book Notices

**War Gases Their Identification and Decontamination** By Morris B. Jacobs Ph.D. Cloth Price \$3 Pp 180 with 8 illustrations New York Interscience Publishers, Inc 1942

In the event of a poison gas attack on civilians, vigorous preventive action by local defense authorities must be taken. Although those already gassed will be cared for by physicians, the gas identification officer, the decontamination officer and the health officer must speedily identify the chemicals involved, mark off contaminated areas and issue such information as will prevent further casualties from occurring, allay fear and in general guide medical treatment. Dr. Jacobs has prepared the present volume to provide these officers with "a system for the detection, the sampling and the identification of the chemical warfare agents, and the decontamination of areas and materials polluted by them." This highly technical material is presented in short textbook form accurately and concisely yet with much valuable factual information. The inclusion of numerous tables, diagrams and references is helpful. Although the book is not intended primarily for the physician, it contains many data on the toxicity and fundamental chemical reactions of the war gases that will be useful to him.

**Growing Up in a World at War** Paper No pagination Chicago Institute for Psychoanalysis 1942

This pamphlet is a report of a group of child psychiatrists and psychoanalysts, members of a committee on psychologic problems of children in wartime. The purpose was to present an analysis of the probable important effects of the war on children and the effect on their character development. Children's reactions to any fearful situation are dependent on their earlier life experiences and the emotional stability of the parents. The reaction to war may mean for the child insecurity based on reopening of old anxiety or on change in the child's environment or may be dependent on transmission to the child of the parents' feelings of insecurity.

The children observed showed defenses against the anxiety provoked by the war characteristic of the age and personality makeup of each child. These defenses, such as talking about the war, bragging, depreciation of the enemy and denial of danger, are discussed. Some of these are recognized to be wholesome defenses and some potentially harmful to the child's growth. Children of preschool age up to 5 or 6 years are particularly sensitive to the attitudes and feelings of those about them. While fears for these children center primarily about fear of separation from their parents they are reinforced by specific anxiety producing situations they have already experienced. The unknown is terrifying for children, and much anxiety is occasioned in this youngest group by their lack of understanding of the situations they have discussed.

The grade school children seem somewhat less vulnerable than the younger children. While faced with the same basic anxieties as are found in little children, they are preoccupied with achievement in academic and physical skills and tend to visualize dangers in more explicit terms than do the younger children. They are curious about the war but feel emotionally somewhat detached from the war threat unless separation from the parents or parental anxieties obtrude. Children of this age are particularly eager to participate in activity of aid in the war.

For the adolescent, wartime conditions are particularly disturbing. For him the insecurity present in children of all ages takes the form of anxiety for his future, his schooling, his career. Natural resistance to authority evidenced by adolescents is greatly accentuated. Interruption of schooling and opportunity for employment disrupt the peacetime controls. The greatest danger to the adolescent, as has been true in England, is delinquency. This is not a wartime problem primarily, but for adolescents the shift of peacetime values to the permissiveness of wartime creates a new burden under which it is more difficult to maintain equilibrium.

This pamphlet is directed to teachers, social workers and group leaders as well as to parents. The planning suggested is based on an interest to avert development of neurotic reactions, character breakdown and delinquency.

**The Aromatic Amino and Nitro Compounds Their Toxicity and Potential Dangers A Review of the Literature** By W. F. von Oettingen Principal Industrial Toxicologist U. S. Public Health Service. From the Division of Industrial Hygiene National Institute of Health. Prepared by direction of the Surgeon General Federal Security Agency U. S. Public Health Service. Public Health Bulletin No. 271. Paper. Price 25 cents. Pp. 221 with 5 illustrations. Washington D. C. Supt. of Doc. Government Printing Office 1941.

The extraordinary development of war industries in recent months has brought into sharp focus the need for detailed knowledge of the toxicology of the manifold chemical compounds used in present day manufacturing. In the present emergency many materials are being used both as solvents and as starting materials for chemical synthesis which have not been carefully scrutinized for possible deleterious action on workers. The hazard involved in the use of these compounds is enhanced by the pressure for production, which tends to minimize the use of peacetime precautions in the now crowded plants. Furthermore, certain solvents, degreasers and chemical reagents which had been restricted in use because of proved toxicity have appeared again because appropriate substitutes are not available in quantity.

Under these circumstances the present compilation of data on the aromatic amino and nitro compounds is peculiarly welcome. Published as a public health bulletin, this summary embodies a wide range of facts. In many cases the chemical formulas, solubilities and chemical properties of the series of compounds under discussion are given, with a synopsis of the method of manufacture and the industrial processes for which they are employed. Methods of detection and analysis are given. The effects on animals are cited, with reference to the literature, from which toxic doses or lethal concentrations of vapor are tabulated. The symptoms and signs of poisoning in man are discussed, and in some instances appropriate treatment is outlined.

Among the aromatic amino compounds included are alkyl and aryl substituted derivatives of aniline, e. g. methylaniline, acetanilid and its derivatives, halogen and nitrated aniline compounds, paraphenylenediamine, and other derivatives of benzene or phenylenediamine. The large group of toluene, xylene and phenolic compounds follows. Next nitrobenzene, chlorinated nitrobenzene, nitrated toluene (e. g. trinitrotoluene), nitrated xylene and nitrated phenols are discussed. Of special interest are the sections on trinitrophenol (picric acid) and on phenylhydrazine. Finally various naphthalene compounds are considered such as diamino derivatives of naphthol.

There are frequent tables and several good graphs showing comparative toxicity at various dosage and concentrations. There is a bibliography of nearly seven hundred references filling some twenty-nine additional pages.

This compact and concentrated compendium will prove invaluable to safety committees in large plants and to industrial physicians. It should be on hand in every state health laboratory and similar municipal institutions or offices of insurance appraisers. In medical schools, particularly in relation to courses on public health and industrial medicine, the bulletin will be especially welcome.

**Surgical Pathology** By William Boyd M.D. LL.D. M.R.C.P. Professor of Pathology University of Toronto Toronto. Fifth edition. Cloth. Price \$10. Pp. 843 with 520 illustrations. Philadelphia & London W. B. Saunders Company 1942.

This edition contains many improvements in text and illustrations over the previous one. Numerous new subjects have been added. The author appropriately devotes chapter 1 to a discussion of the importance of pathology to surgery. He calls attention to the fact that the material seen in the necropsy room is far different from the pathologic material seen in the operating room, since the former represents disease in its late stages whereas the early stages of disease are observed in the operating room. The author therefore correctly implies that surgical pathology is different from pathology but emphasizes that the surgeon or surgical pathologist must first be grounded in the science of pathology. The text reads smoothly, it is readily understandable and is devoid of complicated terms and classifications. For that reason the volume is appropriate for students' use. The early chapters particularly are examples of this simplicity and freedom from complicated discussion.

Although the text in general is an expression of the author's experiences and opinions, he has not failed to include the opinions of others, thereby he has been able to keep his material up to date. For example, in cholecystitis he correctly considers bacterial inflammation of secondary importance to chemical inflammation which he believes is the instigating lesion in gallbladder disease. Moreover, Batson's theory of the spread of carcinoma is given credence and Langley's theory criticized as being wholly inadequate. Strictures of the rectum are correctly ascribed to venereal lymphogranuloma and not to syphilis.

Naturally the description of certain lesions is not as concise and accurate as the description of others. For example the author's use of various terms in the discussion of certain types of goiter is disappointing. Although he occasionally uses some of the terms adopted by the American Association for the Study of Goiter many years ago he fails to adhere to that classification which describes the different types of goiter adequately. Many surgeons indeed would take exception to his statement on page 311 that local excision of malignant polyps of the rectum is sufficient. Although there is a total lack of agreement among surgical pathologists as to the classification to be used for chronic cystic mastitis the reviewer has encountered many descriptions and classifications which might be considered more expressive of the various lesions found in that disease. However, the inadequacies in this textbook are so infrequent that they are overshadowed by the fine points. It may correctly be considered an authoritative treatise on surgical pathology and is particularly adapted for use by the student.

**Medical Manual of Chemical Warfare [Including also] An Atlas of Gas Poisoning.** Reprinted by Permission of the Controller of His Britannic Majesty's Stationery Office. Revised edition. Cloth. Price \$2.50. Pp. 106 with 5 illustrations. 15 with 10 illustrations. Brooklyn Chemical Publishing Company Inc. 1942.

This manual is a British official release on the first aid procedures for and later treatment of war gas casualties. Its value is much enhanced by the inclusion in color of plates from "An Atlas of Gas Poisoning, London, 1918 and 1937, illustrating typical 'blue' and 'gray' cases of suffocant gassing and classic vesicant lesions of the skin and eye. The text is unusually complete for a manual, yet the work has lost none of its force the result chiefly of accurate writing, emphasis on essentials and large print. It must be remembered that knowledge of the treatment of war gas casualties, like the knowledge of the treatment of other injuries, is not static. Thus any manual tends to become out of date. The British have attempted to remedy this by issuing amendments from time to time. The usefulness of the manual is impaired unless these are at hand for reference. British thought has had considerably longer than has ours to crystallize on matters of chemical warfare defense, and this is reflected in this manual. It is heartily recommended. The first American edition of "Medical Manual of Chemical Warfare" published by the same company in 1941, is much handicapped by its less attractive print, black and white illustrations and high retail price.

**Developmental Aphasia in Educationally Retarded Children. An Examination of the Thesis that the Core of Backwardness in the Primary School is so far as This is not due to low Mental Capacity is Provided by Aphasic Characters of Learning Interference.** By M. MacNeehan M.A. B.Ed. Ph.D. Department of Psychology, Edinburgh University. Edinburgh Publications of the W. H. Ross Foundation (Scotland) for the Study of Prevention of Blindness II. Paper. Price 3s. Pp. 95 with 46 illustrations. London: University of London Press Ltd. 1942.

The author has produced an excellent summary on developmental aphasia, a term covering the various types of psychologic disorders which are commonly known as word blindness, word deafness, speech disorders, speech delay and apraxia. He analyzes the syndrome in considerable detail and studies a group of 140 retarded children by means of the Terman Merrill revision of the Stanford-Binet scale and a number of tests of language attainment, as well as tests of laterality and squint. The author devotes many pages to graphs, tables and charts showing psychologic characteristics such as reading and spelling accomplishments, relationship of retardation to learning interference and eye dominance as related to learning interference of both a qualitative and a quantitative nature. The author's conclusion is that the problem of retardation in children due to interference in language learning has a high relationship with left laterality of the eye and some relationship to left

handedness and squint according to either left or right eye dominance. A good deal of learning interference, he says, is not due to "lack of capacity" but is related to a "functional confusional pattern." His data would seem to bear out this conclusion fairly competently.

**Memoranda on Medical Diseases in Tropical and Sub Tropical Areas.** Reprinted by Permission of the Controller of His Britannic Majesty's Stationery Office. By Command of the Army Council. Great Britain War Office. First American edition. Cloth. Price \$4.75. Pp. 282 with 108 illustrations. Brooklyn Chemical Publishing Company Inc. 1942.

This is a military manual of essential material needed during special emergencies. Its table of contents includes most acute diseases which are or may be of importance in hot climates including smallpox, trench fever and typhus fever. It is an excellent practical summary of great value for physicians facing unfamiliar disease problems in warm climates. It is especially strong on control methods. It will be of limited value for American civilian and military physicians. More in detail, the chapter on malaria is a condensed manual of much value. Pelagra is not discussed. There is a tendency to present outmoded and alternative theories which might well be expurgated. Based on British army experience the discussions are not adequate in many fields where American work is preeminent, as in the food deficiency diseases, typhus group and amebiasis. In the case of amebiasis for instance, too many drugs are recommended on the basis of authority and custom rather than on the basis of objective experience and scientific evaluation of their toxicity and action. Probably the most important diseases from a military standpoint in the field are malaria, dysentery and typhus fever. A broader as well as more specific discussion of the last mentioned would be an improvement. Malaria and dysentery are well covered. The illustrations are excellent, as is also the selection of temperature charts and the comprehensive index. The statement under dysentery could well be extended to civil practice. "Any medical officer not submitting the stools of his dysentery patients for laboratory examination, where facilities for such exist, is guilty of criminal negligence." The small but legible type allows a surprising amount of material to be presented.

**Homenaje al Profesor Pedro Belou de sus ex colaboradores y miembros del personal docente y tecnico del Instituto de anatomia y la Cátedra de anatomia descriptiva de la Facultad de ciencias medicas de Buenos Aires en el 28 año de su ejercicio docente en la Cátedra Universitaria.** Paper. Pp. 467 with illustrations. Buenos Aires: Guillermo Kraft Ltda. 1941.

This book was prepared in homage to Dr. Pedro Belou by his collaborators and the group of technicians and instructors of the Institute of Anatomy and the first chair of descriptive anatomy of the Faculty of Medical Sciences of the University of Buenos Aires. It was presented to Dr. Belou on the twenty eighth anniversary of his teaching in the chair of anatomy of the faculty. The book contains several articles of Dr. Belou which were read before medical societies and have not been previously published. It contains also news items in several medical journals of our hemisphere and of Europe concerning lectures, trips and some other medical activities of Dr. Belou, as well as reproductions of speeches in his honor. There are several pictures of Dr. Belou from childhood to his present age, pictures of scenes during ceremonies in his honor and of honorary diplomas given to him in various countries. There is a large section of bibliography of Dr. Belou's work. The larger part of the book is dedicated to the morphology of the arterial system, to which subject Dr. Belou has devoted a large part of his activities.

**Recent Advances in Pathology.** By Geoffrey Hadfield M.D. FRCP. Professor of Pathology in the University of London and Lawrence P. Garrod M.A. M.D. B.Ch. Professor of Bacteriology in the University of London. Fourth edition. Cloth. Price \$5.50. Pp. 346 with 35 illustrations. Philadelphia: Blakiston Company. 1942.

The advancement of our knowledge of disease and its effects on the human body has made necessary discussions of the vitamin deficiency diseases, essential hypertension and some of the problems related to war, such as the crush syndrome. So rapid however has been the progress of problems related to the war that one finds no discussion whatever of blast. There are accounts of new investigations in the field of cancer research, rheumatic fever and pneumonia.

## Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS BUT THESE WILL BE OMITTED ON REQUEST.

### COLD ALLERGY WITH NASAL SYMPTOMS

**To the Editor**—What can be done for a woman aged 38 with a 'cold and moisture allergy' whose general physical and head examinations are entirely negative? On exposure to cold moist air she immediately develops a congestion of the nasal membranes—probably due more to moisture than to cold as dry frosty weather does not bother her much. Physical examinations, roentgenograms and nasal examination in warm dry weather are entirely negative. There are no protein allergies and there is no family history of any. The tonsils are out. Nasal lavage and mild protein silver packs do not help in the least. Nothing in her surroundings appears to contribute to her condition.

M D, Pennsylvania

**ANSWER**—It is questionable whether there is any difference between allergic nasal responses to cold air or to cool humid air—both are undoubtedly instances of cold allergy. Any one of several measures may prove successful in the management of this condition. Daily cold showers, followed by warm if the reaction is too severe, may create a tolerance. Tub baths, the temperature of which is reduced daily, may also be effective. Some clinicians have employed ice rubs to the chest, followed by heat application if necessary. The latter form of treatment may be rather hazardous. A simple method for increasing tolerance to cold consists in immersion of both hands and forearms in cold water (about 45 F) for about four minutes twice daily. In some instances injections of histamine have been of considerable help in relieving the condition. They should be given twice daily at first, beginning with a dose of about 0.1 cc. of a 1 to 5,000 solution and increasing it until a maximum dose of about 0.2 to 0.3 cc. of the 1 to 1,000 solution is reached. After about a two week schedule of bi-daily doses the injections may be given daily and finally twice weekly.

### DISEASES FROM DOGS AND CATS

**To the Editor**—Recently I have been asked by several persons about the advisability of having cats and dogs as pets in a household where there are babies and younger children. Could you give me any references on the subject and perhaps a list of diseases that are carried by dogs and cats?

H R Fishback Jr MD Albuquerque N M

**ANSWER**—Rabies is the most serious of the afflictions which can be charged against the dog. Leptospirosis is becoming an increasing problem in dogs, with human infections by both *Leptospira icterohemorrhagiae* and *Leptospira canicola*.

Animal parasites which infest most dogs form somewhat of a menace to man. The most dangerous is *Taenia echinococcus*, which carries on its adult stage of life in the intestine of dogs while its larval stage is spent in the tissues of man or other animals. Another tapeworm which should be mentioned is *Dipylidium caninum*. Its larval stage occurs in lice and fleas which infest dogs, children becoming infected by accidentally swallowing such lice and fleas or crushing them and afterward sucking the fingers. The guinea worm, *Dracunculus medinensis*, has been found in both dog and man, while several flukes of dogs may be transferred to persons. Three forms of mange afflict dogs, only one of which is transmissible to man—sarcoptic. Among the four forms of ringworm from which dogs suffer, a rare case is passed to persons.

Dogs may become infected with various bacterial diseases from other animals but do not form a serious menace to man. Tuberculosis is contracted sometimes from association with tuberculous persons, from drinking infected cow's milk or from the offal of slaughter houses. Anthrax and glanders are sometimes contracted by dogs from eating animals that have died of those diseases. Infection with foot and mouth disease is difficult, as it is also with trichinosis. Dogs are not generally susceptible to the rodent diseases, but they may act as mechanical carriers of rat bite fever, in which infection has followed the bite of a dog which had recently fed on an animal dead of the disease. The same is possible with other rodent diseases. Sporotrichosis of dogs probably is only a slight menace to man. Rocky Mountain spotted fever infects dogs, while boutonneuse fever, which is closely related to spotted fever, finds its chief reservoir in that animal.

Dogs have been reported susceptible to the organism causing scarlet fever, and free access of a dog to a human case of the disease might be a menace to children.

Cats are fairly resistant to many of the human diseases. On rare occasions they have been found tuberculous from infected milk or meat. They are susceptible to glanders but rarely contract the disease naturally. They may become infected with rabies from contact with rabid dogs, forming a serious menace to children. Cats are hosts of several animal parasites, some of which are transferable to man. The liver fluke, *Opisthorchis felinus*, is common in Europe, while the closely related species *Opisthorchis pseudofelinus* is found in central parts of the United States. Both parasites are natural inhabitants of the cat from which man is infected. The intestinal flagellate *Giardia* found in rats and mice is a variety of the human species, and cats have been found responsible in disseminating the infection. The dog tapeworm *Dipylidium caninum*, is harbored by cats also. Cats are relatively immune to the rodent diseases. They show slight susceptibility to plague and to tularemia but are relatively unimportant in the spread of each disease. Several instances are recorded in which rat bite fever followed the bite of a cat, but probably the cat was a mechanical carrier of the spirochetes picked up from eating an infected rat. While the relation of cats to diphtheria is a disputed point, Simmons reports two cats from which he obtained diphtheria bacilli. Cats may harbor the spirochetes of leptospirosis.

#### Reference

Hull T G. Diseases Transmitted from Animals to Man ed 2. Springfield Ill., Charles C Thomas, 1941.

### PEPSIN CHEWING GUM AND STOMACH ULCER

**To the Editor**—Has any work been done on the question of the pepsin in so called pepsin chewing gum in relation to gastric and duodenal ulcers? Does chewing gum actually contain pepsin, and if so does the amount added to the stomach from chewing such gum have any effect on ulcer?

George N Hosford, MD San Francisco

**ANSWER**—As far as can be determined, no work has been done on the effect of pepsin chewing gum on gastric and duodenal ulcers. The tentative standards of identity discussed by the chewing gum industry with the Food and Drug Department about three and a half years ago contained the following statement:

Pepsin chewing gum contains not less than 0.15 per cent by weight of U S P Pepsin, the proteolytic activity of which has not been impaired in the process of manufacture of the chewing gum."

As far as is known, substantially all of this pepsin is chewed out of the gum within a few minutes and swallowed.

In view of the high peptic activity of the acid gastric juice present in patients with gastroduodenal ulcer, it is apparent that the pepsin content of chewing gum is too small to affect the course of the ulcer process.

It may be stated also that the increased amount of saliva secreted during the chewing of gum would tend to exert a neutralizing action on the acidity of the gastric juice and therefore reduce its peptic activity. Although the buffer capacity of "resting" saliva is low, the buffer capacity of saliva is increased considerably during active secretion. Resting saliva is stated to have a  $pH$  of 6.6, the  $pH$  may rise to 7.5 during profuse secretion. These values obviously are higher than those of acid gastric juice, which range usually from 1 to 2. Drs Alexander Rush and A B Luckhardt (unpublished observations) have found that the swallowing of large amounts of saliva definitely decreases the acidity of the gastric contents obtained after histamine stimulation.

### RIDGED FINGERNAILS—YELLOWING OF GRAY HAIR

**To the Editor**—Is there any agreement as to the cause of ridging in the finger nails which gives them a washboard appearance? Is this considered nutritional in origin? The patient is 68 years of age and is otherwise well. Is there any relation between this condition and the tendency for gray hair to assume a yellowish tinge?

R J Jackson, MD, Rapid City S D

**ANSWER**—Cross furrows and ridges in the finger and toe nails are among the commonest deformities of these structures. They may follow any accident, fever or other disturbance of health, appearing a short time afterward. Zeisler (Trophic Dermatoses Following Fracture, *J Cutan Dis* 16 305 1896) gives an interesting account of his own experiments with Beau's lines. In a symposium on diseases of the nails at the twenty-fifth annual meeting of the American Dermatological Association the same author (*Transactions of the American Dermatological Association for 1901*, p 126) lists as causes typhoid and typhus fevers, severe gastrointestinal disturbances, pneumonia, erysipelas, epididymitis, angina, parotitis, scarlet

fever, measles, influenza, acute rheumatitis and severe general trauma, 'even the normal puerperium and sea sickness seem to have caused it occasionally.' During the discussion Hartzell (p 140) reported Beau's lines after a few days of sea sickness and Bulkley (p 141) stated that he had seen a case of alopecia areata showing finger nail ridges which began simultaneously with the alopecia. Ormsby (Diseases of the Skin, ed 5, Philadelphia, Lea & Febiger 1937 p 1267) mentions that Hyde told of the occurrence of Beau's lines after attacks of dyshidrosis. They are not ordinarily considered of nutritional origin, but spoon nails, another trophic disturbance that might be confused with the cross ridges, are often associated with severe anemia.

The yellow tinge assumed by gray hair in some persons has no relation to the cross furrows of the nails. The yellow hair color is a natural phenomenon connected in some persons with graying of the hair. In bleaching hair, according to Redgrove and Foan (Hair Dyes and Hair Dyeing Chemistry and Technique, ed 2, London, William Heinemann, 1939, p 182), it is found that red or blond hair is much more likely to remain yellow than hair of darker shades which will bleach to white more readily. The only recourse seems to be the skilful application of blueing, to counteract at least to a degree the yellow tinge. This is the advice of Redgrove and Foan, who infer from this characteristic of blond and red hair that there are at least two kinds of melanin in human hair. Those who have investigated the chemical characteristics of the pigment of human hair are in agreement with this opinion (Arnow, L. E. The Acid Soluble Pigment of Red Human Hair, Biochem J 32 1281 [Aug.] 1938).

#### TREATMENT OF CHRONIC GONORRHEAL ARTHRITIS

To the Editor—Can you give me any information on the treatment of gonorrhea with heat therapy or any other suggestion for treating chronic gonorrheal arthritis?

J. Kimber LeVan M.D. Carlisle Pa.

ANSWER—It is most important to establish first that the patient is suffering from chronic gonorrheal arthritis and not chronic rheumatoid arthritis with an associated unrelated gonococcal infection. If the patient's history, physical examination and laboratory findings are consistent with a diagnosis of chronic gonorrheal arthritis, he can be treated in one of several ways.

Sulfathiazole, 4 Gm initially and 1 Gm every four hours day and night. The fluid intake should be constant and sufficiently great to insure a twenty-four hour urinary output of 1,500 to 1,800 cc. A daily fluid intake of 2,500 to 3,500 cc is usually adequate. If the patient is to respond to sulfonamide therapy, one should observe real evidence of improvement within three to four days.

If the patient fails to improve under this form of therapy, one can then employ either fever therapy or fever therapy in conjunction with sulfonamide therapy, the latter being the more effective. Fever therapy can be administered in one or two ways: (a) by means of radiant energy or (b) by means of typhoid vaccine intravenously. The instructions to be employed in these two forms of treatment are listed.

#### FEVER PRODUCED BY RADIANT ENERGY

(The treatment is the same for patients not receiving sulfathiazole except that the drug is omitted.)

1 The patient should receive sulfathiazole 1 Gm every four hours day and night for the preceding three days.

2 Administer 15 to 20 Gm of salt daily for the two days before the fever therapy is to be administered.

3 Fever therapy

(a) Light breakfast. One Gm of sulfathiazole, to be repeated every four hours.

(b) Morphine sulfate  $\frac{1}{4}$  to  $\frac{3}{4}$  gram (0.01 to 0.015 Gm) hypodermically and sodium amytal  $1\frac{1}{2}$  to 3 grains (0.1 to 0.2 Gm) by mouth before placing the patient in the fever therapy box. The dose of drugs used will depend on the size of the patient. The morphine or other opiate can be repeated every two to three hours if necessary.

(c) Take temperature, pulse and blood pressure every fifteen minutes.

(d) The aim is to produce a temperature between 106 and 106.5 F and maintain it for the desired period of time.

(e) Allow liquids (at room temperature) as desired. Encourage the patient to drink as much as 1 per cent saline solution or orange juice containing 1.5 per cent saline solution in order to prevent serious salt and water depletion. The fluid intake should be at least 5,000 cc the day of treatment. When the

procedure is finished, 1,500 to 2,000 cc of isotonic solution of sodium chloride intravenously may or may not be indicated.

(f) If necessary, apply an ice bag to the head.

(g) A medical officer should always be in attendance or at hand.

#### FEVER THERAPY INDUCED BY MEANS OF TYPHOID VACCINE INTRAVENOUSLY

(The treatment is the same for patients not receiving sulfathiazole except for the omission of the drug.)

1 The patient should receive sulfathiazole 1 Gm every four hours day and night for the preceding three days.

2 Administer 15 to 20 Gm of salt daily for the two days before the fever therapy is to be administered.

3 Fever therapy schedule

(a) Light breakfast. One Gm of sulfathiazole, to be repeated every four hours.

(b) Following this place the patient in bed between woolen blankets. Keep the patient completely covered except for the head and neck.

(c) Place four hot water bottles (140 to 150 F) in the bed. These should be replaced every thirty minutes throughout the day care being taken not to uncover the patient when they are changed.

(d) Sodium amytal or some similar barbiturate preparation  $1\frac{1}{2}$  to 3 grains by mouth depending on the size of the patient.

(e) Morphine or other opiate hypodermically, depending on the size of the patient.

(f) After the patient has been in the warm bed for one hour administer triple typhoid vaccine (50 million organisms) intravenously.

(g) Take temperature and pulse every fifteen minutes.

(h) Take blood pressure every fifteen to thirty minutes.

(i) If the temperature is not above 102 F within two hours give another 50 to 100 million organisms intravenously. This can be repeated again in another hour or two if necessary. The aim is to produce a temperature of 105 to 106 F and maintain it as long as possible. Once the peak temperature is reached it can usually be sustained provided the hot water bottles are changed regularly and without uncovering the patient.

(j) The opiate may be repeated every two to three hours if necessary.

(k) Allow liquids (at room temperature) as desired. Encourage the patient to drink as much 1 per cent saline solution or orange juice containing 1.5 per cent saline solution in order to prevent serious salt and water depletion. The fluid intake should be at least 5,000 cc on the day of treatment. When the therapy is completed, 1,500 to 2,000 cc of isotonic solution of sodium chloride intravenously may or may not be indicated.

(l) If the patient is too restless or has a headache, apply an ice bag to his head.

(m) A medical officer should always be in attendance or at hand.

#### SULFANILAMIDE ADDED TO TALCUM POWDER IN RUBBER GLOVES

To the Editor—Recently during an operation one of my gloves was pricked with a needle and the talcum powder was spattered in the wound. Would it be harmful to the surgeon to add a small amount of sulfanilamide to the talcum powder? What percentage of sulfanilamide would give an additional safety factor to the doctor and the patient if the glove is punctured during an operation? Have there been any studies made on this problem?

Harry Kirschbaum M.D. Detroit

ANSWER—There have not been studies on this problem reported. Possibly 10 per cent sulfanilamide added to the talcum powder might give protection to the surgeon. It is almost certain that this would not give protection to the patient.

#### SKIN REACTION FOLLOWING IRRADIATION

To the Editor—On page 1262 of The Journal for Dec 12, 1942 there is an item on Treatment of Recurrent Hyperthyroidism. I think that the following statement is incorrect. Moreover there is some danger of burning the skin which may happen under the most carefully controlled circumstances referring to the use of x-ray irradiation in the treatment of hyperthyroidism. The term burning of the skin should not be used when referring to a skin reaction following irradiation. The careless use of this term is a cause of many damage suits. Reaction is an accurate term and is preferable. The statement that there is danger of burning the skin is misleading because only relatively small doses of x-rays are usually required in the treatment of hyperthyroidism and with the proper control of dosage there should be nothing more than a mild skin reaction.

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## PHYSIOLOGIC CONSIDERATIONS IN THE TREATMENT OF PORTAL CIRRHOSIS

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NEW YORK

The main clinical characteristics of portal cirrhosis are well known. It is most frequently seen during the fifth and sixth decades, the average age being close to 50 years (table 1). Men are more frequently affected than women, the proportion being approximately three to one. The results of a study of 108 cases seen at the New York Post-Graduate Hospital (table 2) were very similar to those reported recently from New York by Patek and Ratnoff,<sup>1</sup> by Fleming and Snell<sup>2</sup> at the Mayo Clinic and by Wayburn and Guerard<sup>3</sup> from San Francisco. These studies in turn do not differ greatly from the earlier reports of Wickham Legg,<sup>4</sup> Murchison<sup>5</sup> and Rolleston.<sup>6</sup>

Clinical studies regarding the pathogenesis of this condition are equivocal. The history of the abuse of alcohol is a frequent but not essential finding. Syphilis was present in about one sixth of the cases reported. This is a much smaller proportion than that noted in some of the earlier studies. Rolleston<sup>6</sup> in the first edition of his classic work reported that syphilis was considered to give rise to lesions quite different from those of portal cirrhosis. In the last edition,<sup>7</sup> published twenty-four years later, he quotes various authors as finding a positive Wassermann reaction in from 40 to 80 per cent of cirrhotic patients.

Clinical evidence as to the pathogenesis of cirrhosis is not as conclusive as is some of the experimental evidence. The older literature has been reviewed by Moon,<sup>8</sup> who points out that numerous agents, diverse in character, are capable of causing degeneration and necrosis of hepatic cells. The continued or repeated action of these agents results in the production of

chronic diffuse hepatitis as indicated by degeneration and necrosis, parenchymal regeneration and proliferation of fibrous tissue.

A few agents,<sup>9</sup> including the chlorinated hydrocarbons, especially chloroform and carbon tetrachloride, inorganic poisons such as phosphorus, arsenic and selenium,<sup>10</sup> other chemical compounds, especially the tars, and some bacterial infections, are accepted on both clinical and experimental grounds as capable of producing cirrhotic changes in the liver.

The role of alcohol is still indeterminate. Connor<sup>11</sup> in particular has emphasized the importance of the fatty infiltration of the liver so frequently noted in alcoholic addicts especially when the excessive intake of alcohol is associated with an insufficient diet. Prolonged fatty infiltration of the liver gradually produces a progressive perlobular fibrosis and eventually a true portal cirrhosis.

This literature dealing with the relation of the liver to fat metabolism has been reviewed recently by several authors.<sup>12</sup> Many different factors acting either singly or in combination may produce an increase in the amount of fat in the liver. A high fat diet, for example, will produce a permanent increase in contrast to the temporary increase produced by fasting. The chronic fatty infiltration of the liver reported in pancreatectomized dogs and some patients with diabetes is well recognized. Extracts of the anterior pituitary will produce a fatty liver. It is generally accepted that an undue increase in the amount of fat present in the liver will contribute to the development of cirrhosis.

Conversely, an increase in the amount of protein or carbohydrate in the diet usually decreases the amount of fat in the liver. Choline, pancreatic extract or lipocain will prevent the accumulation of fat due to a high fat diet and so prevent the development of cirrhosis.

Evidence is being accumulated that dietary factors other than the relative amounts of carbohydrate, protein and fat in the diet affect the liver. Gyorgy and Goldblatt<sup>13</sup> observed that when young rats were kept on a diet devoid of vitamin B but supplemented with thiamine, riboflavin and pyridoxine they showed evidence of hepatic injury. This consisted primarily of

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From the Clinic for the Study of Disease of the Liver and Biliary Tract of the Department of Medicine and the Department of Surgery, New York Post Graduate Medical School and Hospital, Columbia University.

1. Patek, A. J., Jr. and Post Joseph. Treatment of Cirrhosis of the Liver by a Nutritious Diet and Supplements Rich in Vitamin B. *Complex J. Clin. Investigation* 20: 481-505 (Sept.) 1941. Ratnoff, O. D. and Patek, A. J., Jr. The Natural History of Laennec's Cirrhosis of the Liver. *Medicine* 21: 207-268 (Sept.) 1942.

2. Fleming, R. C. and Snell, A. M. Portal Cirrhosis with Ascites. An Analysis of 200 Cases with Special Reference to Prognosis and Treatment. *Am. J. Digest. Dis.* 9: 115-120 (April) 1942.

3. Wayburn, Edgar, and Guerard, Catherine R. Relation Between Multiple Peripheral Neuropathy and Cirrhosis of the Liver. *Arch. Int. Med.* 68: 161-172 (July) 1940.

4. Legg, J. Wickham. On Cirrhosis of the Liver. *St. Bartholomew's Hosp. Rep.* 8: 74-83, 1872.

5. Murchison, Charles. Clinical Lectures on Diseases of the Liver. London: Longmans, Green & Co., 1877.

6. Rolleston, H. D. Diseases of the Liver, Gallbladder and Bile Ducts. Philadelphia: W. B. Saunders Company, 1905.

7. Rolleston, H. D. and McNece, J. W. Diseases of the Liver, Gallbladder and Bile Ducts. ed. 3. London: Macmillan & Co., 1929.

8. Moon, V. H. Experimental Cirrhosis in Relation to Human Cirrhosis. *Arch. Path.* 18: 380 (Sept.) 1934.

9. Greene, C. H. Liver and Biliary Tract. A Review for 1941. *Arch. Int. Med.* 69: 691-714 (April) 1942.

10. Smith, M. I. Chronic Endemic Selenium Poisoning. A Review of the More Recent Field and Experimental Studies. *J. A. M. A.* 116: 562 (Feb. 15) 1941.

11. Connor, C. L. Fatty Infiltration of the Liver and the Development of Cirrhosis in Diabetes and Chronic Alcoholism. *Am. J. Path.* 14: 347 (May) 1938. The Etiology and Pathogenesis of Alcoholic Cirrhosis of the Liver. *J. A. M. A.* 112: 387 (Feb. 4) 1939.

12. Greene, C. H. and Hotz, Richard. Liver and Biliary Tract. A Review for 1939. *Arch. Int. Med.* 63: 778-808 (April) 1939. Greene, C. H., Handelsman, M. B. and Babey, A. M. Liver and Biliary Tract. A Review for 1936. *ibid.* 59: 724 (April) 1937. Best, C. H. and Ridout, J. H. C. Choline as a Dietary Factor in Luck, J. M. and Smith, J. H. C. Annual Review of Biochemistry. Stanford University, Calif. 8: 439, 1939. Channon, J. H. Fat Metabolism in Luck and Smith. *ibid.* 9: 231, 1940.

13. Gyorgy, Paul and Goldblatt, Harry. Hepatic Injury on a Nutritional Basis in Rats. *J. Exper. Med.* 70: 185 (Aug.) 1939. Experimental Production of Dietary Liver Injury (Necrosis, Cirrhosis) in Rats. *Proc. Soc. Exper. Biol. & Med.* 46: 492 (March) 1941. Observations on the Conditions of Dietary Hepatic Injury (Necrosis, Cirrhosis) in Rats. *J. Exper. Med.* 75: 357 (April) 1942.

acute diffuse necrosis with fatty infiltration. In some instances considerable periportal fibrosis was observed. Rats fed on the same basal diet supplemented with yeast or yeast extract did not show pathologic changes in the liver. Shortly afterward, Rich and Hamilton<sup>14</sup> reported the development of cirrhosis of the liver on a nutritional basis in rats, while Spellberg, Keeton and Ginsberg<sup>15</sup> made similar observations in guinea pigs. In both studies the addition of yeast to the diet prevented the development of the changes in the liver. The earlier studies of Curtis and Newburgh<sup>16</sup> and others had shown that an excess of cystine in the diet would produce acute hepatic necrosis. Studies by Gyorgy, Poling and Goldblatt<sup>1</sup> and Blumberg and McCollum<sup>18</sup> showed that the addition of extra cystine to the experimental diet of rats accentuated the development of cirrhosis. Yeast or choline prevented the cirrhosis even though extra cystine was fed. Similar results are reported by Lillie, Daft and Sebrell,<sup>19</sup> who produced cirrhosis in rats by the use of a diet low in protein and fat with added cystine. The cirrhosis was prevented by feeding choline, methionine or casein either singly or in combination. Supplying 20 per cent alcohol to the rats in place of drinking water apparently had no influence on the results.

TABLE 1—Incidence of Portal Cirrhosis with Age

Age	N Y P G H Series	Mayo Clinic Series	Total
0-9	0	0	0
10-19	0	3	3
20-29	7	11	18
30-39	16	25	41
40-49	38	56	94
50-59	28	68	96
60-69	19	29	48
70-79	0	8	8
Total	108	200	308
Average age	48.3	50.4	49.2
Per cent			
Males	78	75	76
Females	22	25	24

Not only may cirrhosis of the liver be produced in experimental animals by dietary means but it has been shown that dietary deficiencies render the liver more susceptible to the effects of various toxic substances.<sup>20</sup>

14 Rich, A. R. and Hamilton, J. D. The Experimental Production of Cirrhosis of the Liver by Means of a Deficient Diet. *Bull. Johns Hopkins Hosp.* **66**: 185 (March) 1940.

15 Spellberg, M. A. and Keeton, R. W. The Production of Fatty and Fibrotic Livers in Guinea Pigs and Rabbits by Seemingly Adequate Diets. *Am. J. M. Sc.* **200**: 688 (Nov.) 1940. Spellberg, M. A., Keeton, R. W. and Ginsberg, Robert. Dietary Production of Hepatic Cirrhosis in Rabbits with an Analysis of the Factors Involved. *Arch. Path.* **33**: 204 (Feb.) 1942.

16 Curtis, A. C. and Newburgh, L. H. The Toxic Action of Cystine on the Liver of the Albino Rat. *Arch. Int. Med.* **39**: 828 (June) 1927. Sullivan, M., Hess, W. C. and Sebrell, W. H. Studies on Biochemistry of Sulfur. Preliminary Studies on Amino Acid Toxicity and Amino Acid Balance. *Pub. Health Rep.* **47**: 75 (Jan. 8) 1932. Lillie, R. D. Histopathological Changes Produced in Rats by Addition to Diet of Various Amino Acids (Glycine, Lysine, Tryptophan, Cystine, Tyrosine and Glutamic Acid) and of Mixtures of Some of Them. *ibid.* **47**: 83 (Jan. 8) 1932. Earle, D. P. Jr. and Victor, Joseph. Cirrhosis of the Liver Caused by Excess Dietary Cystine. *J. Exper. Med.* **73**: 161 (Feb.) 1941.

17 Gyorgy, Paul, Poling, C. E. and Goldblatt, Harry. Necrosis Cirrhosis and Cancer of the Liver in Rats Fed a Diet Containing Dimethylaminoazobenzene. *Proc. Soc. Exper. Biol. & Med.* **47**: 41 (June) 1941.

18 Blumberg, Harold and McCollum, E. V. The Prevention by Choline of Liver Cirrhosis in Rats on High Fat Low Protein Diets. *Science* **93**: 598 (June 20) 1941. Webster, G. T. Cirrhosis of the Liver Among Rats Receiving Diets Poor in Protein and Rich in Fat. *J. Clin. Investigation* **21**: 385 (July) 1942.

19 Lillie, R. D., Daft, F. S., and Sebrell, W. H. Jr. Cirrhosis of the Liver in Rats on a Deficient Diet and the Effect of Alcohol. *Pub. Health Rep.* **56**: 1255 (June 13) 1941. Daft, F. S., Sebrell, W. H. Jr. and Lillie, R. D. Production and Apparent Prevention of a Dietary Liver Cirrhosis in Rats. *Proc. Soc. Exper. Biol. & Med.* **48**: 228 (Oct.) 1941.

20 Messinger, W. J. and Hawkins, W. B. Arsenophenamine Liver Injury Modified by Diet. Protein and Carbohydrate Protective but Fat Injurious. *Am. J. M. Sc.* **199**: 216 (Feb.) 1940. von Glahn, W. C. Flinn, I. B. and Keim, W. F. Jr. Effect of Certain Arsenates on the Liver. *Arch. Path.* **25**: 488 (April) 1938. von Glahn, W. C. and Flinn, F. B. The Effect of Yeast on the Incidence of Cirrhosis Produced by Lead Arsenate. *Am. J. Path.* **15**: 771 (Nov.) 1939.

Closely related to the studies of the production of cirrhotic changes in the liver by dietary means are the studies of the effects of diet on the production of experimental cancer of the liver. It is now known that many chemical compounds have carcinogenic properties.<sup>21</sup> The first changes in the liver of a rat on this carcinogenic regimen are necrosis and fibrosis suggestive of cirrhosis. The characteristic hepatoma develops later. Deficient diets similar to those producing cirrhosis render the animals more susceptible to cancer of the liver.<sup>22</sup> The addition of dried liver, yeast, riboflavin and casein, methionine or choline to the diet, on the other hand, has a protective action.

While the experimental production of cirrhosis of the liver by dietary means now is an accepted fact, the factors responsible are still a source of debate. Many of the diets produce a fatty infiltration of the liver, and the cirrhosis has been ascribed to this. The protective action of choline is cited as confirmatory evidence for this view. On the other hand, the liver is concerned in the absorption, storage and utilization of the various vitamins. Rhoads has stressed the importance of the vitamins, especially those of the B complex, for the maintenance of normal structure and function of the hepatic parenchyme. Supplementing deficient diets by casein, yeast and liver or their extracts had a protective effect. The role of vitamin deficiency in the production of cirrhosis therefore, has been stressed.

The relative importance of these two factors of excess fat and vitamin deficiency in the production of cirrhosis is not established at the present time, but their importance in treatment has been established.

Goodhart and Jolliffe<sup>23</sup> administered large doses of vitamin B to a series of alcoholic polyneuritis patients with good results. Several of the patients had hepatic cirrhosis, and they noted a coincident improvement in the general condition of the patient as well as of the polyneuritis. Patek and Wyburn and Guerard also reported small series of cases showing improvement on vitamin therapy.

More extensive studies have been reported by Patek and Post and by Fleming and Snell. The former used a diet of protein 139, fat 175 and carbohydrate 365 Gm with a caloric intake of 3,591. Fifty Gm of powdered brewers' yeast daily was included in the diet. In addition to the yeast the patients received intramuscular injections of concentrated liver extract 5 cc twice weekly and of 5 mg of thiamine hydrochloride daily.

Fleming and Snell used a diet of from 350 to 500 Gm of carbohydrate, 110 Gm of protein and approximately 50 Gm of fat. The protein was chiefly of vegetable origin or derived from milk or egg white. This diet was supplemented by various vitamin preparations such as 30 minims (2 cc) of oleum percomorphum and 9 to 12 ounces (265 to 355 cc) of orange juice or 100 mg of ascorbic acid daily. Liver extract was given either by mouth, 2 ounces (60 cc) daily or 2 cc of a liver extract intramuscularly three times a week. Thiamine hydrochloride, 4 to 10 mg daily, and two to four tablets of brewers' yeast were given with each meal.

21 Kinoshita, Ryojun. Studies on the Carcinogenic Azo and Related Compounds. *Yale J. Biol. & Med.* **12**: 287 (Jan.) 1940.

22 Rhoads, C. P. Recent Studies in the Production of Cancer by Chemical Compounds. The Conditioned Deficiency as a Mechanism. *Bull. New York Acad. Med.* **18**: 53 (Jan.) 1942.

23 Goodhart, Robert and Jolliffe, Norman. Effects of Vitamin (B<sub>1</sub>) Therapy on the Polyneuritis of Alcohol Addicts. *J. A. M. A.* **110**: 414-418 (Feb. 5) 1938.



While differing greatly in detail, the diets used by these two sets of investigators were alike in that they were high protein, high vitamin, high caloric diets. The protein was preponderately vegetable or of dairy origin. Patek and Post do not stress the point, but in their diet less than one fourth of the protein was supplied by meat. Yeast and liver extracts were used to insure an adequate supply of vitamins.

Both Patek and Post and Fleming and Snell report encouraging results in their series of cases. Not only was the clinical course of the disease influenced favorably but there was an increased period of survival in the treated groups of cases as compared to the control groups. It would seem, therefore, that a high protein, high vitamin diet is capable of favorably influencing the course of a portal cirrhosis presumably by favoring regenerative processes in the hepatic parenchyma. The reports are agreed that on such a diet many of these patients show slow but progressive improvement with the disappearance of ascites, gain in weight, strength and appetite and increase in serum proteins. The results are encouraging, but it must be remembered that the effects are slow. It takes time for the improvement in nutrition as well as for the regeneration of hepatic tissue to take place. Patek reports two months on the average before definite improvement becomes apparent. Fleming and Snell reported that there was very little difference between the mortality rates for the control and treated groups of cases during the first year.

The dietary treatment of patients with cirrhosis, therefore, represents only one phase of management of this condition. The typical patient reports to the physician with a distended abdomen, palpable spleen, dilated veins of the abdomen and considerable amount of ascitic fluid. It is frequently the discomfort produced by the latter that makes him demand systemic relief. This clinical picture, which is also described as the syndrome of portal hypertension, is well known. Two factors enter into this syndrome particularly with reference to the production of ascites. On the one hand there is the interference with the blood flow through the liver<sup>24</sup> as emphasized by Herrick,<sup>25</sup> McIndoe,<sup>26</sup> Wakim and Mann<sup>27</sup> and others. The presence of portal hypertension has been confirmed at operation by direct measurements of the portal pressure.<sup>28</sup> Because of the development of collateral circulation and so-called caput medusae in cases of cirrhosis, an attempt was made to study the venous pressure directly in the veins of the abdominal wall to see how far it reflects the portal pressure. It has been our experience that the venous pressure in the veins of the abdominal wall of patients with cirrhosis is higher than that in the antecubital veins of the same patient. However, following paracentesis the veins in the abdominal wall collapse and further studies were not possible, so that one must conclude that ascites produces a measure of interference with the venous flow in the abdominal wall. The venous dilatation, therefore, is not necessarily evidence of development of collateral circulation

Portal hypertension is only one factor in the development of ascites. Another factor is hypoproteinememia, particularly diminution in the albumin fraction of the serum in consequence of damage to the liver. It is now accepted that the more advanced the cirrhosis, the greater the chance of the patient having a reduction in the serum albumin. In severe involvement there is not only a reduction in the albumin but also a reversal of the albumin/globulin ratio. It is this change in the serum proteins which is responsible for the diagnostic value of the Takata-Ara test in cirrhosis. In addition to the reduction of serum protein there may also be changes in the osmotic pressure of the serum proteins, as suggested by Butt, Snell and Keys.<sup>29</sup>

In the early stages of cirrhosis, ascites often is readily controlled by the use of mercurial diuretics especially when used with ammonium chloride or nitrate. In my experience the efficiency of the mercurial diuretics apparently varies with the difference between the protein concentration of the blood plasma and that of the ascitic fluid. The more advanced the cirrhosis

TABLE 2—Clinical Picture of Portal Cirrhosis

	P	G	H	Mayo Clinic <sup>2</sup>	Patek and Post <sup>1</sup>	Ratnoff and Patek <sup>3</sup>	Wayburn <sup>4</sup>
Total number of cases	108			200	54	326	272
Average age	48.3			50.4	50.3	50	
Sex: Male per cent	78			75	65	69	58
Female per cent	22			25	35	31	42
Antecedent factors							
Alcohol	38			51	87	54	72
Malnutrition					81	17	23
Syphilis	17			16	26	16	
Arsphenamine	6				20	9	
Not determined	33			38.5			
Symptoms							
Abdominal swelling	72			97	89	80	
Edema				58	85	61	
Loss of weight	38			58.5	78	53	
Dyspepsia	34			30	54	33	
Hematemesis	15			13.5	24	27	35
Pain	21			46	40	31	
Clinical signs							
Ascites	74			97	89	80	64
Palpable liver	84			54.5	81	75	74
Palpable spleen	27			31.5	70	44	
Jaundice	30			45.5	63	65	58
Collateral veins	28			34	76	23	
Anemia	31				40		48

and the greater the reduction in the serum proteins, therefore, the less effective has been the response to mercurial diuretics.

Anemia frequently is present in cirrhosis. Under these conditions transfusion improves the general condition of the patient not only by combating the anemia but also by increasing the serum protein, which improves the response to the mercurial diuretics.

Paracentesis has long been recognized as the method of last resort in the control of ascites. When the hepatic damage is so pronounced that the ascites can be controlled only by repeated and frequent paracenteses, the patient tends to go down hill rapidly. Hale-White<sup>30</sup> was one of the first to suggest the serious prognostic import of paracentesis. It is true that some investigators have argued that paracentesis is without effect<sup>31</sup> on the serum proteins or on the process of protein synthesis, though this is denied by Benedetti.<sup>32</sup>

<sup>29</sup> Butt H R, Snell A M and Keys Acel. Plasma Proteins in Hepatic Disease. A Study of the Colloid Osmotic Pressure of Blood Serum and of Ascitic Fluid in Various Diseases of the Liver. Arch Int Med 63: 143-155 (Jan) 1939.

<sup>30</sup> Hale-White W. The Cause and Prognosis of Ascites Due to Alcoholic Cirrhosis of the Liver to Perihepatitis and to Chronic Peritonitis. Guy's Hosp Rep 49: 142 1892.

<sup>31</sup> Niccoli D and Ferroni M. Protein Picture of Blood and Ascitic Fluid in Atrophic Cirrhosis of the Liver. Rassegna di fisiopatol 12: 193 (May) 1940.

<sup>32</sup> Benedetti G. Modification of Equilibrium of Blood Proteins After Paracentesis in Liver Cirrhosis. Rassegna di fisiopatol 10: 159 (March) 1938.

<sup>24</sup> Greene C H, Plotz Milton and Localio, S A. Liver and Biliary Tract. A Review for 1937. Arch Int Med 61: 655 (April) 1938.

<sup>25</sup> Herrick F C. An Experimental Study into the Cause of the Increased Portal Pressure in Portal Cirrhosis. J Exper Med 9: 93 1907.

<sup>26</sup> McIndoe A H. Vascular Lesions of Portal Cirrhosis. Arch Path & Lab Med 5: 23-42 (Jan) 1928.

<sup>27</sup> Wakim K G and Mann F C. Effect of Experimental Cirrhosis on the Intrahepatic Circulation of Blood in the Intact Animal. Arch Path 33: 198 (Feb) 1942.

<sup>28</sup> Thompson W P, Caughey J L, Whipple A O and Rousselot L M. Splenic Vein Pressure in Congestive Splenomegaly (Bant's Syndrome).



Recent studies of Post and Patek<sup>33</sup> suggest that protein synthesis, particularly that of serum albumin is more difficult for the damaged liver than for the normal one. When the protein content of ascitic fluid is under 1 per cent, considerable amounts can be removed without much gross loss of protein. On the other hand, tapping 3,000 cc containing 2 per cent of protein would make a loss of 60 Gm of protein, which is an appreciable quantity. We have tried in a few instances to prevent protein depletion through paracentesis by concentrating the ascitic fluid and reinjecting the concentrated protein solution intravenously. Severe reactions were encountered, and treatment did not prove to be practicable. Numerous investigators have shown the value of plasma infusions in correcting a deficiency of serum protein in a variety of conditions. Ascitic fluid, chemically, is very similar if not the same as serum, and it has been advocated for the treatment of shock.<sup>34</sup> We therefore tried paracentesis and the direct readministration of ascitic fluid. The results have been encouraging.

## REPORT OF CASES

CASE 1—A machinist aged 61, first seen on Feb 5, 1939, had been a consistent alcoholic addict for many years. His father died of cirrhosis of the liver. Abdominal distention and epigastric distress were first noted about a month before admission.

Examination showed evidence of a moderate degree of malnutrition. The abdomen was considerably distended with evidence of fluid. The superficial abdominal veins were distended. Hemorrhoids were present. Vascular spiders were noted on the chest. The liver was palpated 3 cm below the costal margin and was hard and slightly irregular. There was pitting edema of the ankles.

TABLE 3—Clinical Response to Infusion of Ascitic Fluid in Case 1

Date	Weight Pounds	Paracentesis Cc	Infusion of Ascitic Fluid Cc	Fluid Intake Cc	Urinary Output Cc	Excess of Urinary Output Cc
9/9	164	300	200	1,000	600	
10		300	300	880	300	
11		500	500	1,320	530	
12		600	600	1,520	750	
13		700	700	1,560	1,340	
14	140			900	2,450	1,550
15		800	800	1,640	1,500	
16	145			860	2,040	1,580
17	141			900	1,440	640
18	140 1/2			1,020	1,150	130
19	140 1/2	1,000	1,000	1,960	1,380	
20	138 1/2			1,070	1,970	900
21	137 1/2			960	1,240	280
22	136 1/2			900	1,010	110
23	137			1,000	1,470	470
24				960	1,220	260
25	137 1/2			1,260	1,110	
26	137 1/2			840	1,030	
27	137 1/2			1,200	960	
28	136 1/2	1,000	1,000	960	1,575	615
29	135			1,200	1,040	
30				960	910	
31	136			750	1,400	650
6/1	135			900	840	
Total			5,100			7,120

The Wassermann reaction was positive. The urinalysis and blood counts were normal. The bromsulphalein test showed retention at thirty minutes. The Takata-Ara test was positive. An esophageal roentgenogram showed small varices in the lower portion of the esophagus.

<sup>33</sup> Post Joseph and Patek A J Jr. Serum Proteins in Cirrhosis of the Liver. I. Relation to Prognosis and to Formation of Ascites. Arch Int Med 69: 67 (Jan) 1942. II. Nitrogen Balance Studies on Five Patients. Ibid 69: 83 (Jan) 1942.

<sup>34</sup> Davis H A and Blalock J E Jr. Autologous and Homologous Transfusions of Human Ascitic Fluid. J Clin Investigation 18: 219-224 (March) 1939.

He was placed on a high carbohydrate high vitamin diet with a restricted intake of salt. Ammonium chloride and potassium nitrate were given in addition. During the next two months he was given nine injections of 1 cc each of either salyrgan theophylline or of mercupurin without diuretic response. Nineteen days after admission a paracentesis of 3,750 cc was necessary, and four weeks later 24,000 cc was withdrawn.

TABLE 4—Changes in Serum Protein in Case 1

Date	Serum Protein			Ascitic Fluid Total Protein
	Total	Albumin	Globulin	
2/6/39	8.5			
2/23/39	6.0	1.4	4.6	
4/14/39	6.8	2.9	3.9	1.8
5/8/39	8.0	4.0	4.0	
5/10/39	8.5	4.7	3.8	3.9
6/1/39	6.1	2.2	3.7	

He was discharged from the hospital after this paracentesis but returned three weeks later and 17,000 cc was removed. Infusions of ascitic fluid were then started. During the following three weeks 5,100 cc of ascitic fluid containing over 150 Gm of protein was given intravenously. During this period the urinary output exceeded the fluid intake by 7,185 cc and he lost 19 pounds (8.6 Kg). At the time of discharge from the hospital June 1, 1939, he was free from ascites. The serum proteins were 85 per cent. Three years later, June 1, 1942, he was well, and the liver was large and firm 3 cm below the costal margin. The spleen was just palpable. The veins over the abdominal wall were not unduly prominent. There was no ascites. The serum proteins were 69 per cent.

CASE 2—A junk dealer aged 30 first came to the hospital in March 1941 because of flatulent indigestion. He had been decidedly alcoholic for many years. He was underweight and showed evidences of malnutrition. The abdomen was moderately distended, but no fluid was present. The spleen could not be felt, but the liver came down to the umbilicus. He left the hospital against advice the following day. In July frequent nosebleeds began and he noted an icteric tint to his sclera. He returned to the hospital in November with a slight icterus and pronounced ascites. Other findings were the same as before. The icterus quickly disappeared but the ascites increased progressively. The response to mercurial diuretics was unsatisfactory. On December 17 a paracentesis of 9,200 cc was done. Following the paracentesis there was a copious extravasation of fluid into the scrotum and back up to the axilla. This gradually was absorbed. Reinfusion of ascitic fluid was then started without outward reaction. On Jan 13 1942 a second paracentesis of 6,000 cc was necessary. In the following seven days he received 4,175 cc of ascitic fluid containing 138 Gm of protein intravenously. His weight dropped from 162 pounds (73.5 Kg) on December 23 to 144 pounds (65 Kg) on discharge. The serum proteins were albumin 28, globulin 42, total protein 70 on admission and albumin 37, globulin 47, total protein 84 on discharge.

He has reported continued health and freedom from ascites since discharge but refused any further laboratory study.

## COMMENT

In some instances as indicated by cases 1 and 2, large amounts of ascitic fluid have been injected intravenously and the protein apparently has been retained in the blood stream. Following the injections there has been an increase in the serum protein level. As the serum protein level increased, a spontaneous diuresis was observed with complete reabsorption of the remaining ascites. Clinically, improvement in these cases was maintained for a considerable period after the completion of the series of injections.

The biggest difficulty has been the matter of reactions. They seem to be more frequent if the ascitic fluid is injected immediately after tapping. The paracentesis is done under sterile conditions and the fluid

is saved in transfusion bottles, which are kept in the ice box, where cells and bits of fibrin are allowed to settle out. Sterility is confirmed by cultures and the protein content is determined. After twenty-four to seventy-two hours the clear fluid is siphoned off and given intravenously. The infusion is made at room temperature. For the most part it has been given in amounts of 500 to 1,000 cc a day rather than as larger single injections. When these precautions are observed, reactions have been infrequent, though an occasional slight chill has been noted. When the ascitic fluid has been very dilute with less than 1 per cent of protein, the amount of protein lost has not been sufficient to warrant its reinjection. However, if the ascitic fluid contains more than 1 per cent of protein, this procedure has been used. A satisfactory response has not been obtained in all cases. The exact details for the handling of the ascitic fluid have not been completely established, but, in selected cases when the protein concentration of the fluid is high and the serum proteins are reduced, I believe that this method of conserving protein is of value in the management of ascites.

Not only is anemia present in cases of cirrhosis, but in the more severe cases this anemia is of the hyperchromic macrocytic type and the blood picture is not unlike that seen in pernicious anemia. This is due to the fact that the damaged liver is no longer able to store the antianemic fraction of the food. In these cases the blood count can be improved and the anemia controlled in part by the intramuscular use of large doses of liver extract just as in cases of pernicious anemia.

The patient with cirrhosis frequently shows a reduction in the prothrombin time of the blood which, if pronounced, will cause a tendency to hemorrhage. The prothrombin time of the blood of a patient with cirrhosis, therefore, should be watched and sufficient vitamin K administered to keep this at a normal level. In the more severe cases of cirrhosis this may not be possible because the severely damaged liver is unable to form prothrombin even though an adequate supply of vitamin K is present.

The most serious hemorrhages in cases of portal cirrhosis usually are due to ruptured esophageal varices. Many different methods have been tried to reduce the portal flow or obliterate the varices with varying degrees of success—splenectomy used by W. J. Mayo<sup>35</sup> and ligation of the coronary vein of the stomach alone as described by Walters<sup>36</sup> or combined with the ingestion of sodium morrhuate into the intra-abdominal vessels as used by Grace<sup>37</sup>. Most recently Crafoord and Frenckner<sup>38</sup> and Moersch<sup>39</sup> has brilliantly demonstrated the possibility of the direct injection of the esophageal varices.

The most discussed surgical procedure in the treatment of cirrhosis has been the operation of omentopexy, which usually bears the names of Talwa and Morrison. The consensus at present is that the results of opera-

tion as used in the past have been most unsatisfactory. At the same time a considerable number of cases have been reported in which there was freedom from ascites, with good health, five to twenty years afterward. This would suggest that the results depend in part on the type of cases selected for operation. I have seen a few cases in which apparently great benefit resulted from omentopexy. In some of these cases operation was performed before ascites developed. In others the continuance of ascites required paracentesis at frequent intervals. After six months to a year evidence of abdominal collaterals developed and ascites gradually cleared up. A considerable interval of time would seem to be necessary before the benefits of omentopexy can be expected to develop. As a last hope, after other methods of treatment have failed omentopexy would not seem to be indicated. Final conclusions as to its value cannot be drawn until a series of cases have been reported in which the operation was done early in the disease and enough time had elapsed for a collateral circulation, sufficient to relieve the portal hypertension, to develop. Even in such a series of cases the interpretation of results would be difficult, for the longer period of survival would also permit regenerative changes in the liver.

#### SUMMARY

Recent experimental studies have shown that cirrhosis of the liver can be produced in animals by dietary means. Fatty infiltration of the liver and vitamin deficiencies both play a role in the development of this cirrhosis.

Clinical evidence based in part on these experimental studies indicates the value of high protein, high vitamin diets in the treatment of patients with portal cirrhosis.

In selected cases, infusions of ascitic fluid seem to have some value in conserving blood protein and treating hypoproteinemia.

140 East Fifty-Fourth Street

#### ABSTRACT OF DISCUSSION

DR. SEYMOUR J. GRAY, Chicago: I was particularly interested in Dr. Greene's remarks on hypoproteinemia. Electrophoretic analyses of the serum proteins in various liver diseases indicate that two or more protein fractions are abnormal in every case. The most characteristic alteration of the serum proteins in liver disease is a large increase in gamma globulin and a decrease in serum albumin. These changes are seen most frequently and to the greatest degree in cirrhosis of the liver and next most frequently in the acute parenchymatous diseases. Although the serum globulin or albumin globulin ratio is not infrequently normal on chemical analysis in the acute parenchymatous diseases of the liver, the qualitative distribution of the alpha, beta and gamma globulins electrophoretically is invariably abnormal. Thus the qualitative distribution of the serum globulin fractions may be definitely abnormal electrophoretically in spite of a quantitatively normal serum globulin or albumin globulin ratio. Significant increases in beta globulin were observed in all types of liver disease but to a considerably less degree and frequency than the gamma globulin changes. Abnormalities of the serum proteins electrophoretically are less prominent in metastatic carcinoma of the liver than in any other form of liver disease. Jaundice alone does not produce any significant serum protein changes on electrophoretic analysis. The diseased liver according to our studies appears to produce the largest molecular weight protein fractions more readily than the smaller molecular weight fractions. This may be explained by Whipple's theory that protein is stored in the liver as complex protein aggregates which are broken down by the liver to supply the serum and tissue proteins as they are needed. This 'intermediate protein' is converted into gamma globulin by the

35 Mayo W. J. The Surgical Treatment of the Hepatic Cirrhosis. *Ann. Surg.* 80: 419-424 (Sept.) 1924.

36 Walters, W. J., W. L. Rowntree, L. G. and McIndoe, A. H. Ligation of the Coronary Veins for Bleeding Esophageal Varices. *Proc. Staff Meet. Mayo Clin.* 4: 146 (May 8) 1929.

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Recent studies of Post and Patek<sup>33</sup> suggest that protein synthesis, particularly that of serum albumin is more difficult for the damaged liver than for the normal one. When the protein content of ascitic fluid is under 1 per cent, considerable amounts can be removed without much gross loss of protein. On the other hand, tapping 3,000 cc containing 2 per cent of protein would make a loss of 60 Gm of protein, which is an appreciable quantity. We have tried in a few instances to prevent protein depletion through paracentesis by concentrating the ascitic fluid and reinjecting the concentrated protein solution intravenously. Severe reactions were encountered, and treatment did not prove to be practicable. Numerous investigators have shown the value of plasma infusions in correcting a deficiency of serum protein in a variety of conditions. Ascitic fluid, chemically, is very similar if not the same as serum, and it has been advocated for the treatment of shock<sup>34</sup>. We therefore tried paracentesis and the direct readministration of ascitic fluid. The results have been encouraging.

## REPORT OF CASES

CASE 1—A machinist aged 61, first seen on Feb 5, 1939, had been a consistent alcoholic addict for many years. His father died of cirrhosis of the liver. Abdominal distention and epigastric distress were first noted about a month before admission.

Examination showed evidence of a moderate degree of malnutrition. The abdomen was considerably distended with evidence of fluid. The superficial abdominal veins were distended. Hemorrhoids were present. Vascular spiders were noted on the chest. The liver was palpated 3 cm below the costal margin and was hard and slightly irregular. There was pitting edema of the ankles.

TABLE 3—Clinical Response to Infusion of Ascitic Fluid in Case 1

Date	Weight Pounds	Paracentesis, Cc	Infusion of Ascitic Fluid Cc	Fluid Intake Cc	Urinary Output Cc	Excess of Urinary Output Cc
5/9	164	300	200	1 000	600	
10		300	300	880	500	
11		500	500	1 320	810	
12		600	600	1 520	700	
14		700	700	1 560	1 340	
16	149			900	2 400	1 500
17		800	800	1 640	1 500	
18	140			860	2 240	1 380
19	141			1 020	1 440	640
20	140½			900	1 160	260
21	139½	1 000	1 000	1 060	1 230	
22	138½			1 020	1 970	950
23	137½			960	1 240	280
24	136½			900	1 010	110
25	137			1 000	1 470	470
26	137½			960	1 220	260
27	137½			1 260	1 110	
28	137½			840	1 030	
29	137½			1 200	930	
30	136	1 000	1 000	960	1 675	615
31	135			1 000	1 040	
6/1	130			900	910	
				700	1 400	600
				900	840	
Total			5 100			7 180

The Wassermann reaction was positive. The urinalysis and blood counts were normal. The bromsulphalein test showed retention at thirty minutes. The Takata-Ara test was positive. An esophageal roentgenogram showed small varices in the lower portion of the esophagus.

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34 Davis H A and Blalock J E Jr. Autologous and Homologous Transfusions of Human Ascitic Fluid. J Clin Investigation 18 219 224 (March) 1939.

He was placed on a high carbohydrate high vitamin diet with a restricted intake of salt. Ammonium chloride and potassium nitrate were given in addition. During the next two months he was given nine injections of 1 cc each of either salyrgan theophylline or of mercupurin without diuretic response. Nineteen days after admission a paracentesis of 3,750 cc was necessary, and four weeks later 24,000 cc was withdrawn.

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He was discharged from the hospital after this paracentesis but returned three weeks later and 17,000 cc was removed. Infusions of ascitic fluid were then started. During the following three weeks 5,100 cc of ascitic fluid containing over 150 Gm of protein was given intravenously. During this period the urinary output exceeded the fluid intake by 7,185 cc, and he lost 19 pounds (8.6 Kg). At the time of discharge from the hospital June 1, 1939, he was free from ascites. The serum proteins were 85 per cent. Three years later, June 1, 1942, he was well, and the liver was large and firm 3 cm below the costal margin. The spleen was just palpable. The veins over the abdominal wall were not unduly prominent. There was no ascites. The serum proteins were 69 per cent.

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## COMMENT

In some instances as indicated by cases 1 and 2, large amounts of ascitic fluid have been injected intravenously and the protein apparently has been retained in the blood stream. Following the injections there has been an increase in the serum protein level. As the serum protein level increased, a spontaneous diuresis was observed with complete reabsorption of the remaining ascites. Clinically, improvement in these cases was maintained for a considerable period after the completion of the series of injections.

The biggest difficulty has been the matter of reactions. They seem to be more frequent if the ascitic fluid is injected immediately after tapping. The paracentesis is done under sterile conditions and the fluid

is saved in transfusion bottles, which are kept in the ice box, where cells and bits of fibrin are allowed to settle out. Sterility is confirmed by cultures and the protein content is determined. After twenty-four to seventy-two hours the clear fluid is siphoned off and given intravenously. The infusion is made at room temperature. For the most part it has been given in amounts of 500 to 1 000 cc a day rather than as larger single injections. When these precautions are observed, reactions have been infrequent, though an occasional slight chill has been noted. When the ascitic fluid has been very dilute with less than 1 per cent of protein, the amount of protein lost has not been sufficient to warrant its reinjection. However, if the ascitic fluid contains more than 1 per cent of protein, this procedure has been used. A satisfactory response has not been obtained in all cases. The exact details for the handling of the ascitic fluid have not been completely established, but, in selected cases when the protein concentration of the fluid is high and the serum proteins are reduced, I believe that this method of conserving protein is of value in the management of ascites.

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diseased liver more readily than into the smaller protein fractions as alpha globulin and albumin. Finally, our studies indicate that the serum protein changes in liver disease result primarily from the inability of the liver to produce normal serum proteins rather than from external loss in the ascitic fluid.

DR W B YEGGE, Denver I heard several members of the audience say that Dr. Greene had not mentioned what he thought about bile salts in the treatment of cirrhosis. You must remember Dr. Greene's paper had to do with portal cirrhosis, and portal cirrhosis and biliary cirrhosis are two separate things. Bile salts are more often used in biliary cirrhosis. There are different types of bile salts, and some of them are used for biliary drainage and others for liver cell stimulation. This brings up one thing of which I hope the Council on Pharmacy and Chemistry will take note, and that is that there should be some way in which these drugs could be labeled so we would know with what we are dealing. I should like to have a label put on each drug showing exactly what it contains so that the practicing physician would know what he is using. It is annoying to be educated by detail men who know only what some one has told them about a particular drug.

DR WALLACE M YATER, Washington D C I should like to bring up the point of the great difficulty of early diagnosis in most cases of cirrhosis. If we could diagnose our cases earlier diet, abstinence from alcohol and other toxic agents would be all that would be necessary. Lately choline has been used more or less experimentally in cases of cirrhosis of the liver. During the last year I have used it perhaps in 15 cases. Some of these patients went along and died promptly, not because of the choline but in spite of it. Other patients have remained about the same and some have improved. However, these patients have received a diet such as Dr. Greene has prescribed and the necessary vitamins and iron when iron deficiency was apparent, so that it seems hardly likely to me from these cases and from reading the reports of a few others in which choline has been used that we can expect very much from this form of treatment. The use of amino acids in bringing up the plasma proteins has to me been very discouraging. I have used it both parenterally and by mouth in pretty large doses and do not believe that it has caused any elevation of the plasma proteins in the cases in which I have used it. The remarkable effects that I have noticed in cases of severe plasma protein deficiencies associated with ascites have been the result of the infusion of plasma itself. This, of course, is an expensive form of treatment, but if one gives from 250 to 500 cc every two or three days until 3,000 cc has been given the most remarkable result appears in many cases. Plasma proteins become elevated and a great diuresis results. The ascites may not reform for quite a long time before more plasma is necessary. To date, however, it appears to me that the most important advance in treatment is the dietetic one associated with the use of vitamins and iron when necessary. However, there still remains the problem of getting these patients to eat. Many of them of course do not have a particularly good appetite. That brings up the question of preparing food concentrates. I have been employing various soybean preparations and, strangely enough, although I don't like them myself many patients do, and we have been able to give them a much higher carbohydrate-protein diet with the use of the soybean preparations than in any other way.

DR CARL H GREENE, New York The discussion has emphasized one point that I did not have time to make—the change in the qualitative nature of the proteins. I think the change in the character of the proteins is the factor responsible for the clinical value of such qualitative tests as the Takata-Ara and more recently the Hanger flocculation test. The latter is of especial diagnostic value in early diagnosis. I did not take up the question of bile salts because they are of no therapeutic importance in portal cirrhosis and I doubt if they have very much in biliary cirrhosis. My own experience has convinced me that the damaged liver does not respond well to bile salts. It cannot pick them up and it does not secrete them too well. I don't think they are safe in whipping up a damaged liver. Dr. Yater mentioned the use of amino acids intravenously. That is a valuable procedure in a selected series of cases, but

when one can get the patient to take it by mouth I think it is preferable to give the extra protein by mouth rather than intravenously. I am glad Dr. Yater's experience with plasma has been similar to my own. He brought out the one determining factor in my work and that was the question of expense. For many of these patients plasma is so expensive that it is prohibitive. Under these conditions if one is fortunate the patient's own ascitic fluid can be used as a much cheaper substitute.

## THE GASTROINTESTINAL TRACT AND THE LIVER

FRANK C MANN, MD

ROCHESTER, MINN.

The anatomic, physiologic and pathologic relations between the gastrointestinal tract and the liver are discussed frequently, but many problems arising from these relations remain unexplored. It is my purpose to present some of these problems with the view of emphasizing their probable importance rather than supplying an answer to them.

The liver can rightly be considered as one of the organs of digestion because it produces a secretion which is passed into the intestine and which is important in the maintenance of normal digestion. However, the liver is of much more significance in relation to the digestive tract than being merely one of the organs producing a digestive secretion. It is in addition the organ through which most of the products of digestion pass before reaching other tissues of the body. In this capacity it can be considered as a filter of the blood that has passed through the organs that have to do with the digestion and absorption of a large percentage of the food substances that enter the body.

The pathway between the gastrointestinal tract and the liver is the portal circulation. All the blood from the gastrointestinal tract, spleen and pancreas, except the small amount that drains through collateral channels, passes through the liver. The portal circulation therefore is of considerable importance, not only in a consideration of coordination of functions of the gastrointestinal tract and the liver, but also in relation to the development of pathologic conditions in the two organs.

### SPECIFIC CHARACTERISTICS OF THE PORTAL SYSTEM

The portal system has several characteristics some of which are particularly pertinent to hepatic activity. The portal vein drains one of the most vascular regions in the body. The amount of blood that reaches the liver through the venous component of the hepatic circulation may be relatively very large. Since the blood in the portal vein must pass through the capillaries and sinusoids of the liver before reaching the systemic venous system the pressure in the portal vein is normally higher than it otherwise would be. The vasomotor control of the blood flowing through the portal vein is located in the organs which are drained into the portal system. Thus the major source of blood supply to the liver is not controlled within the organ, although the total outflow from the liver may be temporarily restricted by a mechanism located in the small hepatic veins.<sup>1</sup>

From the Division of Experimental Medicine Mayo Foundation.  
Read before the joint meeting of the Section on Pathology and Physiology and the Section on Gastro-Enterology and Proctology at the Ninety-Third Annual Session of the American Medical Association Atlantic City N J June 12 1942.  
<sup>1</sup> Deysach L J The Nature and Location of the Sphincter Mechanism in the Liver as Determined by Drug Actions and Vascular Injections. *Am J Physiol* 132: 713-724 (April) 1941.

THE LIVER AS A FILTER OF THE BLOOD FROM  
THE GASTROINTESTINAL TRACT

Beginning in fetal life, many of the substances that reach the other tissues of the body must first pass through the liver. Evidence indicating the importance of this anatomic fact in relation to hepatic activity and the development of pathologic conditions in the organ is much more meager than the speculations regarding it. Most of the theories in this regard have dealt with the detoxifying functions of the organ. Data proving that the liver has an enhanced physiologic activity with regard to specific substances owing to their higher content in the portal blood as compared with their content in the systemic blood are few. It has been shown that some substances, as strychnine,<sup>2</sup> are readily destroyed in the liver, that transformation of dextrose into glycogen appears to be greater when the content of the former in the portal blood is high,<sup>3</sup> that relatively large amounts of colloidal substances are removed from the portal blood by the stellate cells in a single passage through the organ<sup>4</sup> and that dyes can be injected into the portal vein in amounts which will stain the liver but not cause a discernible coloration in other tissues of the body.<sup>5</sup> Such evidence would indicate that the liver does serve as a filter for the portal blood but the full import of hepatic activity in this respect requires further investigation. The results of investigations on this problem may be of significance in the evaluation of those liver function tests in which the test substance is administered orally.

## AMOUNT OF PORTAL BLOOD FLOW

The liver possesses two sources of blood supply, arterial and venous. Questions concerning the circulation of the liver have dealt, not only with the total amount of blood flow to the organ, but also with the relative amount from each source and whether or not the blood from the separate sources served different functions. Answers to these questions have been obtained in part. Measurements of the amount of blood flowing to and from the liver indicate that the total amount of blood flow to the organ is relatively large and varies within wide limits, that the relative amount of the total flow reaching the organ through either the arterial or venous component likewise varies greatly although the flow through the portal vein is always much greater than through the hepatic artery, that often there is a reciprocal response between the flow in the portal vein and hepatic artery,<sup>6</sup> that under certain conditions the flow can be increased or decreased simultaneously in each and under other conditions increased separately in each,<sup>7</sup> that in general, substances that stimulate the liver, as bile salts, increase the blood flow mainly in the artery.<sup>8</sup>

## CHANGES IN PORTAL BLOOD FLOW

Under certain physiologic conditions the flow of blood in the portal vein can be greatly increased. The best examples of physiologic states that are accompanied by

increase in portal blood flow are digestion and exercise. The ingestion of a meal is followed by an increase in flow of blood throughout the body and the blood flow in the portal vein is also increased greatly.<sup>9</sup> Likewise there is an increased flow of blood through the portal vein as well as to the muscles in muscular exercise.<sup>10</sup> It is presumed that increased hepatic activity is associated with the greater flow of blood. It is assumed that both digestion and exercise produce an increase of functional stress on the liver. The giving of functional tests under the stress of digestion or exercise might supply data that would be of physiologic as well as clinical value.

CHARACTER OF FLOW OF BLOOD IN THE  
PORTAL VEIN

The character of flow of blood in the portal vein appears to be important. Considerable evidence has accumulated which indicates that the flow in the portal vein is streamlined. The results of experiments in which india ink, dyes, emulsions of oil and other substances have been injected into various tributaries of the portal vein and their site of localization in the liver has been determined, as well as direct observation of the flow in the vein by transillumination, demonstrate that the blood in the portal vein originating from various sources is not completely mixed. There is a selective distribution of portal blood in the liver. The blood from the upper part of the gastrointestinal tract and spleen goes mainly to the left portion of the organ, while the rest of the portal blood has a greater distribution and goes to the right side.<sup>11</sup>

The importance of this selective distribution of portal blood from different sources in the liver is not known and the problems involved are mainly unexplored, but some theoretical considerations may indicate its possible significance. Food products that are absorbed from the upper loops of the intestine go mainly to the left portion of the liver while the absorption products from the lower portion of the intestine pass in a larger amount through the right side. If food substances are given in form and amount so that absorption occurs in a localized length of intestine, only a relatively small portion of the liver will receive the portal blood that contains the high concentration of absorbed substances. It would appear that, if the whole liver is to function as a filter for the products of digestion, the ingested meal should be of such an amount and contain such types of food as would insure absorption from the entire length of intestine. It is conceivable that reactions to certain specific food substances may be due to the fact that such substances are absorbed so quickly from the upper portion of the intestine that the localized region of the liver through which they pass may be unable to prevent their reaching the systemic circulation in a sufficient concentration to cause an effect. The decreased toxicity of certain substances when given with food may be in part due to the specific distribution of portal blood in the liver.

While the previous statements have been concerned with the absorption of food, they would appear to be

<sup>2</sup> Priestley J T, Markowitz J, and Mann F G. Studies on Physiology of Liver. XX. Detoxicating Function of Liver with Special Reference to Strychnine. *Am J Physiol* **96**: 696-708 (March) 1931.

<sup>3</sup> Soskin Samuel, Essex H E, Herrick J F, and Mann F C. Mechanism of Regulation of Blood Sugar by Liver. *Am J Physiol* **124**: 558-567 (Nov.) 1938.

<sup>4</sup> Higgins G M, and Murphy G T. The Phagocytic Cells (von Kupffer) in the Liver of Common Laboratory Animals. *Anat Rec* **40**: 15-32 (Sept.) 1928.

<sup>5</sup> Mann F C. Unpublished data.

<sup>6</sup> Grindlay J H, Herrick J F, and Mann F C. Measurement of the Blood Flow of the Liver. *Am J Physiol* **132**: 489-496 (March) 1941.

<sup>7</sup> Wood G O, Herrick J F, and Mann F C. Unpublished data.

<sup>8</sup> Grindlay J H, Osborne S L, Ivy A C, and Goldman Leon. The Effect of Bile Acids on Hepatic Blood Flow. *Am J Physiol* **132**: 375-389 (March) 1941.

<sup>9</sup> Herrick J F, Essex H E, Mann F C, and Baldes E J. The Effects of Digestion on the Blood Flow in Certain Blood Vessels of the Dog. *Am J Physiol* **108**: 621-628 (June) 1934.

<sup>10</sup> Herrick J F, Grindlay J H, Baldes E J, and Mann F C. Effect of Exercise on the Blood Flow in the Superior Mesenteric Renal and Common Iliac Arteries. *Am J Physiol* **128**: 338-344 (Jan.) 1940.

<sup>11</sup> Serege. Contributions à l'étude de la circulation du sang porte dans le foie et des localisations lobaires hépatiques. *J de med de Bordeaux* **31**: 271-275, 291-295 and 312-314, 1901. Copher G H, and Dick B M. Streamline Phenomena in the Portal Vein and the Selective Distribution of Portal Blood in the Liver. *Arch Surg* **17**: 408-419 (Sept.) 1928. Dick B M. Streamlines in the Portal Vein. Their Influence on the Selective Distribution of Blood in the Liver. *Edinburgh M J* **35**: 533-539 (Sept.) 1928.



pertinent also to the absorption of those substances used in hepatic function tests that are administered orally. It is worthy of question whether such substances, administered in a fasting state, pass through more than a limited amount of hepatic tissue before reaching the general circulation. The difference, as far as circulating through the liver is concerned, between substances administered orally and intravenously may not be great. Comparative tests, in which the orally administered test substance would be given in the fasting state and with an inert meal which would insure absorption from the entire length of small intestine, might give different results.

Theories concerning the action of a substance as predicated on its effect in passing through the liver before reaching the systemic circulation should take the specific distribution of blood from the different organs draining into the portal system into consideration. One example can be given. Higgins and I<sup>12</sup> injected gentian violet into the vein which drains the major portion of the pancreas in the rat and found that the left lobes of liver were stained by the dye while the right lobes were unstained. Evidently the right half of the liver receives insulin in a concentration no greater than the other tissues of the body.

The production of a localized lesion in the liver by a toxic substance gaining entrance to the portal circulation through the gastrointestinal tract has been difficult but can be easily accomplished with the spleen as the port of entry. Bollman and I<sup>13</sup> injected carbon tetrachloride repeatedly into the spleen and produced an atrophic form of cirrhosis in the left lobes of the liver which was associated with a compensatory hypertrophy of the other lobes of the organ.

#### EFFECT ON THE LIVER OF LOSS OF PORTAL CIRCULATION

The importance of the portal circulation to the liver is emphasized by the changes produced in the organ by the loss of the blood reaching it through the venous component of its circulation. When the blood in the portal vein is diverted from its normal course directly into the vena cava, the liver atrophies to approximately half its normal size or less and certain definite changes in its gross and microscopic appearance occur which are almost characteristic.<sup>14</sup> The effects on the liver produced by loss of portal blood supply are due not only to the great decrease in total blood supply but also to the fact that certain localized regions of the hepatic lobule receive little or no blood from the hepatic artery.<sup>15</sup> The capacity of the liver for restoration is almost completely abolished with the loss of blood from the venous component.<sup>16</sup> On the other hand, regeneration of hepatic tissue after injury appears to begin in the islands of seemingly normal hepatic cells that are supplied mainly or entirely by arterial blood while the cells in the regions supplied only by portal blood may be too badly injured to regenerate hepatic tissues.<sup>17</sup> Thus the intrahepatic portal pathways are gradually obliterated because the regions of hepatic tissue which

they supply are not regenerated. This process not only decreases the amount of regeneration but also diverts portal blood into collateral channels. Since the functions of the portal blood and arterial blood to the liver are somewhat different, comparable tests of liver function in the condition of cirrhosis in which the test substance is administered orally and intravenously might furnish different results.

#### EFFECT OF DISTENTION OF INTESTINE ON PORTAL BLOOD FLOW

Alterations in the flow of blood in the portal vein depend on changes in the amount of blood that passes through the organs that drain into the portal system. Many conditions may affect the blood flow from one or more of these organs. One illustration will be given. Herrick and I<sup>18</sup> studied the effect of acute distention of the intestine with different pressures on portal blood flow and portal pressure. Our purpose in making the investigation was to determine if there was a basis for the possibility that distention of the intestine might affect hepatic activity by producing alterations in the portal circulation. Our results will be given briefly without reference to the controversial phases of the subject. We found that the effect of distention of the intestine on the flow of blood in the portal vein was variable. Usually the flow decreased progressively with increases in intraintestinal pressures but occasionally the portal flow would increase slightly or remain unchanged. Pressure in the portal vein always increased and when the intestine was greatly distended almost equaled the intraintestinal pressure. Evidently distention of the intestine may produce alteration in the portal circulation to such an extent that hepatic activity could be affected.

#### EFFECT OF OBSTRUCTION OF BILIARY OUTFLOW ON INTESTINAL ACTIVITY

Alteration in the liver either physiologic or pathologic may affect the normal function of the intestine. This statement is especially pertinent to the condition of obstruction of the common bile duct. Obstruction of the biliary outflow and the retention of the constituents of the bile in the liver and other tissues throughout the body may affect the functions of the intestinal tract owing to (1) lack of bile in the intestine or (2) effect of retained constituents of bile on (a) intestinal secretion and (b) motor mechanism.

Observations on intestinal activity in the presence of jaundice are meager. Canonico and I<sup>19</sup> made an experimental study of intestinal activity before and after ligation of the common bile duct using methods which permitted observation and recording of activity of loops of jejunum and ileum under nearly normal conditions. We found that biliary obstruction was followed by a definite decrease of activity in the loops of intestine under observation during the first two weeks after operation. Intestinal activity subsequently increased but never equaled the normal amount in the jaundiced animal. A comparison of the activity of the intestine before and after obstruction of the common bile duct showed that, although the decrease occurred in both the fasting and digesting states, it was more noticeable in the latter. Some suggestive evidence was obtained indicating that the biliary constituents retained in the blood, particularly the bile salts, may be of importance in causing the decreased intestinal activity noted.

12 Higgins G M and Mann F C Unpublished data  
13 Bollman J L and Mann F C Experimentally Produced Lesions of the Liver Ann Int Med 5 699 712 (Dec) 1931  
14 Whipple G H and Hooper C W Bile Pigment Metabolism VI Bile Pigment Output Influenced by the Eck Fistula Am J Physiol 42 544 557 (March) 1917  
15 Wakum K G and Mann F C The Intrahepatic Circulation of Blood Anat Rec 82 233 253 (Feb 25) 1942  
16 Mann F C The Portal Circulation and Restoration of the Liver After Partial Removal Surgery 8 225 238 (Aug) 1940  
17 Wakum K G and Mann F C Effect of Experimental Cirrhosis on the Intrahepatic Circulation of Blood in the Intact Animal Arch Path 33 198 203 (Feb) 1942

18 Herrick J F and Mann F C Unpublished data  
19 Canonico A and Mann F C Intestinal Activity After Obstruction of Common Bile Duct Surgery to be published



## LIVER FUNCTION TESTS

A GENERAL EVALUATION OF LIVER FUNCTION TESTS, AND AN APPRAISAL OF THE COMPARATIVE SENSITIVITY AND RELIABILITY OF THE NEWER TESTS, WITH PARTICULAR EMPHASIS ON THE CEPHALIN-CHOLESTEROL FLOCCULATION TEST, THE INTRAVENOUS HIPPURIC ACID TEST AND AN IMPROVED BROMSULPHALEIN TEST WITH A NEW NORMAL STANDARD

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This discussion deals, first, with a general evaluation of liver function tests and with the importance of adequate and carefully conducted normal control studies. In the second place the comparative sensitivity and reliability of the newer tests, in relation to each other and to the older tests, as evaluated in a recent publication of ours,<sup>1</sup> are reviewed and summarized. Finally, an improved bromsulphalein method has been developed using 5 mg of the dye per kilogram and employing a new time interval as the normal standard for complete disappearance of the dye from the blood stream.

## GENERAL EVALUATION OF LIVER FUNCTION TESTS

Liver function tests offer valuable aid in the evaluation of hepatic cell function. However, these tests should be regarded only as an aid to clinical and other laboratory findings in the diagnosis of the exact pathologic conditions. Liver function tests indicate the existing functional state of the hepatic cells but they do not reveal the cause of the impaired function. They do not indicate whether impaired function is due to a toxin circulating in the blood stream, an acute or chronic infection, faulty diet, compression of liver cells by scar tissue or metastatic carcinoma within the liver or to any one of several other causes. Nor do these tests indicate whether the underlying cause is an acute condition or a more serious, chronic, progressive type of hepatic disease. However, if one knows from clinical and other laboratory or x-ray studies the general nature of the pathologic condition, then the results of the liver function tests are of unusual value. They assume real importance in preoperative and postoperative treatment and in evaluating the degree of impairment, the effectiveness of medical treatment, and the prognosis.

From the practical point of view of the clinician, a basis for liver function tests is being developed on which they do measure, either directly or indirectly, the capacity of the liver to function adequately under various circumstances. To achieve this objective the most urgent need is for normal control studies to demonstrate more accurately the extent of normal variations and to denote more exactly the line of demarcation between normal and abnormal hepatic function. That

the newer liver function tests do measure something of practical importance is evidenced by the close parallelism between changes in the results of these tests and changes in the clinical picture. It has been demonstrated that these tests have both diagnostic and prognostic value.

Probably the most convincing, specific evidence that liver function tests do measure the impairment of liver function is found in a study of "catarrhal jaundice" or acute toxic degenerative hepatitis. In this condition in which the essential pathologic change consists in a destruction of many liver cells, followed by a gradual regeneration of normal liver cells, the liver function tests show a maximum deviation from normal relatively early in the course of the disease. As clinical evidence of hepatic repair develops, there is a continued and close parallelism in the improvement of the hepatic function tests.

In employing different liver function tests in identical cases one is impressed by the fact that there is no constant correlation of the results obtained with different tests. For example in 1 case tests A and B may both show impairment of liver function, in a second case test A may show impairment and test B no evidence of it and in a third case only test B may show impairment. This common observation can best be explained. Mann<sup>2</sup> has emphasized, by the hypothesis that the various functions of the liver are not injured equally under different conditions. There is a dissociation of impairment of different liver functions and a corresponding dissociation of the results of liver function tests.

Therefore, the wisdom of conducting several different types of hepatic function tests is obvious, if one expects to demonstrate evidence of impaired liver function in the greatest percentage of patients with liver damage.

LITERATURE AND HEPATIC FUNCTION  
TEST METHODS

In a recent and much more comprehensive work<sup>1</sup> dealing with this same general subject, we reported the results of a comparative statistical study, conducted to determine the sensitivity and reliability of Hanger's cephalin-cholesterol flocculation test,<sup>3</sup> Quick's intravenous hippuric acid test,<sup>4</sup> a modification of Macdonald's 2 mg per kilogram serial bromsulphalein method<sup>5</sup> and Gray's colloidal gold test<sup>6</sup> in relation to one another and to the two older tests, viz the oral hippuric acid test<sup>7</sup> and the original Rosenthal bromsulphalein method.<sup>8</sup> The exact method used in the conduct of each test was outlined. The previous literature was reviewed in some detail.<sup>1</sup>

Normal control studies were conducted on 40 normal young adults<sup>1</sup> varying between 25 and 35 years of age. Normal standards for each test were determined which would afford the maximum sensitivity compatible with reliability for each test.

2 Mann Frank C in discussion on paper of Mateer, Baltz Marion Holland and Yagle<sup>1</sup>

3 Hanger, Franklin M. The Flocculation of the Cephalin Cholesterol Emulsions by Pathological Sera. *Tr Am A Physicians* 53: 148-151, 1938.

4 Quick Armand J, Ottenstein Harold N and Weltchek Herbert. Synthesis of Hippuric Acid in Man Following Intravenous Injection of Sodium Benzoate. *Proc Soc Exper Biol & Med* 38: 77-78 (Feb.) 1938.

5 Macdonald Dean. Some Observations on the Disappearance of Bromsulphalein Dye from the Blood. Its Relation to Liver Function. *Canad M A J* 39: 556-560 (Dec.) 1938.

6 Gray Seymour J. The Colloidal Gold Reaction of Blood Serum in Diseases of the Liver. *Arch Int Med* 65: 524-544 (March) 1940.

7 Quick Armand J. The Synthesis of Hippuric Acid. A New Test of Liver Function. *Am J M Sc* 185: 630-635 (May) 1933.

8 Rosenthal Sanford M and White Edwin C. Clinical Application of the Bromsulphalein Test for Hepatic Function. *J A M A* 84: 1112-1114 (April 11) 1925.

From the Gastro Intestinal Division of the Medical Department Henry Ford Hospital.

Read before the joint meeting of the Section on Pathology and Physiology and the Section on Gastroenterology and Proctology at the Ninety Third Annual Session of the American Medical Association Atlantic City, N. J. June 12, 1942.

1 Mateer John G, Baltz James I, Marion Donald F, Hollands Robert A and Yagle Elizabeth M. A Comparative Evaluation of the Newer Liver Function Tests. *Am J Digest Dis* 9: 13-29 (Jan.) 1942.

In the conduct of the cephalin-cholesterol flocculation test on normal individuals it was learned that the test is reliable only if (1) unripened cephalin is used, as advised in Hanger's original publication,<sup>3</sup> and (2) if the 1 plus tests are regarded as within normal limits and positive diagnostic importance is attached only to 2 plus 3 plus and 4 plus tests (Ripened cephalin studies on normal controls yielded numerous false positive 2 plus and 3 plus results whereas unripened cephalin yielded only 12.5 per cent of false positive results and only 1 plus results with the normal controls).

Normal control studies with Quick's intravenous hippuric acid method completely corroborated Quick's statement that any urinary output of less than 0.70 Gm. of benzoic acid as hippuric acid in the one hour urine specimen indicates some degree of impairment of hepatic function.

The normal control studies with a modified serial 2 mg. per kilogram bromsulphalein method (obtaining blood specimens every five minutes for thirty minutes after injection of the dye) revealed the fact that twenty minutes is the normal time for complete disappearance of the dye from the blood stream when the aforementioned dose is used and not thirty minutes as previously assumed. Therefore if one wishes to withdraw only a single blood specimen after injecting a 2 mg. per kilogram dose of the dye instead of using the serial method one should withdraw the one blood specimen in exactly twenty minutes rather than in thirty minutes.

The results of the normal control studies with the colloidal gold test will not be referred to here since this test was found not to be adapted to routine laboratory use.

#### COMPARATIVE SENSITIVITY AND RELIABILITY OF THE NEWER LIVER FUNCTION TESTS

In the comparative study of the sensitivity of the four newer hepatic function tests referred to in relation to the two older tests viz. the oral hippuric acid test and the Rosenthal bromsulphalein method (2 mg. dose of the dye administered and a single blood specimen withdrawn thirty minutes later), the following results were obtained in a direct comparison of each test with every other test when conducted on an identical group of subjects.<sup>1</sup>

The intravenous hippuric acid test yielded 85 per cent more positive tests than the oral hippuric acid test. This much greater sensitivity of the intravenous test is due to reasons previously specified.<sup>1</sup> The serial bromsulphalein method using the 2 mg. per kilogram dose of the dye and twenty minutes as the normal clearance time for the dye yielded 100 per cent more positive tests than the thirty minute Rosenthal bromsulphalein method. The cephalin test yielded exactly the same number of positive tests as the intravenous hippuric acid test but 33 per cent more positive tests than the aforementioned serial bromsulphalein test.

A study of the relative sensitivity of these various tests in various pathologic groups of cases indicated that all four of the newer tests (including the colloidal gold test which is not satisfactory for other reasons) are appreciably more sensitive than the two older tests. Of special interest was the observation that in a group of 67 patients with gallstones studied before operation 53 per cent yielded a positive intravenous hippuric acid test, 50 per cent a positive cephalin test and 42 per cent yielded a positive serial twenty minute 2 mg., brom-

sulphalein test whereas only 15 per cent yielded a positive Rosenthal bromsulphalein test. This type of information is of great practical value in selecting cases of cholelithiasis needing special preoperative preparation.

The oral hippuric acid test, although much less sensitive than the three newer tests has one important advantage in a particular group of cases first, because it is less sensitive and a greater degree of liver impairment is necessary to yield a positive test and second because the extensive use of this test over some period of time has led to its well established evaluation. This test has a proved value in determining the operability of patients with known liver damage. Snell<sup>9</sup> and White<sup>10</sup> and we agree that if there is less than 50 per cent of the normal 3 Gm. of hippuric acid excreted in the four hour urine collection viz. less than 1.5 Gm. this finding indicates that such a patient presents a very poor operative risk.

#### ADVANTAGES AND LIMITATIONS OF EACH TEST

The various advantages and limitations of each of the four newer tests and the two older tests have been outlined.<sup>1</sup> These deductions will not be repeated here.

#### AN IMPROVED BROMSULPHALEIN TEST

In the recent literature advocating the 3 mg. per kilogram dose for the bromsulphalein test one finds a wide variation in the normal standard adopted by different workers. This situation is apparently due to taking inadequate precautions in establishing the exact range of normal variations. To avoid this pitfall two precautions would seem necessary. First in the study of normal individuals to establish the correct normal standard, it seems absolutely essential to conduct a serial type of examination after injection of the dye withdrawing a blood specimen for dye estimation every five minutes until after the dye has completely disappeared from the blood. Only in this way can the normal disappearance time be accurately determined and variations in the normal disappearance time of the dye correctly defined. In the second place it is obviously important to study an adequate number of normal individuals if the resulting normal standard is to represent the full range of normal variations. Reported studies of 8, 10 or 12 normal individuals represent an inadequate number of controls.

*A New and Improved Normal Standard for the 5 Mg. per Kilogram Bromsulphalein Test*—In table 1 are presented the results of a study of thirty normal control individuals studied by the serial 5 mg. per kilogram bromsulphalein method. In this group of healthy persons ranging from 25 to 35 years with no history of catarrhal jaundice or of any type of chronic gastrointestinal symptoms who had received 5 mg. of bromsulphalein per kilogram the dye had completely disappeared from the blood stream in 73 per cent of these normal controls in thirty minutes, in 86 per cent in thirty-five minutes, in 96 per cent in forty minutes and in 100 per cent of these normal individuals in forty-five minutes. The forty-five minute period has been adopted therefore as the normal standard for complete disappearance of the dye after injection of 5 mg. of bromsulphalein per kilogram.

<sup>9</sup> Snell, Albert M. and Plunkett, John E. The Hippuric Acid Test for Hepatic Function: Its Relation to Other Tests in General. *U. S. Am. J. Digest. Dis. & Nutrition* 2: 716-721 (Feb.) 1936.

<sup>10</sup> White, Franklin W., Deutsch, Emmanuel, and Maddock, Stephen. The Comparative Value of Serial Hippuric Acid Excretion, Total Cholesterol, Cholesterol Ester and Phospho Lipid Tests in Diseases of the Liver. *Am. J. Digest. Dis.* 6: 603-610 (Nov.) 1939.

<sup>11</sup> Footnote deleted on proof.

It is important to have a normal standard which yields no false positive tests with healthy young adults. At the same time it is not necessary to allow a longer period than the one which just fails to give any false positive results in the entire normal control group. In offering this new recommendation, that the result of this test be interpreted as normal or abnormal, depending on whether the dye has or has not completely disappeared from the blood in the forty-five minute specimen, the reliability of this time interval is enhanced when one realizes that the dye had completely disappeared from the blood in 86 per cent of the normal group in thirty-five minutes, and that the additional ten minutes is allowed to insure the diagnosis of normal

of dye retention as the upper limit of normal are open to one important criticism. For example one person may exhibit 10 per cent retention of the dye in thirty minutes and the dye may have completely disappeared from the blood in forty-five minutes. Another person may exhibit the same 10 per cent retention of dye in thirty minutes, but 4 or 5 per cent may still be present in forty-five minutes. This prolonged delay in the disappearance of the last small percentage of dye from the blood is quite characteristic of impaired liver function and will be noted in numerous cases if the serial bromsulphalein method is used. This fact has not been appreciated generally, because the serial method has not been employed.

TABLE 1—Study of 30 Normal Young Persons with Serial Blood Estimations of Residual Dye to Determine Correct Normal Standard for 5 Mg per Kilogram Bromsulphalein Test\*

(2 Mg per Kilogram Bromsulphalein Test Also Done for Comparison†)

Normal Controls, No	5 Mg per Kilogram BSP Test Minutes										2 Mg per Kilogram BSP Test Minutes					
	5	10	15	20	25	30	35	40	45	5	10	15	20	25	30	35
1	60	30	10	5	Trace	Trace	0	0	0	45	20	Trace	0	0	0	0
2	40	20	5	Trace	0	0	0	0	0	25	10	5	0	0	0	0
3	50	20	10	5	Trace	0	0	0	0	30	5	0	0	0	0	0
4	50	18	7	5	Trace	0	0	0	0	55	25	10	0	0	0	0
5	80	30	15	10	6	4	2	0	0	45	20	0	0	0	0	0
6	60	25	15	5	0	0	0	0	0	30	10	0	0	0	0	0
7	60	30	5	Trace	0	0	0	0	0	35	7	Trace	0	0	0	0
8	40	17	6	4	0	0	0	0	0	60	20	5	0	0	0	0
9	35	15	5	Trace	0	0	0	0	0	25	5	0	0	0	0	0
10	35	20	10	5	Trace	0	0	0	0	30	5	0	0	0	0	0
11	30	20	8	Trace	Trace	0	0	0	0	27	5	0	0	0	0	0
12	60	30	20	10	Trace	0	0	0	0	27	10	0	0	0	0	0
13	35	20	10	5	Trace	0	0	0	0	30	5	Trace	0	0	0	0
14	50	10	5	Trace	Trace	0	0	0	0	30	7	0	0	0	0	0
15	35	25	15	5	Trace	0	0	0	0	30	7	0	0	0	0	0
16	60	24	11	4	Trace	Trace	0	0	0	45	15	5	0	0	0	0
17	50	20	10	Trace	Trace	0	0	0	0	40	12	5	0	0	0	0
18	50	20	6	4	Trace	0	0	0	0	30	5	0	0	0	0	0
19	80	60	40	8	Trace	0	0	0	0	25	5	0	0	0	0	0
20	70	25	10	Trace	0	0	0	0	0	40	15	Trace	0	0	0	0
21	25	8	Trace	Trace	0	0	0	0	0	27	7	0	0	0	0	0
22	95	59	20	17	16	10	5	2	0	2	5	0	0	0	0	0
23	45	15	5	Trace	0	0	0	0	0	25	10	0	0	0	0	0
24	30	20	10	Trace	Trace	Trace	0	0	0	35	10	0	0	0	0	0
25	50	40	20	10	Trace	Trace	0	0	0	4	15	5	0	0	0	0
26			20	12	6	2	Trace	0	0							
27			10	6	4	2	Trace	0	0							
28			14	8	Trace	0	0	0	0							
29			10	4	0	0	0	0	0							
30			8	2	Trace	0	0	0	0							

\* With the 5 mg per kilogram dose of dye it is noted that the dye has disappeared from the blood in every normal person in forty five minutes whereas the normal disappearance time for the 2 mg per kilogram dose was twenty minutes.

† All of these 30 normal persons also yielded a negative cephalin test according to the normal standard recently established.

liver function in the remaining small 14 per cent subgroup of normal persons. Sensitivity of any test is advantageous only as far as it is associated with reliability.

As already noted, in the rather scant recent literature dealing with the use of the 5 mg per kilogram dose of bromsulphalein one finds a wide variation in the standard that has been adopted as normal by different workers.

Several have advised obtaining a single blood specimen in thirty minutes and specifying 6, 8 or 10 per cent retention as the maximum retention for a normal test. For example, Israel and Reinhold<sup>12</sup> regarded any retention of more than 6 per cent in thirty minutes as abnormal, whereas Rosenberg and Soskin<sup>13</sup> accepted a retention of dye varying from 0 to 10 per cent in thirty minutes as within normal limits. Any of these standards which attempt to fix a particular percentage

On the other hand, those workers who have used a normal standard based on the complete disappearance of dye from the blood have used either thirty minutes or sixty minutes as the normal disappearance time of the dye. This wide variation again in normal standards is due apparently as already noted either to (1) a failure to use the serial method in determining the normal standard, (2) to studying an insufficient number of normal controls or (3) to not using sufficient care in selecting the cases that are used for normal control studies.

Although reliable, the allowance of sixty minutes for the normal clearance time of a 5 mg per kilogram dose of the dye detracts from the legitimate sensitivity of the test, since the normal control studies by the serial method shown in table 1 indicate that this time standard is unnecessarily generous and would fail therefore, to detect an appreciable number of cases with slight but definite impairment of liver function. On the other hand, Helm and Machella<sup>14</sup> have recently advocated

12 Israel H L and Reinhold J G. Detection of Cirrhosis and Other Diseases of the Liver by Laboratory Tests. J Lab & Clin Med 23: 588-596 (March) 1938.

13 Rosenberg D H and Soskin Samuel. Azorubin S Test of Liver Function. Evaluation with Comparative Study of Bromsulphalein and Hippuric Acid Tests. Ann Int Med 13: 1644 (March) 1940.

14 Helm John D and Machella Thomas E. The Significance of Dosage and Time Factors on the Value of the Bromsulphalein Test for Liver Function. Am J Digest Dis 9: 141-143 (April) 1942.

thirty minutes as the proper normal disappearance time for the 5 mg per kilogram dose of dye. Our normal control studies by the serial method indicate that thirty minutes is too short a time and would render the test too sensitive. This time interval would yield, therefore, false positive tests. In 27 per cent of our normal control subjects the dye had not cleared from the blood in thirty minutes, although it had disappeared at this time in the other 73 per cent. The probable explanation

as sensitive as either the cephalin test or the intravenous hippuric acid test and at the same time a test which is just as reliable.

*Serial Specimen, Single Specimen or Two Specimen 5 Mg Bromsulphalein Method* (forty-five minute dye disappearance time).—From the standpoint of economy of time and effort a single forty-five minute specimen is satisfactory, since this correct normal standard has been determined by the serial method. Such a

TABLE 2—Sensitivity of 5 Mg per Kilogram Serial Bromsulphalein Test as Compared with That of Cephalin Cholesterol Flocculation Test and That of 2 Mg per Kilogram Serial Bromsulphalein Test \*

Case No.	Cephalin Test	2 Mg Bromsulphalein Test Minutes							5 Mg Bromsulphalein Test Minutes							Diagnosis
		5	10	15	20	25	30	35	15	20	25	30	35	40	45	
1	2+	40	35	30	20	20	15	10	30	20	16	14	14	14	14	Metastatic carcinoma
2	3+				ND†				25	25	20	15	15	15	10	Portal cirrhosis
3	0	25	Trace	0	0	0	0	0	24	22	20	18	14	4	0	Enlarged liver‡
4	3+				ND				38	22	25	22	20	15	10	Enlarged liver
5	1+	25	10	Trace	0	0	0	0	25	15	15	12	10	8	6	Portal cirrhosis
6	4+	70	60	50	45	45	35	20	55	48	42	38	35	30	1	Portal cirrhosis
7	0	45	15	Trace	0	0	0	0	20	14	10	8	6	4	2	Gallstones
8	4+	35	25	15	5	Trace	0	0	24	18	14	10	8	6	4	Portal cirrhosis
9	2+				ND				36	28	24	20	18	16	14	Metastatic carcinoma
10	4+	40	15	Trace	0	0	0	0	10	8	6	4	3	2	Trace	Gallstones
11	1+	55	30	20	Trace	0	0	0	12	5	0	0	0	0	0	Enlarged liver
12	2+	45	10	Trace	0	0	0	0	10	5	Trace	0	0	0	0	Cholecystitis
13	4+				ND				2	Trace	0	0	0	0	0	Gallstones
14	0	45	15	5	0	0	0	0	15	10	5	Trace	0	0	0	Cholecystitis
15	2+	32	12	5	0	0	0	0	2	Trace	0	0	0	0	0	Enlarged liver
16	ND	30	7	2	0	0	0	0	20	16	13	12	12	11	10	Metastatic carcinoma
17	ND	15	10	Trace	0	0	0	0	11	6	3	1	Trace	Trace	0	Gallstones
18	0	27	15	5	0	0	0	0	30	16	10	8	6	4	3	Gallstones
19	0				ND				8	4	3	2	1	Trace	0	Enlarged liver
20	0	35	10	2	0	0	0	0	8	4	3	2	Trace	0	0	Gallstones
21	0	25	5	Trace	0	0	0	0	18	10	6	4	2	1	Trace	Alcoholism
22	4+				ND				8	4	3	2	1	Trace	Trace	Enlarged liver
23	0	15	5	0	0	0	0	0	Trace	0	0	0	0	0	0	Gallstones
24	0	15	5	0	0	0	0	0	10	2	0	0	0	0	0	Alcoholism
25	4+	40	17	10	5	Trace	0	0	30	20	15	10	5	5	0	Portal cirrhosis
26	0	40	20	5	0	0	0	0	20	12	6	4	2	Trace	0	Portal cirrhosis
27	1+				ND				16	7	2	Trace	0	0	0	Enlarged liver
28	0	35	10	Trace	0	0	0	0	16	6	4	4	3	2	1	Portal cirrhosis
29	0	25	16	5	0	0	0	0	40	24	16	12	10	8	4	Metastatic carcinoma
30	4+	40	12	5	0	0	0	0	13	5	3	1	Trace	0	0	Gallstones
31	0	15	5	0	0	0	0	0	20	15	5	Trace	0	0	0	Alcoholism
32	1+	35	15	Trace	0	0	0	0	20	10	8	7	5	4	1	Enlarged liver
33	3+	27	10	2	Trace	0	0	0	12	8	2	1	Trace	0	0	Cholecystitis
34	4+	40	35	30	27	25	20	17	40	30	30	30	25	25	20	Portal cirrhosis
35	3+	30	10	0	0	0	0	0	6	4	2	Trace	0	0	0	Enlarged liver
36	2+				ND				8	5	4	2	1	Trace	0	Alcoholism
37	0	50	35	10	5	Trace	0	0	28	15	5	3	Trace	0	0	Alcoholism
38	0	27	8	0	0	0	0	0	16	12	5	5	2	Trace	0	Alcoholism
39	0				ND				16	12	10	8	6	5	4	Gallstones
40	0	30	10	Trace	0	0	0	0	12	8	6	4	2	1	0	Cholecystitis
41	4+				ND				18	12	6	2	0	0	0	Cholecystitis
42	3+	35	10	0	0	0	0	0	10	Trace	0	0	0	0	0	Cholecystitis
43	0				ND				17	14	12	12	12	12	10	Metastatic carcinoma
44	4+				ND				32	28	24	20	14	12	10	Enlarged liver
45	4+				ND				13	8	6	2	1	Trace	Trace	Enlarged liver
46	0				ND				20	16	12	8	6	4	3	Enlarged liver

\* 5 mg dye test and cephalin test were conducted in 44 of the 46 cases listed in this table. 5 mg dye test and 2 mg dye test were conducted in 32 of the 46 cases listed.

† ND indicates that the test so specified was not conducted in this particular case.

‡ These cases of portal cirrhosis all presented some evidence of portal obstruction (e.g., ascites, superficial collateral circulation or other evidence).  
§ The cases of enlarged liver all presented either an alcoholic history or evidence of chronic gall tract disease in addition to some degree of enlargement of liver.

why Helm and Machella found the blood free from dye in thirty minutes in all their normal controls was that they report studying only 12 normal persons.

In this study of an improved 5 mg per kilogram bromsulphalein method, all estimations of the amount of retained dye in the blood have been conducted with a specially prepared 5 mg colorimetric standard which measures any residual dye in terms of percentage of the amount of dye originally injected.

The forty-five minute interval advocated in this publication for normal disappearance of the dye from the blood with the 5 mg per kilogram dose constitutes a new standard, which, as will be noted, provides a test

single specimen affords the necessary information, provided it is taken exactly at the proper time. A compromise between the serial and single specimen method which would constitute the most desirable method from a comprehensive point of view, would consist in obtaining a forty-five minute and sixty minute blood specimen, with separate venipunctures. This would avoid the need for giving intravenous saline solution to keep the needle open, when using the serial method and obtaining a number of blood specimens. At the same time, obtaining a sixty minute specimen, in addition to the forty-five minute specimen, would supply supplementary information regarding the degree of impaired

liver function in those cases presenting evidence of impairment in the forty-five minute specimen. Thus the further rate of excretion of the dye can be demonstrated in this group of cases.

*Results Obtained with Improved Bromsulphalein Test* (forty-five minute normal standard 5 mg per kilogram dose)—In table 2 the results of the serial 5 mg per kilogram, forty-five minute bromsulphalein method are compared (1) in 44 cases with the results obtained with the cephalin test in this same group of cases, and (2) with the results of the serial, 2 mg per kilogram, twenty minute bromsulphalein method with the 32 patients studied by these two serial dye methods (In all, 46 patients were studied.)

Like the group of 307 cases previously studied,<sup>1</sup> this group of 46 cases also included not only cases in which clinically obvious liver disease was present but also a number of cases of cholelithiasis, in which the hepatic impairment, when present, is usually of lesser degree.

5 mg dose represents an appreciably more sensitive test than the 2 mg dose.

*The Influence of Variable Normal Standards in Producing Extreme Variations in Sensitivity of 5 Mg Bromsulphalein Test*—When using various "normal" standards for the disappearance of the dye, as shown in table 3, extreme variations are exhibited in the sensitivity of the 5 mg bromsulphalein method, as compared with the cephalin test. (The cephalin test was conducted with the constant, recently recommended, normal standard<sup>1</sup>) For example, if thirty minutes is used as the normal standard for complete disappearance of dye from the blood, the 5 mg per kilogram bromsulphalein test yields 76 per cent more positive tests than the cephalin test, if thirty-five minutes is used as the normal standard, the dye test is positive in 52 per cent more cases than the cephalin test, whereas if forty-five minutes, the most sensitive reliable normal standard for the 5 mg dye test, is used the cephalin test and the

TABLE 3—Comparative Sensitivity of Cephalin-Cholesterol Flocculation Test and 5 Mg per Kilogram Serial Bromsulphalein Test, Using Various Normal Bromsulphalein Standards in 44 Cases\*

Various Normal standards for BSP Test	No of Cases Both Tests Positive	No of Cases BSP Test Alone Positive	No of Cases Cephalin Test Alone Positive	No of Cases Both Tests Negative	Relative Sensitivity of Two Tests
1 30 minutes = disappearance time †	17	20	4	3	76% more positive BSP tests
2 35 minutes = disappearance time	15	17	6	6	52% more positive BSP tests
3 40 minutes = disappearance time	13	15	8	8	33% more positive BSP tests
4 45 minutes = disappearance time (normal standard recommended)‡	11	10	10	13	Exactly equal sensitivity of BSP and cephalin tests
5 60 minutes = disappearance time					Cephalin test would be appreciably more sensitive here #
6 Not more than 0% of BSP remaining in blood in 30 minutes	9	9	12	14	16% more positive cephalin tests
7 Not more than 10% of BSP remaining in 30 min	7	3	14	21	133% more positive cephalin tests
8 Not more than 15% remaining in 30 minutes	5	1	16	22	200% more positive cephalin tests

\* The statistics in this table are deduced from those in table 2. The use of the serial method has made possible the comparisons shown.

† If even a trace of dye remained at any of the various normal time standards referred to in this table the test was interpreted as positive for that standard.

‡ That forty-five minutes is the correct normal standard for complete disappearance of the dye from the blood is indicated by the normal control studies listed in table 1.

# The reason for this statement is discussed in the last section of this paper.

It is important to include cases of only slight and moderate impairment, as well as more advanced cases, when attempting to demonstrate the sensitivity of any liver function test.

It is noted in table 3 that the 5 mg bromsulphalein test yielded exactly the same number of positive tests as the cephalin test and therefore exhibited the same degree of sensitivity, provided the recommended forty-five minute disappearance time for the dye is regarded as a normal standard. It is also recalled that the intravenous hippuric acid test possesses approximately the same degree of sensitivity as the cephalin test. Therefore these three tests possess about the same sensitivity.

In comparing the sensitivity of the 2 mg and 5 mg bromsulphalein methods, using twenty minutes as the normal disappearance time of the dye for the 2 mg method and forty-five minutes for the 5 mg method, and utilizing the 32 cases in table 2, in which both dye methods were conducted, the following results were obtained. It is noted that the 2 mg test was positive in a total of 8 cases and the 5 mg test in a total of 13 cases. The 5 mg test was therefore positive in 62 per cent more cases than the 2 mg test and the

5 mg per kilogram dye test yield exactly the same number of positive tests in the 44 cases (table 3). In other words, these two tests possess the same sensitivity provided both tests are conducted with a reliable technique which affords no false positive tests. If the serial dye test had been prolonged for sixty minutes, and sixty minutes had been regarded as the normal standard, it is obvious from tables 2 and 3 that the sensitivity of the 5 mg dye test would have been appreciably reduced and that this test then would be much less sensitive than the cephalin test. In 54 per cent of the cases in table 2 showing a positive 5 mg test with the forty-five minute standard, 4 per cent or less of the dye remained at forty-five minutes, and this small amount of dye would almost certainly have disappeared in sixty minutes in most cases, if the serial method had been continued to sixty minutes.

Another interesting fact apparent from table 3 is that if some particular percentage of dye remaining in the blood at thirty minutes is used as the normal standard (instead of its complete disappearance) it makes a tremendous difference in the sensitivity of the dye test whether one uses as a normal standard an upper limit of 6 per cent of retained dye, as advised by Israel and

Reinhold, or an upper limit of 10 per cent, apparently the most commonly employed normal standard at the present time. If 6 per cent is regarded as the upper normal limit of dye retention, the cephalin test yields only 16 per cent more positive tests than the dye test, but if 10 per cent is regarded as the upper normal limit the cephalin test yields 133 per cent more positive tests than the 5 mg bromsulphalein test. If 15 per cent of retained dye is regarded as the upper normal limit for thirty minutes (a standard which is also used) the contrast in sensitivity becomes even greater. With this 15 per cent upper normal limit of retained dye the cephalin test yields 250 per cent more positive tests than the 5 mg bromsulphalein test.

The pronounced variations in the sensitivity of the 5 mg dye test, occurring with the use of slightly different percentages of retained dye as the "normal" standard for the thirty minute specimen, constitute a second reason why it is undesirable to use any particular percentage of retained dye at thirty minutes as a normal standard. The first and still more important objection to using this type of a normal standard, in contrast to the complete disappearance of the dye at a later period, has been stated under the discussion of normal control studies.

#### POSTSCRIPT<sup>15</sup>

Since the paper was presented, certain additional observations and conclusions of considerable practical importance have been noted.

A. In further studies with different cephalin antigens an appreciable variation in their sensitivity has been noted. It has been observed that the sensitivity of freshly made unripened cephalin, if kept in a stoppered flask in the ice box, increases gradually on standing over a period of four or five months. For example, the cephalin-cholesterol flocculation test was conducted recently on the serums of 150 patients with clinical evidence suggesting liver impairment, parallel tests being run on the same serums with freshly prepared unripened cephalin and also with similarly prepared "unripened" cephalin which had remained in the ice box for about five months. The latter cephalin tended to yield more positive reactions, e g frequently a 3 plus reaction as opposed to a 1 plus reaction, or a 2 or 3 plus reaction as contrasted with a completely negative forty-eight hour reaction. In other words, the unripened cephalin did ripen somewhat on standing in the ice box.

When similar parallel tests were conducted on the serums of 20 normal young control subjects the freshly made cephalin yielded no positive tests, whereas with the cephalin which had stood in the ice box 2 of the 20 normal serums yielded a 1 plus test in the final forty-eight hour reading. None yielded a 2, 3 or 4 plus test.

In our initial observations with the cephalin-cholesterol flocculation test previously reported the cephalin used was cephalin which had not been ripened in sunlight but which had stood in the ice box about four months. The 40 normal serums tested with this cephalin yielded 12.5 per cent of 1 plus forty-eight hour results but no 2, 3 or 4 plus tests. In other words, the results were quite similar to those more recently obtained with cephalin which also had stood in the ice

box an essentially similar period of time. With this type of cephalin 1 plus forty-eight hour results are not interpreted as being definitely positive.

Recent reports from other workers agree with our present impression that freshly made unripened cephalin is not sensitive enough to yield positive tests in a number of cases in which clinical or other evidence of impairment of liver cell function exists. The cephalin which has ripened in an ice box for four or five months is preferable. On the other hand, cephalin which had stood in the sunlight in an unstoppered bottle for a few weeks yielded numerous 2 and 3 plus false positive tests.

Recently several lots of a commercial preparation of cephalin (in the form of cephalin-cholesterol antigen ready for use), ripened in the sun by a special method and provided by the Difco Company of Detroit, have been tested. These lots yielded uniformly satisfactory results. The latter results ran almost exactly parallel to those obtained with the aforementioned cephalin which had stood in the ice box for five months. This commercial preparation was quite sensitive but yielded negative results throughout when tested against the serums of the 20 normal young subjects referred to except for a single serum (5 per cent), which yielded a negative result in twenty-four hours and only a 1 plus result in forty-eight hours. If this commercial antigen is used, at least a 2 plus result in forty-eight hours should be required, therefore, to indicate definite impairment of liver cell function.

The Difco Company has noted that the explanation of false positive results obtained on normal serums with certain sun ripened cephalin preparations consists in the fact that such antigens have not been ripened for a sufficiently long period of time.

B. The only objection to the 5 mg per kilogram dose of bromsulphalein dye consists in the fact that some patients have a transient reaction to the injection of this larger dose of dye. Such a reaction develops in certain cases regardless of whether the injection of the dye is or is not followed by the injection of isotonic solution of sodium chloride and the employment of the serial method. The reaction may consist of transient headache, a feeling of faintness and in some cases a chill. These symptoms tend to occur from forty-five to sixty minutes after the injection of the dye. The headache may persist for several hours. No unfavorable or prolonged after-effect has been demonstrated. This type of reaction rarely occurs after employing the smaller dose of 2 mg per kilogram of bromsulphalein.

C. In cases in which it is desired to determine mainly the presence or absence of a slight degree of impaired liver function, two or three of the most sensitive tests should be employed, e g the cephalin test, the 5 mg per kilogram forty-five minute bromsulphalein test and the intravenous hippuric acid test.

In cases in which it is not only desired to determine the presence of impaired liver cell function but also to obtain from the tests as much information as possible about the degree of impairment, there is an important advantage in using several tests of varying sensitivity, e g the very sensitive cephalin test, the 2 mg per kilogram twenty minute bromsulphalein test of intermediate sensitivity and the less sensitive oral hippuric acid test.

<sup>15</sup> Added after paper was read

## THE SIGNIFICANCE OF MILD HYPERBILIRUBINEMIA IN GASTRO-INTESTINAL PATIENTS

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The routine use of serum bilirubin determinations on nonjaundiced patients discloses a group in which the serum bilirubin value is elevated beyond the usually accepted normal figure but in which there has been no evidence of preceding or subsequent jaundice. Such a group may be said to have latent jaundice.

The presence of an isolated elevated serum bilirubin value in a case in which the routine diagnostic survey discloses no other abnormality imposes certain diagnostic responsibilities on the clinician. Shall he ignore the hyperbilirubinemia? In terms of milligrams per hundred cubic centimeters of blood, at what level should one infer that a given value represents hyperbilirubinemia? Naturally the average patient, seeking relief from some real or fancied ailment, does not represent a normal individual, and a large group of similar patients, by virtue of the size of the group alone cannot be considered a cross section of normal individuals. Nevertheless we believed that an analysis of a large group of patients who had submitted to a diagnostic study might afford some explanation for the presence of mild nonicteric hyperbilirubinemia. We are familiar with the fact that many observers, using the Thannhauser and Anderson<sup>1</sup> modification of the van den Bergh reaction, report normal values up to 1.5 or 2.0 mg per hundred cubic centimeters of blood. Careful estimations of serum bilirubin by more accurate methods indicate that there is a large error inherent in the Thannhauser and Anderson method. The many reasons justifying this critical attitude toward the Thannhauser and Anderson method are well known and need not be reiterated here. Nevertheless some modification of the Thannhauser and Anderson method is in use in most institutions where the serum bilirubin is studied.

In an attempt to determine the basic pathologic condition behind a given case of hyperbilirubinemia, the clinician may approach the diagnostic problem by considering one of the following mechanisms:

1 Obvious obstructive jaundice of high degree due to calculus requires little comment. However, mild or latent icterus due to intermittent ball valve action of a calculus may require intensive study to verify the suspected causal factor. Cholecystography may supply the chief objective diagnostic criteria in this instance. In a small group of cases, wherein the cholecystogram is doubtful, biliary drainage may afford aid by the demonstration of calcium bilirubinate pigment and cholesterol crystals. In the older age group incipient malignant conditions of the biliary tract including lesions of the head of the pancreas and vaterian cancer must be ruled out. A progressive icterus usually but not invariably points toward a malignant process. Persistent occult blood in the stools may point

toward malignancy of the pancreas or papillae of Vater. Varying degrees of hepatic dysfunction may occur in association with obstructive jaundice. Elevation of the serum phosphatase has been reported in obstructive jaundice, particularly when hepatic metastasis is suspected. We have derived comparatively little diagnostic help from the serum phosphatase in early icterus. An elevated serum lipase in the absence of acute inflammatory pancreatic involvement, is almost pathognomonic of pancreatic malignancy.

2 Typical cases of hemolytic jaundice are rare. In most instances the critical data consist of a palpable spleen, varying degrees of anemia, reticulocytosis, spherocytosis and increased fragility of the red blood cells. Familial types of hemolytic anemia together with sickle cell anemia must be ruled out. One must not overlook the fact that occasionally many of the aforementioned diagnostic tests may be normal or present such a small variation from normality that the diagnosis may not be clear. Sternal marrow biopsy may prove of inestimable value in some instances. Certain stages of primary macrocytic anemia (primary pernicious anemia) may be present with hyperbilirubinemia.

3 Toxic hepatocellular mechanisms, including catarrhal jaundice, cholangitis and the various types of chronic infectious jaundice will need to be considered. Frequently the diagnosis of cases in this group is inferential. In most instances however, the history, course of the disease and associated laboratory findings will indicate the type of involvement. The rapid onset of catarrhal jaundice in the younger age group, the rapidly changing and usually favorable clinical course, and a positive galactose tolerance test usually suffice to make the diagnosis. Occasionally an initial picture of catarrhal jaundice may merge into a mild latent icteric stage of varying duration. Acute yellow atrophy of the liver usually follows the exhibition of well known hepatotoxic drugs such as those containing the benzene ring, the arsphenamines, cinchophen and carbon tetrachloride. The recovery stage of acute yellow atrophy may be characterized by latent icterus. Subacute yellow atrophy in the absence of jaundice has been reported.

The term chronic cholangitis is a diagnostic pitfall and seems to be a convenient waste basket into which the busy clinician may cast cases of latent icterus which he cannot otherwise classify. Pathologically the distinction between mild catarrhal jaundice of the hepatocellular type and chronic cholangitis is difficult, and clinically the distinction may be impossible. The repeated recovery by bile drainage of plugs of mucus containing cellular debris and bacteria is said to be somewhat diagnostic of chronic cholangitis. Undoubtedly, chronic cholangitis is diagnosed largely on the basis of exclusion of other causes of latent icterus. Chronic infectious jaundice including that due to *Leptospira icterohemorrhagica* (spirochetal jaundice) offers many diagnostic difficulties. Spirochetal jaundice frequently is overlooked in this country. The various laboratory aids for identifying the causative agent afford the only reliable diagnostic criteria for spirochetal jaundice. Various other organisms occasionally may act as causative factors in chronic infectious jaundice.

4 Incipient spleen-liver disease, variously designated as splenic anemia or early Banti's disease comprises a relatively definite group of latent icteric cases in our experience. We are familiar with the paucity of etiologic factors in this group of cases but clinically certain features seem to predominate. We have studied

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<sup>1</sup> Thannhauser J. S. and Anderson E. Bilirubin in the Blood. Serum. *Deutsches Arch. f. klin. Med.* 137: 179, 1921.



a number of cases in which the initial complaint was a massive gastrointestinal hemorrhage and in which subsequent studies failed to reveal evidence of definite gastric or duodenal ulceration. In some of these, in addition to slight hyperbilirubinemia, blood studies revealed varying degrees of thrombocytopenia, leukopenia and prothrombin deficiency. There usually, but not invariably, is a palpable spleen and the liver may show slight enlargement. Liver function studies may reveal impaired function. One of our patients in this group had several exsanguinating hemorrhages at yearly intervals. Splenectomy coincided with cessation of the hemorrhages, although the thrombocytopenia and leukopenia persisted. Follow up of the nonsplenectomized cases has not been fruitful. Some continue with mild hemorrhages. We do not believe that any of them developed into a full blown cirrhotic stage of so called late Banti's disease.

5 There finally remain a small group of cases with persistent hyperbilirubinemia of undetermined origin

TABLE 1—Serum Bilirubin Values

Serum Bilirubin Mg per 100 Cc of Blood	No. of Cases	Per Cent
0.2	861	46.9
0.3	345	18.8
0.4	209	11.3
0.5	87	4.7
Above 0.5	333	18.3
	1,835	100.0

TABLE 2—Hyperbilirubinemia

Duodenal ulcer	31
Irritable duodenum	49
Colon disease	57
Miscellaneous	50
Liver dysfunction (including cholangitis and catarrhal jaundice)	57
Obstructive jaundice	89
	3

How large a percentage of cases is represented in this category will depend on the diagnostic elasticity of the clinician. For example, one who is fond of the diagnosis of chronic cholangitis may find that he has no cases of hyperbilirubinemia of undetermined origin. Our interest in this problem was stimulated by the fact that over a period of years we studied a group of patients with symptoms vaguely and in some cases strongly suggestive of duodenal ulcer in which mild hyperbilirubinemia persisted. We believed that estimations of serum bilirubin in all of our studied cases might prove of value. Because of this interest, the serum bilirubin was determined in a larger percentage of our office cases than was warranted by the suspicion of any abnormality referable to that test. In the past several years serum bilirubin determinations were performed on almost all our patients.

The present study comprises a group of private patients observed during the period from January 1930 to January 1942 in which serum bilirubin determinations were carried out.

The following technic<sup>2</sup> was used in the determination of the serum bilirubin.

**Solution A.** Dissolve 1 Gm of sulphanic acid in 15 cc of concentrated hydrochloric acid in water and dilute to 1 liter.

**Solution B.** Dissolve 0.5 Gm of sodium nitrite in water and dilute to 100 cc.

**Diazo reagent.** To a 10 cc graduated cylinder add 5 cc of solution A and 3 drops of solution B. Prepare fresh before each determination.

**Saturated ammonium sulfate.** In a bottle place 100 Gm of ammonium sulfate and 100 cc of water. Shake for some time to dissolve and use the supernatant fluid.

**Standard cobalt solution.** Weigh 2.161 Gm of anhydrous cobalt sulfate or 3.92 Gm of  $\text{CoSO}_4 \cdot 7\text{H}_2\text{O}$ , dissolve in water and dilute to 100 cc in a volumetric flask.

**Standard series.** To eight test tubes add respectively 10, 7.5, 5, 4, 3, 2, 1.5 and 1 cc of the standard cobalt sulfate solution. To the last seven add the correct amount of water to make 10 cc. Stopper and label respectively 2, 1.5, 1, 0.6, 0.4, 0.3 and 0.2 mg. The standard tubes are labeled to read directly in milligrams of bilirubin considering the 1-4 dilution in the method.

Pipet into a 15 cc centrifuge tube 1 cc of serum and 0.5 cc of diazo reagent. Mix. Stand three minutes. Add 25 cc of 95 per cent alcohol and 1 cc of saturated ammonium sulfate. Mix and centrifuge at a relatively high speed for five minutes. Remove the supernatant fluid and compare it with the standards in a test tube of the same size.

On the basis of this technic we had assumed that the majority of our normal serum bilirubin values occurred at or below 0.3 mg per hundred cubic centimeters of blood. However, there occurred a sufficient number of instances in which values in excess of 0.3 mg obtained that we believed it desirable to analyze all of our office cases in which serum bilirubin determinations were recorded during a twelve year period. Excluded were all isolated consultations in which no laboratory work was recorded or cases which were studied largely in the hospital. There remained a group of cases (3,782) which we regarded as having had a fairly complete study. Of the 3,782 cases, 1,835 (48.9 per cent) had one or more determinations of serum bilirubin. In cases with multiple determinations of serum bilirubin, the maximum value was used in this study. The serum bilirubin values in 1,835 cases were distributed as shown in table 1.

The 333 cases of hyperbilirubinemia (i.e. serum bilirubin in excess of 0.5 mg per hundred cubic centimeters of blood) were distributed as shown in table 2.

In the group of 333 cases of hyperbilirubinemia (i.e. a value above 0.5 mg per hundred cubic centimeters of blood) the maximum serum bilirubin values were distributed as outlined in table 3.

Of 3,782 cases comprising the total number reviewed, a diagnosis of duodenal ulcer was made in 641 instances. In 313 (48.8 per cent) of the 641 cases, one or more determinations of serum bilirubin were made. The serum bilirubin values in 313 cases of duodenal ulcer were distributed as shown in table 4.

It is evident that the general pattern of distribution of serum bilirubin values in the duodenal ulcer group was similar to that in the total group reviewed, an interesting observation in connection with those serum bilirubin values below 0.5 mg but of no practical importance in comparing the serum bilirubin values above 0.5 mg, since the total group comprised some jaundiced patients with liver and biliary tract disease in which one would anticipate an elevated serum bilirubin.

The diagnosis of duodenal ulcer was entertained only in those cases in which the history, physical examination, gastric analysis and roentgenographic demonstration of a niche supported such a diagnosis. The group labeled irritable duodenum comprised those cases

<sup>2</sup> Keller, A. G. Manual of the Biochemical Laboratories of the Graduate Hospital, University of Pennsylvania, 1934.

in which the clinical picture was not of sufficient clarity to warrant accepting as clearcut cases of peptic duodenal ulceration. While in some instances, undoubtedly the exclusion of certain cases from the duodenal ulcer group was based on capacious criteria, our general observations in this article might apply either to the duodenal ulcer or to the irritable duodenum group. The group labeled colon disease comprised all the cases in which any disorder referable to the colon was present, including malignant disease, polyposis, ulcerative colitis and irritable colon. The liver dysfunction group comprised all the cases of catarrhal jaundice, toxic hepatitis of all types, cholangitis and hepatic cirrhosis of nonobstructive origin. The obstructive jaundice group comprised those cases in which there was the common denominator of some factor or group of factors that gave rise to varying degrees of jaundice due to disease referable to obstruction to the outflow of bile from the biliary tract or associated structures. In the miscellaneous group we placed all the cases with diagnoses which were otherwise unclassified, such as malignant disease of the stomach, hypertension and hyperthyroidism.

Excluding 89 cases of obstructive jaundice from the 333 cases of hyperbilirubinemia, there remained 244

Cases studied over variable periods during which all of the serum bilirubin determinations fell within our defined range of hyperbilirubinemia.

Accordingly, the 244 cases of hyperbilirubinemia were grouped as shown in table 5.

TABLE 5—Groups of Cases of Hyperbilirubinemia

	A	B	C
Duodenal ulcer	23	4	4
Irritable duodenum	20	17	12
Colon disease	37	17	8
Miscellaneous	26	12	12
Liver dysfunction	22	26	9
	123	76	45

Thus there were 45 cases of persistent hyperbilirubinemia in which no clinical evidence of obstructive jaundice could be demonstrated.

The following analysis was made of the cases of persistent hyperbilirubinemia under each of the main diagnostic headings.

1 *Duodenal Ulcer*—Only 4 instances were noted in which persistent hyperbilirubinemia obtained in the duodenal ulcer group. The range of serum bilirubin values varied from 0.6 to 1.6 mg (1 case in which

TABLE 3—Maximum Serum Bilirubin Values in Cases of Hyperbilirubinemia

	Serum Bilirubin Mg per 100 Cc of Blood													Total
	0.6	0.7	0.8	0.9	1.0	1.1 to 1.5	1.6 to 2.0	2.1 to 3.0	3.1 to 5.0	5.1 to 10.0	10.1 to 20.0	Above 20.0		
Duodenal ulcer	12	5	4	3	1	4	2							31
Irritable duodenum	18	3	6	3	5	11	3							49
Colon disease	27	11	10	1	3	5								57
Miscellaneous	17	4	10	3	7	7	1		1					50
Liver dysfunction	9	2	6	1	7	4	8		5			3		57
Obstructive jaundice	21	8	8	1	7	9	5	4	9	5	3	2		89
Total	104	33	44	12	30	40	19	11	15	14	6	5		331

cases which were further analyzed in an attempt to segregate those cases in which persistent hyperbilirubinemia obtained. For convenience, the cases were subdivided into three categories.

A Cases in which only one serum bilirubin determination was recorded, obviously cases in which the persistence of hyperbilirubinemia was not considered.

B Cases in which hyperbilirubinemia was present at some time during the period of observation but in which subsequent determinations were within the nor-

TABLE 4—Serum Bilirubin Values in Cases of Duodenal Ulcer

Serum Bilirubin Mg per 100 Cc of Blood	No. of Cases	Per Cent
0.2	161	51.4
0.3	64	20.4
0.4	39	12.4
0.5	18	5.7
Above 0.5	31	10.1
	313	100.0

mal range. We likewise included in this group some cases in which hyperbilirubinemia was present during the whole course of a short period of observation, cases which certainly could not be regarded as showing persistent hyperbilirubinemia. Three cases observed for short periods in the liver dysfunction group in which death occurred likewise are included in this group.

five serum bilirubin determinations over a period of five years varied from 0.8 to 1.5 mg (showed 0.3 mg on one occasion). In each case the cholecystogram showed a normally functioning gallbladder without evidence of calculi. Repeated bile drainage failed to demonstrate either calcium bilirubinate pigment or cholesterol crystals. In 2 cases the liver edge could be palpated on deep inspiration. A splenic enlargement was absent in all instances. Routine blood studies failed to reveal any hematologic abnormality. The urinary urobilinogen frequently was determined in each case and in no instance was the value any greater than a dilution of 1 to 30. In 1 case four bromsulphalein determinations (2 mg per kilogram dose) over a five year period varied respectively as follows: 20, 10, 0 and 7 per cent retention in thirty minutes. In no instance has there occurred any other clinical or laboratory evidence which might explain the persistent hyperbilirubinemia.

2 *Irritable Duodenum*—Twelve instances were noted in which persistent hyperbilirubinemia obtained in the irritable duodenum group. The range of serum bilirubin values varied from 0.6 to 2 mg. In 8 cases a cholecystogram was obtained which showed a normal gallbladder without stones in 5 cases. In 3 cases the cholecystogram showed a faint gallbladder shadow. In 10 cases one or more bile drainage examinations failed to demonstrate calcium bilirubinate pigment or cholesterol crystals. Many of the bile drainages showed evidence of moderate catarrh and exfoliation of the

biliary tract in the recovered material. In 1 case giardiasis was noted. In only 1 case was the liver edge palpable on deep inspiration. A splenic enlargement was absent in all instances. Routine blood studies failed to reveal any hematologic abnormality. The urinary urobilinogen was present in normal concentrations in each case on many determinations. Bromsulphalein retention tests were carried out in 8 cases. In 3 cases respectively 10, 6 and 5 per cent retention of bromsulphalein was noted, in 1 of which the bromsulphalein was zero at a subsequent examination. In 1 case three bromsulphalein determinations were reported 15, 10 and 2 per cent retention. Whether or not we are dealing with a case of early hepatic cirrhosis is not clear in the 1 case with a consistently positive bromsulphalein retention, although it seems unlikely because the other clinical and laboratory findings are

dye retention was noted. In 7 cases repeated determinations of the urinary urobilinogen were reported within normal concentrations.

4 *Miscellaneous*—There were 12 cases in the miscellaneous group in which persistent hyperbilirubinemia was present. Of these, 2 presented blood dyscrasias (primary macrocytic anemia and hemolytic icteroneumia) which could account for the hyperbilirubinemia. Two other cases present isolated findings (1 showed calcium bilirubinate pigment in the material recovered from the duodenum by biliary drainage and the other case showed a negative defect in one film of a cholecystographic series) not inconsistent with a diagnosis of cholelithiasis but in which the other clinical and laboratory studies failed to confirm the presence of gallstones. There remained only 8 cases in which consideration was given to unexplained hyperbilirubin-

TABLE 6—Liver Dysfunction Group

Case	Period of Observation	Number of Serum Bilirubin Determinations	Range of Serum Bilirubin Determinations	Bromsulphalein per Cent Retention	Galactose Tolerance Gm	Urobilinogen Concentration	Bile Drainage	Palpable Liver	Palpable Spleen	Cholecystogram
B F	5/30 to 10/33 (3½ yrs)	9	0.7-1.0 (1 test 0.4)	Not done	10/32 = 3.0 10/33 = 1.8	1.10	Adequate B catarrh exfoliation	0	0	Normal
J L	9/32 to 10/34 (2 yrs)	27	1.0-3.2	Not done	10/32 = 3.1 1/43 = 4.3 5/33 = 2.5 1/34 = 2.6	1.90	Adequate B catarrh exfoliation	0	0	Not done
M L	7/34 to 6/41 (7 yrs)	9	1.0-1.6	2/38 = 6	10/34 = 1.3	Not done	Adequate B (few cholesterol crystals once 2/38)	Slight	0	Normal
W M	12/31 to 6/33 (6 mos)	10	0.6-1.0 (2 tests 0.5)	Not done	3/32 = 1.7	1.10 to 1.30	Adequate B catarrh exfoliation	Slight	0	Not done
C P	11/33 to 12/38 (5 yrs)	38	0.8-2.6 (1 test 0.4 1 test 4.0)	12/34 = 0 9/36 = 12 12/36 = 0	12/33 = 1.4 3/34 = 0.6	1.90	Adequate B catarrh exfoliation	0	0	Normal
O R	4/32 to 7/33 (1½ mos)	6	0.8-2.0 (1 test 0.4)	Not done	Not done	1.10 to 1.40	Scant B catarrh exfoliation	2 inches below costal margin	0	Slender functioning G B
D C R	3/30 to 5/30 (2 mos) (previous jaundice for 2 yrs)	4	1.3-2.7	3/30 = 5	Not done	1.60 to 1.80	Adequate B catarrh exfoliation	Slight	0	Normal function suspicious negative shadows
A S	3/27 to 5/42 (1½ yrs)	15	0.6-1.6 (2 tests 0.5)	11/8 = 1.7 1/42 = 10	1/30 = 0 2/33 = 1.5	1.90	Adequate B catarrh exfoliation	0	0	Normal
C W	11/33 to 6/34 (7 mos)	21	0.6-1.8 (1 test 0.4 2 tests 0.7)	Not done	1/33 = 2.4 2/34 = 2.0	1.90 to 1.40	Adequate B catarrh exfoliation	0	0	Sluggish

within the normal range. Not 1 of our hyperbilirubinemia cases in either of the duodenal categories has shown any evidence either of definite or of progressive hepatic damage.

3 *Colon Disease*—There were 8 cases in which persistent hyperbilirubinemia obtained in this group with primary colonic disease. The range of serum bilirubin values varied from 0.6 to 1.5 mg. In 7 cases a cholecystogram was obtained which was normal in 4 cases, in 1 case the cholecystogram showed a faint shadow, in 1 case the gallbladder was sluggish and in 1 case there was a slight mottling in the gallbladder shadow. In the last case the collateral clinical and laboratory data did not support a diagnosis of cholelithiasis. Biliary drainage was done in 5 cases and, although at times the recovered material from the duodenum contained some exfoliative debris, no calcium bilirubinate pigment or cholesterol crystals were reported. In 2 instances the liver and splenic edges could be palpated on deep inspiration but there was no great increase in the size of either organ. In 4 cases the bromsulphalein dye retention test was performed, in 3 of which no retention was reported, in 1 case 8 per cent

emia. In 2 of the cases no cholecystograms were recorded, of the remaining 6 cases, 2 showed sluggish gallbladders and in none was there any evidence of cholelithiasis. Biliary drainage was attempted in 4 cases, 3 of which showed some flocculent debris suggesting catarrh, 1 showed giardiasis and in none were either calcium bilirubinate pigment or cholesterol crystals recovered in the duodenal material. The bromsulphalein retention was normal in the 3 cases tested. One case showed urobilinogenuria in the dilution of 1 to 30, the other cases were all reported 1 to 20 or less.

5 *Liver Dysfunction Group*—There were 9 cases in the liver dysfunction group with persistent hyperbilirubinemia, all of which might be segregated under the heading of chronic cholangitis. In these cases we were dealing with certain intangibles in which persistent hyperbilirubinemia was the only common finding. In table 6 the essential data are tabulated. Attention is directed to the length of the periods of observation, in one instance fifteen years. The serum bilirubin values in each case appear to range within definite limits without wide variations. The values for brom-

sulphalein retention do not indicate extensive liver damage. The urobilinogen figures are not indicative of any progressive hepatic disease. The bile drainages universally showed evidence of biliary catarrh and exfoliation, similar to those which B. B. Vincent Lyon<sup>3</sup> attributes to cholangitis of varying degree. In no instance was the spleen palpable and in only 1 case was the lower margin of the liver easily felt. The cholecystograms were variable but in general indicated adequate gall-bladder function. In 1 case the roentgenologist was unwilling to exclude cholelithiasis, however, the other clinical and laboratory evidence failed to support a diagnosis of calculus disease.

#### COMMENT

A survey of the foregoing material suggests the following:

1 Hyperbilirubinemia of moderate degree is frequently encountered in gastrointestinal patients.

2 The most obvious cause of hyperbilirubinemia is obstructive jaundice.

3 In cases in which obstructive lesions of the biliary system can be excluded, one must search for other factors which might give rise to jaundice.

4 There exists a small group of cases with idiopathic persistent hyperbilirubinemia lasting, in some instances, over a period of years, in the absence of obvious etiologic factors.

5 In our series there were no instances of pronounced delayed hepatic changes associated with persistent hyperbilirubinemia.

Some of the limitations of the value and validity of the observations recorded in the presentation might be noted:

1 Of 3,788 cases studied, serum bilirubin determinations were made in 48.9 per cent. The clinical suspicion that some serum bilirubin abnormality might be present in only approximately one half of our cases immediately introduces a large variable. A similar series of 3,788 cases in each of which a serum bilirubin determination was made would offer more accurate data. Serum bilirubin determinations on a similarly large group of normal persons would offer still more evidence on the range of values in normal persons.

2 The number of cases in which repeated serum bilirubin determinations were made is too small to offer any valid data concerning the range of normal values in any given group of patients.

3 Careful studies by other investigators on the range of normal serum bilirubin values indicate variations due to certain technical difficulties with the test itself. The relation of concentrations of serum bilirubin to serum proteins introduces a large variable. Mindful of these limitations, we believed that a review of our experience with the test as performed in private practice might prove of some value. Apparently abnormal serum bilirubin values occur frequently in the routine study of office patients. The clinician must assume the responsibility either of ignoring such values or of attempting to determine their etiology.

#### CONCLUSIONS

1 Hyperbilirubinemia may be due to obstructive jaundice, hemolytic jaundice, toxic hepatocellular disease and incipient liver-spleen disease. In a small group of cases idiopathic hyperbilirubinemia must be considered.

2 A review was made of 1,835 cases in which one or more serum bilirubin determinations were recorded.

3 Serum bilirubin values in excess of 0.5 mg per hundred cubic centimeters of blood were termed hyperbilirubinemia.

4 The distribution of the serum bilirubin determinations indicated that 18.3 per cent of the serum bilirubin values were above 0.5 mg per hundred cubic centimeters.

5 The distribution of the hyperbilirubinemia values was determined in our cases of duodenal ulcer, irritable duodenum, colon disease, miscellaneous disease, liver dysfunction and obstructive jaundice.

6 Further consideration of the clinical and laboratory data in association with persistent hyperbilirubinemia indicates that in a small group of cases followed over a period of years mild hyperbilirubinemia obtains in the absence of hematologic or obvious progressive hepatic disease.

### THE CLINICAL PREVENTION AND DIAGNOSIS OF LIVER DYSFUNCTION

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Liver disease and liver dysfunction are becoming increasingly prevalent. It is now known that any chronically deficient diet may lead eventually to liver disease.

The American dietary is reported deficient in the vitamin B complex. One might assume that the recent enthusiasm for the intake of concentrated vitamin preparations might have counteracted this. However, two factors have nullified to a large extent the possible beneficial effect of increased vitamin intake. 1 Concentrated vitamin preparations are relatively expensive, and those who can afford to take them get an adequate amount in their diet, anyway. 2 A large proportion of commercial preparations do not contain the whole vitamin B complex—are apt to be rich in thiamine and nicotinic acid but poor in the other factors. There is some evidence to show that this disproportion can do harm as well as good. The desire for "slyphlike" figures has undoubtedly induced lowering of the carbohydrate intake. Man has enough carbohydrates or sugars in reserve to last only about one-half day. A certain amount of carbohydrate is essential in the diet if one is to avoid abnormal use of body fat. The hyperlipemia brought about by deficient carbohydrate intake leads to deposition of fat in the liver, producing fatty cirrhosis. Therefore, not only is the glycogen reserve of the liver depleted but the fatty replacement impairs normal liver function. Since an important function of the liver is detoxicating, toxic substances passing into it from the digestive tract may damage it further, owing to lowered local tissue resistance. These substances may even pass into the general circulation, where in turn they set up tissue changes which interfere with normal metabolism and may even lead to retrogressive changes. One may postulate that some of the noninfective types of arthritis may be related to this pathologic function.

From the Medical Department of Michael Reese Hospital and the Medical Department of the University of Illinois College of Medicine. Read before the joint meeting of the Section on Pathology and Physiology and the Section on Gastroenterology and Proctology at the Ninety-Third Annual Session of the American Medical Association, Atlantic City, N. J., June 12, 1942.

<sup>3</sup> Lyon, B. B. V. Nonsurgical Drainage of the Gall Tract. Philadelphia: Lea & Febiger, 1923.

The coexistence of gallbladder disease and hepatitis forms another interesting situation. Many physicians believe that cholecystitis and cholelithiasis produce liver damage which may reach an advanced degree. This is especially true in persons who have acute episodes of suppurative gallbladder disease repeated at intervals.

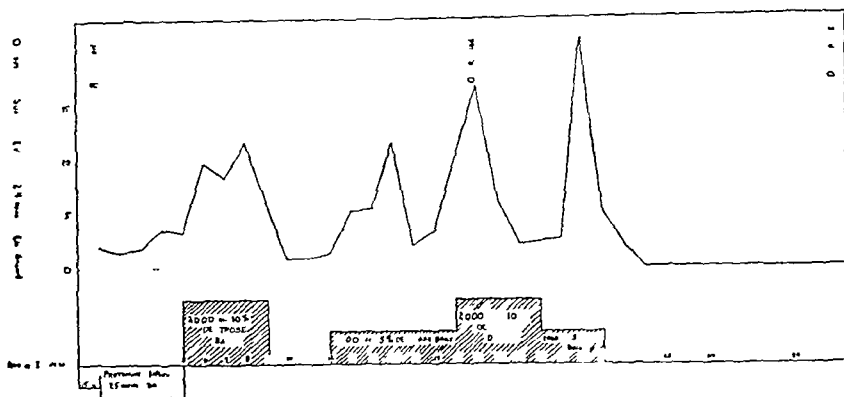


Fig. 1—Effect of cholecystectomy on the daily urinary sugar output by a patient with hepatic damage and glycosuria who had received insulin at the outset and intravenous dextrose without insulin later.

Therefore, unless there is a definite contraindication which may add to the morbidity and mortality associated with surgical intervention, it may be wise to remove a calculous gallbladder to prevent liver damage. Certainly, when there is little surgical risk, I can see no good reason for failure to remove a pathologic gallbladder. In addition, the subgastric acidity and achlorhydria that may develop without operation lead to a lowering of the bactericidal activity of the gastric juice. This may promote the development of flora in the upper part of the jejunum and duodenum which may be a factor in ascending infections to the liver and lead to additional liver damage. Therefore, more accurate evaluation of disease of the gallbladder may be an important factor in removing a source of continued liver damage and allow the normal reparative processes of this organ to go on unhampered.

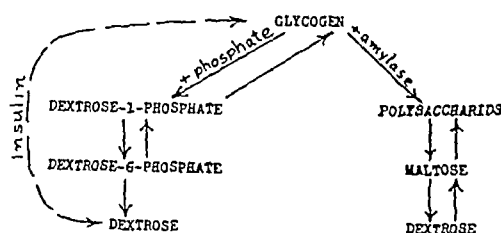
The effect of various diets on liver damage has recently been investigated by Earle<sup>1</sup> and others. They found that feeding rats a diet containing 10 per cent cystine leads rapidly to portal necrosis and hemorrhage and that prolonging such feeding produces cirrhosis of the liver. The type of diet definitely modified the mortality rate and the character of the lesion. Diets high in fat increased the severity of hepatic damage, while diets high in carbohydrate and protein and low in fat increased the number of mitotic figures indicating regeneration. Similarly, Gyorgy<sup>2</sup> concluded that hepatic injury and fatty infiltration are definitely determined by dietary factors. He found that the addition of thiamine and riboflavin to the diet is of value in reducing the incidence of hepatic damage and that a diet low in casein and moderate to high in fat regularly induces hepatic injury after one hundred to one hundred and fifty days. The use of choline seemed to reduce the incidence of hepatic damage, and the addition of yeast was even more effective in preventing liver injury.

One should not look too lightly on jaundice and hepatitis in its incipient stage and pass it off as a supposed "catarrhal jaundice." Too often the disease may pass beyond clinical control and serious or fatal damage occur.

## DIAGNOSIS

Liver dysfunction may be exceedingly difficult to diagnose and in many cases is masked by other clinical syndromes. The loss of appetite, morning nausea, biliousness, constipation, sudden attacks of or prolonged weakness on the least exertion, a tendency to perspire easily, loss of weight, sallow complexion, furred tongue, headaches and vertigo were known to older clinicians as evidences of liver disease. Today the newer knowledge of liver function may establish scientific criteria for old clinical truisms. Jaundice may be below the level for objective clinical manifestations and demonstrable only by serum bilirubin tests. Blood studies usually reveal an increased amount of serum bilirubin (latent jaundice). Liver function tests are discussed elsewhere in this symposium, but the most accurate tests may be negative in the presence of liver disease or one may be positive while others give results within normal limits.

I should like to call attention to one form of liver disease that is not commonly recognized. Until a better name is given, it might be called the "cholecystohepato-hyperglycemic and glycosuric syndrome." This is seen after treatment over long periods for true diabetes. The clinical picture is striking. Usually there is a long-standing history of gallbladder disease, interspersed in most cases with attacks of acute or subacute suppurative cholecystitis. Usually the gallbladder is not visualized. The sugar tolerance is not that of true diabetes but is more like that of liver damage. The urine contains sugar. Ketone bodies are not present and, as a rule, the physician makes a diagnosis of diabetes mellitus. Rarely if ever are there attacks of diabetic acidosis. The patient is usually given insulin even large doses of protamine zinc insulin, with a presumed diabetic diet. In spite of this supposed adequate control



Glycogen breakdown in normal liver (phosphorylation by means of enzymes). Insulin most probably acts in this system.

Amylase breakdown of glycogen in "toxic" liver. Insulin does not act in this system. Dextrose, however, can inhibit the breakdown by mass action.

Fig. 2—Diagram of the breakdown in the liver of glycogen to sugar (glycogenolysis) which is faster than its storage (glycogenesis).

the urine continues to show sugar. Blood studies may reveal high values, even as high as 250 mg per hundred cubic centimeters, depending on the age of the patient and the duration of the disease. This was seen in 1 of the 6 cases that I observed.

## REPORT OF CASE

Mrs. A. S., aged 66, entered the hospital April 22, 1940 with an immediate complaint of a more or less constant dull ache in the right upper quadrant of the abdomen for the previous

<sup>1</sup> Earle V. J. J. Exper. Med. 75: 179-189 (Feb.) 1942.  
<sup>2</sup> Gyorgy, Paul and Goldblatt, Harry. J. Exper. Med. 75: 355-368 (April) 1942.

two weeks radiating to the left upper quadrant as well as in the opposite direction and into the back. She vomited several times. This subsided after limitation of her diet. She had lost 5 to 6 pounds (2.3 to 2.7 Kg.) recently. She had been constipated but noted no change in the color of her stools. She had been treated for many years for diabetes. Twenty years before she had had a presumed cholecystectomy. She had seven children and had ceased menstruating twenty years before. The rest of her history was not significant.

The patient looked her age on physical examination. Her blood pressure was 150 systolic and 70 diastolic, her temperature 99.2 F, her pulse rate 90 and her respiratory rate 20. There was no scleral icterus. The mouth was edentulous but otherwise normal. Aside from a systolic murmur at the base, the heart showed no unusual changes. The lungs showed evidence of moderate emphysema. There was an ancient scar in the right upper quadrant of the abdomen, exquisite tenderness was present in this region and a large mass was felt here apparently connected with the liver, and this was also tender. The spleen was barely palpable.

The clinical diagnosis was recurring gallbladder disease in a patient who presumably had had a cholecystectomy twenty years before.

Wassermann and Kahn reactions of the blood were negative. The blood count showed erythrocytes 4,380,000, hemoglobin content 70 per cent (Sahli) and leukocytes 21,000, with a differential count of neutrophils 82 (stab cells 16 and segmental forms 66), 1 eosinophil, 15 monocytes and 2 transitional cells. Blood chemical analysis showed 244 mg of sugar, 64 mg of nonprotein nitrogen and 14 mg of creatinine per hundred cubic centimeters. The icteric index was 5. Total cholesterol was 193 esters 94 and free cholesterol 99 (47 per cent esters).

The feces were brown and soft with no occult blood. The urine showed no albumin, there were occasional white cells and 0.2 per cent sugar (total for twenty-four hours, 2 Gm.). The flat film revealed a large gallbladder containing multiple radiolucent stones.

The patient had been receiving from 15 to 25 units of protamine zinc insulin daily for five days in the hospital previous to my seeing her.

I was curious about the abdominal mass so I immersed the patient in a tub of warm water to relax the abdomen. At this time the mass was found to be definitely connected with the liver and was either a firm enlarged gallbladder or Riedl's lobe.

The clinical picture resembled that of recurring suppurative cholecystitis with liver damage, and I therefore advised immediate cessation of insulin therapy. The diet was kept at 200 Gm of carbohydrate, 50 Gm of fat and 75 Gm of protein (her weight was 50 Kg.). She was then given daily 200 Gm of 10 per cent dextrose in water intravenously. While the urinary sugar output definitely increased (shown in the table), ketone bodies were not present in the urine and even with the large amount of intravenous dextrose a gradual reduction occurred in the amount of sugar spilled over into the urine. The level of the blood sugar also eventually came down sharply, in spite of intravenous administration.

Fourteen days after this therapy was instituted the patient was considered to be in good enough condition for surgical operation. An empyema of the gallbladder with multiple stones, multiple adhesions of the gallbladder to the hepatic flexure, transverse colon, duodenum and omentum, and a dilated common duct were seen. Cholecystectomy with exploration of the common duct was performed, but there were no stones in the duct. Recovery was uneventful and finally, with the same diet and without insulin, sugar was not spilled in the urine after the intravenous dextrose was discontinued. This is illustrated in figure 1 and the accompanying table.

#### COMMENT

Other patients subjected to cholecystectomy showed essentially the same clinical picture. The best explanation of what is going on in the liver is brought out in figure 2. The breakdown in the liver of glycogen to sugar (glycogenolysis) is faster than its storage (glycogenesis).

Since insulin further depletes the storage of glycogen by the liver, owing to its deposition of sugar in muscle tissue, it increases the glycogenolytic process in the liver. The liver is further damaged when its protective mechanism of glycogen reserve is lowered. The hyperglycemia induced by the intravenous dextrose therapy prevents the rapid glycogenolytic manifestation. The process is reversed, the liver therefore stores more

#### Clinical Course of Patient with Hepatic Damage and Glycosuria\*

Date	24 Hr Urine Output Gm	Sugar per Cent	Sugar Gm	Protamine Zinc Insulin Units	Blood Sugar	Liver Function, Cholesterol Esters per Cent	Comment
8/22†	1020	0.20	2.0	15	244	0	
8/23	720	0.20	1.44	25	0	47	
8/24	900	0.20	1.8	25	0	0	
8/25	900	0.40	3.6	25	0	0	
8/26	1020	0.20	2.04	25	0	0	
8/27	1920	0.00	0.0	0	0	0	2000 cc of 10% dextrose in saline solution
8/28	2880	0.30	8.4	0	0	0	2000 cc of 10% dextrose
8/29	2880	0.40	11.5	0	0	0	2000 cc of 10% dextrose intravenously
8/30	3360	1.20	40.3	0	250	0	2000 cc of 10% dextrose intravenously
8/31	960	<0.10	<0.90	0	0	74	Intravenous dextrose omitted
9/1	480	0.20	0.96	0	0	0	Intravenous dextrose omitted
9/2	600	0.20	1.2	0	0	0	Intravenous dextrose omitted
9/3	1320	0.40	5.2	0	193	0	1000 cc of 5% dextrose intravenously
9/4	1320	0.40	5.4	0	0	0	1000 cc of 5% dextrose intravenously
9/5	1920	0.60	11.5	0	0	0	1000 cc of 5% dextrose intravenously
9/6	2340	<0.10	<2.0	0	172	0	1000 cc of 5% dextrose intravenously
9/7	1020	0.20	3.20	0	0	0	1000 cc of 5% dextrose intravenously
9/8	2210	0	0	0	0	0	1000 cc of 5% dextrose
9/9	2400	0.7	16.8	0	0	0	2000 cc of 5% dextrose cholecystectomy
9/10	1560	0.4	6.20	0	0	0	2000 cc of 5% dextrose
9/11	1140	0.2	2.2	0	0	0	2000 cc of 5% dextrose
9/12	780	0	0	0	0	0	2000 cc of 5% dextrose
9/13	1260	0.2	2.5	0	0	0	1000 cc of 5% dextrose
9/14	3150	0.7	20.0	0	0	0	1000 cc of 5% dextrose
9/15	960	0.5	5.00	0	0	0	1000 cc of 5% dextrose
9/16	960	0.2	2.00	0	0	0	Intravenous dextrose discontinued
9/17	480	<0.1	0	0	0	0	
9/18	930	0	0	0	0	0	
9/19	600	0	0	0	0	0	
9/20	600	0	0	0	0	0	
9/21	600	0	0	0	0	0	
9/22	600	0	0	0	0	0	
9/23	300	0	0	0	0	0	
9/24	540	0	0	0	0	0	
9/25	360	0	0	0	0	0	
9/26	1140	0	0	0	0	0	

\* The patient throughout the period was on a 1500 calory diet

† Admission

glycogen, the blood sugar level during fasting is lowered, the urinary sugar disappears and no evidence of "diabetes" other than the elevated blood sugar level if that could be called evidence, remains. In some cases with the improvement in the storage of glycogen other liver function returns nearly to normal the blood sugar level returns nearly to normal and no urinary sugar is ever present after cholecystectomy, in spite of continuing the diet used before, with no insulin used at any time in the period studied.

This series of cases serves to emphasize apparently unrecognized liver dysfunction treated as diabetes. The

accurate scientific evaluation of this symptom complex and subsequent cholecystectomy substitute a life of well-being for one of invalidism and continued medical care.

The liver may be a factor in many obscure metabolic phenomena, and more investigations and studies should be directed along these lines.

104 South Michigan Avenue

## THE CONCEPT OF LIVER DEATHS

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In 1922 following a rather prolonged period of clinical observation it became evident that there were certain types of mortality that followed operations on the external biliary system.<sup>1</sup> There were three types of death that followed gallbladder surgery. Later these findings were more formally presented as follows:

**GROUP 1**—Liver deaths associated with hyperpyrexia and coma. Death ensues in eighteen to thirty-six hours.

The first group is composed of patients who have had a comparatively simple gallbladder operation. The patients were usually obese and gave a history of chronic gallbladder disease. Preoperative study did not reveal any contraindication to surgical intervention. Following cholecystectomy the recovery from the anesthesia was slow, in fact, the patient never did emerge fully from the anesthesia. In four to six hours after the return to the ward the patient was in a semicomatose state that passed rapidly into stupor and coma, with a rapidly ascending temperature to 105-106 F.

**GROUP 2**—Liver deaths associated with a constantly diminishing jaundice and the secondary development of stupor and coma, the final clinical picture similar to a "cholemic death" in cirrhosis of the liver.

The second group is essentially different in its clinical manifestation. The patients have had a chronic, severe type of biliary duct infection with obstructive jaundice and usually have had a previous cholecystectomy. The common duct obstruction has been relieved by drainage of the common duct and the postoperative condition of the patient has been somewhat but not completely satisfactory. After a variable period four to seven days, the patient falls into a stupor, oliguria develops and the patient dies in coma with hyperpyrexia.

**GROUP 3**—Liver deaths associated with and complicated by a secondary renal degeneration of severe degree.

The third group lacked two essential clinical features of the first two groups. There was an absence of the hyperpyrexia and coma. The patients within this group have had a chronic, severe type of gallbladder and duct disease. Forty-eight hours after operation there was a distinct vasomotor collapse and a continuous and increasing degree of oliguria, with a pronounced elevation of the nonprotein nitrogen. Anuria finally dominated the clinical picture, with death. This third group embraces the dual caption of hepaticorenal syndrome.

It was realized at that time that there was no authoritative foundation for these clinical syndromes except

that based on clinical observation. The following factors, however, were apparent: 1 Postmortem examinations uniformly revealed no adequate cause for death except such associated changes as were incident to the age of the patient. 2 Most of these patients had a relatively good body chemistry before operation and nearly all of them had had adequate preliminary preoperative laboratory studies which indicated that there was no basic defect in kidney function. 3 This group of patients were gravely ill and the majority of them died. 4 All of these patients developed major renal complications if they survived long enough. Group 3 always developed varying degrees of oliguria which preceded the final development of an almost complete anuria. 5 The clinical status of the patients exhibited all gradients of severity. 6 The hyperpyrexia group invariably died in coma as the result of a fulminating toxic process. 7 The ultimate mechanism of death, I believed, was a chemical disturbance within the liver. In my earlier experience the type of mortality under discussion was confined entirely to patients who were operated on for disease of the gallbladder or biliary tract, and the phrase "liver deaths" was coined to express this concept.

In an evolutionary sense the liver is, with the exception of the primitive gastrointestinal tube, the oldest physiologic organ. The liver is able to protect itself and does so continuously from almost every type of intoxication whether introduced through the gastrointestinal tract or distributed through the vascular system. In some way or other the liver is concerned with practically every function in the body. It is an interesting and arresting thought that this organ, which under the ordinary conditions of life is so adequately endowed for the protection of the organism, fails if and when it must combat the by-products of the degeneration of its own cells. The mechanism that the liver exercises for the protection of the body apparently fails when the toxins are of hepatic origin. The condition undoubtedly has its origin in the degeneration of individual liver cells. If the process is acute, fulminating, there is a very early death with hyperpyrexia and coma—"liver death." If the process is less severe and the elaboration of the hepatic toxins less rapid, the patient survives until the secondary effects of this toxin are manifest in destruction of renal parenchyma with the clinical picture of oliguria, progressing to anuria, hence the associated mechanism of liver-renal damage—the hepaticorenal syndrome.

On a few occasions it has been noted that in crushing injuries of the liver there was a clinical picture of hyperpyrexia with coma and death. The importance of this fact was not recognized or given emphasis until 1927, when a case was reported of a young woman who had a grave injury to her liver following an automobile accident.<sup>2</sup> This was followed by hyperpyrexia within the first twenty-four hours and death. Postmortem examination revealed that the cause of death could not have been hemorrhage and that there was a traumatic necrosis of liver tissue with a high degree of parenchymatous degeneration of the cortex of the kidneys—hepaticorenal syndrome.

Another very interesting observation was the degree of liver damage associated with intra-abdominal infec-

Read before the joint meeting of the Section on Pathology and Physiology and the Section on Gastro-Enterology and Proctology at the Ninety Third Annual Session of the American Medical Association Atlantic City, N. J. June 12, 1942.

<sup>1</sup> Heyd, C. G. Hepatitis Associated with or Sequential to Inflammatory Diseases of the Abdomen. *Long Island M. J.* 17: 17-21 (Jan) 1923.

<sup>2</sup> Heyd, C. G. Liver Deaths in Surgery of the Gallbladder. *J. A. M. A.* 97: 1847-1848 (Dec. 19) 1931.

<sup>3</sup> Furtwaengler, A. Diffuse Rindennekrose beider Nieren nach Leberruptur (Ein Beitrag zu den angioastischen Krankheitsbildern in der Chirurgie). *Krankheitsforschung* 4: 349-374 (June) 1927.



tions<sup>4</sup> The mechanism of liver damage was by either the portal system or the intrahepatic bile canalicula and in patients presenting any degree of such liver damage there was almost always an associated change in the capsule of Glisson with the lying down of fibrous tissues capable of being demonstrated as white opaque areas over any or all portions of the liver, more particularly in the area extending out from the gallbladder fossa

Significant experimental work was done by Boyce,<sup>5</sup> who prepared various emulsions of liver tissue from patients dying of this complication, he demonstrated that alcoholic extracts of such liver tissue when injected into dogs did not produce the complication and aside from some slight indispositions in his animals no bad results obtained on the contrary, when an aqueous solution was injected into animals parenchymatous degeneration of liver cells with similar changes in the convoluted tubules of the kidney was found This picture in the experimental animals exactly simulates the picture obtained post mortem in patients who die of the hepatorenal syndrome

It is also interesting that clinical pictures identical with those originally described have been reported as arising with or without surgery and in conditions other than those associated with operations on the biliary apparatus It is also advanced by competent observers that the basic mechanism in these liver deaths is a fulminating overwhelming infection Careful examination of the evidence submitted by the proponents of this idea fails to carry with it sufficient reasonableness as to make it acceptable

Gross traumatic necrosis of liver cells or some unknown mechanism of injury of liver cells may produce an extremely powerful toxin as the result of necrosis of liver cells, and this in turn exercises a specific effect on all parenchymatous tissue and more particularly on the epithelium of the convoluted tubules The toxin, if such it is, does not arise per se in the kidney but arises in the liver and the renal sequelae are the end result effected by the excretion of foreign protein

In group 1 the patients who died in eighteen to twenty-four hours with hyperpyrexia and coma did so because of an overwhelming toxemia and they did not live long enough to develop what I believe to be the inevitable secondary renal changes The persons in the other two groups were able to sustain life for a longer period than in group 1 with the result that on autopsy they invariably exhibited the secondary changes in the renal tubules in the form of cloudy swelling and necrosis It is this peculiar chemical sequence that gives rise to the hypothesis that while the liver has the most extraordinary ability to protect the organism from injury arising from the gastrointestinal tract, through the portal circulation, or from injury coming to it via the systemic circulation, it does not have the same ability to protect itself from necrosis of its own liver cells, and the absorption of the by-products of liver necrosis will lead to death in a relatively short time with hyperpyrexia and coma or a death of later sequence when liver degeneration is associated with degeneration of the kidney

116 East Fifty-Third Street

<sup>4</sup> Heyd C G The Liver and Its Relation to Chronic Abdominal Infection Ann Surg 79 5578 (Jan) 1924 Heyd C G Killian J A and MacNair W J The Liver and Its Relation to Chronic Abdominal Infection Beaumont Foundation Lecture St Louis C V Mosby Company 1924  
<sup>5</sup> Boyce I F The Role of the Liver in Surgery Springfield Ill Charles C Thomas Publisher 1941

## ABSTRACT OF DISCUSSION

ON PAPERS OF DR MANN, DR MATTER, BALTZ, MAKION  
AND MACMILLAN, DRs JOHNSON AND BOCKUS,  
DR FORTIS AND DR HIRSH

DR CHESTER M JONES, Boston If Dr Mann's observations can be transferred from animal experimentation to human beings, the fact of selective diversion of material from the portal stream in various types of liver is of extreme importance, and it may help to explain the fact that the oral tests of liver function differ distinctly from the results obtained when material is given intravenously It is quite possible that comparative values between two such methods will be of real help Dr Mann implied the wisdom of putting the liver under strain either by exercise or by the intake of food in order to obtain the most definitive results in covering the function The factor of safety of this organ is so great, it is perfectly obvious in minor changes that no liver function test gives any information, but if one puts extra strain on the organ the minor differences may be brought out The insistence of Dr Matter and his collaborators on finding normal figures cannot be overemphasized The fact that there are wide variations within the normal has been too generally overlooked Drs Johnson and Bockus say that 0.5 mg of bilirubin per hundred cubic centimeters may not represent an abnormal figure Certainly it is unwise to carry out too fine distinctions when minor differences may well fall within normal limits Liver function tests are not diagnostic, they are not yet delicate enough Their chief value is that they confirm a clinical diagnosis or determine progress The surgeons are using large amounts of sulfonamide compounds intraperitoneally, and no doubt the rapid absorption of these through the portal system at times produces serious liver damage, which may complicate the operation for which the patient came One effect is a dangerous prolongation of the prothrombin time In some cases there is jaundice in addition When the portal blood flow is interfered with either by fibrosis, as occurs in cirrhosis, or by other conditions in which the liver is damaged, the powers of repair are damaged Because of interference with portal blood flow, ascites may develop This is not the case and I think it should be stressed definitely that ascites is an evidence of liver failure rather than of increased portal blood pressure and is due fundamentally to hypoproteinemia

DR J P SIMONDS, Chicago Dr Mann's approach to the study of the liver through the door of morphology is interesting and significant It should be borne in mind that the liver and every organ in the body perform their functions through the medium of a specific structural pattern Morphology, or structure, is therefore the foundation for a complete study of the effects of disease on any organ The structural modification induced in any organ by disease will obviously influence its function The functional disturbances that accompany disease can be adequately understood only if they are studied in connection with the characteristic structural changes Amiebic abscesses of the liver are far more common in the right than in the left lobe of this organ On numerous occasions I have observed atrophy of the left lobe of the liver particularly the portion of it that lies to the left of the falciform ligament It would be interesting to know whether there is any relation between this localized atrophy and the streamlining of the circulation through the liver Dr Matter and his collaborators have rightly emphasized the need of more reliable standards for tests of hepatic function Dr Mann not only has made clear the reason why standards need to be revised but also has furnished the reason for variation in results of such tests when the test material is given in different ways It is significant also that in a paper now in press Hepke and Gurley have shown that there is a close correlation (correlation coefficient as high as 0.875) between the weight of the patient and the quantity of benzoic acid excreted as hippuric acid In this test there is no rigidly fixed standard, but results for any patient must be evaluated in connection with his weight

DR HENRY A RAISKY, New York Abnormal liver function tests in persons below 60 years of age may be normal for persons above this age range The age factor should be taken into account Dr Newman and I have made a study of various

**Liver function tests** We studied the cholesterol partition, cephalin flocculin tests, bromsulphalein and oral and intravenous hippuric acid tests in a group of so called normal persons above 60 years of age. In nearly all of the subjects thus far studied at least one test was positive. In reference to Dr. Portis's mention of vitamin B<sub>12</sub>, we found porphyrinuria comparatively frequently in these persons of normal age. A woman of 53 gave a history of having consumed much alcohol for many years, loss of weight and intestinal bleeding. The liver was enlarged and the hemoglobin was 57 per cent. Cancer of the intestinal tract was ruled out. On proctoscopic examination, with the instrument inserted to a depth of 6 inches, varicosities were noted. This finding is not often emphasized as confirmatory evidence of the presence of cirrhosis of the liver. These varicosities in conjunction with the clinical and laboratory data, made the diagnosis of cirrhosis of the liver a certainty. This simple diagnostic procedure might be helpful in suspected cases of cirrhosis especially when they do not present a typical textbook picture.

**DR. MOSES PAULSON, Baltimore** The interpretation of abnormal liver function tests in nonsurgical patients without jaundice and without clinical evidence of liver disease as indicative of early or occult hepatic disturbances of clinical significance should be accepted with great caution. Under the conditions set forth the tests themselves are open to question. Controls—with one exception by Mateer—have been done with single, not with multiple, tests and chiefly in the young, almost always, in suspected disease. Multiple tests are employed and usually in older persons. When in the control study using multiple tests Mateer encountered unexpected hepatic dysfunction, he discounted such results as being falsely positive because of too sensitive tests. This may or may not be so. Occult hepatic dysfunction or subclinical hepatitis as indicated by abnormal liver function tests have been reported in peptic ulcer, rheumatoid arthritis, skin disorders, neuroses and psychoses. Wyler and I have found that more than 64 per cent of those with dyspepsia without historical cause for liver disease had hepatic dysfunction by at least one of two or more tests used. I used to think that abnormal tests were significant under these conditions, indicating occult hepatic dysfunction of subclinical hepatitis, until this study was completed. When we consider this widespread evidence of liver dysfunction as determined by tests and compare it with the relative infrequency of clinical hepatitis or cirrhosis, several questions arise. Do the tests actually measure liver dysfunction under the circumstances referred to? Are not some of the tests already too sensitive? If the tests actually measure liver dysfunction, does it not seem that such information is not of great import in view of what rarely happens, namely liver disturbance of clinical significance? What has been said is not to be confounded either with tests used in confirmation of clinically evident liver disease or to determine its progression or regression or in the differential diagnosis of jaundice.

**DR. JOHN G. MATEER, Detroit** Most of our normal control individuals, studied with the various newer liver function tests, ranged between 25 and 35 years of age. There were a few persons included in this normal group who were between 35 and 45 years. I am not surprised that Dr. Rafsky found a tendency toward the development of positive liver function tests in elderly persons involving at least some functional impairment of the liver, since other organs and organic systems also tend to deviate from normal in elderly persons. The all important point to emphasize regarding liver function tests is that they should be interpreted properly. We believe that they should always be interpreted only in relation to the clinical, x-ray and other laboratory findings if a reasonably accurate total diagnosis is to be attained. We also believe that, in the determination of the normal standard for any test by the study of normal control individuals, one should be conservative and allow a margin in drawing the line of demarcation between normal and abnormal. We do feel that there is a practical advantage in determining the lesser degrees of impaired liver function, which are not associated with permanent, serious and persistent liver disease. One of the best illustrations of this point is found in the gallstone cases referred to in our paper. It is certainly an advantage to know before operation which of these cases present

impairment of liver function, so that the benefit of special preparation for operation may be given.

**DR. THOMAS A. JOHNSON, Philadelphia** We anticipated Dr. Jones's thought about the matter of the level of serum bilirubin which we accepted as representing hyperbilirubinemia. I should go further and say that the van den Bergh reaction is entirely unreliable in that range and that photoelectric cell determinations of direct serum bilirubin are more accurate.

**DR. SIDNEY A. PORTIS, Chicago** Dr. Mann's discussion regarding the repair of liver damage taking place through the arterial rather than the portal system supports the contentions of those who maintain that intravenous therapy is far superior to that given by mouth. This is especially true in disturbances of glycogen metabolism. One cannot get sufficient concentration in the portal vein at any one time to be of benefit in liver damage, while the hyperglycemia produced by intravenous dextrose is sufficiently high to spill over the increased threshold to nourish the liver cell. The series of patients that I have presented have been treated for a long period of years as diabetic, with insulin and diet, and still could never be made sugar free. A more careful evaluation of these patients revealed that we were dealing with liver damage manifested by increased amylolytic activity in the liver cell which was caused by disease of the gallbladder. Therefore the withdrawal of insulin, the giving of intravenous dextrose and subsequent cholecystectomy brought about a return to near normal in their sugar metabolism. I agree with Dr. Jones and have seen some untoward reactions from the indiscriminate use of sulfonamide compounds. I should like to call Dr. Paulson's attention to the fact that we are not dealing with end results but with subclinical disease, and we hope by these manifestations and tests to prognosticate what might later happen to a patient. Many patients with obscure gastrointestinal symptoms may have occult liver disease without noteworthy objective findings. We should investigate the possibility of hepatitis, and treatment should be instituted long before outspoken liver disease has developed in order to prevent irreparable damage.

**DR. DWIGHT L. WILBUR, San Francisco** Dr. Jones raised the question of the incidence of parasitism and particularly of infection with liver flukes, among the patients who came under our observation. We found infection in only 1 case, the parasite was *Ascaris lumbricoides*. There are many problems in relation to the geographic distribution of primary carcinoma of the liver and particularly to the frequency of it among Chinese, Japanese, Filipinos and members of the Bantu and certain races of South Africa which remain to be solved and which may give significant information regarding the etiologic or predisposing factors of the disease. Undoubtedly in certain parts of China the high incidence of the disease is due to infection with the liver fluke. In other countries the incidence of parasitism is identical in patients who have primary carcinoma of the liver and those who do not have it. It is not unlikely that in Japan the widespread use of "butter yellow," a dye used to color butter, may account for the high incidence of the disease, for it is well known that in the experimental animal this substance is definitely carcinogenic. The importance of dietary deficiency as a predisposing factor of primary carcinoma of the liver is not clear, but in experimental animals it may be an important factor predisposing to the disease.

**DR. VIRGIL H. MOON, Philadelphia** One feature discussed by Dr. Heyd deserves more emphasis. I too have seen that hepatorenal syndrome, the so-called liver deaths, and have been keenly interested in their mechanism, not as related to liver injury, but as related to another syndrome, that of shock. These patients die with the shock syndrome characteristically manifested clinically, and the characteristic pattern of visceral pathologic changes is seen post mortem. A highly important item is the evidence of renal insufficiency among those patients who lived several days. It is now recognized that shock occurs in varying degrees and with varying severity. Those with shock of maximal degree may die promptly or within twenty-four hours, those with shock of minimal degree may recover, but the intermediate group in which a sublethal degree of shock persists over a period of time regularly manifest progressive renal insufficiency. Observations and studies on this point will be published soon.

## SUBDURAL HEMATOMA AND EFFUSION AS A RESULT OF BLAST INJURIES

SECOND PRELIMINARY REPORT  
DIAGNOSIS BY PSYCHIATRIC EXAMINATION

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In this series of 10 patients with subdural hematoma and effusion due to blast, definite neurologic findings have been infrequent or minimal. As a result, some of the patients had repeatedly been considered to have a "functional" condition, and such diagnoses as "psycho-neurosis," "war neurosis" and "traumatic neurosis" had been made. Several had been classified as having "post-concussional" states.

Should this practice be general, it is evident that many will be medically discharged from the armed services with relatively curable organic lesions. The social aspects of such a situation are extremely important, to say nothing of the damage to the personality, future adjustment and earning power of any such patient. He will be considered as "neurotic" or "shell shocked" and in his disabled condition may well become a public charge. Furthermore, it is probable that prolonged presence of a subdural hematoma or effusion will result in permanent cerebral changes and mental deterioration.

It is therefore imperative that every possible facet in our diagnostic armamentarium be exhausted to rule out the presence of these conditions in patients who have been exposed to blast. In our experience, careful psychiatric examination with the use of specialized psychologic testing has been more successful as an indication for pneumoencephalography than the usual neurologic criteria.

### PSYCHIATRIC EXAMINATION

The clinical picture presented by these organic cases is different qualitatively from psychoneuroses with anxiety hysterical states. In the latter, extreme restlessness, motor activity, subjective tension, nightmares and insomnia are prevalent. Loud noises, sounds of airplane motors and exhaust explosions are "triggers" sending them into profound anxiety. Objectively they may demonstrate signs of sympathetic overstimulation with hyperventilation, tachycardia, vasomotor flushing, dilated pupils and cold, moist and discolored extremities. Intellectual impairment is not present, as demonstrated by various test procedures.

The subdural cases, to the contrary, present one of two syndromes. In the most frequent syndrome, there is rather pronounced retardation in intellectual activity and personality interrelationships. The facies is one of dulness with but little play of facial expression. The emotional tone has the "feel" of dulness or vacuousness. The attention, during the interview, is impaired and the response times are slow. Answers to questions are remarkably barren in description and detail. The whole

approach to life situations, as exemplified by the dynamics of the interview situation, is one of superficiality and attempt to "get by" without complicated mental activity. These patients are not dramatic in their assertions of headaches and other complaints.

The most graphic characterization might be made in the terms of pressure or "push." Patients with subdural lesions are noted for complete lack of push and initiative, whereas patients with an anxiety or traumatic neurosis give the impression of nearly overwhelming pressure. The former may state day after day that they have a headache but register no particular surprise nor make requests for attention when treatment is not given. The contrast of the neurotic with the intensity and demanding air of his complaints, is well known.

The less frequent syndrome occurs in those cases of longer duration and demonstrates the more classic picture usually associated with the organic reaction types. The most striking feature is the impairment of inhibition or restraint producing a euphoric and sometimes facetious air. Motor restlessness with exaggerated mannerisms and gesticulations may be prominent. The emotional tone has the raw "feel" of the organic type with lability and explosiveness. Vasomotor flushing of the face and increased neuromuscular tension can be seen as somatic evidence of quickly stimulated rage reactions. The voice is too loud for the size of the room or for the distance between the examiner and the patient, and laughter is stimulated frequently by the patient's own remarks. The patient may assume unusual liberties in the interview situation, demonstrating poor judgment in interpersonal relationships. Undue productivity, unusual expressions of hostility, self aggrandizement and frequent reminiscences may be part of the lack of restraint.

Definite organic intellectual defects in the form of distractibility, memory failure, perseveration and repetition, circumstantiality and "overparticularization," or too much attention to unimportant details may be present. A mild motor aphasia with hesitation on certain words or with difficulty in repeating test phrases may support the impression of organic brain disease.

### USE OF PSYCHOLOGIC TESTING

The routine means of gross psychologic testing may suffice in many instances particularly when correlated with the clinical picture that has been described. The ability to perform complicated calculations may or may not be impaired and care must be used in adjusting the degree of complication to the original level of intelligence and attainment. The recall of digits forward may not be impaired as several patients who had other prominent organic characteristics were able to return eight digits. The reversing of digits, however, represents a higher order of cerebral activity and is likely to furnish added evidence in favor of an organic syndrome. For instance the recall of eight digits forward and only three in reverse represents an inconsistency. The ability for subtraction of sevens from one hundred serially is but slightly impaired in some cases. The organic element may manifest itself by fatigue, with one or two mistakes near the end of the procedure.

Probably more important than the actual figures obtained on the foregoing testing is a qualitative analysis of the patient's performance. Slow response times, poor powers of concentration and emotional upset with rage reaction when confronted with failure may point toward an organic condition.

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## SPECIALIZED TECHNICS

**Rorschach Test**—The Rorschach studies are as yet incomplete and dilation of this method of diagnosis is planned for the future. However, this technic can be an excellent diagnostic aid in borderline and puzzling cases. A fairly characteristic picture is expected in the "dull" syndrome similar to the findings in intracranial tumors by Harrower-Erickson.<sup>1</sup> In differential diagnosis the anxiety and conversion neuroses are likely to give a typically neurotic performance with color shock, lack of human movement and the predominance of animal movement over human movement. Intellectually production is likely to demonstrate some degree of balance between whole and detail responses. The subdural cases, however, demonstrate a lowered productivity with from eight to fifteen responses predominantly of the popular "easy" whole variety. There is little attention to detail and no particular color shock. A previously well adjusted personality may be suggested by several good human movement and form-color responses. Interpretatively the performance can be characterized as a superficial, rather vague adjustment with little drive toward an analytic survey of the environment. Reduced productivity and originality go along with the lack of initiative and "push" mentioned

Pollack.<sup>6</sup> The vocabulary test gives an estimation of the original intelligence, as this faculty is not readily affected by organic brain disease. The test in abstraction requires not only actual intellectual preservation for success but also attentiveness and some drive for accomplishment.

In this total of 10 cases 9 demonstrated conceptual quotients in the direction of intellectual impairment, as shown in table 1. It will be noticed that only one, patient 9 (J P), attained a conceptual quotient above 100, and analysis of the scores indicates that his whole level of performance, including vocabulary, is impaired. A total mental age of 12.1 is not in keeping with his former level of adjustment and his rating as corporal. The two officers with conceptual quotients of 93 were considered on close analysis to be in the direction of impairment because of extremely superior intellectual backgrounds above their abstraction mental age of 16.5.

Generally from our experience with these and other subdural hematomas not due to blast we are convinced that the Shipley test is more sensitive to pathologic conditions of the frontal lobe. On the basis of normal abstractive ability we have been able to speculate correctly in advance that a pathologic condition did not seriously involve the frontal lobes.

TABLE 1—Results of Tests in Ten Cases

Patient	Diagnosis	Vocab ulary	Abstrac tion	Total	Vocab ulary Mental Age	Abstrac tion Mental Age	Total Mental Age	Conceptual Quo- tient
1 H F H S/c	Bilateral subdural effusion frontotemporal area	20	19	39	11.1	11.0	11.5	85
2 W C C P/c	Bilateral subdural effusion frontotemporal area	32	2	34	17.8	13.6	15.9	76
3 R T C Cpl	Subdural effusion right frontotemporal area		10	43	18.5	10.5	13.7	59
4 R T G P/c	Subdural effusion left temporoparietal area	25	28	60	17.8	15.7	17.1	88
5 H A P F/c	Bilateral subdural effusion frontotemporal area	20	8	28	11.1	9.9	10.9	74
6 C M D S/c	Subdural effusion left frontotemporal area	8	6	14	5	9.4	8.6	7
7 E M P Lt Cmdr	Right subdural hematoma left subdural effusion temporal area	38	30	68	20.2	16.5	18.4	95
8 C S M Lt (J G)	Subdural hematoma left frontotemporal area	24	30	54	18.6	16.5	17.8	95
9 J P Cpl	Bilateral subdural effusion frontotemporal area	17	18	35	11.9	12.1	12.1	104
10 C N G WT 1/c	Subdural hematoma left with ventricular shift	5	24	57	18.7	14.5	16.5	89

before rather than an absolute dearth of ideation as a careful testing of the limits will demonstrate. In those with impairment of restraint, a more classic organic picture may be obtained with gross impairment of abstraction demonstrated although the degree of impairment necessary to produce five or more of Piotrowski's<sup>2</sup> signs of organic brain disease is seldom expected.

SHIPLEY-HARTFORD RETREAT TEST FOR INTELLECTUAL IMPAIRMENT<sup>3</sup>

The most useful single instrument has been the Shipley-Hartford Retreat test for measuring intellectual impairment. The ease of administration, scoring and interpretation make it ideal for the military conditions of limited psychiatric personnel. A corpsman can be trained to administer and score the tests with little loss of time by the medical officer.

A complete description of the test with theoretical considerations and methods of standardization has been published by Shipley,<sup>4</sup> Shipley and Burlingame,<sup>5</sup> and

In the aforementioned cases a comparison of preoperative and postoperative examinations reveals that 4 patients have made complete recovery as gauged by the conceptual quotient, while 1 has improved. Others have been operated on too recently for evaluation.

Some caution must be used in evaluating the significance of pathologic conceptual quotients. It must be certain that the patient has exercised due effort in taking the test. Other conditions in this age group, such as schizophrenia and severe depression often demonstrate a low conceptual quotient but these are usually eliminated easily by clinical study. In differentiating between organic injury and neurotic states there should be no serious discrepancies in the latter between the vocabulary level and the ability to perform abstractions. In cases similar to case 9, in which the impairment is so great that all the scores are very low, a comparison should be made between the mental age level and the previous adjustment, life attainments and education. Such a patient is likely to have other striking abnormalities on psychiatric examination.

## REPORT OF CASES

**CASE 3**—R T C corporal U S M C demonstrates the "dull" syndrome. This patient sustained shrapnel and other wounds from blast injury while in action against the enemy in the Pacific area. He was unconscious for an indefinite period of time and "hazy" for several days. Following improvement from the shrapnel wounds he continued to complain of

1 Harrower-Erickson M R. Personality Changes Accompanying Cerebral Lesions. I. Rorschach Studies of Patients with Cerebral Tumors. Arch Neurol & Psychiat 43 859-890 (May) 1940.

2 Piotrowski Z A. The Rorschach Ink Blot Method in Organic Disturbances of the Central Nervous System. J Nerv & Ment Dis 86 525-537 (Nov) 1937.

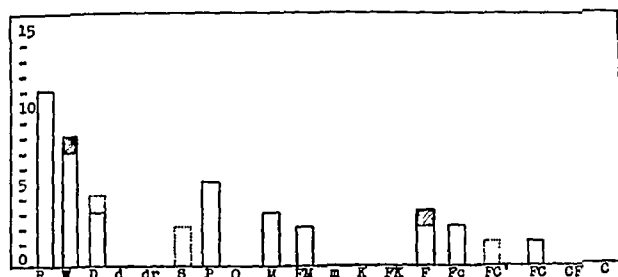
3 Test material furnished by courtesy of the Neuropsychiatric Institute of the Hartford Retreat, Hartford, Conn. Dr C C Burlingame, Director.

4 Shipley W C. A Self Administering Scale for Measuring Intellectual Impairment and Deterioration. J Psychol 9 371-377 (April) 1940.

5 Shipley W C and Burlingame C C. A Convenient Self Administering Scale for Measuring Intellectual Impairment in Psychotics. Am J Psychiat 97 1313-1325 (May) 1941.

6 Pollack Benjamin. The Validity of the Shipley-Hartford Retreat Test for Deterioration. Psychiat Quart 16 119-131 (Jan) 1942.

occipital headaches, dizziness, nervousness and nightmares. Nausea with vomiting was frequent, and a board of medical survey considered that he had a traumatic neurosis. He was therefore transferred back to the continent. Here physical examination demonstrated perforation of the right ear drum and multiple recent scars of high explosive wounds over various portions of the body. The only positive neurologic signs were bilateral nystagmus, a mildly positive Romberg sign and slight dysmetria on the left finger to nose test. On psychiatric



Rorschach psychogram in case 3

examination he presented a facies of dulness with ideational retardation. His attentive powers were impaired. He developed a rage reaction when he found that he could not subtract sevens from one hundred serially. He could return only five digits forward and three in reverse. He attained an intelligence quotient of 98 on the Otis self-administering test, intermediate form A. This, compared with a vocabulary mental age of 182, an abstraction mental age of 102 and a conceptual quotient of 59, indicated a superior original intelligence with definite intellectual impairment.

The Rorschach psychogram is shown in the accompanying chart. The psychogram demonstrates the findings described before with low productivity, slow response time and an over-emphasis of easy and popular whole responses. The personality configuration although barren, is not that of a psychoneurotic condition. Three human movement responses and one form-color response in this setting give evidence of a previously well adjusted personality. Statistically there are only two of Piotrowski's signs of organic deterioration.

Pneumoencephalography revealed a filling defect in the right frontotemporal area with shift of the ventricular system to the left. Craniotomy by means of perforator opening in the right superior temporal area revealed a tense and blue dura. When this was incised, several ounces of old blood and yellow fluid escaped.

He has made an uneventful recovery. A Shipley-Hartford Retreat test performed ten days postoperatively revealed the results shown in table 2.

TABLE 2—Results of Shipley-Hartford Retreat Test in Case 3

	Score	Mental Age Level
Vocabulary	32	178
Abstractions	24	142
Total	56	163

Conceptual quotient 80. This result is still in the direction of impairment but is evidence of improvement.

CASE 8—C S M, lieutenant (j g), U S N R, presented an example of the syndrome described with impairment of restraint. He was rendered unconscious for two hours by the explosion of a ship 100 yards distant, Dec 7 1941. After returning to consciousness he was confused and had a violent headache for several hours. As there was much work to be done, he forgot about his own difficulties and did not report for hospitalization. He experienced a questionable convulsive seizure on April 7 1942 and was given a thorough clinical and laboratory study. Physical and neurologic examinations were negative. One medical officer noted that the patient seemed to be mentally confused. Spinal puncture revealed an initial pressure of 225 mm of water but total protein was

20 mg per hundred cubic centimeters. Roentgenograms of the skull were negative. It was decided that a diagnosis of epilepsy was not justified on the evidence at hand, and the patient was returned to duty. He was again admitted for hospitalization on November 10 following definite convulsive seizures with tonic and clonic convulsions, tongue biting and postseizure confusion and weakness. Neurologic examination was again negative. The diagnosis of epilepsy was established and the patient was transported to this hospital for a pneumoencephalogram.

Here the patient again demonstrated a normal neurologic examination. He was definitely abnormal on psychiatric examination, however, and a positive diagnosis of organic brain syndrome could be made. He displayed pronounced hyperactivity with exaggerated mannerisms and gesticulations. Emotional lability was definite, a basic euphoria being quickly and momentarily replaced by rage reactions and depressions of mood. His restraint and judgment were greatly impaired as demonstrated by his interpersonal relationships during the interview. His voice was too loud and he frequently laughed at his own remarks. Intellectually he was circumstantial and repetitious and demonstrated automatic phrasing. He dwelt on inconsequential reminiscences of his past. He gave a history of increasing impairment of concentration, memory failures and inadequacy in his work as an engineer. He expressed a feeling of insecurity because of his awareness of this inadequacy and general lowering of mental efficiency.

Although his conceptual quotient on the Shipley-Hartford Retreat test was 93, his abstraction mental age of 165 did not conform to his professional and previous university standing in subjects requiring exquisite abstractions. Pneumoencephalograms demonstrated a definite filling defect in the left frontal region. Surgical exploration revealed an old subdural hematoma in that area.

#### COMMENT

It is planned to present a complete clinical and psychiatric study of these and succeeding cases in the future. Follow-up studies will be made as practicable. Electroencephalography will be utilized as a further diagnostic aid when facilities permit.

#### SUMMARY

Early differentiation of subdural hematoma or effusion from psychoneuroses, traumatic neuroses and "postconcussional" states is important individually, socially and economically.

A careful psychiatric examination can demonstrate intellectual impairment in cases of subdural hematoma or effusion despite negative neurologic examination.

Intellectual impairment in blast cases with or without positive neurologic findings is an indication for a pneumoencephalogram.

The Shipley-Hartford Retreat test is an effective instrument in the diagnosis of subdural hematoma or effusion.

**Indigestion in Later Life**—The arteriosclerotic patient has thickened vessels, often hypertension and tardy digestion. The management of this type of indigestion is largely hygienic and dietetic, being calculated to relieve the burden of digestive work. The treatment of such a case would begin with a complete rearrangement of the diet, lessening protein intake and fats, and using foods which are readily digestible. Another type is found in the cardiac individual, particularly of the angina or coronary type, on the one hand and the individual who has defective cardiac function with a tendency to decompensation on the other. These patients suffer from flatulent indigestion and large indigestible meals which embarrass the heart and may produce an attack. Small digestible meals and particularly avoidance of a large liquid intake are the fundamental principles to be followed.—Rehfuß, Martin E. *Indigestion: Its Diagnosis and Management*. Philadelphia: W. B. Saunders Company, 1943.

# ROLE OF THE ANAL GLANDS IN THE PATHOGENESIS OF ANO- RECTAL DISEASE

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Medicine today has come to accept as rational therapeutics the surgical treatment of anorectal disease. This common acceptance of the application of local removal and drainage of diseased tissues in or adjacent to the bowel outlet is not limited to infective processes. One of the common rectal problems from the standpoint of diagnosis and treatment is fistula in ano. Fistulas occur in the various age periods with an increased incidence in adult life. The fact that it is always associated with some degree of abscess formation predetermines the infective nature of this disease process. The tendency of this infective lesion to tunnel through the anorectal tissues, involving adjacent structures and following a multiplicity of patterns with more or less self-limited regional manifestations, but not always communicating with the bowel, stimulated our interest to make a further study of the anatomic background of this problem.

It has been surmised that the system of anal glands somehow acts as a predisposing factor in the production of infectious lesions which develop in the perirectal tissues. It has been presumed that the infection finds its way through the anal wall by way of these glands, however. The nature and extent of this glandular system has not been adequately studied, as shown by a survey of the literature dealing with the problem and of the textbooks concerned with its clinical and therapeutic aspects. Quite obviously, there is no clear conception as to the part played by these glands in anorectal disease. It is our purpose to present in this study the results of our investigation into the embryology and histology of this gland system and to point out the part that it plays in local disease processes.

## REVIEW OF THE LITERATURE

Interest in the existence and function of the anal crypts dates as far back as 1732. At this time Winslow<sup>1</sup> recognized their presence and described them as "semilunar lacunae." About the same time (1738) Astruc<sup>2</sup> in his treatise on fistula in ano refers to the anal crypts as short ducts or lacunae which appear to convey a "viscid humor."

In 1888 Bodenhamer,<sup>3</sup> summarizing the observations of Coats (1841), Gibson (1850) and Gross (1856), described these anal crypts as being foramina and cavities with communicating follicles. These crypts, he claimed, when excited, irritated or chronically inflamed become relaxed, weakened, enlarged and elongated,

thereby losing their contractile power and permitting foreign bodies to enter the pouches, thus favoring production of the disease in question.

It was not until the year 1914 that Franklin Paradise Johnson<sup>4</sup> published his monumental treatise on "The Development of the Rectum in the Human Embryo" and illustrated their structure and location by reconstruction. His studies laid the basis for our present knowledge on this neglected subject. He demonstrated the existence of anal ducts and their glands in the various stages of embryonic development.

More recently, however, Tucker and Hellwig<sup>5</sup> confirmed by examination of diseased tissue removed at operation and by study of embryos of representative vertebrates the constant occurrence of branched tubular ducts as "preformed" structures. These ducts did not seem to be the result of any process of degeneration but were presumed by these investigators to be the vestigial remains of large glands found in the lower animals. They assumed that the crypts of Morgagni were not by themselves responsible for the frequency of anal infection but that infection originated as a rule in preformed tubules which are called anal ducts.

Gordon-Watson and Dodd<sup>6</sup> refer to the anal glands as probably "vestigial" remains which "often lose their connection with the anal glands by obliteration of the ducts during development, and that in some instances when the duct is patent, infection from the anal canal takes place."

The recent observation by Robert Scarborough<sup>7</sup> of a primary carcinoma in the incomplete canalized or "rudimentary" remains of the anal glands served to focus our attention once more on this important problem.

## MATERIALS AND METHODS

A microscopic study was made of the anal canals of 17 subjects: 1 seven month fetus, 5 newborn infants and 11 adults. The tissues from the fetal and newborn subjects were obtained at autopsy, while all specimens from adults were surgical, having been obtained in the course of resections of the colon incident to malignant growths located high in the rectum and sigmoid.

Complete serial sections through the anorectal region were prepared on specimens taken from 2 of the newborn infants, and from 1 of these a scale model (43 diameters) was constructed according to the Harrison method.<sup>8</sup> A second model (250 diameters) representing a further enlargement of a typical portion of the anal gland bearing area from that shown in the first model was fashioned in clay and cast in plaster. From all other specimens serial sections were made through the region of the anal crypts and those sections selected for study which showed the presence of anal glands.

## OBSERVATIONS

In all 17 cases studied anal glands were found extending into the subepithelial tissues in the zone between the anorectal and the anocutaneous line. However, a wide individual variation was noted in the number of the glands, in their structural plan and in the depth to which they invaded the tissues. In the

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Read before the Section on Gastro-Enterology and Proctology at the Ninety Third Annual Session of the American Medical Association, Atlantic City, N. J., June 10, 1942.

<sup>1</sup> Winslow, J. B. An Anatomical Exposition of the Structure of the Human Body, translated by G. Douglas, ed. 4. London, 1732, vol. 2, p. 148.

<sup>2</sup> Astruc, John. A Treatise on Fistula of the Anus, translated by W. Barrowby, London, 1738.

<sup>3</sup> Bodenhamer, William. Observation of the Normal Sacculi of the Anal Canal Both in Health and in Disease and Also on the Prenatal Pouches of the Same Region as Described by Dr. Physic. New York, W. Rec. 33, 569, 1888.

<sup>4</sup> Johnson, F. P. Development of Rectum in Human Embryo. Am. J. Anat. 16, 1, 1914.

<sup>5</sup> Tucker, C. C. and Hellwig, C. A. Histopathology of the Anal Crypts. Tr. Am. Proct. Soc. 34, 47, 1933. Anal Ducts: Comparative and Developmental Histology. Arch. Surg. 31, 521-530 (Oct.) 1935.

<sup>6</sup> Gordon-Watson, C. and Dodd, Harold. Observations on Fistula in Ano in Relation to Perianal Intramuscular Glands with Reports of Three Cases. Brit. J. Surg. 22, 703-709 (April) 1935.

<sup>7</sup> Scarborough, Robert. Primary Carcinoma of an Anal Gland. Tr. Am. Proct. Soc. 42, 172, 1941.

<sup>8</sup> Harrison, B. M. A Modification of Reconstruction Methods. Science 60, 161-162 (Aug. 15) 1924.



newborn case in which the entire anal canal was modeled, more than fifty glands were found arising in this area

An average gland may be described as having a duct which opens into an anal crypt. The duct is lined with a stratified epithelium the surface cells of which appear columnar with basally placed nuclei. Communicating with this duct are from one to six slender tubular structures lined with two or three layers of epithelium. These tubular portions of the gland may run either a straight or a spiral course extending either cephalad or caudad. Glands that extend cephalad from the site of their ducts are usually simpler in structure (unbranched tubules) than those which extend caudad. One adult had a gland which extended so far cephalad that its terminal portions reached past the anorectal line into the submucosa of the rectum (fig 1). The glands usually penetrate only into the deeper portions of the submucosa, but in 2 cases in the series they were observed to extend into the substance of the internal sphincter (fig 2). In 1 case the gland was found to penetrate three fourths of the thickness of this muscle. In this series they were not observed in tissues deeper than that of the internal sphincter.

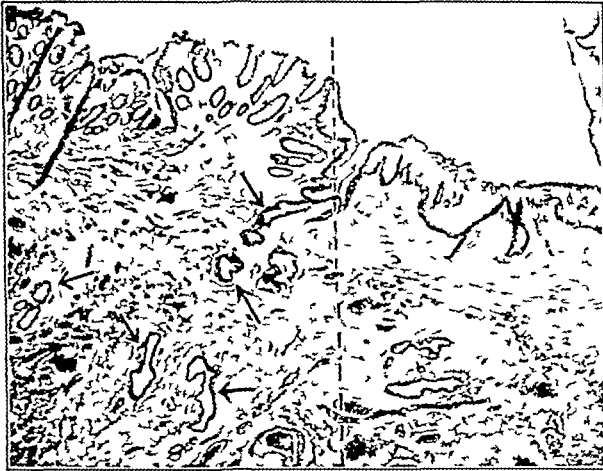


Fig. 1—Cephalad extension of anal glands (arrows) beyond anorectal line (broken line), hematoxylin and eosin stain,  $\times 19$

An interesting finding was the lack of complete canalization of the terminal portions of the anal glands in 3 of the newborn infants and an obvious cyst formation in 1 adult. In portions of the glands which were not canalized the central part of the solid cord of cells often contained large polygonal squamous cells with very light staining cytoplasm. At the point at which the gland became canalized, the central light staining cells were seen to give way to a typical glandular type of lining epithelium with dark, basally placed nuclei. A careful examination of all the adult specimens failed to reveal any positive instances of uncanalized glandular structures. However, in several specimens the lumen of the gland was very small and eccentrically placed and seemed to branch rapidly in a fashion which closely resembled those glands from newborn specimens which were not completely canalized.

In 4 adult specimens the surface layer of the epithelium lining the ducts of the anal glands presented apical cytoplasmic vacuoles (fig 3). The cells containing these vacuoles gave a positive test with Krajian's<sup>9</sup> carbol-fuchsin stain for mucin. Another

evidence of secretory activity of the anal glands was furnished by the finding already mentioned in 1 adult case of a cyst of the tubular portion of an anal gland (fig 4). Since this observation was made accidentally in tissue that was being used for the perfecting of a special staining technic, it was impossible to find and

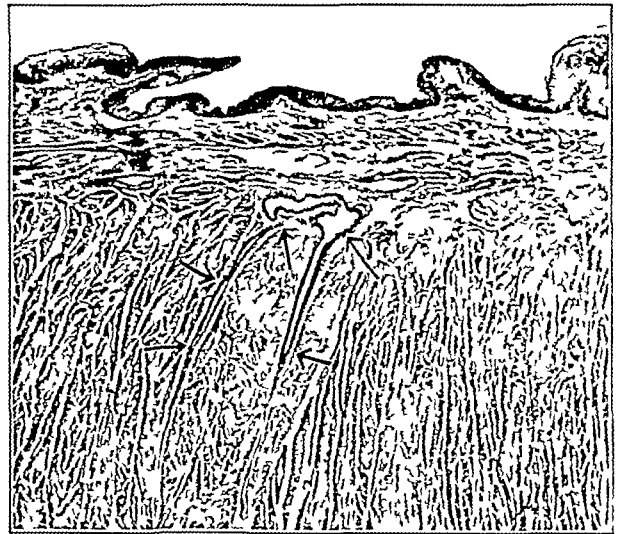


Fig. 2—Anal glands (arrows) penetrating internal sphincter. Lower gland has extended three fourths of the thickness of the muscle. hematoxylin and eosin stain  $\times 19$

examine all portions of the serial section ribbon. However, in none of the 15 to 20 sections available could any connection with a duct be demonstrated. Additional evidence that this structure had possessed secretory function and had lost its connection with its duct was furnished by the fact that its lining epithelium was flattened and that it was definitely distended with coagulated fluid which stained positively with the mucin stain.

Another finding worthy of note was the presence of lymphocytes in the immediate vicinity of practically all

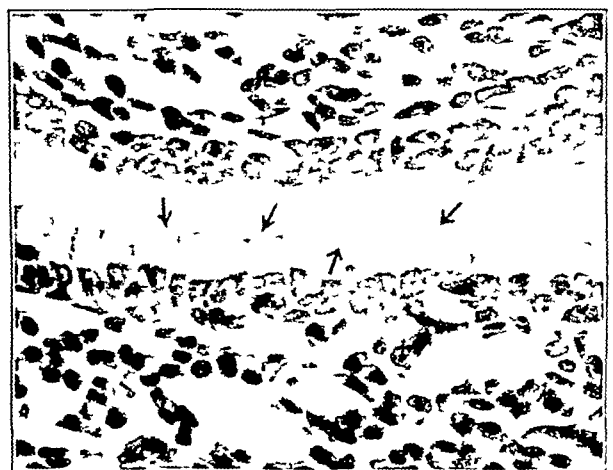


Fig. 3—Epithelium of anal gland showing apical cytoplasmic vacuoles suggestive of secretory function. Krajian's carbol-fuchsin stain for mucin  $\times 520$

anal glands. In some specimens this lymphocytic infiltration was slight, whereas in others it was so pronounced as to suggest the structure of lymph nodules. In only 1 patient, an adult, were the lymphocytes found to have invaded the epithelial lining of a gland or its duct. The zone of lymphocytic infiltration that surrounded the anal glands and their ducts was continuous



with that which occurred deep in the epithelium which lines the anal canal and when followed cephalad proved to be continuous with the diffuse lymphoid tissue of the tunica propria of the rectum and colon. Whether the presence of lymphocytes represented a response to an inflammatory process is a question which can be

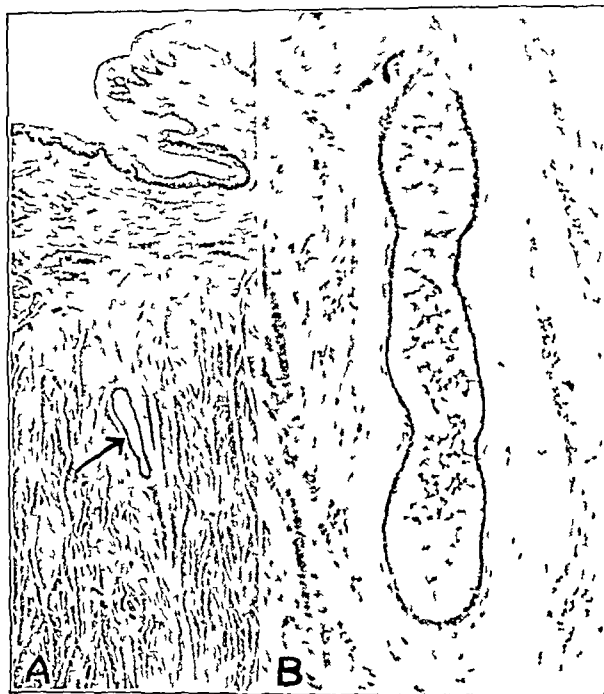


Fig 4—Cyst formation in anal gland showing (A) location of cyst in internal sphincter (hematoxylin and eosin stain  $\times 19$ ) (B) enlarged view of cyst (Krayan carbolfuchsin stain for mucin  $\times 110$ )

answered in the negative on the basis of (1) the presence of some lymphocytes in all specimens examined including those from the newborn, and (2) the absence of any significant number of polymorphonuclear leukocytes in the areas under consideration.

Particular attention was given to the presence of smooth muscle in the submucosa of the anal canal in the anal gland bearing area. In harmony with the findings of Fine and Lawes,<sup>10</sup> this study revealed the presence of smooth muscle in this area of the so-called pecten band in each of the 11 adult specimens examined. In 5 of the 11 cases, the band of muscle was very thick; in 2 it was relatively thin and in the remaining 4 it was intermediate in thickness. In 3 of the 11 small smooth muscle fasciculi were diffusely scattered among the larger strands of connective tissue while in the remaining 8 the muscle fibers were more compactly arranged. In the newborn specimens the smooth muscle of the submucosa of the anal canal was found to be in the process of differentiation; muscle cytoplasm being obvious only in scattered areas of the tissues.

#### CLINICAL APPLICATION

The constant occurrence of anal glands as emphasized by the studies of Tucker and Hellwig and confirmed by our study makes it reasonable to assume, as has been done in the past, that infection may be transmitted by the system of anal glands. The fact that there were such decided individual variations of the anal glands

may explain why some persons seem to be more susceptible to anorectal disease than are others. In order to correlate the microscopic changes of anal glands with the development of anorectal disease, consideration must be given to the various successive steps involved in the disease process.

It is commonly recognized that any alteration in bowel habitus is responsible directly or indirectly for more pathologic conditions of the anorectal region than all other possible causes combined. Limited space will permit only a brief consideration of the various possible factors involved in these changes.

Simple traumatic lesions of the anorectal region are the result of an overdistention of the anal canal by the passage of dry or hard fecal matter. Conversely, it is also acknowledged that constant irritation following frequent loose evacuations for long periods will likewise produce a similar condition. This trauma according to Lockhart-Mummery<sup>11</sup> is most likely to occur in the posterior midline where the arrangement of the muscle fibers of the external sphincter give the least support. This being the weakest point of the anal orifice, any undue stretching is likely to occur at the posterior commissure, since the fibers supporting this region are not parallel to the anal wall. The next weakest point is at the anterior commissure since relatively few circular fibers are present to give support.

Furthermore, it is recognized that the bowel tract acts as a natural habitat for the commonly known pathogenic and nonpathogenic bacteria. As previously mentioned, under certain stress and strain these organisms from the bowel may invade the adjacent tissues, namely the gland bearing area. In addition to this mode of bacterial activation and a weakened constitution, especially in the presence of disease elsewhere in the body, such as infected teeth or tonsils and disease of the upper respira-



Fig 5—Enlarged deep crypt with numerous ramifying anal glands. Lymphocytes are infiltrated around the mucus producing glands. Hematoxylin and eosin stain, reduced from a photomicrograph with a magnification of 73 diameters.

tory tract a decrease in tissue resistance is apt to occur which encourages or enhances the development of infection. Other avenues of activation which affect the gland bearing elements into a state of active localized cellulitis

10 Fine J and Lawes C H W. On Muscle Fibers of Anal Submucosa with Special Reference to Pecten Band. *Brit J Surg* 27: 723 (April) 1940.

11 Lockhart Mummery J P. Diseases of Rectum and Colon and Their Surgical Treatment. Baltimore: William Wood & Company, 1934.

may be brought about not only by direct invasion through the system of anal glands but also by way of the tissues developing as a result of a blood borne origin

Under these circumstances an infective process would be expected to follow the lines of least resistance. Therefore, changes in contour, size and depth of the anal crypts, particularly those situated in the posterior midline or immediately on either side of this area are more frequently found to become involved following continued irritation and trauma. Therefore after infection has invaded the anal crypt its mode of spread and advance would follow a definite microscopic pattern.

One of our specimens (fig 5) clearly demonstrates an enlarged and elongated crypt with numerous ramifying anal glands extending into the muscularis submucosae ani. It is obvious that infection once set up by trauma or other irritation in such a crypt could continue to spread along the avenues of all the glands present in this structural formation.

Another interesting observation (fig 1) was that of several glands which were noted to extend cephalad beyond the mucocutaneous junction into the submucosa of the rectum. This finding offers a logical explanation of the occasional occurrence of abscesses and fistulas encountered in this region when the primary focus of infection is located in an anal crypt.

Similarly the small unbranched type of duct and gland with its shallow penetration pointing toward the lining of the anal canal in close proximity to the anocutaneous line gives satisfactory reason for the acute infected fissure which becomes chronic and unyielding to ordinary simple measures and which at the time of the operation proves to involve the regional anal crypt.

In the adult case represented in figure 2 the extent of invasion of an anal gland is seen to be deep penetration into the internal sphincter. Some authors have expressed the opinion that the glands may invade even the outer longitudinal muscle. This possibility however was not confirmed by our study. Should this penetration of glandular structures be along muscle bundles or fascial planes it is reasonable to conclude that the zone of spread of infection would include those structures adjacent to this line of cleavage.

In the study of the fetal tissue attention was called to two outstanding details: (1) uncanalized glandular structures and (2) a variation in the thickness of the submucosa and the retarded differentiation of the muscularis submucosae ani. These findings suggest two possible explanations for the occurrence in adult tissues of isolated epithelium lined cystic formations. The formation of such cysts may be the result of either (1) failure of the cord of epithelial cells to canalize and communicate with its duct or (2) a choking off of certain glandular tubules which have previously invaded the area in which the fibers of the muscularis submucosae ani subsequently develop.

The findings noted in one of our adult patients of a cyst with flattened epithelial lining and distended with coagulated fluid which stained positively for mucin provides a basis on which may be explained the development of those abscesses and fistulas which do not communicate with the anal canal. The accumulation of fluid within this cyst (fig 4) suggests that its lining epithelium possesses a glandular function. This assumption of glandular activity is further confirmed by the presence in 4 cases of cytoplasmic vacuoles in the epithelial cells of the anal ducts. Such isolated cysts may serve as a focus for the development of a blood

borne infection in a manner similar to that which occurs in other parts of the body such as the thyroglossal duct and cervical cysts. Trauma to such a cyst may conceivably predispose to abscess formation also.

It has always been perplexing and difficult to explain the existence of primary carcinoma when found in the perianal tissue. A recent case report by Scarborough<sup>7</sup> pertains to the possibility of primary carcinoma originating in an anal gland. It is conceded in this study that such a glandular cyst as shown in figure 4 might even serve as a nucleus for the development of a neoplasm.

Since the early part of the sixteenth century anatomists have made mention of a "viscid humor" secreted by the anal crypts, yet it has been quite impossible to uncover any literature of the microscopic picture of an anal crypt that demonstrates by special stain or cytologic procedure this particular function. Many authors discuss this matter, referring to the secretory function of the anal glands, particularly in animals<sup>8</sup> and usually assume that the anal glands of the human being are vestigial<sup>9</sup>. The present study does not bear out the latter assumption. It has been suggested by local pathologists that these glands are active only at certain periods a small number of glands being active at a given time. It is thus assumed that each gland is active by cycles. Special stains applied to the tissues from 3 of our patients gave positive evidence of the presence of mucin either in the cytoplasm of the epithelial cells or in the coagulated fluid adjacent to the epithelium. This observation suggests that these glands are not vestigial but are structures which function throughout life.

#### SUMMARY AND CONCLUSIONS

While some causal relationship between the anal glands, perirectal abscess and fistula in ano has been presumed to exist, the underlying and developmental and structural basis for this relationship has never been fully established. In this study we have investigated the structure, distribution and relationship of the anal glands in 1 seven months fetus, 5 newborn infants and 11 adults.

Anal glands manifested a wide individual variation as to number, depth of penetration and contour. Lack of complete canalization of the terminal portion of the anal glands was observed in 3 newborn infants. In some of the adult specimens the cells lining the anal glands presented apical cytoplasmic vacuoles which stained positive for mucin. The appearance of a cyst of the tubular portion of an anal gland further suggested a secretory function. The presence of smooth muscle in the submucosa of the anal gland bearing area was found to vary in thickness and in stages of development. Variable lymphocytic infiltration was noted in all cases studied and was considered of nonpathologic significance.

Various existing traumatic, bacterial and constitutional factors unite to permit infection to spread by way of the anal gland system. The extension of anal glands upward beyond the anorectal line into the rectal submucosa offers a logical explanation of the occasional occurrence of abscess and fistula in this region. The deep penetration of an anal gland seen extending into the internal sphincter points to possible avenues of invasion along muscle bundles, fascial planes and adjacent structures to these lines of cleavage. One adult had a definite gland cyst which supports the claim that abscess and fistula may develop without communication with the anal canal. Primary carcinoma originating in

the perianal tissue is possible to occur, perhaps following chronic trauma, with a glandular cyst serving as a nucleus for development. The assumption that anal glands in the human being are vestigial remains and function only in animals was not supported by our observation. Instead, these glands are evidently active as secretory structures throughout life.

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#### ABSTRACT OF DISCUSSION

DR ROBERT A. SCARBOROUGH, San Francisco. Owing to the microscopic nature of the anal glands it has appeared reasonable to assume that infection pocketed in an anal crypt was the causative factor in the development of fistula in ano since every such fistulous tract leads back to the site of such a crypt. This crypt is often of considerable depth, showing evidence of a chronic inflammatory process. It occasionally happens that a fistulous tract as it is followed back from the secondary opening, approaches the epithelium at the mucocutaneous line but no actual surface opening can be grossly demonstrated. This has led in the past to some confusion concerning the origin of such fistulas. I have felt that such glands must be an important factor in the not infrequent development of fistula in ano in young infants whose anal crypts are thin delicate, healthy valves without the evidence of chronic infection found usually in this disease in adult patients. The authors' excellent microscopic studies in the newborn have served to support this belief. This paper has given us the first evidence of the secretory function of these glands.

DR CLAUDE C. TUCKER, Wichita, Kan. This demonstration of the presence of lymphocytes in the immediate vicinity of anal glands which had been shut off from anal ducts may be the answer to the origin of abscess and fistulas which do not communicate with the bowel wall. In our studies the ducts and crypts were excised from diseased tissue. In the past nine years we have studied from a histopathologic standpoint several thousand specimens and seldom did we find the wall of the ducts not diseased and oftentimes we found lymphocytes in the surrounding tissue. In second and third stage hemorrhoids the diseased ducts were found in the pile tissue. When all visible ducts and crypts have been removed at the time of operation it is no indication that others may not become infected. Thus the infected crypt becomes edematous and the papillae become enlarged and sensitive. Many reflex symptoms are often produced from a single infected duct and crypt. Many of the so-called tumors arising at the anorectal line are simply enlarged papillae which have grown out of an inflammatory process which had its origin in an infected duct and crypt. Robert Scarborough reported a case of carcinoma with its origin in an anal gland. We also have had one originating in anal ducts proving that these structures are not free from primary malignancy.

DR MALCOLM R. HILL, Los Angeles. The results of our investigation were derived from anorectal tissues showing little or no pathologic change. The newborn subject was selected for model reconstruction in an attempt to make an accurate count of the number of glands present in the tissues of the anorectal canal. We were able to outline in detail the branched intramuscular glands but in addition to this many single unbranched gland structures. In both the infant and adult specimen studied there was noted a pronounced variation both as to location and as to the number of glands present. Lockhart-Mummery explains why daily or repeated trauma to the crypt line and these adjacent glandular structures is more prevalent in the posterior commissure and secondarily in the anterior anal margin by virtue of lack of support to the muscle structures. While the anal crypt is frequently the port of entry to the numerous ducts and glands, it must not be overlooked that the coexisting cryptitis may be secondary to a primary infection in the anal gland system. Blood borne infection to these gland bearing areas must not be overlooked. The isolated gland mentioned by Scarborough gives a ready explanation of the etiology of the abscess and fistula which has no direct continuity with the bowel. The cyst formation present in this type of glandular

structure predicates the possible insurance risk from trauma in line of duty. Modern war surgery has been confronted with a similar analogy in the recurrence of a pilonidal cyst from experience in a jeep car or tank. Our study has not borne out the idea that these glands are vestigial remains. Secretory activity was shown to be present. Hirschman for years has taken cultures of the secretion or discharge from the anal crypt and found that the derived autogenous vaccine is a valuable therapeutic agent. This would lead one to conclude that the anal gland system is a potent field for focal infection.

#### MAPHARSIN IN THE TREATMENT OF CONGENITAL SYPHILIS

WITH ESPECIAL CONSIDERATION OF THE INTRAMUSCULAR METHOD OF ADMINISTRATION

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Mapharsin which was studied and introduced by Tatum and Cooper,<sup>1</sup> was investigated clinically by O. H. Foerster, who made the first report on the use of this drug in antisyphilitic therapy for human beings at the meeting of the American Dermatological Association in 1933. Since then numerous investigators<sup>2</sup> have published articles on the therapeutic efficacy of this drug as well as on its toxicity. Most of the investigators agree that mapharsin is a good antisyphilitic drug<sup>3</sup> and that it is less toxic than nearsphenamine.

The fact that only six fatalities<sup>4</sup> resulting from the use of mapharsin have been reported, while over

Miss Florence Ramden, Dr. Leo Leibovitz and Dr. Israel Hirshon cooperated in looking up records and checking the after effects of treatment. Read before the Section on Dermatology at the Ninety-Third Annual Session of the American Medical Association, Atlantic City, N. J., June 11, 1942.

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<sup>1</sup> Tatum, A. L. and Cooper, G. A. An Experimental Study of Mapharsin (Methylamino Para-Hydroxy Phenyl Arsine Oxide) as an Antisyphilitic Agent. *J. Pharmacol. & Exper. Therap.* 50: 198 (Feb.) 1934.

<sup>2</sup> Foerster, O. H. and others. Mapharsin in the Treatment of Syphilis. *Arch. Dermat. & Syph.* 32: 868 (Dec.) 1935.

<sup>3</sup> Moore, J. E., Hardy, S. M., Robinson, H. M. and Eagle, Harry. The Response of Quantitatively Titered Wassermann Test in Early Syphilis to Treatment with Five Different Arsenical Drugs. *Am. J. Syph. Gonorr. & Ven. Dis.* 20: 503 (Sept.) 1936. Kulchur, G. V. and Barnett, C. W. Mapharsin in the Treatment of Early Syphilis. *ibid.* 20: 482 (Sept.) 1936. Gruhitz, O. M. and Dixon, R. S. Mapharsin in the Treatment of Syphilis in a Clinic for Venereal Diseases. *Arch. Dermat. & Syph.* 34: 432 (Sept.) 1936. Miller, H. E., Epstein, N. and Simpson, R. G. Mapharsin: Its Use in the Treatment of Syphilis. *California & West Med.* 15: 321 (Oct.) 1936. Wieder, L. M., Foerster, O. H. and Foerster, H. R. Mapharsin in the Treatment of Syphilis. Further Studies. *Arch. Dermat. & Syph.* 35: 402 (March) 1937. Cole, H. N. and Palmer, R. B. Mapharsin in the Treatment of Syphilis. *ibid.* 36: 561 (Sept.) 1937. Astrachan.<sup>15</sup>

<sup>4</sup> Schmidt, L. E. and Taylor, G. G. The Treatment of Syphilis with Mapharsin. *Am. J. Syph. Gonorr. & Ven. Dis.* 21: 402 (July) 1937. Astrachan, G. D. and Wise, Fred. Further Experiences with Mapharsin: Its Use in Latent Syphilis. *ibid.* 22: 470 (July) 1938. Chargin, Louis. Lester, William and Rosenthal, Theodore. Mapharsin in the Treatment of Early Syphilis: Comparison of Results in One Hundred and Eighty Eight Cases with Those of the Cooperative Clinical Group. *Arch. Dermat. & Syph.* 40: 208 (Aug.) 1939. Moore, Hardy, Robinson and Eagle.<sup>3</sup> Gruhitz and Dixon.<sup>2</sup> Astrachan.<sup>15</sup> Wieder and the Foersters.<sup>2</sup> Cole and Palmer.<sup>3</sup>

<sup>5</sup> Jordan, J. W. and Traenkle, H. L. Reactions to Mapharsin with Special Reference to Its Use in Patients Who React to the Arspheamines. *Arch. Dermat. & Syph.* 36: 1158 (Dec.) 1937. Epstein, N. N. and Falconer, E. H. Effects of Nearsphenamine and Mapharsin on Formed Elements of Blood. *ibid.* 42: 909 (Nov.) 1940. Schoch, A. G., Alexander, L. J. and Long, W. E. Mapharsin in the Treatment of Forty Patients Following Arspheamine Dermatitis. *ibid.* 42: 919 (Nov.) 1940. Stokes, J. H., Beerman, Herman and Ingraham, N. R., Jr. The Trivalent Arsenicals in Syphilis: Some Recent Advances, Comparisons and Evaluations. *Am. J. M. Sc.* 201: 611 (April) 1941. Foerster and others.<sup>2</sup> Gruhitz and Dixon.<sup>2</sup> Astrachan.<sup>15</sup> Miller, Epstein and Simpson.<sup>3</sup> Wieder and the Foersters.<sup>2</sup> Schmidt and Taylor.<sup>4</sup> Astrachan and Wise.<sup>4</sup> Levin and Keddie.<sup>7</sup>

<sup>6</sup> Rein, C. R. and Wise, Fred. Mapharsin in Treatment of Syphilis in Office Practice. *J. A. M. A.* 113: 1946 (Nov. 25) 1939. Kirkham, Dunham and Perlmutter, Martin. Fatal Aplastic Anemia Following the Use of Mapharsin. Report of a Case. *Arch. Dermat. & Syph.* 43: 111 (Jan.) 1941. Levin and Keddie.<sup>7</sup>

12 million ampules of this drug have been manufactured,<sup>7</sup> makes this trivalent arsenical very suitable for antisyphilitic therapy

The value of mapharsen in congenital syphilis was studied by us<sup>8</sup> as well as by Morgan,<sup>9</sup> Howles<sup>10</sup> and Wile<sup>11</sup> and fairly good results were reported

The present paper deals with the problem of the efficacy of mapharsen in congenital syphilis experimentation with larger doses and also the problem of local pain following the intramuscular administration of this drug

Eighty-seven patients were treated, of whom 57 had late congenital syphilis, 11 early congenital syphilis and 19 latent syphilis (adult women in whom mapharsen injections were given intramuscularly). There were 36 cases from the Metropolitan Hospital division of the Welfare Island dispensary (service of Dr Van Alstyne Cornell), 20 from the Metropolitan Hospital (services of Dr Van Alstyne Cornell and Dr Reuel Benson), 21 from the Skin and Cancer Unit (service of Dr Fred Wise) and 10 from our private practice. Sixty-one patients were females, 26 males. The oldest among the congenitally syphilitic patients was 51 years, the youngest was 4 weeks. Altogether 1742 injections were given (1,507 to congenitally syphilitic patients and 235 to adult patients with latent syphilis). The number of

these cases courses of bismuth and mapharsen administered concurrently were followed by separate courses of bismuth and mapharsen given alternately. There was a slight difference in the serologic results obtained in cases treated with these two methods, that is, in cases treated with the concurrent method the serologic

TABLE 2—Influence of the Methods of Administration of Mapharsen and Bismuth on the Effectiveness of the Therapy in Late Congenital Syphilis

	Total	Improved	Unimproved
A—Patients treated with the concurrent method	17	10 (58.8%)	7 (41.2%)
Patients treated with the alternate method only	25	15 (53.5%)	13 (46.5%)
Concurrent Method Used in			
B—Improved cases	25	10 (40%)	
Unimproved cases	20	7 (35%)	

improvement occurred in 58.5 per cent, while in cases treated by the alternate method a serologic improvement occurred in only 53.5 per cent (table 2)

Among the improved cases the concurrent method was used in 40 per cent, while among the unimproved cases this method was used in only 35 per cent (table 2)

Four cases in which the serologic reaction remained unchanged when the alternate method was used showed a definite improvement when bismuth compounds and mapharsen were administered concurrently

The effect on the serologic reaction was studied in the cases treated with the alternate method after an average of 19.1 injections of mapharsen and 29.7 injections of bismuth compounds had been given. The group treated with the concurrent method received an average of 22.5 injections of mapharsen and 23.6 injections of bismuth

*Effect of Mapharsen Therapy on the Serologic Reaction in Early Congenital Syphilis* (tables 3 and 4) — Ten cases were studied. The dosage of mapharsen given was larger than the one used in the previous investigation.<sup>8</sup> The maximum dosage was 1 mg per kilogram of weight. Because of the increased dosage of mapharsen, and in order to avoid possible toxic

TABLE 1—Effect of Mapharsen Therapy on the Serologic Reaction of Late Congenital Syphilis

Total number of cases	56
Number of cases in which the serologic reaction was studied	45
Blood serologic reaction reversed partially or completely in	25 (55.5%)
Blood serologic reaction remained unchanged in	20 (44.5%)
Average number of mapharsen injections in improved cases	27.3
Average number of mapharsen injections in unimproved cases	20.1

injections given intravenously was 1,012, the number of injections administered intramuscularly was 730. The dosages given to early congenital syphilitic patients ranged from 0.5 to 15 mg. The dosages in late congenital syphilis ranged from 2 to 30 mg for children and from 10 to 60 mg for adults

#### EFFECTIVENESS OF MAPHARSEN THERAPY

*Effect of Mapharsen Therapy on the Serologic Reaction in Late Congenital Syphilis* (tables 1 and 2) — Fifty-six patients were treated and the serologic results studied of 45 patients. They received an average of 21 injections of mapharsen (dosages ranging from 2 to 40 mg). Among these 45 patients 25, or 55.5 per cent, showed an improvement in their serologic reaction (complete reversal in 8 cases) after they had received 27.3 (average) mapharsen injections. In the remaining 20 cases, or 44.5 per cent, the serologic reaction remained unchanged after an average of 20 injections were given (table 1)

In all cases of late congenital syphilis the mapharsen therapy was supported by injections of bismuth compounds. Twenty-eight patients were treated with the alternate method of administration of bismuth compounds and mapharsen. In 17 cases the concurrent method of administration was used and in most of

TABLE 3—Effect of Mapharsen Therapy on the Serologic Reaction of Early Congenital Syphilis

Name	Age	Number of Mapharsen Injections	Average Dosage of Mapharsen	Number of Bismuth Injections	Method of Administration of Mapharsen and Bismuth	Serologic Reaction	
						Before Treatment	After Treatment
G C	6 mos	21	7.3	25	Alternate	4	3
W J	18 mos	3	1.7	9	Alternate	4	1
J H	24 mos	39	8.8	40	Alternate	4	Negative
C J	9 mos	12	4.2	8	Alternate	2	2
G G	22 mos	18	5.4	20	Concurrent	4	Negative
G W	1½ mos	9	2.0	4	Concurrent	4	Negative
G J	2 mos	10	4.0	17	Alternate	4	2
K I	24 mos	30	7.9	20	Alternate	4	1
H G	6 mos	10	5.1	14	Alternate	4	4
S	1 mo	12	3.7	3	Alternate	4	2

reactions, mapharsen and bismuth compounds were given in alternate courses in most cases. Treatment was usually begun with 1 to 2 mg and increased weekly by 1 mg until the maximum dosage was reached (1 mg per kilogram of weight). The average dosage for the improved and unimproved cases was 6.5 mg and 5.9 mg respectively. In 1 case the maximum dosage was 15 mg. If we regard the improvement in case 1 as a very slight one and put it in the group of unimproved

7 Levin E A and Keddie Frances. Toxic Effects Following the Use of Mapharsen. *J A M A* 118:368 (Jan 31) 1942.  
8 Cornell V H and Astrachan G D. Mapharsen in the Treatment of Congenital Syphilis. *Arch Dermat & Syph* 38:943 (Dec) 1938.

9 Morgan E A. The Value of Mapharsen in the Treatment of Congenital Syphilis. *Canad M A J* 38:53 (Jan) 1938.

10 Howles J K. The Treatment of Congenital Syphilis with an Intravenous Arsenical. *South M J* 32:940 (Sept) 1939.

11 Wile U J. In discussion on Foerster and others.

cases, we may say that 7 out of 10 cases, or 70 per cent, showed a partial or complete reversal of the serologic reaction following the injection of 17.3 mg (average) of mapharsen. (The serologic reaction reversed to negative in 3 cases, table 4.) It is also of significance that in both cases in which the concurrent method of administration of bismuth compounds and mapharsen was used the serologic reaction reversed to negative after an average of 13.5 injections of mapharsen were given.

**Spinal Fluid Findings**—The spinal fluid was studied in 40 cases. The results of the examinations were negative except in 2 cases. In 1 case (M G), of frequent convulsions, with some change in the colloidal gold curve (1232210000) in an otherwise negative spinal fluid there seemed to be improvement under the influence of mapharsen therapy.

Patient 2 (baby S), whose mother had syphilis, was apparently normal at birth but on the second day of life began to develop respiratory and feeding difficulties and was put under a constant oxygen tent. Because of the positive cord Wassermann test and x-ray findings of the long bones (syphilitic periostitis) it was thought that the broncholarineal collapse might be due to

TABLE 4 (Analysis of Table 3)—Effect of Mapharsen Therapy on the Serologic Reaction of Early Congenital Syphilis

1 Number of cases in which the serologic reaction was studied	10
2 Number of cases in which the serologic reaction reversed partly or completely	7 (70%)
3 Number of cases in which the serologic reaction did not change	3 (30%)
4 Average number of mapharsen injections in improved cases	17.3
5 Average dosage of mapharsen in improved cases	6.0 mg
6 Average number of mapharsen injections in unimproved cases	14.3
7 Average dosage of mapharsen in unimproved cases	5.9 mg

congenital syphilis. Antisyphilitic therapy was instituted. Three injections of a bismuth compound were given followed by twelve injections of mapharsen, starting with a dosage of 0.5 mg and increasing each time by 1 mg until 5 mg was reached. After four months of therapy the spinal fluid, which was strongly positive for syphilis, became completely negative. The Wassermann reaction of the blood was 2 plus. The baby gained 6 pounds (2.7 Kg), became more active and was not listless. However, the patient presented a pronounced hydrocephalus<sup>12</sup> (ventriculographic study of the skull revealed a tremendous dilatation of both ventricles) which increased in size somewhat in spite of antisyphilitic therapy.

**Effect of Mapharsen Therapy in Cases of Interstitial Keratitis**—Five patients were observed and they seemed to have benefited greatly by mapharsen therapy. In 1 case, in which the condition gradually became worse while sulfarsphenamine injections<sup>12</sup> were being given, there was a decided improvement in the cornea and in vision following ten injections of mapharsen. The second case cleared up almost entirely after five mapharsen and ten bismuth injections were given concurrently. The third patient was readmitted to the Metropolitan Hospital several times because of a recurrent interstitial keratitis. The Wassermann test was persistently negative but the interstitial keratitis improved

each time mapharsen therapy was given concurrently with a bismuth compound. The fourth patient also showed a definite improvement following the alternate administration of mapharsen and bismuth courses. The fifth patient (W G) was admitted to the Metropolitan Hospital with the history of progressive blindness for two months. Concurrent administration of mapharsen and a bismuth compound was instituted and the patient showed improvement after four weeks of therapy. Later on, potassium iodide and boiled milk injections were added to the therapy. The interstitial keratitis was arrested and improved. The serologic reaction, however, did not change following thirty-six mapharsen and thirty-seven bismuth injections.

**Congenital Syphilis and Pregnancy**—Six patients were observed, one of them is now in the fifth month of pregnancy and is receiving weekly injections of mapharsen without any untoward reactions. Five patients gave birth to normal, nonsyphilitic children after having received throughout pregnancy an average of 12 injections of mapharsen and 13 injections of a bismuth compound given in alternate courses. Both the cord and the blood Wassermann reactions were negative in 4 cases. In the fifth case only the cold serologic test was taken and this was found to be negative. All 6 patients tolerated the injections of mapharsen well and had no untoward reactions with the exception of 1 patient, who developed nausea once, and another who developed pruritus. In 2 cases the injections of mapharsen were accompanied by injections of liver extract without any ill effects on the patients or the course of their pregnancies.<sup>13</sup>

**Untoward Reactions**<sup>14</sup>—The majority of our patients tolerated the injections of mapharsen well and showed no untoward reactions. Among 68 patients with congenital syphilis who received altogether 1,507 injections (1,012 intravenously and 495 intramuscularly) there were 15 who developed some kind of reaction. Altogether 17 reactions were observed. Of these 9 were of a mild character and presented some mild gastrointestinal disturbance such as nausea, vomiting or fever. These reactions occurred generally only once and did not recur after the dosage of mapharsen was diminished. There were 7 delayed reactions in 7 patients. Three developed pruritus. In 2 cases the pruritus did not recur when prophylactic liver extract injections were given.<sup>13</sup> In the third case the pruritus was not prevented nor alleviated by concurrent liver extract injections<sup>13</sup> and mapharsen had to be discontinued. Two patients developed erythematous eruptions lasting for a few days. One patient (A H, a boy aged 11 years, weight 83 pounds, 37.6 Kg) developed jaundice following 10 mapharsen injections (7.5 to 25 mg), which were given concurrently with bismuth, one patient developed a moderate anemia combined with poikilocytosis and anisocytosis.

The ratio of immediate reactions to the general number of injections was 9/1,501 or 1/167.4. The ratio of delayed reactions to the general number of injections given was 1/214.4. These data contain a higher percentage of untoward reactions than our previous investigation<sup>8</sup> in cases of congenital syphilis, in which the respective ratios were 1/883 and 1/441. The higher frequency in immediate and delayed reactions in our

12 The baby died on June 7. Autopsy revealed lung abscess and hydrocephalus as causes of death. Examination of all viscera showed no evidence of damage due to medication. (Saccone, Andrea. Personal communication to the authors.)

13 Astrachan G D and Sharp E A. The Value of Administration of Liver in Patients Intolerant to Arsenicals. *J Invest Dermat* 1:427 (Dec) 1938. MacKee and Astrachan.<sup>17</sup>

14 Local complications and pain after injection will be discussed elsewhere.

present series could be explained by the use of the intramuscular method of administration of mapharsen in many cases (pain may often be followed by nausea and vomiting) and by the increased dosage of mapharsen from 0.5 mg to 1 mg per kilogram of weight. Even these figures are lower than in our previous paper, which dealt chiefly with adult patients.<sup>15</sup> In this group the respective ratios were 1:60.4 and 1:121. This proves that mapharsen is less toxic to children than to adults. Nine (0.06 per cent) immediate gastrointestinal reactions were observed in 1,507 injections. This incidence is small in comparison with that of the arsphenamines, following which there have been, according to various observers, from 7 to 25 per cent<sup>16</sup> of mild reactions.

The lower index of toxicity of mapharsen is also illustrated by the following. Three of our cases suffered from severe gastrointestinal disturbances (vomiting, headache) after the injections of neoarsphenamine. These patients tolerated mapharsen well. No reactions developed. One patient had a generalized erythema, a scaly eruption following an injection of 0.2 Gm of arsphenamine. The patient received, one and one-half years later, a course of 14 mapharsen injections (dosage 5 to 35 mg) without any after-effects. On the other hand, only 1 patient sensitive to mapharsen (developed urticaria) tolerated neoarsphenamine well.

**Blood Count Examinations.**—Blood count studies were done in 48 cases. In most of the cases the blood count did not show any changes following mapharsen therapy. However, in 5 cases a decrease in the red blood cell count was noted (average decrease 620,000) as well as a lowering of the hemoglobin (average decrease 14 per cent) following 8.4 (average) of mapharsen injections. In 1 of these cases (G. H., aged 6 months) following 8 injections of mapharsen (average dosage 5.1 mg) the aforementioned changes in the red blood cell count and hemoglobin appeared together with poikilocytosis and anisocytosis. Three among these 5 patients were infants who tolerated the injections of mapharsen well and did not show any signs of discomfort or illness. The changes in the blood counts were discovered by routine repeated blood examinations. These changes in the blood counts were not of a grave character, however, they occurred in 3 of 10 cases of early congenital syphilis. And in our opinion that is quite a high percentage. This could be coincidental, but it could also quite possibly be explained by the high dosage of mapharsen given in the early cases (maximum dosage 1 mg per kilogram of weight).

**Liver Function Tests.**—Icterus indexes were performed in 32 cases. The majority of the tests were found to be normal. Following mapharsen therapy the icterus indexes were found to be elevated in 5 cases. In 3 of these cases (3 of 32, or 9.4 per cent) the icterus indexes were 10 to 12, in the other 2 (2 of 32, or 6.3 per cent) the indexes were 8 to 9.3. These percentages of 9.4 and 6.3 compare favorably with the figures on changes in the icterus indexes in one group of adults treated with mapharsen, in which the respective percentages were 19 and 19.<sup>17</sup> This fact proves again that mapharsen is less toxic in children than in

adults. It is also noteworthy that 2 out of 3 patients with icterus indexes of 10 to 12 were children treated by the concurrent method of administration of mapharsen and bismuth. In 2 cases the icterus indexes were found to be somewhat elevated (8.3-10) before mapharsen therapy was instituted. Mapharsen was then administered accompanied each time by an injection of liver extract.<sup>18</sup> Following ten mapharsen injections and ten liver injections the icterus indexes in both cases became normal.<sup>17</sup>

**Local Complications.**<sup>18</sup> (tables 5 and 6).—In a previous paper<sup>8</sup> the fact was mentioned that the patients with early congenital syphilis<sup>19</sup> who received the injections of mapharsen intramuscularly did not show any signs of general discomfort (fever or restlessness) or any local reaction (necrosis on the site of the injection). We may say that our present investigation confirmed these findings. We had the same experience with all our cases of early congenital syphilis with the exception of 1 case in which crying and restlessness occurred for the entire day following the injection of 8 mg of mapharsen. The patients with early congenital syphilis received altogether 138 intramuscular injections, and the maximum dosage administered was 15 mg.

TABLE 5—After-Effects of the Intramuscular Administration of Mapharsen in Adults

Total number of patients treated	19
Total number of injections given	233
Number of injections which were followed by very mild soreness (duration $\frac{1}{4}$ hour)	179
Number of injections which were followed by slight or moderate pains (duration 1-6 hours)	54
Number of injections which were followed by severe pain (duration 6-24 hours)	46
Number of injections which were followed by long lasting severe pains (duration 2-10 days)	6

Since it is very difficult to evaluate the kind and amount of pain in infants, we decided to use the intramuscular method for children old enough to be interrogated about the after-effects. Nineteen children from 3 to 12 years of age with late congenital syphilis were treated. The maximum dosage in many of these cases was as high as 20 mg; 357 injections were given. The information about the pain was obtained from the children, the parents or the ward nurse in charge.<sup>20</sup>

All children, with the exception of those who had special complaints, stated that the injection of mapharsen was followed by a mild soreness lasting from a quarter of an hour to one hour. Special complaints were recorded by 9 patients after 60 injections. Forty-five of these complaints were of slight or moderate pain lasting from one to four hours. These pains did not interfere with the children's usual activities, such as playing and walking. Fifteen other complaints were of severe pain sometimes lasting almost an entire day. In 1 case the pain, after an injection of 2 mg, lasted all night and was accompanied with vomiting. The patient also vomited the entire week following an injection of 4 mg of mapharsen. The same patient later received 5 more injections of mapharsen (dosage 4 to 12 mg).

15 Astrachan G. D. Mapharsen in Antisyphilitic Therapy. *Am J Syph. Gonorr. & Ven. Dis.* 21: 81 (Jan.) 1937.

16 Stokes J. H. *Modern Clinical Syphilology*, ed. 2. Philadelphia: W. B. Saunders Company, 1934. Moore J. E. *The Modern Treatment of Syphilis*. Springfield, Ill.: Charles C. Thomas Publisher, 1941.

17 MacKee G. M. and Astrachan G. D. The Value of Liver Extract in Cases Intolerant to Arsenicals. *Heavy Metals and Radiation J. Invest. Dermat.* 3: 409 (Oct.) 1940.

18 Mapharsen was dissolved in isotonic solution of sodium chloride 60 mg to 10 cc of solution (Sharp E. Personal communication to the authors). Later a more concentrated solution was used (60 mg of mapharsen to 5 cc of saline solution). For the last three months plain distilled water has also been used as a solvent. Our impression is that the concentration of mapharsen and the kind of solvent used have little if any influence on the amount and kind of complications.

19 The use of mapharsen in early congenital syphilis was suggested by Dr. Rosen (cited by Astrachan<sup>15</sup>).

20 Ramsden F. Personal communication to the authors.



without any special complaints. In another case the pain lasted for about twenty-four hours several times and the intramuscular method of administration of mapharsen in this case was abandoned.

*The Intramuscular Use of Mapharsen for Adult Patients* (table 5).—Children are prone to forget pain on its cessation, they may even discount it or overlook it in the heat of an interesting or competitive game. It is questionable, therefore, whether the answers given by children can be used for evaluation of the kind and degree of after-effects following the intramuscular administration of any medication. It is for this reason that we decided to include in this investigation information about local complications following the intramuscular use of mapharsen to adult patients. They were selected mostly from among obese women in whom intravenous therapy was impossible because of bad veins. Nineteen cases were observed and 235 injections were given. The maximum dosage administered was 30 mg and the number of injections given varied from 1 to 36. The initial dosage was 4 mg. It was increased weekly by 2 mg until 30 mg was reached. The very gradual and slow increase in the dosage can easily be understood if it will be remembered that in experiments of this kind one must proceed with caution because of the possibility of serious complications.

The patients were interrogated each time as to the presence or absence of any reactions, the kind and degree of pain, if any, following the injections of mapharsen. As with the children all patients, with the exception of those who had special complaints, stated that the injection of mapharsen was followed by a mild soreness lasting from a quarter of an hour to one hour. Special complaints were recorded after 106 injections were given to 17 patients, 54 of these complaints were of slight or moderate pain lasting generally from one to six hours. One patient complained once of a sensation which felt as if "some one was drilling the bone," and the pain lasted all day. The same patient, however, stated that she had no pain at all after the succeeding injection of mapharsen. One patient complained of a slight pain lasting for two days, another of the same group stated that the pain was less pronounced than that experienced after bismarsen injections. Prior to the institution of mapharsen therapy 1 patient was treated with intramuscular injections of sulfur arsphenamine (0.1 to 0.2 Gm). She stated that after each injection she suffered a severe burning sensation which lasted for several hours, while the injections of mapharsen did not cause any after-effects. The other fifty-two special complaints were of pains which could be classified as severe. These lasted in the average for six to twenty-four hours and even longer. These pains were characterized as "shooting" or "sharp" or the patient complained of inability to walk or severe pain in the leg causing incapacitation for three days. Three patients complained of pain lasting about a week. One complained of pain lasting ten days. It is interesting to note that some of these patients, after complaining of severe pain several times, stated that the pain was very slight at the next visit, even though the dosage of mapharsen was the same or even larger.

#### COMMENT

This investigation confirmed our conclusions in previous investigations that mapharsen is a useful drug in the treatment of cases of late congenital syphilis.<sup>21</sup> In

55.5 per cent of our cases the blood serologic reaction reversed partially or completely. This percentage is a fairly good one in cases of late congenital syphilis, in which in not less than 50 per cent of instances there is a fixed serologic reaction, regardless of treatment given.<sup>22</sup> The fact that improvement occurred in all 6 cases of interstitial keratitis following mapharsen therapy emphasizes its value in cases of late congenital syphilis.

In a previous contribution a preference was expressed for the concurrent method of administration of bismuth compounds and mapharsen when dealing with cases of late congenital syphilis.<sup>14</sup> With regard to this problem an analysis of the serologic response in our cases showed that there were more improved cases (58.8 per cent) among those treated with the concurrent method than among those treated with the alternate method (53.5 per cent). The concurrent method was used more among the improved cases (40 per cent) than among the unimproved ones (35 per cent). Although the difference in percentages is a very small one, it still points to a favorable influence of the concurrent method on the effectiveness of mapharsen therapy. (The influence of the slightly higher number of injections of mapharsen given in the concurrent group over that given in the alternate group may be discounted because the average number of bismuth injections given in the alternate group was larger than that given in the concurrent group.)

Four of our cases showed an improvement only when the concurrent method was used; this also points to the advisability of the use of this method. On the other hand we have to admit that the concurrent method is more liable to cause untoward reactions than the alternate one (case A. H., jaundice). For this reason the concurrent method should be used only for healthy patients and it should be combined with the alternate method of administration, that is, a course of bismuth and mapharsen given concurrently should be followed by courses of bismuth and mapharsen given alternately. It is also imperative that the patients be carefully observed and frequent blood counts and liver function tests be done.

In 7 out of 10 cases of early congenital syphilis the serologic reaction reversed partly or completely after an average of 17.3 injections of mapharsen were administered. A positive spinal fluid in a 4 months old baby reversed to negative after 3 bismuth and 12 mapharsen injections were administered. These data confirm our opinion in our previous investigation<sup>8</sup> that mapharsen may be useful in cases of early congenital syphilis. Further observation of the efficacy of this drug in many more cases will be necessary before we can come to a definite conclusion.

Because of the large number (3 out of 10 cases) of early congenital syphilis in which regressive changes in the blood count could be attributed to mapharsen therapy, we feel that the maximum dosage employed by us (1 mg per kilogram of weight) was probably too high for infants, who are usually in a weakened condition as the result of their lowered resistance, malnutrition and toxemia, which are caused by the spirochetosis. On the other hand, the maximum dosage employed in our previous investigation<sup>8</sup> (0.5 mg per kilogram of weight) did not cause any after-effects.

<sup>22</sup> Cole, H. N., Usilton, Lida J., Moore, J. E., O'Leary, P. A., Stokes, J. H., Wile, U. J., Parrin, Thomas Jr. and Vonderlehr, R. A. Late Prenatal Syphilis with Special Reference to Interstitial Keratitis. Its Prevention and Treatment. Arch. Dermat. & Syph. 35: 563 (April) 1937. Moore.<sup>16</sup>



We feel therefore, that 0.75 mg per kilogram of weight would be the optimum dosage for cases of early congenital syphilis.

The maximum dosage of mapharsen in some of our cases of late congenital syphilis was somewhat higher than in the first investigation<sup>5</sup> (0.75 to 1 mg instead of 0.5 mg per kilogram of weight). In view of the relative increase in the ratio of reactions in this series, we believe that 0.75 mg per kilogram of weight would probably be the most suitable dosage in cases of late congenital syphilis.

As to the question of the lower toxicity of mapharsen in comparison with other arsenicals we stress the absence of exfoliative dermatitis, nitritoid reactions, the small number of immediate and delayed reactions in our series and the fact that several of our patients who were sensitive to neoarsphenamine tolerated mapharsen well. The lower ratios of reactions in our series in comparison with those in a previous paper<sup>12</sup> which dealt chiefly with adult patients proves again that mapharsen is less toxic in children than in adults. This is also confirmed by the very small percentage of increased icterus indexes in comparison with that of the adult group.<sup>17</sup>

It is also noteworthy that all 6 pregnant women tolerated mapharsen well and developed no untoward reactions except 1 case of nausea (once) and 1 of pruritus. This seems to confirm the opinion of one of us about the low toxicity of mapharsen in cases of syphilis and pregnancy.<sup>23</sup>

Where the question of the feasibility of intramuscular administration of mapharsen is concerned, we stress the facts that, while some patients complained of severe and long lasting pain, the majority of the injections (in adults) were followed by slight or moderate pain only, that not a single case of local necrosis developed following 730 intramuscular injections of mapharsen (in adults and children) and that serious systemic complications did not appear as a result of this method of administration.

It is also noteworthy that 2 patients who received sulfarsphenamine or bismarsen therapy prior to mapharsen injections stated that the intramuscular injections of mapharsen caused less pain and discomfort than the two aforementioned drugs. Taking all this into consideration, we feel justified in stating that in selected cases the intramuscular method of administration of mapharsen may be tried. It should be employed, however, very cautiously, the dosages increased very slowly, and only those cases treated in which all attempts at intravenous therapy have failed.

#### CONCLUSIONS

1 Mapharsen is a good drug for patients with late congenital syphilis.

2 It is useful in cases of interstitial keratitis.

3 The concurrent method of administration of bismuth compounds and mapharsen in late congenital syphilis should be used for healthy patients only and should be combined with the alternate method of administration. Frequent blood counts and liver function tests should be performed on these patients.

4 Mapharsen proved to be useful in our cases of early congenital syphilis.

5 Further observation of many more cases will be necessary in order to come to a definite conclusion about the efficacy of mapharsen in early congenital syphilis.

6 We believe that 0.75 mg per kilogram of weight should be the maximum dosage for patients with any form of congenital syphilis.

7 Mapharsen is less toxic to children than to adults.

8 Mapharsen can be given intramuscularly in selected cases, however, it should be used only in cases in which all attempts at intravenous therapy have failed.

9 Further experimentation with various solvents is desirable in order to find the least painful method of intramuscular administration of mapharsen.

#### ABSTRACT OF DISCUSSION

DR NORMAN R. INGRAHAM, JR., Philadelphia. Many of the studies of a few years ago having to do with the treatment of congenital syphilis (particularly of early congenital syphilis) have had their present scientific value greatly diminished because of a lack of appreciation of the conditions affecting the interpretation of the blood serologic test for syphilis in infancy, because of the roentgenogram in the first few months of life or through a failure on the part of the various authors to make clear the diagnostic standards employed. Moreover the inability to keep these patients under treatment observation with sufficient regularity for a long enough period of time to make available mass statistics has rendered information concerning the long time results of treatment of congenital syphilis hard to obtain. Information such as has been presented could be rendered even more valuable by the addition of brief statements concerning (1) the diagnostic criteria employed, (2) the dosage interval and the regularity of administration of treatment and (3) the total duration of observation. These suggestions would apply to the medical follow-up of the apparently normal infant offspring of the six syphilitic mothers included in the study as well as to the proved cases of congenital syphilis. I have had no personal experience with the use of intramuscular mapharsen in the treatment of congenital syphilis. The intramuscular arsenicals which I have used routinely for infants over a period of years, namely sulfarsphenamine at the Philadelphia General Hospital and bismarsen at the University Hospital, have been therapeutically effective and have resulted in no serious problems from the standpoint of either local or systemic reaction. In the dosage that is used for small infants, even neoarsphenamine may be given intramuscularly (or under the fascia of the scalp). Intramuscular arsenical therapy has definite indications in the treatment of infantile congenital syphilis and in some stages of adult syphilis. I feel, therefore, that this evidence of the possible value of intramuscular mapharsen in the treatment of congenital syphilis is particularly timely.

DR JOHN E. RAUSCHKOLB, Cleveland. In general my observations agree with those of the authors—that is, mapharsen is not only a good but an excellent drug in the treatment of congenital syphilis, especially the early types, for it is in this stage that the arsenicals are of the most value in preventing the destructive changes. The dosage I use is even more conservative—it being 0.5 mg per kilogram of body weight as a maximum. Mapharsen can be given intramuscularly with safety. Especially is this true in the early congenital types. The drug should be given in concentrations of 10 per cent strength in order to keep down the volume, thus minimizing inflammatory areas at the site of the injection. Needless to say, these injections should be given in the upper outer quadrant of the buttocks and intramuscularly, otherwise abscess may follow. I have had one abscess develop, in which concurrent therapy was administered, consisting of both mapharsen and bismuth salicylate injections. Of course, this complication may have been produced by bismuth or a combination of bismuth and mapharsen. In my experience solvents play but a minor factor in preventing pain, but the solvent may raise the incidence of toxic reaction. I now am using only distilled water in concentrations of 5 to 10 per cent. I cannot agree with the authors as to its usefulness in interstitial keratitis. In my experience mapharsen had no beneficial results on this late acute congenital manifestation. Perhaps their improvement may be the combined effect

<sup>23</sup> Astrachan, G. D. Syphilis in Pregnancy, New York State J. Med. 40: 43 (Jan. 1) 1940.

of foreign protein reaction produced by the drug given intramuscularly plus the drug action

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## Clinical Notes, Suggestions and New Instruments

### A DEVICE FOR DETECTING SIMULATED UNILATERAL DEAFNESS

MAJOR LOUIS K. PITMAN  
MEDICAL CORPS ARMY OF THE UNITED STATES

Simulated unilateral deafness is sometimes practiced in wartime among draftees in order to avoid military conscription and among soldiers to avoid duty or to claim compensation after military discharge

Most cases of suspected simulated deafness are unilateral This is due to the fact that a double deafness would previ-

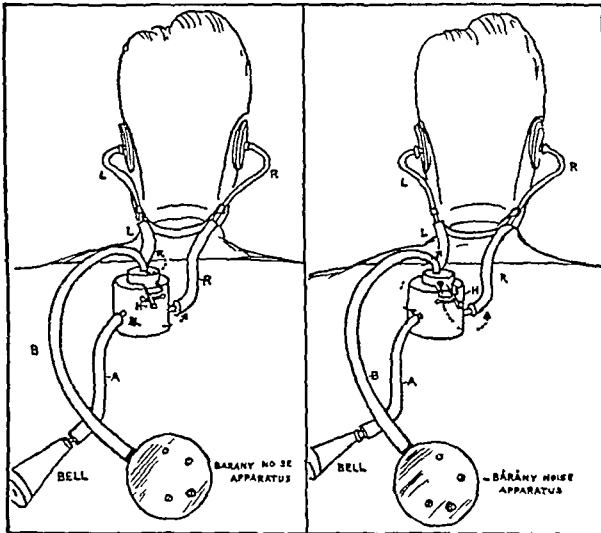


Fig 1—Left Words spoken into bell A will be conveyed into suspect's right ear only and the noise from the Barany apparatus will enter the left ear Right The procedure is reversed Now the spoken words enter the suspect's left ear and the noise his right ear

ously have attracted attention whereas a onesided deafness might have existed without being detected Also it is easier to simulate onesided deafness

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Major Pitman is chief of the Ear, Nose and Throat Service Station Hospital Basic Training Center 7 Army Air Force Technical Training Command Atlantic City N J

The examiner must keep in mind that many of these persons have given considerable study to the malingering tests and have developed shrewd technics in carrying out their attempts to deceive After some practice the malingerer has learned to ignore sounds, tones and words directed toward the ear in which he is simulating deafness He also learns when to elevate the pitch of his voice during the examination

The tests now in use, while attaining a certain degree of success, are not foolproof The tests widely used are

#### 1 Stethoscope Test

—A common stethoscope having one tube closed with a wooden plug is adjusted to the patient's ears the open tube to the suspected ear and the closed one to the normal ear The examiner speaks into the bell of the stethoscope having the patient repeat what he hears The stethoscope is then removed, the normal ear is tightly closed and the same formula is repeated to the patient He will say he cannot hear, whereas he has already repeated after the examiner with the normal ear tightly closed with the plugged arm of the stethoscope

This test is frequently unsuccessful if the malingerer has learned to ignore all sounds going to the suspected ear

2 Lombard's Test—The patient reads some selected passage aloud As long as he hears his own voice it does not change in pitch or articulation The Barany noise apparatus is then applied to the sound ear while he continues reading If he is actually deaf in the other ear his voice will become elevated in pitch and his articulation blurred If he hears with that ear his voice will remain unaffected

This test can also fail in its purpose if the patient learns to elevate his voice when the noise apparatus is directed to his normal ear

3 Double Conversation Test—This test is done by two examiners Simultaneously each examiner tries to hold a conversation with the suspect through a tube leading to each ear In unilateral deafness the suspect will ignore the conversation directed to the affected ear However a good malingerer with a little practice can learn to ignore the conversation directed toward the ear in which he is simulating deafness

All other tests for unilateral deafness are variations of the same principles

#### MODE OF OPERATION OF AUTHOR'S TEST

The device described in this paper makes use of these tests in a new way By interfering with the malingerer's powers of concentration it renders him helpless to carry out his purpose

A common stethoscope is adjusted to the suspect's ears with the bell behind his back At the fork of the stethoscope is set a two in one petcock (fig 1) fitted with tubes A and B The stethoscope bell is attached to the far end of tube A, the Barany noise apparatus to the far end of tube B When the handle of the petcock (fig 1 left) is moved clockwise until blocked words spoken into the bell will be conveyed to the suspect's right ear only and the noise from the Barany apparatus will enter his left ear The procedure is then immediately reversed by moving handle H counterclockwise (fig 1, right) Now the spoken words enter the suspect's left ear, and the noise his right ear The result is that the subject is bewildered, as shown by his responses to the standard tests

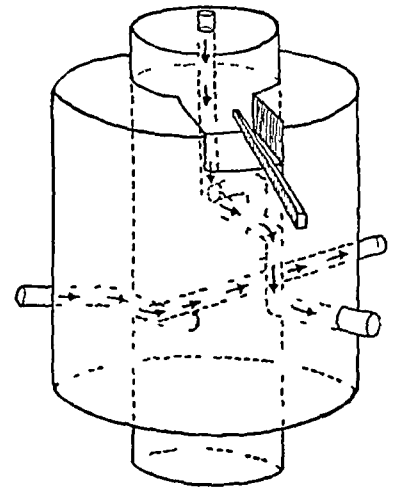


Fig 2—The inner workings of the two in one petcock

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2 *Lombard's Test*—In true unilateral deafness the patient reading aloud will automatically raise his voice when noise is directed to the normal ear and lower it when the noise is switched to the other ear. But the rapid shift of the noise from one ear to the other by my instrument confuses the malingerer. He will not be able to synchronize his tone with the rise and fall of the noise.

3 *Double Conversation Test*—The Bruny noise apparatus is replaced by a second stethoscope bell. Simultaneous conversations carried on by two examiners will not confuse a genuine unilateral deaf person, for he can perceive only one voice. The malingerer, however, will hear both voices and their rapid changing from one ear to the other will greatly confuse him and prevent him from making proper responses.

#### RESULTS OF TESTS

This device has been put to actual use at the Station Hospital, where it was developed by the author, while Lieut. Col. Carl A. Schuck was commanding officer. It has been found to be very valuable in detecting simulated unilateral deafness. Even if the malingerer knows of the tests he cannot protect himself against them, he gives himself away. The device therefore seems to offer a foolproof application of the accepted means of examining this type of case.

#### A SIMPLE HOLDER FOR THE ADMINISTRATION OF PENTOTHAL SODIUM

CAPTAIN ROBERT B. HOPE  
MEDICAL CORPS ARMY OF THE UNITED STATES

Intravenous anesthesia has reached an established place in the armamentarium of the civilian anesthetist. It is now coming to the foreground more and more in the practice of military medicine. It is adaptable in selected cases to surgery both in the field and in the hospital. The anesthetic of choice is pentothal sodium. When judiciously used by a trained anesthetist, anesthetic complications are very few.

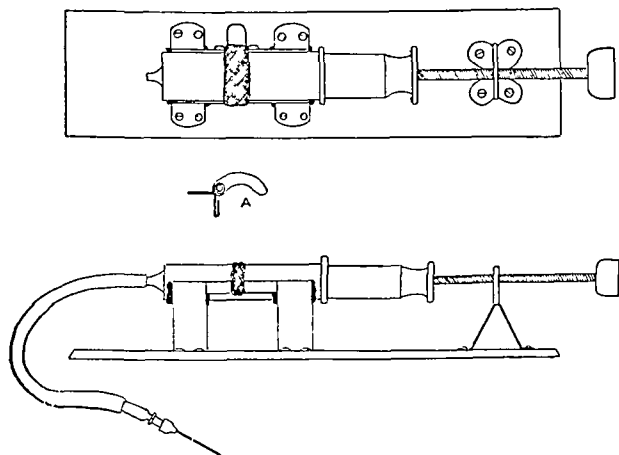


Fig 1—Holder for administration of pentothal sodium. A thumb catch which holds 50 cc syringe in cradle.

Pentothal sodium is best given in a 2.5 per cent solution. Dilution to this strength necessitates using a large syringe. It is important that during the administration of pentothal sodium

a free airway be maintained at all times, which is accomplished by continuously holding up the patient's jaw. To do this, hold a needle attached to a large syringe in place. It is impossible for the anesthetist to administer the anesthetic as well as oxygen if necessary, unless he has an assistant. This has been obviated by the development of a mechanical holder for the



Fig 2—Apparatus in use in operation: open reduction of clavicle.

pentothal syringe. These are made somewhat on the principle of the mechanical stage, so that the anesthetist can merely turn a thumb screw and administer the anesthetic. There are several models manufactured; they are relatively expensive and sometimes not readily obtainable, especially overseas. Not one was available to me.

I presented the problem to our utilities department. The principle and the general needs the instrument must meet were described. For the mechanical part, to push the plunger home a  $4\frac{1}{2}$  inch long,  $\frac{1}{4}$  inch diameter bolt and nut were used. The instrument was made to accommodate a 30 cc syringe, since we had more of that size on hand than the 50 cc size. The latter size would probably be preferable.

The instrument depicted in figure 1 was the result. It is simple, entirely dependable and satisfactory in operation. The cost of making is but a few hours' time. The materials can be found in any utilities department: a bolt and nut, some light weight sheet metal, some inner tube rubber, a cap from a metal cot post and some screws. It is an example of the ingenuity and resourcefulness that we continually find in the utilities departments of our various units. We feel that we are particularly fortunate to have such personnel in our organization.

#### USE OF THE INSTRUMENT

The setup is very simple. A 30 cc syringe will accommodate the 40 cc of solution that is necessary in diluting 1 Gm of pentothal to make a 2.5 per cent solution. The full syringe is placed in the holder. A latex rubber tube 20 cm in length with a ground glass adapter and 20 gage needle is attached to the syringe. The pentothal solution is then forced out to the needle, and the tube is filled by pushing the plunger home. This brings the solution to about the 30 cc mark in the syringe. The needle is inserted in the vein in the usual manner. Pentothal can then be administered at will by merely turning the thumb screw.

In surgery a number of syringes, needles and units of rubber tubing with adapters are kept in separate sterile packs. With ordinary sterile technic, by merely changing the tubing unit and needle, pentothal sodium solution left in the syringe is still sterile and usable for another case. Thus several short cases to be done in succession can be handled on one syringe. If more pentothal is needed for the same case the solution is mixed up in a new syringe and attached to the tubing and needle, which is still inserted in the vein.

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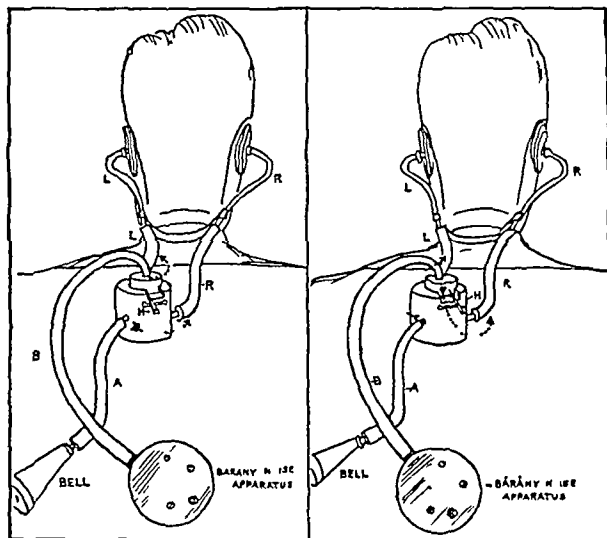


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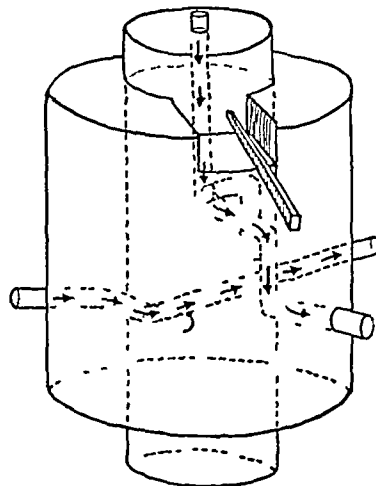


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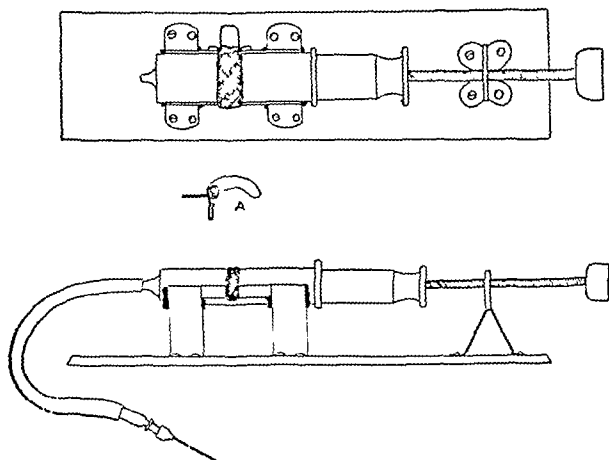


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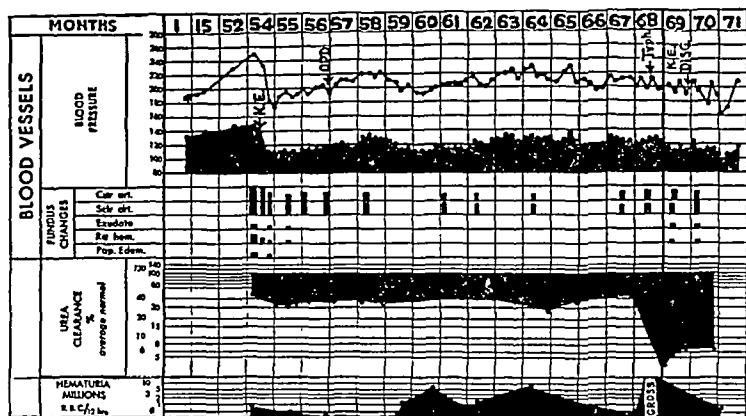
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SEVERE RENAL IRRITATION RESULTING FROM  
FOREIGN PROTEIN (TYPHOID) FEVER  
THERAPYR. D. TAYLOR, M.D. AND IRVINE H. PAGE, M.D.  
INDIANAPOLIS

We have recently studied 2 patients with renal disease in whom signs of severe renal irritation developed following fever induced by intravenous typhoid vaccine. Engman and McGarry<sup>1</sup> briefly describe a patient who developed microscopic hematuria after receiving intravenous typhoid vaccine and Campbell<sup>2</sup> reported hematuria in an arthritic patient being treated with "nonspecific" protein (typhoid) fever therapy. In 1932 Hench<sup>3</sup> reviewed the usual and unusual reactions of typhoid vaccine protein therapy in a series of 2,500 patients. There were 14 unusual reactions in this series, 2 of whom died with anuria. At necropsy acute diffuse nephritis was found in 1 case and no renal lesion in the other. Our 2 patients had previous renal disease—the nephrotic stage of hemorrhagic Bright's disease in 1, and malignant hypertension in the other—conditions which might be contraindications to foreign protein therapy.<sup>4</sup>

Because pyrexia induced by injection of foreign protein has been suggested in the treatment of various types of vascular diseases, including hypertension, it has seemed to us well to point out by these 2 examples that it is a therapy not without danger especially in those with preexisting renal damage.



Course of laboratory examinations of patient 1 while under treatment

## REPORT OF CASES

**CASE 1**—A Negro woman aged 35 admitted to the Lilly Clinic complained of hypertension of two years duration, headache, nausea and vomiting. She was bedridden for two months before admission. The arterial blood pressure was 240 systolic and 140 diastolic. Grade 4 constriction and sclerosis of the retinal arterioles, grade 1 retinal exudates, grade 2 retinal hemorrhages and grade 1 papilledema led to the diagnosis of malignant hypertension. Urea clearance was 47 per cent of the average normal. The maximal ability to concentrate urine was 1020. There were 900,000 red blood cells in the twelve hour specimen of urine. The patient excreted about 1 Gm of protein daily. The electrocardiogram showed left axis deviation.

She was treated for fourteen months with antipressor renal extracts which resulted in lowering the arterial blood pressure to an average of 200 systolic, 110 diastolic and regression of retinopathy with disappearance of hemorrhages, exudates and

From the Lilly Laboratory for Clinical Research, Indianapolis City Hospital.

1 Engman M. F. and McGarry R. A. Treatment of Certain Diseases of the Skin. *J. A. M. A.* **67**: 1741 (Dec. 9) 1916.

2 Campbell D. Nonspecific Therapy in Rheumatoid Arthritis. *Glasgow M. J.* **103**: 79 (Feb.) 1925.

3 Hench P. S. Usual and Unusual Reactions to Protein (Fever) Therapy. *Arch. Int. Med.* **49**: 1 (Jan.) 1932.

4 Cecil R. L. A Report on Forty Cases of Acute Arthritis Treated by the Intravenous Injection of Foreign Protein. *Arch. Int. Med.* **20**: 951 (Dec.) 1917. Nonspecific Protein Therapy, *J. A. M. A.* **105**: 1846 (Dec. 7) 1935.

papilledema. During these fourteen months she had hematuria varying from normal to 5,500,000 red blood cells in twelve hours.

On May 21, 1942 it was decided to determine whether or not fever induced with typhoid vaccine could mimic the results of antipressor renal extracts. She was given an intravenous infusion of 100 cc of isotonic solution of sodium chloride that contained 0.20 cc of typhoid mixed vaccine according to the method of Solomon and Somkin<sup>5</sup>. After a violent chill, the temperature and pulse rate rose to 104 F and 140 respectively and the respirations to 37. The following day gross hematuria was noted, but despite this a similar dose of mixed vaccine was given, again followed by a chill and a rise in temperature to 103.4 F. The gross hematuria persisted for ten days. There was no oliguria, edema or increase in arterial pressure. Urea clearance fell to 3 per cent of average normal. Nausea and vomiting developed and persisted for six weeks. During this time nonprotein nitrogen ranged between 100 and 207 mg per hundred cubic centimeters, hemorrhages and exudates reappeared in the ocular fundi and the hemoglobin level fell to 37 per cent of normal. On July 27 urea clearance had risen to 7 per cent of average normal. The Addis count of the urinary sediment showed 750,000 red blood cells in twelve hours, the maximum ability to concentrate urine was to 1012, and the hemoglobin level had risen to 43 per cent of average normal. Nausea and vomiting no longer occurred. The prognosis is grave and it is doubtful that she will return to her former state of health.

**CASE 2**—A white boy aged 2½ years was admitted to the Indianapolis City Hospital on May 19, 1938. Six weeks before admission the child had a rash followed in three weeks by swelling of his eyes, and still later by anasarca. The mother reported oliguria and increasing irritability. The physical findings on admission were temperature 99.4 F, arterial blood pressure 114 systolic and 70 diastolic, there were generalized edema, ascites and moist rales over the base of the left lung. The urine contained 15 per cent albumin, 10 to 20 hyaline casts per high power field, a few pus cells and occasional red cells. Urea clearance was 100 per cent of average normal. The red blood cell count was 4.10 millions, the white blood cell count 6,500 and the hemoglobin level 61.4 per cent of normal. Total plasma proteins were 4.7 Gm per hundred cubic centimeters, albumin was 0.6 Gm

per hundred cubic centimeters. A diagnosis of the nephrotic stage of hemorrhagic Bright's disease was made. He was in the hospital six months, during which time treatment consisted of bed rest, a salt free, low sodium diet, a high protein, high vitamin diet, intravenous acacia, and potassium citrate and mercurial diuretics. This management maintained edema in the grade 1 stage for the first three hospital months. At the end of the fourth month edema again became grade 4 and blood pressure rose to an average of 138 systolic and 100 diastolic. At this time it was decided to use triple typhoid vaccine in an effort to increase renal blood flow, thereby hastening recovery. On September 20, four months after admission, he was given 0.4 cc of typhoid H vaccine intramuscularly. Two days later he received 0.6 cc, neither of which produced a rise in temperature. Two weeks later 0.1 cc and 0.2 cc of typhoid H vaccine intravenously produced no fever. Three weeks later 0.25 cc of vaccine intravenously produced a temperature rise to 101 F. On October 18 0.3 cc of typhoid vaccine was given intravenously. Three days later 0.5 cc was injected intravenously. The maximum temperature rise was to 100 F. On the following day he was given 0.2 cc of triple typhoid vaccine intravenously. The temperature rose to 101 F. Three days later urea clearance fell to 28 per cent of normal and gross hematuria appeared. Urinary protein increased from an average of 2.5 Gm in twenty-four hours to 6 Gm in twenty-four hours. Hematuria

5 Solomon H. A. and Somkin Eugene. An Improved Method of Obtaining Sustained Controlled Hyperpyrexia with Triple Typhoid Vaccine. *Am. J. M. Sc.* **203**: 736 (May) 1942.

persisted between 750,000 and 2,500,000 red blood cells in twelve hours, and urea clearance was depressed below 60 per cent of average normal for three months. At no time was there oliguria, increase of edema or rise in arterial blood pressure. At the end of this time hematuria disappeared and urea clearance returned to normal. The child subsequently recovered from nephritis as evidenced by absence of edema and proteinuria, normal ability to concentrate urine (1 027) and a normal urinary sediment count on May 28, 1942.

#### COMMENT

Intravenously injected typhoid vaccine was used for these 2 patients in the hope that in the one suffering from malignant hypertension the fever induced would lower arterial pressure and in the other, with the nephrotic syndrome, that edema would disappear. Whatever therapeutic effect occurred was obscured by the appearance of signs of severe renal damage. The nature of the damage is not known, but that it was severe is indicated by diminution of urea clearance, azotemia and hematuria.

Typhoid vaccine has been widely used to induce fever in a variety of diseases and especially in arthritis and peripheral vascular disease. In most cases of this type renal disease is not present. Our experience suggests that preexisting renal disease should warn the clinician of the possible danger of this type of therapy.

#### CONCLUSIONS

Fever induced by intravenous injection of typhoid vaccine caused evidence of severe renal irritation in a patient suffering from malignant hypertension and in a patient in the nephrotic stage of hemorrhagic Bright's disease. It appears that patients with renal disease should be treated by this method with great caution if at all.

## Special Article

### STANDARDS OF EFFECTIVE ADMINISTRATION OF INHALATIONAL THERAPY

BY THE COMMITTEE ON PUBLIC HEALTH RELATIONS  
OF THE NEW YORK ACADEMY OF MEDICINE

The importance of inhalational therapy in modern medical practice is shown by its use in cardiac failure, coronary artery disease, asthma, atelectasis of the lungs of the newborn, postoperative atelectasis, pneumonia, pulmonary edema, emphysema and cerebral thrombosis. A proper understanding of the technic is especially necessary at this time because of its value in the treatment of war gas poisoning, severe hemorrhage, acute altitude sickness, and shock.

The therapeutic use of oxygen is based on the existence of a state of anoxia or of tissue oxygen want. This may be produced by failure of an adequate pressure of oxygen to reach the pulmonary capillaries or by a lowered blood flow which is responsible for a disproportionately large amount of oxygen being taken out of the capillaries, resulting in a diminished oxygen pressure insufficient for normal function of the tissues. Oxygen want may, however, take place with a normal arterial saturation as in a thrombosis of the coronary, popliteal or cerebral artery. Treatment under these circumstances makes use of the increased pressure of oxygen physically dissolved in the blood which is of special value not only in increasing the tension of oxygen through an artery that still may be partly

patent but, more significantly, by increasing the tension in the collateral circulation which feeds the area of the obstructed artery. The most manifest signs of the physiologic advantages of inhalation of oxygen are diminution in pulse rate, cyanosis, dyspnea, restlessness and delirium, and the decrease in the volume of pulmonary ventilation.

Although administration of oxygen is the mainstay of this therapy, new procedures have been developed to maintain respiratory function. These include the administration of helium and of oxygen or helium-oxygen mixtures under positive pressure. The usefulness of substituting helium for nitrogen in a respirable gas mixture is due to the lower specific gravity of helium which makes it possible to breathe through constricted pulmonary passageways at almost one half the effort required for respiration of air or of pure oxygen. The decreased physical pressure necessary for the inhalation of a helium-oxygen mixture results in a lowering of the elevated negative pressure within the chest that occurs in obstructive dyspnea. Positive pressure provided in inspiration tends to prevent the excessive negative intrapulmonary pressure from exerting a suction action on the intrathoracic bronchi and pulmonary epithelium and thus is apt to inhibit the formation of mucus from the bronchi and edema from the pulmonary capillaries. Positive pressure in expiration serves the function of keeping the bronchi from advanced constriction during expiration and also of applying a direct opposing pressure on the external capillary wall, thereby retarding the tendency toward edema production and directly counteracting the internal hydrostatic pressure within the capillary.

The local application of epinephrine and neosynephrin by inhalation of the nebulized spray allows contact of these substances with the smaller bronchi locally and is frequently effective in causing cessation of bronchial spasm and a decreased swelling of the mucous membrane at a relatively low concentration of the drug in the body.

In order that the patient may benefit from inhalational therapy, the physician should be able to prescribe the concentration of oxygen to be breathed by the patient and, in the newer procedures employed, the amount of positive pressure desired or the proportion of helium in a helium-oxygen mixture.

#### OXYGEN REGULATION AND GAGES

Oxygen should be employed in high pressure tanks of 244 cubic feet or 6905 liters capacity. There is no justification for the use of low pressure tanks since there is no special "medical" oxygen and since only small quantities of oxygen can be furnished in this expensive manner. Oxygen used in medical practice is the same as industrial oxygen.

The regulator attached to an oxygen cylinder contains two gages, one which indicates the rate of flow in liters per minute and another which reveals the amount of oxygen in the cylinder. Either a variable orifice float gage or a Bourdon tube spring type regulator gage may be employed, provided the gage chosen is made by one of the reliable standard manufacturers of the equipment. The gage should be tested from time to time by measuring the rate at which the spirometer bell of a metabolism apparatus is filled at standard pressure and temperature. In attaching the regulator to an oxygen tank, the oxygen tank should first be 'cracked,' that is, it should be opened slightly



until the hiss of escaping gas is heard and then quickly closed. This is done to prevent the initial oxygen stream from blowing dust into the regulator.

#### OXYGEN TENT THERAPY FOR ADULTS

The most comfortable method of providing oxygen therapy, next to the use of the oxygen room, is in a tent with a phiofilm or other transparent canopy. However, if the tent is to fulfil its purpose, it must be able to maintain continuously the desired oxygen concentration, generally 50 per cent. The possibility of leaks developing in a unit is such that no tent should ever be used unless the oxygen concentration of the atmosphere is tested at least two or three times a day. The test is so simple and yet so essential that no physician should consent to the employment of a tent either in private practice or in the hospital unless provision is made for periodic testing and recording of the oxygen percentage of the contained atmosphere. Although a concentration of oxygen as low as 35 per cent at times will be adequate to correct anoxia, in other instances concentrations as high as 70 per cent may be desirable. It should be possible to fulfil the recommendation of the physician in respect to these oxygen concentrations in any air-tight tent. In a large oxygen tent the administration of a high flow of oxygen, for example 15 liters a minute, will result in a concentration above 50 per cent oxygen in thirty minutes. If two tanks are employed with a total inlet of 30 liters a minute concentrations in excess of 50 per cent are obtained in fifteen minutes. When the patient is removed for examination or when for other reasons the tent canopy is opened, an increase in the flow of oxygen is indicated. There will be a saving in oxygen if the blower is stopped when ice is added to the unit.

In order to provide maximal comfort the tent should generally have a capacity of more than 8 cubic feet. The temperature inside the tent should be maintainable at the desired level by means of a cooling device. For most patients with fever a temperature between 58 and 68 F is preferred in winter and slightly higher temperatures in summer. For older patients and infants higher temperatures are often desirable. The relative humidity should generally be maintained at between 40 and 60 per cent. When tents are ventilated by motor blown circulation which forces the air over ice, the humidity will usually be within this range. In certain conditions, such as tracheobronchitis, higher humidities and temperatures than are normally employed may be desirable. If this is the case, the circulation of the atmosphere should be lowered and the quantity of ice decreased. A spark-proof vaporizer is being developed at this time in conjunction with tent therapy. The technician should be instructed to observe and record the temperature in the tent. If the temperature goes above 70 F, the indication is that there is inadequate cooling and consequently inadequate removal of moisture also. This may be due to slow circulation of the motor blower, too little ice or ice in such small pieces as to retard circulation. Ice should be inserted in chunks the size of a grapefruit.

Within the last decade it has become apparent that the maintenance of an oxygen flow necessary to keep the oxygen concentration in a general range of 50 per cent requires a minimum flow of 9, and preferably 10, liters of oxygen a minute. This is sufficient to wash out most of the carbon dioxide produced by

the patient, so that the carbon dioxide concentration is rarely above 1.5 per cent. The absence of soda lime constitutes a saving both in cost of the chemical and in the expense of supervision sufficient to compensate for the increased flow of oxygen. As a matter of fact, if lesser rates of oxygen flow are maintained and soda lime is used, there is considerable difficulty in keeping the oxygen concentration at an effectively high level, especially for patients who are seriously ill and require treatment within the tent. Because there is no valid indication for continuous stimulation of the respiratory centers, addition of carbon dioxide to oxygen is not required for most illnesses.

The oxygen concentration of the atmosphere should be tested at frequent intervals and the carbon dioxide percentage in the tent should be tested in each unit under the conditions in which the tent is ordinarily operated. Provision should also be made to test the relative humidity in the tent although when the functional capacity of a motor blower tent has once been appraised this need not be performed daily.

In thermal circulation tents a concentration of 50 per cent may frequently be obtained by an oxygen flow below 9 liters a minute but with the inevitable accumulation of increasing concentrations of carbon dioxide as the flow is lowered below 8 liters a minute. Since a soda lime absorber would have to be added if low oxygen flows (under 8 liters) are employed, it is preferable to administer from 9 to 10 liters of oxygen a minute and give the patient the benefit of the higher oxygen concentration without the physiologic disadvantage of excess carbon dioxide in the inspired air and also without the added need for frequent carbon dioxide testing.

A closed canopy should not be put over a patient's head unless it is equipped with an adequate cooling and dehumidifying apparatus.

Although rubber or canvas canopies are still employed, the psychologic advantages of completely transparent canopies are such as to make the indication for the latter type of tent covering a strong one. Phiofilm or a suitable substitute should be used if obtainable. The modern tent is and should be noiseless and a red light or other mechanism may be provided which remains on as an indication that the motor blower is in action.

#### OXYGEN TENT THERAPY FOR INFANTS

The same general principles apply to tents for infants, except that higher temperatures and higher humidities should be prescribed for very young infants. Furthermore, smaller tents may well be used. It should be recognized that infants deprived of heat by rapid circulation of cold atmosphere over them may have an abrupt fall in body temperature. A tent with an aperture at the top and with provision to admit oxygen may be used provided it is not placed near an open window or door where air currents may blow out the accumulated oxygen. It is desirable in these tents to test the oxygen concentration at a point at the level of the infant's nose. Because of the fact that infants produce so little heat water and carbon dioxide, open top tents without an air conditioner may be employed. When closed canopies and motor driven air conditioned tents are used, the motor should be run at low speed and either no ice should be placed in the unit or only the small amount desired for the prescribed conditions of temperature and humidity.

## STERILIZATION OF THE OXYGEN TENT

After the termination of each case the tent used should be washed with soap and water both inside and outside. It should then either be dipped in a solution of 1:10,000 mercuric bichloride or any other efficient sterilizing solution for five minutes and washed with water or, preferably, rubbed down with 70 per cent alcohol, which is the more common practice. The use of the phiofilm canopy permits frequent replacement of it in private practice.

## FIKE HAZARDS

All tents should be conspicuously labeled "Danger! No flames! No sparks!" When a tent is used within a private room, it is desirable to place on the door a sign with a similar label. Oxygen regulators should also be conspicuously stamped "Do not oil." It is suggested that nonflammable phiofilm material be used in the construction of tent canopies.

Smoking should not be permitted in the room in which oxygen therapy is being conducted. No electric heating pads or electric call bells should be permitted in oxygen tents. Visitors should be warned by word of mouth not to light matches and to observe the regulations, since some do not speak English or do not read the instructions.

## NASAL CATHETERS

There are several effective methods of administering oxygen through the nose by employing a nasal catheter either in the nasopharynx or in the oral pharynx or, in some instances, by the use of a nasal metal tube which just enters each nostril. A soft rubber nasal catheter is generally preferred to the metal nasal tube. The oxygen is first passed through approximately 3 inches of water to prevent drying of the mucous membranes. A 1/8 bricet nasal catheter number 10 or 12 French is inserted into the nostril for a distance of approximately 3 inches, that is, up to but not touching the posterior wall of the nasopharynx. Five liters of oxygen a minute generally provides 37 per cent oxygen in the inspired air. A single catheter may be changed from one nostril to the other if irritation should occur. The terminal inch of the catheter should be perforated with four small holes in order to prevent a single stream of oxygen impinging on one localized area of the mucous membrane.

If the catheter is passed down into the oral pharynx opposite the glottis, a concentration of 42 per cent oxygen may be obtained in the inspired air at a flow of 5 liters a minute. When the catheter is used in the oral pharynx, it is important to remember that oxygen may pass into the stomach and distend the abdomen if the catheter is placed lower than the uvula. If the pharyngeal position of the catheter is adopted, 7 liters of oxygen a minute to supply concentrations of oxygen in excess of 50 per cent may be used with no sensation of discomfort is produced. The nasal catheter should be lubricated with KY jelly or petrolatum each time it is inserted. The catheter should be removed at least twice in twenty-four hours for cleaning and, at the termination of the case, should be cleansed and sterilized. This is important, as otherwise the small holes in the terminal inch of the catheter may be plugged and oxygen may escape through one single orifice, thus producing irritation of the nasal mucous membrane. When a patient after insertion

of the catheter in the oral pharynx, swallows a bolus of air, the inference is that the catheter has been inserted too far, it is then withdrawn until no gas is taken into the stomach during deglutition.

## OXYGEN MASKS

Oxygen masks are especially suitable for administration of high concentrations of oxygen from 50 to 100 per cent. For application in either the nasal or the oral pharynx, the nasal catheter is generally more comfortable for long continued use and just as effective as the oxygen mask if concentrations below 50 per cent are prescribed. The oxygen tents with transparent canopies and air conditioning cabinets are generally more comfortable for the administration of moderate oxygen concentrations, such as between 40 and 60 per cent. Within recent years it has become apparent that pure oxygen is not irritating to human pulmonary epithelium when administered by a mask for two days, and in all probability for four days. The fact that the mask is removed from time to time in order to provide food or that the face may be washed or for other reasons may be responsible for this exceptional tolerance of 100 per cent oxygen. At any rate, the previous warnings regarding the danger of pulmonary edema from inhalation of these very high oxygen atmospheres were based on experiments on animals which were kept in air-tight chambers continuously for three or four days. Since clinical evidence has been forthcoming from a number of hospitals indicating that concentrations of oxygen between 70 and 100 per cent have been used without damage to the lung for periods of from two to five days, there has been opened a new field for the mask in which a large increase in physically dissolved oxygen may be of crucial value in such conditions as shock, severe hemorrhage and imminent cardiac failure.

There are two masks available, the B. L. B. (Boothby-Lovelace-Bulbulian) and the Brach-Eckmann injector meter mask. In the B. L. B. mask a well fitting rubber nasal or oral nasal mask is attached to the face and from it is suspended a small bag in which a moderate amount of rebreathing takes place. Two sponge rubber disks placed in the center of the mask serve as a combination inspiratory and expiratory valve. During inspiration there is sufficient resistance in the sponge rubber to prevent a free flow of air into the mask. When the rebreathing bag is emptied, air is drawn through the sponge disk. During expiration, first the rebreathing bag is filled with the exhaled air and the remainder of expired air then passes through the sponge rubber disk into the outer atmosphere.

During increased ventilation, as in severe dyspnea, the resistance imposed by breathing through the sponge rubber is naturally increased. This is especially significant during the inspiratory cycle if flows of oxygen under 6 liters a minute are used. It must also be pointed out that a flow of oxygen at a rate as low as 2 to 4 liters a minute will be accompanied by sufficient rebreathing to produce a carbon dioxide percentage in the inspired air of approximately 2 per cent. With this mask it is generally desirable to use a high flow of oxygen, as at the rate of from 7 to 10 liters a minute, in order to eliminate the inspiratory resistance and the increased carbon dioxide in the inspired air.

In the injector mask a delicate inspiratory valve is placed between the mask and a large light latex bag

which prevents any rebreathing and simply serves as a collecting bag for oxygen. A light rubber flutter expiratory valve is placed in front of the mask for exit of the exhaled atmosphere. This mask operates at minimal resistance during both high and low oxygen flows. An injector is attached to the regulator, which makes possible the administration of any oxygen concentration desired from 40 to 100 per cent. By use of different sized apertures in the injector, a variable amount of atmospheric air is pulled into it because of the negative pressure created by the stream of oxygen passing through it into the rubber tubing. Calibration of these orifices makes possible the instantaneous provision of the desired oxygen concentration with an error of not more than  $\pm 3$  per cent. If the administration of low flows of oxygen and the exclusion of carbon dioxide in the inspired air are called for, the injector mask is most suitable for this purpose. If carbon dioxide of varying percentages is prescribed, the inspiratory valve in this mask may be removed to allow rebreathing, or the B. L. B. mask may be employed. The latter mask may be obtained in two sizes. It is essential that in cases presenting obstructive dyspnea a minimal inspiratory resistance is present. The rate of flow of oxygen from the regulator may be varied from 4 to 15 liters a minute, depending on the concentration of oxygen desired and the desirability of avoiding resistance from the apparatus itself. The employment of less than 4 liters a minute is rarely indicated except for young children, for whom lower flows may be adequate.

Although these newer types of masks are comfortable for a large number of patients, it must be recognized that their continuous use becomes objectionable to a good many others. When discomfort prevents the continuous administration of oxygen by mask, a shift should be made to the oxygen tent, if it is feasible, or, if not, to the nasal catheter.

After use, the mask should be scrubbed thoroughly with soap and water and boiled, or immersed or washed in a 70 per cent alcohol solution.

#### THE OXYGEN MASK METERED FOR POSITIVE PRESSURE

The injector mask may be obtained equipped with a metal disk which surrounds the expiratory flutter valve and contains on its external surface five orifices of different diameters. When the largest sized orifice is employed, expiration proceeds naturally without pressure. When the disk is turned to the orifices of smaller size, the patient exhales under a positive pressure of 1, 2, 3 or 4 cm. of water, depending on the size of the orifice.

Provision of positive pressure during expiration is specifically indicated for the treatment of pulmonary edema, either during the course of cardiorespiratory illness or as a specific remedy for pulmonary irritants, such as chlorine gas or the fumes of nitric acid. In treating pulmonary edema it is customary to begin with high pressures, such as 4 cm., and gradually lower the pressure to 2 and 1 cm. of water. From 40 to 100 per cent oxygen is employed. The injector attached to the regulator is turned to the oxygen percentage desired, and the flow from the regulator is adjusted at that rate which prevents the collecting bag from collapsing at the end of inspiration. It is desirable to have the injector one third full of water so that the

stream of oxygen may pick up some moisture as it passes into the mask.

The relative humidity of pure oxygen passing at a flow of from 8 to 10 liters a minute through the injector partially filled with water is approximately 20 per cent at 70 F. The inspired oxygen is additionally moistened by the inner surfaces of the mask, which are wet with the saturated water vapor resulting from expiration, so that the ultimate relative humidity of the inspired oxygen is approximately 45 per cent. If a still higher relative humidity is desired during inhalation of 100 per cent oxygen, the injector is removed and a water bottle attached to the regulator, so that the stream of oxygen will pass upward through at least 3 inches of water before entering the mask.

Positive pressure is employed also to prevent or control the oozing that takes place from the tracheo-bronchial tree following tracheotomy in cases of previously existing laryngeal obstruction. In this instance the tracheotomy tube is prolonged so that inspiration may take place through a flutter valve and expiration proceed through an expiratory valve into a water bottle at pressures which generally begin at from 4 to 5 cm. of water and are gradually lowered during a period of twelve hours to from 1 to 2 cm. of water.

Positive pressure respiration appears to be contraindicated in shock in which the venous return to the heart is retarded. The increased intrapulmonary pressure of from 2 to 4 cm. of water may further diminish the flow of blood into the right auricle. When peripheral circulatory failure is suspected the blood pressure should be followed at fifteen minute intervals and the pressure reduced or discontinued if a fall greater than 10 mm. of mercury takes place in the systolic pressure following application of breathing under positive pressure.

#### THE HELIUM-OXYGEN HOOD

Although helium-oxygen therapy may be carried out by means of mask oxygen apparatus, the helium-oxygen hood is the only effective apparatus for administering from 20 to 30 per cent oxygen and from 80 to 70 per cent helium under a positive pressure during inspiration as well as expiration. The apparatus consists of a hood with a removable rubber collar, which fits around the neck, and an air conditioning cabinet. The conditioning cabinet contains two Barolyme carbon dioxide absorbers which are placed in ice water, a motor blower unit and a rheostat for controlling the velocity of air circulating through the hood. To the hood is attached a pressure control water valve that consists simply of a rubber tube with a glass connection leading into a water bottle. The length of the glass tube immersed in the water determines the pressure to which the head of the patient, and therefore the intrapulmonary respiratory passageway, is exposed. This apparatus is employed for the treatment of severe bronchial asthma and for obstructive dyspnea produced by lesions in the tracheobronchial passageway.

Since this is a closed circuit apparatus in which special precautions are taken to avoid all leaks, in order that no nitrogen may be admitted into the helium-oxygen atmosphere, it is especially important to provide efficient cooling and dehumidification and to use a soda lime absorbent to prevent the accumulation of carbon dioxide.

If helium is not available, the helmet may be employed with the administration of 100 per cent

oxygen for the treatment of both asthma and obstructive dyspnea generally. Inhalation of oxygen under pressure during the inspiratory cycle is especially apt to relieve severe dyspnea due to laryngeal or tracheal constriction. The helium-oxygen hood is used also for the treatment of pulmonary edema, at first with a relatively high pressure of from 5 to 6 cm. of water, then with pressures gradually reduced to 2 and 1 cm., and finally to atmospheric pressure.

Since helium is an inert gas it should not be employed without previous admixture with oxygen in tanks containing 20 to 25 per cent oxygen and 80 to 75 per cent helium respectively. If separate tanks of oxygen and helium were employed to supply a hood or mask apparatus, inadvertent stoppage of the oxygen supply would result in progressive elevation of the helium concentration of the contained atmosphere, with danger of asphyxia to the patient.

#### THE ADMINISTRATION OF 5 TO 10 PER CENT CARBON DIOXIDE IN OXYGEN

The administration of 5 to 10 per cent carbon dioxide in oxygen is useful in carbon monoxide poisoning and other clinical conditions such as electric shock, morphine poisoning and drowning in which the respiratory center may be depressed. Carbon dioxide-oxygen inhalation has also been employed in massive collapse of the lungs, in order to stretch the bronchi and perhaps loosen a tenacious plug of mucus, and for short periods after operations to expand the lungs and bronchi in the belief that atelectasis may be less likely to take place. It is particularly useful in intractable hiccup. For this purpose a tank of either 90 per cent oxygen and 10 per cent carbon dioxide or 93 per cent oxygen and 7 per cent carbon dioxide may be employed either with a B. L. B. or an injector mask for short periods of two or three minutes or until an increase in pulmonary ventilation has taken place sufficient to relieve the condition for which it was intended. It must be borne in mind that prolonged administration of carbon dioxide will bring about toxic symptoms, such as headache, nausea and, if concentrations above 10 per cent are employed too long, convulsions.

#### ADMINISTRATION OF VAPORIZED SOLUTIONS OF EPINEPHRINE AND NEOSYNEPHRIN HYDROCHLORIDE

It has been found convenient to use a nebulizer with a hand bulb to vaporize 1:100 epinephrine and 1 per cent neosynephrin hydrochloride. Since the vaporization of relatively large amounts of these drugs has been shown to be valuable in the treatment of severe bronchial asthma, the high pressure tank rather than the hand bulb should be used. One cc. of 1:100 epinephrine or 1 cc. of 1 per cent neosynephrin hydrochloride may be inserted into one of the openings in a glass nebulizer and a tube from an oxygen tank connected to the glass outlet. The oxygen from the tank is then turned to 5 liters a minute and the wide end of the nebulizer held between the teeth with the mouth wide open. The nebulizer is rinsed with warm water after use to prevent clogging. It is generally desirable to use a warm mouth wash and gargle after spraying with epinephrine solutions to prevent drying of the throat. This method of supplying the bronchi and alveoli with nebulized solutions may be used for the administration of other drugs, such as diamino-sulfone glucoside.

#### TECHNICIANS

The technics of inhalational therapy must be skilfully administered if use of the therapy is to be of benefit to the patient. Because of the complexity and diversity of the more modern apparatus, many physicians prefer to have technicians attend to the mechanical details involved. Such technicians should be properly trained and supervised. It is therefore suggested that appropriate courses be given for the training of inhalational therapy technicians and nurses who assist in these procedures.

### Council on Pharmacy and Chemistry

#### REPORT OF THE COUNCIL

THE COUNCIL HAS PREVIOUSLY PUBLISHED ITS CONSIDERATION OF A COD LIVER OIL PREPARATION (THE JOURNAL OCT. 24, 1936, P. 1384) BUT BECAUSE OF RENEWED INTEREST IN THIS CLASS OF AGENTS FOR THE TREATMENT OF BURNS AND THE ACCELERATION OF WOUND HEALING AND IN THE VALIDITY OF CERTAIN ADVERTISING CLAIMS PUBLICATION OF THE FOLLOWING STATUS REPORT WAS DEEMED ADVISABLE. THIS REPORT REVEALS THAT MUCH WORK HAS BEEN PUBLISHED ON THE SUBJECT BUT UNFORTUNATELY, THE LACK OF ADEQUATE CONTROLS OR REPORTS ON SUCH CONTROLS, HAS HINDERED GREATLY A TRUE EVALUATION OF THE STATUS OF COD LIVER OIL IN THE MEDICAL ARMAMENTARIUM AS FAR AS TOPICAL APPLICATION IS CONCERNED. WHILE SOME INTERESTING OBSERVATIONS HAVE BEEN RECORDED, CONSIDERABLE EXPERIMENTATION REMAINS TO BE DONE. IN VIEW OF THE CURRENT CONFLICTING OPINIONS AND LACK OF SUBSTANTIATING EVIDENCE THE COUNCIL IS OF THE OPINION THAT THERE REMAIN TOO MANY UNANSWERED QUESTIONS TO WARRANT ACCEPTANCE OF COD LIVER OIL PREPARATIONS FOR EXTERNAL USE AT THIS TIME BUT IT PRESENTS THE FOLLOWING STATEMENT TO OFFER TO THE MEDICAL PROFESSION A CONCISE REVIEW OF THE PRESENT STATUS OF SUCH MEDICAMENTS AND TO SUGGEST THE NEED FOR FURTHER CAREFULLY CONTROLLED OBSERVATIONS.

AUSTIN E. SMITH, M.D., Secretary

#### A STATUS REPORT ON THE EXTERNAL USE OF COD LIVER OIL

Lohr<sup>1</sup> was the first to publicize widely the use of cod liver oil externally. He employed an ointment containing one part of cod liver oil mixed with two parts of petrolatum in treating burns, abscesses, wounds, ulcers and osteomyelitis. He reported unusual success, especially in the rapid epithelization of large areas and the conversion of unhealthy necrotic areas to clean, bacteria free wounds. Lohr stated that he found skin grafting unnecessary even when large areas were denuded. Since the publication of Lohr's original articles, many reports have appeared in the literature. Thus, Lucke<sup>2</sup> used Lohr's treatment successfully in furunculosis, abscesses, infected wounds and ulcers. Later he added bee honey to the ointment and felt that the results were even better. Buchheister<sup>3</sup> also had good results from the latter unguent in infected surgical wounds, furunculosis, carbuncles, osteomyelitis and mastoiditis. Kirschner<sup>4</sup> disagreed with Lohr's claims. He found zinc ointment to be more effective than cod liver oil, which he reported as actually harmful in some instances. He marked as false the conclusion that under local cod liver oil treatment all wounds epithelize and no skin grafting is necessary. Steel<sup>5</sup> employed

1 Lohr, W. *Zentralbl. f. Chir.* 60:1611 (July 8) 1933. Ueber die Lebertransalbenbehandlung (mit und ohne Gipsverband) bei frischen Verletzungen, Verbrennungen und phlegmonösen Entzündungen. *ibid.* 61:1686 (July 21) 1934. Die Behandlung von schlecht heilenden ulcero- und Gliedmasstumpfen mit grossen Gewebdefekten (nach Verkohlungs-Erfrierung und Amputation) mit dem Lebertran Gipsverband, *ibid.* 61:1515 (Aug. 4) 1934. Die Wundbehandlung schwer heilbarer Wunden unter Benutzung von Lebertran Therapie d. Gegenw. 75:444 (Oct.) 1934. Die Behandlung grosser flächenhafter Verbrennungen 1. und 2. Grades mit Lebertran. *Chirurg.* 6:263 (April 1) 1934. Der Lebertran bei der äusseren Behandlung von Wunden. *Deutsche med. Wchnschr.* 60:561 (April 13) 1934. Die Behandlung der akuten und chronischen Osteomyelitis der Röhrenknochen mit Lebertran. *Arch. f. klin. Chir.* 180:206 (1934). Treatment of Acute and Chronic Osteomyelitis of Tubular Bones by Means of Cod Liver Oil and Plaster Casts. *Deutsche med. Wchnschr.* 62:997 (June 19) 1936. Lohr and Treusch.

2 Lucke, H. *Deutsche med. Wchnschr.* 61:967 (June 14) 1935.

3 Buchheister, H. Erfahrungen mit Honig und Lebertran in der Wundbehandlung. *München med. Wchnschr.* 82:1612 (Oct. 4) 1935.

4 Kirschner, M. Bedeutung der Vitamine für die Chirurgie. *Arch. f. klin. Chir.* 189:63 (Aug. 30) 1937.

5 Steel, J. P. Cod Liver Oil Treatment of Wounds. *Lancet* 2:1, 290 (Aug. 10) 1935.

gauze saturated with crude cod liver oil in the treatment of minor and severe burns and found it suitable for indolent ulcers, deep abrasions and infection. He believed the higher the vitamin content the better the results and used his crude cod liver oil treatment routinely for burns. Schaer<sup>6</sup> found cod liver oil satisfactory in the secondary healing of wounds but felt that its use in osteomyelitis required further investigation. Balachovski and Ratchevski<sup>7</sup> and Balachovski<sup>8</sup> used carotene in a paraffin base for burns. Iost and Kochergin<sup>9</sup> employed a cod liver oil ointment in 263 cases of superficial and suppurating wounds, open amputation stumps, ulcers, frost bites and traumas. Mason<sup>10</sup> advocated cod liver oil to stimulate indolent burns. On the other hand MacCollum<sup>11</sup> used cod liver oil and other unguents in unhealed burns and found that all had about the same effect. Wakeley,<sup>12</sup> in discussing war burns, spoke among other forms of treatment of cod liver oil for burns of the face. Meherin and Schoemaker,<sup>13</sup> reporting on the treatment of cement burns stated that once clean granulations have started, cod liver oil ointment should be used. Driver, Binkley and Sullivan<sup>14</sup> used an ointment containing cod liver oil 88 per cent and white wax 12 per cent and an ointment of white petrolatum to which was added 2000 U. S. P. units of oil soluble carotene per gram. They treated 25 cases of varicose ulcers, 4 of erythema induratum and 3 indolent ulcers. The results were generally more satisfactory than those obtained by other methods. Stevenson<sup>15</sup> has reported good results with cod liver oil ointment in the treatment of burns of the cornea, eyes and lids. Hardin,<sup>16</sup> after reviewing the entire subject and reporting his own experience in 396 cases of various types of wounds felt that cod liver oil ointment was an effective method of local wound therapy. Such treatment according to this author, is applicable to both clean and infected wounds and to new and old burns of major severity. Aldrich<sup>17</sup> found cod liver oil ointment to give excellent results in the treatment of burns, wounds, indolent ulcers and pruritus ani and vulvae while Brandaleone<sup>18</sup> reported that such ointments promote the healing of ulcers of the feet in patients with diabetes.

Many similar clinical reports could be cited. In general such reports stress the impression that cod liver oil applied locally produces a definite leukocytic response with rapid liquefaction of necrotic material, suppression of local infection and stimulation of granulation tissue and of epithelization with rapid healing and minimal scarring. Unfortunately well controlled clinical investigations are remarkable by their scarcity, while only a few studies of the comparative effect of cod liver oil in promoting the healing of experimental wounds in animals have appeared. Puestow, Poncher and Hammatt<sup>19</sup> showed that burns in guinea pigs and rabbits healed 25 per cent faster under cod liver oil therapy than with tannic acid. There was no indication in this report that the results obtained were statis-

tically significant. Getz<sup>20</sup> found that experimentally produced tuberculous skin lesions in guinea pigs healed more rapidly when treated with cod liver oil than when treated with paraffin, lanum or cottonseed oil. Brandaleone and Popper<sup>21</sup> found the rate of healing of elliptic wounds in vitamin A deficient rats (produced by clipping away a portion of the skin with scissors) significantly higher if cod liver oil was locally applied or given orally than if the wounds were untreated or treated with linseed oil. No significant differences in the rate of healing of such treated and untreated wounds in normal rats was found. Puestow and his collaborators<sup>19</sup> could find no histologic evidence that the scars of healed burns following treatment with cod liver oil were different from those following other treatment. Brandaleone and Popper<sup>21</sup> studied microscopically the scars occurring in their animals but report no differences which may have occurred as a result of varying treatments.

The mechanism of any local action which cod liver oil may produce remains unknown. Most clinical reports, beginning with those of Lohr, have assumed on an empiric basis that the activity noted was due to the vitamin content of the oil. Lohr and Unger tested the efficacy of various cod liver oil fractions in promoting the healing of experimental wounds in guinea pigs. No data were given, but they concluded that cholesterol, squalene and saturated fatty acids were ineffective while vitamins A and D and the unsaturated fatty acids promoted healing. Concentrations of the vitamins higher than those found in cod liver oil were said to be detrimental. Lauber<sup>22</sup> found that vitamin A applied locally produced no acceleration of wound healing and in concentrated amounts retarded it. He also reported that, while small quantities of vitamin D produced a slight acceleration, large doses inhibited it. Roth<sup>23</sup> found that the local application of oils containing vitamin A prevented or cured the keratomalacia of vitamin A deficient rats. However, cod liver oil treatment caused no more rapid healing of artificially produced abrasions of rabbits' corners than did liquid petrolatum. Getz<sup>20</sup> fractionated cod liver oil in an effort to determine the principle responsible for the more rapid healing of tuberculous ulcers in guinea pigs. The fatty acid fraction of the cod liver oil was found to be nonhealing. The active agent was concentrated in the "nonresponsable residu," since experimentally it caused faster healing than the whole oil. This nonresponsable residue was further fractionated. The precipitate of heavy sterol was found to be inert, and the filtrate designated the "vitamin fraction" proved to be active. This so called "vitamin fraction" had two known constituents—vitamins A and D—and numerous unknown substances. The author compared as to healing properties three different oils, varying greatly in their content of vitamins A and D: halibut liver oil with 50,000 A and 200 D units; tuna liver oil with 70,000 A and 88,000 D units; and cod liver oil with 1,800 A and 175 D units per gram. Assuming the oils to be comparable in other respects, it vitamin A was the factor, halibut and tuna liver oils should have been more effective while, if vitamin D was the desired agent, tuna liver oil should have been best. Cod liver oil proved to be superior to either of the other agents. In the report of Puestow and his collaborators<sup>19</sup> the healing of electrocautery burns (in pigs and rabbits) was studied following treatment with various vitamin containing oils. While the cod liver oil treated lesions healed 25 per cent faster than those untreated or treated with 5 per cent tannic acid or olive oil, those treated with ointments of varying vitamin content showed approximately the same healing as with cod liver oil. These high vitamin ointments were one containing no vitamin A but containing irradiated ergosterol in oil to give 625,000 units of vitamin D per gram of ointment, one containing fish liver oil to give 28,250 units of vita-

6 Schaer H. Erfahrungen mit Unguentolan Schweiz. med. Wchnschr. 65: 724 (Aug. 10) 1935.

7 Balachovski S. and Ratchevski F. Recherches sur quelques proprietes nouvelles du carotene. Existence d'une insuffisance locale en vitamines? Bull. Soc. chim. biol. 16: 220 (Feb.) 1934.

8 Balachovski S. Sur la possibilite d'insuffisances locales en vitamines: considerations theoriques et application therapeutique. Presse med. 42: 1404 (Sept. 8) 1934.

9 Iost V. I. and Kochergin I. G. Clinical and Laboratory Evaluation of Cod Liver Oil in Therapy of Wounds. Nov. Khir. Arkh. 31: 476 (No. 136) 1935. abstr. J. A. M. A. 106: 586 (Feb. 15) 1936.

10 Mason R. L. Preoperative and Postoperative Treatment. Philadelphia W. B. Saunders Company, 1937.

11 MacCollum D. W. Early and Late Treatment of Burns in Children. Am. J. Surg. 39: 275 (Feb.) 1938.

12 Wakeley C. P. G. War Burns and Their Treatment. Practitioner 146: 27 (Mar.) 1941.

13 Meherin J. M. and Schoemaker T. P. Cement Burn. Its Etiology, Pathology and Treatment. J. A. M. A. 112: 1522 (April 8) 1939.

14 Driver J. R., Binkley G. W. and Sullivan Maurice. Cod Liver Oil and Carotene Ointments in the Treatment of Indolent Ulcers. Preliminary Report. Urol. & Cutan. Rev. 42: 587 (Aug.) 1938.

15 Stevenson Edgar. Cod Liver Oil as Local Treatment for External Affections of Eyes. Brit. J. Ophth. 20: 416 (July) 1936.

16 Hardin P. C. Cod Liver Oil Therapy of Wounds and Burns. South. Surgeon 10: 301 (May) 1941.

17 Aldrich R. H. Cod Liver Oil Ointment in Surgery. Indust. Med. 11: 153 (April) 1942.

18 Brandaleone Harold. The Effect of the Direct Application of Cod Liver Oil on the Healing of Ulcers of the Feet in Patients with Diabetes Mellitus. Ann. Surg. 108: 141 (July) 1938.

19 Puestow C. B., Poncher H. G. and Hammatt Harold. Vitamin Oils in the Treatment of Burns. An Experimental Study. Surg. Gynec. & Obst. 66: 622 (March) 1938.

20 Getz H. R. Cod Liver Oil Therapy in Experimental Tuberculosis. Proc. Soc. Exptl. Biol. & Med. 38: 543 (Mar.) 1938.

21 Brandaleone Harold and Popper Edith. The Effect of Local and Oral Administration of Cod Liver Oil on the Rate of Wound Healing in Vitamin A Deficient and Normal Rats. Ann. Surg. 114: 791 (Oct.) 1941.

22 Lohr W. and Unger F. Tierversperimentelle Untersuchungen über die Wundheilung mit Lebertran und die Wirkung seiner Bestandteile. Arch. f. klin. Chir. 189: 405 (Aug.) 1937.

23 Lauber H. J. Weitere experimentelle Untersuchungen über die Beziehungen der Vitamine zur Wundheilung. Beitr. z. klin. Chir. 161: 565 1935.

24 de Roth A. T. M. Local Action of Oils Containing Vitamin A. Arch. Ophth. 24: 281 (Aug.) 1940.

min A and 46,875 units of vitamin D per gram of ointment, and one containing fish liver oil to give 237,500 units of vitamin A and 1,250 units of vitamin D per gram of ointment. The ointment containing irradiated ergosterol gave startling evidence of toxicity when used on rabbits. 13 of 15 such animals died in less than a week. Dann, Glücksmann and Tansley,<sup>25</sup> using technics and standards considerably more rigid than in most such reports, studied the rate of collagen and epithelial regeneration of "standard" wounds in rats when treated with various agents. The rapidity of healing of such wounds when untreated was compared with that seen when the following oils were used as a local treatment: cod liver oil (two samples), the distillate and the residue of a molecular distillation of cod liver oil, vitamin A naphthoate, vitamin A in coconut oil, coconut oil, peroxidized Arachis oil, Arachis oil, linoleic acid, methyl linoleate, and liquid paraffin. In most cases 12 or more animals were used in each group. It was found that collagen regeneration was stimulated to a varying degree by all the substances. Hypertrophic collagen regeneration after Arachis oil interfered with epithelial regeneration. Epithelial regeneration was promoted by linoleic acid only; it was delayed by all other substances except liquid paraffin and one sample of cod liver oil. Such results cast grave doubts as to whether the local application of vitamins A and D has any effect at all on wound healing, provided always that no general avitaminosis A or D exists. The experiments of Brandileone and Popper<sup>21</sup> do not answer this question, as local cod liver oil treatment produced no increase in the rate of healing of the normal rats of their series.

Löhr and Treusch<sup>26</sup> believed cod liver oil to possess bacteriostatic and bactericidal qualities. They found oil inoculated with staphylococci, streptococci and colon bacilli to be sterile after twenty-four hours. Löhr stated that cod liver oil is always sterile. Tumansky and Yatsevich<sup>27</sup> found that growth of streptococci and staphylococci in sterilized and nonsterilized cod liver oil ceased after one hour and six hours respectively. If sterile petrolatum was added to cod liver oil, bacteria grew for seventy-two hours. In sterile petrolatum alone, growth was prolonged for fifteen days. Kummell and Jensen<sup>28</sup> examined different specimens of Löhr's preparation (one part of cod liver oil to two parts of petrolatum) and gypsum dressings after their removal, took cultures of them and found no interference with cultural growth. Regularly, cultures from the bottom of the oil deposits were sterile. Fresh superficial wounds treated with cod liver oil showed a bacterial growth. The paper of Driver, Binkley and Sullivan,<sup>14</sup> which showed that cod liver oil required the addition of phenylmercuric benzoate 1:1,000 or phenylmercuric borate 1:2,500 before inhibition of bacteria was produced, suggests that its disinfectant properties are definitely limited. Yet von Drigalski<sup>29</sup> claimed that cod liver oil interferes with the growth of organisms cultivated from the ground and from the feces and sputum. Lichtenstein<sup>30</sup> found that in a nutrient medium staphylococci succumbed under cod liver oil in two weeks, *Escherichia coli* was resistant to cod liver oil, the addition of vitamins A and D to cod liver oil did not influence its action, and both staphylococci and *Escherichia coli* survived indefinitely under liquid paraffin. In the absence of a nutrient medium, liquid paraffin had no influence on the vitality of the organisms for the time observed (thirty-five days), olive oil killed bacteria suspended in it in seven to ten days, while cod liver oil had the same effect in seventeen to twenty-two hours and boiled linseed oil in one to one and one-fourth hours.

Irradiated cod liver oil had a greater bactericidal effect under such conditions than before irradiation. The author found an inverse relationship between the length of time required to kill the bacteria and the amount of peroxide present in these oil preparations. He was unable to rule out the possibility that other substances might play a part.

There are differences of opinion in the literature concerning the strength of cod liver oil which should be employed in ointments applied locally. With no conclusive evidence on which to base their opinions, most workers apparently feel that the higher the percentage of cod liver oil, up to 80 per cent, the better the ointment.

The complete immobilization of the affected part was an integral part of the treatment described by Löhr. Hardin<sup>16</sup> stated that his conception of the cod liver oil treatment of wounds closely resembles Orr's closed petrolatum treatment of compound fractures<sup>31</sup> and the closed plaster treatment of war wounds described by Trueta.<sup>32</sup> Many other reports indicate that the success of cod liver oil dressings is dependent in part on such immobilization and the fewer dressings required. The relative freedom from pain during the changing of dressings is thought by some to be a factor to be considered. MacCollum<sup>11</sup> thought the pressure dressings more important in the treatment of burns of children than the type of ointment used.

Most writers emphasize that the use of cod liver oil does not invalidate the accepted methods of routine wound care such as careful debridement, maintenance of blood volume, combating anemia and treatment of general disease. Hardin<sup>16</sup> warns that cod liver oil must be used with judgment in badly contaminated wounds and is not immediately applicable to acute inflammatory lesions, where the usual surgical measures are indicated. Finally, it is agreed that early skin grafting is, above all, a necessity.

In summary, it may be said that there is a significant number of clinical reports favorable to the use of cod liver oil ointments in the local treatment of burns of all types, of wounds and of ulcers. Burns in the "indolent stage" and indolent ulcers are said to be especially benefited by local cod liver oil treatment, when dressings are left in place forty-eight hours. Most workers are agreed that local infection diminishes, necrotic material is liquefied and growth of granulation tissue and epithelization are stimulated. Unfortunately there is a surprising and regrettable lack of control in such studies. The difficulty of evaluating such reports is emphasized by the Youngs and Fisher,<sup>33</sup> who criticized the common practice of basing claims on insignificant data without respect to the biologic variations which count so much in the healing of a wound. The few experimental studies reported are not conclusive, indeed, the more recent and better controlled work on animals has failed to show any advantage of cod liver oil ointment over other ointments. The therapeutic constituents of cod liver oil aside from vitamins are still unknown. The concept that the possible stimulating properties of cod liver oil rest in its vitamin content is purely empiric, studies predicated by the bacteriostatic and bactericidal activity of cod liver oil are controversial. Few reports of toxicity from the use of cod liver oil ointments have appeared. It is apparent that such ointments can serve the function of a stimulating ointment and several reports attest their beneficial effect on indolent ulcers. However their use should not violate recognized surgical principles, such preparations do not obviate the necessity for early and careful skin grafting or of other recognized medical agents for the treatment of burns and wounds.

At the time of considering this report the Council had before it the presentation of two commercially available cod liver oil preparations for topical application. After due consideration the Council voted that any favorable action on such agents must await further evidence. Accordingly, the firms were notified of the Council's decision.

31 Orr H W. Early Treatment of Gunshot Wounds and Fracture. *J. Indiana M. A.* 33: 442 (Sept.) 1940.

32 Trueta Joseph. Closed Treatment of War Fractures. *Lancet* 1: 1452 (June 24) 1939.

33 Young J S, Fisher J A and Young M. Some Observations on the Healing of Experimental Wounds in the Skin of the Rabbit. *J. Path. & Bact.* 52: 225 (March) 1941.

25 Dann Lotté, Glücksmann Alfred and Tansley, Katharine. Experimental Wounds Treated with Cod Liver Oil and Related Substances. *Lancet* 1: 95 (Jan 24) 1942.

26 Löhr W. and Treusch K. Die Wirkung des Lebertrans und der Lebertransalbe auf Wundentzündungen, *Zentralbl. f. Chir.* 61: 1807 (Aug. 4) 1934.

27 Tumansky, V K. and Yatsevich I A. Cod Liver Oil in Treatment of Infected Wounds. Experimental and Clinical Study. *Abstr. J. A. M. A.* 106: 260 (Jan 18) 1936.

28 Kummell H I and Jensen W. Beiträge zum Wirkungsmechanismus des Lebertran und Lebertransalbes, *Deutsche Ztschr. f. Chir.* 248: 238, 1936.

29 von Drigalski W. Zur Wirkung des Lebertrans auf Bakterien, insbesondere Erdbeerbakterien und Sporenbildner, *Deutsche med. Wchnschr.* 62: 1005 (June 19) 1936.

30 Lichtenstein M. Cod Liver Oil Dressings. Their Mode of Action, *Lancet* 2: 1023 (Nov. 11) 1939.



# THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, MARCH 6, 1943

## THE MEDICAL DEPARTMENT OF THE ARMY

When the medical history of World War II is written the year that elapsed following the treacherous attack by Japan at Pearl Harbor will be recognized as one in which the Medical Department of the United States Army was expanded tremendously in personnel, organized units, supplies and responsibilities and in which it met all these demands quietly and efficiently. Now with more than thirty-five thousand medical officers with hundreds of thousands of medical corps men, with double the number of general and station hospitals and well-nigh triple the bed capacity, it stands ready to meet any new obligations that may be placed upon it. During the year the only serious incident from a medical point of view was the jaundice associated with inoculation against yellow fever. The first week of February 1943 found atypical pneumonia and meningitis most prominent of the infectious diseases but even these were scattering with a few cases here and there and only a score or slightly more of cases of either in the few camps most seriously affected. From July 1942 the maximum admissions for venereal disease had reached less than 1 per thousand, and admissions for both gonorrhea and syphilis had fallen in February 1943 below levels of November 1942.

The remarkable records here cited are the actual evidence of the effectiveness of the organization of the Office of the Surgeon General to meet every contingency. In January 1941 a Central Epidemic Control Board was established including such specialists from civilian life as Drs. Francis G. Blake of Yale, O. H. Perin Pepper, Pennsylvania, Alphonse R. Dochez, Columbia, E. W. Goodpasture, Vanderbilt, Kenneth F. Macey, Johns Hopkins, A. J. Warren and Wilbur F. Sawyer of the International Health Division of the Rockefeller Foundation, Oswald T. Avery of the Rockefeller Institute and E. S. Robinson of the Massachusetts Department of Health. A special commission on influenza is headed by Dr. Thomas Francis Jr. of Michigan, one on pneumonia by Colin M. McLeod of New York

University, one on hemolytic streptococcus disease by M. H. Dawson of Columbia, one on measles by Joseph Stokes Jr., Pennsylvania, one on meningitis by Perrin Long, Johns Hopkins, and one on neurotropic virus diseases by John R. Paul, Yale. Dr. Stanhope Bayne-Jones of Yale heads the commission on epidemiologic survey.

To head services in the Office of the Surgeon General have come Brig. Gen. Hugh Morgan of Vanderbilt for medicine, Brig. Gen. Fred Rankin for surgery, Col. Esmond R. Long for tuberculosis. The manner in which these distinguished physicians from civilian life have been drawn into military service in positions of leadership, along with Brig. Gen. Elliott Cutler, now abroad, and many others who serve in organized units has been an inspiration to the many thousands of young men who know that they will find standards of medical service in our armed forces well up to those of civilian practice.

Notwithstanding the speed with which this great medical army has been assembled, the difficulties of adjustment of personnel have been slight. Col. George Lull, whose report was published in *THE JOURNAL* last week, has merited the friendship now held for him by many thousands of civilian physicians who would have found transition to a military status far more difficult without his unfailing tact and courtesy.

Under Brig. Gen. C. C. Hillman, professional services have been standardized utilizing the wealth of talent assembled by the Division of Medical Sciences of the National Research Council. Facilities have been organized by which every person entering the military service is given an x-ray examination of the chest and the roentgenogram is filed permanently with his record. Hundreds of thousands of young men of doubtful physical status have had their records reviewed by this division.

Under Col. James S. Simmons epidemiologic studies have been made which will lead to adequate protection of our young men regardless of the theater of war into which they may be called. Far too often the public thinks of the army doctor only as one who treats wounds on the battlefield. However, insect control, delousing, sanitary dishwashing, development of safe water supplies, selection of clothing for various climates, occupational hygiene and venereal disease control come also under the medical department. Then too the dental division, meat and dairy inspection, care of animals, nursing and physical therapy are parts of the complex organization which has functioned so efficiently under Surg. Gen. James C. Magee in the year of war that has passed.

Today wintertime ailments such as colds, influenza, pneumonia and measles are well below the five year average rate of cases in the Army, even though rates for the civil population in some parts of the country are above the five year average for the country. Venereal disease is substantially less than during World



War I, and the syphilis rate is the lowest in the history of our army. Since January 1941 and up to now, excluding battle casualties, the death rate has been the lowest in the history of our army. During World War I, 1 patient of each 3 with meningitis died, now only 1 in 20 dies. Prompt diagnosis, efficient care and sulfonamides have made the difference. Overseas such conditions as malaria and dysentery are being fought with all that modern medicine has provided for the army medical armamentarium.

The information here made available should be comforting to the American fathers and mothers who have given their sons to the defense of our nation. It is information which should be spread widely so that it may reach the millions of homes in which it will answer questions that have been raised again and again in the family councils. Indeed, if there has been any one obvious deficiency it has been the failure of the Public Relations Division of the United States Army to provide the information that the people want regarding the health of our army, week by week, month by month. Let the people know about the hospitals that have been provided, let them hear about the quality of the physicians enrolled and the medical service that they render, tell about our magnificent record in the treatment of burns and wounds and in the control of malaria, tell of the training programs for thousands of surgical, laboratory, x-ray and other technicians. What about some of the research projects in which the Army has cooperated with the Navy and the Committee on Medical Research? The record of the U S Army Medical Corps is one in which we may all take pride, the public that we serve needs to hear of its accomplishments.

#### CHEMOTHERAPEUTIC AGENTS AND EXPERIMENTAL TUBERCULOSIS

The usefulness of chemotherapy in the treatment of some infectious diseases has strengthened the belief that chemical compounds may yet be found which will effectively combat the tubercle bacillus. The development of the sulfonamides has increased the fervor of those who seek such chemical weapons.

In 1938 sulfanilamide itself was found to exert an inhibitory effect on the development of tuberculosis in the highly susceptible guinea pig.<sup>1</sup> The drug did not prevent completely the growth of the bacilli, but fewer organisms and less extensive lesions were observed in the treated animals. Toxic doses of the chemical were required to achieve this result. The sulfone promin<sup>2</sup> has also been reported to have a notable inhibitory effect on the course of the disease in guinea pigs.<sup>4</sup> In the

meantime a number of sulfonamides and related compounds have been studied with regard to their effect in experimental tuberculosis.

A recent report of Smith and his collaborators<sup>4</sup> of the National Institute of Health merits especial attention because it deals with a large number of compounds, including sulfonamides, sulfones and comparable phosphorus containing compounds, and because it serves as a progress report on the problem of chemotherapy in experimental tuberculosis. Therapeutic tests carried out by these investigators on experimental animals infected with a virulent human strain of tubercle bacilli showed a favorable effect with the three drugs diaminodiphenylsulfone, promin and sulfadiazine as regards both the survival time and the retardation of progress of the disease. The mortality of an untreated group of infected animals was 81 per cent after one hundred and seven days, while the comparable percentage mortality of animals treated with promin was 44 and of those treated with either of the other drugs was 56. Notably the extent of tuberculous involvement, as indicated by examination of several organs, was found to be much less in the animals treated with diaminodiphenylsulfone than in animals of the other groups. Indeed, many of the animals in the former group presented an uninterrupted growth curve after cessation of treatment, indicating attenuation of the tubercle bacillus or arrest of the infection. As pointed out by Smith and his co-workers, the toxicity of diaminodiphenylsulfone, which exerts its effect at 50 to 75 per cent of the lethal dose, makes it desirable to develop derivatives capable of producing the same or better effects with dosages further removed from the toxic level. According to these investigators promin does not fulfil this requirement but appears to be a step in the right direction. It is perhaps pertinent to mention that a phosphorylated derivative of diaminodiphenylsulfone has recently been prepared which, on the one hand, possesses only one-half to one-fifth the toxicity of the parent sulfone and, on the other hand, has a chemotherapeutic action against experimental pneumococcal infection which is superior to that of the original sulfone. Whether or not this phosphorylated derivative will prove effective against experimental tuberculosis remains to be seen.

Work on the problem of chemotherapy in experimental tuberculosis is still in the early stage. The more recent attacks on the problem have however, yielded encouraging results and further developments are awaited. It is hardly necessary to point out here that tuberculosis induced experimentally in guinea pigs is dissimilar to tuberculosis in human beings. The prog-

1 Rich A R and Follis R H Jr. The Inhibitory Effect of Sulfanilamide on the Development of Experimental Tuberculosis in the Guinea Pig. *Bull Johns Hopkins Hosp* 62: 77 (Jan) 1938.

2 Promin is the sodium salt of P P-diaminodiphenylsulphone N N dextrose sulfonate.

3 Feldman W H, Hinshaw H C and Moses H E. The Effect of Promin (Sodium Salt of P P Diaminodiphenylsulfone N N Dextrose Sulfonate) on Experimental Tuberculosis. A Preliminary Report. *Proc Staff Meet Mayo Clin* 15: 695 (Oct 30) 1940. 16: 187 (March 19) 1941.

4 Smith M I, Emmart E W and Westfall B B. The Action of Certain Sulfonamides, Sulfones and Related Phosphorus Compounds in Experimental Tuberculosis. *J Pharmacol & Exper Therap* 74: 163 (Feb) 1942.

5 Smith M I, Rosenthal S M and Jackson E I. The Chemotherapeutic Action of a N Phosphoryl Derivative of 4,4 Diaminodiphenyl sulfone. *Pub Health Rep* 57: 1534 (Oct 9) 1942.

ress of studies on the chemotherapy of tuberculosis in experimental animals is, nevertheless, of obvious importance. While the results of these investigations and the conclusions based on them cannot be directly applied to chemotherapy of tuberculosis in man, they do lead the way in the study of the latter problem.

#### THE NATIONAL CONFERENCE ON PLANNING FOR WAR AND POSTWAR MEDICAL SERVICES

Elsewhere in this issue (p 769) appears an announcement of a proposed conference on the planning of war and postwar medical services, representing a unique assemblage in American medicine. For the first time a variety of organizations associated with many different aspects of medical services, including scientific advancement, personnel and supplies are meeting to discuss jointly urgent problems which affect all. The organizations which participate in this conference, which has been called under the auspices of the Carlos Finlay Institute of the Americas, include the

American Medical Association  
American College of Physicians  
American College of Surgeons  
American Drug Manufacturers Association  
American Hospital Association  
American Pharmaceutical Manufacturers Association  
American Pharmaceutical Association  
American Surgical Trade Association  
Wholesale Surgical Trade Association  
National Physicians Committee for Extension of Medical Service

The program has been planned in three parts: a morning session concerned largely with epidemic disease and nutrition; an afternoon session concerned with personnel, supplies and research; and an evening program devoted to the ideals that should prevail in working out programs of interest to all the peoples of the world. The evening session has been limited to those specially invited to participate, but the morning and afternoon sessions are open to any physician who may be in New York on March 15 and who might wish to attend. Participation in discussions, however, will again be limited to those especially invited to participate in the conference. Mr. Basil O'Connor, president of the National Foundation for Infantile Paralysis, Inc., and also of the Carlos Finlay Institute of the Americas, an organization which was described in an editorial comment in *THE JOURNAL* on Jan 17, 1942 (p 230), will preside at the evening session.

Significant also in this national conference is the extent to which laymen and statesmen whose interests in medicine have been profound will give of their time and services in developing the contribution of America to the rehabilitation of a starved, disease-ridden and war-torn world.

## Current Comment

### THE RED CROSS CAMPAIGN

The Red Cross has just begun a national appeal for a special fund of \$125,000,000 to take care of the unprecedented war demands on the organization. The Red Cross supplies the armed forces throughout the world with many comforts and needs not covered by regular military issue. In areas retaken from the enemy, the Red Cross must be and is prepared to supply food, clothing, medicines and other necessities to large numbers of persons, many of whom may be in a starving or otherwise desperate condition. This organization has taken over the procurement of blood for the preparation of plasma for the armed forces as well as for possible civilian disaster. All the material and personnel for these services and others as well must be ready in advance and available when needed. Physicians, more than any others perhaps, are fully aware of the vast humanitarian service of the Red Cross and can be counted on to support this campaign with all the influence as well as financial assets at their command.

### EVAPORATED MILK

In recent weeks it has been difficult in some areas to purchase certain brands of evaporated milk. Both mothers and physicians have become concerned as to its availability for infant feeding. The amount of evaporated milk produced in 1942 was in excess of that produced in any previous year. The War Production Board has established a packing quota for 1943 for evaporated milk in 6 ounce and 14½ ounce cans of 90 per cent of the 1942 pack. An additional quantity will be packed in larger containers for institutional and military use. The Food Distribution Administration anticipates that sufficient supplies of evaporated milk will be assured to provide an adequate amount for the needs of children under 2 years of age. However, not all brands will be available in all localities. This situation is obviously not serious, since the composition of evaporated milk has less variation than almost any other canned food. Regulations of the Food and Drug Administration fix and establish definitions and standards of identity for evaporated milk, these became effective July 17, 1940. These regulations require a minimum of 7.9 per cent of milk fat and 25.9 per cent of total milk solids. Since most physicians are concerned as to the possibility that a high percentage of fat in a formula may produce digestive disturbances in infants, the fat content of evaporated milk is of major interest. The regulations establish a minimum, and there is little danger of a fat content much above this minimum. Since fat is the most expensive part of milk, manufacturers are not apt to leave more than the required amount in the product. Consideration should be given of course as to whether or not the milk is irradiated or fortified with vitamin D and to the extent of such fortification so that the milk may be supplemented with this vitamin if necessary. Physi-

cians can do a real service to their patients and their country by explaining to mothers the nature of various brands of evaporated milk, the possible use of other brands for feeding infants, if the one to which they have been accustomed is unavailable, and the special character of irradiated as contrasted with nonirradiated evaporated milk.

#### MENTAL SYMPTOMS FOLLOWING THE USE OF ATABRINE

The appearance of mental symptoms during or following the administration of atabrine in curative dosage has been reported by many observers. Conoley working in Perak, one of the Federated Malay States, first drew attention to the restlessness and excitement sometimes associated with the taking of atabrine. Other observers in Ceylon, India and Malaya have reported that mental symptoms are noted more commonly in patients treated with atabrine than with those on treatment with quinine. Many of these reports are summarized by J. W. Field in Bulletin 2 of 1938 from the Institute for Medical Research, Federated Malay States. He says that there is a fairly characteristic clinical course of events. Toward the end of the usual five to eight day course of oral atabrine, or perhaps a few days after treatment has been finished, the patient begins to behave strangely, becoming more or less excited, voluble and confused, or occasionally maniacal. He is mentally disturbed for about a week and gradually returns to normal without special treatment. This clinical picture, or atabrine psychosis, appeared in 13 cases among 700 treated during one period in Ceylon, 6 cases among many thousands treated in Kuala Lumpur and 4 cases in approximately 9,000 treatments in Malaya. Field concludes that the incidence of atabrine psychosis may tentatively be placed at less than one in a thousand cases treated. The incidence of mental symptoms during or subsequent to the administration of atabrine in the Western Hemisphere appears to have been at least equally small. There have been no reports of mental symptoms as a result of the administration of atabrine in prophylactic dosage. Confusional psychoses sometimes occur as a direct result of malarial infection, and some patients under treatment for malaria may have preexisting mental abnormality. Therefore it should not be assumed that every mental aberration following treatment with atabrine is necessarily due to atabrine. Atabrine is used extensively by the United States Army. Circular Letter 22, Office of the Surgeon General, War Department, Washington, D. C., Jan. 16, 1943, outlines the following optional methods of treatment for uncomplicated malaria:

1 Combined QAP treatment (method of choice)

(a) Quinine sulfate 0.64 Gm (10 grains) three times daily after meals for two or three days or until pyrexia is controlled. Then give

(b) Atabrine 0.1 Gm (1½ grains) three times daily after meals for five days. Then after two days without antimalarial medication give

(c) Plasmodium 0.01 Gm (1/10 grain) three times daily after meals for five days, except for the debilitated patient who should receive only two doses daily. (Discontinue if toxic symptoms occur. Never give atabrine and plasmodium concurrently.)

2 Atabrine-plasmodium treatment (May be used for simple Plasmodium vivax infections and in other infections when no quinine is available)

(a) Atabrine as described for seven days. Then after two days without antimalarial medication give plasmodium 0.01 Gm three times daily for five days, as described.

3 Quinine plasmodium treatment (Method when no atabrine is available)

(a) Quinine sulfate as described for seven days during the last five of which accompany each dose of quinine with plasmodium 0.01 Gm three times daily.

NOTE—Quinine sulfate tablets are more quickly effective if dissolved before being taken. Ten grains of quinine sulfate may be dissolved in 1 ounce of water which has been acidified by the addition of 10 minims of diluted sulfuric or hydrochloric acid (U. S. P.) or 2 Gm (30 grains) of citric acid.

The same circular letter outlines as drug prophylaxis or suppressive treatment of malaria the following methods:

Atabrine in doses of 0.4 Gm a week is recommended as the standard suppressive treatment of quinine daily. The atabrine should be taken 0.1 Gm twice a day on two non-successive days a week with water and immediately after meals. The prophylactic dosage of quinine is 5 to 10 grains daily after the evening meal. Under present conditions quinine prophylaxis is to be used only if a man cannot tolerate atabrine.

#### ROLE OF AMINO ACIDS IN HUMAN NUTRITION

Present knowledge of the role of the various amino acids in nutrition is based in large part on observations on the white rat.<sup>1</sup> As one of a series of studies designed to determine the amino acid requirements of the human species, Rose and his colleagues<sup>2</sup> employed two healthy young men to serve as the subjects for preliminary tests. They found that nitrogen equilibrium in these subjects could be readily maintained by diets containing only ten amino acids. This fact demonstrates that the twelve acids previously shown to be dispensable for rats and dogs are also nonessential for man. At the expiration of the 'fore period' of eight days during which these preliminary tests were made, valine was removed from the diet and the other amino acids were increased to provide a sufficient nitrogen content. The effects of this change were profound: immediately each of the two subjects manifested a negative nitrogen balance. On the fourth day the nitrogen output exceeded the intake by 2.19 and 2.91 Gm respectively. Valine was then returned to the food and was followed quickly by the reestablishment of positive nitrogen balances. After six days on the complete diets, methionine was excluded from the food for a period of six days. Again the subjects lost more nitrogen than was ingested, although the negative balances were not so large as after valine deprivation. Immediately after the readministration of methionine positive balances were restored. These observations demonstrate that the amino acids valine and methionine are indispensable dietary components for man; deficiencies of these amino acids create additional "deficiency diseases."

1 Lewis H. B. Protein in Nutrition (Handbook of Nutrition II) J. A. M. A. 120: 19b (Sept. 19) 1942.

2 Rose W. C., Haine W. J. and Johnson I. E. The Role of the Amino Acid in Human Nutrition J. Biol. Chem. 146: 683 (Dec.) 1942.

# MEDICINE AND THE WAR

*In this section of The Journal each week will appear official notices by the Committee on War Participation of the American Medical Association, announcements by the Surgeon Generals of the Army, Navy and Public Health Service, and other governmental agencies dealing with medicine and the war and such other information and announcements as will be useful to the medical profession*

## SCIENTIFIC WORK IN LENINGRAD

PROF K KERCHIEV

Supplied by Soviet Scientists' Antifascist Committee

A rather large volume entitled "Works of the Institute for Advanced Training of Medical Practitioners" has just been published. The volume deals with sixty-eight researches carried out during the first year of the war. In September 1941 the battle front was approaching the gates of Leningrad. The streets, houses and hospitals were being bombed and shelled, the city's food supply was cut off by blockade, the hospitals were deprived of electricity, dressings, equipment and medicines, but still the city did not surrender. In spite of incessant air attacks the doctors continued to treat the sick and the wounded and at the same time made numerous attempts to discover new medicines to replace those usually employed but then unobtainable.

The problem of healing wounds was the chief concern of the medical men in Leningrad. The members of the institute among them the surgeon N. Petrov introduced various new methods for the treatment of wounds, they gave considerable attention to a study of roentgenographic methods of locating shell and bomb fragments, and bullets lodged in the bodies of the wounded. A number of research projects were carried on in connection with serious wounds of the face and jaws. By discovering methods of healing such wounds Leningrad physicians saved the lives of thousands of

fighters. The cure of scurvy and other hypovitaminoses due to the scarcity of food was another subject taken up by the institute.

When motor transportation was established during the winter of 1941-1942 across Lake Ladoga and supplies of food were delivered to the city of Leningrad it was possible in many cases, with the help of physicians, to relieve the effects of undernourishment. The cure of frostbite, the restoration of peripheral nerves and other problems in neurosurgery were studied by Leningrad physicians to find better ways for saving the lives of the fighters. "The interdependence of science and practice has never been felt to such an extent as during the trying months of 1941-1942" say the authors of this volume. The suggestions of doctors were immediately put into effect and served as a "stimulus to continue and widen the field of research." The efforts of these sixty-eight scientific research workers of Leningrad Institute represent heroic exploits carried out under harrowing conditions in a besieged city within range of the enemy guns. These reports prove that it is possible to continue scientific work under the most difficult conditions if the research is of sufficient importance to one's home land and vital to the needs of the army.

## ARMY

### CLASS OF MEDICAL INSPECTORS

A class composed of forty-two officers of the medical corps graduated at the Medical Field Service School at Carlisle Barracks, Pa., February 6, after a month's training in the course for medical inspectors, whose duties are to supervise sanitation and medical preventive measures in army camps and to make recommendations for the correction of insanitary conditions. Twenty-five members of this class had previously graduated at Carlisle Barracks from the basic courses for officers. Another class of medical inspectors, numbering about fifty medical officers, started on February 15.

### MAJOR FLICKINGER AWARDED DISTINGUISHED FLYING CROSS

Major Don D. Flickinger, a graduate of Stanford University Medical School, was awarded the Distinguished Flying Cross in 1941 for his work as flight surgeon on the pioneer trip of a squadron of B17's to the Philippines. Major Flickinger has now returned from the Pacific island theater and has been appointed flight surgeon at the Mather Field, Sacramento, an advanced flying and navigation school. He has developed a rescue method for pilots forced down at sea whereby they become visible for long distances when they land in the water. Major Flickinger spent many hours in the water in developing this device.

### CAPTAIN GAMSO AWARDED SILVER STAR

The War Department announced on February 14 the award of the Silver Star for gallantry in action in New Guinea to Capt. Rafael R. Gamso of Brooklyn. Captain Gamso attended the public schools of Dallas, Texas, graduated in medicine at Baylor University College of Medicine in 1936 and interned at Cumberland Hospital, Brooklyn. He went into the service on Jan. 29, 1941 and went overseas on April 1, 1942. Dr. Gamso is 31 years of age.

### DR. SUTTER CITED FOR BRAVERY

Dr. LeRoy M. Sutter of Orlando, Fla., has been cited in orders of commendation for bravery under fire and for service beyond the call of duty in North Africa, the newspapers have reported. Prior to entering the Army in the spring of 1942, Dr. Sutter was on the staff of the Florida Sanitarium and Hospital in Orlando.

### DOCTORS IN KHAKI

Camera men, technicians and stage director Herman Shumlin arrived at the Medical Field Service School, Carlisle Barracks, Pa., February 13, to begin the production of a movie entitled "Doctors in Khaki" for the Office of War Information for release to civilian audiences. The script, which was prepared by the well known team Mr. and Mrs. Albert Hackett, deals

with the advanced training methods developed at Carlisle Barracks for adapting the talent of medical men to combat duty. The cast will comprise the officers actually on duty at Carlisle Barracks and the officers attending classes there. Thus medical officers from all parts of the country may be seen in the picture at work preparing to save lives on far flung battle fields. The picture, which has been designed to show the training of the nation's doctors of medicine for field duty, will follow the home town physician throughout his period of study at the field service school. It will be a public feature short, released soon. Mr Shumlin and Mr and Mrs Hackett are giving their time without pay in the interest of the war effort.

## NAVY

### PROMOTIONS FOR NAVY NURSES

Recent regulations authorized the promotion of Miss Sue S Dauser, superintendent of the Navy Nurse Corps, to the relative rank of captain and authorized higher relative ranks for two assistant superintendents and four directors of the Nurse Corps, which now comprises 3,200 nurses. Miss Dauser, who has just been reappointed for a second four year term as superintendent of the Navy Nurse Corps, has been in the naval service since November 1917.

The two assistant superintendents of nurses who were promoted from the relative rank of lieutenant to that of commander are Loretta Lambert of Claysville Pa, and Mary D Towse of Pittsburgh and the four directors promoted from lieutenant to lieutenant commander are Helen M Bunte of McSherrytown, Pa, Elizabeth M O'Brien of San Francisco, Myrtle R Carver

of Raleigh, N C, and Anna G Keating of Philadelphia. A number of other nurses were promoted from the relative rank of lieutenant (j g) to that of lieutenant.

### KITS FOR SUBMARINE CHASERS

The Medical and Surgical Relief Committee of America, 420 Lexington Avenue, New York City, shipped on February 5 thirteen special portable emergency medical kits to a submarine chaser training center in the South and announced a drive for \$25,000 to furnish similar medical kits to numerous submarine chasers in the U S Navy. The kits, made of fiber board with metal edges, will fit in a square foot of space. The kits thus furnished contained tourniquet, bandages, forceps, scalpel, gauze pads and ointments and medicines for the emergency treatment of burns and other injuries. In view of their size, submarine chasers are not usually staffed by medical officers.

## CIVILIAN DEFENSE

### ORGANIZATION OF STATE GAS SPECIALIST SCHOOLS

The Office of Civilian Defense, Washington, D C, issued on February 9 Operations Letter No 109, which reads as follows:

The training of gas officers and gas reconnaissance agents, as set forth in Operations Letter No 91, requires the establishment of state gas specialist schools at universities or technical schools to supplement the gas specialist courses given at War Department civilian protection schools. Most gas reconnaissance officers and many senior gas officers will be unable to attend War Department civilian protection schools because of the limited enrolment of these schools and the time and expense involved in attendance.

It is recommended that state schools for gas specialists be established now in regions I, II, III and IX and later in the other regions. The regional sanitary engineer and gas officer should consult with the state director or coordinator of Civilian Defense and the state gas consultant in selecting the schools which will be asked to cooperate in establishing the gas specialist courses. Availability of rooming and feeding facilities for students should be considered.

The selected schools should be asked to provide teaching personnel for technical subjects, classrooms and laboratory facilities. The state gas consultant should be responsible for (1) arranging schedules of instruction with the school authorities, (2) arranging all field administrative matters such as recruiting students and arranging for demonstrations, (3) giving the instruction on organization of the state gas program.

Sanitary engineers and gas officers in these regions should arrange for the attendance at War Department civilian protection schools of one or two representatives of each of the selected universities. Candidates should be members of the faculty who are willing to assist the state defense council in organizing the course and in providing the instruction.

Tentative plans for the state gas specialist schools call for a three day course with emphasis on gas identification and reconnaissance. The gas protection section of the medical division will assist in arranging the procurement of equipment for demonstration purposes. Whenever possible, arrangements will be

made for the attendance of a small military unit to demonstrate materials which cannot be placed in the hands of civilian instructors. A course outline and instructor's manual are being prepared for use in these schools.

### CIVILIAN DEFENSE PERSONALS

Dr Jack Masur, executive director of Lebanon Hospital, New York, has been commissioned passed assistant surgeon in the U S Public Health Service and assigned to the Medical Division of the Office of Civilian Defense as hospital administration specialist to succeed Mr Henry N Hooper, who resigned last October to enter military service. Dr Masur graduated from Cornell University Medical College, New York, served an internship at Bellevue Hospital and had a residency at Montefiore Hospital, New York, from which hospital he was a traveling fellow to the medical service of Prof I Snapper in Amsterdam, Netherlands.

Dr Abraham N Franzblau, professor of religious education and pastoral psychology at Hebrew Union College, Cincinnati, has been commissioned a passed assistant surgeon in the U S Public Health Service and has been appointed to the Medical Division of the Office of Civilian Defense, Washington, D C. Dr Franzblau received his Ph D in 1934 in psychology and education and graduated from the University of Cincinnati College of Medicine in 1937, since which time he has been a fellow in research on diabetes and myasthenia gravis at the Jewish Hospital in Cincinnati.

Dr Dudley A Reekie, Boston regional medical officer of the first civilian defense region has been assigned acting chief of the Field Casualty Section of the Office of Civilian Defense in the absence of Dr Leonard A Scheele, who is assigned to special duty. Dr A William Reggio, Boston, state chief of Emergency Medical Service, is acting regional medical officer.

Dr Lloyd H Gaston, Baltimore, assistant regional medical officer in the third civilian defense region, has been transferred to Chicago to become assistant regional medical officer, associated with Dr John S Coulter regional medical officer for the sixth region.

## MISCELLANEOUS

VICTORY STUDENT NURSE  
CORPS PROPOSED

Mr Paul A McNutt federal security administrator is considering a proposal by the Health and Medical Committee of the Office of Defense Health and Welfare Services intended to help meet the critical shortage of nurses. The proposal includes provisions for stipends for student nurses the use of a portion of the senior students in government and military hospitals and distinct insignia for the corps also the condensing of the training period for student nurses from thirty six to thirty or twenty four months. Maintenance would be provided throughout the training period and on graduation, nurses either would enter the armed forces with the rank and pay of second lieutenant or ensign or be assigned to governmental or civilian nursing services essential to the war effort. Any student enrolled in a participating school of nursing after Jan 1 1941 would be eligible to volunteer for the Victory Student Nurse Corps. In connection with this proposal, Dr Thomas Parran, Surgeon General of the U S Public Health Service, said that future quotas of the army and navy cannot be made from the current nurse supply without a threatened collapse of nursing care for the civilian population.

PERUVIAN PHYSICIAN VISITS  
PLASMA LABORATORIES

Dr Jorge Avendano, director of the clinical laboratories of the Hospital de Obreros Lima Peru is visiting a group of Eastern hospitals under the auspices of the Office of the Coordinator of Inter-American Affairs and the Office of Civilian Defense to study the organization of blood and plasma banks and the preparation of both liquid and dried plasma. Arrangements for Dr Avendano's visit to the United States were made through the Division of Health and Sanitation of the Coordinator's Office, and his itinerary of hospitals was arranged by the Medical Division Office of Civilian Defense. The Medical Division in cooperation with the U S Public Health Service, is assisting about one hundred and fifty hospitals in target areas to establish blood and plasma banks in order that adequate reserves of plasma may be available for the treatment of casualties caused by enemy action or any major wartime disaster. Dr Avendano is spending two weeks at the Bryn Mawr Hospital Bryn Mawr Pa, and several days each at Albany Hospital Albany N Y Strong Memorial Hospital, Rochester, N Y, and Syracuse University Hospital, Syracuse N Y.

MILITARY CROSS AWARDED TO  
PHYSICIAN PARACHUTIST

Lieut Charles Granville Rob of the Royal Air Force medical corps has been awarded the Military Cross, according to a dispatch from London, February 11. He is said to be the first 'parachuting doctor' to gain a military award. After a flight of 350 miles and a parachute drop he performed one hundred and forty surgical operations, under extremely difficult conditions and bombings in Tunisia. After performing many operations in one day, he is said to have given a pint of his own blood when the supplies of blood ran short.

## PERSONALS

Miss Marion W Sheahan of Albany, N Y director of the Division of Public Health Nursing of the New York State Department of Health, has been appointed chairman of the Subcommittee on Nursing Health and Medical Committee, Office of Defense Health and Welfare Services Washington, D C. The purpose of this subcommittee is to make over-all studies of nursing needs and recommend methods of meeting them and to coordinate all phases of the nation's wartime nursing problems. Miss Jean Henderson, public relations consultant of the Florida State Department of Health has been appointed information consultant to the Subcommittee on Nursing of the Health and Medical Committee, Office of Defense Health and Welfare Services Washington D C.

## PUBLIC HEALTH UNDER HITLER

NPD of Dec 14, 1942 states that following an invitation of the reich minister for the occupied eastern territories Dr Conti, the reich health leader, is spending several days in the reich commissariat Ostland. Dr Conti intends to visit the authorities and institutions of the German health services with the reich commissioner and the commissioner generals in Riga, Tallinn and Kaunas, so that he can acquaint himself personally and on the spot with the work of reconstruction carried out so far.

In order to ensure supplies of medicines and dressings for the Ostland, the 'Pharm Ost-Ltd' has been set up in connection with the reich ministry for the occupied eastern territories.

An order made by the reich commissar for the Ostland announces the establishment of "chambers of health" in Estonia, Latvia and Lithuania. These chambers of health unite the following professions of the health services: physicians and their assistants, dentists and their assistants, pharmacists and their assistants, midwives and nurses.

NDZ of Dec 3 1942 says that cancer is one of the diseases which, next to tuberculosis, is not yet being properly dealt with. An average of 150,000 people per annum die of cancer in Germany and 500,000 people suffer from cancer. The fight against cancer has now been put on a new basis by the formation of a reich committee for combating cancer. In the periodical *Gesundheitsführung* the deputy president of the committee, Dr Ramm, describes the task of the committee as consisting in issuing directives for the fight against cancer and for its prevention, diagnosis and cure, holding a census of the number of sufferers from cancer and investigating the course of the disease, promoting the specialized training of doctors and finally conducting a large scale campaign against public ignorance.

It is intended to set up an advice center in every kreis of the reich. All facilities for diagnosis and cure are to be available in every gau. Parallel with the efforts to insure an early diagnosis of the disease, the reich health directorate will take steps to improve preventive measures. These will have to extend for instance, to matrimonial advice, to regulating the manner of living and insuring a natural diet. In addition the winter demands that all women above the age of 30 and men roughly from the age of 40 to 45 should periodically be examined for prophylactic purposes. He does not, however, advocate that this examination should be compulsory but expects that by appealing to the sense of duty of the more enlightened parts of the population it will be possible to carry out these measures on a voluntary basis.

The *Frankfurter Zeitung* of Dec 2, 1942 reports a decree by Koch, the gauleiter of East Prussia, saying that the schools in East Prussia must devote at least two lessons a month to teaching their pupils personal hygiene and decent manners. Koch orders that at least once a week every form master must ascertain whether every child has a clean handkerchief, whether the hands, face and clothes are clean, the hair cut and the boots kept in proper condition. He must pay special attention to cleanliness of the hands ears and scalp. He must examine whether the child's clothes are whole clean and properly aired. He must examine the condition of the children's schoolbooks and at the same time instruct them in the principles of personal hygiene. He must constantly watch the children's state of health and immediately report anything unusual to the parents and the school doctor. In particular he must see to it that the children do not run about in damp clothes before lessons if the weather is bad but must make them change their boots and order them to exercise to get warm. He must make sure that the classrooms are properly aired and that the children regularly get an uncooked breakfast.

According to *Svenska Dagbladet*, Stockholm, January 14, the rumors which circulated in Norway about the death of Germans during a march across the mountains has been confirmed. The German troops, consisting of some infantry and two bicycle companies, were traveling 150 kilometers across Saltfjellet in Nordland County to Fauske. Because of the snow and cold weather the soldiers covered only 30 kilometers on the first day and spent the night in cold barracks. The men were insufficiently clad and 6 froze to death and about 100 were frost bitten.

# ORGANIZATION SECTION

## OFFICIAL NOTES

### NATIONAL CONFERENCE ON PLANNING POSTWAR MEDICAL SERVICES

On March 15 at the Waldorf-Astoria, New York, will be held the National Conference on Planning for War and Postwar Medical Services, under the auspices of the Carlos Finlay Institute of the Americas. Cooperating in holding the conference are the American Medical Association, the American College of Physicians, the American College of Surgeons, the American Drug Manufacturers Association, the American Hospital Association, the American Pharmaceutical Manufacturers Association, the American Pharmaceutical Association, the American Surgical Trade Association, the Wholesale Surgical Trade Association and the National Physicians Committee for the Extension of Medical Service.

The announcement of the conference explains that "There is an urgent need to mobilize the leaders of the medical profession and of the supporting industries for planning of postwar medical services."

The Carlos Finlay Institute of the Americas was organized a year ago<sup>1</sup> in Havana, Cuba, to foster scientific interchange and good will among the medical professions of the Latin American countries. Mr. Basil O'Connor, New York, president of the National Foundation for Infantile Paralysis, is president of the institute. Directors are Dr. Morris Fishbein, Dr. Morton Kahn, Lieut. Col. Thomas Mackie, M. C., U. S. Army, Dr. Edgar Mayer, Mr. O'Connor, and Dr. James E. Paullin. The institute was incorporated in New York state in December 1942. Representing the cooperating organizations in arranging the conference are one hundred and seventeen leaders in medical and allied fields.

The morning and afternoon sessions of the conference will be open to all interested physicians, but the evening session will be limited to an invitation list. All sessions will be held at the Waldorf-Astoria.

Presiding at the morning session which will start at 10 o'clock, will be Dr. James E. Paullin, Atlanta, Ga., president of the American College of Physicians and President Elect of the American Medical Association. Speakers and their subjects will be: Lieutenant Colonel Mackie, executive officer, Tropical and Military Medicine, Army Medical School, Washington, D. C., "War and the Migration of Tropical Diseases"; Dr. Thomas Francis Jr., professor, Department of Epidemiology, University of Michigan School of Public Health, Ann Arbor, Mich., "Epidemiology of Influenza"; Dr. Lowell T. Coggeshall, University of Michigan School of Public Health, "Malaria—A World Menace"; and Dr. John B. Youmans, associate professor of medicine, Vanderbilt University School of Medicine, Nashville, Tenn., "Nutritional Diseases as a Postwar Problem."

At the afternoon session which will convene at 2:30, Brig. Gen. Fred Rankin, M. C., U. S. Army, President of the American Medical Association, will preside. Speakers and their subjects will be: Edward C. Elliott, Ph.D., LL.D., president, Purdue University, member War Manpower Commission, Washington, D. C., "Postwar Needs for Medical and Other Trained Personnel"; Col. C. I. Shook, M. C., U. S. Army, Washington, D. C., "Postwar Channeling of Drugs and Medical Supplies"; and A. R. Dochez, Rockefeller Institute for Medical Research, "Trends in Scientific Research."

The evening session will be a dinner meeting, starting at 7 o'clock. Mr. John G. Searle, president of the American Drug Manufacturers Association, will introduce Mr. O'Connor, who will preside as toastmaster.

Mr. Nelson A. Rockefeller, coordinator of Inter-American Affairs, Washington, D. C., will speak on "The Health Problems of the Americas."

Mr. Frederick P. Keppel, director, Equitable Life Assurance Society of the United States and of the U. S. Guaranty Trust

Company, New York, will speak on "Health—A World Problem."

Mr. Norman Davis of the American Red Cross, Washington, D. C., will tell of "The Place of the American Red Cross in Medical Rehabilitation."

Dr. Fishbein, Editor of THE JOURNAL, will speak on "American Medicine's Contribution to the Postwar World."

### REPORT OF MEETINGS OF THE COUNCIL ON MEDICAL EDUCATION AND HOSPITALS, HELD IN CHICAGO, FEB. 13 AND 14, 1943

The Liaison Committee of the Council on Medical Education and Hospitals and the Association of American Medical Colleges met Saturday evening, February 13, at the Palmer House in Chicago.

The Council approved the basic pattern of the army specialized training program for premedical students as presented by Col. F. M. Fitts of the Army Specialized Training Division, Headquarters Services of Supply, Washington, D. C.

Inter-American relationships in the field of graduate medical education were discussed.

In view of the war demand, the Council withdrew objection to medical schools recorded as on a probationary status on the list of approved medical schools maintained by the Council adopting accelerated programs. This action was taken with the understanding that the responsibility for such programs and the maintenance of standards should be definitely accepted by these schools.

The Council considered reports on eight medical schools visited by the Secretary.

The probationary status of the University of Georgia School of Medicine on the list of approved medical schools maintained by the Council was removed, thus restoring this school to unconditioned approval.

Consideration was given to suggested programs for the development of two schools of the basic medical sciences into complete medical schools.

The Council appointed a committee to confer with representatives of the American Hospital Association and the Association of American Medical Colleges in regard to the general problem of hospital internships.

Attention was given to the problem of the Council meeting its responsibilities during the war period with a more or less depleted staff.

The following internships and residencies were approved by the Council:

#### Hospitals Approved for Internships

San Joaquin General Hospital, French Camp, Calif.  
St. Joseph's Hospital, Joliet, Ill.  
Jennie Edmundson Memorial Hospital, Council Bluffs, Iowa  
Nazareth Hospital, Philadelphia  
Alexandria Hospital, Alexandria, Va.

#### Approved Residencies

**Medicine**  
St. John's Hospital, St. Louis  
**Mixed**  
Mercy Hospital, Hamilton, Ohio  
All Saints Episcopal Hospital, North Worth, Texas  
**Neurosurgery**  
University of Chicago Clinics  
**Pediatrics**  
General Hospital of Fresno County, Fresno, Calif.  
**Surgery**  
St. Francis Hospital, Wichita, Kan.  
St. John's Hospital, St. Louis  
Bronx Hospital, New York City  
St. Paul's Hospital, Dallas, Texas  
Mary Fletcher Hospital, Burlington, Vt.  
**Tuberculosis**  
Hospital for Incipient Tuberculosis, Ray Brook, N. Y.  
Schenectady County Tuberculosis Hospital, Schenectady, N. Y.  
(Glenridge Sanatorium)

Additional residencies were reviewed by the Council, but final action is being held in abeyance pending approval by the

<sup>1</sup> Finlay Institute of the Americas. J. A. M. A. 118:230 (Jan. 17) 1942.



respective specialty boards with which the Council has a program for concurrent approval of residencies

The following technical schools were approved by the Council

#### Schools for Clinical Laboratory Technicians Approved

St Joseph's Hospital Denver  
New Britain General Hospital New Britain Conn  
Waterbury Hospital Waterbury Conn  
Methodist Hospital of Central Illinois Peoria Ill  
Rockford Memorial Hospital, Rockford Ill  
St Anthony's Hospital Rockford Ill  
Maine General Hospital Portland Maine  
St Joseph's Hospital Baltimore  
Taunton State Hospital Taunton Mass  
Tewksbury State Hospital and Infirmary Tewksbury Mass  
Port Huron Hospital Port Huron Mich  
Northwestern Hospital Minneapolis  
Bishop Clarkson Memorial Hospital Omaha  
Newark Beth Israel Hospital Newark N J  
Prospect Heights Hospital Brooklyn  
Meadowbrook Hospital Hempstead N Y  
Beth Israel Hospital New York  
St Luke's Hospital New York  
Grasslands Hospital Valhalla N Y  
St Luke's Hospital Bethlehem Pa  
Williamsport Hospital Williamsport Pa  
Mount Sinai Hospital Milwaukee

**School for Physical Therapy Technicians Approved**  
Graduate Hospital of the University of Pennsylvania Philadelphia

#### School for Occupational Therapy Technicians Approved

New York University, New York

Plans were formulated for revising the "Essentials of an Acceptable School for Physical Therapy Technicians" and the "Essentials of an Acceptable School of Occupational Therapy," as well as the preparation of minimum "Essentials of an Acceptable School for Medical Record Librarians"

Consideration was given to a progress report of the Council's cooperation with the American Medical Association's Committee on Health Resorts involving the inspection of health resorts by the staff of the Council

Other items were discussed or are under consideration

The Council met with the Advisory Board for Medical Specialties on Sunday evening February 14

H G WISKOTTEN, Secretary

## MEDICAL LEGISLATION

### MEDICAL BILLS IN CONGRESS

*Changes in Status*—S 739 and H R 1912 have been respectively reported to the Senate and House with recommendation that they pass. These bills are identical in phraseology and provide that during the present war and for six months thereafter personnel of all components of the Army of the United States may be detailed as students at technical, professional and other educational institutions or as students, observers or investigators at industrial plants, hospitals and other places. H R 1975 has passed the House making certain deficiency appropriations. The House Committee on Appropriations refused to include in the bill an authorization of \$1,200,000 for the Children's Bureau to utilize in making grants for emergency maternity and infant care for wives and infants of certain enlisted men. An effort to have inserted in the bill this authorization on the floor of the House was unsuccessful.

*Bills Introduced*—S J Res 34, introduced, by request, by Senator Russell, Georgia, proposes to establish the first week in October of each year as "National Employ the Physically Handicapped Week." H R 1879, introduced by Representative Bennett, Michigan, proposes a federal appropriation of \$700,000 to construct a veterans' hospital in the Upper Peninsula of Michigan to accommodate 150 bed patients. S 785, introduced by Senator Walsh, Massachusetts, and H R 1936 introduced by Representative Maas, Minnesota, would authorize an appropriation of \$2,000,000 to provide for the expansion of facilities for hospitalization of dependents of Naval and Marine Corps personnel. H R 1956, introduced by Representative Sadowski, Michigan, provides that every person in the military or naval forces of the United States, including the Women's Army Auxiliary Corps, the Women's Reserve of the Naval Reserve, the Women's Reserve of the Coast Guard and the Women's Reserve of the Marine Corps shall be exempt from all taxes imposed by the United States on income. S 778, introduced by Senator Stewart, Tennessee, proposes to authorize an appropriation of such sums as may be necessary to enable each state to furnish financial assistance to needy individuals who are permanently and totally disabled. H R 1990, introduced by Representative Hoch, Pennsylvania, proposes to establish a Chiropody Corps in the Medical Corps of the Army and to establish within the Medical Corps a Chiropody Reserve Corps in accordance with the provisions of the National Defense Act with rank, promotion, pay and allowance equivalent to that of the Dental Corps.

### STATE MEDICAL LEGISLATION

#### Arizona

*Bill Introduced*—H 165, to amend the workmen's compensation act, proposes to authorize an injured employee to elect to be attended by a licensed chiropractor and thereafter to be entitled to the benefits of the workmen's compensation act to

the same extent as if attended by a licensed practitioner of medicine and surgery.

#### Arkansas

*Bill Introduced*—S 162, to amend the medical practice act, proposes to repeal the provisions providing for the annual registration of resident and nonresident practitioners holding licenses issued by the State Medical Board of the Arkansas Medical Society.

#### Colorado

*Bills Introduced*—H 112 proposes to exempt physicians from annually registering their certificates during the term of active duty with the Army, Navy, Marine Corps, Coast Guard, State Militia, Red Cross or in the military service of any of the Allies of the United States. H 199, to amend the chiropractic law, proposes to require chiropractors, at the time of the annual renewal of their licenses, to present proof that they have attended at least three days of a scientific clinic, forum or educational study approved by the Colorado state board of chiropractic examiners.

#### Delaware

*Bills Passed*—S 38 passed the senate, February 15. It proposes to authorize the medical council of Delaware to issue temporary emergency certificates to physicians licensed outside the state. S 41 passed the senate, February 16. To amend the medical practice act, it proposes to exempt therefrom the treatment of human ills by prayer or spiritual means in accordance with the tenets of any well recognized religious denomination.

#### Georgia

*Bill Introduced*—S 85, to amend the uniform narcotic act, proposes, among other things, to exempt from the operation of the act the administering, dispensing and selling at retail of certain attenuated narcotic preparations.

*Bill Passed*—H 136 passed the house, February 22. It proposes to require all licensed physicians attending a pregnant woman to take a sample of blood within thirty days of the first examination and to submit such sample to an approved laboratory for a serologic test for syphilis.

#### Indiana

*Bill Passed*—S 135 passed the senate, February 12. It proposes to prohibit school authorities from employing food handlers who are addicted to drugs or who have tuberculosis or syphilis in an infectious stage and to require all school employees to undergo a physical examination for tuberculosis at least once every three years by a duly licensed doctor of medicine.

#### Iowa

*Bills Introduced*—S 291, to amend the workmen's compensation act, proposes to provide for the payment of workmen's compensation benefits for any disability due to a disease con-

tracted by the employee in connection with the work under the employment S 295 proposes that, in the management of a hospital established by a county, city or town with funds received by gifts, no discrimination shall be made against the practitioners of any school of medicine recognized by the laws of the state, each patient shall have the right to employ at his expense any physician of his own choice, any such physician shall have the exclusive charge of the care and treatment of the patient in such hospital, and the attending nurses shall be subject to the direction of such physician S 299, to amend the law relating to the licensing of maternity hospitals, proposes to redefine "maternity hospital" so as to include any general hospital

*Bill Passed*—S 82 passed the senate, February 18 To amend the income tax law, it proposes to authorize taxpayers to deduct expenses for the medical care of the taxpayer, and the term "medical care" is defined as amounts paid for the diagnosis, cure, mitigation, treatment or prevention of disease, or for the purpose of affecting any structure or function of the body A senate amendment of February 18 proposed to allow also a deduction for treatment or nursing as prescribed by a well recognized church or religious denomination in a hospital or sanatorium conducted by such church or denomination

#### Kansas

*Bills Introduced*—S 227 proposes to provide workmen's compensation for certain occupational disease H 91, previously referred to, was so amended in the house on February 11 as to authorize the state board of osteopathic examination and registration to grant temporary licenses to osteopaths licensed outside the state during the present war emergency

#### Maryland

*Bill Introduced*—H 276 proposes to require any physician who knows, or has reason to believe or suspect, that any person under his professional care is infected with syphilis, gonorrhea or any other venereal disease to give immediate notice thereof in writing to the state board of health

*Bill Passed*—S 84 passed the house, February 16 It proposes to amend the medical practice act by eliminating the proviso that no two courses of medical lectures shall be either begun or completed within the same calendar year This amendment is for the purpose of enabling graduates of accelerated medical courses to obtain licensure in Maryland

*Bill Enacted*—S 47 has become chapter 23 of the Laws of 1943 It increases from one to two dollars the fee which a physician may receive for executing a certificate under the employment law

#### Massachusetts

*Bills Introduced*—H 723 proposes to require a chartered hospital to accept any patient when so requested by a physician licensed to practice medicine in the state H 868 proposes to require an operating surgeon, after the removal of any limb or organ, to deliver a written statement of explanation to the patient or the patient's husband, wife or relatives advising the nature of the operation which he performed and giving reasons for considering such operation necessary H 869 proposes to require every qualified physician to submit, at least twice a year, to a blood test for syphilis and gonorrhea

*Bill Passed*—H 1013 passed the house on February 16 and the senate on February 23 It proposes to add the requirement that physicians report all cases of wounds from a BB gun to the commissioner of public safety and to the police authorities

#### Minnesota

*Bill Passed*—H 273 passed the house, February 11 It proposes that physicians in the armed forces shall not be required to renew their annual licenses during the term of such service and shall be exempt from payment of all renewal fees

#### Missouri

*Bill Introduced*—H 214 proposes to exempt physicians from renewing their licenses annually during the term of their military service

#### Montana

*Bills Passed*—S 63 passed the senate on February 15 and the house on February 22 It proposes to authorize certain institutions of higher learning in Montana to obtain custody of unclaimed human bodies for use in the teaching and demonstration of anatomic science by professional instructors S 97 passed the house, February 22 It proposes to relieve physicians in the military service of the United States from paying annual license fees during the period of such service H 118 passed the house, February 18 To amend the medical practice act, it proposes to authorize the board of medical examiners to prescribe and enforce reciprocity requirements current with changes in standards of the practice of medicine and surgery

#### Nevada

*Bill Introduced*—A 114 proposes to define the term "to practice as an osteopathic physician" to mean the right to practice the art or science of healing limited to the manipulation of the bones and by other manual manipulations intended to restore the deranged mechanism of the human body, provided that any license granted under this proposal shall not give the holder thereof the right to practice obstetrics, nor to administer or prescribe drugs or medicine of any kind, nor to perform operations in surgery by the use of the knife or other instruments

#### New Hampshire

*Bill Enacted*—H 54 was approved, February 16 It provides for the establishment of a state department of health to take over the powers and duties of the state board of health

#### New Jersey

*Bill Introduced*—S 72, to amend the public school law, proposes to make immunization for diphtheria a mandatory rather than optional prerequisite to attendance at school and to make it mandatory for boards of education to provide the necessary equipment to immunize pupils whose parents, in the opinion of the board, are unable to meet the necessary expense

*Bill Passed*—A 94 passed the assembly, February 22 To amend the medical practice act, it proposes to exempt therefrom persons taking charge temporarily, on written permission of the board, of the practice of a lawfully qualified physician in the state, and further proposes conditions under which the board may grant such temporary permission

#### New Mexico

*Bills Introduced*—S 101 proposes to require the county school superintendent to see that all children in his county of school age under 8 years are immunized against diphtheria S 160 proposes that any person having a license to practice a profession in the state shall not be prejudiced by reason of having been drafted into the armed services but shall retain such license after release from such service

*Bill Enacted*—S 141 was approved, February 10 It provides that every physician who makes a diagnosis in or treats or prescribes for a case of venereal disease shall report such case immediately to the municipal or district health officer

#### New York

*Bill Introduced*—A 880 to amend the workmen's compensation act, proposes to authorize an injured employee, when care is required for an injury to his foot to be treated by a duly registered and licensed podiatrist of his own choosing

*Bill Enacted*—A 377 has become chapter 12 of the Laws of 1943 It authorizes a taxpayer to deduct, for income tax purposes, expenses paid or incurred during the taxable year for medical care of himself, his spouse or his dependents "Medical care" is defined as amounts paid or incurred for the diagnosis, cure, mitigation, treatment or prevention of disease or for the purpose of affecting any structure or function of the body or for maternity cases (including amounts paid for accident hospitalization or health insurance)

**North Carolina**

*Bill Introduced*—H 513, to amend the optometry law, proposes to authorize the state board of optometry to make use of the injunctive process in restraining the illegal practice of optometry

*Bill Enacted*—H 110 was ratified February 15. It authorizes state institutions for the care of the sick, feebleminded or insane to have performed on persons dying in such institutions a postmortem examination in the laboratories of incorporated medical schools after securing the written consent of the deceased person's husband or wife or next of kin

**North Dakota**

*Bill Introduced*—H 229 proposes a law for the organization and regulation of nonprofit hospital service plan corporations

*Bill Passed*—S 57 passed the senate February 19. It proposes the enactment of a uniform narcotic act

**Oklahoma**

*Bill Introduced*—S 129 proposes to authorize a person desiring employment, who has a physical defect which would impose on his employer a further or unusual hazard, to waive such physical defect on behalf of himself or his dependents and thus to forego any right to compensation for a personal injury which might be found to be attributable in a material degree to such physical defect

**Oregon**

*Bill Introduced*—S 248 proposes to require persons employed as food handlers to obtain at six month intervals a physician's certificate showing freedom from any infectious and contagious disease

*Bills Passed*—S 175 passed the senate February 16. It proposes to increase the annual registration fee from five to ten dollars for the period beginning Jan 1 1944. H 350 passed the house February 20. It proposes to authorize commissioned medical officers of the army to execute the required certificate necessary under the state premarital examination law

*Bill Enacted*—S 91 was approved February 19. It amends the osteopathic practice act by requiring osteopaths to register annually

**Pennsylvania**

*Bills Passed*—H 235 passed the house February 23. It proposes to authorize the state board of medical education and licensure to issue temporary certificates to physicians licensed in other states to authorize them to practice medicine and surgery in Pennsylvania for the duration of the present war and six months thereafter. H 236 passed the house, February 23. It proposes that for the duration of the war a minimum of nine months rather than one year internship shall constitute the necessary legal training to qualify for admission to examination for a license to practice medicine

**Rhode Island**

*Bill Introduced*—H 665 proposes to add rheumatic fever to the list of diseases which physicians must report to the state department of health

**South Carolina**

*Bill Passed*—S 17 passed the house, February 11. It proposes to eliminate from the medical practice act the requirement that the necessary four full courses of lectures of at least twenty-six weeks each must have been given in four different calendar years. The purpose of this proposal is to enable graduates of accelerated medical courses to obtain licensure in South Carolina

**Tennessee**

*Bill Passed*—H 420 passed the senate, February 9. It proposes to prohibit the sale or advertisement of articles used for the prevention of conception without a license issued by the state board of pharmacy except that physicians and medical practitioners regularly licensed to practice medicine or osteopathy in the state of Tennessee would not be prevented from prescribing such articles

*Bills Enacted*—H 39 has become chapter 107 of the Public Acts of 1943. It provides that hospitals and physicians called on to render first aid to persons suffering from any wound or other injury inflicted by means of a knife, pistol, gun or other deadly weapon or suffering from the effects of poison or suffocation shall report the same immediately to the chief of police. H 129 has become chapter 49 of the Public Acts of 1943. It provides for the creation of a state board of naturopathic examiners and defines naturopathy as the prevention, diagnosis and treatment of human injuries, ailments and diseases by means of any one or more of the psychological, physical or mechanical, chemical or material, forces or agencies of nature. The act shall not be construed, however, to permit or authorize any naturopathic physician licensed thereunder to perform any surgical work other than minor matters. H 903 has become chapter 117 of the Public Acts of 1943. It amends the workmen's compensation act to provide that an employer shall designate a group of three or more reputable physicians or surgeons from which the injured employee shall have the privilege of selecting the operating surgeon or the attending physician

**Texas**

*Bills Introduced*—S 114 and H 208 propose that the superintendent of a state hospital shall be a skilled physician authorized to practice medicine in Texas and of not less than five years' experience in the treatment of mental diseases. H 14, to amend the marriage law, proposes to require a male applicant for a marriage license to produce a certificate from a reputable licensed physician to show that he is free from all venereal diseases. H 65, to amend the marriage law, proposes that each applicant for a marriage license shall produce a certificate signed by a physician legally licensed to practice medicine in Texas showing such applicant to be free from syphilis and all other venereal diseases. Furthermore, the certifying physician would be required to return in his office for a period of at least five years a detailed report of any laboratory test made

**Utah**

*Bills Introduced*—H 29 previously referred to, was amended in the senate on February 16 so as to require applicants for a license to practice naturopathy to have completed at least one year of internship in a hospital accredited by the American Hospital Association. H 160 proposes that any person with tuberculosis in a communicable form who fails to obey the tuberculosis laws or rules of the state board of health may be committed to a sanatorium on complaint by a health officer or a physician or surgeon licensed in the state of Utah

**Vermont**

*Bills Introduced*—S 16 proposes to authorize the institutionalization and treatment of persons who violate the criminal laws or who are guilty of gross immoral conduct because of mental deficiency, insanity or psychopathic personality. The latter term is defined as the existence in any person of such conditions of emotional instability or impulsiveness of behavior, lack of customary standards of good judgment, or failure to appreciate the consequences of his acts, as render him irresponsible for his conduct with respect to sexual or other criminal behavior and thereby dangerous to other persons. H 74, a substitute for H 50, to amend the law relating to the practice of medicine and osteopathy, proposes to authorize the examining board to make rules and regulations covering requirements for admission to practice medicine and surgery and osteopathy. H 151, to amend the premarital examination law, proposes to authorize the execution of the required certificate by an osteopath and by a member of the medical corps of the army, navy or public health service

*Bill Passed*—H 50 passed the house, February 12. It proposes to amend the medical practice act by repealing the section setting forth the requirements for admission to practice and to substitute therefor an authorization that the board shall make rules and regulations covering requirements for admission to practice medicine and surgery

### Washington

**Bills Introduced**—S 181 proposes the creation of full time health districts within the state, provides for the establishment of district boards of health and the appointment of district health officers and prescribes their duties. S 214 proposes to require all persons employed in the preparation, serving or handling of food to be examined by the city health officer and to obtain a certificate showing freedom from any and all communicable diseases at least once every six months. The health officer is limited to a fee of two dollars for making such examination and certificate. S 222 proposes the creation of a state board of practical nurse examiners and defines practical nursing as the performing for compensation of such services as are necessary in the attendance on or the care of persons ill from chronic disease or convalescent, handicapped, mentally unbalanced or aged persons in homes, hospitals or institutions depending on or under the supervision of a regularly licensed and practicing physician. H 121 proposes to exempt charitable hospitals from taxation under certain conditions. H 245 proposes the creation of a cash sickness compensation fund and provides for the administration of such fund. H 256 proposes to require every elementary school from the sixth grade on and every high school or junior high school to institute and maintain as a regular part of its curriculum a course of study and practice of emergency first aid methods.

**Bills Passed**—S 218 has passed the senate. It proposes to authorize the director of licenses, during the present emergency, to grant temporary certificates to practice medicine and surgery to physicians duly licensed and qualified to practice under the laws of some other state and proposes that such temporary license shall be valid from the date of issuance until the next regular examination given by the board of examiners. H 41 passed the house, February 10. It proposes to authorize the establishment of emergency health and sanitation areas and sets forth certain regulations applicable to the state board of health in connection therewith. H 127 passed the house, February 12. It proposes to make it unlawful for any person to maintain or operate a maternity home without a license and defines maternity home as any place where women go to be delivered of children.

### West Virginia

**Bills Introduced**—S 110 and H 181, to amend and reenact the law relating to mentally ill persons and mental defectives, propose, among other things, that the head of the newly created division of mental hygiene shall be a reputable physician and a graduate of an accredited medical school with at least five years' actual experience in the practice of his profession and

at least three years' actual experience as a physician in an institution for the care and treatment of mental illness. The proposals also provide for the licensing of all private institutions for the care, custody or treatment of mentally ill or mentally defective persons. H 264 to amend the medical practice act, proposes to exempt therefrom persons practicing Christian science.

**Bills Passed**—S 36 passed the senate February 24. It proposes the creation of a division of cancer control in the state department of health to administer provisions relating to the diagnosis, treatment and care of persons suffering from cancer, including the conduct of an educational program, the establishment of cancer clinics in general hospitals throughout the state and the furnishing of tissue diagnostic service to all patients. S 85 passed the senate, February 23. It proposes to authorize the board of governors of the West Virginia University to establish a four year medical course to be given either at the university or in part at other universities and medical colleges outside the state.

### Wisconsin

**Bill Passed**—S 53 passed the senate February 17. It proposes to exempt members of the armed forces from being required to maintain a license to practice any profession within the state, proposes that this license shall be suspended during the active service of such persons, and proposes that it may be renewed within six months after such persons' discharge.

### Wyoming

**Bills Passed**—H 58 passed the house, February 12. It proposes to prohibit the operation of a maternity hospital without a license issued by the state board of health. H 77 passed the house, February 12. It proposes regulations for the compulsory sterilization of inmates of certain state institutions if the inmates have been found to be insane, idiotic, imbecilic, feebleminded or epileptic and the probable potential parents of socially inadequate offspring.

**Bills Enacted**—S 2 has become chapter 7 of the Laws of 1943. It amends the premarital examination law by (1) requiring the test to be made on females as well as males and (2) authorizing the execution of the certificate by any physician duly licensed under the laws of Wyoming and engaged in practice there. H 22 has become chapter 39 of the Laws of 1943. It amends the pharmacy law by providing that a hospital shall not be prohibited from keeping on hand and using professionally drugs, medicine or narcotics under the direction of physicians, dentists or veterinarians, even though there be no registered pharmacist present.

## WOMAN'S AUXILIARY

### New Jersey

A symposium on "Doctors' Wives in the War Effort and Home Community Service" made memorable the first of a new type of meeting of the Woman's Auxiliary to the Essex County Medical Society, Nov 23, 1942, at the Academy of Medicine. The program chairman, Mrs S Bernard Kaplan, introduced the uniformed members of the auxiliary prominently engaged in community activities. Mrs Henry C Barkhorn vice chairman of the Newark Red Cross chapter and chairman of the Woman's Division of the War Chest and Roll Call, presided. Mrs H Roy Van Ness discussed the many ways in which doctors' wives have aided in establishing community projects of help to the medical profession. Mrs A Elston Fink told how the wives of doctors at war could substitute for their absent husbands by listening to patients' woes and by entering actively in community projects. Mrs Arnold Kallen and Mrs Arthur Heyman, wives of two doctors who are with the Armed Forces, spoke of the spiritual satisfaction that they had found in their volunteer work as Nurses' Aides. Mrs Asher Yguda auxiliary president and wife of a naval officer, described life in a naval community and how she has organized the Civilian Defense of that community.

### Virginia

The Norfolk auxiliary met on Dec 2, 1942 under the presidency of Mrs W E Butler. Dr A Brownley Hodges, Civilian Defense chief of emergency medical service, requested the assistance of the auxiliary members in distributing equipment for the casualty centers in Norfolk. The auxiliary is sponsoring the sale of war bonds and stamps at Ames and Brownley's Department Store every Monday, and to date stamps and bonds in the amount of \$27,000 have been sold. The members also serve at the sewing room of Red Cross headquarters every Friday and sponsor dances for service men at USO headquarters.

The December meeting of the Woman's Auxiliary to the Alexandria Medical Society was held at the 'Laura Lee Candy House'. Mrs Stanley King chairman of the Volunteer Special Service Committee of the Red Cross, discussed the training duties and requirements of the 'Gray Ladies'. Mrs Harrison Picot, chairman of the committee, with Mrs C E Arnette and Mrs C V Amole, made \$25 selling pansy plants. The proceeds will go to the buying of equipment for the Alexandria Hospital. The auxiliary donated the sum of \$160 to the Alexandria Laboratory for purchasing a microtone. A beautiful handmade quilt was raffled off and \$25 cleared.

## Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

### ALABAMA

**Personal**—Dr William B Nelson, Bay Minette, health officer of Baldwin County, has been placed in charge of the health units at both Baldwin and Escambia counties—Austin W Curtis Jr for eight years assistant to the late George Washington Carver, DSc, director of the department of agricultural research at the Tuskegee Institute, has been named his successor.

**State Committee Approves Establishment of Medical School**—The establishment of a four year medical school in Alabama was assured on January 27 at a meeting of Gov. Chauncey Sparks Montgomery, with members of the state board of health and a special committee of the Medical Association of the State of Alabama appointed to promote the project. Tentative legislation has been drawn by the state medical association committee which would leave to a special commission to be appointed by the governor the matter of location, construction and equipment. The school will be known as the school of medicine of the University of Alabama and Dr William D Partlow, Tuscaloosa chairman of the committee of the state medical association in a statement to the press, said that it will absorb the two year pre-medical course now offered at the University of Alabama. Birmingham has been suggested as the location for the two years advanced training. Establishment of the school has been endorsed by the state medical association, the state board of health and every county medical society in the state. Members of the committee of the state medical association promoting the project include Dr Partlow chairman, Drs Edwin V Caldwell Huntsville, James P Collier Tuscaloosa, Samuel A Gordon Marion, Samuel L Ledbetter Jr Birmingham, Burton F Austin Montgomery state health officer, John H Blue, Montgomery, Emmett B Frazer, Mobile, Paul P Salter, Eufaula, and Audiss M Walker Tuscaloosa.

### CALIFORNIA

**Civil Service Examination for Intern**—The Los Angeles County Civil Service Commission announces that applications for the position of intern are being accepted until April 15. There will be no written test. Candidates will be rated on their professional training and experience and their aptitude and personal suitability for internship as evidenced by investigation or interview. All candidates must be citizens of the United States who have completed a medical course at an approved medical school in the United States or Canada within five years prior to April 15 or who will have completed the course prior to July 1, 1944. Applications may be secured from the dean of any of the accredited medical schools or full information may be obtained by writing directly to the Los Angeles County Civil Service Commission, Room 102 Hall of Records, 220 North Broadway, Los Angeles.

**Memorial to Eric Liljencrantz**—The Hewlett Club of Stanford University School of Medicine, San Francisco recently established the "Eric Liljencrantz Memorial Collection on Aviation Medicine" in the Lane Medical Library in honor of the first member of the faculty to lose his life in the present war. Dr Liljencrantz, a commander in the medical corps of the U S Naval Reserve, was killed in an airplane accident while at sea near the naval air station at Pensacola, Fla., Nov. 5, 1942. He had been granted a leave of absence at Stanford where he was assistant professor of medicine (radiology), to carry out an assignment with the Bureau of Aeronautics in the Navy Department. The *Stanford Medical Bulletin* announced that any contributions to the memorial may be sent either to Dr Loren R Chandler, dean of the medical school or to Lane Medical Library.

**Neurologic Bulletin Dedicated to Dr Ingham**—The *Bulletin* of the Los Angeles Neurological Society for December was dedicated to Dr Samuel D Ingham a former president of the society and clinical professor of medicine (neurology) at the University of Southern California School of Medicine, Los Angeles, as a tribute of esteem of members of the society and in recognition of his contributions to the specialty of neurology. Dr Ingham was born in Mehoopany, Pa., in 1876.

He graduated at the Medico-Chirurgical College of Philadelphia in 1899 and served on the staff there from 1907 to 1910 as instructor in neurology. He was clinical professor of nervous and mental diseases at Temple University School of Medicine, Philadelphia, from 1910 to 1920. He joined the staff of the Los Angeles County Hospital in 1921 and the faculty of the University of Southern California School of Medicine in 1931. He was chairman of the section on neurology of the California Medical Association in 1922, vice president of the American Neurological Association, 1936-1937, and chairman of the Section on Nervous and Mental Diseases of the American Medical Association, 1937-1938. He is now editor-in-chief of the *Bulletin* of the Los Angeles Neurological Society.

### CONNECTICUT

**Hospital News**—A temporary 50 bed wing will be erected at the Bristol Hospital, Bristol, to cost about \$152,000. A grant of \$67,641 was made to the hospital by the Federal Works Agency in November, according to *Modern Hospital*. The project will provide a temporary wartime addition. It will be of stone, brick, mill and frame construction. Only the walls and foundations will be permanent enough to be retained after the war.

### DISTRICT OF COLUMBIA

**Personal**—Rear Admiral Ross T McIntire, Surgeon General of the United States Navy and personal physician to President Roosevelt, received the honorary degree of doctor of science at the commencement exercises at Marquette University School of Medicine, Milwaukee, February 13.

**Society Adopts Civilian Medical Care Program**—A six point program to provide "adequate medical care for the civilian population in wartime Washington" was to be started immediately with a canvass of all physicians. The Washington Star announced on January 19. A committee on medical service for the District of Columbia was set up comprising representatives of the Medical Society of the District of Columbia, the U S Public Health Service, the Health Security Administration, the Emergency Medical Service for Civilian Defense and the Medico-Chirurgical Society. The plan was presented at a meeting of the district medical society on January 18 following its adoption by the newly organized committee. Its objectives are a canvass of all physicians to learn the patient load, establishment of panels of physicians for sections of the city to serve in emergencies and epidemics, and an inquiry into the system of rationing gasoline and tires (doctors say the system takes too much time from attention to the sick), educational program and preventive medicine to meet dangers of overcrowding and postwar planning. The new committee acted under the chairmanship of Dr A Magruder MacDonald, president of the district society and district coroner. Practical phases will be worked out geographically on the basis of the selective service map of the district, with key physicians to be assigned with responsibility for certain areas. The executive board of the district society had at this time approved the project, but it was to be submitted to the entire society for final approval at a later meeting. Meanwhile according to the *Star* the program was to be put into immediate action by a canvass of all physicians "to determine the patient load each medical practitioner is carrying and the demands being made on him for medical service which he is unable to meet." Specialists will be asked to do general practice in the emergency. A committee of the society had in December announced a survey of wartime medical needs of Washington (THE JOURNAL, January 9, p. 139).

### IDAHO

**Physicians in the Legislature**—Physicians in the present session of the Idaho legislature are Drs Charles A Robins, St. Maries, and John D Shinnick, Grangeville. Dr Robins is serving his third successive term as state senator. He was elected president pro tem.

**Appointments to State Examining Board**—Gov. C A Bottolfsen, Boise, recently appointed the following members of the Idaho State Board of Medical Examiners: Drs Albert B Pappenhagen Orofino, Frank C Gibson, Pothlatch, Casper W Pond Pocatello, George C Halley, Twin Falls, Thomas A Ellison, St. Anthony, and Samuel M Poudexter, Boise.

### IOWA

**New Director of Local Health Services**—Dr Chester L Putnam, medical director of district health service number 8 with headquarters in Manchester was recently appointed director of local health services for the state department of health. Dr Donald M Harris, Le Mars, medical director of district health service number 3, with headquarters in Spencer, was named to succeed Dr Putnam in the eighth district.

## LOUISIANA

**Personal**—Dr Herbert Randolph Unsworth was recently installed as president of the New Orleans Neuropsychiatric Club and Dr Guy L Odom was chosen secretary-treasurer—Paul S Lavik, Ph D, has been appointed full time instructor in the department of biochemistry at Louisiana State University School of Medicine, New Orleans

**Dr Matas Awarded Fraternity Medal**—Dr Rudolph Matas, New Orleans, was recently presented with the medal of the Nu Sigma Nu degree of merit, the highest honor conferred by the fraternity. The award recognizes thirty years of service by Dr Matas to the group as a faculty member of Beta Iota Chapter of Tulane University of Louisiana School of Medicine, New Orleans, and as president of the National Honorary Council in 1935. The only other recipients of this medal have been Drs Frederick G Novy, Ann Arbor, Torald H Sollmann, Cleveland, James B Herrick, Chicago, and the late Drs Victor Vaughan, Detroit, Nicholas Senn, Chicago, John B McMurrich, Ste Anne de Bellevue, Quebec, William H Welch, Baltimore, Gotthelf C Huber, Ann Arbor, William H Park, New York, and John M T Finney, Baltimore

## MASSACHUSETTS

**Lecture on Tropical Medicine**—Col Richard P Strong, M C Army of the United States, director of Tropical Medicine, Army Medical School Washington D C, delivered two lectures at the Harvard Medical School, Boston, January 26, on 'Importance of Tropical Infectious Disease in the Present War' and 'Diagnosis and Prevention of Plague and Cholera'

**Dr Thorn Addresses Harvey Society**—Dr George W Thorn, Hersey professor of the theory and practice of physic, Harvard Medical School, Boston, lectured at the Beth Israel Hospital, January 22, under the auspices of the William Harvey Society and Tufts College Medical School, Boston. His subject was "The Clinical Aspects of Sodium and Chloride Metabolism"

**New Hospital House Journal**—The *News*, official house publication of the Massachusetts General Hospital, Boston, recently made its appearance. It is intended not merely as a medium of communication to the staff and personnel but to distribute information about hospital activities and to give news of individual members. The hospital distributes the *News* to all alumni now on military duty as well as to members on the active staff.

**Dr Blake Gives First Begg Society Lecture**—Dr Francis G Blake, dean and Sterling professor of medicine, Yale University School of Medicine, New Haven, presented the first annual Begg Society Lecture at Boston University School of Medicine, January 28, on "Epidemic Diseases in Wartime". The Begg Society was founded about a year ago by a group of third and fourth year students at Boston University School of Medicine to promote good scholarship and fellowship. The recent lecture is the first in a lectureship which the society plans to sponsor annually. The Begg Society was established in honor of the late Dr Alexander S Begg, who at the time of his death was dean of the school of medicine.

## MINNESOTA

**Interstate Shipment of Abortifacient Paste Enjoined**—On January 19 Hon Robert C Bell, U S District Judge for the District of Minnesota, signed an order granting a permanent injunction restraining the shipment in interstate commerce of a drug labeled 'Intrauterine Paste' or 'Dependon Products Paste' manufactured and sold by Anne M Jenks and Jenks Physicians' Supplies, White Bear Lake. The injunction followed a trial that commenced January 5 in St Paul. At the trial the government called forty-six witnesses, thirty-nine of whom were physicians. Of this number six were confessed criminal abortionists and a dozen or more were physicians who had used the paste in so called therapeutic abortions. The state board of medical examiners reports that the court, in its findings of fact, found that the paste as shipped in interstate commerce was composed mainly of potassium soap or other soft soap base with small quantities of alcohol, iodine and distilled water added. The court also found that the paste was represented to the medical profession and others as being safe and appropriate for introduction into the pregnant uterus, for the purpose of inducing labor, terminating pregnancy, and removing the retained portions of the products of conception. The court also found that the paste was represented as 'an effective medicament for the treatment of cervicitis, endometritis, dysmenorrhea, and cervical and uterine

discharges". As a result of the evidence, the court found that the paste "is unsafe and dangerous to health and has caused fatalities and serious injury. Among the specific dangers which are involved in and have resulted from its use are the extensive destruction of tissue, hemolysis or the destruction of the cellular portions of the blood, systemic potassium poisoning, extensive hemorrhage and prolonged bleeding, sterility, peritonitis, pulmonary embolism, damage to kidneys, liver and other internal organs, and increased susceptibility to infection". The court then found as a matter of law that the paste was misbranded and that its labeling was false and misleading and that "in truth and in fact it is ineffective for such purposes".

## NEW JERSEY

**Infectious Diarrhea of Newborn Made Reportable**—At a meeting of the state department of health January 12, infectious diarrhea of the newborn was added to the list of reportable diseases.

**Endowment Fund for Scientific Work**—Plans are under way to establish an endowment fund in the Medical Society of New Jersey 'to support and encourage scientific work, as means and opportunity may be available'. This activity would be carried out under the newly organized committee on scientific work of the state society which is now functioning under the chairmanship of Dr William W Mayer of Jersey City.

**Gonococcus Culture Facilities Offered to Physicians**—A new gonococcus culture service by mail was recently inaugurated by the state department of health. Culture stations have been established throughout the state where the physician to submit a specimen to be cultured for gonococci, must first obtain a culture outfit. After the specimen is obtained from the patient the outfit must be returned to the station within three hours. At the culture station the specimen will be incubated for eighteen to twenty-four hours and mailed to the laboratory of the state department of health. According to the state medical journal, it is recommended that whenever a culture is taken a smear be taken also. It is expected that the new service will materially aid in the reduction of gonorrhea in the state. The state journal points out that chronic gonorrhea in women is often relatively asymptomatic and very frequently smears are consistently negative. Cultures will detect a much higher percentage of the cases. Cultures have an additional advantage over smears in that they differentiate the gonococcus from other gram negative diplococci which may be merely contaminants.

## NEW YORK

**Graduate Lectures**—Dr Frederick N Marty, Syracuse, will discuss "Plasma Therapy" before the Cortland County Medical Society at the Cortland County Hospital, Cortland, March 19, under the auspices of the state department of health and the state medical society. Dr Paul Reznikoff, New York, lectured under the same auspices on March 2 at the joint meeting of the Onondaga County Medical Society and the Syracuse Academy of Medicine on 'The Diagnosis and Treatment of Anemia'.

## New York City

**Personal**—Dr Duncan W Clark, instructor in the department of medicine and director of the student health service, Long Island College of Medicine, Brooklyn, has been appointed assistant dean effective February 1. Dr Clark, who graduated at Long Island College in 1936, later was a Commonwealth Fund Fellow at Yale University School of Medicine, New Haven—Raymond L Zwemer, Ph D, of the Columbia University College of Physicians and Surgeons has been elected an honorary member of the Sociedad de Medicina de Montevideo, Uruguay, and a corresponding member of the Sociedad Argentina de biologia de la Asociacion Medica Argentina.

**Dr Calderone Named Deputy Commissioner of Health**—Dr Frank A Calderone, secretary of the city department of health since July 16, 1942, has been appointed deputy health commissioner to succeed George T Palmer, Dr PH who resigned on February 13. Dr Calderone graduated at the New York University College of Medicine in 1924 and served there as instructor in pharmacology and physiology from 1932 to 1936. After receiving his master's degree in public health at Johns Hopkins University School of Hygiene and Public Health, Baltimore, in 1937 he joined the New York State Health Department as epidemiologist. Later he was district health officer at the lower east side health center and currently is lecturer in the department of preventive medicine at the New York University.



## SOUTH CAROLINA

**Personal**—Dr Charles C Ballard Allendale, has been appointed director of the Pickens-Oconee Health Unit—Dr Lee W Milford Clemson, school physician of Clemson College, was recently elected president of the Southern Conference, he was formerly vice president of the athletic group—Dr and Mrs Joseph H Saxe observed their fiftieth wedding anniversary in Sharon, January 11

**Business Manager Appointed for State Association**—Mrs Claude G Watson, Florence, who for two years has been working in the secretary's office has been elected business manager of the South Carolina Medical Association. This action was taken at a recent meeting of the council to increase the business efficiency of the association. Mrs Watson will continue to work in the office and under the direction of the secretary-treasurer and editor, Dr Julian P Price, Florence

## VIRGINIA

**Personal**—Dr Robert Manton Wilson head of the medical aid division of the Richmond Health Department, has been appointed coroner to succeed Dr John Hamilton Scherer who has resigned to devote his full time to private practice—Dr Powell G Dillard has been named city school physician of Lynchburg succeeding the late Dr John Paullett Clark

**Nutrition in Wartime**—The Medical College of Virginia announces a nutrition symposium to be held March 25-27 at the college, Richmond. Gov Colgate W Darden Jr will open the program with an introduction of Dr Irl C Riggins state commissioner of health who will discuss "Nutrition Plans of the State Department of Health." Other speakers on the program will be

Dr William H Sebrell Jr, Bethesda Md, Nutrition in a Changing World.  
India J Roberts, Ph D, Chicago, Making Nutrition Vital.  
Leander B Dietrick, M S, Blacksburg, Victory Gardens as Related to Wartime Nutrition in Virginia.  
Dr Virgil P Sydenstricker, Augusta Ga, Rationing as It Affects Nutrition of the Public.  
Washington OPA Representative (name not announced), Living Under Rationing.

A dinner meeting will be addressed Friday evening by Dr Sydenstricker on Wartime Nutrition in England. The sessions will conclude Saturday morning with a panel discussion on "Teaching Nutrition Material to Elementary School Children."

## WEST VIRGINIA

**Dr Crosson to Become Industrial Consultant for Sharp and Dohme**—Dr John W Crosson, Charleston, since 1940 director of the bureau of industrial hygiene of the state department of health, has resigned to become industrial consultant for Sharp & Dohme. He will be attached to the medical research staff at Philadelphia.

**Horatio Buonanno Permanently Rejected for License**—Judge Julian F Bouchelle entered a final order, February 4, in the circuit court of Kanawha County forever prohibiting the Public Health Council of West Virginia from further considering the application of Horatio Buonanno for license to practice medicine and surgery in West Virginia, according to an announcement from the state medical association. The action ends the case between the state medical association versus the West Virginia Public Health Council and Horatio Buonanno, although the final order provided that nothing therein should be construed as prohibiting Buonanno from obtaining a license by means of another examination regularly held under the provisions of the code. Buonanno was licensed to practice medicine in West Virginia on August 22, 1927. Prior to his admission to this examination he presented a diploma to the council which purported to show that he had successfully completed a course of study as prescribed by law being one of the prerequisites for examination and for the issuance of a license to practice. In 1928 the council ascertained that the diploma submitted by Buonanno was from a fraudulent school. In 1930 the license to Buonanno was revoked on the ground that he was guilty of dishonorable conduct having secured the license by fraud. Buonanno again appeared before the council in 1934 and presented a diploma purportedly issued by the University of Rio de Janeiro. The council learned that this diploma was not genuine and refused to reinstate the license. Since that time Buonanno has tried repeatedly to have his license reinstated. At a meeting of the council in November 1941 he was advised that the council would act on his application at the meeting to be held in March 1942. The West Virginia State Medical Association instituted a proceeding in March 1942 for the purpose of restraining the Public Health Council from further considering Buonanno's application. In a decision handed down by the

Supreme Court on Dec 8, 1942 the ruling of the circuit court of Kanawha County restraining the Public Health Council from further consideration of Buonanno's application for a license to practice medicine and surgery in West Virginia was affirmed.

## WISCONSIN

**Lippitt Memorial Lecture**—Dr Marcy L Sussman, director of the department of radiology, Mount Sinai Hospital, New York, delivered the eighth annual Lippitt Memorial Lecture under the auspices of the Mount Sinai Hospital, Milwaukee, January 22. His subject was "Newer Concepts in the Diagnosis of Congenital Heart Disease."

**Orthopedic Field Clinics**—On January 1 the bureau for handicapped children of the state board of health started a series of orthopedic field clinics throughout the state for persons under 21 years of age. They will be continued until July 1, 1943. During 1941 and 1942, 1,033 children were examined at these field clinics. All referrals to the clinics for examinations must be made by the family physician. Parents and physicians are invited to attend the clinic with the child. If necessary other services may be obtained in addition to orthopedic treatment.

## GENERAL

**Urologic Prize Will Not Be Awarded This Year**—The American Urological Association announces that its annual research prize of \$500 will not be awarded this year and that plans for its June meeting in St Louis have been canceled.

**Meetings Postponed**—The American Association for the Study of Gonorrhea has announced that all meetings of the association will be postponed for the duration of the war. All the present officers will hold their positions until the next meeting of the association. The 1943 session of the American College of Chest Physicians has been canceled.

**Special Society Election**—Dr Robert Chobot, New York, was recently chosen president of the Society for the Study of Asthma and Allied Conditions, Dr Harry B Wilmer, Philadelphia (now deceased), was elected vice president, and Dr William Cook Sprun, New York, was reelected secretary. The 1943 meeting is tentatively planned for December in New York.

**Dr McGinnes Appointed Director of Red Cross Midwestern Area**—Dr G Ford McGinnes, director of venereal disease control division in the Tennessee Department of Public Health, Nashville, and associate professor of preventive medicine at the University of Tennessee College of Medicine Memphis, has been appointed director of medical and health service of the midwestern area of the American Red Cross with headquarters in St Louis. He succeeds Dr Howard B Mettel who died in November 1942. Dr McGinnes was formerly director of the bureau of communicable disease of the Virginia State Department of Health.

**New Journal on Biochemistry**—The *Archives of Biochemistry* recently made its appearance. Published by the Academic Press, New York, the new journal intends to cover the field of chemical structure and reactions of living organisms including proteins, hormones, vitamins, viruses, enzymology, biochemistry and biophysical research in chromosomes, metabolism, nutrition, photosynthesis, plant chemistry, organic chemistry as related to living organisms, colloid science in its biologic applications and chemotherapy. Manuscripts may be submitted to the editorial office of the *Archives*, 125 East Twenty-Third Street, New York, or to one of the editors:

Moses L Crossley, Ph D, American Cyanamid Company, Bound Brook, N J.  
Fred C Koch, Ph D, Armour and Company, Research Department, Chicago.  
Clive M McCay, Ph D, Cornell University, Ithaca, N Y.  
Frederick F Nord, D Sc, Fordham University, New York.  
Frits W Went, Ph D, California Institute of Technology, Pasadena, Calif.

Chester H Werkman, Ph D, Iowa State College, Ames, Iowa.

**Foundation for the Study of Cycles Offers Prize**—The Foundation for the Study of Cycles, New York, a nonprofit organization created to foster, promote and conduct scientific research in respect to rhythmic and periodic fluctuations in any branch of science, announces the offering of a medal to the person who, during 1943, published the book or paper that in the opinion of the judges is the most outstanding. The foundation is an outgrowth of the permanent committee set up at Matamek in Canada after the first International Conference of Biological Cycles. In its present form the foundation dates from 1940 at which time it was incorporated as a nonprofit organization under the laws of Connecticut. In addition to awarding a medal the foundation makes awards for outstanding work in each branch of science. The person who receives



the medal and the persons who receive the awards will also be elected fellows of the foundation. Additional information may be obtained from Ellsworth Huntington, Ph.D., chairman of the committee on awards, Hendrie Hall, Yale University, New Haven, Conn.

**New Committee on Food Composition**—The food and nutrition board of the National Research Council has organized a committee on food composition, under the chairmanship of Conrad A. Elvehjem, Ph.D., Madison, Wis., to collect, coordinate and appraise food composition data. The committee is to act as repository and point of dissemination for authentic data on all foods being used or considered for use by all branches of the military services. Proximate and mineral composition as well as analyses for vitamins A and C, thiamine, riboflavin and niacin are required as a basis for nutritional evaluation of these foods. Data on new products, processed foods and dehydrated meats, fruits and vegetables especially are needed. The committee has already enlisted the cooperation of federal and state laboratories throughout the country. However, it is also aware that a great wealth of food composition data have been accumulated in the course of research and routine analyses by industrial laboratories. It is the purpose of this communication to appeal to these laboratories of the food industries to make their data active in the war effort. The committee assures that data received for this purpose will be handled with such reservations as should be exercised in the official utilization of this information by the armed services only. Please address Paul L. Packer, Ph.D., secretary, Committee on Food Composition, National Research Council, 2101 Constitution Avenue, Washington, D.C.

**Special Program Marks End of Science Talent Search**—The second Science Talent Search to find potential science talent in high school graduating seniors throughout the nation ended with a special program in Washington, February 26-March 2 at which time the forty finalists including twenty-nine boys and eleven girls, met at the Science Talent Institute to compete in final examinations for Westinghouse science scholarships. The theme of the second annual search was 'Science's Next Great Step Ahead' and the recent program was designed to emphasize some things that will constitute the next great step ahead of science. One session was a panel discussion on vocational opportunities by authorities in special fields. The program included a nutrition luncheon and special broadcast over the Columbia Broadcasting System with an interview of Milburn L. Wilson, D.Sc., assistant director in charge of nutrition, Office of Defense Health and Welfare Services, by Watson Davis, director of Science Service, on "Nutrition in Wartime." At other sessions the speakers included Hugh S. Taylor, Sc.D., Princeton, N.J., on "Molecules and the Future of Chemistry", Eleanor A. Bliss, Sc.D., Baltimore, "Advances in the Sulfonamide Drugs" Dr. Warren H. Lewis, Philadelphia, "Cancer Cells," and Edwin G. Conklin, Sc.D., Princeton, N.J., "The Biological Future." At the banquet Dr. Thomas Parran, surgeon general of the United States Public Health Service, was among the speakers.

**Research in Mental Hospitals**—The National Committee for Mental Hygiene, New York, has recently published a report on "Research in Mental Hospitals—Study Number Two" describing investigations of causes and treatment under way by five hundred investigators in seventy-nine research centers under private auspices, such as general and mental hospitals, clinics, medical schools and universities, located in thirty-nine cities and towns in twenty-two states and the District of Columbia. The first study, issued by the committee in 1938, was a survey of research in state hospitals and other tax-supported institutions for the mentally ill and defective. Both surveys were made in cooperation with and through funds provided by the John and Mary R. Markle Foundation. According to an announcement these surveys are designed to clear the way for further progress in dealing with a major medicosocial problem that takes an enormous toll both of individual lives and of individual and community wealth and that shows signs of becoming even more serious. The magnitude of the problem is reflected in a 'great and ever growing demand for hospital and clinic accommodations for the care and treatment of sufferers from mental and nervous disorders.' Many phases of neurotic and psychotic disorders are covered at certain research centers. Insulin and other shock therapies in treating mental disorders are studied at other centers. Some groups emphasize research on organic symptoms resulting from emotional stress and from the so-called psychosomatic disorders others deal with industrial psychiatry, child guidance studies of marital relations, case work with retarded and delin-

quent children, alcohol and drug addiction, sex variants, suicide symptoms, epilepsy, hypnosis, fever treatment in dementia, paralytica, prolonged sleep therapy in psychoses and various behavior deviations as well as all types of mental disorders and treatments.

## CANADA

**National Program on Nutrition**—A national nutrition program was inaugurated in January, according to the *Canadian Journal of Public Health*. Educational movements were directed by the division of nutrition services of the Dominion Department of Pensions and National Health, the Wartime Information Board and the Association of Canadian Advertisers. The entire program has been designed to educate Canadians to the need of adequate nutrition for the maintenance of health and physical efficiency and arose from dietary surveys carried out throughout the Dominion.

## FOREIGN

**Forty Million Dollar Health Foundation**—William Richard Morris, British motor magnate and philanthropist who bears the title of Lord Nuffield, has given \$40,000,000 to form a "Nuffield Foundation." According to the Associated Press, February 13, income from this capital will be used to assist medical research and teaching, organization and development of medical and health services, scientific research, and teaching in the interests of trade and industry, pursuit of social studies, and the care and comfort of aged persons.

## Deaths in Other Countries

**Sir Robert Armstrong-Jones**, formerly president of the Royal Medico-Psychological Association, president of the psychiatry section of the Royal Society of Medicine in 1929 and former secretary of the psychology section, Congress of Hygiene and Demography in London, died in London, January 30, aged 86. Sir Robert was first superintendent of the London County Council Asylum, Woodford, a position he held for twenty-three years. One of the Lord Chancellor's Visitors in Lunacy from 1921 to 1931. Sir Robert had been a member of the Advanced Board of Medical Studies, University of London.

## CORRECTION

**Annual Report of Hospital Service**—In the Philadelphia item entitled "Annual Report of Hospital Service" (THE JOURNAL, February 20, p. 610) Dr. Lucius R. Wilson should have been reported as medical superintendent of the Hospital of the Protestant Episcopal Church instead of medical superintendent of the Protestant Episcopal Church.

## Government Services

### Office of Indian Affairs Now in Chicago

The United States Department of the Interior announces that the Office of Indian Affairs is now located in the Merchandise Mart Building, Chicago, where it was moved from Washington. Dr. John R. McGibony, director of health, states that all communications concerning employment and health questions should be addressed to the Chicago office.

### Treatment Centers for Venereal Disease

Treatment centers will be set up with Lanham Act funds in eight states, the Canal Zone and the Virgin Islands. Equipped for treating women infected with venereal disease, the centers will provide medical care designed to cure early syphilis and gonorrhea. Treatment in most cases will take about a week, with four or five weeks for observation and medical supervision. In addition to medical treatment the centers will provide some form of vocational guidance. Attempts will be made to find profitable employment for the patients on their release and, when feasible a certain amount of vocational training may be provided during the observation period. A center with accommodations for 200 beds is planned for the Canal Zone. Six hundred beds are planned for the three centers in Florida at Wakulla, Sarasota and Ocala. In Algiers, La. 200. Mississippi, 50. Monett, Mo. 25. Rush Springs, Okla. 50. Goldville and Pontiac, S.C. a combined 400. Knox County, Tenn. 200 and St. Thomas, V.I. 25.

## Foreign Letters

### LONDON

(From Our Regular Correspondent)

Jan 16, 1943

#### Warning as to the Dose of Morphine for the Wounded

In a bulletin on the use of morphine in shock, the War Office points out that the dosage after injuries cannot be standardized, but current variations are perhaps unnecessarily wide. At times of stress the medical officer may be tempted to give considerably more than the ordinary initial dose of a quarter of a grain (0.016 Gm.) but he should remember that the ideal is to use the least dose which will be effective and that anything over half a grain (0.032 Gm.) is likely to increase the symptoms of shock and may depress the respiratory center. For severe injuries with much pain and distress an initial dose of half a grain of morphine hydrochloride or tartrate is reasonable. But, if the full dose is given, no more should be administered for at least four hours.

Disappointing results from the smaller doses are often due to poor absorption, for, in the seriously shocked, morphine may act slowly or irregularly when given subcutaneously. Intramuscular injection is preferable, and when relief of pain is urgent more use should be made of the intravenous route. An intravenous dose of  $\frac{1}{16}$  grain (0.01 Gm.) or  $\frac{1}{4}$  grain (but never more), diluted to at least 1 cc. with sterile water and injected over a period of a minute or more, will reduce pain almost immediately. When injection is impossible, two  $\frac{1}{4}$  grain tablets may be placed beneath the tongue.

It is also pointed out that morphine is given to many patients who would be better without it. It should be used when pain needs relief but should not be given as routine to all who seem the worse for injuries. For some of these a cup of tea would be more appropriate.

#### Compulsory Treatment of Venereal Disease Opposition Defeated

As usual in war there is an increase of venereal disease, which is engaging the attention of the government. Free treatment under conditions of complete secrecy has been available in Britain for twenty-five years. There are now two hundred and forty-nine treatment centers, three fourths of which are in hospitals. Eighteen new centers have been provided since the war began and five more are about to be opened. The demand for specialists and other medical staff for the fighting forces has made the staffing of the new centers difficult. There was no compulsion before the government recently made a regulation that any person who was shown to have communicated a venereal disease to two persons must attend for treatment. But this regulation has been opposed by certain politicians, mainly women. In the House of Commons Dr. Edith Summerskill (physician) moved a resolution for its annulment. She declared that it would be ineffective and would delay real action. During the last year 70,000 new cases of venereal disease came to the civilian clinics. If to these were added those which did not come, the number might be 150,000. To these must be added the number of cases in the fighting forces. The regulation would not protect the men of the country against venereal disease. No two men would inform on a respectable woman who had been infected innocently. The regulation would get only a few women, probably a few prostitutes and a few other unfortunates. She advocated the compulsory notification and treatment of all cases, as in Sweden, where the defaulter rate was only 2.5 per cent in 1935.

In the debate Sir Francis Freemantle (expert in public health) said that the question was "What was going to be effective at present?" The regulation was a useful step and all that could

be done now. What was the good of pretending to set up clinics when we had not the doctors to man them and could not get them while the war continued? Dr. Haden Guest (physician) supported the regulation. In the fighting services, where there were both compulsory notification and compulsory treatment, there was a tremendous rise in venereal infection. Sir Ernest Graham Little (dermatologist) said that we should regard the curve of incidence of venereal disease as an epidemic. Something must be done here and now. We must get at the centers of infection here and now. The compulsory treatment of the regulation was valuable, because, although not cured of syphilis by one or two injections, a person was rapidly rendered non-infective. The resolution against compulsory treatment was rejected by a majority of 245 votes to 31.

#### The Phonoelectrocardioscope

A new instrument, which its inventor, G. E. Donovan, calls the phonoelectrocardioscope, was described by him in a lecture to the Institution of Electric Engineers. Though it has not yet passed out of the engineering stage, it promises to be useful to the clinician and research worker. The instrument incorporates a double beam cathode ray oscilloscope with a fluorescent screen of long afterglow, which permits the simultaneous direct visual recording of two phenomena such as the phonocardiogram and the electrocardiogram, the phonocardiogram and the sphygmogram or the electrocardiogram and the sphygmogram. At the same time the heart sounds, picked up by a special microphone, can be heard through an electrical amplifying stethoscope or a loud speaker. It is claimed that the instrument is reasonably simple to work, it cannot be damaged by overloading or shock and maintenance is simple. A further advantage is that permanent photographic records can be taken of the phonocardiogram, electrocardiogram or sphygmogram. By means of frequency filters, murmurs or other desired sounds can be accentuated and undesirable ones excluded. The instrument has an overall frequency range extending from the lowest frequency to over 1,000 cycles per second, but this band can be divided by means of filters so that the frequency response can be given any desired slope as is done in the tone control of a wireless set.

The most obvious application of the phonoelectrocardioscope is in the teaching of auscultation. Donovan states that the amplification of heart sounds through a loud speaker can never be 100 per cent satisfactory. He prefers multiple head phones, which can be used with his instrument. By means of it a group of students can hear and "see" the sounds produced by the heart, including those not audible in the ordinary stethoscope.

#### The Jubilee of the Clinical Journal

The centenary of the *British Medical Journal* was celebrated two years ago (*THE JOURNAL*, Dec 14, 1940, p. 2099). The *Clinical Journal* has now celebrated its jubilee by a special issue which takes the place of an ordinary one and is no larger, thus keeping to the paper restrictions imposed by the war. It began publication in 1892 to provide clinical teaching by means of lectures, articles and records of cases. A series of articles by leading clinicians includes "Some Medical Aphorisms" by Sir Arthur Hurst, "Trial and Error in Endocrinology" by Sir Walter Langdon-Brown, "Irregularities of Cardiac Rhythm" by E. M. Brockbank, "Some Remarks on Perforated Peptic Ulcer" by V. Zachary Cope, "The Progress and Present Aspects of Medical Science" by Prof. J. A. Ryle, "What Do We Mean by Normal?" by Prof. D. M. Lyon, "Bleeding After the Menopause" by A. C. Palmer, "The Importance of Early Diagnosis of Cancer of the Cervix" by W. F. T. Haultain and "Practical Reflections on Some Genitourinary Conditions" by A. E. Roche. Among the congratulations, Professor Ryle refers to "this honest and helpful periodical, which goes its way unruffled by swift change or novel methods or the impatience of a specialist age."

## JERUSALEM, PALESTINE

(From Our Regular Correspondent)

Jan 3, 1943

### The Fight Against Epidemic Diseases

As a consequence of the disturbances in this country in 1936-1938 and after that of the war, a considerable increase in epidemic diseases has been recorded in Palestine. Reports published by various medical institutions convey a clear picture of the present situation. Thus in December 1942 Dr Katzenelson gave an account of the activities of the health department of the Waad Leumi.

With regard to the present typhoid epidemic he points out that, in contradistinction to England with its population of 40 millions, less than 2,000 cases of typhoid were reported Palestine, however, with a population of slightly more than 1½ million, had a case incidence of 2,500. In rather a small district (the Ein Geb settlement) on the trans-Jordan side of the Lake of Galilee at present 50 out of a total population of 300 are suffering from typhoid.

Braun and Dreyfuss, at the meeting of the Jewish Medical Association of Palestine, spoke about typhoid in Jerusalem in 1940-1941. Reviewing the situation from a clinical standpoint (in the "Refuah," the *Journal of the Palestine Medical Association*, May 15, 1942), they wrote as follows: A greater frequency of enteric fever was observed in Jerusalem during the second half of 1940 and during 1941. Not only in its numbers but also in its severity did typhoid and paratyphoid fever assume the character of a new epidemic. While in former years (1935-1939) no case of death occurred among 114 cases in the medical department of the Hadassah Hospital, 11 cases of enteric fever out of a total of 135 cases were fatal during the period. The clinical course was characterized by its length, its tendency to recurrences and its toxic manifestations. Toxicemia manifested itself by frequent occurrence of rigors, collapses and delirious states. The usual complications of these diseases were more frequent, besides, some rather unusual complications were observed. In a relatively large number of cases ulcerations of the throat were to be seen, in 1 case leading to extensive gangrene of the mouth and throat and so causing a lethal outcome. Other complications were hepatic jaundice, lobar pneumonia and muscular abscess. Avitaminotic states occurred quite frequently, especially of the vitamin B complex and vitamin C.

Another infectious disease which plays an important part in this country is tuberculosis. In the article referred to Katzenelson also criticizes the lack of support given by the government to the maintenance of the antituberculosis campaign. "In fighting the disease the only aid given by the government was a grant of £2,200 toward the maintenance of the Safad Hospital, whose annual budget was £10,000. Other tuberculosis hospitals received no support whatever, nor did the antituberculosis league have any help."

Nine cases of smallpox have been reported in Palestine during the last months, six of which occurred in Haifa, 2 in Beersheba and 1 in Tel Aviv. It was found that the infection had been introduced from Syria (Damas). In case of an emergency large quantities of vaccine can now immediately be made available.

Another 10 cases of plague, preponderantly in the Jaffa-Tel Aviv district, followed those reported from Haifa early in this year. Five of the patients died. Energetic measures to fight the disease were immediately taken by the government, including the establishment of a separate plague department in the Bne-Brak Hospital near Tel Aviv, to which a special plague laboratory has been attached.

Katzellenbogen reports on vaccination against Jericho boil. Jericho boil is common among the workers of the potash plant on the Dead Sea and with the continued introduction of new

labor from Leishmania-free places the problem of prophylaxis has become one of practical importance. For inoculation Leishmania tropica cultures were used which had been taken from a local case and, moreover, Leishman-Donovan bodies of the same strain from the spleens of infected Syrian hamsters.

Of 167 vaccinated persons, 152 could be kept under close observation for six to ten months. Only 7 of them developed the symptoms of leishmania, partly at the site of injection, partly elsewhere. It is assumed that in these cases vaccination coincided with the incubation period of a natural infection. The others remained healthy.

The chemotherapeutic use of halogenized phenols was studied by Bernhard Zondek at his department at the Rothschild Hadassah University Hospital in Jerusalem. In cooperation with the Teva works he was able to prepare a p-chloro-xylenol solution suited for intramuscular injection. It is a special advantage of this compound that it is bactericidal wherever it is allowed to display its activity, be it in the blood stream, where it circulates after administration, or in the urine, where it is eliminated, or even on the skin after external application. Since the active principle is absorbed by the skin, a 15 to 30 per cent ointment was prepared, 10 to 20 Gm of which is applied on the skin on five successive days. Satisfactory clinical results with this method were recorded in pyelitis, cystitis and puerperal infection.

### Palestine Health Report

Dr H G H Smart, medical adviser to the colonial secretary, who left Palestine after a short visit in September 1942, summarized some of his impressions.

"During my tour I have been much impressed by the community service that is so abundantly provided especially by the Jewish community. I have managed to learn a good deal about this and have visited Jewish hospitals and centers near Tel-Aviv and Haifa.

"I have also had the opportunity of visiting the Hadassah Medical Center recently completed after a long period of planning and careful thought. It is first class in every respect.

"The Jewish community in Palestine have a wealth of well known and highly trained scientists and doctors and they are employing this invaluable asset to the greatest advantage in the country."

## Marriages

THEODORE WILLARD WEEKS JR, Moore Haven, Fla., to Miss Anna Florence Joyner of Farmville, N C., in Baltimore, December 30.

JAMES MAC SAMS, Erwin, Tenn., to Miss Mary Elizabeth Jones of Johnson City, Tenn., in Blackstone, Va., February 5.

THOMAS STRINGFIELD JR, Waynesville, N C., to Miss Harriet Cutler Coburn of Asheville in Biltmore, February 3.

HENRY M WILSON JR, Peoria, Ill., to Miss Eleanor Rain of Jerseyville, Ill., in St. Louis, January 30.

EMMETT THOMAS FITZPATRICK to Miss Rose Mary Albury, both of Miami Beach, Fla., January 23.

HARRY L ALPERT, Syracuse, N Y., to Miss Harriet R Ferst in Fayetteville, N C., in January.

FRANK A MANZIONE to Miss Mary Gabriella Kinney, both of Paterson, N J., December 27.

WILLIAM KENNEDY KERR, Greenville, S C., to Miss Rosa Burch in Columbia, January 26.

LESLIE E HILDEBRAND to Miss Kathleen Corrigan, both of Spokane, Wash., December 30.

PAUL ELSBERG, Washington, D C., to Miss Elizabeth Swartz, in Alexandria, Va., recently.

CARL B SPUTH JR to Miss Ruth Agnes Means, both of Indianapolis, February 10.

PAUL L KISTNER St. Louis, to Miss Nina Gleeson of Ferguson, Mo., February 20.

LOUIS HAYMAN to Miss Marion Campbell Bond, both of Baltimore February 6.

## Deaths

**Emerson Frank Root**, Salt Lake City Western Reserve University Medical Department, Cleveland 1880 member and past president of the Utah State Medical Association past president of the Salt Lake County Medical Society and the Pacific Northwest Medical Society, formerly chief of staff of the Holy Cross Hospital fellow of the American College of Surgeons in 1930 was given a testimonial dinner by 150 members of the profession from all parts of the state to celebrate his completion of fifty years in the practice of medicine, aged 84, died, January 18 of carcinoma of the rectum and bladder

**Frederick Casimir Simon** St Louis Missouri Medical College St Louis, 1899 specialist certified by the American Board of Otolaryngology member of the American Academy of Ophthalmology and Otolaryngology fellow of the American College of Surgeons served during World War I and in the U S Public Health Service on the staffs of the U S Marine Hospital Kirkwood, the Evangelical Deaconess Home and Hospital and the Lutheran Hospital aged 64 died December 31 in the Veterans Administration Facility Jefferson Barracks of generalized arteriosclerosis and pneumonia

**Peter Whitman Rowland Jr** Memphis Tenn, University of Virginia Department of Medicine Charlottesville, 1919 specialist certified by the American Board of Internal Medicine formerly assistant professor of medicine at the University of Tennessee College of Medicine member of the American Heart Association and the American Diabetic Association fellow of the American College of Physicians for seventeen years associated with the Crisler Clinic on the staff of the Methodist Hospital, aged 49 was found dead, January 10 of acute coronary thrombosis

**Arden Cline Hornbeck** Marlin Texas University of Texas School of Medicine Galveston 1920 fellow of the American College of Surgeons past president of the Falls County Medical Society and the Twelfth District Medical Society, Federal jail physician of Falls County local surgeon for the Southern Pacific and Missouri Pacific Railroads, examining physician for the state highway department of Falls County, chief surgeon of the Buie Clinic and the Buie Allen Hospital, aged 45 died January 20, of carcinoma of the spine

**William Martin Barnes** Henderson Tenn Memphis Hospital Medical College 1909 aged 59 died January 10 in the Baptist Memorial Hospital Memphis, of pneumonia

**George Thomas Barrett**, Erie Pa, Georgetown University School of Medicine Washington D C 1908, member of the Medical Society of the State of Pennsylvania, on the staff of St Vincent's Hospital aged 57, died, January 1, of cerebral hemorrhage

**Edwin Abraham Beard** Inglewood Calif College of Physicians and Surgeons Keokuk, Iowa 1898 served on the staffs of the Eye and Ear Hospital, Los Angeles, and the Centinela Hospital, aged 72, died, January 4, of coronary thrombosis

**Nahum Binderman**, Brooklyn Fordham University School of Medicine, New York, 1912, served on the staff of the Manhattan General Hospital New York, aged 60 died January 22 in the Israel Zion Hospital of coronary sclerosis, coronary thrombosis and pulmonary infarction

**Cluese A Blanchard**, Augusta Ga, University of Georgia Medical Department, Augusta 1892 member of the Medical Association of Georgia, aged 72, died recently of coronary occlusion

**Clarence Roy Blosser** Dunkirk, Ohio Ohio State University College of Medicine, Columbus, 1912 served during World War I, aged 58, died, January 17, of cerebral hemorrhage

**Charles Jesse Brockway**, Brookston, Ind Jefferson Medical College of Philadelphia, 1911 member of the Indiana State Medical Association, served in the medical corps of the U S Army in France during World War I aged 54 on the associate staff of the Lafayette Home Hospital, where he died, January 8, of cerebral hemorrhage

**William Franklin Byler**, Webb City Mo, University of Louisville (Ky) Medical Department 1904 aged 68, died, January 1, in Lebanon of hemangioendotheliosarcoma of the spleen

**James Castle**, Lynn Mass St Louis College of Physicians and Surgeon 1893 aged 85 died January 8 of heart disease

**Louis Ballantine Chapman** New Rochelle, N Y, Cornell University Medical College, New York 1908, president of the medical board of the New Rochelle Hospital, where he was a member of the board of directors and associate director of medicine, at one time medical director of the Grasslands Hospital, Valhalla, aged 64, died, January 9, of coronary occlusion

**Jesse Franklin Cogan** Dawson Pa, Baltimore Medical College 1892, in June 1942 received a certificate for fifty years practice of medicine from the Medical Society of the State of Pennsylvania, at one time a druggist, aged 77, died, January 1 of cerebral arteriosclerosis

**Francis James Coleman**, Kuna, Idaho Sioux City (Iowa) College of Medicine, 1897 University of Buffalo School of Medicine 1899 aged 74, died, January 2, of arteriosclerosis

**John Philip Cooney**, Providence R I, College of Physicians and Surgeons, New York, 1892, member of the Rhode Island Medical Society for many years on the staff of St Joseph's Hospital, a member of the school committee of Providence, member of the medical staff of the St Vincent de Paul Infant Asylum, aged 72, died, January 15, of heart disease and hypertension

**Charles P Cooper**, Chicago, Bennett College of Eclectic Medicine and Surgery Chicago 1906 on the courtesy staff of the Provident Hospital aged 60, died, January 19, of cerebral hemorrhage and hemiplegia

**Robert Cowger**, Danville, Ark Memphis (Tenn) Hospital Medical College, 1902, aged 70, died, January 16 of heart block

**Hamilton Chalmers Cruikshank**, Toronto Ont, Canada, University of Toronto Faculty of Medicine 1919 served overseas with the Royal Canadian Army Medical Corps during World War I deputy medical officer of health for Toronto for many years medical officer of the Manufacturers Life Insurance Company, aged 54, died, December 25

**Charles W Culp**, Host Kan, Beaumont Hospital Medical College St Louis, 1893, aged 74, died, January 12, of cirrhosis of the liver

**Arland Lewis Darling**, Corning N Y University of Buffalo School of Medicine 1892 member of the Medical Society of the State of New York, aged 72 died December 13 of cerebral hemorrhage

**Nicholas Leeke Dashiell** Baltimore University of Maryland School of Medicine, Baltimore 1882 aged 82 died January 8 in the Union Memorial Hospital of injuries received when struck by a trolley car

**Charles E Doubleday** Penn Yan, N Y Syracuse University College of Medicine 1887 past president of the Yates County Medical Society aged 79 on the staff of the Soldiers and Sailors Memorial Hospital where he died January 14 of cerebral hemorrhage

**Frank P Dunn** Webster Groves Mo, Marion Sims College of Medicine St Louis, 1898, aged 72 died, January 13 of senility

**Louis Joseph Ferrara** New York University and Bellevue Hospital Medical College, New York 1910 member of the Medical Society of the State of New York served on the staffs of the Fordham, Mother Cabrini Memorial and Westchester Square hospitals and University Heights Sanitarium, aged 55, died January 19, of pulmonary fibrosis

**Merle d'Aubigne Flenner** Hamilton Ohio, Miami Medical College, Cincinnati 1903 aged 64 member of the staff of the Mercy Hospital served as chief of the medical staff of the Fort Hamilton Hospital, where he died, January 3, of coronary thrombosis

**Royal L Garner** Milan, Mo, Beaumont Hospital Medical College St Louis, 1900 an Affiliate Fellow of the American Medical Association, aged 81, died, January 4 of arteriosclerosis and chronic myocarditis

**Thomas Cary Geron**, Paris Texas, Medical Department of Tulane University of Louisiana, New Orleans, 1901, served for many years as health officer of Lamar County, on the staff of St Joseph's Hospital, aged 75, died, January 2, of coronary thrombosis

**Alonzo Glass**, Creal Springs Ill Marion-Sims College of Medicine, St Louis, 1897, aged 83, died, January 17, of uremia and chronic nephritis

**Clark S Glover**, Russellville, Mo, American Medical College, St Louis 1901, member of the Missouri State Medical Association served as deputy state health commissioner for Cole County for many years aged 68 died, January 5, of chronic myocarditis

**Joseph Franklin Grist**, Magazine, Ark (licensed in Arkansas in 1903) aged 73, died December 5, of angina pectoris

**Leon Quitman Hall**, Jackson, Miss, Memphis (Tenn) Hospital Medical College, 1913, member of the Mississippi State Medical Association, aged 55, died, December 31, in the Mississippi Hospital of angina pectoris

**Charles Benton Harpole**, Evansville, Ind, Chicago Homeopathic Medical College, 1893 at one time on the staff of the Protestant Deaconess Hospital, aged 77, died, January 10, of gastric hemorrhage

**William Gillespie Harris**, Plano, Texas, Medical Department of Tulane University of Louisiana, New Orleans, 1892, member of the State Medical Association of Texas, on the staff of the McKinney (Texas) Hospital, aged 84, died, December 4, of cerebral hemorrhage

**Richard Taliaferro Henry**, Springfield, Ark, University of Arkansas School of Medicine, Little Rock, 1911, member of the Arkansas Medical Society aged 60, died, January 4, of coronary occlusion

**Christopher Henry Herbert**, Jackson, Miss, Medical Department of Tulane University of Louisiana, New Orleans 1905, served on the board of trustees of the old Mississippi State Hospital for the Insane from 1900 to 1904 also a druggist, served on one of the city's first board of aldermen, aged 76, died, January 13, of arteriosclerosis

**Edward Herzog** \* Bogota, N J, Univerzita Komenského Fakulta Lekarska Bratislava, Czechoslovakia 1920, aged 49, died, December 27, in the Holy Name Hospital, Teaneck, of coronary occlusion

**Kenneth Jastram Holtz** \* Seattle, Jefferson Medical College of Philadelphia 1912, member of the Radiological Society of North America Inc, served as secretary of the Washington State Radiological Society, served during World War I, x-ray specialist at the Polyclinic, aged 52, died, January 9, of angina pectoris

**George Thomas Hopkins**, Paragould, Ark Vanderbilt University School of Medicine Nashville, Tenn, 1893, aged 73, died, January 7, of ruptured abdominal aneurysm

**William Bouldin Hopkins** \* Jeffersonville, Ind University of Louisville (Ky) Medical Department, 1921, member of the Kentucky State Medical Association member of the staff of the Clark County Memorial Hospital aged 51 died, January 1, in the Louisville (Ky) General Hospital of coronary occlusion

**Simon Andrew Huber**, Charter Oak Iowa, John A Creighton Medical College, Omaha, 1908 aged 61, died, December 10, in Sioux City of cirrhosis of the liver

**John Austin Hunter**, West Middlesex, Pa, Western Pennsylvania Medical College, Pittsburgh 1894 member of the Medical Society of the State of Pennsylvania, on the courtesy staff of the Christian H Buhl Hospital Sharon, aged 72, died, January 3, of chronic myocarditis

**J Frank Huss**, Atlanta, Ga, Southern Medical College, Atlanta, 1894 aged 71, died, January 9 of hypertension and heart disease

**Clifford C Johnson** \* Harpers Ferry, W Va, Physio-Medical College of Indiana, Indianapolis, 1905, aged 63, died, January 18, of coronary thrombosis

**J Leon Jones**, Los Angeles, University of Wooster Medical Department, Cleveland 1910, served in the U S Army during World War I, aged 58, died, January 4, of myocarditis and arteriosclerosis

**George M Jordan**, Frost, W Va (licensed in West Virginia in 1896), aged 87 died, December 8, of senility

**Samuel Kavinoky** \* Buffalo, University of Buffalo School of Medicine, 1905 also a pharmacist, aged 68, died, January 23, of coronary occlusion

**Frank Emil Klauser**, Toledo, Ohio, Detroit Medical College, 1879, aged 86, died, January 17, of myocardial degeneration

**Robert Keneborough Black Knowles**, Vegreville, Alta, Canada Harvard Medical School, Boston 1902, aged 65, died November 16

**Horace W Kohler**, Red Lion, Pa College of Physicians and Surgeons, Baltimore, 1911 aged 51, died January 4, of coronary thrombosis

**Fred Herman Kruse** \* San Francisco University of California Medical School, San Francisco, 1915 clinical professor of medicine at his alma mater, specialist certified by the

American Board of Internal Medicine member of the American Gastro Enterological Association and the National Gastro-enterological Association, fellow of the American College of Physicians aged 63, died, January 14 of carcinoma of the prostate with metastases

**David Charlton La Grone**, Midville, Ga, University of Georgia Medical Department, Augusta, 1908 mayor of Summertown for six years, for a number of years surgeon for the Georgia and Florida Railroad, aged 57, died, January 12, in a hospital at Columbia S C, of cerebral hemorrhage

**Orville Nelson Lewis**, Haverstraw, N Y, Long Island College Hospital, Brooklyn, 1903, member of the Medical Society of the State of New York, served on the staffs of the Nyack (N Y) Hospital and the Good Samaritan Hospital, Suffern, aged 63, died, January 9, of coronary occlusion

**Brady Forest Long**, Mifflin Pa Baltimore University School of Medicine, 1900, member of the Medical Society of the State of Pennsylvania, aged 69 died, November 6, in the Lewistown (Pa) Hospital of cardiorenal vascular disease

**William Orville Manion**, Portland Ore, College of Physicians and Surgeons, Keokuk, Iowa, 1886 served during World War I formerly on the staff of the Veterans Administration Facility aged 80 died, December 5 of chronic myocarditis

**Albert James Marks**, Toledo Ohio Physio Medical Institute Cincinnati 1882, Civil War veteran, aged 100 died, January 21 in the East Side Hospital of a fractured hip as the result of a fall, and senility

**Louis Lynn Marshall**, Little Rock Ark, Eclectic Medical University Kansas City Mo 1912 Kansas City (Mo) College of Medicine and Surgery 1916 formerly a member of the Eclectic State Medical Board aged 61, died January 16, of chronic lymphatic leukemia

**Robert Lee Montgomery**, Tuscumbia Ala Memphis (Tenn) Hospital Medical College 1903 member of the Medical Association of the State of Alabama aged 72, died December 28, of cerebral hemorrhage

**Nicholas L Mulvey**, Syracuse N Y Niagara University Medical Department, Buffalo, 1890, member of the staff of the Crouse-Irving Hospital on the staff of the Women's and Children's Hospital, now known as the Syracuse Memorial Hospital, from 1902 to 1913 aged 81 died, January 6, of cerebral hemorrhage and colitis

**Arthur Irwin Murphy** \* Pittsburgh University of Pennsylvania Department of Medicine Philadelphia 1908, member of the American Urological Association aged 59, a member of the staff of the Western Pennsylvania Hospital, where he died, January 17, of pneumonia

**Paul Nathaniel Neal** \* Raleigh N C Harvard Medical School, Boston, 1919 medical director of the Durham Life Insurance Company aged 48 died January 12 in the New England Baptist Hospital Boston of esophageal diverticulum following an operation for mediastinal abscess, emphysema and pericarditis

**Benjamin Cecil Perry** \* Bethesda, Md Baltimore Medical College, 1906, member of the state board of health at one time president of the Montgomery County Board of Commissioners member and at one time chairman of the Maryland-National Capital Park and Planning Commission served as vice president of the Bank of Bethesda, aged 61 died January 8 in the Georgetown University Hospital, Washington, D C, of chronic cardiovascular degeneration

**Alexander Fraser Pirie**, Dundas, Ont Canada Queen's University Faculty of Medicine, Kingston, 1887 died, November 24

**John Edmond Powell**, Westmount, Que Canada, McGill University Faculty of Medicine, Montreal, 1940, commissioned a surgeon-lieutenant in the Royal Canadian Naval Volunteer Reserve, aged 25, was killed when his ship an airplane carrier was blown up while on convoy near Gibraltar, November 15

**Rose M T Reading**, Chicago, Bennett College of Eclectic Medicine and Surgery, Chicago, 1886, aged 75, died, December 22 in Elgin, Ill, of chronic myocarditis and bronchopneumonia

**Edmonds Droke Rollins**, Bristol Va University College of Medicine, Richmond, 1909, aged 55, died, January 6, at his home in Bristol, Tenn, of carcinoma of the throat

**Fred Ernest Ross** \* Erie Pa, University of Buffalo School of Medicine 1897, medical director of Erie County, served on the staffs of the Hamot and St Vincent's hospitals aged 70 died, January 10 of heart disease

**Joseph Francis Ruiz**, San Jose, Calif., Creighton University School of Medicine Omaha, 1939 appointed an assistant surgeon, with rank of lieutenant, junior grade, U S Naval Reserve, March 11 1941 reported to a Marine division for active duty April 22, 1941 promoted to the temporary rank of lieutenant on June 15 1942, killed in action at Guadalcanal while on duty with a Marine division, November 11, aged 27

**Pietro Sarli**, Pittston, Pa., Regia Università di Napoli Facoltà di Medicina e Chirurgia Italy, 1908, aged 63, died, November 1, in the Mercy Hospital, Wilkes Barre, of empyema of the gallbladder and liver abscess

**Gustav Sass**, New York, Medizinische Fakultät der Universität Wien, Germany, 1929, member of the Medical Society of the State of New York, aged 38, died, December 27, of sarcoma

**Joseph Scheidler**, Cheshaning Mich University of Michigan Homeopathic Medical School, Ann Arbor, 1901, aged 70, died, December 3, in the University Hospital, Ann Arbor, of coronary occlusion and arteriosclerotic heart disease

**William Charles Schindler Sr** Cincinnati, Miami Medical College Cincinnati, 1900, aged 73, on the staffs of the Little Sisters of the Poor, Aged and Infirm, St Francis Hospital and the Good Samaritan Hospital where he died, December 18 following a prostatectomy

**Leo Sebastian Schumacher**, Lakewood, Ohio, St Louis University School of Medicine, 1910, on the staffs of St John's Evangelical Deaconess and St Alexis hospitals, Cleveland aged 55, died, December 13 of coronary thrombosis

**Albert Schwartz**, Cincinnati, Eclectic Medical College Cincinnati, 1916, member of the Ohio State Medical Association aged 57, died, December 19, of carcinoma of the neck

**Alexander A Sharp**, Chicago University of Pennsylvania Department of Medicine Philadelphia, 1886 also a lawyer, aged 80, died December 6, in the Henrotin Hospital of coronary heart disease and general arteriosclerosis

**Charles Shattinger**, Los Altos, Calif., St Louis Medical College, 1886, member of the California Medical Association, served on the staff of the Palo Alto (Calif.) Hospital, aged 77, died, December 13, of acute cardiac failure, chronic myocarditis and arteriosclerosis

**Hobart Parker Shattuck** Los Angeles, Cornell University Medical College, New York 1903, aged 64, died, December 10, in the California Hospital of carcinoma of the stomach

**Carl A Sherrill**, Medina, Texas, University of Tennessee Medical Department, Nashville, 1898 aged 70, died, December 15, in Galveston of coronary occlusion

**Richard Anderson Smith**, Omaha, John A Creighton Medical College, Omaha, 1915, for many years physician and surgeon for the Union Pacific Coal Company at Hanna, Wyo., aged 53, on the staff of the Immanuel Hospital, where he died, December 18, of cerebral subdural hemorrhage arteriosclerosis and diabetes mellitus

**August Stark**, Albany, Ore., University of Oregon Medical School, Portland, 1901, aged 78, died December 4, in the Albany General Hospital of injuries received when struck by an automobile on November 13

**Henry Syle Stern** Richmond, Va., Medical College of Virginia, Richmond, 1914, associate professor of pediatrics at his alma mater, specialist certified by the American Board of

Pediatrics, Inc., member of the American Academy of Pediatrics served with Evacuation Hospital number 18 during World War I aged 49, died, December 24, of heart disease

**Frank Louis Stillman** Columbus, Ohio, Bellevue Hospital Medical College, New York, 1881, specialist certified by the American Board of Otolaryngology at one time on the faculty as a lecturer in the sciences at Ohio Wesleyan University one of the founders of the Ohio Society for the Prevention of Tuberculosis member of the American Laryngological, Rhinological and Otolological Society, formerly on the staffs of the Grant and St Francis hospitals, aged 83, died, December 23, of senility

**Thomas Thomassen Stixrud**, Luebo Belgian Congo, Africa, North Carolina Medical College, Charlotte, 1913, for many years a medical missionary with the American Southern Presbyterian Mission and was connected with the McKeown Memorial Hospital, aged 54, died, December 29, in Manchester, Mo., of coronary thrombosis

**Francis Stolle** Dixon, Calif., Stanford University School of Medicine, San Francisco, 1913, aged 55, died, December 18, of coronary heart disease

**Cornelius Francis Sullivan**, Waterbury, Conn., Georgetown University School of Medicine, Washington D C, 1912,

served during World War I, aged 55, died, January 14, in the Veterans Administration Facility, Northport, of acute pericarditis

**Fred Charles Thum**, Louisville, Ky., Hospital College of Medicine, Louisville, 1898, Kentucky University Medical Department, Louisville, 1899, aged 68, died, December 24, in the U S Marine Hospital of mesenteric thrombosis and cerebral hemorrhage

**Elmer E Thurber**, Brainerdville N Y., University of Vermont College of Medicine Burlington 1886 member of the Medical Society of the State of New York, aged 81, died, December 27, in Chirurgery of arteriosclerosis

**William C Vigor**, New California, Ohio Columbus Medical College, 1884 for many years served as clerk

of the Jerome Township school board, aged 82, died December 21, of cardiac valvular renal disease and myocarditis

**David W Ward**, Sparks Nev., Hahnemann Medical College and Hospital Chicago 1888 aged 85 died, December 26 of injuries received when he was struck by an automobile

**James Albertus Watkins**, Uniontown, Ky., Kentucky University Medical Department, Louisville, 1903, aged 68 died, January 1, of influenza and organic heart disease

**Richard Ferdinand Weirich** Marcellus Mich., Northwestern University Medical School Chicago, 1928, served for seventeen months in the photographic section of the air corps during World War I member of the school board of Marcellus, served as psychiatrist at the Michigan State Hospital, Kalamazoo, member of the attending staff of Three Rivers (Mich.) Hospital aged 47, died, December 25, in St Luke's Hospital, Chicago, of carcinoma of the lung

**Frank A Williams**, Lake Providence La., Mississippi Medical College, Meridian, 1909, served during World War I, health officer of Lake Providence, aged 55, died, December 1, in Tallulah of hypertensive heart disease

**Robert Hamilton Williams** Passed Assistant Surgeon, Lieutenant, U S Navy, Lynchburg Va University of Virginia Department of Medicine, Charlottesville, 1938, was commissioned an assistant surgeon with rank of lieutenant, junior grade, U S Navy and later was appointed a passed assistant surgeon with rank of lieutenant aged 32, was killed in action in the battle of the Solomon Islands, November 13

### KILLED IN ACTION



LIEUT. JOSEPH FRANCIS RUIZ, M.C.,  
U.S.N.R., 1915-1942



LIEUT. ROBERT HAMILTON WILLIAMS,  
M.C., U.S.Navy, 1910-1942



## Bureau of Investigation

### MISBRANDED PRODUCTS

#### Abstracts of Notices of Judgment Issued by the Food and Drug Administration of the United States Department of Agriculture

[EDITORIAL NOTE.—These Notices of Judgment are issued under the Food, Drug and Cosmetic Act and in cases in which they refer to drugs and devices they are designated D D N J and foods, F N J. The abstracts that follow are given in the briefest possible form: (1) the name of the product, (2) the name of the manufacturer, shipper or consigner, (3) the date of shipment, (4) the composition, (5) the type of nostrum, (6) the reason for the charge of misbranding and (7) the date of issuance of the Notice of Judgment—which is considerably later than the date of the seizure of the product and somewhat later than the conclusion of the case by the Food and Drug Administration.]

**Dickson's Herb Lax Tonic**—Addison H. Dickson trading as A. H. Dickson, Memphis, Tenn. Shipped May 3, 1940. Composition essentially epsom salt (approximately 28 grams per hundred cubic centimeters), small amounts of methenamine, salicylic acid, sodium benzoate, plant extracts including nuxvomica and a resinous substance such as podophyllum with a trace of iron and water flavored with peppermint oil. Misbranded because the product's name was false and misleading in representing that the mixture was a laxative compound composed entirely of herbs and derived its laxative properties solely from herbs whereas this effect was due in part to epsom salt, a mineral substance further misbranded because label falsely represented that the product would be helpful for indigestion, biliousness, nervousness, bad blood, rheumatism, urinary troubles and general rundown conditions.—[D D N J F D C 486, September 1942.]

**Locao Belem**—Belem Products Company, Houston, Texas. Shipped Nov. 1, 1940. Composition chiefly water, alcohol, a foam producer, perfume materials and a small amount of glycerin. Misbranded because label falsely represented that it was efficacious in treating baldness, falling hair, dandruff and irritated scalp; that ordinary dandruff or itching scalp would respond quickly to this treatment and that satisfactory improvement or even complete elimination of these conditions would result in from two to four weeks; that benefit would be shown in less severe cases of falling hair in a few weeks and in the more severe cases in from three to six months and that the product would develop new growth on bald areas. Further misbranded because claim on cartons, Locao Belem, has been thoroughly analyzed by the Pure Food and Drugs Department of the United States Customs and complies with rigid requirements of Pure Food and Drug Laws, was false and misleading since it had not been found by a government agency to be in strict compliance with the requirements relating to foods and drugs and it did not comply with the Federal Food, Drug and Cosmetic Act.—[D D N J F D C 487 and 507, September 1942.]

**Neff's Gland Tex Tonic**—George G. Neff trading as Prostex Company, Miami, Okla. Shipped between March 22 and April 1, 1940. Composition essentially epsom salt, small amounts of ammonium alum, a mineral acid such as sulfuric acid, minute proportions of quinine compounds of potassium and iron and a nitrate in water. Misbranded because names "Gland Tex Tonic" and "Prostex" in the labeling and accompanying circular were false and misleading in representing that this was a gland tonic and would be efficacious in treating prostate gland cases and kindred disorders of kidneys, bladder and urinary tract, colitis, dropsy, rheumatism and infected internal organs; that it would be of benefit in acute cases of prostatitis and dropsy and in eliminating infection and some other disorders.—[D D N J F D C 488, September 1942.]

**No Wheez for Asthma**—No-Wheez Corporation, St. Charles, Mo. Shipped between March 1 and May 24, 1940. Composition essentially small amounts of inorganic salts commonly found in mineral water with pine tar and an emodin-bearing drug and water. Misbranded because label falsely represented the product's alleged efficacy in treating asthma and hay fever in bringing lasting relief to asthma and hay fever sufferers and preventing wheezing in these conditions.—[D D N J F D C 489, September 1942.]

**Pedimoll**—Pedimoll Corporation, Los Angeles. Shipped April 25, 1940. Composition essentially a magnesium compound with small amounts of sulfur and cresol in an oil base. Misbranded because of false and misleading label representations that it would be efficacious in treating bunions, calluses, corns, sore swollen or sweaty feet, muscular soreness, most skin irritations, eczema and acne, athlete's foot, impetigo and sunburn; that its daily use would prevent suffering with one's feet and make walking a pleasure; that it would have a swift germicidal effect and safe healing action; that when used on any part of the body it would relieve conditions caused by muscular soreness and strain, swelling, itching, sunburn, bruises, infected bites, sore joints, varicose veins and some other things; that by its use children would be spared suffering from corns, calluses and infections; that it would reach deeply into the pores and purge the skin of impurities; that it would be effective in the treatment of nervous, wobbly, stiff, swollen, flabby, knotty legs; would tone the circulation, soothe the nerves, loosen knotted adhesions within the muscles and foster elasticity within hardening vein walls.—[D D N J F D C 490, September 1942.]

## Correspondence

### COOLING IN SHOCK

To the Editor—Apropos of your recent editorial entitled "Cooling in Shock" (THE JOURNAL, February 6, p. 432) it may be of interest to quote from two authors of olden times. Edmund Goodwyn, M.D., writing in 1788 on The Connection of Life with Respiration, said:

it appears on the other hand from the result of many attempts to recover the hibernating animals from their torpor that when the circulation of the blood has ceased and the temperature of the body is reduced near the freezing point, if heat be applied either very suddenly or in a very high degree the principle of life is soon destroyed, whereas if it be applied gradually and in a very low degree to the same animals in the same circumstances the principle of life is often excited to action and the functions are soon restored.

To favour the recovery then most effectually [from the state of suspended animation] the application of heat should be conducted on the same plan, which Nature has pointed out for the torpid animals. It should be applied very gradually and uniformly and it may be raised to 98° but not further than 100°.

John Snow, writing in 1841 on Asphyxia, and on the Resuscitation of Still-Born Children (London M. Gaz. 29, 222, 1841-1842) says:

Dr. Edwards of Paris, by a most extensive and beautiful set of experiments, has found that newborn mammiferous animals die most slowly in water at about 60 degrees, which is ordinary cold water and that they die much more quickly as the water approaches blood heat. Dr. Edwards advises that persons in the state of suspended animation should amongst other measures be exposed to the cool air and that the application of heat should be avoided unless indeed just a momentary application to endeavour to arouse sensibility. The Royal Humane Society, however, directs the application of warmth in all practicable ways not only as an auxiliary to artificial respiration but even to commence with if the means for the latter are not in readiness and most authors I believe coincide with the views of the Humane Society. Dr. Edwards considers it is by its effects on the nervous system and through that on the heart that a high temperature produces its effects. I think that although the nervous system may be affected and is probably the channel of its impression yet that the deleterious effects of an elevated temperature when respiration is stopped depend on its stimulating the capillary circulation of the system and thus promoting the de-oxygenation of the blood, that change which is antagonistic of respiration, which rules its extent under all circumstances and which in fact constitutes the necessity for having a respiration. But whatever view we take of this point, the fact of the influence of temperature on asphyxia proves that the application of heat ought to be avoided until respiration is thoroughly established when it will no doubt be a useful auxiliary to restore sensibility and renovate the patient.

It appears that the beneficial effect of cold in reducing the demand by the tissues for oxygen was appreciated by some thoughtful physicians over a century ago. It is possible that certain case reports in the past of recovery after long periods of extreme respiratory and circulatory depression were unjustly discredited.

RALPH M. WATERS, M.D., Madison, Wis.  
Department of Anesthesia, University of Wisconsin

### PARALDEHYDE

To the Editor—In THE JOURNAL, January 16, the page caption for Dr. Burstein's paper on Paraldehyde Administration, "Hazard of Anesthesia," is misleading. A more fitting caption would have been "Hazard of Overdosage" or "Hazard of Intravenous Dosage." Paraldehyde has been extensively used in mental hospitals as a sedative. By reputation it is the safest of hypnotics, although pulmonary complications have followed continued administration of large doses. As a preoperative hypnotic, paraldehyde is an agent of distinct value. It is suited for rectal administration in a mixture with liquid petrolatum without need for special precautions in preparing the mixture. As it is excreted almost entirely by the lungs, it has no ill effect on liver or kidneys, a point of especial importance if these organs are already diseased. In 1935, intravenous administration of pure paraldehyde as an anesthetic was suggested by Beaumachin, Springer and Elliott, but only for the briefest of operations. Their method was a proper one for the difficult subjects to be found in mental hospitals. They made trial of



doses of from 5 to 19 cc but recommended 9 cc as the maximum intravenous dose

In case 1 of Dr Burstein's paper, death occurred following intravenous administration of 35 cc of paraldehyde. This result is not surprising, as the dose administered far exceeded the limit of safety. 35 cc is about four times the maximum intravenous dose recommended. The margin of safety for paraldehyde administered by rectum is much greater because of the slow rate of absorption from the liquid petrolatum mixture. The preoperative rectal dosage is from 15 to 30 cc administered with 60 cc of liquid petrolatum an hour before the operation. This dose produces a featureless sleep for about five hours. The safety of this procedure is attested by its large margin of safety. Two patients have by mistake received 240 cc of paraldehyde, eight times the maximum recommended dose, but have recovered without complications. Objections to the method are the penetrating odor of paraldehyde and the fact that in warm weather it attracts swarms of flies. In case 2 of Dr Burstein's paper the fatality is attributed to rectal administration of 35 cc of paraldehyde. While this is somewhat beyond the recommended dosage, in view of the great margin of safety of rectal paraldehyde demonstrated in other instances it is possible that the fatality was due to some factor other than the paraldehyde.

I commend Dr Burstein for his painstaking report on paraldehyde but take this opportunity to approve somewhat an agent which if not the safest of hypnotics, is certainly as safe as any.

ALBERT H MILLER, MD, Providence, R I

### MUSCLE PHYSIOLOGY

To the Editor.—I have just read the editorial "Advances in Muscle Physiology" in the January 30 issue of THE JOURNAL. The last sentence states that the muscle of the body comprises approximately 25 per cent of the total body weight. I feel quite sure that this figure is wrong. Scammon states in the first chapter of Morris's Human Anatomy that "the voluntary musculature forms about one quarter of the body in the later part of fetal life and at birth and increases about twofold in relative weight by maturity."

Harry A Wilmer (Changes in Structural Components of the Human Body from Six Lunar Months to Maturity, *Proc Soc Exper Biol & Med* 43:545 [March] 1940) states that the postnatal changes in the relative distribution of components consist of a marked increase in the voluntary muscle from about one fourth to over two fifths of the body mass. A graph in this article shows that muscle makes up 43 per cent of the body in the adult.

C B FREUDENBERGER, MD, Salt Lake City  
Associate Dean, University of Utah School of Medicine

### OCHRONOSIS

To the Editor.—In the Dec 19, 1942 issue of THE JOURNAL, page 1283, in an article by James W Smith on ochronosis, the statement is made that "Harvey Cushing's finding that the first British case of ochronosis had been diagnosed Addison's disease does not appear in the medical literature and is worth recording." On page 12, volume 2 and on page 698 in the single tome edition the reference to this case is made. The case was reported by Dr Frank M Pope (*Lancet* 1:24 [Jan 6] 1906). In the front of the Jan 6 1906 issue of the *Lancet* are about a half dozen colored illustrations of the case. In the article itself the 11 previously reported cases are mentioned and exact references are listed. I enjoyed Dr Smith's article but believe this is worth checking.

JAMES B TWAMAN, MD, Cleveland

## Medical Examinations and Licensure

### COMING EXAMINATIONS AND MEETINGS

#### NATIONAL BOARD OF MEDICAL EXAMINERS EXAMINING BOARDS IN SPECIALTIES

Examinations of the National Board of Medical Examiners and Examining Boards in Specialties were published in THE JOURNAL Feb 27, page 701.

#### BOARDS OF MEDICAL EXAMINERS

- ALABAMA: Montgomery, June 15-16. Sec. Dr. B. F. Austin, 519 Dexter Ave., Montgomery.
- ARIZONA: Phoenix, April 6-7. Sec. Dr. J. H. Patterson, 826 Security Building, Phoenix.
- ARKANSAS: \* Medical, Little Rock, June 3-4. Sec. Dr. D. I. Owens, Harrison, *Eclectic*, Little Rock, June 3-4. Sec. Dr. C. H. Young, 1415 Main St., Little Rock.
- CALIFORNIA: Los Angeles, March 8-11. Sec. Dr. C. B. Pinkham, 1020 N. St., Sacramento.
- COLORADO: \* Denver, April 7-9. *Endorsement*, Denver, April 6. Final date for filing application is March 20. Sec. Dr. J. B. Davis, 831 Republic Building, Denver.
- CONNECTICUT: \* Hartford, March 9-10. *Endorsement*, Hartford, March 23. Sec. to the Board, Dr. Craghton Barker, 258 Church St., New Haven. *Homeopathic*, Derby, March 9-10. Sec. Dr. J. H. Evans, 1488 Chapel St., New Haven.
- DELAWARE: Dover, July 13-15. Sec. Medical Council of Delaware, Dr. Joseph S. McDaniel, 229 S. State St., Dover.
- DISTRICT OF COLUMBIA: Washington, May 10-11. Sec. Commission on Licensure, Dr. George C. Ruhland, 6159 L. Municipal Bldg., Washington.
- FLORIDA: \* Jacksonville, June 21-22. Sec. Dr. William M. Rowlett, Box 786, Tampa.
- GEORGIA: Atlanta, March 23-24. Sec. State Examining Boards, Mr. R. C. Coleman, 111 State Capitol, Atlanta.
- IDaho: Boise, July 13. Director, Bureau of Occupational Licenses, Mrs. Lela D. Painter, 355 State Capitol Building, Boise.
- ILLINOIS: Chicago, April 6-8. Superintendent of Registration, Department of Registration and Education, Mr. Philip M. Harman, Springfield.
- INDIANA: Indianapolis, Sept. 14-16. Sec. Board of Medical Registration & Examination, Dr. W. C. Moore, 301 State House, Indianapolis.
- KANSAS: Kansas City, May 19-20. Sec. Board of Medical Registration and Examination, Dr. J. I. Hirsig, 905 N. Seventh St., Kansas City.
- LOUISIANA: New Orleans, March 11-13. May 6-8. Sec. Dr. R. B. Harrison, 1507 Hibernia Bank Bldg., New Orleans.
- MAINE: Portland, March 9-10. Sec. Board of Registration in Medicine, Dr. Adam P. Leighton, 192 State St., Portland.
- MARYLAND: \* Baltimore, March 25-26. Sec. Dr. J. T. O'Mara, 1215 Cathedral St., Baltimore. *Homeopathic*, Baltimore, June 15-16. Sec. Dr. J. A. Evans, 612 W. 40th St., Baltimore.
- MASSACHUSETTS: Boston, March 9-12. Sec. Board of Registration in Medicine, Dr. H. Q. Gullipe, 413 F. State House, Boston.
- MICHIGAN: \* Ann Arbor and Detroit, June 11-13. Sec. Board of Registration in Medicine, Dr. J. Earl McIntyre, 100 W. Allegan St., Lansing.
- MINNESOTA: \* Minneapolis, March 22-24. Sec. Dr. J. F. DuBois, 250 Lowry Medical Arts Bldg., Minneapolis.
- MISSOURI: St. Louis, March 23-25. Sec. State Board of Health, Dr. James Stewart, State Capitol Bldg., Jefferson City.
- MONTANA: Helena, April 6-7. Sec. Dr. Otto G. Klein, First National Bank Bldg., Helena.
- NEBRASKA: \* Omaha, March 17-19. Dir. Bureau of Examining Boards, Mrs. J. Crawford, 1009 State Capitol Building, Lincoln.
- NEW HAMPSHIRE: Concord, March 11-12. Sec. Board of Registration in Medicine, Dr. Deering, G. Smith, State House, Concord.
- NEW JERSEY: Trenton, June 15-16. Sec. Dr. E. S. Hallinger, 28 W. State St., Trenton.
- NEW MEXICO: \* Santa Fe, April 12-13. Sec. Dr. Le Grand Ward, 135 Santa Plaza, Santa Fe.
- NORTH CAROLINA: Raleigh, June 14-18. Sec. Dr. W. D. James, Hamlet.
- NORTH DAKOTA: Grand Forks, July 6-9. Sec. Dr. G. M. Williamson, 4½ S. Third St., Grand Forks.
- OHIO: Columbus, March 16-19. *Endorsement*, Columbus, April 6. Sec. Dr. H. M. Platter, 21 W. Broad St., Columbus.
- OKLAHOMA: \* Oklahoma City, May 10. Sec. Dr. J. D. Osborn, Jr., Frederick.
- RHODE ISLAND: \* Providence, April 1-2. Chief Division of Examiners, Mr. Thomas B. Casey, 366 State Office Bldg., Providence.
- SOUTH CAROLINA: Columbia, March 22-24. Sec. Dr. A. Earle Boozer, 505 Saluda Ave., Columbia.
- SOUTH DAKOTA: \* Pierre, July 20. Dir. Medical Licensure, State Board of Health, Dr. J. F. D. Cook, Pierre.
- TENNESSEE: Memphis & Nashville, March 24-27. Sec. Dr. H. W. Qualls, 130 Madison Ave., Memphis.
- UTAH: Salt Lake City, June. Dir. Department of Registration, Mr. G. V. Billings, 324 State Capitol Bldg., Salt Lake City.
- VERMONT: Burlington, March 25-27. Sec. Dr. F. J. Trulliss, Richford.
- VIRGINIA: Richmond, March 24-27. Sec. Dr. J. W. Preston, 30½ Franklin Rd., Roanoke.
- WISCONSIN: \* Milwaukee, March 30-April 1. Sec. Dr. H. W. Shutter, 425 E. Wisconsin Ave., Milwaukee.

\* Basic Science Certificate required

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

ARIZONA Tucson March 16 Sec Dr R L Nugent Science Hall  
University of Arizona Tucson  
COLORADO Denver March 10 11 Sec Dr E B Starks 1459 Ogden  
St, Denver  
DISTRICT OF COLUMBIA Washington April 19 20 Sec, Commission  
on Licensure Dr George C Ruhlman 6150 E Municipal Bldg, Wash-  
ington  
FLORIDA DeLand June 9 Final date for filing application is May  
24 Sec, Dr J F Conn, John B Stetson University, DeLand  
IOWA Des Moines April 13 Dir, Division of Licensure & Registra-  
tion, Mr H W Grefe Capitol Bldg Des Moines  
MINNESOTA Minneapolis April 6 7 Dr J C McKinley 126 Millard  
Hall Univ of Minnesota Minneapolis  
NEBRASKA Omaha May 4 5 Dir Bureau of Examining Boards  
Mrs J Crawford 1009 State Capitol Building Lincoln  
OKLAHOMA Oklahoma City May Sec Dr Oscar C Newman Shattuck  
SOUTH DAKOTA Aberdeen June 4 5 Sec Dr G M Evans Yankton  
WISCONSIN Madison April 3 Prof Robert N Bruer 152 W  
Wisconsin Ave Milwaukee

## Bureau of Legal Medicine and Legislation

### MEDICOLEGAL ABSTRACTS

**Medical Practice Acts Prescribing of Drugs and Use of Surgical Instruments by Chiropractor**—Jones, a licensed chiropractor, was charged in an information filed by the prosecuting attorney of a county in Missouri of unlawfully practicing medicine and surgery in that he did attempt to treat a stated woman at a stated time and place by prescribing, dispensing and administering medicines and by using surgical instruments in performing an operation on her person. He was convicted and appealed to the Springfield (Mo) court of appeals.

The chiropractor contended that the information on which his conviction was based was defective in that because it failed to inform him what surgical instruments were used in performing the operation alleged and what medicine or medicines were prescribed it did not enable him properly to prepare his defense. The section of the Missouri medical practice act, answered the appellate court, under which the defendant was convicted reads, so far as is here material, as follows:

Any person practicing medicine or surgery in this state and any person attempting to treat the sick or others afflicted with bodily or mental infirmities without a license from the state board of health shall be deemed guilty of a misdemeanor.

The information filed in this case in charging the crime follows substantially the phraseology of the medical practice act. This is sufficient to constitute a valid charge where, as here, the statute describes the entire offense by setting out the facts constituting it. This having been done, it was unnecessary to enable the defendant properly to prepare his defense to name or describe the kind of surgical instrument or instruments used or the kind of medicine or medicines prescribed in informing the defendant of the nature of the charge against him.

The section of the medical practice act just quoted concludes with a provision that on receiving information that any of its provisions have been or are being violated the secretary of the state board of health, the agency charged with the duty of issuing and suspending or revoking licenses to practice medicine and surgery, shall investigate the matter and on probable cause appearing shall file a complaint with the prosecuting or circuit attorney in the county or city in which the alleged offense occurred. This provision, the defendant argued, sets forth the sole method by which prosecutions may be instituted, and consequently the prosecuting attorney in this case had no legal authority to file the information against him which was filed. Therefore, so his argument went, the trial court should have granted a motion he made to quash the information. The defendant's contention is untenable, said the court. True, the provision of the medical practice act just referred to does set forth a method for instituting a prosecution. This particular provision was inserted by the legislature obviously to require the state board of health to cooperate with prosecuting attorneys by giving information and filing complaints on these particular infractions of the law. This provision, however, by placing a mandatory duty on the state board of health and its secretary

was designed to help prosecuting officials, not to place a limitation, restriction or check on the general powers conferred on them by law.

The chiropractor next complained of an instruction which told the jury that the practice of chiropractic is defined by the laws of the state as being the art of palpating and adjusting by hand the movable articulations of the human spinal column for correction of the cause of abnormalities and deformities of the body and that a license to practice chiropractic does not authorize the holder thereof to treat the sick by the use of operative surgery or by the administration or prescription of any drug or medicine. It was entirely proper, in view of the evidence said the court, for the trial court to define the practice of chiropractic and to advise the jury that a license to do so would not justify the practice of medicine and surgery. There is nothing in the instruction that could have tended to prejudice the jury against the defendant.

The appellate court held further that the trial court properly refused to instruct the jury, as the defendant desired it to do, that if the jury found that the medicines furnished by the chiropractor to the complaining witness were such medicines as are generally used by the public without the prescription "dispensation" and administration by persons licensed under the laws of the state to practice medicine and surgery, the jury should find the chiropractor not guilty. The court likewise held it proper for the trial court to permit a licensed physician and surgeon to testify that he had examined the complaining witness after she had visited the chiropractor and that he observed clots of blood and strips of tissue which indicated that the complaining witness had undergone a miscarriage or an abortion. The defendant contended that the effect of this testimony was to leave the case in such a prejudicial condition that the inference would be given the jury that the miscarriage or abortion, evidence of which was observed by this witness, had been committed by the defendant. While, said the court, it is the general rule that evidence of other crimes independent of that for which the defendant is on trial is inadmissible, where evidence of another crime tends directly to prove guilt of the crime charged such evidence is admissible. Conversely, evidence which is relevant is not rendered inadmissible because it tends to prove the defendant guilty of some other crime. As is stated in Wharton's Criminal Evidence, 11th edition, page 487, section 345:

If the other crime and the crime charged are so linked together in point of time or circumstances that one cannot be fully shown without proving the other regardless of whether the crime incidentally shown is of the same or a different character from the one on trial the general rule of exclusion does not apply. If evidence is competent material and relevant to the issue on trial it is not rendered inadmissible merely because it may show that the defendant is guilty of another crime.

The judgment of conviction was accordingly affirmed.—*State v Jones, 164 S W (2d) 85 (Mo, 1942)*

## Society Proceedings

### COMING MEETINGS

Alabama Medical Association of the State of Birmingham April 20 22  
Dr Douglas I Cannon 519 Dexter Ave Montgomery Secretary  
American Association of Anatomists Montreal Can April 21 23 Dr  
Francis H Swett Box 3701 Durham N C Secretary  
Arizona State Medical Association Tue on April 30 May 1 Dr Frank  
J Milloy 112 North Central Avenue Phoenix Secretary  
Arkansas Medical Society Little Rock April 19 20 Dr W R Broek-  
sher 602 Garrison Ave Fort Smith Secretary  
Conference of State and Provincial Health Authorities of North America  
Washington D C March 22 25 Dr A J Chesley 469 State Office  
Bldg St Paul Secretary  
Florida Medical Association Jacksonville April 15 16 Dr Shuler Rich-  
ardson 111 West Adams St Jacksonville Secretary  
Iowa State Medical Society Des Moines April 29 30 Dr Robert L  
Parker 3510 Sixth Avenue Des Moines Secretary  
Maryland Medical and Chirurgical Faculty of Baltimore April 27 28  
Dr W Houston Toulson 1211 Cathedral St Baltimore Secretary  
Missouri State Medical Association St Louis April 18 20 Mr Ray-  
mond McIntyre 634 North Grand Blvd St Louis Executive Sec-  
retary  
Ohio State Medical Association Columbus March 30 31 Mr Charles  
S Nelson 79 East State St Columbus Executive Secretary

## Current Medical Literature

### AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1932 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending, but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (\*) are abstracted below.

### American Journal of Medical Sciences, Philadelphia

204 625 780 (Nov.) 1942

- \* Syndrome Characterized by Primary Ovarian Insufficiency and Decreased Stature. Report of Eleven Cases with Digression on Hormone Control of Axillary and Pubic Hair. F. Albright, Patricia H. Smith and R. Fraser. Boston—p. 625.
- \* Epinephrine Shock as Manifestation of Pheochromocytoma of Adrenal Medulla. Report of Case with Successful Removal of Tumor. F. L. Engel, W. H. Mencher and G. L. Engel. New York—p. 649.
- Clinical Experience with Radiophosphorus in Treatment of Certain Blood Dyscrasias. T. Fitz Hugh Jr. and P. J. Hode. Philadelphia—p. 662.
- Influence of Blood Transfusion and Injections of Bursa Pratoris (Shepherd's Purse) Extract on Clot Resistance in Two Hemophiliacs. A. L. Copley and J. J. Lahach. Kansas City, Kan.—p. 665.
- Spinal Fluid in Tuberculous Meningitis. E. F. Trout. Chicago—p. 670.
- Gastric Lavage in Control of Treatment of Pulmonary Tuberculosis. J. J. Furlong and Mary K. Warren. Milwaukee—p. 674.
- Successful Removal of Hemangioma of Lung Followed by Disappearance of Polycythemia. J. Hepburn and J. A. Dauphinee. Toronto, Canada—p. 681.
- \* Single Combined Treatment for Gonorrhea. C. Ferguson, M. Buchholz and S. Gersten. Stapleton, N. Y.—p. 682.
- \* Blood Pressure and Sulfocyanates (Thiocyanate). V. S. Caviness, T. L. Umphlet and C. L. Royster. Raleigh, N. C.—p. 688.
- Effect of Potassium Thiocyanate on Occurrence of Migraine. D. E. Engle and C. O. Evanson. Elmhurst, Ill.—p. 697.
- Localizing Value of Clinical Electroencephalographic and Pneumoencephalographic Findings in Epilepsy. H. Sjaardema and M. A. Glaser. Los Angeles—p. 700.
- Effect of Sulfonamides on Artificial Fever Produced by Peptone in Animals. E. M. Boyd and J. S. Pritten. Kingston, Ont., Canada—p. 715.
- Alcaligenes Fecalis* Bacteremia. N. W. Voorhes and C. J. Wilen. New Orleans—p. 719.
- Effect of Hydrogen Ion and Starch Concentration of Substrate on Serum Amylase and Amylase Accelerator of Serum. W. C. Davison. Durham, N. C.—p. 723.
- Significance of the So Called P Pulmonale Pattern in Electrocardiogram. I. H. Shleser and R. Langendorf. Chicago—p. 725.
- \* Essential Hypertension: Concept of Its Mechanism. H. A. Schroeder. New York—p. 734.

**Ovarian Insufficiency and Decreased Stature.**—Albright, Smith and Fraser describe a syndrome of short stature and sexual infantilism which is due to primary ovarian lack rather than to primary pituitary disease. The features which characterize this syndrome are short stature, infantile breasts, uterus and vagina, a small amount of axillary and pubic hair, good physical well being, retarded osseous development, an increase above normal of the follicle stimulating hormone and decrease of 17-ketosteroid in the urine, the development of normal amounts of axillary and pubic hair on estrogen therapy, a normal hypoglycemia responsiveness to the insulin tolerance test, frequent congenital anomalies in addition to the absence or malformation of the ovaries, diffuse osteoporosis and precocious senility. Eleven cases of the syndrome are presented. It is to be differentiated from panhypopituitarism, "premenarchal menopause precoc" and a selective deficiency of the gonadotropic substance of the anterior pituitary. Evidence is presented which suggests that in females the hormone of the adrenal cortex causes axillary and pubic hair growth. Five hypotheses are discussed as causes for the syndrome. The authors believe it results from decreased functioning of the adrenal cortex caused by decreased-pituitary stimulation of the adrenal cortex, which in turn results from decreased estrogen production. Turner's syndrome—congenital webbing of the neck, sexual and somatic infantilism and cubitus valgus—is a subform of this syndrome. Replacement therapy with estrogen,

in addition to increasing the general well being and stimulating the growth of the breasts and axillary and pubic hair, probably leads to an increase in the rate of epiphyseal growth in those subjects whose epiphyses are still ununited.

**"Epinephrine Shock."**—Engel and his associates describe an unusually severe instance of hypercatecholaminemia in a woman of 23, in whom attacks were induced by the most simple physiologic stimuli for epinephrine discharge such as fear, anger, before meals during sexual intercourse and during the induction of anesthesia when apnoea was probably the factor. The attacks, which began two and a half years ago, lasted as long as thirty-six hours, often terminating with a clinical picture suggesting so called epinephrine shock. A pheochromocytoma was suspected. During the first exploration on the left side, anesthesia precipitated a severe attack and a phlebotomy was performed because pulmonary edema developed. Exploration failed to reveal a tumor, and the patient continued to have frequent mild attacks. Roentgen study by perirenal insufflation of 550 cc of oxygen into the right perirenal space suggested a small mass in the right adrenal area. Preoperative preparations were made to "sterilize" the adrenal as is done with the thyroid in exophthalmic goiter. The renal area was exposed through a right lumbar incision and a tumor the size of a large plum was removed. As soon as the tumor was palpated, the blood pressure rose from 120 to 220 mm systolic and remained at this level until the first vessel to the adrenal gland was ligated, when it dropped precipitously to 110 mm and then to 70 mm. Microscopically the tumor had the characteristic structure of a pheochromocytoma. Biopsy of each gram of the tumor caused a reaction in the denervated cat's iris, a retraction of the micturating membrane and a blanching of the sympathetomized ear equivalent to that caused by 8 mg of epinephrine. It also caused the cat's blood pressure to rise. The patient has been free from spontaneous attacks for three months. There was no evidence of insufficiency of the adrenal cortex either by electrolyte studies or from the subsequent course.

**Single Combined Treatment for Gonorrhea.**—To speed the recovery from uncomplicated gonorrhea Ferguson and his associates developed a high concentration of sulfathiazole in the patient and subjected him to hyperpyrexia. Their patients were seamen aged from 19 to 47 years who were infected with various gonococcus strains from many countries. The number of previous infections varied from zero to five and the duration of infection from one to sixty days. The patient after a physical examination and the taking of cultures and smears to confirm the diagnosis, was given 1 Gm of sulfathiazole starting at 2 p. m. and continued every four hours until a total of 5 Gm was administered. After this he was given an enema and then a hot tub bath which brought the surface temperature to about 102 F. The patient was then put into a preheated fever cabinet and his rectal temperature was slowly raised to 106 F. This took about one hour. This temperature was maintained for about seven hours. During his stay in the hypotherm cabinet the patient was given 3 to 4 liters of isotonic solution of sodium chloride flavored with syrup. Following treatment he was warmly wrapped in blankets, brought to his room and given fruit juices and milk for the next twenty-four hours. The criteria of cure included cessation of all objective symptoms, disappearance of discharge and dysuria and a clear urine in the two glass test. For the bacteriologic and cultural examinations, on the second and then on the fourth or fifth day (for three times) after the fever therapy, a sound was inserted, the urethra was massaged gently against the sound, the sound was removed and the prostate was massaged and the strippings were examined microscopically and culturally. Three consecutive negative cultures were required for discharge. Of 25 patients with uncomplicated previously untreated gonorrheal urethritis given sulfathiazole and fever therapy 88 per cent were cured, of 20 receiving this therapy after one course of a sulfonamide compound 90 per cent were cured, of 26 receiving the combined therapy after more than one course of a sulfonamide compound 85 per cent were cured, 2 men with epididymitis recovered after one course of combined therapy and only 2 of 4 given two combined treatments recovered.

**Blood Pressure and Thiocyanate**—The use of thiocyanate in the treatment of hypertension is substitution therapy. It supplies thiocyanate to hypertensive patients, who as a group have less thiocyanate in the blood than other individuals. The treatment apparently is required for life. Best results are obtained in less severe cases. Treatment should be started before there is too much sclerosis of the arterioles. Relief of symptoms can be expected in practically all cases. Functional results are good in two thirds, while one third of the patients show poor or fair results. Proper selection of patients would greatly increase the percentage of good results, but such selection is not justified because of the benefit that patients obtain from fair results and from symptomatic improvement. The underlying factor in failure is fibrosis of the arterioles and capillaries. Fair results after prolonged therapy may be had in old arteriolar sclerosis itself as well as in syphilis, hemiplegia and cardiac decompensation. Of the 136 patients of Caviness and his co-workers 92 have shown good results, i. e. a sustained reduction of at least 15 per cent in both the systolic and the diastolic pressure. Better results are obtained in private than in clinic and institutional patients. A reduction of 15 per cent is sufficient to relieve symptoms and decrease the danger of hemiplegia and angina. None of the patients have died. Best results were obtained when there was a low natural blood thiocyanate concentration, when a satisfactory response followed small doses of thiocyanate and with a blood concentration of 2.5 to 5 mg. of thiocyanate per hundred cubic centimeters of blood while on treatment.

**American J Obstetrics and Gynecology, St Louis**  
44 925-1134 (Dec) 1942

- Malignancy Subsequent to Irradiation of Uterus for Benign Conditions L C Scheffey, Philadelphia—p 925  
Functional Anatomy of Labor with Special Reference to the Human Being A C Ivy Chicago—p 952  
Some Aspects of Early Human Development J Rock and A T Hertig Boston—p 973  
\*Effect of Progesterone in Adolescent Girls and Young Women with Functional Uterine Bleeding W M Allen St Louis and G P Heckel Rochester N Y—p 984  
Experience of Johns Hopkins Hospital with Cesarean Section Analysis of 1333 Operations C P Mannhan H F Connolly Jr and N J Eastman Baltimore—p 999  
\*Possible Etiologic Role of Gynecologic Lesions in Production of Hypertension H S Everett and R B Scott Baltimore—p 1010  
\*Gonorrhea in Female and Its Treatment with Sulfonamides R G Douglas Iona F Davis and J F Shandorf New York—p 1026  
Studies of Human Corpus Luteum Evidence for Early Onset of Regression of Corpus Luteum of Menstruation J I Brewer Chicago—p 1048  
Partial Congenital Aplasia of Vagina W T Dannreuther New York—p 1063  
Bacteriologic Study of Pyometra B Carter Durham N C—p 1074  
Experimental Production of Toxemia of Pregnancy F F Snyder Chicago—p 1091  
Selective Hysterectomy for Nonmalignant Uterine Disease E G Waters Jersey City N J—p 1107

**Progesterone for Uterine Bleeding in Girls**—Menstrual records of 24 adolescent girls and young women with functional uterine bleeding to whom Allen and Heckel gave progesterone or anhydrohydroxy progesterone are listed. The effect of the drugs on the menstrual pattern was observed for many months. In general, the administration of approximately 30 mg. of progesterone (5 mg. daily) caused a cessation of bleeding within ten days of the last injection. Progesterone deprivation bleeding occurred frequently, explaining the bleeding during the first few days after therapy. In about one third of the subjects, normal cycles occurred for four months or more after therapy, whereas in another third there was a recurrence in less than four months but not in the first month. In the final third, amenorrhea followed immediately or after two or three cycles.

**Gynecologic Lesions and Hypertension**—Observations which suggest that hypertension may result from partial ureteral occlusion are presented by Everett and Scott. Among the 100 women with uterine fibroids, ovarian cysts, pelvic inflammatory disease and other pelvic disorders that they studied, 36 were found to have some degree of arterial hypertension. The patients' average age was 37.06 years, only 14 of the 36 were more than 50. Further analysis revealed that 25 of those with hypertension were in the group of 50 showing pelvic and ureteral dilatation. In a study of results of appropriate treatment on

the urinary tracts in 30 of these 50 patients the authors tried to find some common factor, such as infection of the urinary tract or pelvic inflammation, which might explain the failure of the urinary tracts to return to normal following treatment. Neither of these factors seemed to answer the question, and although it is difficult to show statistically it is the authors' impression that an extremely important factor was the length of time over which the gynecologic lesions in question have persisted. Therefore it seems that in the case of pelvic inflammatory disease and especially in the lesser degrees of uterine prolapse, surgical intervention should not be delayed too long. If, after a conservative regimen of palliation and chemotherapy, patients with pelvic inflammation continue to harbor masses causing the signs and symptoms of acute inflammation, the masses should be removed. A young woman with a relaxed pelvic floor and a moderate uterine prolapse should have a conservative repair operation compatible with future childbearing in preference to delaying it until her family is complete and then having a more radical procedure performed.

**The Sulfonamides for Gonorrhea**—From their data on the diagnostic value of cultural and smear methods Douglas and his associates conclude that the cultural methods are superior. They compared the therapeutic value of sulfanilamide, sulfathiazole and sulfadiazine as to dosage, duration of treatment and effect of social and economic factors, pregnancy, race and age in the one hundred and eighty-five admissions of 158 patients with gonorrhea admitted to the New York Living-in Hospital, 25 were admitted twice and 2 three times (for new infections). Sulfanilamide was used 64 times, sulfathiazole 62 and sulfadiazine 59. The latent form of the disease is often asymptomatic or associated only with leukorrhea (43 per cent) and frequently cannot be recognized without the aid of cultures. The efficacy of treatment is unaffected by age, color, pregnancy, duration of the disease or the site of the infection. Treatment and its control are more efficient if the patient is hospitalized. Of the three drugs employed, sulfanilamide was the least specific and the most toxic. Sulfadiazine appeared to be slightly more efficient and less toxic than sulfathiazole. Bacteriologic cure was most frequently encountered within nine to twelve hours after sulfathiazole or sulfadiazine and forty to fifty hours after sulfanilamide was administered. The most satisfactory therapy at present is 4 Gm. of sulfadiazine or sulfathiazole in divided daily doses for six consecutive days. Bacteriologic cure was established in one hundred and eighty of the one hundred and eighty-five admissions.

**American Journal of Public Health, New York**  
32 1319-1434 (Dec) 1942

- Public Health and Civil Defense in Great Britain During the War W M Frazer Liverpool England—p 1319  
Food and Nutrition of the Industrial Worker in Wartime F G Boudreau New York and R S Goodhart Washington D C—p 1335  
Fuel Oil Rationing Protects Public Health J Dean Washington D C—p 1341  
\*Etiology of Acute Illness Among Workers Using Low Grade Stained Cotton R Schneider P A Neal and Barbara H Caminiti Bethesda Md—p 1345  
Effect of Aluminum Hydroxide Sedimentation Sand Filtration and Chlorination on Virus of Poliomyelitis J E Kempf Martha G Wilson Marjorie E Pierce and M H Soule Ann Arbor Mich—p 1366  
Surveys of Nutrition of Populations Description of Population General Methods and Procedures and Findings in Respect to Energy Principle (Calories) in a Rural Population in Middle Tennessee J B Youmans E W Patton and Ruth Kern Nashville Tenn—p 1371  
Effect of Prolonged Storage on Antigenicity of Chloroform Inactivated Canine Rabies Vaccine C N Leach and H N Johnson Montgomery Ala—p 1380

**Acute Illness Among Cotton Workers**—According to Schneider and his collaborators, since April 1941 reports of outbreaks of an acute illness among cotton workers have been received from twenty-five states and two Canadian provinces. More than 700 cases were reported from one state alone. The illness occurred among workers exposed to high dust concentrations, and its severity varied with the degree of exposure. The illness was characterized by sudden onset, one to six hours after exposure, and the short duration of its acute phase, usually twenty-four to forty-eight hours after exposure. The principal subjective symptoms were conjunctival irritation sub-

sternal oppression, dryness of the throat, generalized itching, fatigue, headache, cough, chills, fever, anorexia, nausea and vomiting. During the investigation one hundred and fifteen samples of cotton, cotton dust, linters, cotton plant debris, cotton seed and soil were received from fourteen states, the U. S. Department of Agriculture and two Canadian provinces. All the samples of cotton incriminated in outbreaks were dusty, low grade and stained, and they contained varying amounts of plant debris. The samples contained no toxic gases, chemically extractable substances, insecticides or pathogenic fungi but they did contain a gram negative rod shaped bacterium in numbers ranging from 3,000,000 to more than 10,000,000 per gram. It was not isolated from high grade cotton. Seventy of eighty-one samples of materials reported to have caused illness contained the same strain of this bacterium. The bacterium has been tentatively placed in the genus *Aerobacter*. A heat stable endotoxin-like substance was demonstrated in filtrates from saline extracts of stained cotton, in filtrates from broth cultures and in killed suspensions. It is believed that this toxic substance is in the nature of an endotoxin because of its heat stability, lower antigenic capacity and increase with age of culture or destruction of cells. The severity of symptoms and physical changes was dependent on the concentration of the cotton bacterium or its products in the cotton dust inhaled and on the duration of exposure. Intradermal injections of the filtrate to man resulted in severe inflammatory lesions characteristic of acute intoxication rather than of hypersensitivity. As this acute intoxication resembles mill fever, Monday fever and gin fever in cotton mill workers and respectively, beetling fever, mill fever, grain fever and hemp fever in workers inhaling flax, jute, grain and hemp dust, the toxic products liberated by the cotton bacterium or some closely related species may be the etiologic agent for these diseases.

### Arkansas Medical Society Journal, Fort Smith

39 157-174 (Dec) 1942

Phytobezoar. Report of Case. A. F. Hoge. Fort Smith—p. 157

39 175-192 (Jan) 1943

The Kidney in Hypertension. W. J. McMartin. Omaha—p. 175

### Bulletin of Johns Hopkins Hospital, Baltimore

71 315-388 (Dec) 1942

Topical Projection of Nerve Fibers from Local Regions of Cerebral Cortex of Cat. C. N. Woolsey and E. M. Walzl. Baltimore—p. 315

Effect of Low Oxygen Tension on Development of Experimental Tuberculosis. A. R. Rich and R. H. Follis, Jr. Baltimore—p. 345

Serum Proteins in Sarcoid. Electrophoretic Studies. A. M. Fisher and B. D. Davis. Baltimore—p. 364

Additional Evidence of Role of Hypersensitivity in Etiology of Periarthritis Nodosa. Another Case Associated with Sulfonamide Reaction. A. R. Rich. Baltimore—p. 375

### California and Western Medicine, San Francisco

57 341-392 (Dec) 1942

Abortion Inevitable and Incomplete. Study of 500 Cases. J. W. Ravenscroft. San Diego—p. 346

Foreign Body Localization by X-Rays. E. R. Miller. San Francisco—p. 349

Carcinoma of Fallopian Tube. T. S. Kimball, H. E. Sanford and A. T. Brown. Glendale—p. 351

Contact Stomatitis Due to Denture in Metal Sensitive Patient. A. J. Deissler and G. R. Sheets. Oakland—p. 354

Toxemias of Late Pregnancy. Outlines of Therapy. E. W. Page, Berkeley—p. 355

### Canadian Public Health Journal, Toronto

33 565-606 (Dec) 1942

Food Makes a Difference. L. B. Pett. Ottawa, Ont.—p. 565

Nutrition in War Industry. Florence Ignatieff. Toronto—p. 571

Immunization Program in the Royal Canadian Air Force. A. H. Sellers—p. 575

Individual Variation in Immunity. Variance of Antibiotic Response in Guinea Pigs Inoculated with Diphtheria Toxin. Dorothy J. Stewart and F. G. Jones. Indianapolis—p. 588

Incidence of *Trichomonas vaginalis* in Clinic Patients at the Women's College Hospital, Toronto. E. Kuitunen, Ekbaum and Eva Mader MacDonald. Toronto—p. 59

### Iowa State Medical Society Journal, Des Moines

33 1-40 (Jan) 1943

Carcinoma of Stomach. Early Recognition and Results. J. T. Priestley, Rochester, Minn.—p. 1  
Primary Fractures of Hip. H. T. Dolan. Annapolis—p. 5  
Recurrence of Scurvy. R. H. McBride. Sioux City—p. 7  
Minimal Criteria of Coronary Disease. C. E. Harris. Grinnell—p. 10  
Genital Prolapse. R. M. Collins. Council Bluffs—p. 11  
Ingrown Nerve. B. J. Moon. Cedar Rapids—p. 13

### Journal-Lancet, Minneapolis

62 419-466 (Dec) 1942

Important Advances in Physiology of Sex Hormones. L. T. Simons. Minneapolis—p. 419  
Methods of Measurement of Naturally Occurring Sex Hormones. Clara M. Szego. Minneapolis—p. 423  
Endocrine Factors in Menstruation and Its Relation to Dysmenorrhea. Nora Wintler. Minneapolis—p. 428  
Irregular Shedding of Endometrium. J. L. McKelvey. Minneapolis—p. 434  
Relation of Sex Hormones to Climacterium. Della G. Drips. Rochester, Minn.—p. 437  
Relation of Hormones to Lactation. W. J. Petersen. St. Paul—p. 442  
Intersexual Manifestations of Neuroendocrine Origin. M. H. Hoffman, St. Paul—p. 446  
Evaluation of Clinical Use of Male Sex Hormone. C. E. Rex. St. Paul—p. 449  
Hormones and Carcinoma of Prostate. C. D. Creevy, Minneapolis—p. 452  
Prefabricated Feshar or Binalake Centrimum Sulfonamide for Treatment of Burns. W. G. Clark, I. A. Strickosch. Minneapolis and L. N. Jevon. St. Paul—p. 455

**Hormones and Carcinoma of Prostate**—His own experience with estrogen in about 60 patients with prostatic carcinoma is still too meager for Creevy to draw definite conclusions, but he is convinced that the work of Huggins and his followers constitutes a major contribution to the comfort of old men and that its full possibilities are to be explored. Some investigators have reported the disappearance of all the characteristics of prostatic cancer on rectal examination and on metastasis to bone on roentgen examination but he has seen both regress but not disappear. Estrogens should be tried in every case of prostatic cancer not in the gland itself, and if they fail only then should castration be performed.

### Journal National Malaria Society, Tallahassee, Fla

1 1-182, 1942

Species Eradication. Practical Corollary of Species Reduction in Control of Mosquito Borne Disease. I. L. Soper and D. B. Wilson. Toronto, Canada—p. 5

Anophelines of Southwestern Yunnan and Their Relation to Malaria. W. C. Sweet, L. C. Fung, C. Y. Chow and S. C. Hsu—p. 25

Observations on Malaria Around Lake Wilcox, 1934-1941. R. B. Watson, Helen C. Maher and Margaret E. Rice. Wilcox, Ala.—p. 33

Crushing Strength of Biologic Films on Natural Waters and Spread of Larvicidal Oils. C. L. Kenn—p. 4

Malaria Control. Ditch Lining Experience in a South Georgia County. J. Andrews, R. S. Howard, Jr. and E. A. Turner. Atlanta, Ga.—p. 57

Circular Joint and Concrete Form Design for Precast Inverts for Malaria Control Ditch Lining. W. A. Iegwen and Louisa G. Lenert. Atlanta, Ga.—p. 69

Design and Application of New Type Automatic Siphon for Malaria Control. W. A. Iegwen and R. S. Howard, Jr. Atlanta, Ga.—p. 83

Studies on Artificial Posing Places of *Anopheles quadrimaculatus* Say. M. H. Coolidge, Jr. Newton, Ga.—p. 93

Studies on Choice of Medium for Oviposition by *Anopheles quadrimaculatus* Say. H. O. Lund. Newton, Ga.—p. 101

Review of Recent Publications on Prophylaxis and Treatment of Malaria. H. C. Clark. Panama Republic of Panama—p. 113

\*Malaria Mortality in Southern United States for Year 1940 with Supplementary Data on Malaria in Other States. E. C. Faust and Louis DeBakey. New Orleans—p. 125

Human Malaria. H. W. Brown. Chapel Hill, N. C.—p. 133

Review of Recent Work on Pathology of Simian Malaria Infections and Simian Plasmidiosis. J. C. Swartzwelder. New Orleans—p. 141

Review of Recent Work in Avian Malaria. M. D. Young. Columbia, S. C.—p. 149

Entomologic Work During 1941 Bearing on Malaria Problem. S. J. Carpenter. Camp J. T. Robinson. Ark.—p. 157

Report of Subcommittee on Engineering. D. B. Lee, J. C. Clark, J. H. O'Neill, S. L. Davies and C. A. White. Jacksonville, Fla.—p. 163

**Malaria Mortality in the Southern United States**—Faust and DeBakey believe that the low malaria mortality rate for 1940 helps in discovering the chronic foci of the disease. Analysis of the malaria mortality data for the United States, especially for the Southern states, reveals a continued reduction especially since 1938 to an apparently all time

average low of 302 for the fourteen endemic malaria states in the South. With a population of one third of the entire nation the South had 96 per cent of the reported malaria deaths in 1940. These deaths occurred in 34 per cent of the counties in the fourteen states. There has been a favorable reduction in the number of counties in the South contributing to deaths. There was an apparent suppression of the five to seven year cyclic increase, which should have occurred in 1938-1940 in the South, in malaria deaths. The factors responsible for the decrease in rate since 1938 are unknown but may be due to better economic conditions of the poor, that is, better food, more funds for the purchase of antimalarial drugs and the screening of homes. Also intensive measures have been carried out to suppress or to reduce the number of Anopheles mosquitoes. Evidence indicates that *vivax* malaria has similarly decreased. The present reduced trend should not tend toward complacency, as reduced control may allow recrudescences to occur in endemic foci. As long as susceptible malaria mosquitoes breed, new infections may be introduced from tropical America and thus "seed" the country with new, possibly more virulent strains of malaria plasmodia. Possibly with continued treatment of malaria patients in endemic foci the gametocyte rate may become so low that mosquito infection will be difficult leading temporarily to a condition of anophelism without malaria. Outside the Southern states there were only fifty-seven malaria deaths in the United States in 1940. Several of these were of drug addicts, while many of the others were probably the result of exposure to infection in the South or in tropical America.

### Journal of Nutrition, Philadelphia

24 503-614 (Dec) 1942 Partial Index

- Periodic Administration of Anterior Pituitary Extract as Affecting Metabolism of Rats on Diets of Different Composition Helen E. Archer, M. Kriss and L. Voris State College Pa.—p. 535  
Metabolism of Arginine and Leucine with Special Reference to Respiratory Exchange and Heat Production M. Kriss and R. S. Bowman State College Pa.—p. 547  
\*Evaluation of Nutritional Status of Population Group in Madrid Spain During Summer of 1941 W. D. Robinson, J. H. Janney New York and F. Grande (Covian) Madrid Spain—p. 557  
\*Effects of Diet Deficient in Part of Vitamin B Complex on Men Doing Manual Labor R. E. Johnson, R. C. Darling, W. H. Forbes, L. Brouha, E. Egaña and A. Graybiel Boston—p. 585  
Relationship Between Vitamin A and Iodine Metabolism in Rat R. E. Remington, P. L. Harris and C. L. Smith Charleston S. C.—p. 597

**Nutritional Status Evaluation in Madrid**—A study of the nutritional status of 561 persons of a low economic level was carried out by Robinson and his colleagues in an industrial suburb of Madrid during the summer of 1941. The combined dietary records of the family food consumption indicated an average intake of calories and calcium far below maintenance levels, and a protein intake of questionable adequacy. The levels of iron, phosphorus, thiamine and ascorbic acid appeared generally adequate for maintenance, those for vitamin A and riboflavin were at or below the borderline. Clinical examination revealed almost universal evidence of quantitative (caloric) underfeeding. Classic deficiency disease was rare; there were 2 instances of nutritional edema, 1 of chronic pellagra and 3 of rickets. Search for the early manifestation of these diseases disclosed a significant number of persons with cutaneous lesions attributable to vitamin A deficiency and a fairly high incidence, especially among the females, of capillary invasion of the cornea which was probably due to ariboflavinosis. In addition, many of the persons had signs and symptoms of a mild neural or neuromuscular disturbance of undetermined origin. About one third of the subjects had a mild macrocytic hyperchromic anemia, and the incidence of hypoproteinemia among males was 11 and among females 5 per cent.

**Vitamin B Complex and Manual Labor**—Johnson and his co-workers subjected 10 men to hard daily physical work on a diet deficient in parts of the B complex, notably thiamine. During the first week of the experiment 5 of the men were given daily 2 mg of thiamine hydrochloride, the other 5 were given placebos. During the third week (one week was spent in preliminary observations with the men on a normal diet) of the experiment all subjects received daily doses of 18 Gm of brewers' yeast containing 0.5 mg of thiamine. At the end of the second week all subjects complained of easy fatigue and their physical fitness had definitely deteriorated, this was

greater in the subjects not given thiamine hydrochloride, most of whom exhibited symptoms, sometimes acute, of muscular and articular pains, lack of well being, poor appetite and constipation. These symptoms were mild or absent in those receiving thiamine. All these symptoms disappeared during the week that brewers' yeast was taken. The usual level of fitness was regained more rapidly and more completely by the subjects who had received thiamine during the first week. Changes in the electrocardiograms of certain subjects in both groups, noticed at the end of the deficient period, disappeared by the end of the yeast period. At the end of the week the daily urinary excretion of thiamine by those who had not received this vitamin was well within the range of deficiency. The conclusions are that when men are doing hard physical work, even for a few days it is imperative that they have an adequate daily intake of the whole vitamin B complex, if physical fitness is to be maintained. Of the vitamin B complex, thiamine alone will not maintain physical fitness of laborers in single daily doses of 2 mg, but brewers' yeast appears to be a complete and adequate supplement for a diet grossly deficient in the vitamin B complex. When the addition of vitamin B complex to a ration (as in emergency rations of troops and sailors separated from bases) is indicated, yeast would seem to be a certain source of all the necessary components.

### Journal of Thoracic Surgery, St. Louis

12 109-208 (Dec) 1942

- Hemoptysis in Metastatic Tumors of Lung Simulating Bronchiogenic Carcinoma Report of Two Cases S. O. Freedlander and J. Greenfield Cleveland—p. 109  
Thoracic Gastric Cysts Report of Two Cases with Review of Literature H. Schwarz 2d and C. S. Williams St. Louis—p. 117  
Tuberculosis of Mediastinum Report of Case A. J. Grace London Ont. Canada—p. 131  
Cancer of Trachea Fifteen Years After Treatment for Cancer of Larynx W. L. Watson New York—p. 142  
\*Decompression of Chest for Dysphagia Due to Marked Cardiac Enlargement F. C. Newton and S. A. Levine Boston—p. 151  
New Instruments Description of Two Gadgets of Value in Thoracic Surgery R. Adams and E. D. Churchill Boston—p. 158  
Postpneumonic Empyema in Infants and Children M. H. Williams Binghamton N. Y.—p. 160  
Method of Preventing Perforation in Esophagoscopy Treatment by Open Drainage Thirty Nine Cases One Death M. S. Lloyd New York—p. 186  
Spinal Anesthesia in Thoracoplasty V. D. Schaffner and E. M. Found Kentville N. S. Canada—p. 190  
Blood Loss in Thoracic Operations M. L. White Jr. and R. W. Buxton Ann Arbor Mich.—p. 198

**Decompression of Chest in Dysphagia**—Newton and Levine report a case in which pronounced dilatation of the heart, especially of the left auricle due to rheumatic valvular disease caused dysphagia. The chest was decompressed by removal of portions of the third, fourth and fifth ribs anteriorly. The dysphagia disappeared and there was a distinct improvement in the condition of the heart. Palpitation was less troublesome, the heart rate could be slowed more satisfactorily and the patient's general strength improved. The patient lived for almost nine years after the operation. At necropsy the heart was found to be substantially dilated; it weighed 590 Gm. There was decided mitral insufficiency with slight stenosis and slight stenosis of the aortic and tricuspid valves. The pericardial cavity was entirely obliterated by thin, old fibrous adhesions. The esophagus was displaced slightly to the right.

### Laryngoscope, St. Louis

52 923-1000 (Dec) 1942

- Neurologic Complications of Serum Sickness with Special Reference to the Ear H. M. Taylor Jacksonville Fla.—p. 923  
Practical Aids in Technique of Catheterizing, Larynging and Injecting Sphenoid Sinus J. C. Peele and F. E. LeJeune New Orleans—p. 933  
Cricopharyngeal Spasm L. H. Clerf and F. J. Putney Philadelphia—p. 944  
Pathologic Changes of Temporal Bone in Otitomycosis of Skull H. Brunner Chicago—p. 954  
Cancer of Esophagus Study of 100 Consecutive Cases P. H. Holinger Chicago and H. J. Hara Hinsdale Ill.—p. 968  
Pre-entation of Simple Device for Excluding Interfering Noises from One Ear While Testing Hearing Acuity of Other Ear H. Newhart Minneapolis—p. 983  
Hematology J. J. Shea Memphis Tenn.—p. 984  
Suffocation by a Sunflower Seed G. B. Cilmore and M. D. Grant New York—p. 993



**Medical Annals of District of Columbia, Washington**

11 465 504 (Dec) 1942

- Health of Civilian Population During War The National Problem J W Mountin Bethesda Md—p 465  
Public Health Control of Venereal Diseases in District of Columbia R A Vonderlehr Bethesda Md—p 471  
War Injuries of Head W M Craig Rochester, Minn—p 474  
Importance of Laboratory Examinations in Administration of Sulfonamide T M Peery Washington—p 479

**New England Journal of Medicine, Boston**

227 893 938 (Dec 10) 1942

- \*Skin Disturbances in Diabetes Mellitus Their Relation to Vitamin Deficiencies A Rudy and R Hoffmann Boston—p 893  
Venenteric Thrombosis in Mentally Ill Patients C Bell W Corwin, O J Marcil and E V Semrad Waltham Mass—p 901  
Male Sterility W W Williams Springfield Mass—p 905  
Wound Healing A D Holmes Boston—p 909

**Cutaneous Disturbances in Diabetes Mellitus**—Rudy and Hoffmann present 5 case reports which demonstrate that the cutaneous disturbances in diabetes mellitus are most frequently due to a vitamin deficiency, especially that of nicotinic acid. The authors have seen many more diabetic patients with similar more or less pronounced cutaneous eruptions. The skin of some of these diabetic patients is not unlike that of pellagrins. Its vulnerability to any kind of external irritation (rubbing or other mechanical or chemical trauma, perspiration, heat or sunlight) and to infections especially those due to monilia, is increased. Vulvitis as well as pruritus vulvae and an in diabetes are proved signs of pellagra and are due to a nicotinic acid deficiency. The most frequent manifestation is a vivid, more or less indurated erythema characterized by a violaceous or brownish color and a definite shiny surface. Fine lamellar peeling or psoriasiform scaliness, more or less deep ridging of the papillary lines and fissuring edema, blistering, maceration and even superficial ulceration vary the morphologic picture. Superinfection with monilia on predisposed regions suggests intertrigo or paronychia. Pruritus vulvae in diabetes does not respond to local treatment and does not always clear up with the control of glycosuria. In the authors' patients improvement followed the administration of nicotinic acid or its amide with, and at times without, the addition of vitamin B complex. This occurred even in the presence of glycosuria and hyperglycemia. Nicotinic acid, like thiamine chloride, is essential for the satisfactory oxidation of carbohydrate foods. This explains why some cutaneous manifestations appear for the first time or become aggravated after the diabetes is controlled. In such cases the symptoms disappear with the addition of the nicotinic acid. The same happens with other vitamins, such as riboflavin and thiamine hydrochloride. It is not unusual for a neuritis or perleche to become manifest or aggravated following the control of the diabetes or diabetic acidosis. The vitamin deficiency in diabetes mellitus may affect the gastrointestinal tract including the mouth, the central and peripheral nervous system and the genitourinary tract. The degree of the cutaneous infection depends on the severity of the vitamin deficiency and not on the glycosuria or hyperglycemia. The predisposing factors in the development of deficiency in diabetes mellitus are a diet deficient in the components of the vitamin B complex, disturbance of absorption and assimilation, and impaired hepatic function. The precipitating factors may be loss of weight infection, gastrointestinal disturbance, operations, acidosis and intemperance.

227 939-974 (Dec 17) 1942

- Bacteriology of Wounds of Compound Fractures of Skull D Munro Boston—p 939  
\*Plasma Prothrombin and Liver Function During Sulfonamide Therapy I Kapnick J D Stewart and C Lyons Boston—p 944  
Simultaneous Hyperfunction of Thyroid and Parathyroid Glands E S Miller and L R Evans Boston—p 949  
Complete Situs Inversus Report of Case with Calcareous Aortic Stenosis and Cor Bovinum J G Pasternack Staten Island N Y—p 953  
Pathology Diseases of Bone T B Mallory, Boston—p 955

**Plasma Prothrombin and Hepatic Function**—The hepatic function, as measured by the prothrombin, van den Bergh and bromsulphalein tests, was determined by Kapnick and his associates for 68 patients receiving sulfonamide therapy for acute infection. There was a significant decrease in the prothrombin

level of 14 patients during chemotherapy. The severity of the infection seemed to be more significant as the cause of prothrombin depression than did the type of sulfonamide used. A decreased prothrombin time may be the consequence of factors other than impaired hepatic function. Since serious infection and the sulfonamides are prejudicial to the welfare of the liver, it seems that some test of hepatic function should be used as a routine procedure with this group of patients. A decrease in plasma prothrombin is found early in impending hepatic failure. It is suggested that prothrombin determinations by the Quick method be done every three days on seriously ill patients receiving sulfonamide therapy. In this way patients in whom serious hepatitis is apt to develop would be recognized before the symptoms became clinically alarming.

**New York State Journal of Medicine, New York**

43 1-96 (Jan 1) 1943

- Epicondylitis Humeri K G Han on New York—p 29  
Spinal Fluid Examinations Report of Investigation of Procedures Followed Throughout the United States W B Jong and J A Goldberg New York—p 34  
Surgery in the Aged F W Bancroft New York—p 37  
Outbreak of Acute Fluoride Poisoning H S Ingraham Kingston and A J Flood, Coxsackie—p 41  
Studies in Thromboembolization II Observations on Use of Dicumarol [3,3 Methylene B (4 Hydroxycoumarin)] in Embolization Report of Five Cases S Shapiro and B Sherwin New York—p 45  
Role of Liver in Surgery A O Whipple New York—p 53

**North Carolina Medical Journal, Winston-Salem**

3 623 670 (Dec) 1942

- Pleural Reflex Syncope and Air Embolism in Artificial Pneumothorax Allen I Ormond Black Mountain—p 623  
Early Diagnosis of Shock C I Royster Raleigh—p 628  
Treatment of Chronic Alcoholism M A Griffin Asheville—p 632  
Intramural Postgraduate Education in Obstetrics for Practicing Physicians A W Wakepeace Chapel Hill—p 633  
Treatment of Congestive Heart Failure C H Armentrout Asheville—p 636  
Advances and Limitations in Treatment of Gonorrhea in the Female I B Lounsbury Wilmington—p 640  
New Physical Sign in Infarction of Lung R I McMillan Winston-Salem—p 642  
Pentosuria D N Stewart Hickory—p 643  
The Hot Douche C A Anderson Burlington—p 644

**Pleural Reflex Syncope and Air Embolism in Pneumothorax**—Although concrete evidence proving the existence of pleural shock is not to be found in the literature Ormond believes that the condition exists. He reports 5 cases of this symptom complex. 2 were possibly due to pleural shock and in 3 there was definite air embolism. The symptoms of pleural shock are generally indistinguishable from those caused by air embolism. The symptoms usually appear suddenly at a moment when the needle is entering or leaving the pleural space. The psychic symptoms are giddiness and loss of consciousness, the motor, tonic and occasionally clonic spasms flaccid paralysis with contractions hemiplegia or monoplegia, and the circulatory and respiratory symptoms are rapid weak, irregular pulse pallor of the skin and cyanotic patches over the face neck and thorax. Pleural shock should be spoken of only when embolism can be excluded. One example of the existence of pleural shock is the patient with tuberculous empyema, whose chest has to be repeatedly aspirated and who goes into mild shock when the visceral pleura is irritated. Pleural shock has been observed in oleothorax, pleural exploration, pleural tap and simple pleural lavage. Many of these accidents in the pneumothorax procedures may be avoided by the proper choice of patients, proper examination, careful study of the roentgenograms, use of proper instruments and careful manometric readings.

**Early Diagnosis of Shock**—It is more important to detect the earliest signs of shock, says Royster, than to know the advantages and disadvantages of the various available means for combating it. A cold and clammy skin, rapid and thready pulse, low or absent blood pressure and ashen pallor are not signs of shock but of impending death. These signs indicate that the condition is approaching or has reached the point of becoming irreversible. The common denominator of all theories of the production of shock and all systems of treatment is a decrease in blood volume in relation to the total capacity of the circulatory bed. Whatever the remote factors involved the



peripheral circulatory deficiency which manifests itself as shock results from a disparity between the circulating blood volume and the volume capacity of the vascular system. Continued operation of the factors causing fluid loss depletes the stores of sodium in the interstitial spaces, and the delicate balance between the predominance of sodium outside the body cells and the predominant potassium within them is upset. In developing shock the two ions may effect a startling reversal. In simple, uncomplicated and not profuse hemorrhage the patient responds well to the introduction of whole blood, saline solution or plasma. The normal or artificial compensation results in hemodilution. Hemoconcentration is the earliest practicably measured change which occurs in shock. If unchecked, further hemoconcentration results and the vascular system becomes more constricted. The process is still reversible, provided the causative factor is not too overwhelming or too persistent in its action. The intravenous introduction of plasma or whole blood will usually save the patient, even though these elements are often lost through the damaged capillary walls. With excessive amounts of fluid loss and vascular damage a point is reached at which further vascular constriction is no longer possible. The reduced circulatory pressure results in tissue anoxia, and tissue anoxia causes a further demand on the capillaries for dilatation and permeability. To wait for a fall in blood pressure before diagnosing and treating shock is like waiting for general peritonitis to develop before making the diagnosis of appendicitis. Hemoconcentration appears sooner than any measurable fall in blood pressure. It takes no more time than it does to make a leukocyte count. Another method of arriving at the same conclusion is by determining the hematocrit. This reading roughly parallels the erythrocyte count in nonanemic persons. The use of the densimeter to determine the falling drop time takes only two or three minutes. The advantage of this apparatus is that in one operation the density of the blood is determined and a quantitative estimate of the type of fluid necessary is obtained. The hemoconcentration test can be used for following the effect of treatment.

### Pennsylvania Medical Journal, Harrisburg

46 177-304 (Dec) 1942

- Medical Profession's Part in the War Industrial Effort O J Johnson Chicago—p 191  
Wartime Medicine and Selective Service L G Rowntree Washington D C—p 194  
Interpretation of Draft Rejection Figures W W Bauer Chicago—p 204  
Diagnosis and Surgical Aspects of Carcinoma of Colon T E Jones Cleveland—p 208  
Clinical Use of Tuberculin W E Nelson Philadelphia—p 213  
Infectious Eczematoid Dermatitis D L Cooper Erie—p 218  
Surgical Management of Spinal Cord Trauma and the Neurogenic Bladder T Fay Philadelphia—p 221

### Public Health Reports, Washington, D C

57 1883-1922 (Dec 11) 1942

- Lesions in Rats Given Sulfaguanidine in Purified Diets L L Ashburn F S Daft K M Endicott and W H Sebrell—p 1883  
Transmission of Plasmodium Lophurae Avian Malaria Parasite by Anopheles Quadrimaculatus H S Hurlbut and R Hewitt—p 1891  
Sulfanilamide in Treatment of Leprosy G H Faget F A Johansen and Hilary Ross—p 1892  
Antibacterial Action of Several Sulfonamide Compounds on Hemophilus Influenzae Type B Margaret Pittman—p 1899

57 1923-1962 (Dec 18) 1942

- Experimental Chemotherapy of Burns and Shock I Methods II Effects of Local Therapy on Mortality from Shock S M Roenthal—p 1923  
Observations on Epidemiology of Leprosy G W McCoy—p 1935  
Location and Movement of Physicians 1923 and 1938—Effect of Local Factors on Location J W Mountin E H Pennell and Virginia Nicolay—p 1945

### Rocky Mountain Medical Journal, Denver

40 1-72 (Jan) 1943

- Reaction of Central Nervous System to Trauma W M Craig Rochester Minn—p 18  
Cardiac Irregularities and Tachycardias J G Carr Chicago—p 27  
Treatment of Fractures of Upper End of Humerus G A Caldwell New Orleans—p 33  
Progress in Burn Therapy D W Macomber Denver—p 34

### South Carolina Medical Assn. Journal, Florence

38 307-344 (Dec) 1942

- Recent Advances in Chemotherapy W H Barker Baltimore—p 307  
Metrazol (Pentamethylenetetrazol) in Auricular Paroxysmal Tachycardia W W Boyd Spartanburg—p 317  
Functional Heart Disease H Smith Greenville—p 318

**Metrazol in Auricular Paroxysmal Tachycardia**—Boyd tried unsuccessfully all the recognized procedures and drugs to abort a prolonged paroxysm of tachycardia. He gave 1½ grains (0.1 Gm) of metrazol intravenously and noted almost immediate improvement in the patient's general condition. The attack ceased within two or three minutes. He has used the drug for 11 patients who did not respond to vagovagal stimulation, with almost immediate relief in all but 1. This patient responded to an intravenous dose of 12 grains (0.8 Gm) of digitalis. The response in these patients and those of other physicians may have been coincidental, but the author believes it is due to the action of the drug, since the response has been uniform in all.

### Southern Medical Journal, Birmingham, Ala

36 1-86 (Jan) 1943

- Progress Against Bacillary Dysenteries H Emerson New York—p 1  
Accelerated Program in Medical Schools F H Swett Durham N C—p 5  
Recent Advances in Study of Cancer J S Horsley Richmond Va—p 8  
Modern Interpretation of Physical Therapy F H Ewerhardt St Louis—p 12  
Compensatory Divergent Strabismus C A Clapp Baltimore—p 15  
Some Observations on Maxillary Sinus L C McHenry Oklahoma City—p 18  
Premenstrual Cystitis L A LeDoux New Orleans—p 22  
Vaginal Biopsy Studies After Total Hysterectomy W O Johnson Louisville Ky—p 23  
Postoperative Management of Anal Surgery G F Eubanks Atlanta Ga—p 29  
Patient After Gastric Surgery D C Browne and G McHardy New Orleans—p 32  
Obstetric Problems in the Rural South R E Seibels Columbia S C—p 41  
Effect of Diabetes on Nervous System W R Jordan Richmond Va—p 45  
Psychotherapy G F Witt Dallas Texas—p 49  
Consideration of Factors in Therapy of Dermatitis T W Murrell Richmond Va—p 50  
Old Wine in New Bottles G W Leadbetter Washington D C—p 52  
Pediculosis Capitis Treatment Among School Children in District of Columbia J A Murphy Washington D C—p 53

### Southern Surgeon, Atlanta, Ga

11 809-878 (Dec) 1942

- Chemical Transformation of Iodine Fixed by Thyroid Gland W Mann and C P Leblond Rochester N Y—p 828  
Repair of Cranial Defect by Insertion of Vitallium Plate W H Parsons Vicksburg Miss—p 840  
Spondylolisthesis Treated by Posterior Bone Graft Fracture of Vertebra Above Graft H A Swart Charleston W Va—p 846  
Intravenous Anesthesia in Major Surgery (Sodium Pentothal Oxygen) T C Davison Atlanta Ga—p 849  
Infected Presacral Dermoid Cyst with Perforation of Vagina G H Ewell and R Jackson Madison Wis—p 855  
Surgical Management of Certain Phases of Lesions of Stomach and Duodenum C J Hunt Kansas City Mo—p 859

### Transformation of Iodine Fixed by Thyroid Gland—

The fate of the iodine in the thyroid was determined by Mann and Leblond in two groups of dogs: those given amounts of iodine comparable to the minute quantities present in the food of man and those receiving a dose of iodine comparable to that used in therapy. In physiologic conditions the iodide coming from the blood stream accumulates in the thyroid mainly as diiodotyrosine. This is the natural precursor of thyroxine. The results indicate that 1.55 per cent of the thyroxine contained in the thyroid is formed hourly. When excessive or therapeutic doses of iodine are administered, the iodine is incorporated in the gland probably as stored iodide. In relation to the large dose administered, the proportion which is transformed into diiodotyrosine is much smaller than in the small dose administration.

### Southwestern Medicine, Phoenix, Ariz

26 407-428 (Dec) 1942

- Tumors of Testis M L Day Phoenix Ariz—p 408  
Simplified Tourniquet for Venipuncture W M Hayes Hamilton Ohio—p 411  
Some Considerations of Water Balance in Health and Disease C A Ploussard Phoenix Ariz—p 412

## FOREIGN

An asterisk (\*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

## British Journal of Ophthalmology, London

26 529-576 (Dec) 1942

- Traumatic Ulcer of Cornea with Special Reference to Coal Miners  
R. M. Dickson—p. 529  
Sympathetic Ophthalmitis T. H. Butler—p. 546  
Choroidal Melanoma Treated by Surgical Diathermy L. H. Savin and  
G. C. Pritchard—p. 551  
Test Type J. P. S. Walker—p. 556

## British Journal of Tuberculosis, London

36 153-188 (Oct) 1942

- Malignant Adenomatosis (Alveolar Cell Tumor) of Lung J. V. Dacie  
and C. Hoyle—p. 158  
Hematogenous Malignant Deposits in Lung Simulating Tuberculosis  
G. S. Erwin and H. G. H. Butcher—p. 166  
Bronchial Carcinoma with Infiltration of Left Auricle of Heart B. A.  
Dormer, J. Friedlander and F. J. Wiles—p. 169  
Hemoptysis Case N. R. Barrett and C. Hoyle—p. 172  
Chronic Miliary Tuberculosis Case Report P. Hutchison—p. 177

## Journal of Laryngology and Otology, London

57 401-426 (Sept) 1942

- Headaches of Acute Nasal Sinusitis and Attempt to Explain Them  
E. Wodak—p. 401  
Periosteal Flap in Mastoid Surgery W. O. Reid—p. 405

## Lancet, London

2 633-660 (Nov 28) 1942

- Chemistry and Physics of Antiseptics in Relation to Mode of Action  
A. Albert—p. 633  
\*Dyspepsia in the Royal Navy Study of 1,003 Consecutive Cases H. J.  
Wade—p. 636  
Radiologic Evidence of Decalcification in South Africa A. A. Meyer  
S. F. Oosthuizen and H. A. Shapiro—p. 639  
\*Passive Hyperemia for Chilblains H. Herxheimer—p. 640  
Unusual Meningococcal Relapse Syndrome A. B. Christie—p. 641  
Diphtheria Immunization in England and Wales Statistical Study of  
Reactions and Difficulties of Mothers Committee for the Study of  
Social Medicine—p. 642

**Dyspepsia in the Royal Navy**—Wade states that 217 of the 1,003 consecutive cases of dyspepsia encountered at a large navy auxiliary hospital between October 1939 and October 1941 were in the active service of the Royal Navy and 786 were reserve and "hostilities only" personnel. The diagnosis in all was confirmed by roentgen examination or at operation. There is no evidence that wartime service in the Royal Navy has increased the incidence of dyspepsia. The expansion of the service and the inclusion of personnel from the prewar civilian population account for any apparent increase in incidence. An urgent need for organized clinical research into all aspects of the problem of dyspepsia of uncertain origin (so called gastritis) is revealed, in the series such dyspepsia was diagnosed in 24 per cent of the patients, 175 of whom had joined the service since the war began. Usually the history was long, only 12 per cent of the patients with duodenal ulcer and 20 per cent of those with duodenal dyspepsia dated their symptoms from the taking up of war service, 62 of 404 with duodenal ulcer and 17 of 148 with duodenal dyspepsia had symptoms for eleven to fifteen years. Of the 1,003 patients 56 per cent had clinical ulcers, in 47 per cent ulceration was proved roentgenologically (67 per cent gastric, 40 per cent duodenal and 0.5 per cent anastomotic). 15 per cent had duodenal dyspepsia and 24 per cent suffered from dyspepsia of uncertain origin. Patients with proved peptic ulceration should be invalided from the service unless circumstances permit adequate dietary control. In all, 329 of the 1,003 were invalided from the service. Overcooking, reheating of meals, excess of canned and fried food and short mealtime are difficult factors to control on small ships. Many patients had taken alkaline powders regularly to control symptoms.

**Passive Hyperemia for Chilblains**—Herxheimer produced artificial hyperemia by Bier's method of applying a constricting rubber bandage at the middle of the humerus or femur of 24 persons suffering from chilblains. Most of the patients were

schoolboys, the treatment of 21 was completely successful in five to seven days. Swelling, pain and itching disappeared and small ulcers and cracks of the skin healed. The only remaining sign was redness of the skin, sometimes associated with thickening and wrinkling. In spite of this early success, treatment was continued for at least six weeks because if it was interrupted after a week or a fortnight the chilblains recurred at once but did not after the prolonged period of treatment. A Martin's bandage  $2\frac{1}{2}$  to 3 inches wide was used, but any other elastic bandage, even bandages made without rubber, will do. The color of the limb should deepen under its influence, but it should not become colder to the touch than it was before, and the feeling of pins and needles should not ensue. On the other hand, the constriction should be so firm that this sensation and coldness are only just avoided. A reliable sign of correct technique is that the big veins in the elbow protrude and that the arm is deep purple without being uncomfortable. In some cases swelling of the hand, a sign of too firm bandaging, is visible next morning, but this subsides in a few hours. The bandage may be left in position for twenty-two out of the twenty-four hours, but usually all night treatment is sufficient. The beneficial effect of this local venous congestion is not easily understood. It seems that the unhindered arterial inflow forces blood through all potential blood spaces in the limb, including the capillary spaces dilated (and paralyzed) by cold, thus reopening the circulation through them.

## Medical Journal of Australia, Sydney

2 433-454 (Nov 14) 1942

- Remarks on Some Fundamental Principles in Otorhinolaryngology of  
Interest in General Practice B. Miller—p. 433  
Blood Grouping of Aborigines of Northwest Australia R. K. Gay  
—p. 435

2 455-474 (Nov 21) 1942

- Arms and Anophelines or Military Significance of Malaria R. Fowler  
with addendum by A. H. Baldwin—p. 455  
Treatment of the Wounded in Forward Areas E. W. Kyle—p. 459  
Physical Signs of Pleural Collection with Particular Regard to New  
Sign for Its Detection M. Berah—p. 463

## Practitioner, London

149 321-384 (Dec) 1942

- Industrial Medicine and the General Practitioner D. Munro—p. 371  
Chest Disease in Industry A. J. Amor—p. 326  
Industrial Dermatitis Diagnosis and Treatment A. D. K. Peter—  
p. 340  
Treatment of the Injured Workman W. Gilman—p. 349  
Problems of Neuroses in Industry E. H. Cypel—p. 354  
Advances in Treatment of Chronic Nasal Sinusitis J. Harper—p. 364  
Minor Surgery Anaesthesia and Analgesia C. L. Hewer—p. 373

## Quarterly Journal of Medicine, Oxford

11 181-246 (Oct) 1942

- \*Pathologic Changes in Brain in Fatal Hypoglycemia R. D. Lawrence  
A. Meyer and S. Nevin—p. 181  
Maffucci's Syndrome (Dyschondroplasia with Hemangiomas) Alice  
Carleton, J. St. C. Elkington, J. G. Greenfield and A. H. T. Robb  
Smith—p. 203  
Localized Pretibial Myxedema in Association with Toxic Goiter W. R.  
Trotter and K. C. Eden—p. 229

**Changes in Brain in Fatal Hypoglycemia**—The neuro-pathologic changes in 6 fatal cases of hypoglycemia are described by Lawrence and his associates. The lesions were similar in all and differed only in intensity and the stage of the process. Widespread degeneration and necrosis of nerve cells were found, with corresponding microglial and macroglial proliferation, homogenizing and severe nerve cell changes were the predominating types of degeneration. The cerebral cortex, the caudate nucleus and the putamen were most affected, the cerebellum less so and the remaining centers of the brain stem were slightly involved. In 2 cases a widespread glial fibrosis of the cerebral and cerebellar white matter was a striking feature. The pathogenesis is discussed in relation to the biochemical alterations in hypoglycemia and in comparison with similar lesions in anoxia. The main cause is considered to be failure of the vital oxidative processes from lack of substrate dextrose, probably reinforced by subsequent vasomotor disturbances. The primary factor seems to be chemical and akin to anoxia.

**Ophthalmologica, Basel****104 121-176 (Sept) 1942**

- Problem of the Weil-Felix Reaction in Trachoma L. Poleff—p 121  
\*Ocular Inflammations of Focal Origin D. Anastassoff—p 136  
Differential Perception for Brightness of Eyes Adapted to Darkness C. B. Stübermann—p 157  
Production of Aqueous Humor and Development of Glaucoma P. Weinstein—p 166  
Instrument to Facilitate Suture of Mucosa in Dacryocystorhinostomy A. Bangerter—p 171

**Ocular Inflammations of Focal Origin**—Anastassoff reports 6 cases of iridocyclitis of which 4 had their origin in an infected dental root 1 in the tonsils and 1 in the prostate In 2 cases of episcleritis a focus of infection existed in the tonsils By means of Rosenow's technic Anastassoff was able to produce an iridocyclitis in rabbits and an immature cataract Bacteriologic examination disclosed no specific agent leading the author to conclude that the lesions were of a toxic nature

**Schweizerische medizinische Wochenschrift, Basel****72 833-856 (Aug 1) 1942**

- Nature and Treatment of Bronchial Asthma O. Müller—p 833  
Study of Case of Chronic Bacteremia and Question of Its Place in Nosology of Tuberculosis R. Burnand—p 838  
Unusual Roentgen Findings in Region of Digestive Tract H. Gysin—p 841

\*Nystagmus as Recessive Sex Linked Characteristic in Four Generations O. Kaser—p 846

\*Wound Treatment with Chlorophyll Ointment F. Boehringer—p 850

**Nystagmus as Recessive Sex Linked Characteristic**—Kaser presents the genealogical table of a family with hereditary nystagmus The table includes six generations and 121 persons, of whom 13, or 10.7 per cent, had a pronounced nystagmus The pronounced nystagmus appeared only in men but was transmitted by women Thus it is a recessive sex linked defect In addition to the 13 persons with pronounced nystagmus 3 men and 3 women were discovered with a nystagmus elicited only on extreme rotation One man exhibited jerking of the head without accompanying nystagmus Nystagmus on extreme rotation and jerking of the head in supposedly healthy members of the family are interpreted as manifestations of a familial defect Three persons presented nystagmus and head jerking in combination The family likewise included members with amblyopia myopia, hypermetropia and astigmatism, but also many with normal eyes

**Wound Treatment with Chlorophyll Ointment**—At Boehringer's clinic in Bern, it is the rule to test new remedies for wounds only when control experiments can be made, as on patients with several wounds or a single wound of such extent as to permit one half to be treated with the new preparation and the other with a control substance Under such conditions the differences in results with the use of expensive ointments and isotonic solution of sodium chloride were negligible In some instances isotonic solution of sodium chloride actually appeared superior Chlorophyll ointment has been tested at the Bern clinic for some time Of the 8 cases in which chlorophyll ointment was used and in which other salves were employed for control purposes 7 exhibited better granulation under chlorophyll ointment than under that of other ointments Epithelial growth was the same under chlorophyll and control ointments One case failed to respond to ointment treatment of any kind In 5 additional cases treatment with chlorophyll ointment produced a favorable change in chronic torpid wounds Chlorophyll ointment has proved particularly valuable in torpid wounds and in wounds with extensive and deep tissue defects

**Revista Medica Cubana, Havana****53 649-744 (Aug) 1942 Partial Index**

- \*Surgical Therapy of Ozena C. de Lejarza—p 670  
Diagnosis and Therapy of Tumors of the Bladder R. Portilla—p 689

**Surgical Therapy of Ozena**—De Lejarza states that the caliber of the nasal fossae is greatly enlarged in ozena There is a general belief that the amplitude of the nasal fossae and the consequent local increased ventilation are the causal factors of the condition and that it can be improved by any surgical operation which reduces the size of the fossae The author

reports the case of a girl aged 24 with typical ozena There was no infection of the maxillary sinuses The therapy of ozena in this case consisted in opening the maxillary sinuses by a surgical operation and leaving them open The patient recovered

**Rev Med-Quirurg de Pat Femen, Buenos Aires****20 145-224 (Sept) 1942 Partial Index**

- New Apparatus for Extracting Estrogens and Androgens from Urine A. E. Raices—p 145

\*Preserved Blood A. Battaglia—p 151

\*Estrogen Therapy of Retention of Urine in Postoperative Period of Extensive Pelvic Interventions F. Bazterrica and J. A. Poch—p 186

**Conserved Blood**—Battaglia believes that conserved blood is indicated only in emergencies when fresh blood is not available In the Department for Blood Transfusion of the Hospital Rivadavia, 1,500 transfusions have been performed in the last four years Conserved citrated blood was used in 181 transfusions The amount varied from 50 to 550 cc for a transfusion Blood conserved for less than a week was used in 153 transfusions Blood conserved for thirty-one days and forty-four days respectively was used in only 2 cases Conserved citrated blood is tolerated better than fresh blood Conserved blood which shows evidence of early hemolysis due to shaking of the flasks is also well tolerated Transfusion of conserved blood does not cause hemoglobinuria or symptoms of renal damage Best results are obtained from blood conserved for not more than three days Fresh blood is indicated in acute and chronic infection, anemia, shock and hemorrhage If fresh blood is not available conserved blood not older than 3 days can be used

**Estrogen Therapy of Urinary Retention**—Bazterrica and Poch's patient with extensive rectovaginal cancer was subjected to abdominoperineal resection of the rectum and hysterectomy The ensuing shock was combated by transfusion intravenous dextrose and cardiac tonics Intractable retention of urine established itself from the first postoperative day A permanent catheter was kept for thirty-five days Intramuscular injections of estrogens in doses of 60,000 units given at intervals of three and four days respectively up to a total of six injections rapidly controlled the retention

**Revista Peruana de Pediatría, Lima****1 1-146 (Sept) 1942**

- \*Cholesteremia in Healthy Infants and Its Variations in Dystrophy and Toxicosis G. Lloa Ricketts—p 1  
Case of Still's Disease L. A. Surres—p 25  
Tuberculosis in Children of Lima H. Cachay Dıaz—p 44  
Universal Blood Donors T. Escaridillo—p 56  
Osteoarticular Tuberculosis in Infancy R. F. Tijero—p 65

**Cholesteremia in Healthy Infants and in Dystrophy and Toxicosis**—According to Lloa Ricketts the biologic role of cholesterol in immunity, in erythrocytic resistance, in cellular absorption and as an antitoxic factor has acquired great importance in the light of recent studies There is no record of the importance of cholesterol in dystrophy and toxicosis The author investigated blood cholesterol by means of an electric photocolormeter in young children with these two disorders His studies were made on 57 infants and children 15 were healthy 22 had dystrophy and 20 had toxicosis The quantity of cholesterol in healthy children up to 2 years of age averaged 171 mg per hundred cubic centimeters and varied between 140 and 200 mg There exists a close parallelism between the weight and the cholesterol content of the blood In obese children the blood cholesterol values may reach 250 mg per hundred cubic centimeters Dystrophy is always accompanied by hypcholesteremia which is the more pronounced the more grave the dystrophy The lowest values, 53 correspond to athrepsia The blood cholesterol content of children with toxicosis is likewise inferior to the normal average, it decreases in direct ratio with the loss of water One of the factors responsible for infection, anemia, disturbance in water exchange and the toxic state which are observed in dystrophy and toxicosis is hypcholesteremia The determination of the quantity of blood cholesterol in dystrophy and toxicosis is of prognostic importance The prognosis is unfavorable when values of less than 100 mg per hundred cubic centimeters are present

## Book Notices

**Therapeutics of Infancy and Childhood** Edited by Harry R. Litchfield M.D. F.A.C.P. Attending Pediatrician Beth El Hospital Brooklyn and Leon H. Dembo M.D. Visiting Pediatrician St. Luke's and St. Anne's Hospitals Cleveland Ohio. [With] 117 Contributors. In four volumes and de k. index. Fabrikoid. Price \$32. Pp. 816 1001 1816 2001 2745 '001 3831 1 203 with illustrations Philadelphia F. A. Davis Company 1942

One hundred and seventeen contributors have combined to prepare this work which includes four volumes and a desk index. Forty years have passed since the publication of Jacobus' comprehensive book on the therapy of infancy and childhood. The advances that have been made since that time particularly in relationship to specific therapy, biologic and glandular therapy and new methods of treatment for diseases formerly considered incurable would alone warrant a work of such great scope as is the system here reviewed. Moreover, the mental aspects of child care are in themselves so important and have been so exhaustively investigated that they too would well warrant a systematic discussion.

Recognition of the importance of the mental aspect is revealed in the first chapter, which is concerned with the psychological care of the sick child, followed by another on the art of treatment. Then come considerations of legislation affecting therapy, medical aid until the doctor comes, and a consideration of various materials and techniques used in treatment. The remainder of the first volume is devoted to asphyxia neonatorum, anomalies, nutrition, disorders of the skin and the acute infectious diseases.

Subsequent volumes cover rheumatic fever, the diseases of various regions of the body including the circulation, diseases of metabolism and of the nervous system and, in the final volume, tropical diseases, radiation therapy, diseases of the skin and surgery. A detailed index volume completes the work.

The selection of authors has been excellent embracing most of the well known pediatric clinics of the United States. The type selected is an exceedingly large type with plenty of white space, indicating no doubt the development and planning of this work well in advance of the restrictions now placed on paper and printing by the exigencies of the war. The modern character of the work is shown in the special chapter on blood plasma, which is discussed in great detail with numerous illustrations. Indeed, the many colored illustrations in this work are an indication of its comprehensive and elaborate approach to this subject.

In his chapter on whooping cough Dr. Sauer has brought down to date the present point of view regarding that disease. Each of the chapters is accompanied by a bibliography, unfortunately limited to names of authors and periodical references without in any instance providing titles of the articles concerned. For the young man about to undertake a pediatric practice a work of this type is exceedingly valuable since it will bring him promptly into touch with the latest points of view regarding any of the problems which may come before him. As might be expected in such subjects as the treatment of burns and in much of the surgery concerned, time was too short to permit some of the changing points of view brought about by the experience of the war. It is rather strange to find appended to the volume, almost as an afterthought, a special chapter on hypertension—a subject which, incidentally, is not of primary importance as a condition affecting the child.

**The Hormones in Human Reproduction** By George W. Corner. Cloth Price \$2.75. Pp. 265 with 56 illustrations. Princeton New Jersey Princeton University Press London Oxford University Press 1942

The author presents a comprehensive story of reproduction, beginning with the simple processes exhibited in the lower animals and ending with the complicated processes in the higher apes and the human being. The physiology of menstruation, ovulation, fertilization and early implantation of the fertilized ovum are clearly described. The changes in the uterus and the endocrine glands as a result of pregnancy are discussed. Most of the chapters are devoted to the glands and the hormones which control reproduction. The discovery of the ovarian hormones, their isolation, their chemistry and their physiologic role are described by presenting many key experiments by numerous

investigators. The story of progesterone, with which the author was closely identified, is particularly interesting.

This small monograph is the result of the Vanuxem Lectures which the author delivered at Princeton in February 1942. These lectures with many additions have been embodied in one of the most delightful books that has come to the attention of the reviewer in many years. All the scientific data have been carefully evaluated by one of the foremost scholars in the field of reproduction and yet they are presented in such a simple, interesting manner that any college student can follow the discussion with ease. The numerous illustrations, many of which are simple, add greatly to the clarity and interest of the text. Pertinent quotations from the literature introduce each chapter. This small book should be read by every student of biology as well as by the ever increasing number of men and women who are intrigued by the miracle of reproduction.

**Just for Two. A Handbook of Cookery for the Small Household** By Lily Huxworth Wallace. Cloth Price \$2. 1p. 311. New York N. Y. Barrows & Company Inc. 1942

**Home Canning for Victory Also Preserving Pickling and Dehydrating** Compiled and edited by Anne Pierce. Cloth Price \$1.25. 1p. 106 with 3 illustrations. New York N. Y. Barrows & Company 1942

**Diet Without Despair** By Marlon White. Cloth Price \$1.00. Pp. 128. New York N. Y. S. M. M. Co. Inc. 1943

**Sweets Without Sugar** By Marlon White. Sixth printing. Cloth Price \$1.25. 1p. 125. New York N. Y. S. M. M. Co. Inc. 1943

**The Food You Eat. A Practical Guide to Home Nutrition** By Samuel and Violette Clastone. Cloth Price \$2.25. Pp. 177 with 15 illustrations. Norman University of Oklahoma Press 1943

If ever anybody needs a cookbook, it is likely to be the new bride who is trying to plan meals for herself and her husband. Even her mother will sometimes have trouble translating the quantities of a large household into something suitable for two people. There are many dishes that are easy to make and are economical when prepared for a large family but difficult if not impossible, to prepare in small amounts. "Just for Two" is designed particularly for meeting this need. It begins with a statement on the essentials of a well balanced diet, indicates the need for a satisfactory breakfast and lunch, particularly for those who are working and then provides unnumbered recipes worked out in chapters according to the class of foods concerned. Sections on how to market and how to plan daily meals for variety, flavor, nutrition value and economy are especially worth while.

The experience of the author of "Home Canning for Victory" in conducting the section of the New York *Herald Tribune* concerned with home economics is a warrant of her ability to consider the subject which she covers in this book. All of the problems related to home canning are modified at this time by the ability to secure materials to be canned and packages in which to do the packing. Dehydration is for most people a new process. Miss Pierce considers home canning, preserving, making pickles and relishes and dehydration of food. A number of articles in the appendix are especially practical. Here are time tables for all of the processes involved and a discussion of utensils and of the sugar situation. The book is excellently printed.

Dieting demands, most of all, will power and full information regarding the number of calories in an ordinary serving of most foods. "Diet Without Despair" provides the charts and in addition a good many recipes for items that are low in calories. There is even a section devoted to cakes and pies, with the warning that the butter and the cream and sugar in the frosting are the chief items to be avoided. Here is information on how to make a low calory sponge cake and also menus for such special occasions as bridge luncheons, afternoon teas, midnight snacks and drugstore luncheons for the business girl. By its emphasis on mathematics this book fills a special need.

Miss White has also made available a book on "Sweets Without Sugar" and, for that matter, without saccharin. She substitutes, however, honey, molasses, corn syrup and maple syrup, with a recognition of their content. Unfortunately, some of the statements regarding the food value of the substitutes are slightly exaggerated, since they do not take account of the amounts of these substances necessary to give equal sweetening value.

The university presses are making many valuable contributions to American publications. "The Food You Eat" from the University of Oklahoma is a modern, up-to-date, simple presentation of food problems based on a knowledge of the physiology of digestion, new information regarding the vitamins and a practical experience with menus. The book is supplemented with an outline on practical nutrition and a good index.

**Abdominal and Genito Urinary Injuries.** Prepared under the Auspices of the Committee on Surgery of the Division of Medical Sciences of the National Research Council. **Abdominal Injuries.** Prepared by Ambrose H. Storck. Everts A. Graham, Chairman. **Genito Urinary Injuries.** Prepared and edited by the Subcommittee on Urology of the Committee on Surgery. Herman L. Kretschmer, Chairman. Volume III. *Military Surgical Manuals.* Cloth. Price \$3. Pp. 243 with 79 illustrations. Philadelphia & London: W. B. Saunders Company, 1942.

This is the third volume of a series of six manuals prepared under the auspices of the Committee on Surgery of the National Research Council as concise presentations of fundamental knowledge in the various fields of surgical specialization in relation to military surgery. They were originated, planned and largely written before Pearl Harbor, being thus a monument to the foresight of the surgical profession but perhaps suffering slightly from their prewar origins. The set of war manuals was designed to crystallize in short, practical form present day knowledge of the basic principles of surgery in all fields of specialization, applied to the problems of trauma produced by enemy action. The volume under review is well done and will probably suffer little from new observations based on experience on the firing lines of today.

Part I, on abdominal injuries, comprises eleven chapters with many pertinent and well executed drawings by Miss Vera Morel that illuminate and clarify the text. The chapters deal in an orderly manner with all phases of the management of abdominal injuries from their reception, study and diagnosis to general care and preoperative preparation, the selection for operation, the anesthetic, the operative procedure, wounds of special organs, postoperative treatment, complications and a final evolution of results, mortality and statistics. The whole is covered by an emphasis on the patient rather than on one particular injury, with excellent balance and an emphasis on fundamentals that will not change although they may be garnished by newer experience in the field. There is at this time no more pithy presentation of the basic principles of the treatment of abdominal trauma than is here proffered, and the author is to be heartily commended for an admirable summary of postwar experience, combined with modern scientific advances.

Part II consists of six chapters on genitourinary injuries, prepared and edited by a distinguished group of urologists, and is comprehensive, authoritative and complete. Diagnostic methods are explained in great detail and in a practical way. The discussion of renal and ureteral injuries is commendable for its completeness and soundness. The treatment of crushing injury and renal failure is both timely and apropos. However, in light of recent research it is becoming evident that, in cases reported in the British literature, renal failure has not resulted from toxic degenerative products of traumatized muscle, as has been thought by the foreign observers, but rather from intravenous saline solution administered to these patients for treatment of their shock. The complete discussion of the care of the neurogenic bladder is particularly praiseworthy and should be read and reread by all physicians who expect to treat war casualties. The principles enunciated are sound and the procedures described are essential to good practice in this difficult group of cases.

This volume can be heartily recommended to those who will have opportunity for treating patients injured by missiles of war and accidents of civil life.

**The Standard of Living in 1860.** *American Consumption Levels on the Eve of the Civil War.* By Edgar W. Martin. Cloth. Price \$4.50. Pp. 451. Chicago: The University of Chicago Press. London: The Cambridge University Press, 1942.

A distinguished committee which studied economic changes in the United States in 1923 pointed out that the most significant factor in the changes that had occurred in the previous quarter century had been the increasing expansion of human desires and wants. In no other field perhaps has this expansion been more significant than in the field of medicine and public health. The author discusses the conditions that pre-

vailed in 1860 in diets, housing, clothing, transportation, education and leisure. One chapter is devoted to medical care and the public health. Characteristic of the 50's were high death rates and low life expectancy. The first disease microbe was identified in 1863, but anesthetics had come in in 1844. Quacks and frauds preyed on the ignorant masses. Phrenologists and spiritualists claimed special abilities, hydropathy and homeopathy were in their heyday. The legal requirements for practice were not exacting. There were only faint indications of trends toward specialization. At that time there were only 5,600 dentists in the country, or about 18 for every 100,000 persons. There were only 8,000 nurses, or about 26 for every 100,000 persons. The first hospital training school for nurses was opened in 1873. As late as 1890 there were less than 500 graduate nurses in the United States. There were wide differences between the quality of medical practice in different parts of the country. In many plantations physicians were employed on a yearly salary to take care of slaves. The average annual income for country doctors in Alabama was \$1,000, \$2,000 for the city practitioner. Medicine was then just on the threshold of becoming a science. In 1873 there were only 149 hospitals in the country. In 1923 there were 6,762. In the Massachusetts General Hospital at that time there was no attempt to classify or segregate patients. There was no public health nursing until 1877. Only a few cities had boards of health in 1860. The first state board of health was established in 1869. From a recapitulation of the situation then prevailing and a comparison with the advancements of today one must derive great encouragement.

**Diseases of Women.** By Ten Teachers under the direction of Clifford White, M.D., B.S., F.R.C.P. Edited by Sir Comyns Berkeley Clifford White and Frank Cook. Seventh edition. Cloth. Price \$6. Pp. 435 with 168 illustrations. Baltimore: William Wood & Company, 1942.

It is a remarkable achievement to revise a book under present conditions existing in Great Britain. That this has been successfully accomplished by nine contributors is even more creditable. The popularity of this gynecologic textbook is evidenced by the fact that this is the seventh revision. The gynecologic subjects are covered in a brief and concise manner, including the etiology, symptoms, diagnosis and treatment. Controversial data have been entirely eliminated. All the contributors have read and constructively criticized the entire book, so that the conclusions represent a good cross section of gynecologic thought and practice in the British Isles. There is little to which one can take exception. The Wertheim operation for carcinoma of the cervix has been replaced by irradiation in most clinics in the United States. American gynecologists do not favor the transplantation of ovarian fragments in the event that it is necessary to remove both ovaries in young women. A few operative procedures are presented rather sketchily in the last chapter. The descriptions may be sufficient for one who has had operative experience but they would not suffice for the novice. The book is an excellent outline of gynecologic thought and practice.

**Silent Enemies.** *The Story of the Diseases of War and Their Control.* By Justina Hill. Cloth. Price \$2.50. Pp. 266. New York: C. P. Putnam's Sons, 1942.

The success of Dr. Hill's contribution "Germs and the Man" has led her to reflect for the public interest some of those conditions caused by bacteria which are particularly a problem of war. Thus she has sections on the tropical diseases, the plagues, wounds and burns, the respiratory diseases, filth, venereal diseases and the viruses. The final chapter indicates the tremendous scope of the postwar problem, which involves the freeing of the world from the menace of all the various forms of contagion likely to become widespread by the movement of great bodies of troops. The health problems of relief and reconstruction abroad, including the care of refugees, are likely to be almost as difficult a task as the winning of the war itself. Badly needed, says Dr. Hill, is a chemical coup for the viruses equivalent to what the sulfonamides have done for the bacteria. Needed also are drugs of equal potency against tuberculosis and syphilis. She indicates the need for improved research in many fields. Altogether, the book is one of the most pleasantly written and informative available to the general reader.

## Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

### HYPERHIDROSIS OF FEET

**To the Editor**—A man aged 27, a butcher, shows no physical abnormalities but he presents an unusual and to him a distressing phenomenon. In summer his body perspires profusely yet his feet are dry in the winter the reverse is true his body being dry but his feet constantly wet with perspiration even though he bathes his feet daily wears thin socks and shoes and does the same amount of work the year round. Please advise me regarding the probable cause of this condition and what can be done for it.  
M D New York

**ANSWER**—The general sweating of the body in the summer is not remarkable; some people naturally sweating more than others. This may be increased by such diverse factors as obesity, hyperthyroidism, organic changes in the central nervous system and exhausting illness. The hyperhidrosis of the soles would not be expected to manifest itself particularly in summer, because the sweating of the palms and soles is somewhat independent of temperature. At these sites accentuation is speeded up by emotional stress. Here too the insensible perspiration is greater than at other sites, except perhaps at the axillae. This insensible perspiration consists of two elements, namely the smaller amount as a physical discharge of water through the epidermis and the larger perpetual secretion of sweat. This not inconsiderable amount of liquid forming on the palms and soles regardless of temperature has to be volatilized. There might be a less ready evaporation during winter, especially in one whose skin is cool. At any rate persons with a chilblain type of circulation tend to have hyperhidrosis of the palms and soles. This is commonly expressed as the cold, clammy hand or foot. There are no data at hand to show whether such extremities actually sweat more or volatilize less readily than they do secrete by reason of lower surface temperatures. Other causes for hyperhidrosis of the soles may be flat feet and impaired circulation. It might be worth while inquiring into possibilities of undue stress or diet. It is known that certain articles of food and some drugs are capable of inducing excessive sweating in some people and especially at localized sites. Among such foods should be mentioned chocolate, tomatoes, cheese, pickles and onions.

If none of the elements suggested can be found in the background as contributing agents in this case, certain measures may be instituted to give some relief. Dehydration therapy with curtailment of the fluid intake and the administration of atropin or belladonna. For the feet, dusting powder of talcum or mixed with boric acid 5 to 10 per cent, salicylic acid 1 to 3 per cent and formaldehyde 1 to 3 per cent (formaldehyde is capable of producing a dermatitis through sensitization). Aqueous solutions of the following are somewhat easier to use and more effective: boric acid, salicylic acid or formaldehyde in 3 per cent concentration; aluminum chloride 10 to 25 per cent and sodium hexametaphosphate 1 to 5 per cent. They may be applied morning and evening and then less often when the amount of sweating is reduced. The use of x-rays for the control of hyperhidrosis is a method preferred by the patient. There is a difference of opinion regarding the advisability of its use. Conservative opinion holds that sufficient doses to produce atrophy are necessary to achieve the desired reduction in sweating. This in turn leads to persistent dryness of the palms and disagreeable sensations often worse than the original hyperhidrosis.

### AMPHETAMINE FOR OBESITY

**To the Editor**—Kindly give me information as to the use of amphetamine (benzedrine) sulfate and dextroamphetamine in the treatment of obesity.  
M D California

**ANSWER**—Amphetamine sulfate is a sympathomimetic drug which stimulates the higher cerebral centers, especially the cortex. The dextrorotatory form is said to be two to four times more active than the levo form or dl mixture. Among its many actions it may cause anorexia with such associated complaints as nausea, belching, flatulence, abdominal cramps and a disturbance in bowel habits. Since anorexia follows its use, amphetamine has been employed in the treatment of obesity. It is maintained by Ersner that when a patient loses his appetite he is more likely to follow diet. With this statement there would be no disagreement.

The depression of the appetite would seem to be the chief action of amphetamine in the treatment of obesity, since the effect on the basal metabolic rate is neither constant nor significant. Altschule and Iglauer found an increase in the basal metabolic rate in only 2 of 12 normal subjects following the use of the drug, and in these they attributed the increase to restlessness. Dill, Johnson and Daly reported a definite calorigenic action following intramuscular injection in man.

The impression is gained that the loss of appetite, the increased activity and the restlessness of patients under the influence of amphetamine are sufficient to account for the weight loss which often follows its continuous use. This drug should be used only under the careful supervision of a physician and when disagreeable side effects appear it should be discontinued.

### References

- Ersner, Jack S. The Treatment of Obesity Due to Dietary Indication (Overeating) with Benzedrine Sulfate. *Endocrinology* 27: 116 (Nov.) 1940.  
Altschule, M. D. and Iglauer, Arnold. The Effect of Benzedrine ( $\beta$ -phenylisopropylamine Sulfate) and Paredrine ( $p$ -Hydroxy- $\alpha$ -Methyl-phenylethylamine Hydrobromide) on the Circulation, Metabolism and Respiration in Normal Man. *J. Clin. Investigation* 10: 497 (Mar.) 1940.  
Dill, D. B., Johnson, R. F. and Daly, Cornelius. Metabolic and Cardiovascular Effects of Intramuscular Injections of Adrenalin and Amphetamine. *Am. J. M. Sc.* 198: 702 (Nov.) 1939.

### EOSINOPHILIA AND PARASITIC INFECTION

**To the Editor**—I have recently had 2 patients with eosinophilia. The first, a man aged 61, a plumber, gave a history of becoming violently nauseated soon after eating a meal about Aug. 1, 1942. He does not remember what he ate. He had no diarrhea. About two weeks after this he began to tingle and itch all over his body from head to toes and this tingling has continued to the present time. About the time the tingling began he had a severe itching spell and a red blotchy rash across the abdomen. He has lost 20 pounds (9 Kg.). He has not had further vomiting or muscle or joint pains. The physical examination was essentially negative. His blood picture on Dec. 4, 1942, was as follows: hemoglobin 90 per cent, erythrocytes 5,800,000, leukocytes 11,500, polymorphonuclears 29 per cent, eosinophils 53 per cent, lymphocytes 18 per cent. The sedimentation rate was 12 mm. in one hour. The serum Kahn and Kline reactions were negative. A biopsy from the deltoid muscle 5 mm. in diameter contained no trichinas. Examination of warm stools after a saline purge showed a few ova both fertilized and unfertilized of *Strongyloides stercoralis*. In the third stool passed were numerous parasites that fit the description of *Strongyloides stercoralis*, some of them alive and most containing ova. The other patient was a housewife aged 24. On Nov. 30, 1942, she complained of aching over the whole body but especially in the arms and of a severe headache. She had been aching for a week. The pain began in her right shoulder. Any movement starts the pain in the arm. There is no history of any gastrointestinal disturbance except cramping immediately after putting food in the stomach. There was no rash. Her temperature varied from 99.8 to 100.5 F. She gave a history of liking her meat not too well done and also of usually taking a bite of raw lean meat when slicing bacon. On Dec. 4, 1942, her blood picture was as follows: hemoglobin 75 per cent, erythrocytes 5,100,000, leukocytes 10,500, polymorphonuclears 59 per cent, eosinophils 21 per cent, lymphocytes 20 per cent. The sedimentation rate was 29 mm. in one hour. The serum Kahn and Kline reactions were negative. Muscle biopsy has been refused up to the present time. An examination of stools for parasites was done and no ova were found but one parasitic worm was found containing a row of embryo worms. The embryos were partially uncoiled so that they formed a line of identical S's lying sideways. The head and tail of the adult worm were not seen. Neither of these patients has lived outside the state of Ohio. They have had no contact with each other. Intracutaneous tests with trichinella extract 1:10,000 were negative in the case of the man and a doubtful positive in the case of the woman. Could the first patient's symptoms be due to infestation with *Strongyloides*? What is the probable identity of the parasite found in the second patient?  
M D Ohio

**ANSWER**—In connection with the first case it is improbable that the symptoms and eosinophilia were due to *Strongyloides*. Only in extremely heavy infections is such a high eosinophilia encountered, and larvae would have been found in large numbers in every stool specimen. It is doubtful that the parasites found were *Strongyloides* because only larval forms would be found in fluid stools and larvae do not contain ova. Parthenogenic female *strongyloides* would not be evacuated ordinarily by a saline purge. It is suggested that this patient's stools be examined again by a competent parasitologist. The eosinophilia might have been caused by sensitivity to some foreign protein other than an animal parasite. If the eosinophilia still persists, another cutaneous test for *Trichinella* might be performed although the symptoms were not typical of that infection.

In the second case the description of the presence of an adult worm containing embryos is not typical of any parasite commonly infecting man. It might have been a free living worm swallowed with food or drink. The description sounds more like an artefact. In this case again a reexamination of the stools by a competent parasitologist is recommended.



## TECHNICS OF ERYTHROCYTE SEDIMENTATION TESTS

To the Editor—I should like to ask regarding the present status of the normal range for the erythrocyte sedimentation index. During my internship and residency I used the Linzenmeier technic wherein the time was recorded in which an 18 mm fall occurred. This was two hours for women and slightly less for men corresponding to 9 mm an hour. This was frequently compared to the standard Wintrobe hematocrit tube. Yet in *The Journal* March 7 1942 page 779 the authors consider as an increased sedimentation rate one exceeding 20 mm in one hour. My query is: What is the normal index or rate for the various technics? Has any attempt at standardization of technics been made? How should the index be stated preferably as time or as millimeters? Also it has been stated that pertussis allergy and liver disease prolong the sedimentation time. Is it known in what way this occurs?

R G Lehman Lieutenant, M C, U S N R

ANSWER—There is no one standard method for performing the sedimentation rate, and the variety of technics and methods for expressing results continue to cause confusion. The Westergren method is probably used more than any other. In general the sedimentation rate of erythrocytes usually serves as a rough

volume of venous blood, the mixture drawn into the Westergren tube. Other investigators have modified the proportion of sodium citrate solution used for the Westergren method or have substituted potassium oxalate as the anticoagulant. These modifications do not improve Westergren's method but add further confusion by changing the values for the normal and abnormal range of sedimentation rates. Change in the anticoagulant to a small volume potassium oxalate, for example, alters the characteristics of the settling velocity, increases the rate for normal subjects and increases the effect of anemia, which is minimal in the original Westergren method. The unmodified Westergren method performed with one reading at the end of one hour and without correction for anemia is the best simple method available for clinical purposes.

Preferably the sedimentation rate should be expressed as the number of millimeters of settling per hour or per minute as observed during the period of constant settling velocity rather than the less convenient method of Linzenmeier, namely the

Comparison of Five Commonly Used Sedimentation Methods

Sedimentation	Rourke-Ernstene	Wintrobe-Landsberg	Westergren	Linzenmeier	Cutler
Tube length	120 mm	120 mm	300 mm	65 mm	70 mm
Internal diameter	4.0 mm	2.5 mm	2.5 mm	5.0 mm	5.0 mm
Graduations	0-100 mm	0-100 mm	0-200 mm	0-18 mm	0-50 mm
Height of blood column	100 mm	100 mm	200 mm	50 mm	50 mm
Anticoagulant	Heparin 15 per cent Dry oxalate mixture * Potassium oxalate †	Dry oxalate mixture *	Sodium citrate 3.8 per cent	Sodium citrate 5 per cent	Sodium citrate 3 per cent
Amount	0.013 cc heparin in 3 cc blood. For oxalates see notes.	See note	0.2 cc in 10 cc mixture	0.2 cc in 10 cc mixture	0.1 cc in 10 cc mixture
Concentration (mg per 100 cc mixture)	60 heparin 200 oxalates	200	760	1,000	300
Dilution of blood (per cent)	0.4 heparin 0.0 dry oxalate mixture 1.0 potassium oxalate	0	20	20	10
Method of timing	Slope of period of constant fall	Distance settled in 1 hour	Distance settled in 1 hour	Time to settle to 18 mm	Graph of curve and distance settled in 1 hour
Sedimentation rate units	Millimeters per minute	Millimeters	Millimeters	Minutes	Slope of curve and millimeters
Correction for erythrocyte concentration	Required	Required	Seldom used	None	None
Normal range	0.0-0.40 mm per min	0.9 mm men 0.15 mm women	1.3 mm men 4.7 mm women	200-600 min	Horizontal line and 2.8 mm men 2.10 mm women
Abnormal range					
Slight	0.4-0.6 mm per min	10-20 mm men 20-25 mm women	8-15 mm	100-900 min	Diagonal line
Moderate	0.6-1.0 mm per min	20-30 mm	15-40 mm	60-100 min	Diagonal curve
Extreme	2.0-2.5 mm per min	35-50 mm	80-110 mm	15-30 min	Vertical curve

For discussion of anticoagulants see Ham T H and Curtis F O *Medicine* 17: 447 (Dec) 1938

\* Dry oxalate mixture. The solution is made by dissolving 3 Gm of crystalline ammonium oxalate and 2 Gm of crystalline potassium oxalate in distilled water with the aid of heat making the final volume to 100 cc. This gives an oxalate mixture concentration of 5 Gm per hundred cubic centimeters. The concentration employed for blood is 200 mg of oxalate mixture per hundred cubic centimeters of blood. Accordingly 0.013 cc of the solution is pipetted into a tube or bottle for each 5 cc of blood to be drawn. The anticoagulant is then dried (to prevent dilution of blood) by heating in an oven at 100°C for one hour or by desiccation at room temperature for several days. This anticoagulant has the advantage that it causes no change in erythrocyte size and no change in the sedimentation rate.

† Potassium oxalate. The solution is made by dissolving 20 Gm of crystalline potassium oxalate in distilled water with the aid of heat making the volume up to 100 cc. Concentration employed is 200 mg per hundred cubic centimeters of blood. Accordingly 0.013 cc of solution is pipetted accurately for each 5 cc of blood. This anticoagulant is not dried. It produces somewhat variable shrinkage of the erythrocytes which can be corrected approximately by multiplying the erythrocyte volume (hematocrit reading) by the factor 108. This anticoagulant does not influence the sedimentation rate.

index of the concentration of plasma fibrinogen. The sedimentation rate of erythrocytes fails, however, as an index of plasma fibrinogen when there are abnormally elevated levels of serum globulins or of lipids and when there is advanced microcytic or macrocytic change in the red blood cells. The closest correlation between the sedimentation rate and the concentration of plasma fibrinogen has been obtained by use of the Rourke-Ernstene method and the Westergren method. Poorer correlation has been obtained by the methods of Linzenmeier, Cutler and Wintrobe-Landsberg. Each of these five methods, however, has proved useful clinically. The Rourke-Ernstene method is the most reliable but also the most time consuming and complex.

The Westergren technic is a simplified procedure which has been widely used and can be recommended since a single reading in millimeters taken at the end of one hour, uncorrected for anemia, has a high degree of correlation with concentration of plasma fibrinogen. This is true for the Westergren method performed as described by the author, employing 20 per cent by volume of 3.8 Gm of sodium citrate solution per hundred cubic centimeters as an anticoagulant, mixed with 80 per cent by

observation of the time in minutes required to settle 18 mm. A quantitative comparison of the five commonly used sedimentation methods has been reported by Ham and Curtis (*Medicine* 17: 413 and 447 [Dec] 1938) and by Hambleton and Christianson (*Am J M Sc* 198: 177 [Aug] 1939). Ham and Curtis have also discussed the relation of plasma proteins, especially plasma fibrinogen and serum globulins, to the sedimentation rate. A table of normal and abnormal sedimentation rates is submitted here.

It has been reported that the sedimentation rate is prolonged in allergic states, certain virus infections and certain cases of brucella infection. This indicates that the concentrations of plasma fibrinogen and of serum globulins are not elevated in these diseases. In overwhelming liver disease, however, the sedimentation rate may decrease from an abnormally elevated level to normal, coincident with a decrease in the plasma fibrinogen from above normal to below normal, with resulting fibrinogenopenia. This is a sign of liver failure which is encountered rarely (Ham and Curtis, p 413). A normal sedimentation rate or a so-called prolonged rate therefore is indirect evidence that



the plasma and serum globulins are not elevated above normal concentrations, but a normal sedimentation rate is not a reliable index for abnormally decreased concentrations of these globulins

#### References

- Rourke M D and Ernestine, A C *J Clin Investigation* 8 545 (June) 1930  
Wintrobe M M, and Landsberg J W *Am J M Sc* 189 102 (Jan) 1935  
Westergren A *Acta med Scandinavica* 54 247 (Jan) 1921  
Linzenmeier G *Arch f d ges Physiol* 181 169 1920  
Cutler J *Am J M Sc* 171 882 (June) 1926

### SULFONE COMPOUNDS FOR PULMONARY TUBERCULOSIS

To the Editor—Will you please send me information on the treatment of pulmonary tuberculosis with the sulfone drugs or any other effective drug therapy? Is there enough backing for a trial of sulfone compounds in a fairly severe case of tuberculosis with considerable loss of weight?

L E Blachman M D, Cleveland Heights, Ohio

ANSWER—Feldman, Hinshaw and Moses were the first to employ in experimental tuberculosis a group of compounds known as sulfones. The nucleus of this group is 4,4'-diaminodiphenylsulfone. This parent compound has been found effective in controlling tuberculosis in animals, but, unfortunately, it is highly toxic. Therefore, various derivatives have been produced. Feldman and Hinshaw have employed not only the parent compound but ten derivatives in the treatment of experimental tuberculosis. Among these preparations five were found to have no significant effect, while the remaining six exerted varying good effects. The three which were found to be superior to all others are the parent compound and two derivatives, sodium p,p'-diaminodiphenylsulfone-N,N'-dixetose sulfonate (promin) and disodium formaldehyde sulfoxylate diaminodiphenylsulfone. The first of this group employed in experimental tuberculosis by Feldman and Hinshaw was the derivative commonly known as promin. They observed that, when this drug was administered a few days before animals were inoculated with tubercle bacilli, the expected course of the disease in these animals was materially altered; indeed, most of them were little affected by the disease. Animals were then infected with tubercle bacilli after which the administration of the drug was begun at different periods. Indeed, in some animals treatment was not begun until six weeks after the usual lethal dose of tubercle bacilli had been administered. At the end of six months all of the control animals, that is, those which had been infected and were not treated with promin, were dead. Autopsy revealed the presence of severe widespread tuberculous lesions whereas in 57 per cent of animals treated with promin it was impossible to find lesions in the liver, spleen or lungs. Moreover, those animals which were not treated until six weeks after they were infected fared as well as those treated earlier. The next experiment consisted in infecting guinea pigs with tubercle bacilli later performing laparotomies in order to visualize the lesions and actually take specimens from the livers for microscopic examination. About this time treatment with promin was instituted. When all the untreated control animals in this study had died from tuberculosis, 81 per cent of those treated with promin were still alive. Necropsies on these animals revealed that not only had the disease failed to progress after the administration of promin but the lesions had receded and resolved. This is the first time in the history of tuberculosis therapy that tuberculosis in animals has been completely controlled by a drug.

Hinshaw, Pfuetze and Feldman have administered promin to 106 tuberculous patients. Thirty-six of these received what was regarded as an adequate trial of therapy. The most favorable effects were observed on exudative pulmonary lesions of recent origin without extensive destruction of tissue and without definite fibrosis. All such lesions showed evidence of improvement within two months and were nearly or completely resolved within four to six months. They emphasized the fact, however, that many such lesions tend to resolve spontaneously and that their series of cases is not large enough to justify the conclusion that promin was responsible for the observed improvement in the treated cases. Closure of one or more cavities was observed in 10 of 26 adequately treated patients with cavities, and tubercle bacilli apparently disappeared from the sputum in 14 of 36 cases (39 per cent). The sedimentation rate was definitely decreased in 70 per cent of all cases with elevated rate. Among 18 febrile patients 10 showed significant reduction in temperature. In 1 patient a new progressive lesion developed in the course of the treatment. Four patients died 3 of whom were in the terminal stage before treatment was instituted. Six patients with tuberculous meningitis 2 of whom had treatment instituted in an early phase of the disease died. No noticeable effects were observed among 4 patients suffering from renal tuberculosis, but observations were incomplete in these instances.

The authors report that promin is potentially toxic when given in large doses, therefore the dose must be carefully regulated to avoid serious destruction of blood. Headache, restlessness, anorexia and malaise are the chief symptoms from which patients have complained. The authors are of the opinion that the results to date justify further clinical trial of promin and other drugs of the sulfone series, particularly among patients who have fresh exudative lesions. Under the direction of these workers a large number of patients are now being treated. Since the entire subject is in an experimental stage and since the drugs now in use are sufficiently toxic to result in serious harm to the patient, it seems best to refrain from prescribing these drugs until such time as their efficacy can be more definitely established and their dosage so standardized as to make their administration safe. No drugs of this series are available commercially at the present time.

Of all the other drugs that have been administered throughout the centuries, not one has been found efficacious in the treatment of tuberculosis in animals or man.

#### References

- Allison S T and Myers Robert The Treatment of Pulmonary Tuberculosis with Sulfapyridine *THE JOURNAL* Oct 28 1939 p 1631  
Birkhaug Konrad Sulfonamide Treatment of Experimental Tuberculosis in Guinea Pigs *Chr Michelsens Institute Bergen* 1939  
Callomon Fritz F T New Derivatives of Diaminodiphenylsulfone *Am Rev Tuberc* 47 97 (Jan) 1943  
Domagk Gerhard *Deutsche med Wchschr* 61 250 (Feb 15) 1935  
*Klin Wchschr* 15 1585 (Oct 31) 1936  
Feldman W H Chemotherapy in Experimental Tuberculosis *Minnesota Med* 25 339 (May) 1942  
Feldman W H and Hinshaw H C Sulfapyridine in Experimental Tuberculosis *Am Rev Tuberc* 11 732 (June) 1940  
Feldman W H and Hinshaw H C Effect of Sulfapyridine on Experimental Tuberculosis in the Guinea Pig *Proc Staff Meet Mayo Clin* 14 174 (March 15) 1939  
Feldman W H Hinshaw H C Mann F C and Moses H E The Effect of Promin on Experimental Tuberculosis in the Guinea Pig *Tr Nat Tuberc A* 1942  
Feldman W H Hinshaw H C and Mann F C Chemotherapy in Tuberculosis An Appraisal of Present Evidence and of Future Possibilities to be published  
Feldman W H Hinshaw H C and Moses H E The Effect of Promin on Experimental Tuberculosis Preliminary Report *Proc Staff Meet Mayo Clin* 15 695 (Oct 30) 1940  
Feldman W H Hinshaw H C and Moses H E Promin in Experimental Tuberculosis *Am Rev Tuberc* 15 303 (March) 1942  
Feldman W H Mann F C and Hinshaw H C Promin in Experimental Tuberculosis *ibid* 16 187 (Aug) 1942  
Hall B E Pfuetze Karl Hinshaw H C and Feldman W H Effect of Promin on the Blood of Patients with Tuberculosis Preliminary Report *Proc Staff Meet Mayo Clin* 17 24 (Jan 14) 1942  
Hinshaw H C and Feldman W H Treatment of Experimental Tuberculosis *THE JOURNAL* Sept 27 1941 p 1066  
Hinshaw H C Pfuetze Karl and Feldman W H Treatment of Tuberculosis with Promin *Am Rev Tuberc* 17 26 (Jan) 1943  
Smith M I Emmart E W and Westfall B B The Action of Certain Sulfonamides Sulfones and Related Phosphorus Compound in Experimental Tuberculosis *J Pharmacol & Exper Therap* 74 163 (Feb) 1942

### "CANNED HEAT" FOR EMERGENCY USE

To the Editor—Would you kindly inform me as to whether there is available a formula for a preparation of a substance such as the commercial 'Sterno' for use in heat sterilization in the event of a situation in which gas and electricity should be unavailable?

Shepard Shapiro M D New York

ANSWER—Commercial preparations termed "canned heat" are jellies commonly containing denatured alcohol as a source of heat. A suitable formula, according to the Chemical Formulae by Bennett, volume I 1933-1934, is denatured alcohol (methyl alcohol may be used) 1 000 cc., soap chips (well dried) 28.30 Gm., and shellac (dry flakes) 2 Gm. Heat the alcohol to 140 F (Caution: Danger of fire), add soap chips and shellac, until the solids are completely dissolved, pour into suitable metal capped containers and allow to cool.

### ROENTGEN THERAPY FOR RECURRENT HYPERTHYROIDISM

To the Editor—The reply to a query on recurrent hyperthyroidism published in *The Journal* Dec 12 1942 page 1262, surprised me in that the writer appears to feel that thyrotoxicosis is mainly a surgical problem. There is at present a useful nonsurgical treatment of diffuse thyroid enlargement associated with thyrotoxicosis which is the application of radium used as a collar over the neck by the method described in 1913 by Dr Solomon Ginsberg. The consultant also stated in his reply that the skin may be burned which is a misstatement that has been printed in every textbook on thyroid disease by those who write about it but who have had no experience with radiotherapy. I can conservatively state that at least 80 per cent of the diffuse swellings of the thyroid gland associated with thyrotoxicosis can be cured in this way. I am so enthusiastic about this form of treatment that I hold it comparable to the action of sulfonamide drugs in acute bacterial infections.

Louis E Weinberg M D New York

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## WOMEN IN INDUSTRY

PRELIMINARY REPORT OF THE COMMITTEE ON THE  
HEALTH OF WOMEN IN INDUSTRY OF  
THE SECTION ON OBSTETRICS  
AND GYNECOLOGY

RECOMMENDATION TO THE COUNCIL ON  
INDUSTRIAL HEALTH

H CLOSE HESSELTINE, M.D., CHICAGO, CHAIRMAN  
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### GENERAL STATEMENT

Shortage of man power and economic pressure necessitate the employment of millions of women in industry. Sufficient medical data are not available to draft final recommendations about the effect of various kinds of employment on the gynecologic or future obstetric health of unmarried or childless women, on the pregnant, puerperal or lactating women or on mothers with home and family responsibilities. However, it is common experience in industry that women absent themselves from work much more often than men and that the duration of individual absences tends regularly to be longer. The available data do not clearly assign the responsibility for this tendency directly to obstetric or gynecologic functions (although it has been taken for granted by some) as against ordinary causes of disability which are equally applicable to men. All of these relationships need careful study over an extended period of time.

Therefore, the present report is preliminary in character and contains recommendations on which there is already substantial agreement. The committee expects subsequently to submit additional statements from time to time as greater experience and more accurate observations become available.

### ESSENTIALS OF MEDICAL SERVICE IN INDUSTRY

The increasing employment of women in industry will intensify demands for competent medical supervision, especially in those industries using women for the first time. The Council on Industrial Health of the American Medical Association lists the essentials for such service as follows:<sup>1</sup>

A. A physician who takes genuine interest in a properly conducted industrial medical department and who is willing to devote regular hours to services inside the plant.

B. Industrial nurses with proper preparation acting under the physician's immediate supervision or under standing orders, constitute the principal source of sustained industrial health activities for most small industrial concerns.

C. Industrial hygiene services, directed at improvement of working environment and control of unhealthful exposures provided by physicians and others under the guidance and assistance of the specialized personnel in the state and local bureaus of industrial hygiene.

D. A health program which will include

1. Good first aid, emergency, and subsequent medical and surgical care for all industrially induced disability.

2. Good correlation with the family physician and other community health agencies for proper management of non-occupational sickness and injury.

3. Health conservation of workers through physical examination and health education.

4. Good records of all causes of absence from work as a guide to the establishment of preventive measures.

Consulting services in industry commonly include dermatologists, ophthalmologists, surgeons, internists, neurologists, neurosurgeons, psychologists and psychiatrists and other recognized medical specialties. The committee recommends that competent gynecologists and obstetricians be included in the consulting services where substantial numbers of women are employed.

### GENERAL HYGIENE FOR WOMEN IN INDUSTRY

Ordinary industrial hygiene activity, safety practice and medical or engineering control over conditions of work apply to men and women alike. However, additional safeguards have been set up in nearly every jurisdiction as supplementary protection for the health of women. Physicians called on to exercise supervision over employed groups should familiarize themselves with all applicable statutes or health codes. However, the committee does wish to emphasize the following special considerations:

A. *Type of Work*—Generally women work at home in addition to a regular shift in the plant. A wife and more especially a mother may be engaged as many hours at housework as in industry. Such excessive burdens are undesirable, especially during pregnancy. Since rest is difficult in the home during the day, mothers should work either the day or afternoon shifts.

Women have been employed by almost every industry successfully. They are particularly suitable where manual dexterity is involved. This applies to work in the assembly lines, with small drills, with punch presses, at mailing and filing in the preparation of food in textile or weaving industries, in small arms plants and in many other war industries. Lifting, pulling, carrying or shifting weights should not be beyond a reasonable and comfortable capacity for the individual. The maximum units for weight lifting should not exceed 35 pounds probably. Weight factors should be

Read before the Fifth Annual Congress on Industrial Health, Chicago, Jan. 12, 1943.

<sup>1</sup> An Industrial Health Program for a County Medical Society. J. A. M. A. 121:259 (Jan. 23) 1943.

<sup>2</sup> Or obstetrician and gynecologist.

lower for the gravid individual and also for older women and those with vaginal wall relaxations or beginning prolapse

**B Working Garments and Equipment**—The woman worker should have the same clothing protections as the man. Slacks will be preferable to skirts in certain types of work. Blouses with long dangling sleeves may be dangerous about machinery. It is equally important that appropriate garments and protection be afforded to those exposed to excessive heat or cold. The customary protection for the eyes, hands and the hair is self-evident. In general, women should use low heeled comfortable shoes, and this is most important for those who are gravid.

**C Optimum Hours of Work**—The maximum number of hours for women employment has been established in many localities. The nature of the work as well as the urgency of the situation may influence somewhat the number of hours employed per day or per week. Ordinarily, women may be employed from thirty-six to forty-eight hours a week depending on the local statutes, the type of work and the individual's capacity.

**D Industrial Sanitation**—The standards for adequate lighting and ventilation are equally applicable here. An adequate number of toilets and lavatories properly maintained and reasonably accessible constitute part of the necessary rules of good hygiene. Rest-rooms where the pregnant, menstruating or ill women may rest or recline should be provided. Rest periods are desirable and may be conducive to more production.

**E Supervision**—Adequate supervision at the plant is necessary, particularly a foreman or forewoman trained or experienced in the supervision of women employees. The management of any plant not accustomed to the employment of women would do well indeed to consult plant physicians and others experienced in the problems of women employees before employing women. Even the placement of women in another division in the same plant may bring about new problems.

A matron or "counselor service" has been found unusually successful in several large plants where a large number of women are employed.

The evaluation of movement and monotonous work is one of the problems of the plant physician. Likewise, constant sitting or prolonged standing is more disturbing to the gravid patient. Adjustments should be made in such a fashion that the employee does not work in a strained position at benches, tables and machines.

#### TRANSPORTATION OF WOMEN TO AND FROM WORK

Transportation of women to and from work may be even more difficult than that of men. Adequate protections and shelters should be afforded women between the transportation system and the place of employment.

#### PHYSICAL EXAMINATION AND PLACEMENT

**A General Recommendations**—The general recommendations developed by the Council on Industrial Health apply. These are:<sup>3</sup>

Preplacement physical examinations should be complete. They should be used only for the purpose of assigning work adjusted to the physical and temperamental fitness of the applicant and to maintain safe and healthful employment for all employees.

Subsequent physical examinations should be complete enough to provide positive health protection for all workers and to safeguard public welfare. Repetition of such physical examinations must be determined by the physician in accordance with specific requirements.

In the interest of uniformity, physical examination forms are recommended. Personal records of this character are confidential and should be kept in the custody of the medical department. Access to these records should be granted only on request or consent of the examinee.

The examining physician should acquaint the examinee with the results of all examinations or take steps to refer all conditions requiring correction to the physician of the worker's choice.

**B Obstetric and Gynecologic Recommendations**—At the time of the regular examination and history, special inquiry should be made about the breast and obstetric and pelvic conditions.

From the obstetric and gynecologic point of view, the opportunity is too good to be missed for as thorough an evaluation of the system as possible. For example, a thorough examination may elicit an early but serious lesion of the breast, cervix, uterus or adnexa. Other conditions may be revealed which are less serious but which should be reexamined at regular intervals as a health measure to the employee.

A thorough preemployment evaluation of the pelvic organs will permit better placement of the employee more appropriately, as well as to discover early significant and serious disease or altered physiologic states which are still subject to correction.

Women with relaxation of the pelvic structures or prolapse should be placed in work where the stress and strain of lifting or the prolonged effect of gravity can be entirely avoided.

The pregnant or lactating woman as well as women affected by sterility or habitual abortion, should be particularly protected against lead, mercury, arsenic, phosphorus, solvents, benzene and homologues, volatile oils, nitrobenzene and explosives, x-rays and radium and other dangerous agents. Any substance or agent which might injure the liver or kidney may precipitate extremely serious complications during pregnancy or in relation to pregnancy and lactation. Women who have had toxemia in previous pregnancies or difficulty with fertility or completing a pregnancy should avoid employment during pregnancy.

#### MFSTRUATION

Many women have little or no incapacitation during menstruation. Those with mild distress may be benefited by dietary improvement, by the avoidance of unnecessary physical and strenuous activities for a few days prior to the expected period or by the administration of mild sedatives and analgesics, under the direction of the plant physician or the employee's personal physician.

Severe cases of dysmenorrhea may require the attention of the specialist. Dysmenorrhea is a symptom and results from many conditions such as pelvic inflammatory states, endometriosis, pelvic neoplasms, cervical stenosis, maladjustment, hormonal imbalance, migraine and allergic states. Adequate rest facilities at the plant are desirable and a brief rest may cause only a slight interruption in the day's work rather than a loss of several hours. Hot applications to the lower abdomen or back may be helpful. Stimulants as coffee, tea or other hot drinks are sometimes beneficial.

For those who must lose one or two days regularly because of dysmenorrhea, a rearrangement of work schedules so that an extra day could be worked on

<sup>3</sup> Outline of Procedure for Physicians in Industry J. A. M. A. 118:895 (March 14) 1942

one or two weeks prior to the catamenia would be very helpful. In this way the woman would not be penalized because of her menstrual distress.

In a few instances efficiency may be so greatly lowered at the time of the menstrual period that the woman should not work. If flexibility in hours or days of work could be arranged there should be more efficient and better production.

A change in climate or altitude may be associated with an increase in menstrual distress, alteration or abnormalities, as dysmenorrhea, amenorrhea, menorrhagia or metrorrhagia. Likewise positions of responsibility, tension or worry may be associated with altered menstrual action.

On the other hand, menorrhagia or metrorrhagia may be the first symptom of cancer or neoplasm. Thus, careful consideration should be given to all complaints and appropriate investigation made by the employee's physician or obstetrician and gynecologist.

#### MENOPAUSE

Because of nervous and vasomotor instabilities, increased excitability and increased susceptibility to fatigue, women in the climacteric may need special consideration. Estrogenic therapy or sedatives may be extremely beneficial, particularly when there is disturbing noise, excitement or tension, as well as maladjustment to employment to associated workers, to supervisors or to environment. The menopausal syndrome is certainly not caused by employment and the treatment is not primarily an industrial problem.

Not uncommonly prolapse or cystocele and rectocele become worse near or after the menopause. Consequently women in the postmenopausal period should be particularly evaluated for placement in industry and urged to profit by periodic examinations.

#### PREGNANCY

*A Normal Pregnancy*—Normal pregnant women need reasonable activity, but when employment is necessary stresses and strains should be eliminated. Continuance of employment is common practice in the first half of pregnancy or perhaps longer, depending on the woman's physical tolerance to the type of work. The pregnant employee must not be overburdened by home duties. Each pregnant employee should have individual consideration by her obstetrician and by the plant physician as to the hours and duration of the employment as well as to type of employment.

As the pregnancy advances beyond the twentieth to twenty-fourth week of gestation the woman becomes progressively more awkward and thus must avoid climbing and walking where delicate balance is involved.

Pregnant women should have a regular shift of employment in order that their lives may be regulated for the greatest amount of rest and regular sleep. If the employment is improper or cannot be physically tolerated the patient must stop work or be transferred to more suitable activity.

*B Leave for Pregnancy and Puerperium*—The pregnant employee should not be employed after the thirty-second week of pregnancy (that is, within six weeks of term). It is believed that the discontinuance of employment in the last trimester would benefit many prospective mothers, if economic circumstances permit.

This committee recommends that each employee inform the proper authority in the industry about her pregnant state within the first trimester (three months),

that she obtain a statement from her physician to the effect (1) that her work is not contraindicated and (2) that she may work not longer than a given period of pregnancy. If contraindications to work arise, the employee's physician should notify the employer.

The patient should not return to work until six weeks after delivery and then only when her physician notifies the employer that she may return. If her return to work at six weeks is inadvisable because of her own condition or because her baby actually needs her at home she should request further extension of time.

*C Antepartum Care*—Every gravid woman should seek the advice of her physician or obstetrician in the first trimester of pregnancy. For the best interest of the patient, her own physician or obstetrician and gynecologist should administer all antepartum, obstetric and puerperal care. In case of emergency, of course, additional medical care should be obtained from the nearest available source.

Antepartum care consists of a complete history, physical examination, pelvic examination, pelvic measurement, serologic test for syphilis, hemoglobin test, usual urinalysis and blood pressure recording. Ordinarily, return visits need not be oftener than once every three weeks until the thirty-second week of pregnancy and then every two weeks until the thirty-sixth week after which weekly visits may be required. A urine specimen must be left at each visit, blood pressure taken and the weight recorded. In the last month or so of pregnancy it is good practice to note the position and size of the fetus.

*D Complications*—Unintentional abortion is the most likely obstetric complication in the first trimester of pregnancy and it may have no relationship to the employment. These accidental abortions result perhaps more often from abnormal or diseased ova and not because of work or activity. Excessive vomiting is the second most likely problem in the first trimester.

The last trimester is complicated most often by toxemia of pregnancy, placenta previa or abruptio placentae. All of these obstetric emergencies are incompatible with employment of any kind and need immediate treatment.

The midtrimester is a comparatively safe period but any complication may arise at this time, as well as any other, such as anemia, hyperthyroidism, diabetes, tuberculosis, syphilis, gonorrhea, heart disease, hypertension and nephritis, pyelitis, neoplasms (both benign and malignant) and many other conditions.

Other complications will also alter the program. Genital tract infections may require treatment from every two to seven days. Antisyphilitic treatment should be weekly. The management of medical complications will necessitate a specially devised program. In the event of excessive weight gain or evidence of toxemia, special instructions must be given. These are only some of the conditions that the obstetrician may encounter in the care of his patients.

#### LACTATION

Unless special facilities are available, it is unsatisfactory or impossible for lactating mothers to work and continue to nurse a baby. If sufficient facilities are arranged ample time must be allowed for nursing and for the patient to obtain food and fluid. The employer should have a statement from the employee's physician prior to employment of a nursing mother that there is no medical reason contraindicating employment.

## CARE OF CHILDREN OF MOTHERS IN INDUSTRY

If mothers are employed, arrangements must be made to provide suitable facilities and properly trained personnel to care for dependent children safely. Such care will depend on the size and age of children and the hours of the mother's employment. Infants will require a different type of attention than older children well along in school. Children attending school will need adequate supervision before and after school hours for the assurance of adequate diet, proper clothing and other protections until the mother can take over the responsibility. Special study of this problem must be undertaken wherever these social problems arise.

## CONTROL OF COMMON RESPIRATORY INFECTIONS

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To say that respiratory infections are responsible for more loss of time from industry than any other single group of disorders is only to repeat a well known statement. This subject has been discussed on many occasions, and at the Third Annual Congress on Industrial Health which was held by this group in 1941 it was the topic of a most enlightened symposium.<sup>1</sup> Such topics as the incidence and economics of acute respiratory infections, the role of the physician in the control of respiratory infections and air conditioning were discussed.

Today I propose to discuss some of the methods which are available for the prevention and control of these infections. While it will be admitted at once that there is no completely effective method for their prevention and control at least more is known today about certain aspects of the problem than was the case some years ago. In regard to treatment we are on much safer ground, great strides have been made within recent years. I shall confine my remarks to the common cold, epidemic influenza and pneumonia.

## THE COMMON COLD

It is now agreed that the common cold is caused by a filtrable virus and that it is the most frequent of all respiratory infections. It is a widespread infection and occurs throughout the world. Epidemiologic studies disclose that the frequency of colds is between two and three per person each year. It has been demonstrated by Dochez and his associates<sup>2</sup> as well as others<sup>3</sup> that the virus of this disease promotes and furthers infection of the respiratory organs by pathogenic organisms such as the pneumococcus, hemolytic streptococcus, staphylococcus and influenza bacillus. It also facilitates the distribution of these bacteria in

the community and establishes a background for the occurrence of severe outbreaks of respiratory diseases.

Before saying anything about the prevention of colds, I will cite a few pertinent facts concerning their pathogenesis. The incidence of colds in the United States varies throughout the year and the morbidity rate is cyclic. There are three main peaks of incidence each year: the first in January and February, the second in April and May and the third in September and October. The epidemic occurring in the spring tends to be the mildest while that occurring in January and February is the most serious as measured by absence from work and severe complications. Infection is frequent in families, in schools, in industries and where overcrowding is common.

The common cold is highly contagious and the incubation period is short, varying between twenty-four and thirty-six hours. The infected individual can transmit the infection to others only during the early stages of the disease, that is, during the first day or two after the onset of infection. The most infectious period is the first day and it is known that a patient may actually infect others from four to six hours prior to the development of symptoms.

Carriers of the virus of the common cold are thought to be infrequent but on this point there is very little precise information. The opinion prevails that carriers are encountered only rarely. This is a matter which needs more investigation.

Once colds become prevalent in any community many susceptible people who are exposed to an infected person come down with the disease. The degree of susceptibility and resistance varies from one individual to another and from year to year. This is brought out in epidemiologic studies in families and in schools. Resistance seems to increase with age since there are fewer colds in the elderly than in the young.

A certain degree of immunity as judged by resistance to reinfection develops as a result of a cold but it is of short duration. In the experimental studies of Dochez and his associates<sup>4</sup> it was found that resistance lasted about a month in the chimpanzee. In man, it was estimated by Paul and Freese<sup>5</sup> to be not less than twenty-three days with an average of about seven weeks.

It seems clear then that the common cold is due to a filtrable virus and that a part of its action is to promote secondary bacterial infection of the respiratory organs. It is cyclic in its morbidity and varies in its seriousness, depending on seasonal factors and the frequency and incidence of secondary invaders. It is highly contagious and while one attack confers increased resistance to reinfection this period is of short duration.

One of the puzzling features about the common cold in temperate and tropical zones is its cyclic morbidity. We are almost wholly ignorant of the factors that promote the dissemination of a virus in any community and cause outbreaks of the disease. It is well established that colds are contagious and are spread by contact infection and probably by the air, but it is completely mysterious why there should be sudden outbreaks of the disease. It has been postulated that

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From the Evans Memorial, Massachusetts Memorial Hospitals and the Department of Medicine, Boston University School of Medicine.

1. Piersol, G. M. Role of the Physician in Industry in the Control of Acute Respiratory Diseases. *J. A. M. A.* **116**: 1339 (March 29) 1941.  
Lanza, A. J. Incidence and Costs of Acute Respiratory Disease in Industry. *ibid.* p. 1342.  
McCord, C. P. Diseases of the Respiratory Tract and Air Conditioning. *ibid.* p. 1360.

2. Dochez, A. R. Limited Consideration of Certain Aspects of Acute Infection of Respiratory Tract. *Medicine* **12**: 245 (Sept.) 1933.  
Shibley, C. S., Hanger, F. M. and Dochez, A. R. Studies in the Common Cold.

I. Observations of the Normal Bacterial Flora of Nose and Throat with Variations Occurring During Colds. *J. Exper. Med.* **43**: 415 (March) 1926.  
Dochez, A. R., Mills, K. C. and Kneeland, Yale Jr. Variation of H. Influenzae During Acute Respiratory Infection in the Chimpanzee. *Proc. Soc. Exper. Biol. & Med.* **30**: 314 (Dec.) 1932.

3. Bloomfield, A. L. The Significance of the Bacteria Found in the Throats of Healthy People. *Bull. Johns Hopkins Hosp.* **32**: 33 (Feb.) 121 (April) 1921.

4. Dochez, A. R., Shibley, G. S. and Mills, K. C. A Study of Acute Infection of the Respiratory Tract in the Ape. *Proc. Soc. Exper. Biol. & Med.* **26**: 562 (April) 1929.  
Studies in the Common Cold. IV. Experimental Transmission of the Common Cold to Anthropoid Apes and Human Beings by Means of a Filtrable Agent. *J. Exper. Med.* **52**: 701 (Nov.) 1930.

5. Paul, J. H. and Freese, H. J. An Epidemiological and Bacteriological Study of the Common Cold in an Isolated Arctic Community (Spitsbergen). *Am. J. Hyg.* **17**: 517 (May) 1933.

sudden changes in temperature and excessive chilling or wetting of the skin promote conditions in the respiratory passages that permit the virus to invade and then spread through the community. There seems to be little doubt that these environmental factors are of importance but their precise role remains unclear. The studies of Paul and Freese,<sup>6</sup> carried out in Spitsbergen, and those of Paul<sup>5</sup> on the nonmagnetic ship *Carnegie* shed some light on this problem. In Spitsbergen, which is an extremely isolated community in winter, it was found that an unfavorable environmental factor such as a sudden drop in atmospheric temperature, was not necessary for the development of an epidemic of colds. It was noted, however, that the arrival of the first boat of the shipping season was usually followed by an epidemic involving the whole community in a short time. This suggests that the introduction of the virus from outside is more important than the climate. Also it was noted by Paul and Freese that trappers who fell through the ice did not develop colds during the winter and spring but did so only if such an accident occurred after the men had been to town in the summer and fall. Such observations suggested that sudden chilling of the body may bring on an attack in a person who has had a recent infection or a recent contact, but only if such a condition accompanied the chilling. That chilling may predispose to colds in isolated groups, however, would seem to receive some support from the following observations of Paul. Outbreaks of colds were noted on the *Carnegie* when the ship entered a cold current from warmer waters even though it had been out of port for days or weeks. This suggests that exposure to cold may in some way activate the virus in a group after it has failed to produce infection for many days or weeks preceding the outbreak.

It seems plain that a more careful definition of the host and environmental factors which favor the spread and invasion of the virus of the common cold is necessary before the spread of this infection can be effectively controlled.

**Prevention**—Methods of preventing colds have been directed along several lines. It can be said at once that none of them are effective. Since it is as yet impossible to prevent the spread of the virus in the community, attempts have been made to increase the resistance of the host. Within recent years vaccines, vitamins and "hardening processes" have been investigated. These deserve individual comment.

**Cold Vaccines**—In attempting to reduce the number of colds in susceptible persons, vaccines containing a wide variety of micro-organisms commonly found in the respiratory tract have been used. Since the common cold is due to a filtrable virus and the organisms included in the vaccines are now believed to be of secondary importance, it is not surprising that these vaccines, whether given by mouth or by injection, have been a great disappointment. In spite of the many supporters of this method of prophylaxis, it is generally agreed that the incidence of colds is no less following their use than in groups of nonvaccinated controls, and there is good evidence that these vaccines may produce little or no protection against diseases of the upper respiratory passages.<sup>6</sup>

Since so-called cold vaccines are still widely used, it is well to review the evidence on which the foregoing

statements are based. To Diehl, Baker and Cowan<sup>7</sup> belongs the credit for clarifying the position of cold vaccines. In two reports, one appearing in 1938<sup>7</sup> and the other in 1940,<sup>8</sup> the following results were recorded. In 1938 it was found that in a group receiving a polyvalent vaccine by mouth the incidence of colds was the same in the vaccinated as in the control group, and the same was true when Rosenow's streptococcus vaccine was used. In a third group receiving vaccine subcutaneously there were 25 per cent fewer colds per person than in the control group. This difference was noted during both years of the study and was considered statistically significant. Practically, however these authors expressed the opinion that this reduction of 25 per cent in the average number of colds in the group was not sufficiently great to justify the time and expense involved in carrying out the program. In the second report, appearing in 1940 it was concluded that in a group of cold susceptible students at the University of Minnesota there was no evidence that heat killed vaccine was of any value in preventing the common cold.

As the virus of the common cold promotes the growth of micro-organisms in the respiratory passages, it might be hoped that vaccines made from these organisms would reduce the number of complications. Experiments designed to shed light on this question have been carried out by Dochez and his associates<sup>6</sup> and by Diehl, Baker and Cowan.<sup>7</sup> The results have not been very encouraging. The former investigators studied a group of 20 infants in an institution and gave vaccine at weekly intervals over a period of months. Nine injections were given in the autumn and a similar number in February and March. Another group of infants of the same age and living under the same conditions were observed as controls. The results of this carefully controlled study were of great interest. There was no reduction in the number of simple colds or of respiratory infections associated with fever in the vaccinated when compared with the nonvaccinated. There was, however, an apparent reduction in the severity of the infections as judged by the duration of the fever, which was shorter by 40 per cent in the vaccinated than in the nonvaccinated. There were 5 cases of pneumonia among the nonvaccinated group and 1 case in the vaccinated group. Dochez and his co-workers concluded that the protection against febrile respiratory complications of a cold was incomplete and that the technic of carrying out such immunization so time consuming and burdensome that this method did not seem promising for general use.

Diehl, Baker and Cowan<sup>7</sup> were unable to find any difference in the incidence of complications in the vaccinated and the nonvaccinated. The slight difference in the two groups may have been due to the difference in ages and in environment. One group lived in an institution, the other was composed of students in a university.

On the whole, then, one can say without fear of contradiction that the results obtained from cold vaccines have been disappointing. The vaccines have failed to prevent colds, and they have failed to lessen the number of complications except when given repeatedly over a long period of time.

<sup>6</sup> Dochez A R, Mills K C and Kneeland Yale Jr. Disease of the Upper Respiratory Tract. Problems Connected with the Etiology and Prophylaxis. J A M A 101 1441 (Nov 4) 1933

<sup>7</sup> Diehl H S, Baker A B and Cowan D W. Cold Vaccines: An Evaluation Based on a Controlled Study. J A M A 111 1166 (Sept 24) 1938

<sup>8</sup> Diehl H S, Baker A B and Cowan D W. Cold Vaccines: A Further Evaluation. J A M A 115 593 (Aug 24) 1940

**Vitamins**—Deficiency states often predispose to infections, but the supplying of extra vitamins and other food elements to the person who shows no signs of deficiency disease does not protect him against respiratory infections, including colds. Carefully controlled studies have been made recently by Cowan, Diehl and Baker<sup>9</sup> and by Kuttner<sup>10</sup>. The evidence is good that large doses of vitamins A, B<sub>1</sub>, B<sub>2</sub>, C and D and nicotinic acid, or vitamin C alone, have no significant effect on either the number or severity of upper respiratory infections when exhibited to young adults who are on a reasonably adequate diet. Besides these observations, Sutliff, Place and Segool<sup>11</sup> were able to show that large doses of vitamins A and D failed to prevent complications in established hemolytic streptococcus infections of the throat. Experiments such as those carried out by the Minnesota group<sup>9</sup> are of the highest importance, since here was a group of investigators sincerely interested in methods of preventing and treating colds, who have devoted a number of years of study to this most important problem. They understand the significance of a controlled experiment. A careful study of their data leaves no doubt in the minds of the most critical observer that vitamin therapy in the group studied by them was of no value as far as either the number or the severity of colds was concerned. There is no reason to believe that their experience is unique.

**Hardening Processes**—A number of procedures have been recommended from time to time which have as their objective the conditioning of the body to sudden changes in external temperatures of the skin, such as cold shower baths every morning and exercise outdoors followed by hot and cold shower baths. Controlled experiments on this subject have been carried out by Gafafer,<sup>12</sup> who was unable to show any lower incidence of colds in people who followed these practices when compared with a group who did not.

To sum up, it can be stated that vaccines containing the ordinary organisms found in the nose and throat are of no practical value in the prevention of colds. There is no conclusive evidence that they even shorten the course of a cold or prevent the development of secondary infections. It is also true that vitamins fail to prevent colds, at least in a group of cold susceptible people. To date, all other measures have failed to influence the frequency of colds, and we are forced to the unhappy conclusion that at present there are no effective methods available for the prevention of the common cold. Personal hygienic measures and the avoidance of excessive chilling and sudden changes in temperature, especially at a time of year when colds are prevalent, may aid in reducing the total number of colds in some individuals. Avoidance of exposure to colds is important but not always practicable. Every effort should be made to practice hygienic measures, such as washing the hands before meals and avoidance of direct contact with persons with colds. Once colds have developed, relief can be obtained by rest, from codeine and papaverine, and through symptomatic

treatment. Undue risks should not be taken, since colds are often followed by pneumonia and other serious respiratory illness.

Continued study of the factors influencing the development and spread of colds is needed, such as a search for adequate and effective chemotherapeutic agents.

#### INFLUENZA

**Terminology**—Since it has been demonstrated repeatedly that the clinical picture recognized as influenza is not a single etiologic entity, it has been suggested by a group of prominent students of the problem<sup>13</sup> that a more precise nomenclature be used. They suggest that influenza be identified according to the virus which is isolated from the patient by such terms as "influenza A" and "influenza B." When a disease occurs in which the clinical features are like those of influenza but it is impossible to isolate a specific virus, it is suggested that the name "clinical influenza" be used.

Clinical influenza occurs as a sporadic, epidemic or pandemic infection. The sporadic and epidemic forms which have occurred in this country and elsewhere within the last few years are due in many instances to a filtrable virus designated as influenza type A and type B respectively. Whether the pandemic disease which occurred in 1918 was due to the same virus is not known. There seems little reason to doubt, however, that it was due to a virus infection. Of all the epidemic respiratory infections, influenza is perhaps the most important, since it can virtually paralyze the activity of civilian and military units. It not only causes great loss of time from work but, since it predisposes its victims to pneumonia, it is responsible for many deaths. In the United States alone in 1918 the attack rate varied from 150 to 280 per thousand, and the total number of deaths reached 500,000. It is no wonder, then, that this pandemic is remembered as one of the worst calamities affecting any nation.

Stimulated by this experience, a number of agencies, among them the Influenza-Pneumonia Commission of the Metropolitan Life Insurance Company, the International Health Board of the Rockefeller Foundation, the Chemical Foundation, the Commonwealth Fund and the National Institute of Health, and a number of scientists working in our leading universities and research institutes began an intensive study of the cause of influenza together with an investigation of methods of prevention and control. Within recent years, great advances have been made. We now know that some forms of influenza are caused by a filtrable virus which can be isolated and used as a vaccine. We also know that there are available both antipneumococcus antiserum and sulfonamide drugs for the treatment of pneumonia, which is so often a complication of influenza. While the sulfonamides have no demonstrable effect on the influenzal infection, they are powerful agents in the treatment of pneumonia and there is some evidence that they may aid in its prevention.

In an attempt to prevent influenza, three lines of investigation have been prosecuted: the use of vaccines, the control of air borne infection by means of ultraviolet irradiation of air and the use of propylene glycol vapor, and the use of immune serum.

**Vaccines**—As soon as a virus was isolated from cases of influenza, attempts were made to develop a vaccine which would produce protection against infection. It was soon found that neutralizing and protective

<sup>9</sup> Cowan D. W., Diehl H. S. and Baker A. V. Vitamins for the Prevention of Colds. *J. A. M. A.* **120**: 1268 (Dec. 19) 1942.

<sup>10</sup> Kuttner A. G. The Effect of Large Doses of Vitamins A, B, C and D on the Incidence of Upper Respiratory Infections in a Group of Rheumatic Children. *J. Clin. Investigation* **19**: 809 (Nov.) 1940.

<sup>11</sup> Sutliff W. D., Place E. H. and Segool S. H. Cod Liver Oil Concentrate (Concentrated Vitamins A and D). Ineffectiveness of Large Doses in the Prophylaxis of Otitis Media Complicating Scarlet Fever. *J. A. M. A.* **100**: 725 (March 11) 1933.

<sup>12</sup> Gafafer W. M. Hardening Processes and Upper Respiratory Disease (Common Cold). *Am. J. Hyg.* **16**: 233 (July) 1932.

<sup>13</sup> Horsfall F. L. Jr., Lennette E. H. and Richard E. R. The Nomenclature of Influenza. *Lancet* **2**: 413 (Oct. 5) 1940.



antibodies could be produced in animals vaccinated with the virus. A wide variety of vaccines have been used in man to stimulate antibodies and protect patients against attacks of influenza.<sup>14</sup> Without attempting to review in detail the literature on this subject, I can make the following statements. Vaccines made of influenza virus call forth an antibody response in the recipients but they do not completely protect against attacks of influenza. The evidence is good that the incidence of the disease is reduced in some groups and the duration of the disease is shortened. Stokes and Henle<sup>15</sup> have pointed out that the higher the titer of antibodies in the blood, the lower the incidence of influenza. It would appear that the presence of antibodies in the circulating blood aids greatly in the protection against attacks of influenza but from many studies it seems evident that there are often other factors aside from the antibody titer in the circulating blood which are important in preventing infections. For example Francis<sup>16</sup> has found that nasal secretions from some human subjects contain material which neutralizes the influenza virus. Such an observation suggests that local as well as general factors are important in the resistance of individuals to the invasion of the influenza virus. The studies which have been carried out so far with vaccines give considerable promise and are a real step in advance.

*Control of Air Borne Infection*—Aside from increasing individual resistance to infection, attempts have been made to prevent the spread of the influenza virus and other infective agents by means of ultraviolet irradiation of air and propylene glycol vapor. It was first demonstrated by Robertson and his associates<sup>17</sup> that the vapor of propylene glycol, even in a dilution of 1:50,000,000, was effective in destroying air borne bacteria and the human influenza virus A, as demonstrated by plating and animal tests. Harris and Stokes<sup>18</sup> and Stokes and Henle<sup>19</sup> have recently reported their results with the effect of this vapor on the incidence of respiratory infections in a convalescent home for children and in the prevention of air borne infection of mice by influenza A virus. These preliminary observations leave no doubt in any one's mind that this vapor is an effective means of sterilizing or reducing the bacterial counts in the air of hospital wards. They are also indicative of the great potential value of this method in the prevention of cross infection,

especially when persons live in close contact with others indoors. When the effect of ultraviolet irradiation was compared with that of propylene glycol vapor it was demonstrated that they were almost equally effective in the prevention of air borne infection of mice by influenza A virus. These experiments suggest that both ultraviolet radiation and propylene glycol vapor spray are agents which deserve extended trial in the prevention of the spread of respiratory infections.

*Immune Serum*—The use of immune serum locally in the nasal passages has also been explored. Stokes and Henle<sup>15</sup> have reported encouraging preliminary results with this method in experimental animals which indicate that it deserves a trial in man.

It can be seen, then, that intensive investigations are being carried forward at the present time which have as their objective the prevention of influenza. The results which have been obtained so far are extremely encouraging, and there are good reasons for believing that further advances will be forthcoming in the near future.

#### PNEUMOCOCCIC PNEUMONIA

Great strides have been made in the treatment of pneumococcic pneumonia but very little has been accomplished in its prevention. It is now acknowledged that the death rate from pneumonia has decreased considerably since the introduction of sulfapyridine in 1937. This decline has occurred in spite of the fact that there has been no decrease in the incidence of the disease. Concurrent with a reduction in the death rate there has occurred as a result of modern treatment a decrease in the total number of days of illness. For example, Ungerleider and Gubner<sup>19</sup> of the Equitable Life Assurance Society of the United States, in commenting on the economic aspects of pneumonia with reference to the prevalence and duration of illness in the years before and since the development of the sulfonamides have pointed out the following facts. When the incidence of pneumonia in the three years preceding the use of the sulfonamides was compared with its incidence in 1939, 1940 and 1941, it was clear that there was no decrease, indeed there appeared to have been an increase. Secondly, the duration of illness has been greatly reduced, that is to say, the average period away from work in 1941 was 35 days, compared with 45 days in 1935. The modal or most frequent duration of illness in 1941 was 27 days, compared with 38 days in 1935. The experience of others is in agreement with these findings.

There seems to be no doubt, then, that with modern methods of treatment the total number of days lost from work by persons who develop pneumonia can be greatly reduced. In the aggregate this results in great economic savings to industries, employees and insurance companies.

*Cause of Death*—We may now turn our attention to the question of the cause of death in patients with pneumonia, since it is only by a knowledge of these factors that improvement can be made possible. It is well known and widely recognized that the prognosis in pneumonia depends on the summation of many factors, including age, sex, season of year, occupation, bacteremia, number of lobes involved, type of pneumococcus, complications, pregnancy, debilitating diseases and the time and type of treatment. In order

<sup>14</sup> Hirst, G. K., Richard, E. R., Whitman, Loring and Horsfall, F. L. Jr. Antibody Response of Human Beings Following Vaccination with Influenza Viruses. *J. Exper. Med.* **75**: 495 (May 1) 1942. Martin, W. P., and Eaton, M. D. Experiments on Immunization of Human Beings Against Influenza A. *Proc. Soc. Exper. Biol. & Med.* **47**: 405 (June) 1941. Daildorf, Gilbert, Whitney, Elinor and Ruskin, Arthur. A Controlled Clinical Test of Influenza A Vaccine. *J. A. M. A.* **116**: 2574 (June 7) 1941. Horsfall, F. L. Jr. and Lennette, E. H. A Complex Vaccine Effective Against Different Strains of Influenza Virus. *Science* **91**: 492 (May 24) 1940. The Synergism of Human Influenza and Canine Distemper Viruses in Ferrets. *J. Exper. Med.* **72**: 247 (Sept. 1) 1940. Eaton, M. D., Martin, W. P. and others. Immunization with Inactive Virus of Influenza B. *Comparison of Antibody Response with That Produced by Infection*. *Pub. Health Rep.* **57**: 445 (March 27) 1942. Horsfall, F. L. Jr., Lennette, E. H. and Richard, E. R. A Complex Vaccine Against Influenza A Virus. *Quantitative Analysis of the Antibody Response Produced in Man*. *J. Exper. Med.* **73**: 35 (March) 1941. Francis, Thomas Jr. The Immunology of Epidemic Influenza. *Am. J. Hyg.* **28**: 63 (July) 1938.

<sup>15</sup> Stokes, Joseph Jr. and Henle, Werner. Studies on Methods of Prevention of Epidemic Influenza. *J. A. M. A.* **120**: 16 (Sept. 5) 1942.

<sup>16</sup> Francis, Thomas Jr. The Inactivation of Epidemic Influenza Virus by Nasal Secretions of Human Individuals. *Science* **91**: 198 (Feb. 23) 1940.

<sup>17</sup> Robertson, O. H., Bigg, Edward, Miller, B. F. and Baker, Zelma. Sterilization of Air by Certain Glycols Employed as Aerosols. *Science* **93**: 213 (Feb. 28) 1941. Robertson, O. H., Bigg, Edward, Puck, T. T. and Miller, B. F. The Bactericidal Action of Propylene Glycol Vapor on Micro-Organisms Suspended in Air. *J. Exper. Med.* **75**: 593 (June) 1942.

<sup>18</sup> Harris, T. N. and Stokes, Joseph Jr. The Effect of Propylene Glycol Vapor on the Incidence of Respiratory Infections in a Convalescent Home for Children. Preliminary Observations. *Am. J. Hyg.* **204**: 430 (Sept.) 1942.

<sup>19</sup> Ungerleider, H. E. and Gubner, R. S. Economic Aspects of Pneumonia. Prevalence and Duration of Illness in Pre-sulfonamide and Post-sulfonamide Year. personal communication to the author.

to gather more information concerning the factors responsible for death among a group of industrial policyholders, a study along these lines was made by the Metropolitan Life Insurance Company and published in 1941.<sup>20</sup> It was found that the age of the patient, delay in calling a doctor, premature discontinuance of chemotherapy and complicating diseases were vital factors in influencing the death rate. This being the case it would seem necessary to stress to the patient as well as to the physician the importance of early and thorough treatment. In this way the death rate may be reduced still further.

**Prevention**—What can be done about the prevention of pneumonia? It has already been stated that very little has been accomplished in this direction and the disease continues to remain a major factor in loss to industry through illness. In any discussion of the prevention of a disease, it is well to ask how it is acquired and what factors predispose to its development. While the factors of susceptibility to pneumonia are not all clearly understood a number of advances have been made recently in the epidemiology of pneumococcal infections. The reviews of Finland<sup>21</sup> are recommended for reading and study. In these reviews it is stated that both carriers and cases of pneumonia serve as foci for the spread of the disease, carriers being more important than cases. Finland also asserts that the occurrence of pneumococcal infection is dependent on the individual's susceptibility to the particular strain of pneumococcus with which he comes in contact. While the aspects of this underlying susceptibility are not all understood, it is recognized that the following features are important: excessive fatigue from overwork and inadequate rest, excessive chilling following exposure to cold or wet, sudden chilling when overheated, the presence of other infections such as colds, influenza, bronchitis and acute or chronic alcoholism. To these of course, should be added the extent and intimacy of contacts with cases or carriers. The spread of pneumococci is greatest within families, in barracks or in open dormitories where the chance for intimate and repeated contacts is possible.

**Recommendations for Control**—What specific recommendations can be made for the control of the spread of pneumonia and pneumococcal infections in general? A few of the chief points may be enumerated:

- 1 Education of the medical profession and public concerning the dangers of the spread of pneumonia by contact with cases of pneumococcal infection in the home or elsewhere.
- 2 The isolation of all active cases.
- 3 The adequate medical care of colds and bronchitis.
- 4 The destruction of all discharges from the nose and throat.
- 5 The early recognition, reporting and isolation of the infective agent.
- 6 The prompt and effective use of chemotherapeutic agents.
- 7 The avoidance of overcrowding.

Predisposing factors leading to the spread of pneumonia in industries must be studied carefully with an attempt to eliminate each one as far as possible.

#### ATYPICAL BRONCHOPNEUMONIA OF UNKNOWN ETIOLOGY

In conclusion something should be said about a group of respiratory infections which has attracted considerable attention within the past few years. These conditions have been described under a variety of names such as virus pneumonia, atypical bronchopneumonia of unknown etiology and acute pneumonitis. It is plain that they do not represent a single etiologic group since several different viruses have been isolated from clinically identical cases. In the vast majority of instances, however, no specific agent has been isolated.

The prevailing type is acute in onset, with fever, prostration and cough. It is highly contagious and the incubation period lasts from ten to fourteen days or longer. The course is extremely variable, but it tends to be self limited, lasting from ten days to two weeks. Complications are few and the outcome is usually favorable. The course of the disease is not altered by chemotherapy.

Since the cause of this disease is unknown, its prevention is difficult. However, the same general measures should be taken in an attempt to control it as are recommended for the control of other types of pneumonia.

### THE OLDER WORKER

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While it is true that modern war, the organized killing of our fellow men and wholesale destruction of the products of human toil, can be waged most efficiently by men between the ages of 18 and 35, the industrial needs of this war have already demonstrated anew several important facts about the older industrial worker, facts well known but forgotten or ignored in the plethora of peacetime manpower and in the fog of a social philosophy according to which a life of leisure is heaven and society must feed, clothe and house all idle chicks whether or not these chicks can scratch. These facts are:

1 The physiologic age of the worker is not synonymous with his chronologic age, owing to the individual variables in heredity, mode of living, accidents and sequence of disease.

2 While most workers past 50 or 60 years of age have somewhat less physical strength and physical endurance as well as some impairment of hearing and vision, this may be compensated for in many forms of labor by the greater skill and experience and the decrease in youthful dissipation.

3 By keeping in idleness older workers who can still perform useful labor, we are not only wasting valuable human resources but we are contributing to biologic parasitism and degeneration of human society. For man is no exception to the biologic law that existence without effort, without struggle, impairs the species.

4 By forced idleness of the increasing army of older workers in our midst we are forging a dangerously weak link in that large fraction of society whose experience, wisdom and relative unselfishness could guide those with less experience and wisdom. For when a person is shunted out of the dynamic current of life, courage and incentive are at low tide.

<sup>20</sup> Some Current Results in Pneumonia Treatment. Statistical Bulletin Metropolitan Life Insurance Company 22: 1 (Oct.) 1941.

<sup>21</sup> Finland. *Recent Advances in the Epidemiology of Pneumococcal Infections*. Medicine 21: 307 (Sept.) 1942. *The Spread of Pneumococcal and Streptococcal Infections in Hospital Wards and in Families*. Pub. 17. Ann. N. Y. Acad. Sci. 47: 212.

5 One element in the philosophy of organized or union labor, namely equal hourly wage for all workers in each special trade, must share part of the blame for the past practice of discarding the older worker by the management of industry. Even though all workers are not equal in skill and efficiency, and in spite of the fact that the practice of organized labor tends to gear the rate of all workers to the slowest in the group, there comes a day when the older worker in many given tasks cannot keep pace even with the slowest and least efficient younger comrades. Economic management calls for dismissal of the older worker at that point. If wage in proportion to performance was recognized as a fundamental principle, the older worker could taper off in industry, just as the young apprentice works himself gradually up in skill, performance and remuneration. From my knowledge of human nature another destructive effect on morale, efficiency and joy of living results from the practice of gearing the most efficient to the rate of performance of the least efficient. On that plan the ablest worker will seldom, if ever, experience the joy of performance according to his superior ability or the growth in skill commensurate with his ability. This not only is a waste of precious human resources but tends to make lives humdrum that could be enriched by the daily challenge and joy of more and better performance. For the ablest worker to be geared to mediocrity, to do less than his best, is bad psychology for our ablest people and is, so far as I can see, of little or no aid to the less able fellow citizen or to society. I speak not without experience. I was a firm hand and a labor union carpenter before I became a college student, an investigator and a teacher in the medical sciences.

Under more primitive and biologic conditions of human life, as in life on the farm and in agriculture in general, work and responsibility of children and youth have their normal biologic upward curve, as is the case among all wild animals who have to scratch for their living. Under similar conditions of life, as on the farm, men and women past 50, 60 or 70 years also find their niche of productive work, happy in the knowledge that they still have a part in the stream of life. Biologically, man grows in understanding and physical and mental efficiency from birth up to 25 or 30. Then there is a plateau of efficiency for some twenty years, health being present. Then the reversal of the youth curve sets in, the gradual impairment of the physical and considerably later even of memory and of mental efficiency. A civilization, a social or an economic system that discards men and women of 50 or 60 as no longer a link in the chain of human labor, as no longer productive physically and mentally, I say such a civilization, such social and economic systems, are thoroughly unbiologic, thoroughly wasteful and thoroughly cruel and inhuman to our fellow men at the later decades of life. A man or a woman in modern industry, trained to do, and for twenty or thirty years having done only one such small thing as fitting a screw on a certain size nut for eight hours a day, may not be able to perform that mechanical feat at the standard rate when past 50 or 60. But it is a terrible reflection on our education if that man and woman past 50 or 60 cannot do something else of value to society and to themselves. And it is certainly no indication of intelligent planning on the part of such society if opportunities for such work are not afforded. In fact tasks for which men and women past 50, 60 and 70 are thoroughly capable lie all around us like mountains

but we do not see them. Social security for our aging population is all right in principle, but it should take the form of labor for which these people are capable and not the form of pay for doing nothing.

In industrial tasks calling for maximum performance of the entire machinery of the human body, the older worker by and large will be increasingly handicapped by the sequelae of accidents and disease, despite all efforts of accident prevention and our growing knowledge and skill in medicine. Apart from and in addition to these factors, what are the inevitable and unavoidable aging changes of man rendering him less fit, if not unfit to labor? When and how speedily do these aging changes come on in the individual? Do these aging changes or impairments constitute a bar to all useful labor? Can industry be organized so as to make fair and adequate use of men and women handicapped by age alone? Is there no alternative to the relegation of men and women past 50, 60 or 70 years of age to the scrap heap of idleness and the dole, to parasitism and charity? All age changes come on gradually. Those body changes with age involving the strength and endurance of the skeletal neuromuscular mechanism and the senses of hearing and vision are probably the most significant for the industrial worker, but it must also be kept in mind that these systems are all dependent on a good diet, a good intestine, good blood, good kidneys and good lungs. The human body is a machine. Any weak link tends to impair all the other links. Some age impairments appear as early as the third decade. If all industrial labor was physically as exacting as prize fighting, marathon running or professional football, nearly all workers would be retired at 35 years of age.

Progressive age changes, not as yet shown to be due to specific diseases are

- (a) Gradual tissue desiccation
- (b) Gradual retardation of cell division, capacity or cell growth and tissue repair
- (c) Gradual retardation in the rate of tissue oxidation (lowering of the basal metabolic rate)
- (d) Cellular atrophy, degeneration, increased cell pigmentation and fatty infiltration
- (e) Gradual decrease in tissue elasticity and degenerative changes in the elastic connective tissue
- (f) Decreased speed, strength and endurance of skeletal neuromuscular reactions
- (g) Decreased strength of skeletal muscle
- (h) Progressive degeneration and atrophy of the nervous system, impaired vision, hearing, attention memory and mental endurance

#### THE NEUROSKELETAL SYSTEM

The gradual slowing and weakening of reflexes and general body activity in the aging mammal is so obvious as to be well known both to physicians and to laymen. Decreased functional capacity both in the nervous tissues and in the skeletal muscular tissue seems to be at the base of this gradual decline. Actual atrophy of the Purkinje cells of the cerebellum has been described in the aged and, since this part of the nervous system is seriously concerned with skeletal muscle tone and coordination of skeletal muscle contractions, it may be a factor in the growing muscular weakness of old people irrespective of the cause or causes of this atrophy in the cerebellum.

As regards the cerebrum of aged people, general atrophy has been described especially in the frontal and occipital lobes and actual disappearance of cells in some of the layers of the cerebral cortex, as well as pigmentation and fat infiltration of the nerve cells and actual

hyperplasia of the neuroglia cells. Similar degenerative changes with age occur in the spinal cord, that is, atrophic pigmentation, actual loss of cells and degeneration of the axons of many ventral horn cells. In the case of the brain, thickening of the meninges occurs with advancing age, but it is difficult to see how this in any way should interfere with nervous action or nervous function.

Recent investigations appear to demonstrate a very gradual but significant decrease in the myelinated fibers of the dorsal nerve roots with advancing age. This must be secondary to an atrophy and death of spinal ganglion cells and is probably the basis of the reduction in cutaneous and protopathic sensibility of aged people. The sense of pain seems to be the least affected by aging. In view of such evidence of atrophic and degenerative changes in the central and peripheral nervous system irrespective of the primary cause or causes of these changes, it is not surprising that neuromuscular weakness, slowing of the reaction time and decreased capacity to learn are part and parcel of the physiology of aging. The speed of learning seems indeed to decrease gradually in man from the fourth decade on. But this handicap of the aged is on the whole more than made up for in some individuals by their greater speed of correlation and evaluation of a new experience.

There is very little evidence of aging changes in smooth muscle, which seems on the whole to retain its normal histologic character into advanced old age. The diminished tone in smooth muscle, as may be seen in the blood vessels in the intestine and the smooth muscles of the skin and other structures in old people, may be secondary to the impairment in the nervous system that has been indicated. But not all the impairment of body motility with age can be ascribed to degenerative changes in the nervous system itself because the striated skeletal muscle system shows fatty infiltration and brown atrophy with advancing age. The strength of the biceps at the sixth decade of life is only about 50 per cent of that at the age of 25 to 30. The trunk muscles decline in power somewhat slower. However, the recent investigation by Kubo (1938) reports little evidence of decrease in muscle strength and endurance in people that would ordinarily be called old, that is, people 70 to 90 years of age. This is just another illustration of the individual variations in the chronologic age appearance of the aging processes. There is some increase in connective tissue and elastic fibers in the skeletal muscle of old people and there is clear evidence of desiccation, that is, decrease in intracellular fluid. But in this respect the skeletal muscle of the aged falls in line with all the other tissues of the body.

#### VISION AND HEARING

Because of the accessibility of the organs themselves and the availability of quantitative tests of function, we have more accurate information regarding the aging changes in the physiology of the eye and the physiology of the ear than in the case with most of the other systems in the human body. In the case of vision there is a gradual decrease in visual acuity (central vision), a gradual narrowing of the visual field, as well as a slowing of the dark adaptation (peripheral vision) and a gradually higher threshold for light stimulation for man past the fourth decade. The narrowing of the visual field is probably due to the actual degeneration of the nerve cells (cones), starting in the periphery of the retina. We are not yet in a position to say whether

these visual impairments occur independent of, or are secondary to, impaired retinal circulation. It is equally well known that the incidence of cataract increases with aging irrespective of whether or not the tendency to cataract formation is hereditary. Arterial sclerosis would undoubtedly accelerate any such hereditary weakness, and so would certain faulty diets and certain endocrine and other metabolic disorders. The gradual decrease of the elasticity of the lens is another well known and accurately measured phenomenon of aging man, with the exception that diminution in lens elasticity actually starts in childhood and practically all lens elasticity is lost before 60 years of age. The lens continues to grow at the periphery (vertex) and thus approaches closer and closer to the center with advancing years. At the same time the material at the center of the lens becomes more dense. Both of these factors and the lens swelling from increased water content, are responsible for the well known phenomenon of so called second sight of people 60 years of age and beyond. This lens change tends to counteract the presbyopia, or impairment of accommodation in hyperops due to the loss of lens elasticity. Other age changes that may contribute to the gradual impairment of vision with age are diminished translucency of the cornea, the arcus senilis and the vitreous humor. It need not be pointed out that the retina being actually a lobe of the brain, is necessarily seriously impaired by local vascular pathologic change as is any other part of the brain. However, because of the accessibility of the retinal vessels to direct inspection we have probably earlier factual information regarding such pathologic change in the retina than we have in most of the other deep organs of the body.

#### HEARING

From the age of about 20 on there is a gradual loss of acuity to all tones but the loss of sensitivity is greater to the high tones. This deterioration of hearing is somewhat greater in the male, but the degree of retrogression is not predictable on chronologic age, as some people at 80 have no greater auditory impairment than other normal people at 50. This impairment of auditory acuity is present even when tested by bone conduction. The cause for this decline in auditory acuity appears to be a gradual but distinct atrophy of the nerve cells in the basal coil of the cochlea. But anemia, due to incipient arterial sclerosis, may also be a factor, since in experimental anoxia the perception of the high tones goes out first.

In the light of all these facts, one would expect that intellectual capacity should decline parallel with neuromuscular strength and endurance. According to all existing evidence, this is not the case. This exception is probably due to the significant role of experience especially in the case of complex intellectual problems.

#### THE DIET OF THE OLDER WORKER

While we do not know what may be the optimum diet for optimum efficiency for any age, we do know enough to say with certainty that the older worker will keep most fit by eating enough good food to avoid underweight and avoid eating so much food as to become obese. Life insurance statistics show clearly that definite underweight as well as definite obesity shortens the life span. Common experience demonstrates that both impair physical endurance and performance. It is not difficult to understand why ingestion of food to the point of obesity is injurious to people with reduced factors of safety in the matter of insulin pancreas, sugar and fat metabolism. Such dietary excesses

damage by overwork already impaired mechanisms. But in the absence of diabetes, actual or incipient, why does obesity, maintained for years, initiate or aggravate cardiovascular, renal and other disorders that shorten the life span? While the answer to these questions is being sought by experiments and accurate observation on mice and men, prevention of obesity in all workers past 30 appears to be a prophylactic imperative, a must.

From time to time financially fortunate and humane fellow citizens provide funds for "old peoples' homes." I hope that some financially fortunate, humane and farsighted fellow citizen will soon provide the National Research Council with a fund of \$1,000,000 to be used toward learning what is the optimum diet for old people—old workers on the farm, in industry in business and professions as well as those in old peoples' homes.

We know that the digestive secretions decline with age. The frequency of achlorhydria rises gradually in the population even past 30. What this means in the way of diet and nutrition of the older worker is not yet known. Dr. Edward L. Tuohy<sup>1</sup> recently published an excellent review of the known and the unknowns in "Feeding the Aged." There can be little doubt that persistent bad food habits will induce increasing impairments with the added years. The lower basal metabolic rate may call for fewer calories (less fats and starches) for men and women past 60 or 70, but the need for proteins, minerals and vitamins does not seem to be correspondingly reduced. Cash in the paltry sum of the price of a single super bomber would go far toward replacing with knowledge our present gaps and guesses as to the optimum diet for the older worker.

It should be quite clear to all informed people that normal aging strikes no man with the suddenness of an acute disease. We are not worth 100 per cent industrially today and worth zero tomorrow on our sixty-fifth or seventieth birthday. We grow old and inefficient just as we grow up and efficient over the years. We have discovered that useful work can be performed by people with disabilities more serious than those of normal aging, such as the blind, the deaf, the mute, people minus a hand, an arm, a leg or both legs. We readily admit that useful work suitable to the gradually aging worker is less readily provided in industry than on the farm. But it can be done, it has been done, it is being done even in industry. Such an experiment by the Dodge Division of the Chrysler Corporation in Detroit is described in some detail in *Forbes' Magazine* for November 1942 by Don Wharton. This experiment seems more significant as it was well under way (1934) before the present war and hence not carried financially by the present billions of federal war appropriations. The ninety-nine workers in the "Old Man's Division" of the Dodge plant average 66 years in age and some of them are past 80. But the fact that all these workers receive the same pay (93 cents an hour) makes me think that the department is not run on a strict economic basis, that the excess costs, if any, are charged against all the workers in that industry or added in the price of the product, a practice not uncommon and possibly justified in the better morale of the older worker. The general formula relating work to remuneration seems simple.

A The younger worker. Physical strength and endurance growing, but not at adult par, skill and experience growing, but not at adult par = less than adult performance and pay.

B The adult worker. Strength and endurance at maximum experience and skill near or at maximum = maximum performance and pay.

C The older worker. Physical strength and endurance receding, experience and skill at par = generally less than adult performance and therefore less pay.

I never could understand, I do not now understand how industry as such can practice charity. Monies so devoted must by necessity be deducted from wages, salaries and dividends to stockholders or else the cost added to the cost of the product, in which case the charity is given, to be sure, without their knowledge by the consumers of the industry's product. Some day man may achieve sufficient stoicism to face with equanimity the fact that charity and doles are for the children and the sick, not for the aged, unless incapacitated by age.

If what I so far said squares with facts, reason and wisdom as well as with our conception of justice, we might expect educational institutions to be ahead of industry in the elimination of waste of the older workers. But this is not so. In general there is full salary and duties of college and university men up to 65 or 70 and then abrupt unemployment on assumed total incapacity. Two factors are probably mainly responsible for this waste: (1) the younger generation in a hurry and (2) the older generation so ignorant of biology that it cannot see the justice of reduced pay for reduced capacity and performance. One of our large state universities recently recalled as dean of its graduate school a man now 77 whom the same university retired from that position nearly ten years ago. It is not probable that this university dean is today more capable than he was ten years ago. It seems more probable that this university wasted a valuable human resource for ten years.

According to the U. S. census, the number of people past 65 years of age in our population has increased during the last ninety years from 2.6 per cent to 6.8 per cent. If this trend continues, and I think this is assured by more of science and the better art in medicine, fifty years hence about fifteen out of every hundred people will be over 65 years old. I think we can add that, by and large, this army of older people fifty years hence will be even better qualified for useful work than are the people of the same age today. Thanks to more science and better art in today's medicine, our larger aged army of 1940 is less decrepit than was our smaller army of 65 year olds a hundred years ago. It is sheer waste, bad biology and gross injustice all around to feed, house and clothe this army in idleness. Old age pension is not the answer. The dole is not the answer. The only answer is useful work for pay, plus sickness and accident insurance. When aging has rendered us incapacitated for useful work we are truly sick, and sickness insurance should meet our needs. I think I am discussing important principles, not arguing about names, not fighting windmills. Still it must be admitted that at 68 some people fail to recognize their own delusions. I think that useful work is a privilege and a blessing, not a curse. It is also a biologic and social duty as long as we can carry on. Because the probability of less elastic arteries and less cardiac reserves, not to mention less strength in the skeletal muscles, the worker past 60 should, as a rule, not be put at tasks calling for the physical power that a worker aged 20 to 40 can deliver with safety. Moderation in all things, and a thorough medical check up twice a year will aid the older worker in keeping fit to carry on.

<sup>1</sup> Tuohy, E. L. Feeding the Aged. *J. A. M. A.* 121: 42 (Jan. 2) 1943.

There is the prevailing view that quitting useful work before the infirmities of old age and specific disease compel it hastens the age decline and brings on death sooner. It is difficult to check this view by adequate controls. So far as I know, this view is based on conspicuous instances forgetting the exceptions. But to the extent that idleness decreases the zest of living, and unhappiness and depressing mental states actually impair some of our body machinery, it may be true, especially if the pleasure from good food is still strong, for in that case injurious overeating is likely to become the rule. I dream of a tomorrow when our millions of men and women well past the chronologic three score will say, with Albert J. McCray, aged 71, now running a drill press at a Douglas Aircraft plant, "I'd rather have a job than a pension any time,"—for that spirit helps to keep the older worker young and aids in making America stronger.

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## PROCESSING TECHNIQUES IN PHYSICAL EXAMINATION

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The success of the American production system is dependent on many factors, of which two extremely important ones are (1) progression from one phase of assembly to the next and (2) elimination of repetitive operations. In a tour through a well organized industrial plant one is at once impressed with the fact that, while innumerable dissimilar operations are being done, an atmosphere of order pervades the whole with each step properly placed in sequence and essential to the completion of the finished product. This is necessary for two particular reasons: (1) the need for using available manpower to the best advantage and (2) the fact that waste motion (or material) represents an increased production cost which in a highly competitive market directly affects sales and profits. This is one essential difference between private industry and politically controlled or operated manufacturing units.

Although industrial medical practice has been a separate entity and a recognized specialty for many years, very little has been done until comparatively recently to improve its operating status—to streamline it to eliminate waste motion. During the past four or five years the duties of the plant physician have more than doubled. In many plants the physician has to pass on transfers, all changes of jobs and manufacturing processes which entail hazardous operations or the use of toxic materials, and he finds his time otherwise taken up in conferences and the like—all this in addition to what he used to consider his regular duties—emergency surgery, physical examinations and so on. Without organization he would never get his work done, he would either quit in disgust or suffer a nervous collapse.

Our own medical department was similar to the departments of the majority of industrial plants visited during the past few years. It had started out as a glorified stepchild of the employment office and had gradually expanded through the years to include radiography and other activities but was still only too

apparently in overgrown first aid station. When one considers the evolution of industrial medical practice, this is not at all difficult to understand. Originally, first aid was a necessary evil with some retired pensioner in charge. The fact that he had little if any knowledge of medicine or first aid training had no bearing on the matter. I very soon had its cigar box containing iodine and assorted bandages, while frequently certain workers acquired considerable renown for their skill in removing foreign bodies from eyes with toothpicks. So the first aid station came into being. Later on practical nurses and still later graduates were placed in charge under the supervision of some doctor who dropped in occasionally but never took it very seriously. Then came the full time plant physician who was willing enough but who had to prove his worth to management and who found it quite difficult to demonstrate the dollar value of intangibles. But gradually the scope of his activities increased until at the present time the ramifications of the medical department reach into all manufacturing departments and processes. At first there was very little order and less system. Applicants for employment reporting for physical examination, were conducted past employees being treated for wounds of all sorts, the odor of disinfectants permeated the air, and the impression on the candidate was that this must be a bloody place in which to work. It was always our luck to have a lot of accidents on days when hiring was heavy, so that the people coming in were certain to see us at our best—or worst.

There were other problems also, one being that of department layout. The nurses were constantly walking from one end of the place to the other, so that an eight hour tour of duty resolved itself into a sort of "bumper derby." Patients were received in one room and taken down a long hall to the x-ray room, where they removed such articles of clothing as the nature of the examination required and then had to dress before being taken elsewhere for treatment or further examination. The use of the x-ray room for disrobing and dressing prevented its being used for other purposes, so that it was only about 60 per cent efficient. After taking the picture, the technician had to carry the cassette a considerable distance to the darkroom for processing. She then had to take the wet film across a hall to the view box. After returning the film to the darkroom for drying. If the doctor wished to see some one particular film, the technician had to wait until others in course of development were sufficiently processed to permit her to turn the light on or open the darkroom door. These were minor delays, yes, but in the aggregate entirely too much time was wasted, and when production schedules are up and the plants want their help, delay means the loss of a lot of production dollars, the ill will of the foreman and supervisors who want to know why they haven't gotten their men and criticism of the personnel-medical setup, until tempers get badly frayed and we say things we really shouldn't.

Another problem was that of individual rather than collective examinations. When several men are stripped in one large room they resent the lack of privacy. While curtained booths help somewhat they do not fully solve the problem. A solid door has a certain psychologic value, even though there may be others on the other side, the closed door insures privacy.

These are only a few of the problems with which we had to contend. Through the years we had given the matter considerable thought and we recognized that it

we were willing to break with tradition our production system had many features which were applicable to our own problems, such as elimination of repetitive motions, standardization of technic and other features which would increase our efficiency.

In planning our layout, the first step was to classify our contacts into one of three main groups:

1. Preemployment physical examinations
2. Employees who had been off sick reporting back for duty
3. Employees on company time reporting for treatment examination or consultation

Groups 1 and 2, i.e., those undergoing preemployment physical examinations and those returning to work following absence from all causes, should not come in contact with group 3, employees undergoing treatment or examination nor should those in group 3 come in contact with groups 1 and 2. To accomplish this two waiting rooms would be required, so situated that a man coming from the shop would not get into the applicant's waiting room, which communicated with the employment office and an outside factory entrance, nor should a prospective employee be able to get into the factory proper. This was quite important, for in times past applicants or those off duty would frequently be found wandering through the production departments. The most strict inspection at the factory gates would be futile if this by-pass existed.

It had long been our routine practice to take x-ray films in all cases of injury to bones and joints, no matter how presumably trivial the injury appeared to be. Although this necessitated quite a bit of extra work, experience has shown that it was fully justified. In addition, all applicants for employment, as well as those returning from sick leave have chest films taken, also a film of bone or joint injury sustained in recent automobile accidents or the like. We felt that it would be better to have one radiographic unit of superior quality with a centrally located processing room than to install two units and divide our activities and records. In order that the x-ray equipment might be equally accessible to the two groups (old and new employees) we decided to locate this room first and arrange the other activities around it. In laying out a medical department one should dismiss any idea of remodeling, as such, lest the completed job be no better than before. The fact that a certain unit such as the first aid, or a waiting room always had been in this corner or that does not necessarily mean that it was most efficient in that location.

As all our plants are conveniently situated with reference to an excellent general hospital, we have never attempted to keep any patients overnight or perform any surgery in our plant setup, which is essentially a minor dressing station and examination and consultation center. Many years ago Dr. Allen B. Knavel of Chicago educated us to the fact that tendon suturing and repair of traumatized extremities merited greater care than that afforded by kitchen table technic. By referring our surgical work to the city hospital our main planning problem was that of examination and consultation with dressings and treatment playing a secondary role. We therefore broke down the entire procedure of physical examination of applicants into individual steps, which we arranged in sequence. It began with his reception in the applicant's waiting room, where he was given a physical examination card and conducted into the preliminary examination room.

Presuming that a complete examination, including photograph, finger prints, chest x-ray and physical inspection takes thirty minutes, if the examining physician interested himself in each step of the procedure he could pass on only some sixteen applicants during an eight hour day. But if he delegates the bulk of these duties to others and confines himself solely to a review of the x-ray film and inspection of the candidate, he can handle from twelve to fifteen per hour, i.e. one hundred and twenty or more per day. Furthermore, a clever nurse can do many of these minor tasks far more quickly and efficiently than the doctor himself. In the matter of drawing blood specimens for serologic examinations we have several nurses who are extremely adroit at hitting veins and draw a hundred or more specimens of blood a day as a matter of course. Our x-ray technician and her assistant are both graduate nurses interested in radiology. To them a hundred or more chest films are a normal day's run, with the last as technically perfect as the first. This is very important, for aside from the diagnostic value of a well taken and properly processed film there is a medico-legal angle, we might have to display some one film in court in the event of a damage suit, and nothing is more embarrassing than to attempt to defend a case by presenting inferior films, besides, it takes no more time and but little more effort to take a good picture than a poor one. For fingerprinting and photography we trained two young women from our office staff.

The functioning of the preliminary examination room is under the supervision of the nurse who draws the bloods. It is her duty to see that things go smoothly, that applicants are admitted promptly, treated politely and passed on to the x-ray department. The average applicant is frequently a bit confused and apprehensive. If he is made to wait any great length of time, is greeted in a brusque manner or is treated roughly, he at once gains an unfavorable impression of the medical department and of the corporation which it represents, for quite frequently the only contacts an employee has with management are his foreman and the doctor. If we start a man off right we seldom have much trouble with him later.

We first take his photograph for identification purposes using a 35 mm camera at 30 inches,  $\frac{1}{25}$  second exposure at  $f/4.5$ , with one number 2 Photoflood bulb in a reflector. He is seated at the photograph table which was carefully designed for that purpose. His name, Social Security number and the date, together with 'Delco Remy, G. M.' are arranged on a "bulletin board" which is placed in position before him. The finished film shows these data below the picture of the person himself. All data are carefully checked, particularly the social security number, so that no mistake will be made. Having his picture taken by an attractive young woman makes him feel better, and he is then ready for his finger prints. This done, he is stretched out on a cot and a blood specimen drawn by the nurse before he has time to become alarmed. Further, very few men, or women either, will argue with a woman, which they might and probably would do if a man was to be drawing bloods, so that to date we have had practically no refusals in some 9,000 cases. Occasionally some man faints (no women to date) and for that reason we always have them lie on a cot, for if a man faints and falls to the floor he might injure himself seriously, and even if he does not, a 200 pound man on the floor is somewhat of a problem to the attendants.



### Points to consider

1 Drawing a specimen of blood makes many persons nervous and they do not finger print or photograph well afterward

2 To roll up his sleeve, the applicant must remove his coat or sweater. He then has to put the garment back on before being photographed

3 When he lies down for his blood test he musses his hair and collar and then has to pump a while before having his picture taken, all of which takes time

We therefore take the picture first and then the finger prints. Finally we draw the blood specimen. When this is done the applicant is conducted to the disrobing booth and does not need to pause to rearrange his hair or put on his sweater or coat. At the door of the disrobing booth the nurse instructs him to strip to the waist and slip on the poncho-like gown which he will find in the booth. The nurse takes him to the booth rather than an ununiformed attendant, as it gives this step a more professional tone, particularly the instructions relative to disrobing. His examination card is placed in a rack on the x-ray room door and a signal given to the x-ray nurse, who goes to the booth and escorts the man across a narrow hall to the x-ray room, where his chest film is taken. An observant person can be of great value at this point. Our technicians, being graduate nurses, make a quick survey of the man's general appearance—rash or other skin disorders, deformities of the thorax and arms, spinal curvature and many other things. She at once informs the examiner by means of our interdepartmental phone system. He comes to the x-ray room and may suggest other films, such as a lateral view of the spine or a film of the hip or other part. The examiner would doubtless pick up these things in the course of his inspection later, but that would necessitate the man returning to the x-ray room, instruction of the technician as to what was desired, and considerable time lost. Our x-ray technicians have seen so many skin cases that they can diagnose secondary syphilis and other undesirable conditions at a glance. The chest film having been taken, the man resumes his gown and is escorted back to his booth by the technician, who directs him to remove the rest of his clothes, lock the booth door from the inside and await the examiner. She then flashes a light which is seen in the examining room, takes the examination card to the examining room rack, returns to the x-ray room and hands the cassette containing the exposed film to her assistant. She is now ready for the next one. The assistant immediately starts processing the film in a temperature controlled tank. We use standard Eastman x-ray developer and hypo at from 65 to 69 F for five minutes developing, five minutes fixing in the hypo. We do not use "refresher" chemicals. After seventy-five, 14 by 17 films or their equivalent are run through, the tanks are drained, cleaned and supplied with fresh solution. Since we take about that number of films daily as a routine, the solutions are changed every day, and if the run is particularly heavy we may pause in the middle of the afternoon to change our solutions. At first thought this might appear to be wasteful, but we do not feel it to be so, for a good film used in evidence can, and in several instances has, saved enough to buy a lot of chemicals.

Within ten minutes from the actual taking of the film it is ready to be viewed by the examiner. The

doctor notes the signal over the dressing booth door goes to the rack and, taking the examination card left there by the x-ray technician, calls for the man by name, asking him to step out into the main examination room. The man steps out and goes immediately to the scales, where he is weighed and his height noted. The matter of weight is of considerable importance. Most men, particularly light weight ones, list their poundage at more than it really is. A month or so later, particularly if they don't like their job or the shift they report back, complaining of loss of weight as evidence of an inability to eat, general nervousness and the like. We frequently find that many who think they are losing have actually gained in weight, so that they are not suffering as much as they think they are. This is particularly true of men on the night shifts who want to be transferred to days, or foundry men who want jobs in other departments. We might have had weight and height recorded in the preliminary examination room but felt that it would be better to include it in the course of the physical examination, with the man stripped.

The examiner then takes a short history. We do not rely to any great degree on a history given at time of employment, for the average man in search of a job will often very conveniently forget various items which might be of more than passing interest. If there are any objective signs, such as operative scars or deformities, note is made of them. The blood pressure is then taken. While most younger persons will have a normal pressure or even a hypotension, occasionally we find one with a pronounced hypertension, sufficiently often to justify taking a reading on all. The heart sounds are noted by means of a stethoscope for murmur, arrhythmia, extrasystole and so on. No effort is made to get breath sounds. The examiner then goes to the grid which separates the two through the wall view boxes and calls through the grid, which is light proof but transmits sound, to the technician in the x-ray processing room and asks for the film whose number was written on the examination card by the technician who took the chest film. All films have a number photographed into the corner as a matter of permanent record. The technician then places that particular film in the view box, closes her side and turns the handle. The examiner can then open his side, the box becomes illuminated and the film is at hand for inspection in the presence of the applicant who is usually quite interested and joins the examiner in viewing it. If there is any pathologic condition present, this is the proper moment to discuss it with the applicant. It has been our practice to take a first film of every one and, when any pathologic condition is observed, return the man to the x-ray room for a stereoscopic series of his chest. We do this in all cases even though there may be sufficient pathologic change present to justify rejection such as presumably active pulmonary tuberculosis, as we feel that we can learn enough from stereoscopic films of any one particular case to more than compensate us for the expense incurred. By this practice we have built up quite a considerable library of stereoscopic films of about every sort of pulmonary disease from "Wheaten" to carcinoma (of which we have 3 cases of primary carcinoma of the lung).

Presuming that everything is all right so far, we next test the applicant's vision. In times past we were constantly misplacing our reading chart (we test for

close vision only, on the theory that if a man can see to read he can see distant objects sufficiently clearly to satisfy our demands), so we arranged to have our examination cards printed with a type which, when held at 20 inches distance indicated a 20/20 vision. Therefore, if the man can read the type on the examination card he has a normal reading vision. In the event that he fails with either eye he is then tested by means of a stereoscopic eye testing apparatus which gives him visual factor for each eye and is so designed that it is quite impossible to cheat even if he was so inclined, which of course he would not be. By means of this machine we can evaluate his vision within one or two minutes and check him for stereopsis, color blindness and other conditions. The examiner then tests his knee jerks, elbows and so on, palpates his abdomen, has him stand up and checks him for hernia, has him walk about a bit to observe his gait and survey him generally, and if nothing else is noted the inspection is over and the applicant returns to his booth to resume his clothing. Items noted are recorded on the examination card and the applicant is ready to return to the personnel office for assignment to his job, and the examiner calls for another one. In all, this part of the examination took from five to seven minutes, frequently less, sometimes more particularly in the case of rejections when the examiner discusses the matter at considerable length with the applicant, explaining just why he cannot be taken on and if some disease condition is present tuberculosis and the like, arranges for an appointment with the man's personal physician and otherwise manifests some personal interest in the man's condition. We do not subscribe to the practice of rejecting a man and saying nothing about it—passing the buck to some one else to break the bad news to him.

It will be noted that at no time has the applicant come in contact with the other activities of the department. When he has dressed and walks out of the disrobing booth and through the short hall with which it communicates, he finds himself in the personnel waiting room—there is no other place for him to go. He cannot get out into the shop until he is officially taken there by a guide. Nor as stated before, can an old employee with a bandaged arm or leg stumble into the examining unit to disturb the new applicants.

The outer door of the examining room opens into the first aid section, so that an employee coming in from the shop can be admitted to the examination room direct without passing through the outer maze. If he is to disrobe, he can enter a booth to do so and later on pass out into the first aid section and thus to his job.

The x-ray room likewise has two doors, one for applicants from the booths and the other opening into a hall adjacent to the first aid section. An employee can thus be admitted to the x-ray room via the first aid section and then wait in a booth located across from the x-ray room while the film is being developed. This film can be viewed in the view box through the wall in the manner described before or if it is a follow-up film it is taken to the battery of view boxes, previous films are gotten out and comparisons are made. As occasionally happens an employee may have been sufficiently wounded to indicate hospitalization. All such men are removed by ambulance as we feel that any one sufficiently hurt to justify hospitalization suffers less shock when taken away in an ambulance than would be the case if he was to walk out to a car and

be driven over. With this in mind an entry was arranged through the back end of the medical department, so that a stretcher can be brought directly into the x-ray room and the man removed without being observed by others in the first aid section, and certainly not by any applicants for employment.

#### COMMENT

The examination layout described has more than doubled the efficiency of our examination procedure. It keeps applicants for employment from coming in contact with the other activities of the department.

### CRITERIA FOR THE EVALUATION OF NUTRITION EXPERIENCE IN INDUSTRY

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Much has been written and spoken about the advantages of an improved nutritional status, and it is not surprising therefore that employers and workmen alike are eager to apply the facts of this branch of medical science as an aid to production in the war effort. Many conflicting statements are made and it is difficult at times to separate established facts from unestablished claims. If one could believe all the statements which one reads or hears, especially from organizations that have something to sell, but not limited to that field, it might be thought that the taking of vitamin capsules would speed up production or that the eating of candy bars would prevent industrial fatigue and reduce the rate of accidents. Just recently there came to attention a report to the effect that eating doughnuts between meals would reduce absenteeism. Manufacturers are being importuned to give their workmen chewing gum which contains ascorbic acid, or gum drops which contain salt, dextrose and ascorbic acid and which are said to prevent cramps, yield quick energy and serve as a preventive against certain industrial hazards. Unusual food preparations in the form of wafers or crackers reputed to be palatable and fortified with a number of vitamins and with inorganic salts have been represented as a convenient and sure means of improving the diet. Before accepting the claims which have been advanced for each of these and other similar products it would be well to ask where the evidence is. Are the conclusions supported by adequate scientific data? Do the representations have the approval of the several scientific bodies that have been established for the purpose of providing unbiased scientific and medical opinion of newer developments in this field?

From the scientific point of view there are two aspects to the problem of nutrition in industry: the determination of new facts through research on the effect of specific nutrients or groups of nutrients on the health and productivity of workers and the application of known principles of diet to the special population group represented by the employees of a war industry. It is my purpose in the present report to mention some of the criteria that will help evaluate the experience of others and that might be helpful to the industrial physician who is considering undertaking an investigation or a nutritional program in an industrial plant.

# REQUIREMENTS FOR A SATISFACTORY RESEARCH PROGRAM ON NUTRITION IN INDUSTRY

The requirements for a satisfactory experiment on any aspect of nutrition in industry do not differ from those that apply to other investigations on human beings. First of all, no research should be undertaken except by a competent investigator. No better description of the ideal qualified investigator has been provided than that written by Karsner and Goldblatt.<sup>1</sup> According to their view a competent investigator is a person "who by training, experience, initiative, imagination, controlled curiosity and intellectual honesty is qualified to undertake an objective examination of the matter in hand without preconceived ideas or prejudice. He must attack the problem calmly, deliberately, with a clear program based on a well conceived hypothesis, and be thoroughly familiar with the work of others along the same and similar lines." Of course it goes without saying that such a person must be supplied with the materials and the equipment necessary for the problem to be studied.

It is regrettable that some investigations of the effects of the administration of vitamins or other ingredients of food have been made without sufficient attention having been given to the diet of the subjects. It is only by appraisal of the diet that a suitable experiment on human nutrition can be formulated. Workmen may be living in an unusual environment for many hours of the day and the question arises whether the dietary requirements might not be greater than normal for these persons. Only a careful evaluation of the diet on which these subjects are living will enable one to interpret the results of an investigation in general terms. With greater use of older workers, as discussed by Carlson,<sup>2</sup> there is the question of requirements for special age groups. Worthwhile studies can be made without giving special attention to the diet, particularly if there is made a thorough physical examination with the aid of some of the newer methods, developed particularly by Kruse,<sup>3</sup> but the field is limited and the results may not be susceptible of general application unless the diet of the subjects is appraised or controlled.

A dietary survey provides only an indication of the probable nutritional status of the workers in terms of some standard. At best the dietary survey is difficult to carry out and equally difficult to interpret. Huene-mann and Turner<sup>4</sup> have found considerable discrepancy between dietary intakes computed first according to diet histories obtained by questioning the patient and, secondly, according to diet records obtained by weighing all portions of foods eaten over periods of ten to fourteen days repeated every three or four months for a year. The diet record of course is more accurate, but it repeatedly has been shown that even the diet record does not give a true picture if the contribution of each food is estimated from diet tables rather than from analysis of the foods that are eaten. For accurate metabolic data both diet histories and diet records are inadequate, but for purposes of showing the nature of the foods consumed and indicating where possible deficiencies exist the dietary study is invaluable and should be considered as a prerequisite for any suitable investigation of the nutritional problems of industry.

There is a difference between dietary adequacy and nutritional adequacy. The first involves an evaluation of the foods consumed and the second a medical evaluation of the nutritional status of the patient. Many tests of physical fitness and of nutritional adequacy have been devised, and there is still a need for improvement through simplification of methods. In some of the more elaborate programs of research there are described a considerable number of physical, microscopic, roentgenologic, chemical and physiologic procedures. Not all of these tests have been thoroughly developed and applied, and certainly not all of them are needed in the appraisal of the nutritional status of workmen in order to make a satisfactory investigation in this field. Some of the equipment, such as the biomicroscope and the slit lamp, may be difficult to secure at the present time. The important point is that the measures of nutritional status should be objective wherever possible and adequate for the purposes of the investigation. Well trained investigators prefer to have records of objective tests interpreted by a colleague who makes his readings without knowledge of the treatment which the patient has received. This method of controlling the preconceived ideas and prejudices of the investigator who after all is simply another human being is to be highly recommended.

A properly planned experiment involves the establishment of suitable controls. For every group of treated men there should be an equal number of men who are untreated. It is preferable that the treatment should be done without the knowledge of the men and if possible without the knowledge of the investigators who are recording the results. This cannot always be done. If vitamin preparations are being studied, however it is a relatively simple matter to administer a placebo to the control group. Because of the psychologic factor in all experiments with human beings it is worth while to have still another group whose members receive neither the therapeutic agent nor the placebo. In that way one can measure both the physiologic effect of the preparation being administered and the psychologic effect of giving something from which the workman expects to receive benefit. Differences in response between control and experimental groups should be significant as shown by appropriate statistical methods. To this end it is helpful if the investigation can be made on large groups over long periods of time. The number of persons in each group and the length of time of the experiment depend on the nature of the problem.

Finally it should be pointed out that any unusual results should be received with caution until the experiments have been verified by other competent investigators in other places.

## THE MEASURE OF EFFECTS

Current interest in studying the nutritional requirements of industrial workers is prompted in part by the desire to improve the nutritional status and presumably the health of the workman and partly by the desire to increase production for war purposes. Can improved nutrition lead to increased production, cut down spoilage, improve general efficiency, reduce absenteeism and diminish accidents? Many leaders in the field of nutrition believe that improvement in the nutritional status will do all of these things in time, but the criteria mentioned are measures of human performance which are influenced by many factors other than diet. The maintenance of adequate nutritional status is a health problem, and the effects of procedures for improved nutrition should be noted in the worker's body. Man has the

1 Karsner H. T. and Goldblatt Harry. *Evaluation of Methods Used in Physical Therapy Handbook of Physical Therapy* 1939 ed. Chicago: American Medical Association.

2 Carlson A. J. *The Older Worker* this issue p. 806.

3 Kruse H. D. *Medical Evaluation of Nutritional Status* J. A. M. A. 121: 584-591 (Feb. 20) 1943. Kruse H. D., Palmer, C. E., Schmidt W. and Wiehl Dorothy G. *Medical Evaluation of Nutritional Status* Milbank Mem. Fund Quart. 18: 257-298 (July) 1940.

4 Huene-mann Ruth L. and Turner Dorothea. *Methods of Dietary Investigation* J. Am. Dietet. A. 18: 562-568 (Sept.) 1942.

ability to do wonderful things even though he may not be in that condition often referred to as "buoyant health." The history of nations illustrates the ability of man to surpass his physical limitations. It therefore seems unfortunate to have the sole measure of any nutritional investigation one of these secondary effects. The physician and the medical investigator, it seems to me, had best devote their efforts and measurements to health matters and, while controlling the psychologic and other factors inherent in any study with human beings recognize that the measurement and interpretation of such phenomena are primarily the concern of workers in other fields.

#### PRESENT KNOWLEDGE

Just a year ago a combined committee of the Council on Foods and Nutrition and of the Council on Industrial Health gave consideration to the practice of indiscriminate administration of vitamin preparations to industrial workers.<sup>5</sup> The decision was reached that this practice could not be approved because of lack of sufficient evidence to show that it was desirable from therapeutic nutritional or economic points of view. To date there has been nothing reported that has led the councils to revise those conclusions. It is understood that several well planned experiments on the effect of administration of vitamins now are in progress. Some of these investigations are very extensive and it will be interesting to apply the criteria already mentioned to the reports when they are published.

As other speakers at this symposium will point out, the problems of nutrition in industry are so varied and so interesting that they present a challenge to investigators. Since the industrial worker is a member of the general population, it is apparent that he reflects the general picture of nutritional deficiency reported to affect the various sections of the United States. While there is considerable discrepancy between the reported incidence of dietary deficiency and the incidence of nutritional inadequacy, based on the experience and records of physicians, it can still be concluded that the diets of many persons can be improved with probable benefit to health. The working man is likely to be better fed than other members of the family, but there is evidence that there is much room for improvement in the nutritional status of the wage earner. In a study of the diets of aircraft workers in southern California, Wiehl<sup>6</sup> has found the choice of foods to be exceedingly poor. The amount of green or yellow vegetables and of citrus fruits or tomatoes, these two classes of foods being our chief contributors of vitamins A and C, were very low and the amount of milk consumed was less than that considered desirable. Taking as a criterion two thirds of the recommended dietary allowances of the Food and Nutrition Board, she found that the diets selected by these workers were deficient as follows: 14.8 per cent were low in vitamin A, 24.8 per cent in calcium, 43.2 per cent in riboflavin and 46.0 per cent in ascorbic acid. No doubt investigation would reveal a similar situation differing in nature and in degree among industrial workers in other parts of the country.

Under certain environmental conditions it is possible that there may be an enhanced requirement for one or more of the dietary factors. This is well known in the

case of some industries where men are subjected to high temperatures and where, in order to replace the salts lost in the sweat, sodium chloride is made available. Whether more of the water soluble vitamins is required under these circumstances still remains to be demonstrated. Some of the vitamins, especially thiamine and ascorbic acid, have been suggested as prophylactic aids for protection against some industrial poisons. Work on these problems is still in the experimental stage. In the meantime a word of caution should be added. Where workmen are subjected to toxic substances it is important to continue to apply principles of sanitation and hygiene that are already established and known to be of value.

#### DIETARY IMPROVEMENT

Although studies of an experimental nature might well be undertaken only by those who have the training, facilities and time to make a worthwhile contribution, it is still possible for every industrial plant to contribute to the national nutrition program. As other speakers on this symposium will bring out, help and advice are available from trained nutritionists in every section of the country. Lunchroom facilities usually can be improved and in them the employees can receive a practical demonstration of the principles of wise selection of foods. Educational material can be provided to help workmen and their families to guide their food selections along scientific lines. All medical scientists interested in nutrition confidently believe that improvement in our dietary habits is capable of yielding tremendous dividends in time to come. Good diet does not necessarily assure good health, but it is one of the factors involved in the maintenance of health, along with adequate rest, tranquility of mind and freedom from infection. Further, good diet is so easily secured in this country under ordinary circumstances, if one has the necessary knowledge, that it is a health factor every one should avail himself of. Minor changes in faulty dietary habits and slight adjustments in the selection of foods and meals are capable, if wisely done, of converting an inadequate diet to one that is entirely adequate, as judged by any standard.

Of all physicians the pediatrician no doubt understands diet and the resulting advantages best of all, probably because the requirements for growth are better understood than are the requirements for maintenance of the adult organism. To grow well the child must eat well and adequately. The flesh of the well nourished child is deposited in firm form on a well mineralized skeletal frame. The characteristic turgor of the muscles, the healthy appearance of the skin, the milk-blue color of the conjunctiva, the firm pink gums, teeth unaffected by dental caries, the tongue pink, uncoated and with well marked papillae and with regular margin, and the glossy appearance of the hair are some of the attributes that we all associate with the healthy well nourished child. The healthy child is a happy child. Something approaching the feeling of youthfulness should exist for the well nourished adult. Our criteria of health in adult life may be too crude to permit a proper classification of the better nourished from the ordinarily nourished person. The signs and symptoms of mild thiamine deficiency, for example, are vague but they appear to be real and they disappear on administration of thiamine to the deficient patient. Among the symptoms reported are a general lack of well being, easy fatigue, loss of efficiency in daily work, sleepiness, lethargy, lack of ambition, forgetfulness, constipation, poor appetite, irritability,

5 Indiscriminate Administration of Vitamins to Workers in Industry. Joint Committee of Council on Foods and Nutrition and the Council on Industrial Health. J. A. M. A. 118: 618-621 (Feb. 21) 1942.

6 Wiehl, Dorothy G. Diets of a Group of Aircraft Workers in Southern California. Milbank Mem. Fund Quart. 20: 329-366 (Oct) 1942.

paresthesias and gastrointestinal disturbances. Perhaps symptoms such as these, to which all of us at some time or another are subjected, may be alleviated to a considerable degree by devoting more attention to the diet. It will require considerable time, however, and many additional properly conducted experiments, before we can appreciate the potentialities of giving more attention to the nutritional quality of the foods we eat. Meanwhile, in the difficult days ahead before this war is won, with a need to conserve food and dietary supplements such as vitamins, it is the duty of all of us to obtain the best possible diet that our food supply and our knowledge of dietary requirements will permit.

535 North Dearborn Street

## IMMUNIZATION FOR INDUSTRIAL WORKERS

### PROBLEMS OF ORGANIZATION AND ADMINISTRATION

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The curative and the preventive treatment of disease including all specific prophylactic measures are functions of the physician. These functions particularly those of immunization through the use of serums and vaccines have been carried on in the home, the doctor's office, the clinic or the hospital, in connection with private practice, and in clinics and health services associated with public schools, colleges, public health departments and other public agencies, including the various military branches of the government. As a result of rapid developments in the field of industrial health, and particularly as a wartime measure it is now necessary and desirable to give attention to these problems as they relate to the needs of the working population and to determine how best to organize and administer these preventive medical functions in industry.

To assist management and working forces, there are four professional groups that should be brought together in any well developed cooperative plan for the immunization of industrial workers, namely (a) private practitioners of medicine, (b) industrial physicians, (c) public health authorities and (d) industrial health committees of state and county medical societies.

The private physician must be considered the key person in any immunization program for industrial workers. Upward of 85 per cent of medical service to industry is supplied by private practitioners. So far as possible and feasible a worker should be referred to his own doctor for any immunization procedure which may be desired on a voluntary basis.

The industrial physician should function as a deputy health officer in practice if not in fact and should be keenly aware of all opportunities to suggest and promote generally accepted scientific methods for the specific prevention of disease. In those instances in which it seems desirable to have employees immunized by industrial physicians in plant medical departments, this should be done on the request or with the approval of the employee's own physician.

Local public health authorities in many communities make available necessary services for the protective immunization of the civilian population. The coopera-

tion of community public health clinics should be sought by industrial management for the immunization of employees in special emergencies or where the services of a private physician or an industrial physician are not available.

Industrial health committees of state and county medical societies are logical groups to render advisory leadership and should include in their programs suggested procedures for the immunization of workers in industry. This would make it possible to take into account the variable local conditions and needs as they exist in different communities and industries. These committees, as recommended by the Council on Industrial Health of the American Medical Association are made up of representatives of the groups just mentioned thus making possible a close, cooperative relationship in working out a local program.

In general, it may be assumed that the working population is a cross section of the community, many of whom as infants and as preschool and grade school children have had the benefit of protective immunization against various diseases through the services of private physicians or school and health department clinics. While the control of these diseases rests largely with the community health authorities in cooperation with private practitioners of medicine, industrial organizations may do much to assist the public agencies by including attention to and education on these subjects in their own industrial health program.

### SMALLPOX VACCINATION

Although the incidence of smallpox is currently at a relatively low level there are still enough cases to serve as focal points for epidemics, particularly at this time when military mobilization and industrial expansion lead to more than the normal number of changes of residence and place of work. It would seem desirable therefore, to continue our interest and efforts in smallpox vaccination.

### ANTITYPHOID INOCULATION

Immunization against typhoid, being of a somewhat transitory nature is not practicable as a routine among employed groups. It should be promoted chiefly among workers whose occupation requires considerable travel and contact with an outdoor rural environment, where special hazards may exist in regard to questionable drinking water and food supplies. Agglutination tests among those previously immunized would serve as a check on the need for further protection.

### IMMUNIZATION AGAINST TETANUS

In industry, tetanus always must be considered a potential complication of accidental wounds. For this reason any program of immunization for industrial workers must take into account the possible use of tetanus toxoid particularly for those whose work definitely involves the contamination of wounds with dirt or soil which may contain this bacillus or its spores. Some companies according to the nature of their work, have promoted the giving of tetanus antitoxin to employees as a first aid measure following all cases of accidental wounds, while others have advocated it only in suspected cases.

### IMMUNIZATION AGAINST UPPER RESPIRATORY INFECTIONS

If and when the value of protective vaccines or serums against the diseases of the upper respiratory system, such as the common cold and influenza, becomes

as scientifically established and medically accepted as that of vaccination against smallpox, typhoid and tetanus, it will be early enough for industrial management and industrial physicians actively to promote and encourage such immunizations among workers. This statement is not intended to discourage well controlled experiments or demonstrations, particularly with newly developed products in the possible reduction of sickness absenteeism, lengthy disability and secondary complications and after-effects of colds or influenza

## CURRENT NUTRITIONAL ACTIVITY IN INDUSTRY

A REVIEW AND APPRAISAL

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The topic assigned to me is obviously one that cannot be discussed in any thorough fashion in the brief time at my disposal. Therefore I shall attempt merely (a) to present briefly some of the important phases of the subject that must occur to any thoughtful student of the problem of improving the nutrition of industrial workers and (b) to cite some examples of what is being done in this field.

Interest in this problem is comparatively new. In view of this it is natural to find some controversy existing in many industrial circles concerning the need for giving it any attention. To many a busy industrialist the idea that he is somehow responsible for properly feeding his employees means paternalism of an extreme degree. If his particular industry presents to its workers special hazards for which an improved diet is a preventive or an insurance against poor health, he no doubt feels willing to do what is called for in the circumstances. If such an industrial hazard cannot be shown to exist in his plant, he feels justified in objecting to any request that he "do something." Conservatism on his part is readily understandable. On the other hand it is generally recognized that there now exists a large body of knowledge in the science of nutrition which is not being applied as it should be, and there are possibilities for its application in the field of industry. It is now known that the shortcomings of diet can operate to affect health not merely in perfectly obvious fashion but also in very subtle and unappreciated ways. Therefore, improvement of the diet of industrial workers can have an important bearing on problems of absenteeism and the like.

The war has focused our attention on food problems. It has been said that "food can win the war." As a result of announcements regarding food shortages, the need to eat less of this and more of that in order that the armed forces may have what they require, the rationing of foods and kindred topics, housewives are finding it important to know some of the fine points of the science of nutrition and its practical application, how properly to substitute one food for another, and a host of related practical questions. Workers in industrial plants represent a very considerable part of our population. Along with everybody else they find themselves tremendously interested in this matter of the good diet, but with them still another reason operates namely the importance of keeping well through proper

eating in order that they may do their special part in making the materials of war needed by the soldiers in the front lines and the sailors on the high seas. It is probably safe to say that as a result of this combination of circumstances and proper utilization of our resources, we should within the period of one year be able to do more in changing the food habits of our people for the better than we could accomplish in a decade or even a generation of peacetime. Industrial physicians should be interested in this for several reasons, not merely because of obvious disease of dietary origin that may occur in industry, but because, as a result of some current activities in industry, we are seeing hitherto unappreciated ways that industrial organizations can assist in solving what is really a problem of public education.

Current nutritional activities in industry present several categories of interest. Research is being conducted on many basic questions involving foods and special food factors. The data gained in these studies will do much to determine the validity of certain current practices and to indicate various possible lines of future action. For example, how good are the diets that given groups of workers select? Does the scientific evidence at hand indicate that the administration of polyvitamin preparations is a simple and desirable solution to the problem of improving and insuring the workers' health as far as that is related to diet? Are there any particular vitamins or other food factors that are especially important in certain industrial situations? Special attention is also being paid to the adequacy of plant facilities for feeding workers, to insure that they are under the supervision of persons competent in the science of nutrition and experienced in the application of that science. The basic problem of education of the worker and his family in matters concerning wise selection of food is now being attacked in many interesting ways. Let us consider briefly each of these current lines of activity bearing on our main theme.

### NUTRITION OF INDUSTRIAL WORKER

The National Nutrition Conference held in Washington, D. C., during May 1941 had a section devoted to the problem of the nutrition of the industrial worker. In its report that section called attention to the lack of scientific knowledge on which to base answers to numerous questions that were being discussed in many quarters. Later the Committee on Nutrition in Industry<sup>1</sup> of the National Research Council reached the same conclusion. Before long an opportunity presented itself for a carefully planned and controlled investigation in a large airplane factory in southern California. This plant employs from 30,000 to 45,000 workers. The plan of study called for careful physical examination of a representative group numbering at least 1,000. The examination was to include use of some of the latest techniques believed to reveal early stages of vitamin deficiencies. Efforts were to be made to learn the dietary patterns of these workers and thus to evaluate their ordinary diets. The effects of the administration of vitamins were to be studied. The importance of examining the diets of such workers must be obvious. If the diets should prove to be good, then the effects of administration of vitamins might well prove to be negative. The final report of this investigation has yet to be written, and therefore I can discuss the study only in very general terms and advise you to be watch-

Read before the Fifth Annual Congress on Industrial Health, Chicago, Jan. 13, 1943.

From the Department of Physiological Chemistry, Yale University School of Medicine.

1. Committee on Nutrition in Industry. *The Food and Nutrition of Industrial Worker in Wartime*. First Report. National Research Council, Washington, D. C. Reprint and Circular Series No. 110, April 1942.



ing for the detailed report, which will be forthcoming sooner or later. It is possible to mention here something about the dietary habits of these particular workers because a report on this was published recently.<sup>2</sup> It appears that over half of the 1,100 workers studied did not get enough green and yellow vegetables, and nearly half ate too few citrus fruits and tomatoes. Almost all ate enough lean meat, but one third failed to get enough milk, and a fifth were low in eggs consumed. This proves particularly interesting because, according to the Stiebeling-Phipard<sup>3</sup> study of 4,000 family diets collected in different sections of the country, the southern California area proved to be one of the best on account of its liberal supply of milk and milk products, citrus fruits, fresh colored vegetables and meats. Evidently it cannot be assumed that, just because an industrial plant is located in a region well favored as regards supply of the important classes of valuable foods, the industrial workers in that plant will therefore be well fed, using these terms in their best nutritional sense.

The National Research Council's Committee on Nutrition in Industry has appreciated the importance of conducting similar studies in industrial plants located in at least four different sections of the country, because food conditions and other pertinent factors may differ considerably in respective areas. It has not been easy to get such additional studies carried out, but efforts are being made along this line.

It is an interesting observation that women workers as a rule make poorer selections of foods than the men. This proved to be the case in plants manufacturing munitions in England in 1917 and was even mentioned in a paper entitled "Women's Work,"<sup>4</sup> included in "Occupation and Health," an official publication of the International Labor Office.

Let it be added that women, although possessing a large amount of energy in reserve, tend to feed themselves less substantially than men do (consuming fancy foods of little nourishing values), and to restrict their nourishment in difficult economic circumstances.

Discussion of this point with various persons leads me to conclude that this may be true to an appreciable extent in this country even now, for reasons most interesting to contemplate. One suggestion is that women are notoriously prone to worry about gaining weight and the effect of this on their figure, among them the so-called Hollywood diet for reducing has many devotees. This means that they avoid foods rich in energy. Unless they are unusually careful when doing this they can easily develop dietary deficiencies. With more and more women going into industry these days it is evident that we have here a problem worthy of serious consideration. Obviously its main solution lies in education regarding foods and nutrition.

Another line of research related to our theme is the study of special industrial situations like the manufacture of trinitrotoluene and beta-naphthylamine, which may present interesting toxicities in workers exposed to these chemicals. Until recently it had been thought advantageous to give each worker with trinitrotoluene a quart of milk per daily shift. Although milk because of its high calcium content is of value in

combating the intestinal absorption of lead, this food according to Foulger,<sup>5</sup> has no particular ability to detoxify trinitrotoluene or prevent its absorption. On the basis of experiments with guinea pigs it appears that large doses of ascorbic acid are required to prevent loss of body weight when trinitrotoluene is taken. Foulger states that "as a result of our laboratory work we recommended in September 1941 that all workers exposed to trinitrotoluene in our plants should receive at least 100 mg of vitamin C per day and 1 mg of vitamin B<sub>1</sub>. This practice is being followed." Confirmatory observations made in Britain have recently been cited by Holmes.<sup>6</sup> The evidence that vitamin B<sub>1</sub> is of value here does not seem to be as clearcut as that concerning the value of ascorbic acid. It seems evident that we have here an important line of research that needs to be followed further. Much of the work done thus far is inconclusive and therefore should be regarded as interesting and suggestive but not warranting dogmatic statements at the present time.

#### PLANT FACILITIES FOR FEEDING WORKERS

Another current nutritional activity in industry relates to the examination of plant facilities for feeding workers. Industrial physicians whose plants maintain cafeterias, dining rooms, canteen wagons or food dispensing machines can do much to advance this line of work. They can make certain that these facilities are under the immediate supervision of persons competent in the science of nutrition, particularly the application of that science. It has been learned that too often such facilities have been turned over to a concessionaire whose chief objective is to operate them so as to show a profit. Extremely few of these concessionaires have been found to know anything at all about relative food values. Their chief plan of action seems to be to "give the public what it wants." In one instance the plant's eating facilities were handled by an employee whose chief qualification for the job seemed to be that he could successfully feed a given large number of workers in a minimum time.

Observations have been made of what workers select when passing through the plant's cafeteria. Such observations indicate that approximately half of the workers are in need of special instruction on how to select foods wisely. This has led some plants to adopt subtle and indirect techniques by which to get employees to make good selections, such as, for example, offering at a slightly lower price a special plate called a "victory lunch." Such a plate furnishes several of the protective foods which, if offered separately, would probably not be selected voluntarily. In those plants that have been quite successful in this sort of thing investigation reveals that the planning or supervising committee almost always had on it at least one person whose specialty was salesmanship, and who therefore was given a chance to bring the arts of his specialty to bear on this food education problem. This suggests that the industrial physician who is just beginning an attack on this problem in his plant will do well to establish a committee to help him and on this committee have representatives of the various interests, talents and responsibilities characteristic of his organization.

It is now possible to use in the plant's eating places enriched bread instead of the ordinary white bread. In the days ahead, when there will be shortages of

<sup>2</sup> Wiehl, Dorothy G. Diets of a Group of Aircraft Workers in Southern California. Milbank Memorial Fund Quarterly, 20: 329-366 (Oct.) 1942.

<sup>3</sup> Stiebeling, Hazel K. and Phipard, Esther T. Diets of Families of Employed Wage Earners and Clerical Workers in Cities. Circular 507 U. S. Dept. Agric. January 1939.

<sup>4</sup> Women's Work. Article in Occupation and Health. An Encyclopedia of Hygiene, Pathology and Social Welfare. vol. 2 pp. 1234-1262. See particularly p. 1239. International Labor Office, Geneva 1934.

<sup>5</sup> Foulger, John H. Importance of Nutrition in Prevention of Industrial Injury. unpublished communication.

<sup>6</sup> Holmes, H. N. Vitamin C in the War. Science 96: 384-386 (Oct. 23) 1942.



various common foods, it will probably be necessary to limit the number and variety of items offered, to do this properly will require the attention of some one trained in the science of nutrition. Under such conditions it should be possible to reduce the offerings to a relatively few extremely valuable foods, and employees will doubtless accept this limitation of choice because we are at war. To the extent that this situation is met by wise choice of items to be offered the nutrition of the employees in that plant will be improved accordingly.

The plant's eating facilities can be utilized to advantage in educating workers by the preparation and exhibition of good well selected meals. Demonstrations of this sort have an educational value that is difficult to overestimate. In Britain it has been found that such food demonstrations in the industrial canteens have a favorable effect on the worker and even on his wife, what the worker has experienced in the plant he demands in the home as well. What the worker has seen with his own eyes he remembers much better than what he has heard through his ears or read in a leaflet.

Other interesting points that might be mentioned here relate to the proper handling of food in its preparation for the ultimate consumer. It has been learned that many of the cooking methods in common use in restaurants, hotels, even hospitals, result in greater losses of nutritive values than are necessary. Many foods are first cooked and then kept on the hot table for from one-half to two hours, and such an additional period of heat has been found to result in losses. Cabbage, which is a good source of ascorbic acid when the leaves are fresh and uncut, so to speak, soon loses the vitamin when the leaves have been chopped up, thus exposing the cells to contact with air. The applications of such facts are obvious, but what is important here is that these applications too often are not being made. Competent nutritionists working under the supervision of the industrial physician and instructed to make the appropriate changes in methods of cooking and food handling can do much to remedy this situation and to make the plant's facilities for feeding workers do what is expected of them. Incidentally, it may be remarked that the physician who undertakes this line of work will acquire from his nutritionist quite an education in practical food matters.

#### EDUCATION IN FOOD AND NUTRITION

Underneath this question of improving the nutrition of industrial workers lies the fundamental problem of education in matters of food and nutrition. This education can be accomplished in part through efforts made by the plant itself and in part through general community, state and national effort. Let us analyze this briefly.

Activities at the community level naturally make the closest contact with the food consumer. At the county and state level the activities are more definitely of the coordinative, pooling of information and planning type. At the national level they are based on a view of the nation as a whole, the nation's relations to other countries, the special needs of the war effort, the balancing of national supply against national demand, the formulation of main policies that are in the interest of the nation as a whole, the implementation of these policies and coordination of them with activities at the state and community levels. Certain national activities, particularly those related to food advertising and the activi-

ties of industrial organizations which are interstate in character, do reach rather definitely the food consumer. This is well illustrated in many current nutritional activities dealing with this problem of education.

Many of our large industrial organizations have made valuable contributions in this connection. Concerns like Westinghouse Electric and Manufacturing Company, the General Electric Company and Servel, Inc. for example, in peacetime are manufacturers of household appliances such as refrigerators and electric stoves used for storing and cooking foods. Such firms have long had in their employ home economists and nutritionists trained to demonstrate these appliances, an activity that is educational in character. These concerns have devised ways of bringing to bear on the broad educational problem their trained personnel and other resources.

The first action taken was to educate their own employees and their families through carefully planned classes with demonstrations and the issuance of literature specially written for the purpose. The success attending such initial activities was so great that the material was soon made available to other firms. This led to the formulation of plans by which any industrial organization regardless of its size, can, if it wishes, now do something to educate its employees and their families by using material prepared by these several utility concerns. It is possible to establish "Health for Victory" clubs, a Westinghouse contribution, for which suitably written material is provided for the class leaders and all members. This particular scheme has developed to the point where any group of interested persons in a community can use it. Just as the National Red Cross will establish nutrition classes for any interested group, whether it is a mothers' club, a parent-teacher organization, a group of church women, a club of lodge members or the wives of members of a labor union, in the same way it is now possible to establish nutrition clubs using the teaching material furnished by the corporations just mentioned. In some cities, Chattanooga, Tenn., for example, the home economists of the utility manufacturer, the General Electric Company in this particular case, actually gave nutrition courses for the National Red Cross. In Chattanooga they conducted at one time five nutrition classes a week and taught a canteen class for the volunteer Red Cross canteen workers.

Approximately three hundred concerns have made or are making use of the material prepared by the Westinghouse Company for clubs, in some cases consisting of plant employees, in other cases made up of interested persons in the community in no way connected with particular concerns.

Servel, Inc., has featured a plan that is particularly serviceable for the concern operating a cafeteria or similar facility. It also utilizes the local gas company and through it distributes teaching material to all interested parties.

In Peoria, Ill., the Caterpillar Tractor Company, through an interested plant physician has taken the lead in getting all firms in the city active in this educational work through the formation of such clubs as have just been mentioned and in other ways.

In Omaha the local program was primarily under the Civilian Defense organization assisted by a committee of the meat packing establishments. As part of the class demonstrations, samples of meat were donated by the local packers, and the Union Pacific

Company ran in the local papers full page advertisements of the community's educational campaign.

The Inland Steel Corporation has run its own employee classes, but these are under the management of the labor committees, so that in this case the activity might be called a labor project. The plant management makes facilities available and defrays the cost of the special teaching literature.

In some cities the direction and planning have originated in the community instead of in industrial concerns themselves. A good example of this is seen in the so called Bridgeport Plan, developed in Bridgeport, Conn. In this case the community committee, under the direction of a physician and his enthusiastic colleagues and assisted by the local gas company, felt that the logical approach to the problem was through the lunch box, and the community's campaign was worked out accordingly. As a result of the tremendous interest thus aroused, many of the local industrial plants became interested. They requested advice, which was gladly given on their feeding practices and programs. In pushing this community program there was developed the slogan "Pack A Lunch A Man Can Work On." Other slogans have come into the picture. As part of the Scovel collection of literature one finds cartoons featuring Hitler's face and the slogan "Eat To Beat The Devil." In Rockford Ill., the publicity of a campaign mentioned a "dynamite sandwich." This name apparently arose from a conversation two men had about a particularly valuable sandwich that was being exhibited. One man remarked that it certainly packed a lot, or words to that effect, his companion said "Yes! It's got dynamite." And so we now have the "dynamite sandwich," a term that a dry professor like myself would probably never have thought of in years but one which for a popular campaign does have its special appeal to many people for whom a special appeal of some sort is really needed.

These educational services developed by industrial organizations have concentrated on the most practical everyday problems that the food consumer faces. Technical material is always translated, so to speak, into common terms of simple well known foods and quantities, and illustrations are freely used. The material provided for nutrition clubs is remarkably complete. All that the teacher needs is given carefully outlined. No one can examine this literature without being impressed with the teaching skill and genuine salesmanship of things nutritional that have gone into its preparation.

At the beginning of this paper I mentioned the objection frequently encountered among industrialists to their firms undertaking any work dealing with the nutrition of their workers unless some industrial hazard preventable by diet or special dietary factors can be shown to exist in their given situations. In view of what has already been done by industrial units just as a contribution to our broad educational problem, and mentioned here only briefly, it seems to me that every interested industrial physician now has all that he needs to justify his firm finding some way to participate in this phase of current nutritional activity. This view receives added emphasis when one considers also the voluminous literature prepared by our government bureaus and agencies and readily procured from the agencies themselves the national nutrition office and various state and local committees. To the extent that a firm participates in this international effort through

any of the many ways open to it to that extent it can be sure that its employees have learned how to secure their own health through the proper use of food, and how they can help to win the war through the best possible use of our national food resources.

333 Cedar Street

## HOW TO GET ALONG WITH LESS HELP

LEGITIMATE SHORT CUTS TO ROUTINE SERVICE  
CAN WE SECURE AND TRAIN TECHNICAL ASSISTANTS  
FOR CERTAIN ROUTINE INDUSTRIAL  
DIAGNOSTIC PROCEDURES?

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In these wartimes, among the many problems confronting us in the practice of industrial medicine and surgery, is the necessity of doing more work in a shorter period of time with less help. The very rapid expansion of some of our industries has placed tremendous demands on the medical profession. Not only has the actual enlistment of trained industrial medical personnel depleted our forces but one of our sources of available medical personnel is almost completely gone. These are the young physicians and surgeons who have completed their internships and residencies and normally would be part time medical members in industry from two to five years or more. Practically all of these young men are taken into military service immediately on completion of their internships. Those available because they have been rejected from military service are very few, and even then more interesting or lucrative opportunities attract their services.

The necessity for devising short cuts is indicated by the number of persons per physician in industry as compared to civilian practice or even military service. We are informed that the usual personnel for a medical battalion is eight physicians, two dentists and from ninety to one hundred enlisted men who are responsible for a thousand or possibly twelve hundred persons. In industry these ratios are tremendously greater per physician, ranging all the way from two thousand to five thousand employees per physician. A hazardous war plant not so far away, where frequent periodic examinations should be done regularly, has six physicians for thirteen thousand employees, working three eight hour shifts and treating all the injuries as well as being responsible for the health of their workers and their preplacement examinations. Is it any wonder that some of these physicians are working fourteen to sixteen or even eighteen hours a day?

What legitimate short cuts may be devised in our routine services? First, I would say, is the necessity for adequate up to date equipment. Why should the industrial physician hinder himself with old or poorly functioning equipment? He should have the best of tools, adequate space conveniently designed examining rooms, dressing stations treatment and consultation rooms. Good light, adequate ventilation and pleasant surroundings and proper physical equipment are the least that industry should provide for their medical departments. Most of the larger industries have recognized this advantage, but I know of one large industry in this city doing about 75 per cent war work, expanded

to several times its usual enrolment, where the medical director has been trying to get new accommodations for his medical department for the past five or six years without success. The excuse that such equipment cannot be purchased because of war conditions is a mighty weak alibi.

Second, the industrial physician and surgeon should devise improved methods of treatment. Sets of rustless instruments with needles already threaded and placed in sterile packages can be run through a steam sterilizer at 20 pounds pressure for thirty minutes days in advance and kept available. When minor surgery presents itself, all that needs to be done is to open up the sterile towel and package and proceed immediately. In one plant the nurse had actually traced the exact size and shape of the enclosed needle on the outside of the package to save the doctor time in selecting a desirable sized needle and suture. Two 5, 10 and 20 cc syringes are likewise put up sterilized in advance, ready for immediate use. Eye spuds so sterilized in advance also are kept in small vials, the corks being inserted on removal from the sterilizer.

In a plant the other day I saw a nurse checking the vision by having the applicant start at the top and read down all the letters on the eye chart from 20/200 to 20/20. She could just as easily have skipped all the larger letters, being sure that the applicant was not cheating on the 20/20 line by substituting one or two different charts and have him read them backward as well as forward.

Third, simplified records are very definitely in order. Records where history questions and past medical history have to be answered Yes or No are very time consuming. This may be necessary to legalize a life insurance examination, but a simple check mark or zero can be made ever so much faster. A lot of the questions are not worth the time and space consumed in their asking or recording. Some insurance companies have simple medical blanks, others very complicated ones. Such a simple question as "For what period of time is he entitled to total disability?" saves answering a lot of unnecessary questions and places the responsibility on the integrity and honesty of the certifying physician, to whom it belongs in the first place. Did you ever stop to consider the amount of the negative findings recorded in the files of some of our larger medical departments and of just how much value these efforts are? One very practical director the other day pointed out that only abnormal or positive findings should be recorded, all others are assumed to be negative, something very worth while thinking about when you revise your forms next time.

Screening tests, whether they be x-ray films of the chest, blood pressure readings, urinalyses, pulse rates or weights, are of value only as far as they reliably portray positives or abnormalities in their findings.

Fourth, efforts should be made to avoid unnecessary preemployment examinations. During the first part of December 1942 a young man whom I examined boasted of having had six preemployment examinations in the preceding four months. He almost talked himself out of a job when I realized the wasted efforts of all those physicians' examinations of such an unstable employee shifting employment with the slightest whim or breeze. The rapid turnover in labor has been a serious problem in some medical departments. Recently one of the larger railroads found that by the time preemployment examinations cleared the general office almost two weeks after being done half had already left the

employment. They met this problem by allowing applicants to work two weeks without examination, and those that remained were examined at that time not ideal, but a practical way of handling this problem.

In some medical departments the preemployment examinations and periodic health examinations are being curtailed for the duration. It is pointed out that these applicants or reexaminees often purposely hide or cover up symptoms and maintain an attitude of "Here I am, a specimen in perfect health. Now try to find something wrong with me." The examiner has to go over him with a fine tooth comb to bring out a true appraisal of the man's condition. On the other hand when an employee has reported a sour stomach and abdominal pain several times, blood in his stools or recurrent persistent coughs and colds to the plant nurse or to the medical department such positive findings are of the greatest significance and warrant careful work-up, laboratory studies and diagnostic consultation—again in endeavor to apply our efforts and work to those who need it most, and where our efforts will be productive of the greatest results. Another group justifying reexamination are those returning to work after a period of three days or more of absence from work. Studies of these cases bring out interesting findings.

Fifth, many examiners are suggesting a simplified form of preplacement examinations. In reality they are inspections of physical appearance, functional tests of joint movements and the results of simple observations such as pulse, respiratory rates, temperature, blood pressure readings, vision and hearing tests. These are all simple procedures that can legitimately be done by any nurse under proper medical supervision. Only those with abnormal findings need be referred to the physician for study and decision. This also serves to eliminate one of the monotonous, fatiguing and exhausting phases of an industrial physician's work. What challenge is there to a physician's knowledge and eight or ten years of medical preparation to be doing routine preemployment examinations all day long? He is entitled to the joy and happiness in his work and the satisfaction of having accomplished something worth while.

#### TECHNICAL ASSISTANT FOR ROUTINE PROCEDURES

I have been asked to discuss the question "Can we secure and train technical assistants for certain routine industrial health procedures?" This, I would take it, goes beyond the graduate R.N. nurse assistant and brings up the question of certain duties and functions that can be delegated to persons with special training and qualifications but who have not had the advantage of a physician's or nurse's training. Let us first consider whether such are employed at present. I find that nearly all of our pathologic and clinical laboratory workers fall into this classification. Such medical technicians are doing blood counts, urinalyses, blood chemistry determinations, serologic and other types of laboratory work efficiently. Wise it is that their training should meet certain minimum standards and that schools training such technicians should meet an approved standard rating. One of the finest contributions to this field has been made by the American Society of Clinical Pathologists, which organized a registry of medical technicians in 1928. This registry has done much to raise and maintain the quality of the medical technicians. A statement made by Dr. Walter Simpson in 1933 is of the greatest significance as a guide in this field. The code of ethics of the American

Society of Clinical Pathologists demands that all registrants must agree to work at all times under the supervision of a qualified physician and that they shall under no circumstances on their own initiative render written or oral diagnoses, except so far as self evident in the report or to advise physicians or others in the treatment of disease."

There are other medical technicians that are recognized as auxiliary in the practice of medicine. Some of these are x-ray technicians, physical therapy technicians, occupational therapy technicians, hydrotherapy, dietetic, anesthetic and many other forms of medical technicians. Let us for a moment consider the technical assistants of an allied profession, namely dentistry. Almost every dentist has one or more full time assistants at his beck and call to assist in the routine work. These assistants only rarely have ever had any professional dental schooling and teaching. They are usually persons with a natural inclination to serve, assist, learn to improve their accomplishments and incidentally get joy and happiness out of their work as well as an average living. Might we likewise give consideration to somewhat similar assistants, if and when the shortage of physicians and nurses makes this desirable and advisable? The training of medical secretaries and personnel for taking medical histories has already a good start in some localities. The taking of histories and notating of normal and abnormal physical findings are frequently routine functions of junior medical school students. The public as well as the medical profession has found that, when registered nurses are no longer available, practical nurses are frequently called in during an emergency. The important thing is that medical technicians in whatever field of endeavor they wish to become proficient should have the specialized training considered desirable. We have such lists of approved schools for chemical laboratory technicians, x-ray technicians, physical therapy and occupational therapy technicians. There are possibly others. Might it be possible to set up standards of training and instruction for medical technicians or technical aids to physicians and surgeons in industry? It is a field well worth exploring. I should think that the selection of such aids and technicians is most important. One would like to select those with qualities most likely to succeed in such an undertaking. Studies might be carried out to devise various types of aptitude tests and personnel and psychologic screening tests for the selection of those most likely to succeed. These workers are entitled to happiness and satisfaction in their work as well as a satisfactory living. I have had a most interesting and constructive communication from Mr. C. d'A. Gerken, director of personnel of Rochester Junior College, Rochester, Minn., who speaks with authority and the keen observation of a student pioneering in some of these personnel fields of study.

Now for a practical approach to this problem as to just what type of work and duties such technical aids and assistants might do. First, they must have adequate medical supervision at all times in all their work and must not diagnose nor treat ill or injured patients. They can be trained to take medical histories of illnesses and injuries competently for review by the examining physician. Heights, weights, simple inspections, color vision or urine tests, even respiratory and pulse rates might come within the scope of their endeavor. Individual capabilities and proficiencies will vary so much that the amount and type of work will have to be delegated to them by the responsible physician.

Around industrial medical departments are many such duties to be assigned to these technical physicians' and nurses' aids: maintaining of equipment, ordering, storing supplies, manufacturing or packing supplies. All the secretarial, clerical, recording and filing type of work falls into this category. Also there are certain types of health instruction, the chaperoning of women workers during examination by male physicians, the inspection of lunch rooms and inspection of general plant housekeeping, that can efficiently and properly be done by these workers.

With the safeguard and precaution that all their services be properly delegated and supervised by the responsible physicians and nurses, it seems to me that the judicious use of technical physicians' and nurses' aids offers the best solution for supplementing the shortage of physicians and nurses which has already occurred in some localities. As the war effort continues to expand taking more and more physicians and nurses, this shortage promises to become more acute in all industries and all localities.

28 East Jackson Boulevard

## THE HEALTH AND SAFETY PROGRAM OF THE U. S. MARITIME COMMISSION

AND THE U. S. NAVY IN CONTRACT  
SHIPYARDS

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Professor of Industrial Hygiene, Harvard School of Public Health  
and Health Consultant to the U. S. Maritime Commission

BOSTON

The Maritime Commission and the Navy together now employ about 7 million workers, men and women, in contract shipyards. These yards do not include government navy yards such as those at Brooklyn, Norfolk and Mare Island. In the case of the Maritime Commission general policies emanate from Washington but the contract supervision comes from Maritime's regional directors at the four offices in Philadelphia, New Orleans, Oakland and Chicago. In the case of the Navy supervision emanates from the Supervisor of Ships in the Office of the Assistant Secretary of the Navy and then through the Navy's representatives at the yards themselves and in the appropriate Navy District offices.

In both cases contracts are let by the commission or by the Navy to private contractors. Methods used, general processes and the like are left to the contractor, the government keeping hands off except for inspections leading toward final approval and acceptance of the ships.

The size of the yards varies all the way from a few men to many thousands. Women gradually are getting more and more into shipyard work, the actual percentages, as one might guess, varying with localities. In general the day shift takes in something over half the total number of workers in each yard and the remainder are divided up between the second or swing shift and the third or graveyard shift.

Many of the yards, in fact most of them, have as little as 1 or 2 per cent of experienced men—men who have worked in shipyards before this war. Some of the

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best yards that we have are built on made land in localities where ships never have been built before. Consequently, transportation and housing problems have been and often still are very serious.

Last summer the commission and the Navy appointed John M. Roche and myself as consultants on safety and health. A survey of selected yards around the country was made and a set of minimum standards for health and safety were evolved. These standards were presented before the various yards and the labor management groups and adopted on December 7 and 8 last at a conference held in Chicago. They will serve as our future guide for health and safety control in all the contract yards.

The Navy has assigned eight experienced officers to work with myself while Maritime has obtained the services of four safety engineers to work with Roche. These men will serve as consultants to all the contract yards throughout the country. Laboratories will be established on the East and West Coast as they are needed.

In general the health and safety problems confronting us are comparatively simple but because we have such an overwhelming percentage of green employees the task of carrying them out is not always easy. The pressure to turn out ships is great—it should be, for the need is urgent—and often we must condone practices that we would not accept in peacetime. We are glad to be able to say that both management and labor appreciate the situation and their cooperation has been most gratifying.

Eye flash burns and foreign bodies are among our most serious and most frequent causes of lost time. Obviously they are preventable but we are building ships in yards which often cover very large areas. Welding goes on everywhere, and it is very difficult to prevent flash burns of the welder's neighbor or even of an experienced welder who lifts up his welding shield momentarily and happens to be near another man who is welding.

Because of the general time and construction schedule it is common maritime practice to paint all metal surfaces as soon as possible with red lead. Generally this is done after the metal plates are in their final position, but some pieces are painted while in the yard. Welding painted surfaces into place presents a serious risk of lead poisoning, so that this practice has to be watched and the welder protected.

Similarly paint spraying which we do on a large scale, requires special protection for the sprayers and for the helpers and even for men in the immediate vicinity.

We propose to allow the use only of masks and respirators with Bureau of Mines approval. Heretofore there has been no control at all of the quality of protective equipment used in contract yards. It will be our job to see that such control now is put into effect.

In naval craft electric wiring is far more elaborate than on maritime freighters. Necessarily the Navy's wiring specifications demand better insulation than we need on freighters, so that it is common practice to protect these cables with insulators such as the fire resistant chlorinated naphthalenes and phenols. These may cause dermatitis unless proper precautions are

observed and we have met such troubles in some of the contract yards.

The rapidity with which all ships are built today is due in no small measure to the excellence of the construction planning. It would be impossible without arc welding, which can be seen today in all our large yards. Prefabrication of huge portions of the ships is the normal practice in all yards. Some of the jobs such as fore and after peaks and double bottoms, put the men in comparatively small spaces in which special ventilation is necessary to control welding fumes. All our health and safety consultants are prepared to advise the yards as to the adequacy of their ventilation and to make such air analyses as may be needed.

In general the medical and safety departments in the various yards are well organized and well run. We have been hit badly by the shortage of doctors in some districts, especially in rural communities, but probably we are no worse off than many other industries. We doubt if our situation in this respect presents any new problems.

Our work cannot be done as it should without preplacement physical examinations and occasional check-up examinations of men engaged in jobs potentially risky to themselves or to their fellow employees. Labor is apprehensive about physical examinations because of their occasional unintelligent use in the past. We are pledged to see that such examinations are done as they should be and that the results are used solely to help the men and thus to help us relieve the shortage in manpower. After all, our most valuable national asset is manpower. We believe we have the best there is, and our health and safety program is dedicated to its service.

## THE NATIONAL NUTRITION PROGRAM FOR INDUSTRY

ROBERT S. GOODHART, M.D.

Technical Adviser on Nutrition in Industry, Nutrition Division  
Office of Defense Health and Welfare Services

WASHINGTON, D. C.

It is hardly necessary to recite to a group of this character the advantages which might reasonably be expected to accrue for one who is careful to maintain himself in an optimum state of nutrition. That not only the individual but the nation as a whole would derive benefit from a system which would insure each and all of us an adequate supply of foods to provide all our dietary essentials will also be accepted. I believe, without argument. Unfortunately the food situation in this country has never approached such an ideal state. Prior to the onset of the present war many millions of American people were not eating the minimum amounts of all the essential food factors needed to keep them in good health. In part economic factors were to blame, every dietary study or nutrition survey of population groups has clearly shown the greatest incidence of poor diets or of malnutrition to be in the economically poorest one third of the population. However economic factors have not been by any means, the sole determining forces, as evidenced by the fact that poor diets and malnutrition occur in all economic strata. Ignorance, food habits and prejudices and problems of supply have been responsible for a considerable proportion of the

malnutrition in the United States. The diets of war workers cited by the Committee on Nutrition in Industry in its report<sup>1</sup> and the results of the dietary studies on aircraft workers in California<sup>2</sup> nicely illustrate the roles played by ignorance and food habits.

In the California study, 56 per cent of 1,103 aircraft workers were found to ingest less than the recommended amounts<sup>3</sup> of green or yellow vegetables, 49 per cent had 0 to 4 tomatoes or citrus fruits a week, 33 per cent had 0 to 5 glasses of milk a week, 0 to 1 egg was eaten by 23 per cent, while only 1 per cent consumed meat as infrequently as twice a week. For most of the men an increased consumption of milk and of citrus fruits, tomatoes and certain green vegetables would correct the major deficiencies of riboflavin, calcium and ascorbic acid and raise the intake of most other nutrients. It is of interest that 85 per cent of the diets furnished the recommended amounts<sup>4</sup> or more of protein. This survey was made between November 1941 and February 1942. There is reason to believe that the supply of food to this region has deteriorated since then, particularly in relation to meat, milk and milk products, eggs, butter, tomatoes and canned goods.

Since the beginning of the war the problem of food supplies and distribution has achieved a position of paramount importance in practically every section of the country. Paradoxical as it may seem, this has tremendously increased the importance of the national nutrition program. No matter how efficient a distribution system may be set up or what efforts might be taken to stimulate farm production, it is most unlikely that we can continue to supply the armed forces and our allies with the foods which they must have, without bringing about some decided changes in the eating habits of the civilian population. Control of the production and distribution of foods is the responsibility of the Office of the Food Administrator. The prime function of the Nutrition Division of the Office of Defense Health and Welfare Services is, through the national nutrition program, the education of the American people so that every one will make the best possible use of available foodstuffs to meet his nutritional requirements. If morale is not to be adversely affected, changes in food habits necessitated by shortages of particular food items must be preceded and accompanied by effective nutrition propaganda showing that such changes in food habits are not detrimental to health and are often beneficial; that they need not detract from the joy of eating and that the government is doing everything within its power to insure an adequate diet for all of us.

It is particularly important that the nutritional status and the morale of war workers should not be adversely affected by food shortages, poorly prepared and poorly balanced meals and inadequate feeding facilities and eating conditions. The aim of the national nutrition program for industry is to prevent loss in war production through illness and dissatisfaction of war workers arising from poor dietary conditions and misunderstandings of food needs.

The nutrition in industry section is an integral part of the national nutrition program. It constitutes one of

the two major steps taken by the nutrition division of the Office of Defense Health and Welfare Services to tie the national nutrition program closely to the war effort. The other major step is the adaptation of the program to serve as a prime force in promoting willing acceptance of rationing and an equitable distribution of available foodstuffs compatible with the maintenance of good nutrition.

The nutrition in industry section functions mainly through the organization set up by the nutrition division for the implementation of the national nutrition program, i. e., through the eleven regional nutrition representatives and the state and local nutrition committees. Arrangements have been made for the appointment of an assistant nutrition representative for nutrition in industry in each region. It is probable that most if not all of the assistant representatives will have been appointed by February 1943. In the interim the regional representatives are attending to the industrial aspects of the nutrition program in their regions.

Approximately one third of the state nutrition committees have formed subcommittees on nutrition in industry. It is expected that the remainder will rapidly follow suit. The membership of the subcommittees on nutrition in industry quite generally includes representatives from health departments and their industrial hygiene divisions, industry and industrial organizations, industrial physicians, labor, labor departments, food producers and merchants, caterers, service clubs and newspapers, in addition to nutritionists. Both the regional representatives and the assistant representatives of the nutrition division of the Office of Defense Health and Welfare Services are ex officio members of the nutrition committees and their subcommittees on nutrition in industry. The subcommittees are extremely useful, as they provide the nutrition committees with a direct contact with those groups in the state and community which are in a position to implement their recommendations. Such subcommittees are also frequently eminently qualified to define the needs of industries and war workers in their communities.

In addition to the organization set up for the national nutrition program, the nutrition in industry section of the nutrition division of the Office of Defense Health and Welfare Services has an arrangement with the Industrial Hygiene Division of the United States Public Health Service and the Ordnance branch of the United States Army whereby in inspection of meals, feeding conditions and requirements is to be included in industrial hygiene surveys of army ordnance plants. Reports prepared on nutritional conditions in army ordnance plants are transmitted through the industrial hygiene division of the U. S. Public Health Service to the army ordnance headquarters in Chicago as integral parts of the regular industrial hygiene reports. The regional nutrition representatives are requested to take whatever steps may be indicated to remedy community feeding problems about such ordnance plants.

Dr. Townsend, chief of the industrial hygiene division of the U. S. Public Health Service, has informed the nutrition division of the Office of Defense Health and Welfare Services of the close relationship which exists between his division and the various state industrial hygiene departments. As the "inplant" feeding problem logically belongs in the field of industrial hygiene, Dr. Townsend has requested that the state industrial

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Many industrial feeding problems arise from or are aggravated by difficulties in transportation, inadequate housing, poor sanitation and inadequate community marketing and eating facilities, problems which are the direct concern of governmental bodies other than the nutrition division. The regional nutrition representatives are responsible for bringing such conditions to the attention of the regional director of the Office of Defense Health and Welfare Services when they adversely affect the nutritional status of the worker. The nutrition representatives are consulted by the representatives of other divisions of the Office of Defense Health and Welfare Services when any of the latter are contemplating procedures which may have nutritional implications.

No program of industrial nutrition can be complete without an effort to improve the eating habits of the worker in his home and his community. This can best be achieved by a system of adult education which recognizes the intimate and personal nature of food habits and is fully aware of the subtleties needed to inject a lesson of science into well established and cherished habits. Obviously the homemaker has to be approached and also the local caterers and storekeepers, with added problems as homemakers are drawn into industry.

It was realized early in our program that the prestige and cooperation of existing labor organizations must be solicited to make the nutrition message more acceptable. A National Labor Advisory Committee was set up representing unions within the Congress of Industrial Organizations, the American Federation of Labor, their respective auxiliaries and the Railroad Brotherhood. Our office is in constant touch with each representative regarding any matter within affiliated organizations.

Both the national Congress of Industrial Organizations and the American Federation of Labor organizations have dispatched messages to all their state and city organizations urging them to cooperate with the nutrition committees. Each labor group is urged to set up its own committee on nutrition, the chairman of which may function as a delegate to the local nutrition committee.

Possible functions of local labor nutrition committees are (1) to set up small nutrition committees in each plant to cooperate with the plant cafeteria management and with other implant activities, (2) to consider the feeding problems in the absence of cafeterias, (3) to exert an influence on proprietors of vending machines and neighborhood stores or stands, (4) to help the packed lunch campaign, (5) to pool information and popularize successful solutions, (6) to set up nutrition campaigns, demonstrations and courses at union meetings and obtain material, movies, advisers and leaders from local nutrition committees or other qualified sources

and (7) to harmonize these activities with sound attitudes toward the rationing situation, availability, shortages, alternatives and whatever else the food situation may require.

To assist this program we provide news and feature articles regularly to the labor press. The American Federation of Labor has a feature service supplying about 450 union papers. In addition, a special section on labor and food for war workers has been set up in the WPB labor press service which reaches 800 labor press editors weekly with 3,000 words on nutrition in industry.

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ACUTE SODIUM FLUORIDE  
POISONING

WILLIAM L. LIDBECK, M.D.

IRVIN B. HILL, M.D.

SALEM, ORE

AND

JOSEPH A. BEEMAN, M.D.

PORTLAND, ORE

The recent accidental ingestion of sodium fluoride at the Oregon State Hospital at Salem, Ore., resulted in the highest morbidity and mortality thus far reported in the medical literature from this particular poison. There were 263 cases, of which 47 terminated fatally following a meal of scrambled eggs. The identity of the poison was not established until approximately twenty-two hours had elapsed except that preliminary tests performed by Drs. F. R. Menne, N. A. David and H. J. Sears of the University of Oregon Medical School indicated a virulent poison in the stomach of some of the victims and in the scrambled eggs. When toxicologic examination revealed the presence of sodium fluoride, it was apparent that roach powder had been placed in the scrambled eggs served at the evening meal. Subsequent investigation disclosed that a patient helper had unwittingly mistaken roach powder for powdered milk and had added approximately 17 pounds of the compound to a 10 gallon mixture of scrambled eggs. Fortunately the eggs were not generally distributed throughout the hospital but were served to only five of the working wards.

## CLINICAL FINDINGS

The food was rejected by many of the patients because of a salty or soapy taste, while others complained of numbness of the mouth. Extremely severe nausea, vomiting and diarrhea occurred abruptly and at times simultaneously, and blood was noted in the vomitus and stools in many instances. Soon after the meal there were complaints of abdominal burning and cramplike pains. General collapse developed in most instances but at variable periods of time, apparently depending on the concentration of the poison. This was characterized by prostration, weakness, absent or thready pulse, shallow unlabored respiration, weak heart tones, wet cold skin, cyanosis and equally dilated pupils. When this picture was pronounced death almost invariably occurred. Local or generalized urticaria occurred in some instances while in others there was a thick, mucoid discharge from the mouth and nose. When death was delayed, and in some cases in which recovery occurred, there were paralysis of the muscles of deglutition, carpopedal spasm and spasm of the extremities. Convulsions and abdominal tenderness and rigidity were absent. In the majority of cases death occurred between two and four hours after ingestion of the food, although in a few instances death was delayed for eighteen or twenty hours.

With the explosive occurrence of 263 acute and violent cases, amid inadequate surroundings, treatment was of necessity on an empiric basis. A teaspoon of salt and sodium bicarbonate in a glass of water served as a gastric lavage. Shock was combated with respira-

tory and cardiac stimulants, and the following were used alone or in combination, depending on the individual case: nikethamide, epinephrine, caffeine with sodium benzoate, neosynephrin subcutaneously, 50 per cent dextrose intravenously, whisky by mouth and external heat. Magnesium sulfate was used as a purge and was probably of more specific value than was appreciated at the time.

Through the office of the district attorney and the coroner examination of 6 bodies was authorized, and on 3 of these a complete autopsy was performed. The essential findings are grouped as follows. In the most acute deaths the mucosa of the stomach, duodenum and first portion of the jejunum was edematous and hyperemic. The stomach contents were mucinous and contained large amounts of undigested egg. The colon was empty except for portions of undigested food, indicating the fecocity of the diarrhea, the mucosa here was unchanged. There was a general increased wetness and acute congestion of the abdominal viscera, and the liver and kidneys were swollen. The lungs were ballooned at their edges, with occasional interlobar petechial hemorrhages. There was no aspiration of the stomach contents. The heart showed decided dilatation of the right chambers, which contained fluid blood. The brain revealed only slight edema and hyperemia. When death was delayed the only other changes consisted of petechial hemorrhages of the gastric and duodenal mucosa. In no case was increased fat noted in the liver. Microscopic examination of the various organs confirmed these gross findings.

## TOXICOLOGIC EXAMINATION

The cooked eggs contained from 3.2 per cent to 13 per cent sodium fluoride in analyses made on different portions of the same sample indicating a spotted distribution of the poison. One patient dying fifteen minutes after ingestion of the eggs showed an estimated 17.2 Gm. of sodium fluoride present in the stomach contents, when death occurred one hour after ingestion of the eggs an estimated 3.7 Gm. of sodium fluoride remained in the stomach contents, when death was delayed four hours, the stomach was empty but the entire liver contained an estimated 0.85 Gm. of sodium fluoride and both kidneys an estimated 0.21 Gm. of sodium fluoride, when death was delayed for eighteen hours only 0.18 Gm. of sodium fluoride was found in the stomach contents. In all cases fluorides were easily identified by the etch test on glass from the ash in 10 Gm. samples of kidney and liver and by the presence of calcium fluoride bands on spectrographic analysis.

Roach powder contains anywhere from 30 to 90 per cent sodium fluoride depending on the manufacturer. The powder in question contained 90 per cent of the commercial salt. Sodium fluoride is a white powder with a salty, alkaline taste, odorless, very soluble in water and appearing grossly similar to sodium bicarbonate or flour. The fatal dose is given by Baldwin<sup>1</sup> as from 5 to 10 Gm. for human beings. This figure is the one most commonly accepted. Thienes<sup>2</sup> states that 0.25 Gm. has caused nausea and 4 Gm. has caused death.

The majority of reported poisonings by sodium fluoride have been mass poisonings due to the use of the compound in place of sodium bicarbonate, flour

Dr. Lidbeck is the director of the laboratory and Dr. Hill, assistant physician at the Oregon State Hospital. Dr. Beeman is a member of the Crime Detection Laboratory, Department of State Police, University of Oregon Medical School.

<sup>1</sup> Baldwin, H. D. J. Am. Chem. Soc. 21: 517, 1899.  
<sup>2</sup> Thienes, C. H. Chemical Toxicology, Philadelphia, Lea & Febiger, 1940, p. 167.

or epsom salt (magnesium sulfate) In Pittsburgh on Nov 11, 1940 sodium fluoride was mistaken for flour and added to pancakes at a Salvation Army service center, resulting in the poisoning of 40 persons and 12 deaths.<sup>3</sup> Wirthlin<sup>4</sup> reported a death by suicide following the ingestion of ½ pound of sodium fluoride in two hours Geiger<sup>5</sup> reported 3 deaths when sodium fluoride was mixed with sodium bicarbonate, and in the same outbreak Carr<sup>6</sup> reported 3 additional fatalities and 2 suicides Bell<sup>7</sup> reported the recovery of 1 patient who was seriously stricken after ingesting an estimated 5½ grains (0.33 Gm) of sodium fluoride Maletz<sup>8</sup> reported 1 case of fatal poisoning and 1 recovery, in which the amount of fluoride taken was small Sharkey and Simpson<sup>9</sup> reported 1 case of fatal and 7 of nonfatal poisoning in which sodium fluoride was mistaken for epsom salt Their paper also contains an excellent review of the literature up to that time

## COMMENT

The medical and nursing staff of the hospital found themselves confronted with an enormous task in caring for such a number of acutely ill patients The difficulty was further aggravated by the obscure nature of the poison which excluded the use of a specific antidote It is interesting to speculate as to the reasons underlying the severity of the reaction in the different cases On the basis of the toxicologic examination it is apparent that the sodium fluoride was unevenly mixed in the eggs, with consequent variation in the concentration It was also apparent that the older patients, because of their generally poor physical condition, withstood the effects of the poison less readily than younger ones The amount of food eaten naturally varied considerably, but it appeared that the more demented patients, who would be less discriminating in their food habits, suffered more than others When there was prompt and copious vomiting, the effects were less severe

Roach powder is commonly used around institutions, and our experience indicates that sodium fluoride is a more potent poison than has been generally recognized It would seem that the same precautions concerning the packaging, labeling and distribution of this compound should be taken as with other well known poisons That this danger is not apparent is indicated by the absence of a poison label on the container and failure of the manufacturer to color this substance so that it would be less easily mistaken for certain food substances to which it bears a close resemblance

THE ORAL USE OF SULFATHIAZOLE  
AS A PROPHYLAXIS FOR  
GONORRHEA

## PRELIMINARY REPORT

CAPTAIN JAMES A LOVELESS  
MEDICAL CORPS, ARMY OF THE UNITED STATES  
AND

COLONEL WILLIAM DENTON  
MEDICAL CORPS, ARMY OF THE UNITED STATES

Our purpose in this study is to determine whether the prophylactic administration of sulfathiazole prevents the development of gonorrhea The existence of an inordinately high gonorrhea rate among certain troops makes the development of an easily administered chemical prophylaxis particularly important The following incomplete experimental data are published as

*Veneral Disease Rates in Control and Sulfathiazole  
Test Group at Fort Benning*  
(All rates per thousand per annum)

Month	Number in Group	Gonorrhea		Chancroid		Syphilis		Total	
		Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
		1 Control Group (No Sulfathiazole)							
March	3 771	68	216	38	121	10	48	191	300
April	1 883	61	375	19	121	13	83	83	99
May	3 970	48	145	0	66	17	51	87	202
June	4 101	60	176	10	44	13	38	88	208
July	4 390	80	218	30	82	39	106	140	460
August	5 100	63	148	10	24	20	50	76	231
September	5 669	43	102	13	31	16	38	72	170
2 Test Group Including All Failures									
March	1 200	18	150	6	60	0	0	24	200
April	1 560	28	216	10	110	4	21	42	267
May	1 560	5	38	7	54	0	23	12	110
June	1 560	5	38	2	15	8	62	15	110
July	1 440	4	33	6	50	7	58	17	141
August	1 200	7	70	3	30	1	10	11	110
September	1 223	1	10	4	39	4	39	9	88
3 Test Group Omitting Failures Not Under the Sulfathiazole Medication as Prescribed									
March	1 200	18	150	7	60	0	0	25	210
April	1 560	28	216	10	110	4	21	42	267
May	1 560	1	8	1	8	3	20	4	39
June	1 560	1	8	0	0	8	62	9	71
July	1 440	1	8	1	8	7	58	8	71
August	1 200	1	10	1	10	1	10	3	30
September	1 223	0	0	0	0	4	39	4	39

a preliminary report because of the encouraging results already achieved

Jones<sup>1</sup> and Kline and Ryan<sup>2</sup> have published articles on the subject of sulfathiazole prophylaxis In both studies sulfathiazole was given in divided doses after exposure In the former study gonorrhea did not develop in any of 350 men who received sulfathiazole, in the latter, of 1,000 who received the drug 3 developed gonorrhea

## METHOD OF STUDY

The test group consisted of a company of approximately 1,400 Negroes The control group consisted of approximately 4,000 Negro troops from the same post

The method of administering sulfathiazole was as follows All soldiers in the test group were required to "sign out" and "sign in" through the noncommissioned officer in charge of quarters On signing out, each soldier was given 2 Gm of sulfathiazole and was observed to swallow it in the presence of the noncommissioned officer During the first few weeks of the study all soldiers who did not have in their possession a copy of form 77 MD (station prophylaxis slip) on signing in were given 2 more Gm of sulfathiazole and an additional 2 Gm the following morning under the

Captain Loveless is venereal disease control officer and Colonel Denton is post surgeon at Fort Benning Georgia

<sup>1</sup> Jones Maurice Sulfathiazole Prophylaxis of Gonorrhea and Chancroid U S Nav M Bull 40 113 (Jan) 1942

<sup>2</sup> Kline E F and Ryan T C Sulfathiazole Prophylaxis in Prevention of Gonococcus Infections U S Nav M Bull 40 360 (April) 1942

- 3 Food and Drug Review January 1941
- 4 Wirthlin M R U S Nav M Bull 35 205 (April) 1937
- 5 Geiger J C California & West Med 44 81 (Feb) 1936
- 6 Carr J L California & West Med 44 84 (Feb) 1936
- 7 Bell R D Brit M J 1 886 (May 2) 1936
- 8 Maletz Leo New England J Med 213 370 (Aug 22) 1935
- 9 Sharkey T P and Simpson W M Accidental Sodium Fluoride Poisoning J A M A 100 97 (Jan 14) 1912

**Medical Slang**—There is not sufficient distinction in the medical mind between the spoken and the written word Certain medical slang is highly descriptive and emotionally and intellectually suited to the purpose of professional discussion, when, however, such idiom is transferred to print it produces a different effect There are too many examples of words and phrases incorporated and accepted into the medical press which offend against rules of style and grammar Textbooks on the acute abdomen are numerous disease may be acute, but an abdomen, never Exactness and dignity are the two essential qualities of good medical expression The surgeon who 'laparotomises' his patient and the physician who diagnoses 'P T B' achieve neither—The Decay of Medical Language, editorial, New Zealand M J 41 236 (Dec) 1942

same strict supervision. Later this exemption on the basis of station prophylaxis was discontinued and sulfathiazole was administered to all. Early in the course of the experiment restriction to the camp for a period of one week of those who received 6 Gm. was attempted in order to prevent overdosage. This restriction was later relaxed. The cost of this prophylaxis has been about 10 cents per soldier monthly.

#### RESULTS

The accompanying table presents the rates for gonorrhea, chancroid and syphilis of the test and control group from March through September. The administration of sulfathiazole to the test group was started on May 1.

It will be noted that in the control group there is no distinct trend of the rates for gonorrhea or syphilis. The rate for chancroid is considerably lower during the last four months of the total period.

Section 2 of the table includes all cases of venereal disease diagnosed during the period March through September. The decline in the gonorrhea rate is evident. Chancroid shows no clerical change, and syphilis remains constant except during the month of August, when a sharp decline is noted. Section 3 excludes those cases not under the influence of sulfathiazole when exposure occurred—men who were exposed away from the post while on overnight leave or furlough and who could therefore not obtain the additional sulfathiazole that would have been given could they have returned to the post. These cases are counted in section 2 as they were members of the group under study but are omitted from section 3 because of their failure to carry out the provisions of the study. One gonorrhea failure was noted in each of the months May, June, July and August. The situation is similar with chancroid infection. When sulfathiazole was taken according to the plan of the experiment, gonorrhea and chancroid almost entirely disappeared. Syphilis was unaffected, although the low rate noted in August is not explained.

#### SULFATHIAZOLE REACTIONS

No toxic or allergic reactions in the test group other than occasional complaints of mild urticaria have been observed. No case has been hospitalized nor have any days been lost from duty as a result of the sulfathiazole administration. The possibility of sulfonamide sensitization has been considered, but there has not yet been an opportunity to investigate this problem. However, no indication of sensitivity has been observed thus far.

#### COMMENT

It is recognized that this presentation is preliminary in nature. However, it is believed that sufficient evidence is presented to prove that sulfathiazole prophylaxis will prevent gonorrhea and chancroid. It is our opinion that, under certain conditions and in a final form yet to be developed, prophylactic sulfathiazole administration would produce a remarkable decline in gonorrhea and chancroid in the Army. It is admitted that certain dangers are involved in administering this drug, particularly on a large scale and that the answer to certain questions has not yet been determined. In view of the magnitude of the venereal disease problem and its effect on man days, we believe that the risks are justified.

This experiment is being continued in an effort to simplify the administration of the drug and to obtain further corroborative data. Although no untoward reactions have been observed, no data are as yet avail-

able as to possible sensitization or other ill effects consequent on repeated administration of small doses. The study group is being observed carefully for such evidence. Until such data are available the study is not being extended, nor is it felt advisable that such measures be made routine practice.

#### SUMMARY<sup>3</sup>

1. A company of approximately 1,400 Negro troops was given sulfathiazole prophylaxis of 2 Gm. before leaving the fort on pass. Those taking station prophylaxis received no further drug. All others received 4 additional Gm., 2 on returning to the fort and 2 the next morning.

2. In this company there has occurred a phenomenal disappearance of gonorrhea and chancroid. Excluding the failures not under the influence of the drug at the time of exposure, the gonorrhea rate dropped to a level of 8 per thousand yearly as compared with 171 per thousand in the control group, and the chancroid rate dropped to 6 as compared with 52.

#### CONCLUSIONS

1. Sulfathiazole administered orally appears to be an effective preventive against gonorrhea and chancroid.

2. Its administration in this experimental group has not been attended by serious reactions.

3. Sufficient evidence has been obtained to justify further extensive study of this problem.

### Clinical Notes, Suggestions and New Instruments

#### Q FEVER

T. LUCIEN ZEPH, M.D., COLUMBIA, S. C.

The present war with its rapid means of transportation has focused our attention on diseases of far distant lands, some of which have never occurred in this country. The typhus fever group is of particular interest, and one should be ever on the alert for its appearance. McGraw's<sup>1</sup> classification is based on the insect vector and is divided into the epidemic and non-epidemic forms. The epidemic form is true typhus, the louse being the insect vector. Under the non-epidemic form are classified flea typhus or Brill's disease, tick typhus which includes Rocky Mountain spotted fever, Mountain tick fever and other and mite typhus, sometimes called Japanese river fever or tropical typhus. In 1935 a new fever entity was first noted among the meat workers in Brisbane, Queensland, Australia. The cases reported were studied by Derrick<sup>2</sup> and Burnet and Freeman,<sup>3</sup> who made their report in 1937. They described its clinical course and identified the causative organism as Rickettsia burneti. Although it has a certain resemblance to typhus fever, Q fever differs in that its clinical course is variable, there is no characteristic rash and the Weil-Felix reaction is negative. Recent investigations by Kendall,<sup>4</sup> Bowen,<sup>5</sup> Cox,<sup>6</sup> Derrick

<sup>3</sup> Since this article was written data have been collected on 10 soldiers from the test group who were subsequently admitted to the Station Hospital for various illnesses. All had previously received sulfathiazole as a prophylaxis. Over an average period of six to five days each had taken an average of 45 Gm. of this drug. In the hospital 12 patients received an average therapeutic total of 24 Gm. The individual prophylactic total ranged from 4 to 100 Gm. and the therapeutic total ranged from 5 to 52 Gm. Three of the 20 were treated with sulfathiazole powder or ointment. In this entire group a therapeutic response to the drug was satisfactory and there have been no reactions.

<sup>1</sup> Manson-Bahr, Phillip H. *Manson's Tropical Diseases*. Baltimore: William Wood & Company, 1942. pp. 274-275.

<sup>2</sup> Derrick, E. H. *Q Fever: A New Fever Entity*. Clinical Features, Diagnosis and Laboratory Investigations. *M. J. Australia* 2: 281 (Aug. 21) 1937.

<sup>3</sup> Burnet, F. M. and Freeman, Mavis. Experimental Studies on the Virus of Q Fever. *M. J. Australia* 2: 299-306 (Aug. 21) 1937.

<sup>4</sup> Kendall, A. I. *Australian Q Fever: Mountain Tick Virus and Pneumonia*. Quart. Bull. Northwestern University M. School 15: 110-113, 1941.

<sup>5</sup> Bowen, Albert. Acute Influenza Pneumonitis. *Am. J. Roentgenol.* 34: 168 (Aug.) 1935.

<sup>6</sup> Cox, H. R. *Rickettsia Diaporica and American Q Fever*. *Am. J. Trop. Med.* 20: 463-469 (July) 1940.

Burnet and Freeman,<sup>7</sup> Dyer, Topping and Bengtson,<sup>8</sup> Hornbrook and Nelson,<sup>9</sup> and Dyer<sup>10</sup> have shown a close relationship between Montana tick fever, pneumonitis and Australian and American Q fever. Etiologically they all agree that the rickettsial virus is the responsible organism and that the clinical variation may be due to different strains. Cox<sup>11</sup> suggested *diaporica* as the species of *Rickettsia* in American Q fever whereas it is the burneti in Australian Q fever. The insect vector in the former is *Dermacentor andersoni*<sup>12</sup> and in the latter *Hemaphysalis humerosa*.<sup>13</sup>

The bacteriologic, epidemiologic, cultural and serologic aspects of this rickettsial virus have been studied by Derrick,<sup>2</sup> Cox,<sup>13</sup> Dyer,<sup>14</sup> Davis and Cox,<sup>12</sup> Parker and Davis<sup>15</sup> and Bengtson.<sup>16</sup> The pathologic effects on the various organs of the mouse, guinea pig, rabbit and monkey have been demonstrated by Burnet and Freeman,<sup>3</sup> Lillie, Perrin and Armstrong.<sup>17</sup> Perrin and Bengtson,<sup>18</sup> and Lillie.<sup>19</sup> Dyer<sup>10</sup> has shown a close similarity between Australian Q fever and a disease caused by an infectious agent isolated from ticks in Montana and also reported a case<sup>14</sup> of human infection in a laboratory worker. Burnet and Freeman<sup>7</sup> made a similar study and concluded that the virus of each of these diseases should be included in the same species. Heddorffer and Duffalo<sup>20</sup> reported a probable case of American Q fever with a definite pneumonitis. A number of cases of atypical pneumonitis have been reported in which a serologic test was positive for the rickettsial virus. The clinical course of Q fever is variable which is due in all probability to the various strains of the rickettsial virus. Until the various strains have been properly identified it seems wise to separate the cases of Q fever with pneumonitis from those in which the clinical course is that of a true fever.

## REPORT OF CASE

J A, a white girl aged 18 whose family history was negative and whose only illness besides the usual childhood diseases was acute catarrhal jaundice in November 1941, had the onset of her present illness one week after returning from the mountainous country of western North Carolina where she had visited in the country, drunk water from many sources and been on a number of hikes. Three days before the onset there was

general malaise, loss of appetite, constipation and an unwell feeling. The onset was dramatic and was ushered in with a hard chill and a temperature of 105 F on July 25, 1942. After three days of chills, fever, headache and generalized aching the patient was admitted to the Columbia Hospital. On admission the physical examination was entirely negative except for slight generalized tenderness in the lower part of the abdomen. Repeated examinations continued to be negative. A slight cough developed.

The fever together with the chills continued daily for two weeks. The chills were rather severe, during them she shook as if riding a rocking horse. The spleen was never palpable. A mild neuritis developed in the legs and feet and they became quite sensitive to touch. During the first week the highest daily temperature ranged from 105 to 105.8 F and never dropped to normal during the day. The temperature continued to reach 104 to 105.8 in the second week, 102 to 105.4 in the third week and 102.4 to 104.4 in the fourth week, dropping to normal once during the day. It gradually fell and became normal on the forty-sixth day, five days after she was given a blood transfusion. The pulse remained moderately slow and the lungs remained clear during the entire illness.

The laboratory findings were as follows: July 28, the hemoglobin content was 70 per cent, red blood cell count 3,500,000, white blood cell count 9,650 and the differential count: polymorphonuclear leukocytes 68 per cent and lymphocytes 19 per cent. July 29, the white blood cells numbered 9,000 with polymorphonuclear leukocytes 78 per cent, lymphocytes 19 per cent, transitionals 3 per cent. August 6, hemoglobin was 71 per cent, red blood cell count 3,600,000, white blood cell count 7,100 with polymorphonuclear leukocytes 75 per cent, lymphocytes 25 per cent. August 17, hemoglobin was 65 per cent, red blood cell count 3,610,000, white blood cell count 5,200, with polymorphonuclear leukocytes 70 per cent and lymphocytes 27 per cent. August 20, hemoglobin was 67 per cent, red blood cell count 3,300,000, polymorphonuclear leukocytes 60 per cent and lymphocytes 40 per cent. The urinalysis showed a specific gravity of 1.016, was negative for sugar and showed 1 plus albumin and a few pus cells in the microscopic study. Repeated urinalyses were negative. August 11 a tuberculin test was negative. August 7 the stool culture was negative for the typhoid group. Blood cultures were negative on repeated examinations. Agglutination tests were as follows: July 31 typhoid positive in a dilution of 1:25, paratyphoid negative, *Brucella abortus* negative, Weil-Felix reaction positive in dilutions of 1:25 and 1:50. These tests were repeated on August 4 and 8 and all gave entirely negative results. A sample of the blood was sent to the United States Public Health Laboratory for examination, stress being laid on the various strains of the typhus group. The report on August 22 was as follows: agglutination for *Bacillus proteus* X 19 negative, *Pasteurella tularensis* negative, *Brucella abortus* negative and *Salmonella paratyphi* B positive in a dilution of 1:20. Complement fixation for Rocky Mountain spotted fever negative, endemic typhus negative, Q fever positive in a dilution of 1:4. Roentgenologic examination of the lungs was negative on August 25.

## COMMENT

A tentative diagnosis of Q fever was made on the eleventh day based on the following findings: (1) Clinically the condition belonged in the typhus group. (2) there was an absence of rash. (3) there was a negative Weil-Felix reaction and also a negative reaction for other specific fevers. On the twenty-fifth day of the illness the complement fixation test was positive for Q fever.

The illness was most severe during the first two weeks at no time was the patient critically ill. Toward the latter part of the illness the devitalizing effect became apparent and a blood transfusion was given. Quinine was administered during the first three days with no effect. This was followed by moderately large doses of sulfadiazine for five days with no effect. The treatment then became one for fevers of long duration.

7 Burnet F M and Freeman Mavis. Comparative Study of Rickettsial Strains from an Infection of Ticks in Montana (United States of America) and from Q Fever. *M J Australia* 2: 887 (Dec 16) 1939.

8 Dyer R E, Topping N H and Bengtson Ida A. An Institutional Outbreak of Pneumonitis. II. Isolation and Identification of Causative Agent. *Pub Health Rep* 55: 1945 (Oct 25) 1940.

9 Hornbrook J W and Nelson K R. An Institutional Outbreak of Pneumonitis. Epidemiologic and Clinical Studies. *Pub Health Rep* 55: 1936 (Oct 25) 1940.

10 Dyer R E. A Similarity of Australian Q Fever and a Disease Caused by an Infectious Agent Isolated from Ticks in Montana. *Pub Health Rep* 53: 1229-1238 (July 7) 1939.

11 Cox H R. Studies of a Filter Passing Infectious Agent Isolated from Ticks. Further Attempts at Cultivation in Cell Free Media. Suggested Classification. *Pub Health Rep* 54: 1882 (Oct 8) 1937.

12 Davis Gordon E and Cox H R. A Filter Passing Infectious Agent Isolated from Ticks. Isolation from *D. Andersoni* Reactions in Animals and Filtration Experiments. *Pub Health Rep* 53: 2259 (Dec 30) 1938.

13 Cox H R. Cultivation of Rickettsiae of the Rocky Mountain Spotted Fever Typhus and Q Fever Groups in the Embryonic Tissues of Developing Chicks. *Science* 94: 399-403 (Oct 31) 1941.

14 Dyer R E. A Filter Passing Infectious Agent Isolated from Ticks. Human Infection. *Pub Health Rep* 53: 2277 (Dec 30) 1938.

15 Parker R R and Davis G E. A Filter Passing Infectious Agent Isolated from Ticks. Transmission by *D. Andersoni*. *Pub Health Rep* 53: 2267 (Dec 30) 1938.

16 Bengtson Ida A. Immunologic Relationships Between the Rickettsia of Australia and American Q Fever. *Pub Health Rep* 56: 272-281 (Feb 14) 1941. Studies on Active and Passive Immunity in Q Fever Infected and Immunized Guinea Pigs. *ibid* 56: 327-345 (Feb 21) 1941.

17 Lillie R D, Perrin T L and Armstrong C. An Institutional Outbreak of Pneumonitis. III. Histopathology in Man and Rhesus Monkeys in the Pneumonitis Due to the Virus of Q Fever. *Pub Health Rep* 50: 149-155 (Jan 24) 1941.

18 Perrin T L and Bengtson Ida A. The Histopathology of Experimental Q Fever in Mice. *Pub Health Rep* 57: 790-798 (Mar 22) 1942.

19 Lillie R D. Pathologic Histology in Guinea Pigs Following Intraperitoneal Inoculation with the Virus of Q Fever. *Pub Health Rep* 57: 296-306 (Feb 27) 1942.

20 Heddorffer M B and Duffalo J A. American Q Fever. *J A M A* 116: 1901-1902 (April 26) 1941.



## CONCLUSION

1 One should think of Q fever when clinically the disease resembles the typhus fever group, there is no rash and the Weil-Felix reaction is negative

2 A constant alert should be maintained throughout the war for fevers and diseases of the Orient.

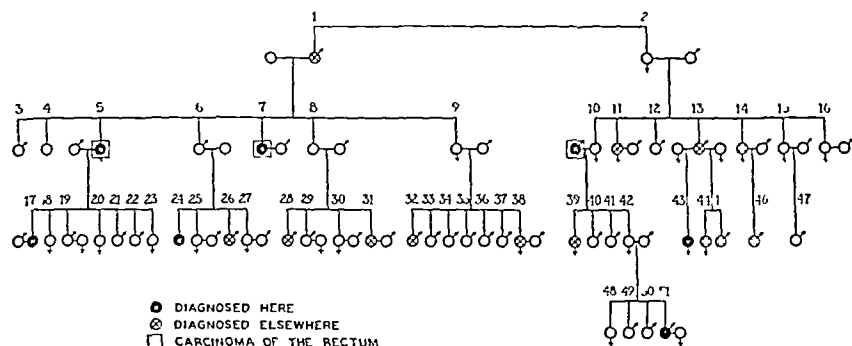
1515 Bull Street

## FAMILIAL POLYPOSIS OF THE COLON

LIEUTENANT (JG) MORRIS T. FRIEDEL (MC) U. S. N. R.  
and  
E. G. WAKEFIELD, M.D.  
ROCHESTER, MINN.

Harrison Cripps<sup>1</sup> is credited with recording the first observation that two members of the same family might have polyps of the rectum. Since this report many isolated family histories have been recorded. Some of these reports have consisted of two or three members of one generation or two or three generations who have had polyps of the colon. Such reports are of limited value. The larger families, such as the one reported herein and the one reported by Jungling<sup>2</sup> also are of limited value so far as human genetics is concerned. These reports are of limited value because family histories are notoriously inaccurate and also because not enough information concerning the general health of the family can be obtained.

The great number of members of a family like the one recorded herein and the one studied by Jungling definitely



Family tree showing incidence of polyposis of the colon

indicates that in some families there is a hereditary factor so far as polyps of the colon are epithelial proliferations which are potential carcinomas. Such polyps probably all will be carcinomas if the patient who has them lives long enough. Therefore, carcinoma of the rectum and colon among those who have polyps is certain to occur in time. But one must not be confused: carcinoma arising in polyps of the colon is secondary to the polyps and is not a part of the hereditary factor.

As to the hereditary factor of disseminated polyposis of the colon when it is present, one can say that the disease is transmitted by both males and females. This is shown in the family tree. Both males and females suffer from the disease. The inheritance has been traced through several generations. At this point it must be emphasized that about half of the patients with disseminated polyposis of the colon who have been seen at the Mayo Clinic do not have this hereditary factor. Their family histories are not even suggestive that any other members of their families have or have had polyps of the rectum and colon.

## REPORT OF CASES

CASE 1—A man aged 61 registered at the clinic in September 1921. He had had melena for two years and for six months had had alternating diarrhea and constipation. Proctoscopic examination established the diagnosis of rectal carcinoma. There were numerous polyps above and below the lesion; these polyps extended beyond the range of the proctoscope.

CASE 2—A woman aged 56 registered at the clinic in March 1932. For three months she had had pains in the lower part of the abdomen which were relieved by the passage of stool and flatus. Roentgenologic and proctoscopic studies revealed a carcinoma of the rectum and multiple polyposis of the colon. The adenocarcinoma was of grade 4 malignancy (Broders). The patient died of hepatic metastasis subsequent to removal of the rectal lesion.

CASE 3—A woman aged 27 registered at the clinic in April 1932. She had had frequent bloody stools for four years. Roentgenologic and proctoscopic studies revealed multiple polyposis of the colon.

CASE 4—A woman aged 18 registered at the clinic in November 1934. For six months she had had four to six stools daily and had noticed gross melena for two months prior to her coming to the clinic. A diagnosis of multiple polyposis of the colon was made on the basis of proctoscopic and roentgen studies.

CASE 5—A woman aged 61 registered at the clinic in August 1935. She had had rectal bleeding for twelve months. Proctoscopic studies revealed a carcinoma of the rectum and multiple polyps above and below the lesion.

CASE 6—A woman aged 27 registered at the clinic in April 1932. She had had rectal bleeding for four years. Roentgenologic and proctoscopic studies revealed multiple polyposis of the colon.

CASE 7—A woman aged 27 registered on May 31, 1935, complaining of weakness. Results of examination were negative except for evidence of secondary anemia. She returned in October 1937, at which time she complained of alternating diarrhea (three or four stools daily) and constipation. Proctoscopic examination revealed numerous tiny polyps in the rectosigmoid. This condition has persisted to the date of our report and has been verified by roentgenologic studies. In September 1937 appendectomy and the transcolonic removal of a polyp were performed. A diagnosis of grade 1 adenocarcinoma in an adenoma was made. In October 1940 ileosigmoidostomy was performed, and a polyp was removed from the transverse portion of the colon. This polyp also was found to contain portions of a low grade (grade 1) adenocarcinoma.

In the illustration is revealed such information concerning additional members of this family as was available to us. The family had originated in Germany, and both the brother and sister (cases 1 and 2) were born there. At the time of writing it was impossible to gain any further information from Germany concerning the family. There are approximately forty-nine descendants of the brother and sister. Of these, nineteen or 39 per cent, had either multiple polyposis or a carcinoma of the large intestine. The disease was manifest in nine males and eleven females. Of the seven members examined at the clinic, two were males and five were females. Carcinoma of the rectum was present in three of these seven. Multiple polyposis of the colon was found in all the patients examined at the clinic.

## SUMMARY

In about half the cases of multiple polyposis of the colon there is a definite hereditary tendency. This hereditary tendency does not produce any known genetic pattern. It is not sex-linked and is neither a mendelian dominant nor a recessive. In half of the cases the family history is entirely negative for polyps or carcinoma of the colon.

From the Division of Medicine, Mayo Clinic.

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This article has been released for publication by the Division of Publications of the Bureau of Medicine and Surgery of the U. S. Navy. The opinions and views set forth in this article are those of the writer and are not to be considered as reflecting the policies of the Navy Department.

1 Cripps, W. H. Two Cases of Disseminated Polyposis of the Rectum. *Tr. Path. Soc. London* 33: 165-168, 1882.

2 Jungling, Otto. Polyposis intestinalis. *Beitr. z. klin. Chir.* 143: 476-483, 1928.



## Special Article

### HANDBOOK OF NUTRITION XXII

#### ADEQUACY OF AMERICAN DIETS

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WASHINGTON, D C

*These special articles on foods and nutrition have been prepared under the auspices of the Council on Foods and Nutrition. The opinions expressed are those of the authors and do not necessarily reflect the opinion of the Council. These articles will be published later as a Handbook of Nutrition—Ed*

A description of the diets of a whole population can never be simple. Food habits vary from place to place and from season to season. They differ from family to family too, reflecting economic circumstances and cultural backgrounds. Even within a single family group diets of individuals vary more than is generally realized. The latter point, preserved in legend by the Mother Goose rhyme about Jack Spratt and his wife, has recently been spelled out in terms of its nutritional significance by Canadian investigators. Their studies show that among low income groups food tends to be distributed inequitably among family members.<sup>1</sup> As a rule, the men—the breadwinners—appear to fare best relative to nutritional needs, women and older children, worst. When there is scarcely enough to go around, mothers tend to sacrifice for other family members. Even so, however, teen age children with their high nutritional requirements often get less than enough.

Information regarding dietary levels in this country is available from two types of statistics. On the one hand are the United States Department of Agriculture's figures showing average quantities of various foods or groups of food disappearing in consumptive channels and long time trends in our nation's over-all consumption. These estimates are constructed from available data on production, imports, exports and changes in quantities in reserve (stocks) as of the beginning and the end of each year. On the other hand there are data from numerous family dietary studies which throw much light on the extent to which various groups of the population share in these national food supplies.

#### TRENDS IN FOOD CONSUMPTION IN THE UNITED STATES

Per capita food supplies in this country are bountiful compared with those of most other parts of the world. The per capita volume has remained fairly constant during the last three decades, but within the total the relative importance of various foods has shifted.<sup>2</sup> As charts 1 to 7 show, there has been a phenomenal rise in the consumption of sugar and citrus fruits, and an upward trend in the consumption of dairy products and fruits and vegetables on the whole. Paralleling these increases, there has been a decline in the consumption of potatoes, meats and grain products. From the standpoint of nutrition, certain of these trends in food

consumption have enriched the diets of American people while others have impoverished them. On the credit side, for example, is the increase in consumption of dairy products, fruits and succulent vegetables, on the debit side, the increase in consumption of refined sugar.

These shifts in consumption have not occurred to the same extent among all population groups. According to dietary studies made during the period 1885 to 1937,<sup>3</sup> the decline in the consumption of grain products by village and city families has been greater among those with comparatively low food expenditures (\$1.25 to \$1.87 a week per person, 1935 retail food price levels) than among those with average and higher than average food expenditures. Among families spending less than average amounts for food, meat consumption fell to a low level in 1915-1924 and since that period has increased relatively little. In contrast, among families

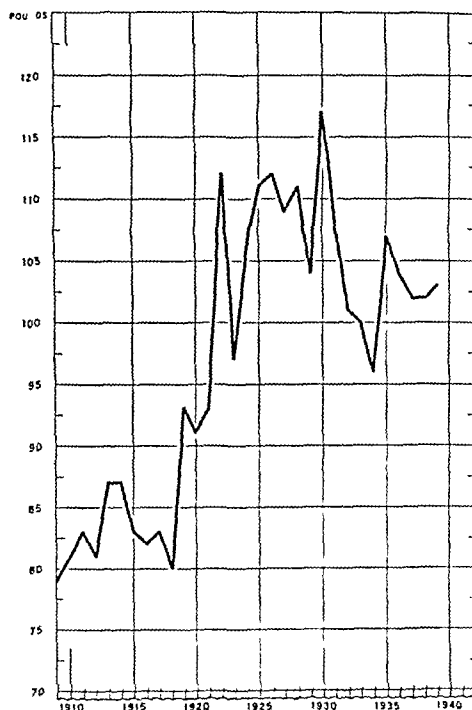


Chart 1—Per capita consumption of cane and beet sugar (raw basis) in the United States 1909-1939

spending more than average amounts for food, meat consumption declined relatively more in the decade 1915-1924 but since that period has increased considerably. The rate of increase in the consumption of milk and leafy green vegetables during the last fifty years has been of about the same order of magnitude among all expenditure groups, whereas the relative increase in the consumption of vitamin C rich fruits has been more striking at lower than at higher food spending levels.

On a per capita basis, the nutritive value of the aggregate assortment of uncooked food materials estimated as delivered to the nation's kitchens during the two periods 1920-1924 and 1936-1940 is compared in certain respects with the dietary recommendations announced at the 1941 National Nutrition Conference for Defense by the National Research Council's Food and Nutrition

From the Bureau of Home Economics, U. S. Department of Agriculture.

1. McHenry, E. W. Nutrition in Canada. *Canad. Pub. Health J.* 30: 431-434 (Sept.) 1939. Hunter, George and Pett, L. B. A Dietary Survey in Edmonton. *ibid.* 32: 259-265 (May) 1941.

2. Consumption of Agricultural Products mimeographed releases March-August and December. United States Department of Agriculture, Bureau of Agricultural Economics, 1941.

3. Stiebeling, Hazel K. and Coons, Callie M. Present Day Diets in the United States in Food and Life Yearbook of Agriculture 1939. Washington, D. C. Government Printing Office, 1940.

Board<sup>4</sup> (table 1) It would appear that diets in this country could meet the recommendations for nutrients listed except in the case of calcium, riboflavin and thiamine (on a per hundred calory basis), provided the food was distributed equitably among the population

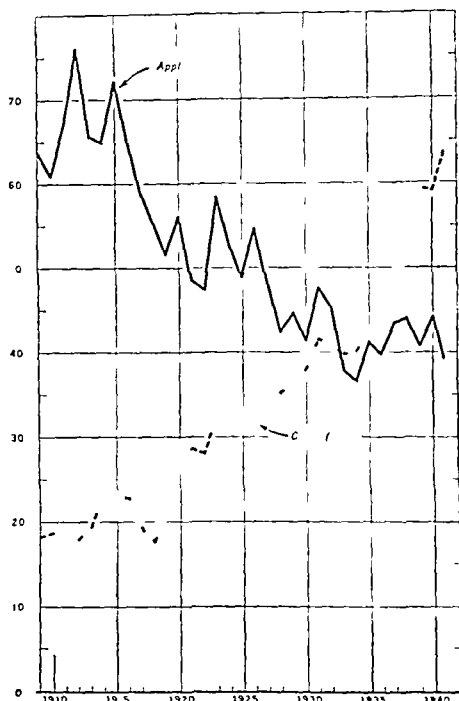


Chart 2—Per capita consumption of fresh apples and citrus fruit in the United States 1909-1941

The figures presented on nutritive content of our food supply tend to be high, however. They refer to food brought into the kitchen and take insufficient account of the losses of nutrients in the preparation of food and of the edible food waste. Only average quantities of inedible refuse were deducted. In contrast, the dietary recommendations of the National Research Council's board with which the nutritive values of food supplies are compared represent actual intake and do not make allowances for losses in cooking. Hence, the over-all picture drawn of dietary adequacy tends to be optimistic. Nevertheless, the differences between the two five year periods probably are reliable—little change in the nutritive value of diets with respect to food energy, protein, iron and most of the B vitamins but an upward trend in calcium, vitamin A value and ascorbic acid.

#### SOME FACTORS AFFECTING FOOD CONSUMPTION LEVELS

Averages for the country as a whole are useful chiefly as a background against which to discuss variations in consumption. The generous food supplies enjoyed by some families bring up national averages but confer no benefit on those having but meager resources. Dietary studies show that within a population families in the upper income classes tend to have a greater variety and abundance of food than their less prosperous neighbors. However, at each income level the larger the family the less ample the diet of each person tends

to be. Furthermore, there are wide variations in nutritive quality of diets even among those having equal economic resources, owing to differences in managerial ability and knowledge and skill in food selection and preparation.

This section of the paper will be confined to variations in diet reflecting differences in income, family size and management practices with some comparison of farm and nonfarm situations. These appear to be among the most significant, though by no means the only factors affecting family dietary levels. Most of the illustrations are taken from reports of large scale dietary studies made by federal agencies in 1936.

#### DIET IN RELATION TO INCOME

Comparatively little difference from one income class to another was found in 1936 in per capita consumption of grain products, of fats and in villages and cities, of sugar. On farms there appeared to be some increase in sugar consumption as incomes rose. Both in villages and cities and on farms there were moderate increases in the consumption of milk, eggs and meat at successively higher income levels with the rate of increase about the same for all of these groups of products. Of fruits and vegetables (other than potatoes and dried beans and peas) there was a decided increase in the quantities consumed as incomes went up. In general, however, the rate of increase in consumption accompanying successively higher incomes was greater in the lower ranges of the income scale—e.g., under \$1,500 a year—than in the upper. Table 2 illustrates these points.

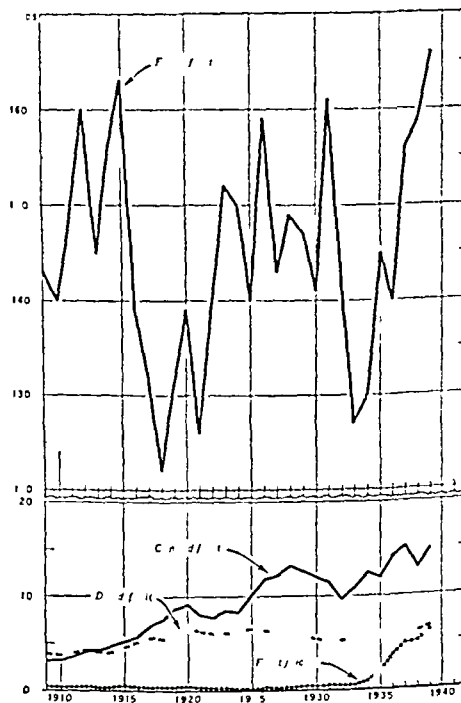


Chart 3—Per capita consumption of fruits in the United States 1909-1939

As would be expected from such trends in consumption, diets of higher income groups tend to provide more protein, minerals and vitamins than those of low income groups, both absolutely and relatively to caloric value. The nutrients with respect to which diets of

<sup>4</sup> Recommended Dietary Allowances Committee on Food and Nutrition, National Research Council (May) 1941. Distributed by Federal Security Agency, Washington, D. C.

<sup>5</sup> Family Expenditures in Selected Cities 1935-36. Food bulletin 648, vol. 2. United States Department of Labor, Bureau of Labor Statistics, 1940. Stiebeling and her associates.<sup>6</sup>

low and high income groups differ most widely are calcium, vitamin A, ascorbic acid and riboflavin

Farm family diets differ from those of village and city dwellers in a number of respects. At comparable income levels farm groups consume per capita decidedly more of the important energy yielding foods—grain

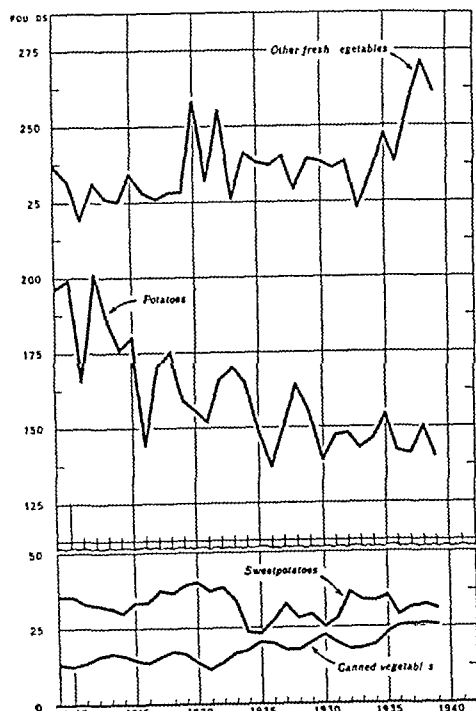


Chart 4—Per capita consumption of vegetables in the United States 1909-1939

products, potatoes, mature beans and peas, sugars and fats, reflecting perhaps the heavier manual work, longer hours of toil and probably greater exposure to weather. Farm families consume more milk too. This is due, in part, to the fact that cows are milked on about three fourths of the farms in this country. Milk, then, is available for use by many families without direct cash outlay, and hence there are fewer economic barriers to its use. Furthermore, on farms there are more children per family than in urban areas. The census of 1940 showed that of every hundred persons on rural farms there were 32 persons under 15 years as contrasted with 22 in cities.

Farm families do not consume more than city groups of all kinds of food, however. In general, on a per capita basis, they tend to eat less meat, poultry and fish and less fruit and vegetables (other than potatoes and mature beans and peas).

Knowledge is still too incomplete to make possible a thoroughgoing appraisal of the nutritive adequacy of the diets of this nation. There is need for more information regarding both nutritive values of food as commonly eaten and human nutritional needs. But a provisional picture of the nutritive quality of diets of various population groups can come from the Bureau of Home Economics classification of family dietary records by their nutritive content.<sup>6</sup>

<sup>6</sup> Stiebeling, Hazel K., Monroe Day, Coons, Callie M., Phipard, Esther F., and Clark, Faith, Family Food Consumption and Dietary Levels Five Regions Farm Series, miscellaneous publication 405, United States Department of Agriculture, 1941. Stiebeling, Hazel K., Monroe Day, Phipard, Esther F., Adelson, Sadie I., and Clark, Faith, Family Food Consumption and Dietary Levels Five Regions Urban and Village Series, Miscellaneous publication 452, United States Department of Agriculture, 1942.

On the basis of these studies tentative estimates for 1936 indicate that about one fourth of the families in this country had diets that could be rated good, more than a third diets that could be considered fair and another third diets that should be classed as poor. Recently the food records from these studies have been reclassified by separating from those formerly called good the ones that provided the several nutrients in the quantities recommended in 1941 by the National Research Council's Food and Nutrition Board. In this paper these diets of higher nutritive value have been labeled excellent. Considerably fewer than a fourth of the nation's families in 1936 would have been in the excellent diet category.

At successively higher incomes there generally is found an increasing proportion of families with diets that could be graded excellent. This follows from the larger quantities of milk, butter, meat, eggs, succulent vegetables and fresh fruits usually found in the more expensive diets. Chart 8 shows the proportion of families at different income levels with diets classed as excellent, fair or good. (The chart is based on food records obtained in 1936 from village and city families of parents and one or two children living in the North and West.) In the income class \$500-\$999, about 10 per cent had excellent diets, in the class \$3,000 and over, 40 per cent.

Both on farms and in villages and cities, family diets vary in their richness with respect to different nutrients at any given level of food expenditure. Take, for example, diets of families in the North and West

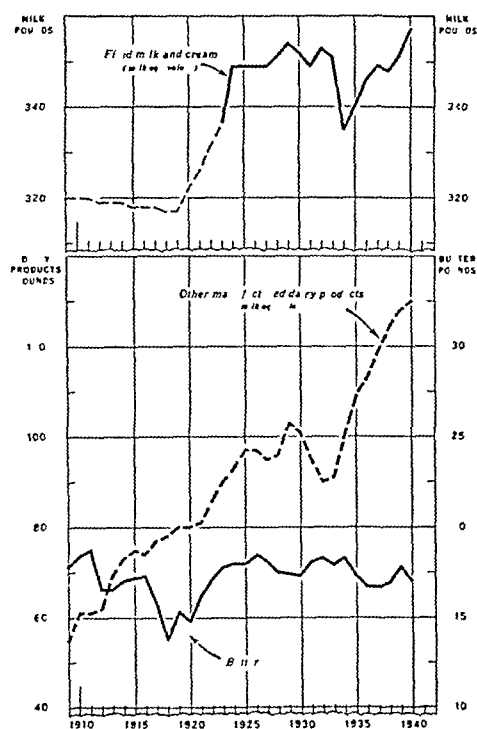


Chart 5—Per capita consumption of dairy products in the United States 1909-1940

with food worth 30 to 40 cents a day per man—a not uncommon level of food expenditure in 1936. About 70 per cent of the village and city families in this population group had food that provided less calcium than that recommended by the Food and Nutrition

<sup>7</sup> Stiebeling, Hazel K., Are We Well Fed? Miscellaneous publication 430, United States Department of Agriculture, 1941.

Board Thirty per cent had less vitamin A, 70 per cent less ascorbic acid and 75 per cent less riboflavin. On farms, 30 per cent of families with food valued at 30 to 40 cents a day per man had diets providing less than the recommended quantities of calcium, 20 per cent less of vitamin A, 60 per cent less of ascorbic acid and 40 per cent less of riboflavin. (Because farm furnished food was valued at less than urban retail prices, a given sum represents a greater total volume of food among farm than among nonfarm groups, this fact as well as characteristic differences in diets, discussed earlier, accounts for the differences in nutritive value just noted.)

No one should assume that all families with diets falling short of desirable goals suffer from obvious nutritional deficiencies. But the diets of many such families are amenable to improvement, the degree dependent on the extent to which the diet falls short of optimum. Many diets that are "passable" in the sense that their nutritive quality is not questioned by the general public cannot be considered satisfactory by the scientist with an insight into the contributions that food at its best can make to the well-being of the individual and the race.

Food plays an important part in determining the composition of body tissues and the fluids that bathe the cells, forming what Sherman calls the "internal environment" in which life itself goes on.<sup>8</sup> Differences in this environment, many of which may be too small to be measured by present methods, definitely affect the plane on which physical and mental functioning

sure the incidence of malnutrition in the United States merely by the number of death certificates that list malnutrition as a primary cause, the country would appear to be singularly free from this reproach. In recent years considerable progress has been made in developing techniques for measuring nutritive status and

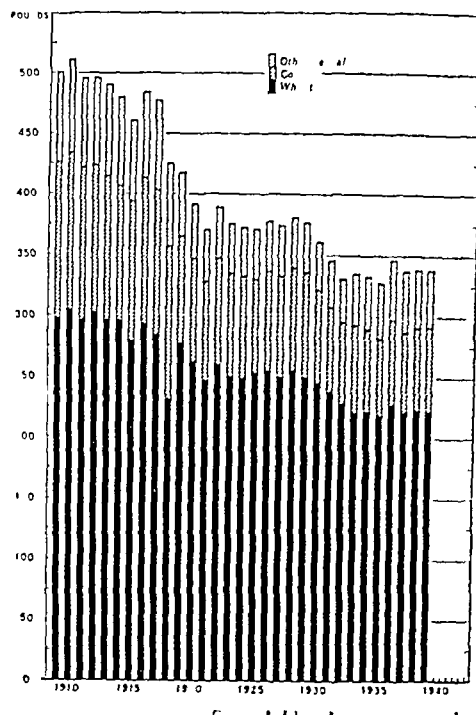


Chart 7—Per capita consumption of wheat, corn and other cereals for food in the United States, 1909-1939. This includes grains used in the manufacture of beer. Other cereals include rye, barley, oats and rice used for food and industry and in fermented malt liquor.

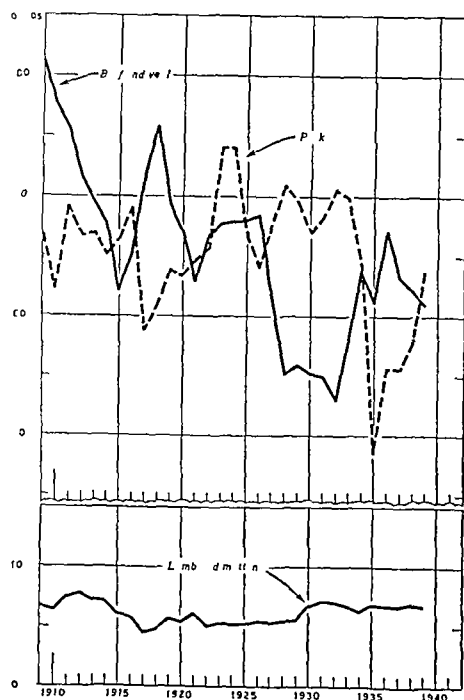


Chart 6—Per capita consumption of meats in the United States, 1909-1939.

go on. As far as the immediate or long term well-being of a person can be improved through dietary betterment, that person falls short of being truly well fed.

A nationwide study has not been made of the prevalence of inferior nutritional status. Were one to mer-

revealing incipient malnutrition through biochemical or physiologic tests. Viewed broadly, the results of such studies support conclusions derived from an appraisal of diets of various population groups. To cite from but one—a study made recently in New York City comparing the nutritive status of children in a school serving chiefly families of the lower income group with those in a private school patronized by the more well to do.<sup>9</sup> In the low income group more than three fourths of the city children examined showed some stage of avitaminosis A, three fourths

<sup>8</sup> Sherman, H. C. Some Aspects of the Present Significance of Nutrition. *J. Franklin Institute* 231: 305-321 (April) 1941.

<sup>9</sup> Wehl, Dorothy G. and Kruse, H. D. Medical Evaluation of Nutritional Status. V. Prevalence of Deficiency Diseases in Their Subclinical State. *Milbank Memorial Fund Quarterly* 19: 241-251 (July) 1941. Hunt, Eleanor P. VI. Dark Adaptation of High School Children at Different Income Levels. *ibid.* 19: 252-281 (July) 1941. Crane, Marian M., Woods, P. W., Waters, E. M., and Murphy, E. F. A Study of Vitamin C Nutrition in a Group of School Children. *Proc. Am. Inst. Nutrition* 19: 16 (June) 1940. Zayaz, Stella L., Mack, Pauline, Berry, Sprague, Phyllis K., and Brauman, A. W. Nutritional Status of School Children in a Small Industrial Area. *Child Development* 11: 125 (March) 1940. *Milbank Memorial Fund New York*. The Changing Front of Health. *Proc. 18th Ann. Conf. of Milbank Mem. Fund* 1940. Goldberger, Joseph, Wheeler, C. A., Svedenstricker, Edgar, and King, W. J. A Study of Indemic Pellagra in Some Cotton Mill Villages of South Carolina. *United States Public Health Service Hygienic Laboratory Bulletin* 153, 1929. Jeness, Rachel N. C. in Weight and Its Association with Ancestry and Economic Status. *Human Biology* 12: 532-544 (Dec.) 1940. Sandels, Margaret R., Cate, Helen D., Wilkinson, Kathleen P., and Graves, I. J. Follicular Conjunctions in School Children as an Expression of Vitamin A Deficiency. *Am. J. Dis. Child* 62: 101-114 (July) 1941. Milam, D. F., and Williams, W. Plasma Vitamin C Levels in a Group of Children Before and After Dietetic Adjustment. *Am. J. Trop. Med.* 21: 487-491 (May) 1941. Ebbs, J. H., Tisdall, I. I., and Scott, W. A. The Influence of Prenatal Diet on the Mother and Child. *J. Nutrition* 22: 515-526 (Nov.) 1941. Kooser, J. H., and Blankenhorn, M. A. Pellagra and the Public Health. A Dietary Survey of Kentucky Mountain Folk in Pellagrous and in Nonpellagrous Communities. *I. A. M. A.* 116: 912-915 (March) 1941.

some degree of ariboflavinosis and one half plasma levels of ascorbic acid below 0.6 mg per hundred cubic centimeters. In the high income group less than 3 per cent of the children showed mild ariboflavinosis and less than 6 per cent had ascorbic acid levels below 0.6 mg per hundred cubic centimeters. Studies in other communities also show differences in nutritive status associated with dietary differences characteristic of various economic groups.

#### DIET IN RELATION TO SIZE OF FAMILY AND INCOME

The size of the family as well as its income determines how much money may be spent for the food of each person. For example, in small North Central cities in 1935-1936, families of two persons with incomes of \$500 to \$750 spent an average of about 11 cents a meal per person. When there were four in the family, it seemed to take incomes of \$1,250 to \$1,500 to afford approximately 11 cent meals, and with five or six in the family, incomes of \$2,000 to \$2,250.<sup>10</sup> While the larger sized family can effect some economies in the purchase of food as well as in its preparation, these economies seldom compensate for the progressive reductions in average food expenditures per person made within an income class by groups of families progressively larger in average size. In general, within an income class, the larger the family the less money is available for the food of each person and therefore the smaller the quantities of protective food bought for each person and the smaller the proportion of families with diets that can be classed as excellent.

#### DIET IN RELATION TO MANAGEMENT PRACTICES

At every level of money value of food, some families succeed in obtaining better diets than others. Granted that there are minimum expenditures below which fully adequate diets cannot be purchased and that increases in economic resources simplify the matter of obtaining satisfactory meals, it should be noted that even liberal

likely to keep her family well fed. She knows how to buy food economically, to prepare it appetizingly and to serve it attractively. Without such skills and thrift in market and kitchen, a family may be aware of the importance of good nutrition but be unable to achieve it within the limits of its resources.

TABLE 1—Comparison of Nutritive Value of Food Estimated to Be Delivered to Nation's Kitchens in Two Five Year Periods with 1941 Dietary Recommendations of National Research Council's Food and Nutrition Board

Nutrient	Nutritive Value per Capita per Day of Total Food Delivered to Kitchens * in		Per Capita Allowances † Based on 1941 Recommendations of National Research Council's Food and Nutrition Board
	1920-1924	1936-1940	
Food energy calories	3,280	3,220	2,800
Protein Gm	84	82	66
Calcium Gm	0.77	0.82	0.9
Iron mg	14	14	12
Vitamin A value international units	4,900	6,000	4,700
Riboflavin mg	1.7	1.8	2.3
Thiamine total mg	1.7	1.7	1.6
Thiamine per 100 calories mg	0.05	0.05	0.057
Ascorbic acid mg	80	90	70

\* Computations based on unpublished data on consumption supplied by O. V. Wells, Bureau of Agricultural Economics.

† Allowances suggested by the committee for seventeen age-sex activity groups were weighted by the number of persons in each group as judged from the 1940 census of population.

Families in the higher income classes are somewhat more likely to buy satisfactory diets than those with more limited economic resources, even with the same expenditures for food. Not only do family members in the higher income classes usually have the advantage of a longer period of formal education, but they are the more likely to have radios and periodicals that bring up to date nutrition information, including facts regarding food requirements, food values and selection and wise food preparation. In addition they are more likely to have the resources and storage space that are needed for buying food on a relatively large scale. The hand to mouth or meal by meal buying that many low income families resort to is, of course, a relatively expensive practice.

Farm families face additional problems in safeguarding the nutritive quality of diets. Most of them must raise a substantial share of their food supply if they are to be well fed. This requires labor. It requires land for food and feed and capital for investment in cows, pigs, chickens and farm equipment for production. It requires managerial ability in planning ahead for months and even years. It requires knowledge and skill for production and conservation of food. It requires courage when weather hazards or uncontrollable insect pests bring ruin to months of work. But well planned home food production programs enable farm families in many communities to enjoy diets of enhanced nutritive value.

A dollar's worth of milk, eggs, meats, vegetables and fruits from the farm (valued at prices farmers would pay if they bought them from neighbors) represents much higher returns in the nutritive essentials than a dollar's worth of staple products such as white

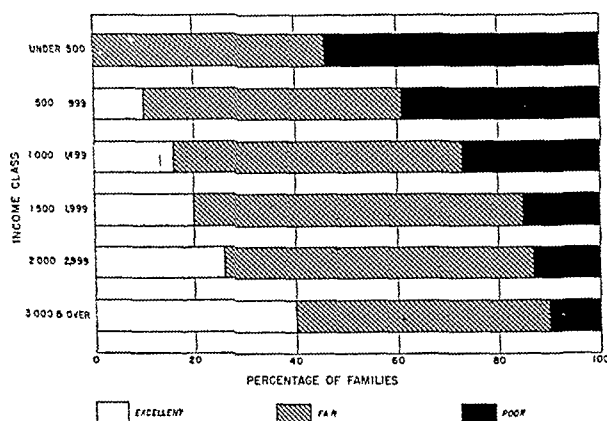


Chart 8—Percentage of families in various income classes having diets of specified nutritive value. Dotted area indicates excellent; diagonal lines fair; black poor.

expenditures for food do not guarantee adequate diets. The homemaker who is a good manager and a good cook, who keeps up to date on food values and nutrition and applies this knowledge to her meal planning is

<sup>10</sup> Bradly Dorothy S. Monroe Day Phelps Elizabeth and Ramboth Fifth D. Family Income and Expenditures Five Regions Part 2 Family Expenditures Urban and Village Series miscellaneous publication 1946 United States Department of Agriculture 1940

flour, lard, sugar and coffee bought at the retail food store. Dietary studies among farm groups have shown that within a given income class, especially at the lower range of the income scale, adequacy of diet depends much less on the cash spent for food than on the quantity and variety of farm furnished food. Of course, highest returns for productive effort will come if planning—with human needs in mind—precedes the work of production. Agencies working to help farm families improve their living levels have placed increasing emphasis on planning ahead for the production and purchase of an adequate family food supply on a year round basis.

THE DIETARY SITUATION IN THE EARLY 1940'S  
AS COMPARED WITH THE MIDDLE 1930'S

There are reasons to believe that diets in the United States were better in 1940 and 1941 than five years earlier. Many families had higher incomes and could

highlighted the subject so that it has become the focal point for the research, teaching and action programs of an increasing number of persons, groups and agencies. Following this conference there has been renewed interest in establishing state and local nutrition committees whose function it is to integrate the work of all groups that impinge on the problem of better diets. This action has greatly stimulated the demand for simple educational material and effective methods to help families redirect their dietary habits and to revamp their management practices for the sake of improving dietary levels.

Public interest in nutrition also has led to growing concern regarding the nutritive value of common foods and the effect of processing on them. On the recommendation of the National Research Council's Food and Nutrition Board, millers and bakers began in 1941 to put on the market an "enriched" white flour

TABLE 2—Per Capita Food Consumption Farm and Village and City Families in the United States. Estimate of Average Quantities Consumed of Eleven Food Groups per Year by Income Class 1935-1936\*

Income Class	Milk (or Its Equivalent) Quarts	Potatoes (Sweet Potatoes) Pounds	Dry Beans, Peas, Lentils Pounds	Tomatoes (Fruit) Pounds	Leafy Green Yellow Vegetables Pounds	Other Vegetables and Fruits Pounds	Lean Meat Poultry Fish Pounds	Flour (Baked Goods) Equivalent Pounds	Fats (Including Butter, Bacon, Salt Lard) Pounds	Sugars, Syrups, Preserves Pounds
<b>Farm families</b>										
All incomes	276	159	16	43	51	157	109	91	70	89
Under \$500	177	97	14	37	40	125	76	74	61	68
\$500 to \$999	217	131	14	39	54	118	90	65	71	77
\$1,000 to \$1,499	241	198	18	49	59	150	117	41	70	89
\$1,500 to \$1,999	264	209	16	53	64	161	110	25	69	91
\$2,000 to \$2,999	282	233	16	66	71	193	148	26	71	101
\$3,000 to \$4,999	278	270	21	75	78	261	118	247	84	108
\$5,000 or over	321	252	26	94	61	260	111	243	83	105
<b>Village and city families</b>										
All incomes	161	116	10	101	3	230	110	117	69	68
Under \$500	84	85	10	31	41	105	15	25	61	64
\$500 to \$999	136	117	12	68	58	164	110	17	57	65
\$1,000 to \$1,499	173	119	10	96	72	210	117	16	58	69
\$1,500 to \$1,999	179	122	11	117	82	247	141	16	61	69
\$2,000 to \$2,999	196	124	9	143	91	256	150	14	63	71
\$3,000 to \$4,999	210	124	8	174	103	341	155	167	65	73
\$5,000 or over	242	133	10	240	117	498	152	290	75	89
<b>All families</b>										
All incomes	177	127	11	87	60	203	111	106	69	71

\* Data from Consumer Purchases Study (Stiebeling and her associates<sup>1</sup> Stiebeling,<sup>2</sup>) adjusted for seasonal consumption and for food eaten away from home.

buy more and better food. With the acceleration of the defense program, many unemployed got jobs, WPA employed workers got better jobs, part time workers got full time employment, and some workers in defense industries got higher wages. Food prices were at a low level in 1940 and early 1941, so that despite the rises in the cost of food during the latter part of 1941 incomes of wage earners bought more food in both 1940 and 1941 than five years earlier. Indeed, it seems possible that, with their increased power to buy, at least one family out of every seven that had had poor diets in 1936 was able to obtain a fair or good diet in 1941.

Public interest in food has been on the increase for many years, thanks to the cumulative effect of sound educational programs. The National Nutrition Conference for Defense called by the President in 1941

and bread, thereby contributing to the thiamine, nicotinic acid and iron content of diets of families customarily consuming large quantities of these products. Canadian and British scientists and policy makers have recommended that flour in those countries be milled somewhat less highly, so that more of the vitamin and mineral content of the original berry is retained, thus securing without "restoration" a product much more nutritious than patent flour.

The manufacture of vitamin concentrates and the production of synthetic vitamins have been stepped up greatly during the last few years. These special foods can play a useful role in dietary reinforcement, although their indiscriminate use often wastes money which might better be spent for ordinary food.

Contributing directly to the dietary improvement in recent years are the several food distribution pro-

grams of the United States Department of Agriculture. The food stamp program, direct distribution, school lunches and arrangements for low priced milk help channel an enlarged share of national food supplies to needy persons.<sup>11</sup> As a result, almost 175 million dollars' worth of additional food was made available to the underprivileged in 1940-1941. Although this amount is small compared to the total food bill of the country, the programs are of very great importance to the participants.

In 1940-1941 a monthly average of 8.8 million persons in family groups received foods made available under the direct distribution program, and an average of 2.9 million persons a month participated in the food stamp program. The school lunch program reached an average of 2.9 million children a month during the year (4.7 million in March, the peak month). Under the penny milk program, more than 900,000 children in eight cities, principally New York, purchased nearly 12 million quarts of milk. About 460,000 persons in family groups in six cities participated in low priced milk programs, purchasing 68 million quarts.<sup>12</sup>

As far as studies have been made,<sup>13</sup> it seems clear that participants in these programs have better balanced as well as more abundant diets than nonparticipants of equal economic status. Something of the variety of the foods made available through the programs is indicated by the following list: butter, eggs, pork, lard, potatoes, other fresh vegetables, dry beans, rice, corn meal, wheat flour (white and whole wheat), oranges, grapefruit, apples and prunes. All these foods were bought in comparatively large quantities with blue stamps in 1940. (The list of foods available under the several programs varies from month to month.) These foods are not merely superimposed on supplies that

would normally be purchased. Participating families follow the procedure of farm families—modifying their usual purchases somewhat, the better to complement those obtained without direct outlay.

Both the school lunch and food stamp program in 1940 reinforced the diets of participants in many directions, but especially with respect to vitamin A, thiamine and ascorbic acid. Food obtained directly through the program contributed little, however, to correcting the frequently recurring shortages of calcium and riboflavin. The fact that the programs were in operation, however, contributed to this end. For example, studies have shown that stamp plan participants buy more milk than comparable nonparticipants (milk is an economical source both of calcium and riboflavin, among other nutrients). Furthermore, sponsors of school lunches in many communities provided milk to supplement meals that could be prepared from foods furnished by the Surplus Marketing Administration.

The two government aided milk programs directly encouraging milk consumption among needy families were on a small scale in 1940. That families will greatly increase their purchases of milk when it is available at a low price is illustrated by figures from a study made in Washington, D. C. Before the program was begun white participants consumed milk in all forms (fluid or evaporated or in the form of cheese or ice cream) in quantities equivalent in nonfat milk solids to 2.50 quarts of fluid milk a week per person and to 4.06 quarts after the program went into effect, among Negro families, the average quantity was equivalent to 1.89 quarts a week per person during the preprogram study, compared with 3.48 quarts afterward.

It is difficult to estimate the net effect on dietary levels of any public aid food distribution programs. How much the nutritive value of the customary diets of families on relief is improved depends on many things, including the usual food consumption of families before their participation in the program, the variety and quantity of foods purchasable or distributed through the programs and the adjustments in usual diet patterns that families make because of the foods available under the program.

Over-all per capita consumption of many foods was higher in 1940 and 1941 than in 1936 as a result of the combined influence of educational programs, increased power of consumers to buy, food distribution programs and more abundant food supplies. Gains were greatest in fruit and fresh vegetables. Consumption of fresh citrus fruit was more than a third higher—other fruit and fresh vegetables between 10 and 15 per cent higher. Consumption of meat and eggs was 8 to 10 per cent higher, but of dairy products less than 5 per cent higher. There was a slight decrease in the quantities of grain products and potatoes. These shifts probably have meant considerable increases in the ascorbic acid content of American diets and some increase in the consumption of protein, thiamine and riboflavin.

To provide the nutrients in quantities and proportions recommended by the National Research Council's Food and Nutrition Board, the Bureau of Home Economics has evolved a number of plans for market lists at various cost levels.<sup>14</sup> These market lists are in terms

11 The food stamp program was operating early in 1942 in areas containing more than half of the nation's population. Blue stamps given under certain arrangements to public aid families serve to increase by about 50 per cent the food buying power of those taking part in the program. Commodities designated by the Secretary of Agriculture are available at local stores in exchange for the blue stamps. Blue stamp foods listed during January 1942 for example included eggs, butter, pork, fresh pears, apples, oranges, grapefruit, fresh vegetables including potatoes, dried prunes, dry beans, corn meal, hominy (corn), grits and various forms of wheat flour.

Where the food stamp program is not in operation, commodities bought by the Surplus Marketing Administration under programs designed to strengthen farm markets are distributed by welfare agencies to public aid families. The supplies so distributed are in addition to what these needy families are able to buy or otherwise obtain.

Increasing quantities of food are being distributed for use in school lunch programs for needy children. The lunches may be made in whole or in part from the commodities supplied by the Surplus Marketing Administration. In most places foods needed to round out the meals are supplied by the local community groups sponsoring the program in the schools.

Greater consumption of fluid milk is being encouraged among underprivileged families by low priced milk programs. These are of two types—one supplies milk to public aid families at a low price and the other makes milk available for use by school children at a penny a half pint. The low price at which the milk is supplied to eligible persons is made possible through provision for a special price to be paid producers and through a federal indemnity payment to handlers whose bids for furnishing the milk are accepted. The indemnity payment plus the price received from sales, reimburse each handler for the milk and the handling and distributing services. The special producer price paid for milk used in the programs is lower than that for regularly sold fluid milk but higher than the price producers receive for so-called surplus milk used for manufacturing purposes.

12 Surplus Marketing Administration. Monthly Reports. United States Department of Agriculture.

13 Gold, A. L., Hoffman, A. C. and Waugh, F. V. *Economic Analysis of the Food Stamp Plan*. A Special Report. United States Department of Agriculture. 1940. Southworth, H. M. and Klayman, M. I. *The School Lunch Program and Agricultural Surplus Disposal*. Miscellaneous publication 467. United States Department of Agriculture. 1941. Stiebeling, Hazel K., Adelson, Sadye F. and Blake, Ennis C. *The Effect of a Low Priced Milk Program on the Consumption of Dairy Products Among Certain Groups of Low Income Families*. Washington, D. C. 1940. Circular 64. United States Department of Agriculture. 1942.

14 Three market lists for low cost meals and market lists for moderate cost and liberal meals. Bureau of Home Economics. United States Department of Agriculture. 1941.



general enough to be followed in any part of the country. If every one in the United States should follow such plans and thus redirect dietary habits, 1936 levels of consumption for the country as a whole would be increased by at least 50 per cent in milk and by at least 50 to 100 per cent in vitamin C rich fruits and the nutritionally important leafy, green and yellow vegetables. The increases in the consumption of milk in its various forms—skim milk, fluid and dry, cheeses and evaporated milk as well as whole fluid milk—would help enrich diets in both calcium and riboflavin. At the present time too large a proportion of our skim milk—a product that supplies all the nutrients of milk below the cream line—is used in animal feed rather than for human consumption.

Whether in the war year 1942 the dietary gains of the recent past can be maintained or accelerated and improvements in still other directions initiated time alone will tell. Enormous quantities of food are needed for our own civilian population and armed forces and for those of other countries resisting aggression. Unless enough food and food of the right kind is produced, dietary levels will fall. To meet these enlarged needs the farmers of this country are undertaking in 1942 the greatest program of agricultural production in our history. Goals that tax farm capacity have been established for all products. In setting these goals, consideration has been given to the dietary needs of the people of the United States as well as to anticipated domestic and foreign market demands. While the increases necessary to provide nutritionally adequate diets for our entire population cannot be made in a single year—this would call for changes in dietary habits as well as in purchasing power and food production—steps in these directions are being taken.

If agriculture achieves its 1942 goals and no demands develop beyond those foreseen in early 1942, per capita consumption of domestically produced food can be maintained at a level as high as or higher than in the recent past. If these conditions prevail there should be further strengthening rather than any weakening in our nutritive status. Expected reduction in imports will result in only relatively minor changes in our dietary habits for 1942-1943. The smaller supplies of imported sugars may bring about the partial replacement of a highly refined product by foods having higher mineral or vitamin value. Unless oil production can be increased greatly (as is the plan) there may be some shortage of oil by 1943, but reduced supplies of sugar and oil augur no ill for the nutritive level of this country. In fact, they may even bring improvement.

It is well to keep in mind, however, that there may be unexpected demands on our food supplies. In January 1942 the Secretary of Agriculture has said—"We are one of the twenty-six United Nations whose resources for winning the war are to be shared and placed wherever there is need. We don't know how many people we shall be called upon to feed outside the borders of the United States. Neither do we know how great the difficulties in the way of increasing our farm production may become, through shortages of rubber, steel, fertilizer and so on, but farmers and the processors and handlers of farm products are going to do their level best to meet the goals for higher production in 1942."

Whatever lies ahead, all of us as consumers can make a real contribution to dietary adequacy in this country if we will renew our efforts to use food wisely by avoiding waste and by bringing food habits closely into line with the teachings of the modern science of nutrition. Only thus can we translate into reality the oft repeated challenge "Let us make America strong by making Americans stronger."

## Council on Pharmacy and Chemistry

THE COUNCIL HAS AUTHORIZED PUBLICATION OF THE FOLLOWING STATEMENTS  
AUSTIN E. SMITH, M.D., Secretary

### ANNUAL MEETING OF THE COUNCIL ON PHARMACY AND CHEMISTRY

The Council on Pharmacy and Chemistry of the American Medical Association convened at the Association Headquarters, Oct. 23, 1942. Those in attendance were Drs. David P. Barr, S. W. Clauson, H. N. Cole, Morris Fishbein, E. M. K. Geising, Chester S. Keefe, James P. Lenke, Stuart Mudd, F. M. Nelson, W. W. Palmer, William C. Rose, Elmer L. Seyringhaus and Austin E. Smith. In addition to the members of the headquarters staff there were present, either for certain discussions or during the entire meeting, Dr. Ernest L. Irons, Secretary of the Board of Trustees, Dr. Robert P. Herwick, Chief, Drug Division of the U. S. Food and Drug Administration, Dr. Milton Valdez of the National Institute of Health and Dr. Donald Wallace, Secretary of the Council on Dental Therapeutics. In the absence of the Chairman, Dr. Torald Sollmann, the meeting was opened by Dr. W. W. Palmer, Vice Chairman.

The following is an abstracted report of some of the more important discussions and actions.

**Dermatophytosis—Athlete's Foot, Preparations**—The Council has thus far not accepted any preparations specifically for use in this condition. After extended discussions the Council took two actions: (1) authorization of the appointment of a subcommittee of the Council to draw up a plan of procedure for the consideration of preparations proposed for use by the public for the prevention of fungous skin infection (dermatophytosis) and preparations for the treatment of this infection to be used by the medical profession, (2) authorization of a status report concerning the prophylaxis and treatment of fungous skin infection by men with special knowledge in this field under the supervision of a Council member.

**Vitamin Preparations**—The Council gave further consideration to this question and voted that no objection be made against advertising to the public of such preparations when the dosage is for prophylactic use only and provided such advertising is not objectionable under the Council's rules concerning direct advertising. The Council voted further that when such preparations are offered for therapeutic use, generally when the dosage prescribed is more than three times the minimum daily requirement [FDCA, Sec. 403 (j)], the advertising should be directed only to the medical profession. The Council also will publish a statement on the declaration of dosage on the label.

**Contraceptives**—The Council considered recommendations of its Committee on Contraceptives for a method of procedure for consideration of contraceptive preparations and devices. The Committee's report was adopted, providing also for a further report on scope and criteria from the Council's Advisory Committee on Contraceptives. This advisory committee consists of men with special knowledge and training in this field.

**Artificial Mineral Waters**—After extensive discussion the Council declared artificial mineral waters nonessential modifications of natural waters and voted that natural mineral waters be considered only as one feature prescribed by spas and health resorts and that they be not considered for acceptance by

the Council as individual products as there is no convincing evidence to show that the many therapeutic claims, which are made attendant to these preparations when bottled for individual use, are valid

**Metric System**—The Council considered the question of abandoning in its publications the use of the apothecary system and the use only of the metric system. After extended discussion the Council voted that, in future editions of New and Nonofficial Remedies, Useful Drugs, the Epitome of the U S Pharmacopeia and National Formulary and in Interns' Manual (with the consent of the Council on Medical Education) as well as in other Council publications, the metric system only will be used and that conversion tables for the apothecary system will be included in all publications. The Council further authorized the appointment of a committee to draw up a statement for publication at the time the foregoing action goes into effect, calling attention to trends such as the use of the metric system in vitamins and sulfonamide preparations and indicating the Council's desire for rapid progress in this matter.

**Scope, Official Articles**—The Council discussed the question of the continued inclusion in New and Nonofficial Remedies of brands of drugs which have become official by reason of adoption in the U S Pharmacopeia. Although the Council's rules state that articles official in the U S Pharmacopeia or National Formulary are exempted from consideration by the Council if they are marketed under the official name or a name which makes the official status evident, and if no unestablished therapeutic claims are made for them, a number of brands of official preparations are listed in New and Nonofficial Remedies. The Council voted that the status quo in regard to the pattern of admitting articles to New and Nonofficial Remedies be observed within reason for the duration of the war, and that all official preparations be reviewed with the express purpose of elimination from New and Nonofficial Remedies of all those the retention of which seems to serve no useful purpose. The Council also voted that products which have been official for no more than twenty years will be considered for inclusion or retention in New and Nonofficial Remedies, also all serum and vaccines, and arsenicals for the treatment of syphilis.

**Articles Accepted But Not Described**—For many years the Council has carried as an addendum to New and Nonofficial Remedies a "List of Articles and Brands Accepted by the Council but not Described in N N R". This was at first intended to be a list of articles exempt from the Council's consideration, such as official preparations, but has grown to include a miscellany of medicinal and nonmedicinal articles. The Council discussed the usefulness of such a list and voted that it now be deleted as a separate section from the book. Under the Council's rules this action cannot be completed until the expiration of the term of acceptance for the articles of this list now standing accepted. Articles whose usefulness justify retention will be inserted in an appropriate part of New and Nonofficial Remedies.

**Censorship of Published Description of Articles**—The Council has been informed of the decision of the local Office of Censorship and the Board of Economic Warfare that statements of description or methods of preparation of new drugs on their original publication in THE JOURNAL should be subject to censorship in the interest of national defense. The Council voted to adhere to this decision and as a consequence for the duration of the war will eliminate from descriptions published in THE JOURNAL such statements as are disapproved by the authorities concerned or at the discretion of the Council and editorial offices. These statements will be available, however, in New and Nonofficial Remedies.

**Medical Pharmaceutical Cooperation**—A report of the committee to the Council concerning the Medical-Pharmaceutical Cooperation was made. The Council agreed to participate in another meeting which is to be arranged with representatives of the pharmaceutical profession.

## MENADIONE BISULFITE

The Council adopted the term Menadione as the nonproprietary designation for 2-methyl-1,4-naphthoquinone (THE JOURNAL, Jan 17, 1942, p 226). Subsequently two pharmaceutical manufacturers corresponded with the office of the Council regarding water soluble derivatives of menadione, one of the firms submitted a product which was believed to be a sulfonated derivative of menadione but which, on examination in the A M A Chemical Laboratory, proved to be a sodium bisulfite addition product of menadione.

In order to avoid confusion in the literature it is pointed out that published clinical studies which have dealt with the use of the compound 2-methyl-1,4-naphthohydroquinone 3 sodium sulfonate are in fact studies based on menadione-sodium bisulfite.

The Council has now adopted the term Menadione Bisulfite as a nonproprietary designation for the water soluble monosodium bisulfite addition product of menadione, and the interested manufacturers have been so informed.

## NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

AUSTIN E SMITH M D Secretary

### PURIFIED PROTEIN DERIVATIVE OF TUBERCULIN (See New and Nonofficial Remedies, 1942, p 531)

The following dosage form has been accepted

SHARP & DOHME, INC., PHILADELPHIA

**Vacule Ampoule-Vial Lyovac Tuberculin Purified Protein Derivative** Containing an amount of lyophilized tuberculin purified protein derivative sufficient to yield at least 1 test dose per 0.25 cc of restored solution, packaged with a 0.25 cc ampoule of phosphate buffer solution for dilution, preserved with 0.5 per cent of phenol. Available in first test strength and second test strength. Also marketed in 10, 100 and 250 Vacule Ampoule-Vials packaged with sufficient phosphate buffer solution preserved with 0.5 per cent phenol to yield 15 cc, 125 cc and 30 cc respectively, of restored solution in either the first test strength or the second test strength.

### SULFATHIAZOLE (See New and Nonofficial Remedies, 1942, p 150)

The following dosage form has been accepted

DRUG PRODUCTS COMPANY, INC., LONG ISLAND CITY, N Y  
Pulvoids Sulfathiazole 0.5 Gm (77 grains)

### DIETHYLSTILBESTROL (See THE JOURNAL June 20, 1942, p 635 and the Supplement to N N R, 1942 p 26)

The following dosage forms have been accepted

ABBOTT LABORATORIES, NORTH CHICAGO, ILL

**Ampoules Diethylstilbestrol in Oil**, 0.5 mg per cc  
1 cc in sesame oil

**Ampoules Diethylstilbestrol in Oil**, 10 mg per cc  
1 cc in sesame oil

**Tablets Diethylstilbestrol** 0.1 mg 0.25 mg, 0.5 mg  
1 mg and 5 mg

**Vaginal Suppositories Diethylstilbestrol** 0.1 mg and 0.5 mg

### THEOPHYLLINE WITH ETHYLENEDIAMINE-U S P (See New and Nonofficial Remedies 1942 p 332)

The following dosage form has been accepted

WM S MERRELL CO, CINCINNATI

**Aminophylline Tablets** 0.1 Gm (15 grains)

### ASCORBIC ACID-U S P (See New and Nonofficial Remedies, 1942 p 564)

The following dosage forms have been accepted

JOHN WILEY & BROTHER, INC., PHILADELPHIA

**Tablets Ascorbic Acid** 50 mg and 100 mg

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SATURDAY, MARCH 13, 1943

## TRANSPORTATION OF DISEASE AGENTS

The movement of great numbers of men and women in the armed forces and in industry, the speed of transportation and the great variety of the regions concerned cause the United States Public Health Service to be faced with extraordinary problems in the prevention of importation of diseases into the continental United States. The ramifications of the problem are suggested by two recent reports from the Public Health Service. The first, by Parker,<sup>1</sup> deals with *Ornithodoros* ticks as a medium for the transportation of disease agents. Some of these ticks harbor in their tissues for a long time certain disease agents of which they are not known to be spontaneous hosts or transmitters. Ticks of this genus must therefore be considered as a possible medium for the transportation of disease agents such as rickettsiae and viruses when long periods of transit are involved.

Three attempts to use ticks of the genus *Ornithodoros* as a medium for importing from foreign countries disease agents of which they are not known to be normal hosts or vectors were successful. The diseases, the tick species and the minimum intervals between the ingesting of blood of infected guinea pigs by the ticks and the subsequent recovery of the disease agents from them were, for Tobia petechial fever, *Ornithodoros rudis*, eleven days and fifty-three days, for South African tick bite fever, *Ornithodoros moubata*, thirty-six days, for spring-summer encephalitis, *Ornithodoros moubata*, forty days. The recoveries of the causative agents were not made by tick bite but by injecting guinea pigs with saline suspensions of the tick tissues in the case of the rickettsial diseases and a broth suspension in the case of spring-summer encephalitis.

Olesen and Sherrard<sup>2</sup> discuss variations in rat infestation on vessels. Since 1940, they say, the number of fumigations of vessels has gradually increased and the

average rat recovery from each vessel has been greater than during previous years. This has been due to the considerable increase in the number of tramp vessels coming to New York. Over such vessels competent sanitary supervision has not been heretofore exercised. As Olesen and Sherrard point out, it is not pleasant to contemplate the effect on the public health or on the war effort of the introduction of quarantinable diseases into the United States. Therefore it becomes increasingly important to maintain rat control as well as other precautions on arriving vessels. The difficulty of performing the requisite steps in the face of the secrecy necessarily attending ship movements, the loss of trained personnel, the quick turn around of ships and other factors is readily apparent. From reports such as these however, it is clear that the United States Public Health Service is thoroughly aware of its responsibilities in this regard.

## PROSPECTS AND PROGRESS IN INDUSTRIAL HEALTH

Modern preventive industrial medicine was born in the first world war, then declined in the postwar years, only to regain lost ground and to uncover many new fields of usefulness during the period of preparedness and conflict in the Global War. The urgent necessity for conserving the health of essential war workers is unquestioned. Leaders in government, industry and medicine agree that this objective is of utmost importance, second only, in fact to the health and medical requirements of the armed forces. The benefits of prevention of sickness and accident are equally valuable in peace, the only variables being urgency and the number of persons involved. Is this renaissance likely to subside again after the present unusual stimulus of production for war is over?

The force of interest in industrial medical organization will not subside as readily as it did twenty years ago. Large industry will continue to support a maintenance system which has demonstrated its ability to promote better production, lower absentee rates and improved labor relations. A major function of medicine and industry during the next few years will be the production of similar advantages for the small plant. The structure of governmental industrial hygiene services was largely undeveloped ten years ago, now it flourishes in every industrial state. The spread of dependable industrial health service is best consummated where correlation exists between the practicing medical profession, nursing and these public agencies for investigation and consultation in industrial hygiene. In this direction lies the hope for conservation of health in the small plants.

Much interest is developing in labor management committees now widely organized in war production

1 Parker R. R. *Ornithodoros* Ticks as a Medium for the Transportation of Disease Agents. *Pub. Health Rep.* 57: 1963 (Dec. 25) 1942.

2 Olesen Robert and Sherrard G. C. Variations in Rat Infestation on Vessels. *Pub. Health Rep.* 57: 1966 (Dec. 25) 1942.

plants and in the possible relation of such committees to industrial health administration. This type of organization is strongly advocated by the War Production Board. Advocates suggest that many of the former causes of apprehension and militant objection by labor toward certain phases of industrial medicine could be effectively overcome by such arrangements. The medical profession has always felt that the interests of employer and worker are close together where health is concerned.

The trend toward prevention in industry has tended in recent years to modify the need for purely remedial medicine and surgery. This current will be reversed by the casualties of war and the reintegration of the disabled into useful employment. Rehabilitation, both physical and vocational, must therefore become a predominant medical problem, so that maintenance of the handicapped in gainful occupation will occupy medical and surgical minds for years. Welcome also is the attention that rehabilitation and prevention are apparently receiving from administrators of workmen's compensation.

The changing nature of the work force emphasizes the need for medical and hygienic supervision in industry. Millions of women are demonstrating ability to compete on equal terms with men in some occupations, they introduce new problems in industrial medical supervision. In one corporation the frequency rate of absenteeism due to sickness runs 320 per thousand for women compared to 89.1 for men, and the average time loss is forty-two days.

Innumerable proposals appear concerning techniques for supplying preventive medicine and medical services to workers. One such plan offers health insurance with labor shouldering a proportionate share of the cost as a means to minimize many of the perplexing problems of administration of workmen's compensation. Such proposals must be examined with care and tested scientifically to determine their advantages and disadvantages. When sufficient data become available, medical economists may evaluate such plans more accurately.

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#### STATE INDUSTRIAL HEALTH PROGRAMS

The movement toward more and better preventive industrial medicine has received force and direction from committees on industrial health in the state medical societies. Following the recommendations of the Council on Industrial Health, these agencies were to contain representation from private practice, industrial practice and the state bureau of industrial hygiene, all to assist in focusing the interest of every element in medicine on the physical welfare of workers. Already significant advances have been made. When the full implications unfold, no other committee in the structure of medical organization in each state is likely to exert

more influence on the nature and standards of medical practice.

One of the principal obstacles to widespread industrial medical activity is lack of public interest, particularly among the managers of small plants. The fault is not that of medicine alone, it is equally a responsibility of management and labor. State medical society committees on industrial health have established excellent working relations with state manufacturing associations and are bringing directly to them dependable information on the benefits of competent industrial medical supervision. Representatives of organized labor need to be approached to secure cooperation in the development of medical and hygienic programs in large and small plants and also in the province of general health education. Workers spend far more time off the job than on it. Ordinary illness plus the combined effects of poor housing, wrong nutrition and injudicious use of leisure time are the most prolific causes of absenteeism due to sickness.

Two other phases of activity by state committees contain the secret of successful advancement of industrial health. If any considerable degree of public acceptance is to be developed, physicians, hygienists and nurses must be capable of meeting these new demands. Much effort is now being exerted to supply the medical profession with an awareness of modern industrial health methods. Much remains to be done, however, largely under the immediate stimulus of state medical organizations.

Already some of the state committees have organized cooperating units in the medical societies of industrial counties. Efforts in the counties should be undertaken in accordance with accepted community medical practice and public health administration. The type of committee representation described for the states is equally important in counties. Recommendations have already been published about a county medical society program in industrial health.<sup>1</sup> These committees must exercise medical initiative and leadership in any community industrial health department. Opportunities are numerous for local investigation of causes of absenteeism, for correlation of interested community health facilities, for education of the public to the advantages of preventive industrial medical service and for continuous instruction of the profession and ancillary groups about advances in industrial medicine, surgery and hygiene. It is through responsive activity in this field by individual practitioners that satisfactory contributions to the war production effort will be made by the medical profession.

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<sup>1</sup> Medical Service in Industry. An Industrial Health Program for a County Medical Society prepared by the Council on Industrial Health, American Medical Association. J. A. M. A. 121:29 (Jan. 23) 1943.

## Current Comment

### PHYSICIANS URGED TO RELEASE QUININE SUPPLIES

Every physician is urged to contribute to the National Quinine Pool<sup>1</sup> all supplies of quinine and other cinchona salts and alkaloids not absolutely essential in his practice for the treatment of malaria. These compounds are needed to maintain an adequate stockpile of antimalarial agents for use in the armed forces. Although synthetic substances such as atabrine are being produced in enormous quantities and are used wherever possible, there are many conditions for which the drug of choice is quinine. Until the war is over little cinchona bark of good quality will be forthcoming. The currently available barks from South America are of a low grade and sufficient only for the manufacture of totquinine, which is satisfactory for domestic use. The provisions of conservation orders M-131 and M-131A<sup>2</sup> essentially restrict the sale, transfer, delivery or use of quinine salts and alkaloids to the treatment of malaria. Quinidine is an exception which may be used in the treatment of certain heart conditions. Such restrictions will permit physicians to contribute unused and opened quinine supplies to the National Quinine Pool, care of the American Pharmaceutical Association, 2215 Constitution Avenue, Washington, D. C. Each package received will be tested for identity, pooled and assayed. The less common salts will be processed to quinine sulfate or hydrochloride. The materials needed are bulk cinchona salts and alkaloids, tablets, capsules and pills, quinine, quinidine, cinchonine and cinchonidine. Do not send preparations of quinine or other cinchona derivatives in combination with other medicinal agents, ampuls and parenteral medication, liquid preparations or quinine and urea hydrochloride, quinine and urethane, quinine bismuth iodide, elixir iron, quinine and strychnine and similar preparations. The armed forces need all available quinine. Any contribution, no matter how small, will be useful, the need is urgent.

### NATIONAL NURSING COUNCIL NEEDS COOPERATION OF PHYSICIANS

The National Nursing Council for War Service, which represents the voluntary, professional nursing organizations in the total war program, urges every physician in the country to lend his help and support to the current nationwide effort to locate all graduate registered nurses. A second national inventory of nurses, a follow-up on the inventory of 1941, was begun in January 1943. To date (February 25) responses from nearly 50 per cent of the nurses in the country have been reported. To help bring in responses from the remaining 50 per cent, physicians are asked to

1 Encourage the nurses who may be associated with them, especially the nurses in their employ, to respond without delay to the post card questionnaires sent to them by the special

state agent of the United States Public Health Service in January of this year.

2 Urge nurses they may know who have not received questionnaires (many physicians' wives who are nurses have failed to receive them) to request cards from the special agent in their states. If they do not know the agent's address, the National Nursing Council for War Service, 1790 Broadway, New York, will forward their requests.

Information provided by the inventory will furnish the basis of operation for the nursing supply and distribution unit now being formed in the War Manpower Commission. The purpose of the unit, as the name implies, is to determine the availability of nurses for local, state and national emergencies and to aid in the equitable distribution of nurses, so that the nursing needs of the armed forces and of civilians will be adequately met. This distribution will be on a voluntary, not a compulsory, basis. The inventory is being conducted by the United States Public Health Service and has the approval of the National Nursing Council for War Service, the War Manpower Commission and the Health and Medical Committee, Office of Defense Health and Welfare Services, Federal Security Agency.

### INDUSTRY AND THE MEDICAL PROFESSION

Increased utilization of medical services by industry has been so rapid that training and experience have frequently had to be overlooked. Complaint is made that personnel without proper qualifications assume responsibilities beyond their professional capacity. Faulty x-ray interpretation by doctors and technicians and medical-surgical treatment by unsupervised nurses and aides lead to much dissatisfaction. Continued, unwarranted performances of this type hardly conform with standards of acceptable industrial medical procedure recommended by the Council on Industrial Health.<sup>1</sup> Until recently, management has been unable to secure dependable advice in the development of industrial health service. Improved organization in the state and county medical societies and in the state and local health departments will do much to overcome this lack of satisfactory rapport between medicine and industry. However, industry has sometimes misconstrued its own responsibility. If progress toward better working conditions and healthier employees is to occur, management must make industrial health service professionally worth while. The population groups involved and the results in terms of community betterment and well-being are so great that industrial health service should attract the best professional minds and equipment. Advancement will occur in direct proportion to the willingness of management and insurance to take industrial medical service off the bargain counter. Complaint is also received that physicians in industry occasionally use industrial connections to enhance private practice. The use of direct or indirect pressure on industrial workers by personnel in the industrial medical department in respect to management of any nonoccupational disorder is decidedly unfair.

<sup>1</sup> The National Quinine Pool. Current Comment J. A. M. A. 121: 434 (Feb. 6) 1943.

<sup>2</sup> Restrict Sale of All Quinine J. A. M. A. 119: 1512 (Aug. 29) 1942. Further Conservation of Cinchona Bark. *ibid.* 121: 439 (Feb. 6) 1943.

<sup>1</sup> Medical Service in Industry. Outline of Procedure for Physicians in Industry prepared by the Council on Industrial Health. American Medical Association J. A. M. A. 118: 895 (March 14) 1942.

# MEDICINE AND THE WAR

In this section of *The Journal* each week will appear official notices by the Committee on War Participation of the American Medical Association, announcements by the Surgeon Generals of the Army, Navy and Public Health Service, and other governmental agencies dealing with medicine and the war and such other information and announcements as will be useful to the medical profession

## ARMY

### PROCEDURE OF PROCESSING PHYSICIANS, DENTISTS AND VETERINARIANS IN THE FIELD

The War Department Service of Supply, Officer Procurement Service, issued the following memorandum under date of February 27, covering the procedure for processing physicians, dentists and veterinarians in the field

NOTE—This memorandum both restates prior instructions and contains new instructions. Immediate attention to its provisions is essential to field office work.

1 *Scope of Memorandum Rescission of Prior Instructions*—(a) This memorandum states the procedure under which Officer Procurement Service will assist the Surgeon General in processing physicians, dentists and veterinarians for appointment as officers in the Army of the United States. The procedure here stated is approved for the processing and appointment of physicians, dentists and veterinarians only and does not apply to the processing and appointment of candidates for any other position for the Surgeon General.

(b) Prior instructions still in effect have been consolidated in this memorandum. Accordingly FT-15 (January 13) and attached memorandum, FT-17 (January 18), FT-24 (January 27), FT-29 (February 11), FT-31 (February 17), FT-33 (February 22) and all other instructions in this connection are hereby rescinded.

2 *The Surgeon General's 1943 Recruiting Program*—(a) The 1943 program of the Surgeon General for the appointment of qualified individuals from civil life in the Medical Corps, Dental Corps and Veterinary Corps includes not only physicians, dentists and veterinarians established in their communities but also medical interns and residents of hospitals. This program is as follows:

	Hospital Interns and Residents	Others	Total
Physicians	3 000 approx	6 900	9 900
Dentists	0 imately	4 800	4 800
Veterinarians	0	900	900
	3 000 appr	12 600	15 600

The requirements of the Air Surgeon are included in the foregoing.

(b) The monthly objective for appointments of those other than from the hospital intern and resident category is as follows:

Physicians Medical Corps	575
Dentists Dental Corps	400
Veterinarians, Veterinary Corps	75

1 050 per month

(c) The objective for appointments from the hospital intern and resident category cannot be readily stated in monthly quotas. Most internships terminate about June 30. Whereas small numbers of interns and residents may be available in all months, the bulk of the processing in this category should come during May, June and July. The number of hospitals in the eastern part of the United States being greater than elsewhere, the number of cases in this category to be processed in the East will be proportionately greater.

(d) All cases included within the Surgeon General's program here outlined will be dealt with in accordance with the procedure stated in this memorandum.

NOTE—During years prior to 1943 the Medical Department commissioned many students and interns in the Medical Administrative Corps A U S. These individuals have remained on inactive duty status pending completion of their medical education. Also medical dental and veterinary students and interns who have previously been commissioned

and now hold appointments in the Officers Reserve Corps in other branches have been similarly deferred from active duty. During 1943 the existing commissions of these individuals may be terminated at their own request under certain circumstances and when qualified these individuals may be appointed as officers in the Medical Dental or Veterinary Corps. Officer Procurement Service has no processing or other function in regard to such appointments. The appointment of individuals referred to in this note will be handled by the individuals directly with the Surgeon General. Inquiries in regard to such appointments should be referred to the Procurement Section Military Personnel Division, Office of the Surgeon General of the Army 1813 H Street NW Washington D C.

3 *States from Which Physicians, Dentists and Veterinarians Will Be Recruited*—(a) (1) Physicians will be procured in the following states: California, Colorado, Connecticut, District of Columbia, Illinois, Iowa, Maryland, Massachusetts, Minnesota, Missouri, Nebraska, Nevada, New Hampshire, New Jersey, New York, Ohio, Oregon, Pennsylvania, Rhode Island, Vermont and Wisconsin.

(2) The following states have already contributed more physicians to the armed forces than the sum of their 1942 and 1943 quotas and will not be called on to furnish any more physicians, except interns and residents and except special cases for specific position vacancies, during 1943: Alabama, Arizona, Delaware, Georgia, Idaho, Kentucky, Louisiana, Mississippi, New Mexico, North Carolina, South Carolina, Tennessee, Texas, West Virginia and Wyoming.

(3) In states not listed in either a (1) or (2) there will be at present no procurement of physicians, except interns and residents and except special cases for specific position vacancies.

(b) There will be no procurement of dentists, except special cases for specific position vacancies in Alabama, Arizona, Arkansas, Delaware, Florida, Georgia, Kentucky, Louisiana, Mississippi, New Mexico, North Carolina, Oklahoma, South Carolina, Tennessee, Texas and Virginia.

(c) There are no restrictions at present on recruiting veterinarians.

4 *Function of Officer Procurement Service*—(a) Officer Procurement Service will process the papers of all physicians, dentists and veterinarians whose availability for commissioning in the Army of the United States has been determined by the War Manpower Commission (see paragraph 5) and will transmit to the Secretary of War's Personnel Board requests for appointment of such individuals, submitted by the Surgeon General.

(b) Officer Procurement Service has no function to perform until an officer procurement district office has received from the War Manpower Commission a determination of availability of a physician, dentist, or veterinarian. See paragraph 6.

(c) The district office will interview each candidate for character, integrity, reputation and qualification for commissioning as an officer. The investigation will be limited to these subjects and will not extend to an appraisal of professional qualifications. A form OPB 2 (completed as to the side containing the interviewer's remarks) will be included with the candidate's file when forwarded to the Surgeon General. (The other side of the form need not be completed.)

(d) The Surgeon General has discontinued all medical officer recruiting boards. In certain service commands officer procurement district offices may find it desirable to arrange in investigating candidates, for assistance from the chief of the medical branch in the service command.

(e) District offices will not forward to the Surgeon General any papers concerning unavailable physicians, dentists or veterinarians except as requested by higher authority. Questionnaires

and related papers of unavailable physicians, dentists and veterinarians, if any, should be retained in the District office's inactive file pursuant to FP-14, Feb. 3, 1943, paragraph 6 c.

(f) Inquiries to a district office by physicians, dentists and veterinarians concerning whom no determination of availability has been received by the district office should be referred to the appropriate state chairman, Procurement and Assignment Service, War Manpower Commission. See paragraph 5.

**5 Function of War Manpower Commission.**—(a) The War Manpower Commission functions through its Procurement and Assignment Service. This service determines whether a physician, dentist or veterinarian is available for commissioning in the armed forces of the United States. No physician, dentist or veterinarian may be processed for appointment or appointed in the Army of the United States unless and until his availability has been so determined.

(b) In each state the Procurement and Assignment Service has set up three state chairmen: medical, dental, veterinary. Attached hereto marked Tab A is a schedule showing for each state the authorized chairmen and their co-chairmen and vice chairmen, if any (herein called state P and A chairmen).

(c) Each state P and A chairman prepares a monthly quota list of physicians, dentists and veterinarians (as the case may be) who are apparently suitable and who are determined to be available for commissioning in the Army of the United States. To each individual so listed the central office of the Procurement and Assignment Service sends a communication inviting him to apply for service with the armed forces (opportunity being afforded to indicate on the inclosed reply card preference for Army, Navy or Medical Department of the Air Force). The reply cards are sent by the potential applicants to the appropriate state P and A chairmen.

(d) On receipt from time to time by the state P and A chairmen of such reply cards they give to Officer Procurement Service the notice of availability provided in paragraph 6.

**6 Notice of Availability Given by State P and A Chairmen.**—(a) Notice of availability of a particular physician, dentist or veterinarian within the jurisdiction of a state P and A chairman will be given by such chairman to Officer Procurement Service on form 97 ("Availability Clearance Form") or some similar form in duplicate. Preference for service with the Medical Department or the Army Air Forces will be plainly indicated on form 97 by the state chairman.

(b) Such notice of availability will be given by the state chairman direct to the designated officer procurement district office in accordance with the schedule shown on Tab B attached. This schedule has been set up to meet the convenience of the Surgeon General and must be explicitly followed. A designated district office which receives a notice of availability may forward it to another district office for necessary action (for example, New York City may forward to Albany or Buffalo).

(c) In the event that a notice is received by an officer procurement district office signed by other than the authorized state chairman, his alternate or a person duly authorized by such state chairman to give notice in his behalf, the office will return such notice to the state chairman before taking action, with an explanation that only notices bearing authorized signatures can be honored.

(d) No action will be taken by an officers' procurement district office in any case until receipt by it of a properly executed form 97, evidencing determination of the individual's availability. Form 97 indicating unavailability should be returned by district offices to the proper state P and A chairman without action.

(e) Attention is invited to the provision of AR 605-10 paragraph 6.

An officer of the Army of the United States must at the time of appointment be a citizen of the United States or of the Philippine Islands or a citizen of a cobelligerent or friendly country who otherwise possesses the same qualifications as a citizen of the United States.

Any notice of availability of a physician, dentist or veterinarian who does not comply with this provision should be returned to the proper state P and A chairman without action.

**7 Processing Procedure.**—(a) On receipt of notice of availability in regard to an individual physician, dentist or veterinarian the officer procurement district office will promptly

contact the individual and arrange for an interview. At the same time the individual should be advised of the papers which he must furnish and the steps which he must take. See paragraph 8.

(b) In areas where considerable travel is involved, district offices will endeavor to schedule visits of their officers through such areas so that applicants may be interviewed at or near their home cities. District offices are authorized to cooperate with state P and A chairmen so as to facilitate the scheduling of such visits.

(c) The individual will be requested by the district office to complete all papers and take all steps required of him within fourteen days of the date of such request.

(d) If no reply is received from a candidate or if a candidate declines to act as indicated, a report thereon will be transmitted by the officer procurement district office to the state chairman.

(e) As soon as the candidate's processing is completed, the fully processed papers will be forwarded by air mail by the field office direct to:

Procurement Section  
Military Personnel Division  
Office of the Surgeon General of the Army  
1818 H Street N.W. Washington, D.C.

It is essential to carrying forward the Surgeon General's program that such completed papers be sent direct and not through channels.

(f) If the completed papers cannot be forwarded within two weeks after the date of receiving the notification of availability, the district office will advise the state chairman of the exact status of processing. The state chairman is charged with responsibility for making further inquiry of the candidate. In the event that the district office is about to complete the processing at the end of the fourteenth day of the period, such advice to the state chairman may be omitted.

(a) If a candidate's papers on submission by the Surgeon General to Officer Procurement Service on a form OPS 3 are incomplete, they will be returned to the appropriate district office attached to a form OPS 2. When a district office receives such papers, it will take the action necessary to complete the same. On completion the papers will be returned to Chief Field Operations Branch, Officer Procurement Service, Washington, D.C. This is the only instance in which a district office sends papers concerning physicians, dentists and veterinarians direct to Washington headquarters of Officer Procurement Service.

(b) The decision as to grade and appointment to be recommended for each candidate rests with the Surgeon General.

**8 Papers to be Furnished by Candidates.**—(a) The completed file of each physician, dentist or veterinarian forwarded by a district office to the Surgeon General pursuant to paragraph 7 d, should include:

- (1) WD AGO Form 0850 in duplicate with passport size photo attached and each question fully answered.
- (2) WD AGO Form 178-2 in duplicate (Classification Questionnaire of Medical Department Reserve Officers).
- (3) WD AGO Form 63 in triplicate.
- (4) Affidavit of physical defect in duplicate if required.
- (5) Form OPB 2 (OPS interviewer's report) in duplicate. See paragraph 4 c.
- (6) Form OPB 5 (certificate of inspection of naturalization papers if candidate is not a citizen by birth or has lost citizenship) in duplicate.
- (7) Federal employee — written release from federal employment signed by responsible executive.

(b) In addition to the papers listed in a, the completed file of each physician, dentist and veterinarian who is a graduate of a foreign (other than Canadian) medical school should include the following or if not available a detailed explanation in lieu thereof, with request for a waiver:

**NOTE.**—Canadian medical, dental and veterinary schools are not deemed foreign medical schools.

(1) Transcript of preprofessional education, which must be equivalent to the requirements for admission to an approved American medical, dental or veterinary school (with certified translation).

(2) Resume of the credit hours and grades received in each course at professional school and if more than one professional school was attended, full particulars in regard thereto.



(3) Photostat of diploma which was awarded after four years' academic instruction in medicine, dentistry or veterinary medicine (with certified translation)

(4) Photostat of license to practice in a state, territory or the District of Columbia (such licensure cannot be waived) or certification by an army officer on active duty that he has seen the applicant's license, also a license or registration authorizing practice in the country where professional education was obtained

(5) Certificate of approved internship of not less than one year's duration in the case of physicians

(6) If the candidate is a diplomate of the National Board of Medical Examiners, or if accepted by said board for examination, substantiating evidence

(c) In addition to the papers listed in *a*, the completed file of each physician who is a graduate of a nonapproved medical school (Chicago Medical School Middlesex College of Medicine and Surgery and Cincinnati Eclectic School of Medicine) should include the following

(1) Letter from the dean of his medical school verifying the fact that he has satisfactorily completed a four year course of regular medicine and has been granted an M.D. degree

(2) Letter from the superintendent of a hospital verifying at least one year of rotating internship on the part of the applicant

(3) Photostat of, or certification by, an army officer on active duty that he has seen the applicant's license to practice medicine in a state, territory or the District of Columbia (Such licensure cannot be waived)

(4) Letter from three physicians who are graduates of an approved medical school and are practicing in the county where the applicant resides, stating that they know the applicant to be engaged in the ethical practice of medicine. Such letters should state the writer's school and year of graduation, in addition to information concerning applicant's professional qualifications

(5) Evidence of membership in his local county medical society or a letter from the secretary of the district or county medical society, substantially as follows

Dr	of	Place	
society as a graduate of		Date	
in			is known to this
practice of medicine in			Medical School located
having been licensed by this state since			He is engaged in the
so far as is known an ethical practitioner of medicine			He is
eligible to apply for membership in the			Medical
Society if he had been in practice for	years		Having attained
such membership he would be accredited to the			
District (County) Medical Society			
Signed			
Secretary	(District) (County)		
Medical Society			

(The applicant should bring his diploma and certificate of licensure to the district or county secretary when requesting such a letter)

(d) In addition to the papers listed under *a* and otherwise required under *b* or *c*, the completed file of each physician, dentist or veterinarian who is a Canadian citizen should include the following

(1) Evidence that he has applied for his first papers as an American citizen

(2) A release from the Canadian legation

(c) In addition to the papers listed under *a* and otherwise required under *b* or *d*, the completed file of a dentist or veterinarian should include the following

(1) Photostatic copy or certified evidence of license to practice his profession for the current or the ensuing year in a state, territory or the District of Columbia

(2) For an individual who has graduated from dental or veterinary school in 1942 or 1943 either a license to practice or a photostatic copy of diploma or certificate of the dean of the appropriate school as to graduation

9 *Nonrequirement of Release from Selective Service Classification II-A, II-B, or III-B*—Notwithstanding the provisions of AR-605-10, Dec 30, 1942, paragraph 7 *j* to the effect that "No civilian, of any age, will be appointed if classified as II-A, II-B, or III-B unless released from such classification by his local draft board," no such release need be obtained in the case of a physician, dentist or veterinarian whose availability has been determined by the War Manpower Commission (Procurement and Assignment Service). Neither is it required that a draft status certificate be furnished in regard to a physician, dentist, or veterinarian

10 *Weekly Reports*—(a) Each officer procurement district office will submit to Washington headquarters of Officer Procurement Service, as of Thursday night, commencing with March 4 1943, a report of all cases handled under the foregoing procedure, in the form attached hereto and marked Tab C

(b) In the March 4 report district offices will break down the prior cumulative aggregates of physicians, dentists and veterinarians into the three separate categories

(c) The accuracy of the figures in the weekly report will be verified by the district office before submission, by checking as indicated on the form (Tab C)

(d) Notices of availability concerning physicians, dentists and veterinarians which are received by officer procurement districts designated to receive them from state chairmen (see Tab B), and which are forwarded to other officer procurement districts for action, will not be included in the weekly report of the office forwarding them. Such requests will be included in the report of the office which does the processing

For the Director

ENMETT F. CONNELLY,  
Colonel, A U S  
Chief, Field Operations Branch

## COLLECT 150,000 GRAINS OF QUININE

In response to the government's appeal for quinine for the treatment of American troops in malaria infected areas (THE JOURNAL, Oct 3, 1942 p 377) the eleven Illinois state mental hospitals have collected from their supplies nearly 150,000 grains. Dr Harry R Hoffman, director of the Neuropsychiatric Institute University of Illinois School of Medicine, Chicago, announced on March 5. Dr Hoffman, who acted as collecting agent in the drive for quinine for the state of Illinois indicated that the supplies in these mental hospitals presumably were acquired to be used in the artificial fever therapy of dementia paralytica the quinine being used to cure the malaria in patients after it had served its purpose. This method is not now so frequently employed, as electrical means of causing a better controlled fever have been introduced. The Philadelphia College of Pharmacy and Chemistry Forty-Third Street and Woodland and Kingsessing avenues Philadelphia was authorized by the War Production Board to act as an assaying depot for any unopened packages of quinine compounds that are contributed by pharmacists. All such packages should be addressed to the Quinine Pool at the foregoing address.

## DEDICATION OF THE PERCY L JONES GENERAL HOSPITAL

The U S Army Percy L Jones General Hospital at Battle Creek, Mich, was formally dedicated February 22. Among those present were the Honorable Harry F Kelly, governor of Michigan, Major Gen Henry S Aurand, commanding officer of the Sixth Service Command, with headquarters in Chicago. Major Gen James C Magee, Washington D C Surgeon General of the Army, Brig Gen John M Willis commander of the medical replacement training center at Camp Grant Illinois, Col Joseph E Bastion chief of the medical branch of the Sixth Service Command, Chicago. Col Norman T Burk commanding officer of the hospital, Dr John Harvey Kellogg founder and for many years director of the Battle Creek Sanitarium. Mrs Percy L Jones and her daughter Mrs Charles Siegel of Erie Pa and many other distinguished guests. The remodeling of the hospital buildings which a few months ago were those of the Battle Creek Sanitarium is practically complete and about 400 patients have been admitted including 175 sick and wounded soldiers from the Pacific theater of war. This hospital was named in honor of the late Col Percy L Jones for many years a distinguished member of the U S

and related papers of unavailable physicians, dentists and veterinarians, if any, should be retained in the District office's inactive file pursuant to GP-14 Feb 3, 1943, paragraph 6 c

(f) Inquiries to a district office by physicians, dentists and veterinarians concerning whom no determination of availability has been received by the district office should be referred to the appropriate state chairman, Procurement and Assignment Service, War Manpower Commission. See paragraph 5

5 *Function of War Manpower Commission*—(a) The War Manpower Commission functions through its Procurement and Assignment Service. This service determines whether a physician, dentist or veterinarian is "available" for commissioning in the armed forces of the United States. No physician, dentist or veterinarian may be processed for appointment or appointed in the Army of the United States unless and until his availability has been so determined.

(b) In each state the Procurement and Assignment Service has set up three state chairmen: medical, dental, veterinary. Attached hereto marked Tab A, is a schedule showing for each state the authorized chairmen, and their co chairmen and vice chairmen, if any (herein called 'state P and A chairmen').

(c) Each state P and A chairman prepares a monthly quota list of physicians, dentists and veterinarians (as the case may be) who are apparently suitable and who are determined to be available, for commissioning in the Army of the United States. To each individual so listed the central office of the Procurement and Assignment Service sends a communication inviting him to apply for service with the armed forces (opportunity being afforded to indicate on the inclosed reply card preference for Army, Navy or Medical Department of the Air Forces). The reply cards are sent by the potential applicants to the appropriate state P and A chairman.

(d) On receipt from time to time by the state P and A chairmen of such reply cards, they give to Officer Procurement Service the notice of availability provided in paragraph 6

6 *Notice of Availability Given by State P and A Chairmen*—(a) Notice of availability of a particular physician, dentist or veterinarian within the jurisdiction of a state P and A chairman will be given by such chairman to Officer Procurement Service on form 97 (Availability Clearance Form) or some similar form in duplicate. Preference for service with the Medical Department of the Army, Air Forces will be plainly indicated on form 97 by the state chairman.

(b) Such notice of availability will be given by the state chairman direct to the designated officer procurement district office in accordance with the schedule shown on Tab B attached. This schedule has been set up to meet the convenience of the Surgeon General and must be explicitly followed. A designated district office which receives a notice of availability may forward it to another district office for necessary action (for example, New York City may forward to Albany or Buffalo).

(c) In the event that a notice is received by an officer procurement district office signed by other than the authorized state chairman, his alternate or a person duly authorized by such state chairman to give notice in his behalf, the office will return such notice to the state chairman before taking action, with an explanation that only notices bearing authorized signatures can be honored.

(d) No action will be taken by an officers' procurement district office in any case until receipt by it of a properly executed form 97, evidencing determination of the individual's availability. Form 97 indicating unavailability should be returned by district offices to the proper state P and A chairman without action.

(e) Attention is invited to the provision of AR 605-10, paragraph 6

An officer of the Army of the United States must at the time of appointment be a citizen of the United States or of the Philippine Islands or a citizen of a cobelligerent or friendly country who otherwise possesses the same qualifications as a citizen of the United States.

Any notice of availability of a physician, dentist or veterinarian who does not comply with this provision should be returned to the proper state P and A chairman without action.

7 *Processing Procedure*—(a) On receipt of notice of availability in regard to an individual physician, dentist or veterinarian, the officer procurement district office will promptly

contact the individual and arrange for an interview. At the same time the individual should be advised of the papers which he must furnish and the steps which he must take. See paragraph 8.

(b) In areas where considerable travel is involved, district offices will endeavor to schedule visits of their officers through such areas so that applicants may be interviewed at or near their home cities. District offices are authorized to cooperate with state P and A chairmen so as to facilitate the scheduling of such visits.

(c) The individual will be requested by the district office to complete all papers and take all steps required of him within fourteen days of the date of such request.

(d) If no reply is received from a candidate or if a candidate declines to act as indicated, a report thereon will be transmitted by the officer procurement district office to the state chairman.

(e) As soon as the candidate's processing is completed, the fully processed papers will be forwarded by air mail by the field office direct to

Procurement Section  
Military Personnel Division  
Office of the Surgeon General of the Army  
1818 H Street N.W. Washington D.C.

It is essential to carrying forward the Surgeon General's program that such completed papers be sent direct and not through channels.

(f) If the completed papers cannot be forwarded within two weeks after the date of receiving the notification of availability, the district office will advise the state chairman of the exact status of processing. The state chairman is charged with responsibility for making further inquiry of the candidate. In the event that the district office is about to complete the process, at the end of the fourteenth day of the period, such advice to the state chairman may be omitted.

(g) If a candidate's papers, on submission by the Surgeon General to Officer Procurement Service on a form OPS-1 are incomplete they will be returned to the appropriate district office attached to a form OPS-2. When a district office receives such papers, it will take the action necessary to complete the same. On completion the papers will be returned to Chief Field Operations Branch, Officer Procurement Service, Washington D.C. This is the only instance in which a district office sends papers concerning physicians, dentists and veterinarians direct to Washington headquarters of Officer Procurement Service.

(h) The decision as to grade and appointment to be recommended for each candidate rests with the Surgeon General.

8 *Papers to be Furnished by Candidates*—(a) The completed file of each physician, dentist or veterinarian forwarded by a district office to the Surgeon General pursuant to paragraph 7 d should include

- (1) WD AGO Form 0950 in duplicate with passport size photo attached and each question fully answered.
- (2) WD ACO Form 178.2 in duplicate (Classification Questionnaire of Medical Department Reserve Officers).
- (3) WD AGO Form 63 in triplicate.
- (4) Affidavit of physical defect in duplicate if required.
- (5) Form OPB 2 (OPS interviewer's report) in duplicate. See paragraph 4 c.
- (6) Form OPB 5 (certificate of inspection of naturalization papers if candidate is not a citizen by birth or has lost citizenship) in duplicate.
- (7) Federal employee—written release from federal employment signed by responsible executive.

(b) In addition to the papers listed in a the completed file of each physician, dentist and veterinarian who is a graduate of a foreign (other than Canadian) medical school should include the following or, if not available, a detailed explanation in lieu thereof, with request for a waiver:

NOTE—Canadian medical, dental and veterinary schools are not deemed foreign medical schools.

(1) Transcript of preprofessional education, which must be equivalent to the requirements for admission to an approved American medical, dental or veterinary school (with certified translation).

(2) Resume of the credit hours and grades received in each course in professional school, and if more than one professional school was attended full particulars in regard thereto.

(3) Photostat of diploma which was awarded after four years' academic instruction in medicine, dentistry or veterinary medicine (with certified translation)

(4) Photostat of license to practice in a state, territory or the District of Columbia (such licensure cannot be waived) or certification by an army officer on active duty that he has seen the applicant's license, also a license or registration authorizing practice in the country where professional education was obtained

(5) Certificate of approved internship of not less than one year's duration in the case of physicians

(6) If the candidate is a diplomate of the National Board of Medical Examiners, or if accepted by said board for examination, substantiating evidence

(c) In addition to the papers listed in *a*, the completed file of each physician who is a graduate of a nonapproved medical school (Chicago Medical School, Middlesex College of Medicine and Surgery and Cincinnati Eclectic School of Medicine) should include the following

(1) Letter from the dean of his medical school verifying the fact that he has satisfactorily completed a four year course of regular medicine and has been granted an M D degree

(2) Letter from the superintendent of a hospital verifying at least one year of rotating internship on the part of the applicant

(3) Photostat of, or certification by, an army officer on active duty that he has seen the applicant's license to practice medicine in a state, territory or the District of Columbia (Such licensure cannot be waived)

(4) Letter from three physicians who are graduates of an approved medical school and are practicing in the county where the applicant resides, stating that they know the applicant to be engaged in the ethical practice of medicine. Such letters should state the writer's school and year of graduation, in addition to information concerning applicant's professional qualifications

(5) Evidence of membership in his local county medical society or a letter from the secretary of the district or county medical society, substantially as follows

Dr _____ of _____ is known to this	Place
society as a graduate of _____ Medical School located	Date
in _____ He is engaged in the	
practice of medicine in _____ He is	
having been licensed by this state since _____	
so far as is known an ethical practitioner of medicine He would be	
eligible to apply for membership in the _____ Medical	
Society if he had been in practice for _____ years Having attained	
such membership he would be accredited to the _____	
District (County) Medical Society	
Signed _____ (District) (County)	
Secretary _____ Medical Society	

(The applicant should bring his diploma and certificate of licensure to the district or county secretary when requesting such a letter)

(d) In addition to the papers listed under *a* and otherwise required under *b* or *c*, the completed file of each physician, dentist or veterinarian who is a Canadian citizen should include the following

(1) Evidence that he has applied for his first papers as an American citizen

(2) A release from the Canadian legation

(c) In addition to the papers listed under *a* and otherwise required under *b* or *d*, the completed file of a dentist or veterinarian should include the following

(1) Photostatic copy or certified evidence of license to practice his profession for the current or the ensuing year in a state, territory or the District of Columbia

(2) For an individual who has graduated from dental or veterinary school in 1942 or 1943 either a license to practice or a photostatic copy of diploma or certificate of the dean of the appropriate school as to graduation

9 *Nonrequirement of Release from Selective Service Classification II-A, II-B, or III-B*—Notwithstanding the provisions of AR 605-10, Dec 30, 1942, paragraph 7 j, to the effect that "No civilian, of any age, will be appointed if classified as II-A, II-B, or III-B unless released from such classification by his local draft board," no such release need be obtained in the case of a physician, dentist or veterinarian whose availability has been determined by the War Manpower Commission (Procurement and Assignment Service). Neither is it required that a draft status certificate be furnished in regard to a physician, dentist, or veterinarian

10 *Weekly Reports*—(a) Each officer procurement district office will submit to Washington headquarters of Officer Procurement Service, as of Thursday night, commencing with March 4 1943, a report of all cases handled under the foregoing procedure, in the form attached hereto and marked Tab C

(b) In the March 4 report district offices will break down the prior cumulative aggregates of physicians, dentists and veterinarians into the three separate categories

(c) The accuracy of the figures in the weekly report will be verified by the district office before submission, by checking as indicated on the form (Tab C)

(d) Notices of availability concerning physicians, dentists and veterinarians which are received by officer procurement districts designated to receive them from state chairmen (see Tab B), and which are forwarded to other officer procurement districts for action will not be included in the weekly report of the office forwarding them. Such requests will be included in the report of the office which does the processing

For the Director

EMMETT F CONNELLY,  
Colonel, A U S  
Chief Field Operations Branch

## COLLECT 150,000 GRAINS OF QUININE

In response to the government's appeal for quinine for the treatment of American troops in malaria infected areas (THE JOURNAL, Oct 3 1942 p 377) the eleven Illinois state mental hospitals have collected from their supplies nearly 150 000 grains, Dr Harry R Hoffman director of the Neuropsychiatric Institute, University of Illinois School of Medicine Chicago, announced on March 5 Dr Hoffman, who acted as collecting agent in the drive for quinine for the state of Illinois, indicated that the supplies in these mental hospitals presumably were acquired to be used in the artificial fever therapy of dementia paralytica, the quinine being used to cure the malaria in patients after it had served its purpose. This method is not now so frequently employed as electrical means of causing a better controlled fever have been introduced. The Philadelphia College of Pharmacy and Chemistry Forty-Third Street and Woodland and Kingsessing avenues, Philadelphia, was authorized by the War Production Board to act as an assaying depot for any unopened packages of quinine compounds that are contributed by pharmacists. All such packages should be addressed to the Quinine Pool at the foregoing address

## DEDICATION OF THE PERCY L JONES GENERAL HOSPITAL

The U S Army Percy L Jones General Hospital at Battle Creek, Mich, was formally dedicated February 22. Among those present were the Honorable Harry F Kelly, governor of Michigan, Major Gen Henry S Aurand, commanding officer of the Sixth Service Command, with headquarters in Chicago, Major Gen James C Magee, Washington D C, Surgeon General of the Army, Brig Gen John M Willis commander of the medical replacement training center at Camp Grant, Illinois, Col Joseph E Bastion chief of the medical branch of the Sixth Service Command, Chicago, Col Norman T Kirk commanding officer of the hospital, Dr John Harvey Kellogg founder and for many years director of the Battle Creek Sanitarium, Mrs Percy L Jones and her daughter, Mrs Charles Siegel of Erie Pa and many other distinguished guests. The remodeling of the hospital buildings which a few months ago were those of the Battle Creek Sanitarium is practically complete and about 400 patients have been admitted, including 175 sick and wounded soldiers from the Pacific theater of war. This hospital was named in honor of the late Col Percy L Jones for many years a distinguished member of the U S

**Army Medical Corps** During the ceremonies an oil painting of Colonel Jones was unveiled by his widow. Following the dedication, a reception in honor of Mrs. Jones was held in the Officer's Club. The *Battle Creek Enquirer and News* issued a special section pertaining to the hospital and the dedication. Additional information concerning the hospital was published in *THE JOURNAL*, Dec 12, 1942, page 1220.

### IN MEMORY OF FLIGHT SURGEONS

In memory of deceased flight surgeons, the memorial window which has been placed in the post chapel at the School of Aviation



Memorial window in post chapel at School of Aviation Medicine, Randolph Field, Texas

Medicine, Randolph Field, Texas, will be dedicated April 2. The window was presented by more than three hundred medical officers in the class of '42-F of Aviation Medical Examiners.

### ARMY PERSONALS

Major Guy W. Harlow, Medical Administrative Corps, stationed at the Medical Replacement Training Center, Camp Berkeley, Texas, has been promoted to the rank of lieutenant colonel. Lieut. Col. Harlow has served eighteen years in the Army and was first commissioned as a second lieutenant in 1933. His family home is in Newark, Ohio.

### PRESBYTERIAN HOSPITAL (CHICAGO) UNIT

Although U. S. Army General Hospital No. 13, the Chicago Presbyterian Hospital Unit, has not been called to active duty as a unit, the administrative officers, the 350 enlisted men and more than two thirds of its nurses are now in army camps and hospitals. The enlisted personnel reported to Camp Grant in December and to Camp Robinson in January, and the following medical officers had already reported for duty at Camp Robinson at the time the February bulletin of the Presbyterian Hospital of the City of Chicago was published: Lieut. Col. Homer K. Nicoll, chief of medical service, Majors Linden J. Wallner, Cyril V. Crane and George C. Turner, Capts. John Tysell and George Pelkey, and Lieuts. A. Deo Klein, DDS, and Robert K. Stockton, DDS. The commanding officer of the hospital unit is Col. Lyle S. Powell, and the administrative officer in charge of enlisted personnel is Major William T. Willis.

### HOSPITALIZATION OF WOUNDED FROM OVERSEAS

The War Department has promulgated a hospitalization distribution plan for patients returning to the United States from overseas providing for transfer to general hospitals in the interior of officers, army nurses, warrant officers, enlisted men, dietitians, physical therapy aides, members of the WAACs, contract surgeons and other military personnel who are to be kept under further observation and treatment. While such transfers will not be made when a break in treatment might retard recovery of the patient, the general policy will be to transfer to general hospitals designated for special cases those persons who require special treatment and to send patients who will be discharged for disability or who require prolonged hospitalization to a general hospital in the vicinity of their homes. Such transfers will be made, generally, when there are 25 or more such patients.

### "HEALTH BOMB" FOR PROTECTION AGAINST INSECTS

With the guidance of the Surgeon General's Office of the Army, Westinghouse engineers have developed a simple throw-away metal dispenser, about the size of a tin can which discharges a mist that is fatal to mosquitoes and flies yet harmless to men and thus arms our fighting men in tropical jungles with a new weapon against malaria and yellow fever. Each dispenser or health bomb is loaded with 1 pound of a liquid insecticide developed by a chemist in the Department of Agriculture, Dr. Lyle D. Goodhue. The fine mist released can be turned off and on at will. Only three seconds is required to fumigate a pup tent, and one dispenser will fumigate two hundred and forty pup tents, fifty grant bombers, or 150,000 cubic feet of space.

The facilities of the Westinghouse plants are being expanded in order to be able to supply dispensers at a rate of ten thousand a day. This dispenser makes unnecessary cumbersome spraying equipment. The insecticide used is effective also against ants and cockroaches, and experiments are under way to establish its effectiveness against still other forms of insect life.

### CAPTAIN FURBECK GRADUATES AT CARLISLE

Capt. George Nelson Furbeck, a native of Albany, N. Y., and a resident of Mexico, graduated in the twentieth officers' class at the Medical Field Service School, Carlisle Barracks, Pa., February 25. Captain Furbeck was the first United States citizen to graduate from the National University of Mexico Medical School. He interned at the General Hospital in Mexico City, was admitted to practice in accordance with regulations in Mexico and in 1932 came to the United States for a year's internship in Charity Hospital, New Orleans. In 1933 he returned to Mexico City, where he practiced medicine until the attack on Pearl Harbor, when he volunteered and was commissioned a captain in the U. S. Army. Captain Furbeck plans after the war to return to practice in Mexico City, where his wife and daughters reside.

## PUBLIC HEALTH SERVICE

## THE RAPID TREATMENT CENTER PROGRAM

To clarify the policies and responsibilities of the United States Public Health Service in the new nationwide system of rapid treatment centers for persons infected with venereal disease, a special edition of the *VD War Letter* was issued, March 1.

The rapid treatment center program, it is said, is an outgrowth of the national venereal disease control program begun in 1938 and has been developed by state health departments, United States Public Health Service, the Office of Defense Health and Welfare Services and the Federal Works Agency as a direct effort to combat a wartime threat to our national strength.

The basic responsibility of the Public Health Service is to provide consultation service to other agencies cooperating in the program and to furnish specially trained physicians, nurses and technical personnel to operate the centers. More than thirty centers will be in operation by the end of 1943.

Federal funds are made available for the establishment of the centers under the Lanham Act, which is administered by the Federal Works Agency. Each state project approved by Federal Works Agency is subject to prior review and certification by the U S Public Health Service.

The establishment of hospital facilities to which state health authorities may send a large number of infected persons, with the assurance that they will receive prompt effective treatment will mean real progress in the ultimate eradication of venereal diseases as well as immediate assistance to wartime control. Federal, state and local health authorities will gain valuable experience in the administration of this type of institution. Finally, by applying the newer technics in the treatment of syphilis and gonorrhea, under the best medical supervision available in this country, we shall be able to demonstrate the effectiveness of these treatment methods on a large scale in order that the entire medical profession may profit by the experience thus accumulated.

Public Health Service physicians assigned on request by state health officers will be responsible for the medical program in

most of the rapid treatment centers now operating, and others will be assigned to those established in the future. The physicians assigned to centers are given special training in the new technics of intensive treatment of syphilis and gonorrhea at Ann Arbor and Detroit, under the supervision of Dr Udo J. Wile of the School of Medicine, University of Michigan. Public Health Service nurses assigned to the centers are similarly trained at the City Isolation Hospital St. Louis.

Every syphilis patient admitted to a rapid treatment center is given a complete medical examination to determine his physical capacity to benefit from rapid treatment and the particular method to be used. It is expected that the maximum length of stay will not exceed ten weeks. Four rapid treatment plans ranging from the one day massive dose with fever therapy to the six to eight week multiple injection method are being used at the present time in syphilis control. No one of these has been accepted as standard by the Public Health Service or by the medical profession. All of the current methods, or modifications of them, are used or considered for use at the rapid treatment centers.

Following are the rapid treatment centers by state and status of operation, as of February 13.

## I Rapid Treatment Centers Already in Operation

State and City	Capacity	State and City	Capacity
Arizona Phoenix	56	Puerto Rico Agudilla	300
Colorado Denver	40	Puerto Rico Caguas	150
Illinois Chicago	350	South Carolina Goldville	125
Indiana Indianapolis	25	South Carolina Pontiac	125
Louisiana Leesville	75	Tennessee Knoxville	50
Missouri Monett	25	Tennessee Chattanooga	150
Oklahoma Rush Springs	150	Texas Houston	60
		Utah Salt Lake City	40

## II Proposed Rapid Treatment Centers for Which Applications Have Been Approved by the Federal Works Agency and the President but Which Have Not Started Operations

State and City	Capacity	State and City	Capacity
Florida Ocala	100	Panama Balboa Heights	200
Florida Wakulla	100	Tennessee Memphis	150
Louisiana New Orleans	200	Tennessee Nashville	150
Mississippi McLain	60	Virgin Islands St Thomas	25

## MISCELLANEOUS

## PUBLIC HEALTH UNDER HITLER

*Ergebnisse der inneren Medizin*, Berlin, contains an article by Dr. Widorfer on the spread of infantile paralysis in Germany. Since 1908 epidemics of this disease have occurred at shorter and shorter intervals. While the great epidemics of 1927 and 1932 soon became extinct, the epidemic which occurred in 1938 has never been wholly subdued. Places where children are present in larger numbers for purposes of recuperation are particularly vulnerable. The average age of the patients has shifted to the older age group (many adults now become infected). It seems that the virulence of the virus and also the spread of the disease have increased. Increases in the cerebral forms of infantile paralysis have also been observed.

According to *Dagens Nyheter*, Stockholm, of Dec 2, 1942, TT reports from Oslo. The Home Department has decreed that doctors and dentists must pay a yearly subscription of 100 kroner to be allowed to carry on their profession. The new decree is intended to strengthen the economy of the new ordered doctors' and dentists associations which have very few members.

*Folkviljan*, Stockholm, of January 12, contains a front page article which states *inter alia* that during the previous session a Social-Democrat member of the Swedish Parliament, Andersson said in Riksdagen that "one wonders at the large export of horses from Sweden." Horsepower has the advantage over manpower that sausage can be made of its producer when its strength declines, and horsepower is needed in Hitler Germany for sausage too. Just consider all the horses which have been eaten by the German divisions surrounded at Stalingrad for lack of other food. Possibly the small demand for horses in Sweden has caused the mass export of horses which is now

taking place. An advertisement by the State Export Institute of the Royal Agricultural Board in Jordbrukarnas Foreningsblad, No. 2, informs horse owners in Scania, Halland, Smaland, West Sweden and Narke that the purchase of horses intended for export will take place at forty-one different places between January 11 and January 22.

*Berner Tagwacht* of January 12 reports that the milk supply allowed to large cities in the south of France is catastrophic. Marseilles, Toulon and Nice receive only a few hundred liters daily, which is insufficient even for sick persons, small children and mothers. The inhabitants in these towns are receiving from the government's emergency supply 25 Gm of rice and spaghetti per head daily.

NDZ of January 4 reports an order issued by the Reich Minister of the Interior amending the order concerning the admission of doctors. The new order introduces certain relaxations of conditions for the students and thus speeds up the training. Under the old regulations the direct training consisted of six months nursing, six weeks factory or land service and six months' work as a medical assistant (*famulus*). The new order cuts down the nursing service to four months; moreover it need no longer be done before the beginning of the studies but the holidays may be used for it. The factory and land service need not in future be performed in factories or on the land but may be done in institutions and organizations which directly or indirectly work for the public health service. Finally, the order introduces certain changes in the regulations concerning examination marks. Child therapy is added to the three principal subjects of internal medicine, surgery and gynecology.

# ORGANIZATION SECTION

## OFFICIAL NOTES

### ANNUAL CONGRESS ON INDUSTRIAL HEALTH

*Fifth Annual Meeting held in Chicago Jan. 11-13, 1943*

DR. STANLEY J. SEEGER, Milwaukee, Presiding

JANUARY 11—MORNING

#### Report of the Council on Industrial Health

DR. STANLEY J. SEEGER, Milwaukee. The necessity of coordinating activities of those interested in industrial health has reached a critical point. The shifting of large numbers of the population, the problems of housing and nutrition and the new hazards which are introduced by tremendous industrial expansion have all contributed to make the situation more complex. The essential medical character of industrial health problems and the necessity of medical guidance in their solution have remained a basic principle the soundness of which has become more and more apparent. The war has emphasized the fact that the American worker occupies a position which is superior to that of any other worker in the world when considered from the social, economic, medical and educational standpoints.

One of the important elements in the program of the Council on Industrial Health has been the development of cooperating agencies in the constituent state medical societies and, where practicable, in county medical societies. During the past year this activity has received vigorous stimulation from field work originating in the central office of the Council. Today the rank and file of physicians are being prepared to participate in industrial health activities to help safeguard our essential war workers.

The Council has repeatedly placed emphasis on the large number of workers whose entire medical program is provided by the general practicing physician. In smaller industries in most instances the only services in the field of industrial hygiene and health control are those which he may direct. The small plant offers numerous difficult problems when an attempt is made to supply to it modern industrial health service. The program for industry advocated by the Council stipulates the following:

- 1 A physician
- 2 A nurse
- 3 Industrial hygiene service
- 4 Proper correlation of plant health activities with those of
  - (a) The practicing medical profession
  - (b) Industrial commissions
  - (c) Units of state, county and city health department
- 5 A health program to include
  - (a) Physical examinations
  - (b) Plant inspections
  - (c) Emergency stations
  - (d) Reporting
- 6 Adequate compensation of health personnel

Definite progress can now be reported in the development of health programs of this nature. Those responsible for the conduct of industry must make industrial health programs professionally worth while. Not only must opportunities for satisfactory medical attainment be offered, but industry and the insurance carriers must take medical service, particularly in the small plant, off the bargain counter. Any one familiar with this work is impressed by the fact that many men have been discouraged not only by the professional uncertainties which surround it but by the nature of the competition which has been fostered by various agencies interested in the purely business aspects of health.

The obvious dependence of the practicing physician on the industrial hygienist and on the public health worker has been repeatedly emphasized by the Council. In order to accomplish their objectives, public health workers must make a genuine effort to foster the development of health service through the agencies of organization of the private physician. There is a growing recognition of the distinction between the functions which are appropriate to the practicing medical profession and those which belong to plant medical directors or official health administrators. The United States Public Health Service, through its division of industrial hygiene, has made most important contributions. Its states' relations have been established on a sound basis but in the light of the problem the latter activity can be regarded only as a beginning. The necessity of integrating the work of the practicing physician with that of other agencies, official and nonofficial, has not only been recognized by this council but its organization has been perfected so that such integration can be carried out effectively today. It is evident that conditions of work and their effect on health in relation to almost every human activity eventually come within the compass of medical study and research. It is hoped that industry, both large and small, can be made to see the advantage of developing health programs which will provide careers of satisfactory professional attainment so that workers may be provided with a uniformly high quality of medical service.

#### The Physician and Industrial Mobilization

MR. CHARLES P. TART, Washington, D. C. The record of war industrial production in 1942 was accomplished by materials and men in industrial plants. The productivity and effectiveness of each man were profoundly influenced by many elements. None of these can be neglected in the future as many of them have been neglected in the past. We cannot permit conditions to continue at any point that keep us from the maximum application of manpower at the point of production. Health for the manpower is your concern but it cannot have any narrow interpretation. It means safety too and requires the intelligent integration of health and safety services from cities, states and the federal government.

There is urgent need now for health and safety education, for good food, for sound health habits for adequate recreation and for personal service and help in solving the family and home problems of the worker. Lack of ordinary sanitation in the community is an obvious danger but crowded, dirty living quarters, filthy eating places or completely inadequate ones and no decent opportunities for relaxation begin to show their effects in a hurry.

The reported figures on time lost from industry are shocking. First comes the 15 per cent of time lost by reason of accident and occupational disease. That is your specific job, and it is being well handled in most of the larger plants. The smaller plants are a different story. Then comes the 85 per cent of time lost by illness arising outside the plant. The Public Health Service and Procurement and Assignment Service are hard at work to see that medical and dental service is available even in boom towns. We need more action and less resistance from local medical societies. Now we hear of absenteeism because of other reasons, holidays, necessary shopping, need for beauty service, excess spending money, hangovers, and illness of children of mothers in the plant. We are working to eliminate the latter by setting up adequate services for these children. The other causes need organized thinking in the plant and in the community. They won't solve themselves. One manufacturer put a beauty shop in the plant and cut the absenteeism of his new women employees.

The professional leaders in this field have the great opportunity which may never be adequately recognized but which is absolutely fundamental to winning the war.



### Preventive Medicine in Industry

DR JOHN H POLICER, Wilmington, Del Since in our war program few industries can avoid using chemicals, a discussion of preventive medical programs used in the chemical manufacturing industry will apply generally to all industry

The problem before us is, first, to establish a program of preventive medical control in industry and, second, to educate physicians, management and workers in the details of this program

Many physicians have entered the field of industrial medicine for the first time Among other problems they have been faced with those of industrial toxicology To a few, libraries may be easily accessible, but most new physicians in industry are being forced to learn by bitter experience The demand for information especially on industrial toxicology, has led to the planning of intensive training courses in many of our better medical schools Most such courses are too comprehensive and too detailed They do not approach the subject from the aspect of prevention but adhere to the conventional literature and procedures of industrial toxicology, giving information which helps only in diagnosis and treatment Programs which include separate sessions on lead poisoning, benzene poisoning or poisoning by chlorinated hydrocarbons are not programs to teach preventive medicine As long as they are chiefly concerned with ultimate effects of toxic agents or disease just so long are they perpetuating the old idea of diagnosis and treatment and forgetting prevention

A practical program of preventive medicine in industry must comprise two major parts first, a proper selective examination, so that workers can be allocated according to their physical ability to withstand the health hazards of the job, second properly designed and timed periodic examinations to assess the status of each worker while on the job and so to measure the efficiency of physical protective measures or to detect adverse effects of industrial or nonindustrial environment The selective examination must include all those items normally used in diagnosis—x-rays, serology, electrocardiography if necessary, as well as tests and standards which will be used in the periodic examination Too often the industrial physician is merely an examiner and does not observe his men at their work It is wrong to rely on second hand information for a knowledge of equipment and conditions in a plant Situations which may seem admirable to the most conscientious manager or safety supervisor may be seriously wrong from the medical standpoint As an example, consider the unrecognized frequency with which toxic materials are absorbed through the skin and the great practical difficulty of preventing all contacts of workers with materials which they use

The physician must know the relative degree of hazard in different plant occupations He must know it not merely in terms of the ultimate toxic action of materials handled but also in terms of tests for departure from usual physiology which are to form the basis of the periodic examination It will be useful if he knows a little of the ultimate effects of the materials used in his plant so that he will not assign a worker with a history or signs of liver disease to jobs involving exposure to compounds such as chlorinated hydrocarbons or trinitrotoluene, which injure the liver, or a man with an anemia to work with substances such as benzene, which affect the hemopoietic system If he supervises men working with new chemicals of unknown toxicity he can and should assume them to be highly toxic and not allocate to the place in which they are used any man with a history or evidence of injury to any major tissue or organ

The keystone of the program of preventive medicine is the periodic examination, which must be based on fundamental knowledge of the early effects not only of known chemicals but of chemicals which may be used in the future

Each examination necessitates absence of the worker from the job It must therefore be as brief as possible Complex procedures using elaborate equipment or technical skill are obviously ruled out So also are such manipulations as might evoke resentment from the worker or lead to possible claims of lost efficiency Studies requiring blood sampling or twenty-four hour urine specimens should therefore be reduced to a mini-

mum The need to get the greatest possible amount of information from a brief examination requires that tests used in the periodic examination must give measurements, not opinions, and the measurements must be recorded in a form amenable to statistical study

We have based a program of medical control of industrial exposure to toxic chemicals on measurements of blood pressure The method depends on first giving a score to each properly measured blood pressure according to the difference between pulse pressure and diastolic pressure and established means for these two pressure components Blood pressures at the exact mean (44 mm pulse pressure 79 mm diastolic pressure) are given a score of 10 Other pressures have scores less than 10, the score diminishing the greater the difference between the pulse pressure or diastolic pressure and the corresponding mean

Experience and statistics show that a score of 01 or less is definitely unusual and should not occur by chance alone in more than 6 per cent of a large number of normal people

The blood pressure method is but one of a number which might be used to follow development of abnormal physiologic functions It is the easiest and least expensive to apply but other methods are being investigated continually and simplified for possible general use The blood pressure method is particularly suitable for small industrial plants and therefore can fill an urgent need in the present war program

### Employee-Management Cooperation for Industrial Health

MR WENDELL LUND, Washington D C Many attempts have been made to solve the problems of industrial accidents and industrial illness and malnutrition I am convinced that a major reason why we have failed so far is that our approach has in the main been one sided Because it is necessary to spend money to insure protection for workers the responsibility for industrial health and safety has rested largely on the shoulders of the employer Today the importance of war production demands that every man and woman in industry take part in the fight against accidents and sickness Organized labor frequently feels about the company safety program the way it has felt about the company union—that both are designed primarily for the benefit of management Workers feel that they have a special stake in matters of health and safety and that they should have something to say about them It is for this reason that collective bargaining contracts so often include clauses dealing with health and safety

The activities of the labor unions in the needle and garment trades are an example both of worker interest in working conditions that affect health and safety and of what can be accomplished through worker participation In this case a powerful union, determined to better the working and living standards of its members, succeeded in improving working standards as well as wages and hours in what was a notorious sweatshop industry composed of thousands of small owners weak unorganized and incapable of taking broad steps to improve conditions throughout the industry Yet the improvements brought about by the union have benefited the employers as much as the workers Employee management cooperation is now the pattern in the industry

Another large labor organization which has shown a clear understanding of the importance of health and safety measures and of labor-management cooperation in applying them is the C I O's Industrial Union of Marine and Shipbuilding Workers of America Of sixty-two collective bargaining agreements signed by that organization, forty-six contain health and safety clauses and most of these clauses provide for the establishment of joint labor-management safety committees The agreements which do not include such clauses are those signed with small subcontracting and supplier companies A majority of A F of I unions active in the shipbuilding industry have incorporated similar clauses in their collective bargaining agreements

About 1,900 joint labor-management production committees were established in war plants all over the country Three to four hundred of these have special subcommittees on safety and health



In their efforts to reduce absenteeism, these joint committees have made special efforts to attack the causes of absenteeism. For example, where colds have resulted from poor nutrition, lack of rest or personal carelessness the committee members have discussed with their fellow workers the importance of proper eating and sufficient rest, and of caution in the presence of people with colds. Where sickness or injury as a result of working conditions or carelessness has kept workers away from their jobs, the committees have attempted to discover poor plant conditions and have suggested remedial measures to management or have analyzed job methods to eliminate unsafe working habits.

In a plant making gun mounts the Production Drive Subcommittee on Health has made a study of diet and nutrition at home and at work, using literature and movies to spread the information in nutrition courses for workers' wives. This is training which shows results in the contents of the worker's lunch box and in the meal he finds waiting for him after the day's work. It is training which shows results in greater production. This subcommittee has also taken steps to arrest the incidence of oil dermatitis and to improve washroom facilities and has been instrumental in installing a shop canteen.

In a California shipyard employing many thousands of workers the joint labor-management subcommittee on safety has made recommendations and helped to put them into effect concerning (1) the use of respirators in spray painting, (2) safe construction of scaffolding, (3) improvement in sanitary conditions (4) improvement in housekeeping arrangements in the plant and (5) regulation of crane loads in shipbuilding operations. This subcommittee has also enrolled nearly a thousand men in first aid training classes and has established first aid stations at danger points in the yards.

There is a great deal of educating to be done, educating of both labor and management, before we can make any considerable inroads on the accident and sickness toll in industry. A large share of the responsibility for this education falls on the industrial doctor in his contacts with management and labor within the plant. On the management side he can make sure that the company's health and safety policies, implicit in the existence of the medical department, are understood and followed by all the supervisory employees in the plant. He can establish a close working relationship with the personnel office to help determine the job in which each new worker can achieve peak production. On the labor side he can take positive steps to know the workers and their organizations and to secure their confidence. In the matter of preplacement examinations, for example, he can make a point of discussing with the shop steward or other union officials the purpose of such examinations and the distinction between the preplacement and the preemployment examination. He should make it clear that all medical information resulting from such examinations will be held in strict confidence between the worker and the doctor and will in no way be used to the detriment of the worker but rather to insure his personal well-being and his effectiveness on the job.

One of the most constructive steps the industrial physician can take is to meet with the members of the local union in their own headquarters in order to explain to the workers themselves the purposes and principles of the plant health program and to give them a chance to ask questions and make suggestions. A series of such meetings on various subjects might be held: one on nutrition, one on venereal disease, one on control of the common cold, one on health habits, and so on. If the union has the facilities for a health program for its members and their families, the doctor might well serve as an adviser in setting up such a program.

The Labor Production Division is the agency within the War Production Board which is responsible for the best utilization of labor's energies and skills in war industry. Industrial health and safety are production problems of major importance which must be solved simultaneously with those of materials and facilities. The division staff in Washington and in the field is ready to help in developing labor participation in industrial health programs.

### Procurement and Training of Professional Personnel for Industrial Health

DR CLARENCE D SELBY, Detroit. The war industries are losing doctors in considerable number. Medical service in the war industries is deemed to be essential. It cannot be dispensed with. A specialty has grown up. General practitioners are not qualified either by experience or by knowledge to take the place of the physicians who have been trained in the industries. Therefore the problem became a serious one. It finally reached the point where about 20 per cent of the physicians in the war industries had accepted commissions in the military service, and great difficulty was found in replacing them, also great difficulty in obtaining physicians to take care of expanding industries. So the matter was brought to the attention of the Committee on Industrial Health of the Procurement and Assignment Service. This committee promulgated a definition of essentiality which specified that a physician employed in a war industry, as a medical director, as a specialist, a department head or as the only physician so engaged would be essential, provided he is carrying on an industrial health maintenance program, a program designed particularly to accomplish the selective placement of women, handicapped workers and overage men in addition to the whole and healthy, and efforts based on our conceptions of preventive medicine for the reduction of absenteeism.

That original definition did not give consideration to the age of the physician. Any physician, regardless of age, who is carrying on such a program and occupied such a position in a war industry was deemed to be essential. More recently that definition has been modified to exclude physicians under 38 years of age from essentiality. In other words, any physician under 38 employed by industry, regardless of the program he is carrying on, or his status, is not regarded as being essential. However, I am informed that, in considering applicants for commissions from industry, the Procurement and Assignment Service will permit time for replacement purposes.

The Procurement and Assignment Service has instructed the chairman of the state committees to cooperate with the Committees on Industrial Health of the various state medical societies, which have been organized under the inspiration of the Council on Industrial Health in an effort to supply qualified applicants for the industries.

On request of the Procurement and Assignment Committee of the state, the Committee on Industrial Health will canvass the possibilities for qualified replacements. If none are found it will canvass further the possibility of obtaining somebody who might become qualified through a training program. That training program has been designed already and is rather rapidly being put into effect in two or three states. It does not involve a great deal of time. I will not burden you with the details, but the fact is that the Procurement and Assignment Service is quite cognizant of the needs of qualified medical service in war industries, and it has put into effect, in my opinion, an adequate program.

When the question comes before you, my suggestion is that you leave the decision to the Procurement and Assignment Board.

JANUARY 11—AFTERNOON

DR LEROY U GARDNER, Saranac Lake, N. Y., Presiding

### Ocular Signs of Industrial Poisoning

MR ROY S BOESIB, New York. A large variety of industrial poisons give rise to transient disorders of the eyesight and some of them to permanent effects. Various toxic compounds may give rise to any one or more of these conditions, depending on the strength of the poison and the duration of the exposure. Other substances which formerly produced much eye trouble have been eliminated from modern processes of manufacture or the operators are better protected by the wearing of respirators and goggles, as well as the installation of exhaust fans.

Toxic amblyopia is a partial or complete blindness caused by a toxic substance which interferes with the function of the

retina, the optic nerve or the more central optic pathway. Every new drug used in medicine and every new chemical used in industry is a possible cause of toxic loss of vision so that this subject is constantly growing in scope. Victims are becoming more and more compensation conscious, and the ophthalmologist, in order to be fair to both employer and employee, must have a thorough understanding of this subject. Persons who have been exposed to poisons which affect the optic nerve or the retina as a rule complain of temporarily disturbed vision as a first symptom. Recently acquired color blindness is an early symptom of poisoning. Another common symptom is disturbed vision described as heat waves. Diminished sharpness of vision and general depression of the visual fields bring the victim to an ophthalmologist usually with a request for glasses. The characteristic changes in the fields are a central blind or partially blind area in the visual field and disturbances in the color field. There may be deficiencies in accommodation. Carroll divides toxic amblyopias into three groups: (1) those caused by poisons which produce cortical or central blindness, (2) those caused by poisons depressing the entire visual field, but more especially the peripheral fields, and (3) those caused by poisons depressing exclusively or chiefly the central visual field.

Many volatile substances may seriously affect vision. Any substance that will cause accumulation of a fluid in the brain will cause a similar response in the eye.

Occupational keratitis as well as several other forms of keratitis are treated by Fuchs under diseases of the conjunctiva, and occupational conjunctivitis is defined as "an acute conjunctivitis found in certain industries where irritants—acid vapors, liquids or dustlike particles—get into the eyes either by accident or as part of the day's work."

Davidson asserts that true occupational dystrophy such as is reported in textbooks and in the literature has not been observed. It should be the axiom in safety practice that there is no such thing as a minor hazard to the eye.

It is the responsibility of every safety engineer, of every physician or surgeon having any industrial practice and of every industrial nurse to become familiar with all the poisonous substances used in their respective plants and to take all possible steps to protect the employees who are exposed to these poisons.

### Newer Concepts in the Prevention and Treatment of Wound Infections

DR. AUSTIN E. SMITH, Chicago. Various attempts have been made to define the properties of a good disinfectant for local use, but the prerequisites of a chemical agent remain, essentially, high activity against infecting organisms, fast action, low toxicity for human tissue, efficiency in the presence of organic matter, ability to penetrate tissue, solubility, stability, absence of unpleasant odor, absence of deleterious effect on instruments and comparatively low cost. No one agent has yet met all these requirements, although many preparations have been of inestimable value as aids in the prevention and control of infection. Certain agencies have taken steps to cope with the situation. The Food and Drug Administration now demands not only adequate labeling but definite antibacterial activity for new agents. The Council on Pharmacy and Chemistry, in recently adopting criteria for surface antibacterial agents, proposed that certain prescribed data be submitted when a manufacturer presents a preparation for Council consideration.

Under the laboratory section of the American Public Health Association there has been set up the Standard Methods Committee for the Examination of Germicides and Antibacterial Agents. At present this committee has referees for antibiotic agents, chemical antiseptics, chemical disinfectants, detergents, fungicidal and fungistatic agents, disinfection of air by germicidal vapors and mists and disinfection of air by ultraviolet irradiation.

Clinical knowledge has changed and is changing daily the practice of anti-infective therapy. The sulfonamides are one of the best examples for the cause of such changes. Effort to lessen the confusion over the number of agents in use by determining their specific values and by minimizing this number has made some progress.

The sulfonamides have created striking changes in the handling of wounds and the treatment of infection. Sulfanilamide, sulfathiazole and sulfadiazine locally have produced, as compared to the results of wound therapy of a few years ago, almost miraculous cures. Locally the sulfonamides have been applied as powder and in ointments, emulsions and solutions. It is interesting to note, however, that certain leading scientific bodies have declared that the local use of such preparations requires much more investigation.

Ultraviolet radiation has been advocated for sterilizing the air of operating rooms to prevent wound infection during operations, for use in wards of infectious diseases to prevent cross infection, for the sterilization of footwear, drugs, instruments, water and many other things. Notwithstanding the many unknown factors in this problem, the use of ultraviolet lamps for the control of infections which may be due to contaminating organisms from the surrounding area merits further investigation for application in hospital units, plants and laboratories. An example of industrial application is the use of ultraviolet germicidal ray lamps by some manufacturers of pharmaceuticals to keep the air as nearly sterile as possible in the vicinity of operations calling for the filling of ampules.

The spraying of chemical agents into the air to render that air sterile is not new. Recently this procedure has been subjected to renewed investigation and interest, and a number of agents, including propylene glycol, are being studied. While much of the work in this field has been of an experimental nature on the control of influenza infection, some work has been done on streptococci, staphylococci, pneumococci, *Hemophilus pertussis* and other organisms. Some contradictory findings on the control of air borne beta-streptococci have been found to be due, at least in part, to changes in the humidity, high humidity apparently neutralizing the germicidal action of the propylene glycol vapor employed. Present work suggests that the amounts that have been necessary in the past for experimentation are not toxic. The pure vapor appears to be more effective than the so called aerosol.

Detergents, both anionic and cationic, have received some investigation and again some recognition as antibacterial agents or as adjuncts to other anti-infective compounds.

Some ingredients of soap are claimed to have anti-infective properties. The Council on Pharmacy and Chemistry has periodically been requested to consider certain of these preparations and has found in each case that the claims exceeded the possible therapeutic effects.

Quaternary ammonium compounds have been suggested as anti-infective agents. This group of compounds is receiving much attention and appears to offer considerable promise for certain uses.

There is a class of agents that is currently the object of considerable attention because of the effectiveness of its members against certain bacteria of which they are extracts. This group of compounds has variously been called "metabolites" and "antibiotics" and includes extracts of fungi and bacteria. The following representative examples have been demonstrated and purified to varying degrees: gramicidin, tyrocidin, actinomycin, citrinin, penicillic acid, streptothricin, gliotoxin, proactinomycin, tyrothricin, penicillin, fumigacin and clavacin. All are being studied for specificity, comparative effect with other bacterial agents such as sulfonamides, the most effective mode of application and optimal dilutions, but isolation and identification remains to be achieved. Members of this group are almost specific in the treatment of certain infections, the most striking effects having been observed following application to gram positive and certain gram-negative bacteria. In many instances the action is bacteriostatic, in other instances, definite bactericidal action may be elicited. Regardless of the ultimate findings attention may well be directed to these agents in the hope that valuable aids may be added to the medical armamentarium.

While investigations on specific agents are proceeding at headlong pace, the prevention and treatment of certain types of infection also are receiving due attention. Thus some practices in therapeutics are being approached from two sides. For example, fungous infections such as ringworm are in a sense wound infec-

tions. Since they are the source of much trouble in industry as well as elsewhere, innumerable new agents and variations of old treatments are being tried. These measures range from the direct application of organic and inorganic preparations to the feet, stockings and shoes to the ultraviolet irradiation of foot-wear. However, the ideal agent or method has not been demonstrated. At present the Council on Pharmacy and Chemistry is undertaking a survey of agents used in this field in an effort to establish criteria for the evaluation of drugs used in the prophylaxis and treatment of fungous infections, to determine their merit on a comparative basis and to define the allowable claims which may be made for their effectiveness.

#### Recognition, Prevention and Essential Treatment of Occupational Dermatitis, with Particular Reference to Oil Dermatitis and Folliculitis

A full report by the Committee on Occupational Dermatoses, American Medical Association, Dr. Harry Foerster, chairman, will appear in *THE JOURNAL* at a later date.

#### Respiratory Infections in Industry

This joint report, by the Council on Pharmacy and Chemistry and the Council on Industrial Health, presented by Dr. Chester S. Keefer, appears in full in this issue, page 802.

#### Program of Immunization for Industrial Workers

##### 1 Vaccines and Serums Indications and Procedure

DR. JAMES P. LEAKE, Bethesda, Md. Though the risk from smallpox has decreased definitely in the United States as the result chiefly of the ordinary electric refrigerator with its freezing compartment where smallpox vaccine can be kept, the danger from fatal smallpox has not been extinguished, as last year's outbreak in Glasgow, Scotland, reminds us.

Our position on the immunization against smallpox may be indicated as follows:

1 Vaccination is the most important measure in the prevention of smallpox.

2 There are limitations to the value of vaccination in preventing smallpox, especially in regard to the duration of protection.

3 There are disadvantages, not always appreciated, in vaccination, especially if due care is not given to the procedure.

4 The hazards of smallpox have been diminishing recently and before any given program of vaccination is adopted the advantages should be weighed against the disadvantages with respect to the various conditions in the employment concerned.

5 Thorough preemployment or early postemployment vaccination, if applicable, is the most desirable form of protection for industry and should be required in some places where the population is shifting. Active tetanus immunization with toxoid is used in the Army and Navy and is good. The Army has been using the fluid toxoid, the Navy the alum precipitate. In using alum precipitate it is worth while to put the needle parallel with the humerus, and not across, so that the injection is as deeply subcutaneous as possible, not intramuscular but so the deposit of the material isn't just under the skin. It remains there and sometimes becomes fluctuant. If some physician who doesn't understand those things sees it, it may be incised. It shouldn't be incised. They are not abscessed. They will go away, in general, with practically no attention at all.

#### Program of Immunization for Industrial Workers

##### 2 Problems of Organization and Administration

DR. LEVERETT D. BRISTOL, New York. This article appears in full in this issue, page 816.

JANUARY 12—MORNING

DR. WARREN F. DRAPER, Washington, D. C., Presiding

#### Industrial Physical Examinations

This report by the Committee on Physical Examinations of the Council on Industrial Health, American Medical Association, Dr. Harvey Bartle, chairman, will appear in full in *THE JOURNAL*.

#### The Toxicity of Military Explosives

DR. LEMUEL C. MCGEE, Wilmington, Del. Explosives are chemical compounds which can be made to break down rapidly and release energy through the formation of comparatively large volumes of gas. The various military explosives are prepared by simple chemical reactions and possess well known chemical and physical properties. Propellants such as smokeless powder liberate their expanding gas energy mass at a lower velocity than do high explosives, of which trinitrotoluene is an example. Some chemicals which are required in, and some compounds which arise out of, the manufacture of military powders and explosives have a toxic action on human tissues. This discussion concerns medical experience with a few of these substances.

Moderate exposure of man to toluene for a few hours results in fatigue, drowsiness, headache and evidence of depression of the central nervous system. If continued, such exposure causes muscular weakness and incoordination, nervousness, paresthesias and confusion. Acute poisoning by toluene can result in convulsions and death through respiratory paralysis.

Trinitrotoluene, (TNT, trotyl, trinol, tolite, triton or trilit) may enter the body by absorption through the skin, by inhalation of dust and fumes or by ingestion along with food and drink. It colors the skin yellow. Many such stained workmen have no complaints, others have skin irritation. When a mild dermatitis appears during the first few days or few weeks of exposure it is prone to clear spontaneously even though the workman continues his contact with trinitrotoluene. When the dermatitis appears in a worker having had several months to a year or more of contact with trinitrotoluene the lesions are apt to persist until the worker is removed from contact. Trinitrotoluene can damage the liver. Physicians who follow the experiences of trinitrotoluene workers feel that some persons are particularly susceptible to toxic effects of the compounds.

The most common complaint of workers in dinitrotoluene is that of an unpleasant, metallic, bitter taste in the mouth. Other symptoms are muscular weakness, headache, loss of appetite, vertigo, nausea, vomiting, insomnia and pain, numbness or tingling sensations in the extremities. The chief findings from clinical examination of intoxicated dinitrotoluene workers are pallor, cyanosis and anemia.

Tetryl (trinitrophenylmethyl nitramine) is used as a filling for detonators and as a primer for high explosive shells. Because of its finely divided physical state tetryl dust readily floats into the air. Coughs with sneezing, lacrimation and blepharitis with sticking together of the eyelids are common. The commonest complaint from tetryl workers is that of dermatitis. Lesions of the skin and bleeding from the nose are early manifestations of tetryl irritation. Symptoms which appeared late, usually after exposure of several months, are ease of fatigue, headache and loss of weight.

Fulminate of mercury ( $\text{Hg}[\text{CNO}]_2$ ) is highly irritating to the human skin. Experienced workers on getting fulminate sores have learned that it is worth while to use a magnifying glass to enable them to find and remove crystals of the compound which lie buried in the lesions. Prolonged exposure to fulminate occasionally results in systemic mercurial poisoning.

The toxicology of the oxides of nitrogen has received extensive investigation. The clinical picture of nitrous fume poisoning may be one of several types. The most constant effects are those which refer to the respiratory tract. Poisoning by nitrous fumes usually leads to some degree of edema of the lung. The treachery of nitrogen dioxide lies in the seeming mildness of damage to the exposed man initially. The effects of exposure are notably insidious.

Diphenylamine, also known as hexite, is a derivative of aniline and is used extensively as a stabilizer in explosives containing nitro compounds. In American industry no instances of poisoning from exposure to this compound have been reported in recent years.

Lead azide ( $\text{PbN}_6$ ) is an initiating compound used for bringing about detonation of high explosives. In spite of the potential hazard of lead poisoning, I have found no published reports of its occurrence in American plants preparing or handling lead azide.

### Optimum Hours of Work

DR JAMES G TOWNSEND, Bethesda, Md There is a point where one can labor to maximum production and keep within a minimum number of hours There are many variables, the type of work, its intensity and the type of employee, to consider Older men, women and younger persons show signs of fatigue more readily than the young, virile individual who has been on the job a longer time and is used to it Myers, in his work on industrial psychology, emphasizes the fact that every reduction in the working day leads to a decrease in accidents, spoilage of work, sickness and absenteeism The reduction of working hours from twelve to ten, he says, leads to an increase in hourly and daily output The reduction of working hours from ten to eight leads to a further increase in daily and hourly output, except in operations whose speed depends mainly on the speed of the machine The reduction of working hours below eight, although increasing hourly output, does not usually lead to an increase in daily output

Collier, in his work on outlines of industrial medical practice, says that a categorical answer to the question "What is the optimum hours of work?" is difficult Evidence accumulated over a long number of years and in various occupations shows that, if hours of work habitually, or for long periods of time, exceed forty-eight per six day week, industrial health and efficiency are bound to suffer

Brown of Princeton obtained opinions from executives of 128 companies Sixty-nine executives of the 128 circularized preferred a forty-eight hour week Brown states that the opinion seems to be unanimous that hours less than forty a week do not increase individual productivity, and hours above sixty a week decrease productivity and increase absences and accidents

An advisory committee of government officials, together with industrial labor, has just met at the Department of Labor to secure a policy on optimum hours, concurred in by the War and Navy departments, the War Production Board, the Maritime Commission and the Departments of Labor and Commerce and Public Health Service A joint committee examined all the available evidence, including studies made by experts and the practical experience of management and labor The recommendations of this committee are pretty general and make ample allowance for temporary emergencies when, for a short time, longer hours or seven day weeks may have to be worked out Furthermore, allowance is made for some variation in the optimum work week on different types of employment In order for a plant to make this evaluation it is recommended that daily and weekly hours of employees in war production plants should be reexamined to assure those schedules which will maintain maximum output over a long war period Hours now worked in some plants are in excess of those which can be sustained without impairing the health and efficiency of workers and reducing the full production Plants which are now employing individual workers longer than forty-eight hours a week should carefully analyze their present situation with respect to output and time lost because of absenteeism, accident, illness and fatigue It is also recommended that one day a week should be devoted to rest, with a thirty minute lunch period and a vacation Vacations should be staggered and spread over the longest possible period Vacations should not be permitted to excuse any shutdown of any department of any war production plant, except where such shutdown would not curtail production

In order to assist plants to analyze their work week, a check list was prepared The War Production Board has sent the list to over fifteen hundred labor-management committees, and it has been reprinted in many of the labor journals It was realized when this check list was sent out that a good deal of confusion had been created by the emphasis given to the statistics on average hours released by the Bureau of Labor Statistics These averages concealed the fact that many plants had been working hours that are much longer than the average, and it is precisely to this group that the hours recommendation is addressed

This check list we do not have for distribution, but it is about the same size as the pamphlet containing the recommendations on optimum hours It says on the face of it "This is not a government questionnaire It is for your use in the plant

and it is not to be returned to any government agency" The check list calls attention to how to locate what we call trouble spots "Have you had an increase in accidents? Have you had an increase in absenteeism? Have you had an increase in labor turnover? Have you had a drop in output per worker or increase in spoilage, and rejects or poor quality of work? Have you had an increase in grievances or disciplinary cases for no apparent reason? In what departments or working units are any of these symptoms found? What hours per week are in effect in the departments or units in which these troubles, symptoms appear?

"The most efficient hours schedule for sustained maximum production depends, in part, on the type of work, the best hours to be determined by keeping certain records for each department or for operating units within departments"

Then the check list tells how the records should be kept, a record on output, which is the number of units produced per man-hour, man-hours per unit of output, the number of units rejected per man-hour, the time lost because of accident, illness voluntary absenteeism It is explained how to keep such a record To measure, for example, the time not worked by persons who were scheduled to work If 100 workers are scheduled to work 48 hours a week, that is 4,800 hours If 20 are absent, 1 a day for an 8 hour day, that is 160 hours per week, 160 divided by 48 is 33 per cent absenteeism

Then plants are asked to keep records of the accident frequency rate and the number quitting because of too long hours, the number of grievances arising out of too long hours, and a comparison of absentee records with earlier periods Ways to determine the best daily and weekly hours and sample forms of tables are shown It is some gratification to know that this pamphlet, through the combined thinking and action of eight different government agencies, has been responsible for being of some help in pointing toward solving a perplexing problem

### Women in Industry

The preliminary report of the Committee on Health of Women in Industry, Section on Obstetrics and Gynecology, American Medical Association, Dr H Close Hesselstine, chairman, appears in full in this issue, page 799

### Prehabilitation A Report and Recommendations

DR WILLIAM A SAWYER, Rochester, N Y A health project for industrial trainees was set up in Rochester, N Y, about two and a half years ago The total cost of this prehabilitation project over a two and a half year period (up to Dec 31, 1942) has been \$18,087

The trainee in the Rochester project is given a complete pre-placement medical examination, of the type given at larger industrial plants of the city, at the time he registers for a shop school course His physical condition and defects are noted on a special record card with a separate blank for past medical history In addition to the general check-up, the examination included a urine examination (discontinued in February 1942 because of a lack of personnel, but to be resumed shortly), a tuberculin skin test and a Wassermann test All persons who react positively to the tuberculin skin test are urged to have an x-ray examination of the chest at the County Sanatorium All but 9 per cent have availed themselves of this opportunity Those who have not are periodically (every two months) sent a letter urging them to make an appointment for an x-ray examination

Following the medical examination, a preliminary rating is made At the time of being notified of the rating the trainee is urged to visit the Tuberculosis and Health Association office There the record is reviewed and the noted defects are rechecked with the objective of qualifying the trainee as soon as possible for employment "specifically cited" Arrangements for necessary treatment are made through personal physicians or existing community facilities, as under no circumstances does the medical consultant give treatment or do nurses make home visits for treatment purposes Clinics and hospitals as well as private physicians, are most cooperative in this respect The medical consultant suggests the type of work the trainee is capable of doing Fitting the man for the job he is physically qualified to fill is the most significant feature of the project

All trainees found to have definite visual and hearing defects, cardiovascular disease, diabetes, kidney disease and other chronic diseases were referred to clinics or private physicians, and physicians were requested to give reports of present status to the employment service. In the original ratings hernia (138 cases) was an invariable cause for rejection and therefore 45 trainees were referred for surgical treatment. Of the 210 trainees (4 per cent of the total examined) found to have varicose veins, all except 4 were approved for some form of employment after reexamination. The 65 (1.24 per cent) trainees having positive Wassermann reactions, having satisfied health department authorities that they would continue under treatment, were subsequently approved for employment with one exception. Arrangements were made to give smallpox vaccinations to men with no vaccination scar.

### Defects Noted

Total industrial trainees examined 5 242 (1 534 women)

Underweight	567
Overweight	1 203
Vision distant pronounced	541
Slight	696
Near pronounced	538
Slight	417
No vision in one eye	121
Teeth Caries	1 116
Pyorrhea	57
Cleaning	251
Extraction	132
No teeth	8
Infected gums	50
Low hemoglobin	57
Pronounced	57
Slight	100
Tonsils	2
3	155
4	100
Infected	49
Thyroid	12
Hearing	117
Pronounced	84
Slight	93
Heart murmur	223
Rapid pulse	12
High blood pressure	549
Low blood pressure	97
Hernia	138
Relaxed rings	86
Skin condition	59
No vaccination	151
Scoliosis	32
Varicose veins	210
Relaxed arches (flat feet)	433
Varicocele	96
Hydrocele	15
Genitourinary	18
Gonorrhea	3
Positive tuberculin skin test	1 726
Positive chest x-ray examination	40
Positive Wassermann reaction	65

Of the total examined, 1,726 (33 per cent) were found to have positive tuberculin skin tests and were referred to the County Tuberculosis Dispensary for chest x-ray examinations. Of this number 4 by 5 photoroentgenograms were taken of 1,567 (91 per cent). A total of 40 cases of clinically significant tuberculosis (0.76 per cent) were discovered after 150 (9 per cent) were given repeated x-ray examinations at the sanatorium. Of the 1,059 trainees seen by the medical consultant, 951 were found to be employable, 242 in selected jobs.

In this prehabilitation program, effort was concentrated on the correction of the following defects or conditions: Overweight, 1,203 by treatment. High and low blood pressure, heart murmurs, 646 by reference to work specifically cited. Pronounced near vision, 538 by examination for glasses. Pronounced distant vision, 541 by examination for glasses. No vision in one eye, 121, special job assignment being recommended. Hernia, 138, of whom 45 were referred for surgical treatment others by wearing a truss. Pronounced hearing defects, 84, with special job assignments. Positive Wassermann reactions (syphilis) 65, by physician treatment till Wassermann reaction becomes negative. Tonsils grossly enlarged and infected 61, by operation or treatment. Anemia, 57, by treatment. Positive sugar or albumin in urine, diabetes, 54, by physician or hospital treatment till urinalysis was negative. Infected mouth conditions, 50, by dental treatment. Tuberculosis, 40, by medical supervision through county sanatorium. Gonorrhea, 18, by physician treatment till culture was negative.

A total of sixty-seven physicians have participated in the physical examinations. Approximately six are examining at any one time. They are assisted by two nurses (full time) and eight nurses (part time, during clinic sessions only). Physicians are paid \$1 for each examination, and clinic nurses are paid at the rate of \$1 an hour. The medical consultant received a small monthly honorarium. Clerical service was in charge of a trained information secretary. She was given office assistance. Every six months home visits are made to those who have not responded to letter follow-up. Through the two and a half year period of the operation of the project a number of improvements in procedure and changes have taken place.

Among the procedures recently carried out which have improved clinic service have been the centralizing of activities in a central clinic, holding two sessions a week, the central housing and handling of all records and an increase in clinic service provided, which has made possible the speeding up of rating and referring to cooperating agencies.

Recommendations 1. A community preplacement medical examination consultation, refer service is essential, especially in wartime, when there is a manpower shortage. It can be carried on at a reasonable unit cost if the various agencies interested help to bear a part of it. With all items included, the cost will not be less than \$5 per person examined.

2. Examination should be compulsory. Those found not to be employable should be eliminated from shop school instruction. The seeking of medical advice regarding job placement should be made compulsory.

3. It is believed that there should be some way of requiring trainees to have defects corrected before completing the course.

4. No financial provision need be made for corrective care but some provision should be made for recording the care sought and obtained.

5. At the time the trainee is recommended for employment there should be a certification that those recommended for job placement are free from active tuberculosis, infectious syphilis and any other communicable diseases or conditions dangerous to fellow employees.

6. During the course of training advice regarding the importance of good health habits and nutritional needs should be systematically presented in their relationship to efficient work capacity. Health education is a vital part of prehabilitation.

### The Older Worker

DR. ANTON J. CARLSON, Chicago. This article appears in full in this issue, page 806.

JANUARY 12—MORNING

DR. RAYMOND HUSSEY, Baltimore, Presiding

### SYMPOSIUM ON MEDICAL RELATIONS IN WORKMEN'S COMPENSATION

#### Report of the Committee

DR. RAYMOND HUSSEY, Baltimore. The Committee on Workmen's Compensation of the Council on Industrial Health has been in existence now for eighteen months. Our effort has been one of achieving orientation in this field. Workmen's compensation is complex and heterogeneous. Many of us are inclined either not to think at all about workmen's compensation or we are inclined to think of it rather lightly.

There is a great deal of adverse criticism by the representatives of the various agencies concerned with the development and operation of workmen's compensation. That is particularly true in the papers that are read at the meetings of the International Association of Accident Boards and Commissions. I have been impressed with the almost venom one encounters in reading the proceedings of that organization, and it is usually aimed either at the insurance group or at the medical group.

If we stop and think of what the situation in medicine and in law and insurance was when workmen's compensation was first started, we shall find much to feel encouraged about. In 1911 when the first workmen's compensation act became effective—that was in Wisconsin or California if I remember correctly—medicine was largely a neighborhood practice. The attitude of

the medical man toward his patient was extremely private in nature, what we usually speak of as the physician-patient relationship. He regarded whatever he learned about the patient in great confidence and kept that information in confidence.

The legal profession had been buried for years in the idea that damage claims for personal injuries were carried on through action of what the lawyers called "tort," which has to do with the fault or negligence of some one else, and with respect to industrial injuries they had the master-servant concept in the law. An interesting paper was written by Mr. Tom Bartlett of Baltimore in which he leaves me with the impression that for lawyers to be separated from that idea of the master-servant concept is pretty much the same as taking away our idea of the Holy Trinity. Administrative law, in which workmen's compensation is included, was hardly popular to say the least. Lawyers distrusted this type of law.

Workmen's compensation is more than merely a provision for benefits and the payment of the cost of medical care. Too frequently one's idea of workmen's compensation stops with that concept. Equally important is prevention of accidents or disease, and the rehabilitation of the injured person. I feel that that triad must be regarded as the fundamental principle of workmen's compensation.

What was the status of medicine at the time workmen's compensation commenced? Public health was in its swaddling clothes. We had no one, so far as I am aware, in this country who was appointed health commissioner. We had no public health schools. We had practically no instruction in public health. Preventive medicine had hardly commenced to breathe. Administrative medicine was in the blastodermic stage.

There are two things that we ought to attempt to accomplish. One is to hold meetings between the various groups interested in workmen's compensation where points of view can be expressed, where corrections can be made in points of view and where we shall have a basis for common understanding.

All of us must recognize that we do have a new branch of medicine, administrative medicine, which deserves a much more prominent role in the commissions that administer compensation laws. In my opinion all hearings on disputed medical issues should be before medical men. One of the greatest difficulties that has been emphasized all through this work has been the absurdity of medical testimony and the ridiculous judicial decisions that are made from time to time. We must keep in mind always, it is true, that workmen's compensation is social legislation. It is a legal system but it is also a social system, and the judiciary certainly are influenced in their liberal interpretations because of that.

We have had enough information accumulated in Maryland with the Medical Board for Occupational Diseases to indicate that the testimony that physicians give when the hearing is before medical men is entirely different from the testimony they give when it is being heard before laymen. All laymen like to dabble in medicine, but when they have no background in physiology, pathology or biology it is merely having so many words in one's mind. Sometimes the way they are employed is rather funny so far as the medical man is concerned.

One of the problems of workmen's compensation that is crying for help is the problem of disability determination. It is one thing to say that and it is quite another thing to do something about it. It is an extremely complex field of effort. I hope sometime within the next year it will be possible for us to get a group interested in doing something that has never been done, and that is to state clearly what the problem of disability determination really is.

The most frequent criticism made of medicine in workmen's compensation is that it is not an exact science. What is an exact science? The term "exact" is relative. Physics was regarded as an exact science until radioactivity was discovered.

The American Medical Association, through its Council on Industrial Health, is intensely interested in doing something in the field of medical relations to workmen's compensation, and we cannot do it unless we get the cooperation of all parties concerned.

I hope that we may regard this as the first annual conference on this subject.

## DISCUSSION

MR. J. W. HOLLOWAY JR., Chicago. The Bureau of Legal Medicine is happy to collaborate with the Council on Industrial Health in initiating a conference of this type. Our contact with the problem of workmen's compensation is limited to a study of pending legislation or proposed legislation in the different states. We have a legislative reporting service that sends us copies of all legislation of any particular interest to the question of public health or to physicians. We get copies of all state legislation on workmen's compensation, and as far as we are able to do so we study those proposals and abstract them and publish them in *THE JOURNAL*. Our other contact with the problem is through court decisions. We try to keep in touch with the current decisions of the courts of record, the courts whose decisions are published, and compile these cases, and we are trying to develop in the Bureau a fund of information to which the various state medical associations, the county medical societies and physicians may turn in case they need information of this particular type. We are constantly receiving inquiries from physicians all over the country who have been called to testify in workmen's compensation cases, asking for information that will qualify them really to testify as experts. The information may be available, but unfortunately it is not very accessible at the present time.

### Allergy Its Place in Compensation Procedure

DR. J. A. CLARKE JR., Philadelphia. This report may be useful to legislators and compensation boards of various states in their efforts to dispense justice.

I. Allergy is a term used to explain certain diseases of man resulting from contact with various substances foreign to the individual. It differs from the usual diseases in that in allergy a special abnormality exists in the affected individual rather than in any harmful quality inherent in the substance which produces the disease, which appears then through no fault or neglect of either the employer or the employee. It is therefore purely accidental (dependent in some measure on a constitutional defect in the individual in which inheritance plays some part) and little if anything can be done to prevent it.

Allergy may be defined as an unusual reaction on second or subsequent exposure to substances that are ordinarily considered harmless. An excessive response to natural irritants is therefore not an allergy, as some observers claim, and such quantitative variations appearing particularly in the skin are not considered in this report (Idiosyncrasy more accurately describes such conditions).

The foreign substances causing the allergic symptoms are known as allergens, and the person in whom the symptoms appear is known as an allergic person. The allergic diseases recognized at the present time are asthma, hay fever, certain cases of nasal congestion, certain dermatoses (eczema) and urticaria. Any one or all of these diseases may be produced by allergens encountered in industry, but the symptoms may not appear until after months or years of contact without symptoms.

If any employee eligible for compensation becomes incapacitated because of an allergic disease he should be studied by a physician skilled in allergic methods. The result of the study should be made the basis of any settlement.

II. After such a study, the majority of the sufferers will fall into one of the following classifications, which it is hoped will be accepted and used as the basis of laws and rulings.

A. When the allergic person becomes sensitive to an allergen which he encounters only in the pursuit of his occupation, thus making it impossible for him to pursue this occupation. Allergic treatment cannot be relied on because contact with the allergen in industry is usually excessively great. The injections decrease a person's sensitivity and he is correspondingly relieved of his symptoms. However, since this relief is only relative, the result is not likely to be satisfactory. It should be attempted only under unusual circumstances, in which case the possibility of failure should be realized by both the employer and the employee. Such persons should receive compensation in the form of weekly payments for a fixed and limited period sufficient to enable them to secure other employment.



Note 1 While a person is becoming sensitive to a substance in his occupation, he is likely to become sensitive to other substances, particularly in his home. Discovery of any other substances to which the sufferer may be sensitive should not influence the case in any way.

Note 2 It is impossible to determine how long a time interval is necessary to develop a sensitivity. Therefore when a man is employed in the same occupation by a number of different employers the firm employing him at the time the allergy appears should be arbitrarily liable for compensation.

B When the allergic person becomes sensitive to an allergen encountered in large quantities in his occupation but encountered in less quantities outside. Here the damage is greater than in A because symptoms will persist for years after he finds other employment.

It is at least reasonable to presume that the excessive exposure in his occupation largely contributed to his sensitivity. Under these circumstances an attempt at allergic treatment is imperative and the cost of this treatment should be added to the compensation allowed in A. The limits of such compensation should be fixed arbitrarily.

C When an allergic person becomes sensitive to an allergen largely encountered outside his occupation but present also at his work. The employer alone cannot be held accountable for this illness. On the other hand the worker will be unable to pursue his usual occupation in the future.

In this group the occupation is at most only a contributory cause of the allergy. The man would have become allergic in any employment but is unable to pursue his present job.

In this group justice is not as simple as it is in A and B. Since the employment is only a minor cause of the disease the employer should not be held responsible for future treatment. However since the nature of the employment precludes the possibility of the employee continuing at his old job it would seem just that he receive a limited compensation to pay for his loss of time while seeking other employment.

Note Many persons in this group can be given other work by the same employer in which he will not be exposed to the allergen to which he is sensitive. If this is possible it should relieve the employer entirely of further responsibility.

D When an allergic person becomes sensitive to substances never encountered in his occupation. It would be unfair to hold the employer responsible in any way for this illness unless contributory factors in E or F can be shown.

In the present state of our knowledge of allergy it is comparatively easy for a trained allergist to prove beyond doubt the sensitivity of a person to substances found in his occupation. Unless proof of contact while at work with an allergen to which the allergic person is sensitive can be furnished the employer should not be held.

E In respiratory allergy there can be little doubt that acute infections, from simple colds to pneumonia may greatly aggravate allergy from any cause. Compensation under this heading should be allowed only when the following conditions are satisfied:

- 1 Unusual exposure in line of duty while employed must have occurred.

- 2 Evidence of an acute infection within a few days of the exposure must be presented.

- 3 The allergic conditions must appear or be aggravated within a few weeks of the acute infection.

These requirements must be rigidly enforced. Furthermore the maximum compensation under this group should be set arbitrarily. The acute infection should not be regarded as the cause of allergy but only as an aggravant. The employer's responsibility should therefore be limited.

Such compensation should include payment of loss of time from work and payment for treatment. Since infectious allergy may be very chronic definite limits of liability should be set.

F It was formerly believed that nervous factors, such as fright, accidents or undue tension were important in the etiology of many allergic conditions. It is the opinion of the majority of this society that this view is no longer tenable and should not be considered in workmen's compensation. To avoid further confusion it would be well to exclude by a statute or ruling,

nervous factors as either a cause of or an influence on allergic conditions, and if allowed, to define its limits rigidly and to decide—

- 1 Whether accidents while employed should be considered as a cause of allergy.

- 2 If so what maximum interval should be allowed between the accident and the onset of the allergy.

- 3 Whether unusual nervous tension during ordinary employment should be considered a cause of allergy.

If allowed by law, compensation should include payment for the time lost and payment for medical treatment, the limits of which should be arbitrarily set.

All of those in groups A and B suffer from unfortunate, unpredictable and unpreventable illness due to employment. As such they come well within the spirit of workmen's compensation. Likewise rigidly selected persons under classes C, E and F have had their suffering increased as a direct result of their employment and are entitled to appropriate compensation.

On the other hand, those in class D can show no connection between their illness and their employment and are not entitled to any compensation.

The majority of allergic sufferers belong in class D. The just and equitable claims of the small percentage in the other groups would be a very slight burden on industry. Laws and rules should be designed to exclude persons in class D otherwise employers will be prejudiced against employing allergic persons. A well trained allergist should have no trouble in determining into which of the six groups an individual belongs.

#### DISCUSSION

DR NATHAN B. HERMAN, Baltimore. It was stated in this report that 'Likewise rigidly selected persons have had their suffering increased as a direct result of their employment and are entitled to appropriate compensation. Unfortunately, compensation does not deal with suffering. Compensation deals with loss of time with incapacitation. That alone would indicate that the framers of this report have not had much actual experience with the administration of compensation acts. The report medically is an excellent one, but administratively it poses so many difficulties that I do not believe it would be of a great deal of help to compensation boards. After defining allergy the report says 'It is therefore purely accidental. As soon as you introduce the word 'accident' you get into great difficulties, indeed in the administration. Under degree of exposure the report says that material may be encountered largely in occupation or largely out of occupation. Lawyers will argue endlessly and medical boards particularly about this administrative pitfall. The paragraph dealing with respiratory allergy also presents great difficulties and I doubt if it is feasible to follow the outline. Lastly a great deal of the responsibility devolves on adequately trained allergists. We have endless discussions and it is not easy to determine so specifically the sharp demarcations indicated by the report. We owe a real debt to the committee for bringing in the report. It is helpful and presents a skeleton on which we can group further ideas.

MR THOMAS N. BARTLETT, Baltimore. The report gives a great deal of food for thought. Lawyers and claims men must deal with these cases from an insurance standpoint. Some schedule could be worked out in these cases to pay a certain compensation for a certain period of time by the employer under whom the man first manifests the allergic condition and disability. After the man gets over an attack he may not go back to work for the same employer. Even if he does go back to work for the same employer how far can you go in awarding compensation for a succession of periodic disabilities? A man may be allergic to one thing or he may be allergic to half a dozen things all of which are contributing factors, some relating to his employment and some not. I think the report is a start toward some definite information and as a basis for some definite plan in compensable cases. From the medical point of view the problem is a big one from the preventive aspect.

MR BENJAMIN MARCUS, Detroit. I am associate counsel of the U A W-C I O and I am interested in the problem of drafting workmen's compensation acts. The suggestions contained in this paper present certain serious problems about



drafting of workmen's compensation acts. If we treat every disease in a separate chapter we are going to have a law so unwieldy that it is going to be difficult, if not impossible, to administer. Two problems are raised. First, the question of limitation of liability in regard to allergic diseases. From the employee's point of view we are opposed to any special limitation on liability in relation to a specific disease. We believe that liability should be determined by the legislature in relation to all disabilities and that liability should govern no matter what the cause, whether it is allergy or dust disease or accident or anything else. The other point raised which I wish briefly to mention is the question of apportionment of liability. Perhaps those who drafted the report do not know that we have approximately fifty laws dealing with workmen's compensation and there are very many treatments as to just how liability is to be apportioned. Recommendations of the medical profession are useful and interesting and quite valuable, but there again the question of just how liability should be apportioned is not strictly a medical problem. It is one of legislation. While it may be advisable in certain cases to limit liability, from labor's point of view we want liability not to be apportioned. We want liability for the entire duration of the man's disability, as long as the disease contributed to the disability. Of course, there are certain practical limitations to that, but let me assure you that as long as you have good administration of an act you do not have to write the limitations into the act. The problem is one of administration, one of understanding, and is not one strictly of drafting legislation.

MR VERNE A ZIMMER, Washington, D. C. Administratively it would be almost impossible to apply the theory in this report. We ought to evaluate or appraise how important this particular subject is in relation to the whole workmen's compensation scheme. Experience of twenty years in two or three of the jurisdictions in this country that have carried on under all inclusive occupational disease legislation shows that at the very most occupational disease does not produce more than 4 per cent of the total cost of workmen's compensation. That is not a tremendous problem. There is probably less difficulty on the whole for administrators of workmen's compensation to administer occupational disease cases than accident cases. You would think that one would require practically all the medical talent of the state in order to adjudicate a case of lead poisoning, dermatitis or some other commonly accepted occupational disease. That is not true. Very few jurisdictions have an array of specialists in allergy at the beck and call of the administrators in order to break down and classify those types of allergy. Actually in practice no jurisdiction will get enough volume of cases attributable to allergy to warrant any such attempted administrative refinement.

DR D. J. GALBRAITH, Toronto. I agree with Mr Zimmer that, from the administration standpoint, occupational disease does give very little trouble. The percentage is small, and with careful medical investigation of these cases we do not consider they are at all a serious problem, not nearly so much as accidents. I can agree with the chairman's early statement that medical evidence given before medical men does vary widely from medical evidence given to laymen. I think that has something to do with minimizing our troubles.

DR HARRY LEE HUBER. This is a first report primarily as a guide and as a starting point from which we can work. About 10 per cent of those who are employed probably have some problem of allergy. Whether it is something that incapacitates them or not is a question. The word "suffering" as used means that these patients are incapacitated or partially incapacitated.

#### Control of Medical Testimony The Minnesota Plan

DR ERNEST M. HAMMES, St. Paul. In July 1940 Dr B. S. Adams, president of the Minnesota State Medical Association, called a joint meeting of some members of our association and of the Minnesota State Bar Association to discuss the problem of unethical expert medical testimony. At that time it was felt that attempted legislative measures had improved but not solved the problem. A committee was appointed by the president with the approval of the counsel of the Minnesota State

Medical Association. The committee was empowered to review those court cases in which medical testimony appeared to the court or to the attorneys or to some physician to have been so contradictory as to indicate that one or more of the medical witnesses appeared to be consciously deviating from the truth. The medical testimony under scrutiny was not to be confined to any particular type of legislation or to any particular court. It included all civil, criminal and personal injury cases and all cases tried before the industrial commission. The committee on medical testimony consisted of five members representing the various sections of the state. At their first meeting they determined the following policy:

- 1 That the judge or attorney or accusing physician must submit in writing a brief statement to the committee, giving the name of the physician to be investigated, and also the names of the principals of the trial, in order that a transcript of the entire testimony may be obtained.

- 2 That a transcript of the entire testimony of the case in question must be obtained and placed at the disposal of the committee. Only by this method will the committee be able to obtain a true knowledge of all the facts and assist it to arrive at an unbiased and just opinion.

- 3 To assist the committee, members of the state association in the various specialties must be willing to appear before the committee when requested to do so and express their opinion regarding the testimony in question.

Repeated complaints about medical testimony have been reported to the members of the committee but the accusing physicians were not willing to submit them in writing because of possible embarrassment. To obviate this the committee decided this year to keep the name of the accusing individual confidential.

The expense incurred to obtain a transcript of a three day trial in district court is approximately \$100. In the industrial commission a similar transcript will cost about \$75. The council of our state medical association has approved these expenditures. The committee has deemed it advisable to ask three outstanding specialists in the question involved to assist the committee in the investigation of a case. Their willing cooperation, sound judgment and unbiased advice have materially lessened the responsibilities of our committee. We also have the assistance of our state medical society attorney to avoid any possible legal complications.

Our committee has no disciplinary or judiciary power. In cases in which the testimony was of a mildly questionable character, more due to ignorance or overenthusiasm, the committee deemed it advisable to have one of its members discuss the problem with the accused physician and point out his delinquencies. This has proved satisfactory.

In cases of a flagrant character our committee submits a complete report with transcript to the state board of medical examiners. This board has judiciary power and can suspend or revoke the offending physician's license.

The late Associate Justice Royal A. Stone of the Minnesota Supreme Court suggested that this new plan should be given statewide publicity. Articles were published in the leading newspapers and news services throughout the state. Editorials have appeared frequently in our state medical journal. A detailed outline of this new undertaking was sent to every member of the state medical association and to every judge in the courts of our state. It was felt that the existence of such a committee would have a beneficial effect on the few medical men in our state who needed some guidance in their expert medical testimony.

In 1940, 1941 and during the spring of 1942 our committee received repeated complaints regarding medical expert testimony in our courts. Some were found unwarranted. The most satisfactory result noted is that during the present fall term of court not a single request has been made to any member of our committee to investigate the testimony of any medical witness. This, to say the least, is very encouraging.

J. W. Holloway Jr., director of the Bureau of Legal Medicine and Legislation of the American Medical Association pointed out to Morris B. Mitchell, chairman of the committee of the judicial council of the Minnesota State Board Association,

that unless consideration should be given to the crooked lawyer as well as to the crooked medical expert little could be anticipated from this program. He proposed, in order to get down to the roots of the evil, that the bar association appoint a committee to which could be referred all cases that are called to the attention of the medical committee, with the idea in mind that if it should be found that the attorney who proffered the suspected testimony did so with a knowledge of its falsity then he should be disciplined along with the medical expert witness.

The Minnesota state and the local bar associations have committees to which our committee can refer any questionable case for investigation and disciplinary action. The judges of the supreme and district courts, as well as the members of the bar association, have been very cooperative and our committee greatly appreciates their assistance.

This program of the committee has been outlined in detail because of the many requests we have received regarding its inception and method of functioning.

#### DISCUSSION

DR. RAYMOND HUSSEY, Baltimore. These committees in our medical society organization are extremely important. I presented the matter to our council in Maryland and asked it to consider the possibility of having such a committee in our organization. The council took it up with several of the justices in the courts of Maryland and they decided they didn't want it, that is, the judges decided they didn't want it. I should like to ask Dr. Hammes if he has had testimony from workmen's compensation cases presented to the committee.

DR. ERNEST M. HAMMES, St. Paul. Just one.

DR. DEAN CLARK, Washington, D. C. Can you give us an idea about what the volume of the work of the committee is and about how many cases you handle?

DR. HAMMES. We have had few cases, and those have been of a mild character. Many of the young men who get to court are afraid to say "I don't know" when asked a question. That is purely a lack of experience in court, much more so than trying to evade the truth. There is another group who feel that they must help the attorney win his case, and they become so overenthusiastic that they deviate just a little, probably unconsciously. Then we have those who are frank out and out. We had such a one that was referred to the state board of medical examiners. The board advised him that unless his attitude changed it would take drastic action. One case like that does wonders throughout the state.

#### Workmen's Compensation: The Shape of Things to Come

MR. HENRY D. SAYER, New York. Compensation laws are not identical. But there is one unyielding rule underlying all compensation laws—the rule that compensation will be paid regardless of fault as a cause of injury. The liability of the employer is certain, but it is not unlimited. Monetary benefits are fixed at limits that are measured by the loss of time or of wage earning capacity. They do not include what might be termed "punitive damages"; they take no account of pain and suffering, mental anguish or any of those other conditions that would be sympathetically urged on juries. And, in addition to payment for loss of time or earning capacity, the compensation system provides for the furnishing of medical and surgical care and treatment at the expense of the employer. This was not the obligation of the employer under the old employers' liability laws. His only liability for medical care was in case of a recovery for damages by the employee, who might in such case include in his suit the value of the medical services for which he had obligated himself.

The compensation laws have been declared by the courts in many states to be beneficial statutes, that is, they are recognized as having been enacted for the benefit of the workers, and as beneficial statutes the courts will strive to give full effect to their beneficial provisions and will interpret them liberally. Public opinion and policy will demand that all who have any duties under those statutes shall do their full part to make effective their beneficial provisions. Among the groups whose

participation in the system is essential are the employers, the insurance carriers and the physicians. The interest of each group is different, yet they have much in common. The employer, of course, has had a keen interest in compensation right from the first. The insurance carrier too has been keenly alive to its rights and obligations under the law.

From the first day of the law and from the first occurrence of an accident, the doctor has been a force to recognize. Doctors are commonly inclined to resent the making of paper reports to employers or insurance companies and to the public authorities. The first questions that naturally arise in the mind of the insurance examiner are: Who is the doctor, for what is he treating, how long will disability extend and what will be the ultimate result? On the true answers to these questions depend in large measure the position of the insurance company toward accepting liability and determining the preliminary reserve to be set up on the company's books, so that the money to pay the claim to its ultimate may be set aside and always made available. This is not only the obligation of the company under its policy contract but is also its legal responsibility under the insurance laws of most states. Continuing reports of disability provide the basis for continuing payments of compensation. Thus reports are a prime necessity if the compensation law is to be fairly and adequately administered.

If a doctor would practice his profession in the industrial medical field, there are many things that he must do. He must be something of an engineer, for his talents must be employed in an advisory way in the prevention of accidents as well as directly in the treatment of injuries after they have occurred. He must know something of industrial processes and methods, otherwise the histories he obtains from injured workers may sometimes be unintelligible to him or may lead to wrong conclusions. He must be something of a statistician if he would attempt to draw conclusions in regard to types of injuries and their causes and their end results. And today the industrial doctor must be something of a public and industrial health expert.

As originally introduced in this country workmen's compensation laws were generally limited in application to accidental injuries, just as the law was originally in England. But early in the compensation era there began a movement to provide compensation for disability or death due to occupational disease. In some thirty or more states there is now coverage for occupational diseases in some form. Compensation for specific occupational disease is the natural corollary of compensation for accident without fault. The assumed risk of accident in a hazardous employment, having been abolished as a defense in compensation, there would seem to be no good reason to permit the inherent hazard of diseases to be a bar to compensation for sickness or death from a disease that is a characteristic of the employment. It is reasonable to expect that as compensation laws shape up in the future they will in time all provide coverage for industrial diseases. Almost insuperable difficulties in defining the coverage of the law for occupational diseases have been encountered, however, because of the impossibility of exactly defining the term "occupational disease." Not all diseases affecting or acquired by workers are occupational diseases, not even all diseases that occur in the course of employment. That cannot be too strongly emphasized. Nor is an occupational disease law to be regarded as the employer's contribution to a general health law for workers. In an effort to define and delimit properly the occupational disease coverage there have developed two general methods, one the so-called "schedule law," and the other the "open" or "all inclusive law." The schedule law sets forth in a list embodied in the law all the diseases or disease conditions for which liability is sought to be established under the law. These diseases are frequently related in the law to specific working conditions or processes in which there is a characteristic hazard of the specific disease. Thus, for example lead poisoning is a disease occurring among men who work with or handle or are exposed to lead in some form. If a man who works with lead develops lead poisoning, it will be conclusively presumed that he got the poisoning in his employment. If a person, however, develops lead poisoning and

it is conclusively shown that he does not handle lead or work with it and is in no way exposed to lead or lead fumes, it cannot be said that his lead poisoning is an occupational disease, and it must be caused by some exposure outside his employment.

What has been said of lead may be said equally of arsenic, mercury, benzene and any of the other toxic or harmful substances enumerated in the law.

The other common method of providing coverage for occupational diseases set forth in some laws is the general or all inclusive coverage, under which method specific diseases or disease conditions are not named in the law, but the law provisions include occupational disease by vague, general language or by attempted definition. I say "attempted definition," because there is no such thing as a standard or exact definition. Seemingly, this type of law would be more easily administered, for the administrative authority would not seem to be bound by the rigid restrictions and limitations of the schedule form of law. But that is not necessarily the case, as there are other tests that must be applied when diseases do not fall within the common category of "occupational." Such common and deadly diseases as pneumonia, tuberculosis and heart disease occur among workers just as they do among the nonindustrial people. When then if ever, may such diseases be regarded as occupational? The questions that may arise in connection with such diseases are difficult and may lead to long, expensive and discouraging litigation. In the one case both employers and workers are fully informed of the disease conditions for which the one is permitted to claim and for which the other is liable. The coverage is not so broad, because of its certainty and definite nature. In the other case the coverage may be theoretically more broad, but it is shrouded in such vagueness and uncertainty that the right to compensation may not be determined until after lengthy hearings and protracted legal process.

These seem to be the alternatives that present themselves in the development of occupational disease legislation up to the present time. The medical profession can contribute to the study of the fairest and most satisfactory method of providing coverage for occupational diseases in the shape of things to come. It is a question that should not be left wholly to the lawyers or to the industrialists or to labor, although the views of all these parties must be taken into account. Those views should be based on informed opinion, and the information to be supplied by the doctors could be most impressive. The great problem, the real problem of the future, is not in the payment of money benefits. It is in the prevention of accidents and the furnishing of healthful working conditions. Great strides have been made in the field of safety during the past twenty-five years. That field is the particular one of the engineer. Insurance will fail industry which it serves, medicine will fail the public to which it owes endless allegiance, if they do not work together for the solution of these problems.

### Practical Problems in Framing Occupational Disease Legislation

#### ROUND TABLE DISCUSSION

DR KENNETH MARKUSON, Lansing, Mich. The workmen's compensation act in the state of Michigan is entirely under the administration of the Michigan Department of Labor. At the present time Michigan has a schedule law of thirty-one diseases. In my opinion it is not a good law, because there are certain inequalities. A workman has to be extremely fortunate to be exposed to one of the thirty-one scheduled diseases. The proposal which I believe will be presented at the present session of the legislature is for an all coverage law. I think that is a fair law if properly administered, but I do feel that there should be proof of exposure along with clinical findings. The law as it now stands provides payments for medical care for a period of ninety days. Many of the industries are paying for continued medical care, feeling that it is their responsibility although not a legal one. After the present emergency, when the labor market is going to be much more open than it is today, a lot of men are going to be out of work, principally on account of compensation laws. The man with physical defects, with mental defects, whatever they may be, is going to be denied employment.

DR BARNEY J HEIN, Toledo, Ohio. Ohio has an occupational disease law. It was passed in 1939 and it was the result of several court decisions by the Ohio Supreme Court, in which certain occupational diseases were recognized. This law specifies twenty-two different diseases and then goes on to say "All other occupational diseases. An occupational disease is a disease peculiar to the particular industrial process, trade or occupation and to which an employee is not ordinarily subjected or exposed outside of or away from his employment." That certainly takes in everything. In the way of administration, the Industrial Commission of Ohio has a silicosis board consisting of three doctors, one a roentgenologist, another a specialist in chest diseases and the third an internist. Cases of silicosis are referred to this committee. Questions about other occupational diseases arise so a list of doctors has been selected throughout the state based on qualifications. They are selected by the dean of Ohio State University, the Industrial Commission of Ohio and by the department of health. Any employee has a right to appeal to this board for final discussion.

DR HUSSEY. In Maryland our law states that the medical board is to investigate and hear controversial medical issues. We actually go into the plants and see for ourselves what the situation is. We accomplish the same thing that we do in hospital wards when certain clinical situations demand study and we call on consultants. We cannot be physicians and cover all the other technical fields. We must have the cooperation of the engineer. We must be possessed of sufficient knowledge to direct the effort of the engineer. The engineer is helping us, not directing us. Because relatively few men have realized that situation the engineer has taken the initiative. We cannot define occupational disease. The subject of nosology in medical science embraces the classification of disease. The basis for the classification of disease is etiology. As we understand the pathogenesis of the disease we are in a position to express an opinion. Our economists, our legislators and our employers must provide the means for the proper care of the workman, but it is up to the medical persons to decide what the disease is, what the etiology is and whether that etiologic agent is one that is associated with the processes involved in his work. The difficulty arises in getting the facts and fitting those facts into the definition of accident. In medicine etiology is the basis of our knowledge of disease, and injury is any change that takes place in the body as a result of the effect of an etiologic agent.

DR D J GALBRAITH, Toronto. In our setup there is no appeal from the decision of the board. We administer the act. Appeal is not allowed on point of law or fact. Medical aid is entirely in the hands of the board. We feel that the entire responsibility for the injured man is ours from accident prevention through his medical care and treatment, until the man is back on a job again or is compensated for the loss which he has sustained. Under an act of that kind, many of your difficulties are removed. We have still the schedule type of occupational disease coverage. We would rather have the blanket coverage, but under the act as we have it we have a great deal of leeway. We can call these conditions accidents and as such we have found that both the employers and the workmen readily give approval. Our government some years ago came to the conclusion that the majority of the problems that came before a workmen's compensation board were medical problems, and as such they felt that a medical man should be placed on that commission. When the next vacancy arose another doctor was appointed, so that we then had a commission composed of a manufacturer, an industrialist and two physicians. There is now a vacancy on the board. In administering an act of this kind, medical men have an advantage. You have injured men. You have men suffering from industrial diseases. Every x-ray film in the province of Ontario is sent to our board immediately and is examined by the most competent radiologist in the province. If he finds that postoperative films do not show adequate reduction he takes the film immediately to our chief surgeon whom we recently appointed because we felt that he was one of the outstanding orthopedic surgeons in the country. Between them they decide what should be done for that man and it is done.

We remove the patient definitely from the hands of the incompetent doctor and put him in the hands of the man who we feel is most competent. The medical profession, with which this was discussed from one end of the province to the other, has so far given us nothing but kindly comments on the results. Some of the outstanding traumatic surgeons have made slips which we have discovered and brought to their attention. They thank us for it and generally commend the policy. We know that we shall get objections from the weaker men, the men who are not doing so good a job, but the medical profession, the Ontario Medical Association discussed this with me before the plan was put into operation and gave us the green light. Certainly there are advantages for the medical profession and for the workman himself. In the early days of workmen's compensation in the province the Ontario Medical Association appointed a Committee on Problems of Workmen's Compensation. The medical profession was to take all its grief to this committee and it was to present it to the board. Last year the chairman of that committee came to me beforehand, before the annual meeting, and he said 'I am going to have a very nice report this year. During the whole year there has not been one single complaint from the medical profession with regard to the work of the compensation board.' He said 'I think we shall have to dismiss our committee.' That is the committee you are talking about.

MR VOLTA WRABELTZ, Madison, Wis. In Wisconsin we have covered all diseases whether occupational or not, and the job of administration and the costs have been so small that we sometimes wonder what in the world you are arguing about. Certainly any disease I don't care what it is, if it is caused by any occupation, causes just as much wage loss, just as much hardship to the worker as if it were a typical occupational disease. There is no justifiable reason for merely placing on the compensable list only those diseases that stand out as typically occupational. We have covered in our law all diseases of occupation since 1919 probably an experience as long as any other state. The over-all cost for the past twenty-two years has been 3.3 per cent of the cost of all compensation for accidents and diseases. Certainly that isn't a terrific load. That cost probably is larger than it should be and than it will be in the future. We have met the problem frankly without attempting to leave out so-called accrual disabilities and we met it at a time when it was really critical, at the beginning of the depression when symptoms were magnified much by lack of employment opportunities and every one regarded the problem somewhat in a hysterical state of mind. In our desire not to do harm we paid compensation in many cases in which not a cent should have been paid. Many cases were settled on the basis of partial disability, 20, 30, 40, 50 per cent that should never have been compromised at all. We know in the light of our experience today that there is hardly any such thing as partial disability in the case of silicosis. It is either a total disability or none at all. These cases were settled on an overliberal basis in the years 1933, '34 and '35. That problem will never be met again in Wisconsin. From the standpoint of prevention and of minimizing the effects of disease you may have to have some special approach to some special problem, but from the standpoint of compensation there is no reason for you to have a special chapter in your schedule books covering occupational diseases. Bring them in like any other disability. It is very essential that a really constructive program of physical examinations be instituted so that the rights of workers may be protected. But above all no compensation law should be written or any amendment put into the law in the belief that somebody is going to be incompetent or not have the proper concept of the law to administer it properly. Whenever we enact a law we should assume that the people who are going to administer it are competent and if they are not that is the fault of your state. You should develop a tradition of appointment to offices of this kind on a nonpolitical basis and administrators should be retained in office long enough so that they are familiar with the problems with which they have to deal and they should not be kicked out every time a new governor is elected.

MR SAMUEL KAITMAN, New York. What we need is some one who will be able to determine the question 'Is that disease due to the employment?' Is it to be done by having a doctor who perhaps knows how to determine that question from a medical point of view? Is it to be done by a layman appointed without political considerations and with sufficient tenure of office to be able to learn those determinative factors or is it to be done by a lawyer who might know the legal aspects and will have to learn the medical aspects? I don't care how it is done, but they must be able to determine whether or not that disease is due to the occupation. I don't care whether you have a schedule or whether you have an all inclusive occupational disease law, the crux of the situation is 'Is it due to the employment?' In New York we deal with any number of allegations of tuberculosis, heart disease and kidney disease. The whole gamut of systemic diseases is alleged to be due to occupational exposure. Some of them may be. I know from experience that many of them are not. The doctors can assist the administrators tremendously in making the determination as to whether the disease in question is due to the employment. We have heard some statistics to the effect that not very much is involved and therefore there is no problem. If there is anything we can do to eliminate those diseases which are due to occupation we must and should do it immediately. The salvation for the worker is in prevention. We as insurance carriers, you as doctors, the administrators of the laws, labor—all of us can get together and plan some definite action whereby first we determine what effects are due to employment and, secondly, we prevent them from occurring.

JANUARY 12—AFTERNOON

DR ROBERT T. LEGG, Berkeley, Calif., Presiding

## INDUSTRIAL MEDICAL PRACTICE AND THE EMERGENCY

### Correlation of Industrial Medical Organization with Community Emergency

DR WARD L. MOULD, Washington, D. C. When the national emergency was first declared by the President in 1941, he created the Office of Civilian Defense and made that agency responsible for the development of plans for the protection of life and property against enemy attack. This organization was to be correlated with the armed forces through a joint board representing the Army, Navy and Office of Civilian Defense. Plants manufacturing war material were made the responsibility of the Internal Security Division of the Office of the Provost Marshal General, and the responsibility was decentralized into the Internal Security Divisions of the nine service commands. The Navy likewise was given responsibility for plants in which it was concerned.

Because of the placing of responsibility in the Office of the Provost Marshal General, it is not surprising that the principal consideration in the internal security administration was in the policing and guarding of plants, and it is not surprising that, even in setting up programs to cope with disasters, again the emphasis has been placed on the security of information, the security of plant property and the security of records. Plans which were to provide for the care of people who might be injured in such catastrophes were deplorably weak. Plants have set up organizations designed to provide first aid for people who might be injured in catastrophes but they have failed to realize that no plant organization will make that plant self sufficient that the minute anybody is so seriously injured that he requires hospitalization or the services of a coroner the plant has ceased to be a self-sufficient organization. It is necessary that there be a correlation between the plant medical department in planning for the care of a large number of injured people who might be injured in a disaster with the local organizations responsible for the care of civilian casualties due to air raids.

Recognizing the weakness of the internal security program as it applied to catastrophes the Office of Civilian Defense and the Internal Security Division in the Provost Marshal General's Office and in the nine service commands have worked out a

program jointly for adoption by plant medical departments where it is feasible. Certainly the plant medical department is not set up to care for a lot of seriously injured persons at one time. Its personnel is limited. The number of personnel even in a good plant medical department need not be particularly numerous to cope with the problems of industrial medicine, and if a large number of people are injured at one time the deficiencies of plant medical departments would be greatly magnified. Facilities are a little better. If one surveys industrial medical facilities one finds that very few plants have their own hospitals and that only 20 per cent of plants have made arrangements for the hospitalization of industrial accident victims. First aid rooms are provided in a goodly number of plants, but still there are about 30 per cent that do not have first aid rooms. Plants that have dispensaries are fortunate in that they then have a facility for the treatment of the industrial accident victim, but such rooms are not ordinarily adaptable to the care of a large number of people at one time. They are small. They are compartmented. They perhaps have an eye chart, a goose-neck lamp, an examining table, an examining chair and a couple of beds to one side where persons can be put for a little while until transportation can be arranged, but they are not ordinarily adapted to the care of many persons. So we have felt that an entirely different type of organization should be developed within the plant for the care of persons injured in a plant catastrophe.

We have conducted surveys of hospitals in cities to determine the possibility of their expansion of bed capacity, and not only in the cities themselves but in outlying areas, so that, in the event of an emergency, patients occupying city institutions would be evacuated to other communities, thereby making city institutional beds available. We have conducted, in cooperation with the Public Health Service, a program for the organization of blood banks in hospitals. Money made available to the Public Health Service and jointly administered by it and by the Office of Civilian Defense has been awarded to about one hundred and fifty hospitals for the creation of blood banks, in return for which the hospitals have agreed to accumulate 1 unit of plasma per hospital bed. In addition to this plasma, which is a steadily growing pool, we have bought outright from the processors dried and frozen plasma prepared from blood collected by the Red Cross. This plasma has been placed in strategic locations all over the country. Not every hospital, of course, has blood within its walls or in its pharmacy, but all hospitals have access to this blood through its local organization of civilian defense. While the blood is primarily accumulated and stored for the treatment of civilians injured in enemy action, it may be used in any emergency.

Because we have developed our organization along these lines, it was felt by the Office of Civilian Defense and by the military authorities that, where the organization was properly and well developed, with the facilities available in the community and under the central administrative direction of the local chief of emergency medical service, if the plant medical department and the community emergency medical service could get together and work out a joint program of mutual assistance, much confusion might be avoided in the event of a plant catastrophe. Of course, the whole civilian defense program at the local level is a volunteer effort, and it is to be expected therefore, that the development of our program is spotty, but for the most part there has been a pretty good development of emergency medical service.

The plan that is developed by the plant medical department in cooperation with the local emergency medical service should provide for two contingencies: first, a catastrophe which is localized within the plant, in which case all the resources of the community can be made available to the plant, and it should also provide for a catastrophe in which the plant and the community are involved, in which there has to be an apportionment of medical service between the two. The plan should provide for the hospitalization of people who are injured. It is necessary, in the administration of such a responsibility as the hospitalization of people, that patients be spread through as many hospitals as possible so that one is not going to be overloaded while others are twiddling their thumbs. The plan should also

provide for efficient ambulance transport which in many instances has been pretty well tied together by the local emergency medical organization, and in communities where our organization has been well developed the local chief has not only surveyed the facilities which are available in the community but has determined the possibilities for the emergency expansion, by the conversion of panel-body trucks, and other similar vehicles.

One point that causes, I think, an undue amount of confusion in catastrophes is the matter of identification of casualties. In any plant disaster a careful record must be kept not only of people who are injured but of people who are uninjured who leave the plant. Unless this is done it will be a very difficult matter to determine the number and the names of the missing.

The identification badges that are used in most plants will assist materially in determining the identity of people who may be unconscious. Too frequently one finds that in the administration of first aid in the plant medical department or in the plant yard or at some point the patient is very carefully disrobed, and with his clothes go his identification badge. He is transported in an unconscious state to an unknown hospital in an unknown community. In a recent episode to quote a specific example, three weeks after the catastrophe patients were turning up who were presumed dead. They had been transported in unknown numbers to unknown hospitals in unknown cities in unknown ambulances. While this did not detract necessarily from the quality of the medical care which they received it certainly did not contribute to the improvement of public morale.

Another phase of catastrophe planning which is frequently overlooked is that inevitably some people are going to be killed if the catastrophe is of any consequence, and we fail to make provision for people who are killed. There should be a room designated to which they can be taken and left until arrangements can be made for transportation to mortuaries or morgues. While it is not necessary that they be identified before they leave the plant property, it is necessary that all identifying data should be on the person when the body is moved.

Our civilian defense scheme of emergency medical service does not differ materially from the program of the Army in its care of casualties. We feel that treatment on the spot is very necessary and that that treatment should be given by qualified persons.

In order to filter the casualties, to prevent an overload of patients with minor injuries and patients with hysteria arriving at the admitting office of the hospital, we have established what we call casualty stations where these lesser degrees of injury can be cared for. The casualty station is ideally a big open room. It is not equipped for surgical procedures. It is set up primarily for the administration of first aid and the care of minor injuries.

We fail frequently to consider the importance of sanitation services in plant catastrophes, and yet dangers to community and plant sanitation are inherent in all disasters. Explosions that will cause fractures of water mains and sewer pipes, fires, fire fighting operations, may cause such a drop of water pressure as to cause a back siphonage of sewage into potable water supplies. Many plants have their own water supply which is independent of that of the community, and frequently it is not a potable supply. All of these things must be taken into consideration. Following a catastrophe of any degree at all it would probably be wise to obtain the assistance of the sanitary engineer of the local health or water department to determine whether there is a sanitation hazard in the plant as a result of the accident.

One thing which we have been working on diligently in the Office of Civilian Defense is the matter of admission of physicians to assigned plants, an assigned plant being one which has been turned over to the War or Navy Department for the security of the plant. Visiting in such plants is rigidly controlled, and properly so, but in November the War Department emphasized its stand on visitors' clearance and placed responsibility for the admission of personnel on the plant management but said that special provision should be made for the admission of policemen, firemen and physicians to the plant in time of disaster. We have been working with the various service com-

mands to develop a procedure whereby selected members of our organization, of our local organization, would be identified, following investigation by the service command, by passes that would be issued by the Office of Civilian Defense and counter-signed by the security officers of the War Department.

Last, but not least, is the matter of responsibility for people who are injured, who are carrying on civilian protection duty in plants. I know plants which have several thousand men engaged in plant protection activities and the activities are in some instances hazardous. Auxiliary firemen, in their tramping, climb up ladders, scale walls and so on laying themselves open to accidents which will necessitate medical care and hospitalization. Some categories of plant protection workers—when I say that I am not referring to guards—are employees during the time they are carrying on their plant protection activity. The Wage and Hour Division of the Department of Labor has ruled that if the activity is carried on during the usual working hours of the employee, he must be paid wages for his activity, and, if he is paid wages, it is presumed that he will be covered by the compensation law obtaining in the state. If he carries on his activity outside his regular working hours, in some instances he will and in some instances he will not be an employee for whom wages must be paid, depending somewhat on who the directing agency is within the plant having charge of the civilian protection activity of the plant. If he is a member of the local citizen's defense corps, which is the protection organization of the community under the Office of Civilian Defense and he is assigned to the plant he will not be an employee of the plant, in that wages do not have to be paid for his activity as a civilian defense worker. In February of last year a special allocation was made from the President's Emergency Fund to the Federal Security Agency to provide for the medical care and other benefits to civilians who were injured as a result of enemy action. As no specific provision was made for civilian defense workers, no coverage was furnished such persons during drills and exercise, though they would be covered in the event of injuries sustained in an air raid by virtue of the fact they were civilians. To provide for financial protection and medical care for civilian defense workers injured in training exercises and other drills of the Office of Civilian Defense, a supplemental allocation was made, to be administered by the Federal Security Agency. The manner in which this fund is to be administered has not been completely worked out, but the regulations which are now being prepared will, I think, be very specific in providing assistance to members of the local citizen's defense corps who may be injured while on active civilian protection duty. While there may be some adjustment made for people engaged in such activities but not actually members of the corps, I don't think that any specific provision will be made for such situations. We feel, therefore, that it is important that people who are engaged in passive plant protection as auxiliary firemen, auxiliary policemen, air raid wardens and so on, be made members of the local citizen's defense corps so, in the event they become injured in the performance of their functions they will be covered by some type of program insuring medical care and certain other disability benefits.

#### The Health and Safety Program of the U. S. Maritime Commission and the U. S. Navy in Contract Shipyards

MR. PHILIP DRINKER, Boston. This article appears in full in this issue, page 822.

#### DISCUSSION

DR. DEAN A. CLARK, Washington, D. C. Can you tell us something of the way in which the unions were brought in on your industrial health and safety plans?

MR. PHILIP DRINKER, Boston. The survey we made last summer was first suggested before the so-called Ship Stabilization Committee meeting in New York last July. At that meeting were representatives from the government from the labor unions and from management. Labor knew of the projected survey last summer. They all expressed approval. When we had made the rounds, I met again with the C. I. O. and with the A. F. of L. and told them the results of the survey and the

essential recommendations and changes we were going to ask for. We were perfectly frank with them. We told them that one of the things we thought was not handled properly was the total lack, in some districts, of preplacement physical examinations. Literally there are none. We told them why we wanted them. They agreed that a change was in order and should be made, which was quite a revolutionary step. How quickly we can put through the benefits of that change in attitude has yet to be proved, but we have every hope it will be. When we survey the yards, yard by yard, we don't always get in touch with the union men because of the time that that would consume, but we take care that the unions themselves know we are coming. There hasn't been a single step in any of this but that the union has been appraised fully.

#### STREAMLINING INDUSTRIAL MEDICAL SERVICE

##### How to Get Along with Less Help

DR. EDWARD C. HOLMELAD, Chicago. This article appears in full in this issue, page 820.

##### Outline of Procedure for Nurses in Industry

A report of the Council on Industrial Health, American Medical Association, presented by Dr. Orlen J. Johnson, Chicago, will appear in full in THE JOURNAL.

##### Putting Your Medical Records to Work

DR. M. H. MANSON, New York. If some aspect of the work must suffer it is usually the records. The prospective employee should encounter the physician first in industry and does so in many instances. It is difficult to estimate at the present time the percentage of workers in industry who receive preplacement examination. In 1932 the American College of Surgeons reported preplacement examinations in 63 per cent of 925 industries studied in 1939 the National Industrial Conference Board 84.4 per cent and in 1940 in a study made by the National Association of Manufacturers, 72 per cent was reported. With thousands of people being added to payrolls practically overnight the number of preemployment or preplacement examinations now is considerably less than the incidence indicated in these studies.

What can we learn from the results of preemployment examination and to what use can we put this knowledge? With few exceptions there are no analyses made other than a percentage calculation of rejections, which varies from 2 to 5 per cent in most industries in normal times. We have gained considerable information about the physical status of a specific group of our population as the result of analyses of selective service examinations both in the last and the present great war. These data are not comparable to standards and methods of examination in industry, nor are they as inclusive in scope, considering industry's wide spread of age groups, racial differences and sex differences. Much significant information is buried in the medical files of industry concerning the medical status of our population at the time they enter employment which should be currently and periodically analyzed and compared. Wider usage of preplacement medical records will give us a base line of incidence of actual or incipient medical conditions for specific industries for which these industries will ultimately pay millions of dollars either directly in sick and accident benefits or indirectly as a result of lost time. A compilation of such information would also provide a more accurate picture of the nation's health geographically than some widely quoted studies such as have been made by WPA workers. I should like to see some group sponsor and provide the mechanism for uniform studies and compilations of similar data. Work sheets for this purpose are simple to devise and put into use.

Development and morbidity of newly arising conditions should be similarly studied by tabulation and analyses through periodic health audits of individual employees. The term health audit is used because a periodic medical appraisal is, or should be, far more than a physical examination. Work sheets identical with, or similar to, preplacement analyses may be used to facili-



rate comparisons. The 1941 report on industrial health practice made by the National Association of Manufacturers indicated that only 21 per cent of the 2,064 industrial establishments studied conducted periodic physical examinations. According to some observers cardiovascular diseases occur with undue frequency in occupations which demand severe physical exercise. The most recent and perhaps only study of death rates by occupations was that made by Whitney in 1936, which revealed that the rate for males from all causes, corrected for variation in age, was 623 per hundred thousand for agricultural workers, 775 for clerical workers, 829 for skilled industrial workers, 1,009 for semiskilled industrial workers and 1,448 for unskilled workers. This undoubtedly indicates a field for some detailed study as to causes and methods of prevention, and further continuous studies of a similar type are certainly indicated at the present time.

Sickness is responsible for about 85 per cent of absences, off the job accidents approximately 10 per cent and on the job accidents 5 per cent. Illness causes fifteen to twenty times as much absenteeism and about seven times as much lost time from work as industrial accidents. Reflecting that industrial accidents are responsible for about one billion five hundred million man hours loss of production each year, the importance of illness is tremendous. Absenteeism is greater following holidays and at the beginning of hunting seasons and is decreased on pay days and days when overtime rates are in effect, and it is often reduced by the mere knowledge that a study is being made of the subject. Absenteeism is greater in plants where employees are paid for all absences. In one shop the rate increased over 300 per cent when pay was given for the first two days of absence. I do not believe that there is any one answer to absenteeism.

Illness absences are said to be at least three times more important economically than the actual number of days lost because of reduced efficiency in the developmental and recuperative stages of the illness. It has been stated that every employee loses an average of nine and one-half working days each year, the rate being twelve days for women and seven days for men. With the increasing displacement of men by women in industry and the prophesied addition of thirteen million workers to plants manufacturing war material, the importance of the problem of absenteeism due to illness can well be visualized.

Before anything can be done toward solving this costly and vital problem, an absenteeism analysis is essential such as the report of studies in personnel policy (number 46) made by the National Industrial Conference Board entitled "Reducing Absenteeism." We in the New York Telephone Company employ the following procedure in cases of absenteeism due to illness. On the third day of any absence a representative from the disability bureau of our traffic department visits the employee (telephone operator) at her home. At this time it is ascertained whether or not the employee is under proper medical care and a medical certificate is left to be forwarded to our medical department by the employee's private physician. The visitor completes a report which indicates, if known, the nature of illness and other pertinent information. From this, together with a report from our medical department, a card index is built which indicates the frequency of absences and the nature of the disabilities. Every employee having six or more absences in any given six months period is referred to the medical department for special examination (this is termed a frequent illness visit and is obligatory) to determine whether or not any corrective measures are indicated and for advice on general or specific health problems. The value of keeping a constant check on absences may be better visualized by considering a plant employing ten thousand workers, forty-eight hours a week. They can expect a loss of approximately eighty thousand man days this year, or two hundred and eighty employees absent every day. If the plant is employing more women than usual or inexperienced men, the loss will be one hundred thousand man days, or three hundred and fifty absences each day.

The question of toxic hazards and exposures is of paramount importance because of the continuing use of substitutes and new materials in manufacture. The apparent interruption in the downward trend of tuberculosis certainly deserves careful consideration.

The work of the medical department is divided into two categories, administrative and diagnostic. A code is used for the various subdivisions in each category. Administrative coding makes provision for tabulating preplacement examinations, employee examinations of all types, accidents, sickness, consultations and other interviews, x-ray examinations, laboratory examinations and other services such as injections or treatment, the latter either at the behest of the employee's private physician or of an emergency nature. The diagnostic code makes provision for diagnoses according to systems, such as respiratory, digestive, genitourinary, endocrine, circulatory and special sense organs, plus a diagnostic classification for injuries. The combined coding is transferred from the individual employee record to a work sheet on which is also indicated other information such as original or repeat visits and the disposition of the patient. This information is then transferred to punch cards by means of the Hollerith machines. At any given period these cards may be sorted to obtain any desired combination of information. For example, one may compare the number of absences for more or less than seven days due to influenza or any other illness for any given period. This method of tabulating the experience of the medical department has been desirable and helpful.

We need more and better medical records, more widespread use of these records applied to our problems in industry, and improved interchange of experience to aid production.

#### Processing Industrial Physical Examinations

DR FRED B WISHARD, Anderson, Ind. This article appears in full in this issue, page 810.

#### DISCUSSION

MEMBER I should like to ask Dr Wishard about the expense of the examination, if it has ever been figured out.

DR FRED B WISHARD, Anderson, Ind. We never figured it out. We have made some calculations with regard to our total cost. I think it runs about 6 or 7 cents, but the amount of the examination would be, roughly, \$2. It costs 97 cents to use, process and store a 14 by 17 x-ray film.

MEMBER What percentage of women do you examine in relation to men? Do you have a duplicate setup or can you use the same one?

DR WISHARD We don't examine women to any appreciable degree. We do check vision, chests, blood pressure and a blood test.

MEMBER Do you do urinalyses on your preplacement examination?

DR WISHARD We do not. We probably would be better off if we did.

#### Resuscitation: A Review and Demonstration

DR HART E FISHER, Chicago. A demonstration of lantern slides.

JANUARY 12—AFTERNOON

DR RAYMOND HUSSEY, Baltimore, Presiding

#### SYMPOSIUM ON REHABILITATION

##### Rehabilitation—Recent Developments in Connecticut

DR JAMES H BIRAM, Hartford, Conn. We have had in Connecticut since 1920 a vocational rehabilitation service which supplemented workmen's compensation and had for its object the training of injured employees and fitting them again for industry, and in supplying artificial appliances and training in their use. Somewhat over a year ago clinics were established in conjunction with the State Medical Society, the Manufacturer's Association of Connecticut and the Departments of Psychology at Yale and Trinity. Handicapped individuals were evaluated and were presented before groups of manufacturers or their representatives. This was not a true rehabilitation program but more for reeducation and job placement, depending on interested charitably inclined employers. With the shortage of labor, most of this group were placed. This plan found



employment for a considerable number of handicapped individuals. One day last September I received a call from the employment office and found that on that day it had one hundred and fifty requisitions; that fifty-four had applied for work and my examiners had turned down twenty-four and had taken waivers on most of the remainder. On investigation I found that ten had been rigidly rejected for machine jobs because of varicose veins. I arranged time to examine all questionable rejections and found that varicose veins was second in causes for rejection just below cardiovascular disease and above visual defects. A considerable proportion of these could be salvaged by the simple operation of ligation and injection of the saphenous vein.

How was this to be accomplished? It was not entirely the manufacturer's responsibility nor the state's, as these people came from all over the country. After unsuccessful attempts to interest various groups in this venture I finally called Mr. Edward Chester, director of vocational rehabilitation at the state board of education, and stated the trouble to him. In a few days a meeting attended by fifty representatives of various organizations was held. The representatives were informed as to our undertaking, shown its need, and invited to express their opinions. Because each group saw that this venture vitally affected them there was complete cooperation.

Mr. Chester, as director of rehabilitation in the state, was authorized to serve as chairman of a committee and to appoint a small advisory committee, each member of which was to be chairman of a larger group representing his special interest. It was decided that each committee was to meet the following Wednesday morning at the Hartford Club and have a definite proposition ready so the chairmen could meet that same afternoon to plan for carrying out the program. This was done, and the Connecticut Wartime Manpower Rehabilitation Committee started to function in its advisory capacity to the Rehabilitation Division of the State Department of Education.

At this meeting it was determined:

A. That at present only defects in the preemployment group that needed relatively short treatment or evaluation should be attempted. As a guide the following conditions were named: (1) cardiovascular disease, (2) varicose veins, (3) hernia, (4) vision, (5) minor orthopedic defects, (6) diabetes, (7) miscellaneous.

B. That candidates for rehabilitation were to come from: (1) plant physicians, (2) rehabilitation offices set up in the different industrial centers of the state, in this case plant physicians or a group of consultants would determine the advisability of making a correction of the disability.

C. That a statewide panel of doctors be set up to secure competent men to carry out the necessary procedures. That names for consideration on this panel were to be submitted by: (1) plant medical directors, (2) medical directors of the insurance companies, (3) hospitals, (4) specialists. Workmen's compensation rates should govern the fees paid to doctors for services rendered.

D. That hospital rates were to be their lowest semiprivate charges.

E. That the client should have the choice of hospital and panel doctor.

F. That medical and hospital bills be paid by the Rehabilitation Division of the State Department of Education and that the individual make repayment to them on an installment basis. Also that inability to pay would not disbar any one.

Expenses were to be met by a revolving fund, furnished one half by the state of Connecticut and one half by the United States.

This program was at once put in effect in Hartford County on an experimental basis, and after a month's trial during which time a panel of doctors and hospitals was set up it was established on a statewide basis. At the time this paper was written too short a period has elapsed to speak of accomplishment.

It will be interesting and instructive to see how this works out now that it is on a statewide basis, but I am sure that the same enthusiastic response to a need that started this work will carry it on.

We in Connecticut believe in state rights. We will welcome all governmental advice and help that is offered, but we believe that with the earnest and hearty cooperation of the state agencies, the medical societies and hospitals and with the backing of the manufacturers, the compensation commissioners and labor that we can take care of our rehabilitation problem without regimentation.

#### DISCUSSION

DR. WILLIAM ARKWRIGHT DOPPLER, New York: In Connecticut they are quite successful in handling the tuberculous. Have you run across any situations of that kind?

DR. JAMES H. BIRAM, Hartford, Conn.: We have in the plant now fifteen or twenty known cases of tuberculosis.

DR. HUSSEY: Can you say anything about this work in relationship to the waivers that Connecticut is so noted for in its compensation act?

DR. BIRAM: If we couldn't take waivers on some of these conditions we wouldn't feel that it was fair to the company to take these people in. Maybe we do run high in waivers, but most of the sizable plants now have a medical director and a medical staff. They make preplacement examinations.

DR. HUSSEY: What force does the waiver have actually, if there is a test of it in a legal procedure?

DR. BIRAM: There never has been a test of the waiver in Connecticut in all the years during which it has been in operation. I don't see why a waiver isn't perfectly justifiable. When you have a plentiful choice of men it may not be, but when you are down to the dregs, as we are in Connecticut, I think a waiver is perfectly justified.

DR. HUSSEY: It is my understanding that the whole waiver plan in Connecticut was really initiated by labor.

DR. BIRAM: It was.

DR. JOSEPH H. CHIVERS, Chicago: Is there any implication on the part of manufacturers that a man will be given a job if he submits to the recommended treatment?

DR. BIRAM: Yes, we go over the man to be sure that he won't be turned down for any other cause and we obligate ourselves to give him a position in the plant. Of course, later on after this is over, it might not be possible to do that, but at the present time as soon as the man is said to be ready for work we look him over and see that he is and if so he comes to work the next day.

MR. H. E. CORFVONT, Lansing, Mich.: Do you have any state agency other than rehabilitation or a local agency that will be responsible for operative care or medical care of adults?

DR. BIRAM: Not that I know of.

MR. MARTIN DAILEY, Brooklyn: Is there any provision in this program for persons who have been employed for some time and who have had breakdowns or is this just for pre-employment?

DR. BIRAM: This is just preemployment. A great many of these men have been employed and have left one job and are seeking a higher paid job. We take anybody who is capable of rehabilitation and see what can be done with him.

DR. R. L. NICHOLS, Chicago: It has been said that people with major disabilities make better employees from the point of view of absenteeism than the normal. Have you found that true or not?

DR. BIRAM: I agree with that. Absenteeism in the factories now runs somewhere between 8 and 12 per cent. Labor turnover varies from 8 to 12 per cent, practically 100 per cent a year. These semidisabled people stay at work and do a good day's job and are thankful for their jobs. The average employee today if he can get 10 cents an hour more will leave you and go somewhere else.

DR. HARRIS POWERS, Manchester, N. H.: Is there any question of aggravation being brought up afterward?

DR. BIRAM: A waiver stands as far as any aggravation of the condition is concerned. You take a waiver on a hernia and the waiver will stand whether the hernia strangulates or not. We are not responsible for it.

CHAIRMAN HUSSEY Connecticut is the only state in the Union that has such a satisfactory waiver law. Is that true?

DR BIRANI The compensation act in Connecticut works very well. We have high grade commissions. It is the only court I have ever been in in which I thought any attempt was made to obtain justice.

DR C F YEAGER, Bridgeport, Conn. In the eight years that I have been affiliated with the Remington Arms Company we have never known an instance in which advantage of this waiver was taken. However, I do feel that we would have a moral responsibility in case of aggravation, if not a legal one and I am sure that we would take care of it.

### Psychiatric Problems in Rehabilitation

DR ALFRED P SOLOMON, Chicago. If the physician decides that the patient is feigning or shamming, that his simulation is conscious or deliberate, he recommends that the patient be discharged from further compensation and medical care and that he return to his work. In most instances he does not anticipate that his attempted disciplinary action will immediately rehabilitate his patient.

It is a human trait to want to take things easy, to drop everything and take a long rest. The continuing disability payments in psychologically protracted convalescences encourage a satisfaction of this biologic urge. The alternative, a lump sum settlement, removes the parentalistic figure. However, paradoxically, the anticipation of this lump sum settlement often motivates the development of a protracted convalescence.

Large sums of money are spent each year for lump sum settlements when a diagnosis of traumatic neurosis has been made. I raise the question as to whether a much smaller sum of money could not be spent on a method of rehabilitation more psychiatrically sound both for the patient and for society as a whole. In this paper I will propose such a method. The method has four major divisions:

1. Psychologic understanding of the patient's character, in order to avoid emotional trauma to his personality during all his professional and industrial contacts.

2. Psychiatric evaluation of the patient's emotional problems, both related and collateral to his accident, in order to clarify the dynamic meaning of his attitudes and so that the patient may be made to understand his own behavior.

3. Careful supervision of all the psychologic aspects of his return to employment, so as to avoid maladjustment and if possible improve his previous work adjustment.

4. Instituting at the first evidence of psychologically protracted convalescence of a recreation and exercise therapy program supervised by psychiatrically trained physical directors.

With psychotherapeutic interviews alone, the average patient will require additional therapy. It has been my experience that because of the frustrations involved these patients will cooperate in a treatment which offers them diversion, recreation and play, good body development and amiable companionship, even if the acceptance of that treatment denies the further existence of the convalescence.

For the past thirteen years I have used the full facilities of a well equipped gymnasium, such as the Lawson YMCA, for this treatment. Best results were obtained with nonresidents of Chicago who lived at the Lawson YMCA, confirming a usual psychiatric observation that patients more readily recover away from the influences contributing to their behavior. The luxurious atmosphere of this particular institution is far above the average standard of living of the workmen I have treated. This enables the employer to be seen as one who is generous rather than one who takes and deprives. The patient is carefully instructed in the indications for and the nature of the treatment. His cooperation will depend on his confidence in the assisting therapist as well as that of the physician. An athletic companion is selected who must be skilled in sports, a leader, decisive, resourceful, tolerant, sympathetic to the patient's resistant behavior, interested in a therapeutic result, able to comprehend a psychologic explanation and to follow orders. He should be

able to motivate the patient by gaining his confidence, maintaining control of the situation at all times, be able to engage in competitive games, winning or losing at will, be able to teach the patient athletic skills, and to show enthusiasm and gratification at the patient's successful performance. On sight seeing excursions, on long walks in the parks on visiting places of interest and amusement, he should be friendly, companionable and appropriately enthusiastic.

The patient should be introduced to the regimen with emphasis on play and recreation. As soon as he develops skill in a given sport he should engage in competitive games. The companion should play the game as fast as the patient's physical condition and ability permit. If the patient favors the right arm the companion as in the case of badminton, should direct the play toward that extremity without making this apparent and also avoiding pressure of this type if the patient is angered. The periods of activity should be short at first, later increased, with rest taken at the first sign of fatigue or physical complaint. The patient should not be coerced into activity. The companion should accept the patient's complaints at their face value.

The patient should be forewarned of the usual exercise muscle soreness concerning which he will usually make an 'addo'. The exercise therapy on the stationary bicycle, rowing machine, mat and pulleys are added later. The patient will not accept these as readily as those involving the pleasure of the game. To him these are tests.

The companion should intelligently present these activities as muscle training exercises beginning with muscles not involved in the patient's complaints. Swimming will be found to be a favorite sport. Massage or heat therapy may follow the workouts to advantage and early in the treatment rest in bed. The evenings should be devoted to supervised amusement and entertainment.

The physician should see the patient at his office for psychotherapeutic interviews, the purpose of which is to encourage the patient through friendly understanding and if possible psychologic understanding, to engage in more and more activities. As the patient begins to enjoy the regimen and notes the general increase of body health, he will cooperate to the point of recovery. About six weeks is the average duration of treatment necessary to rehabilitate the patient. Some patients will use the gymnasium as a scene for indicating the alleged grave nature of their disability. These patients may be refractory to this therapy or require a much longer time to treat.

It is my recommendation that private capital or the government equip a large gymnasium for competitive sports, swimming, occupational and physical therapy, staffed by psychiatrically trained physical directors and occupational and physical therapists.

The problem of rehabilitation is a psychiatric one. Just as Freud acquired an understanding of human behavior through the study of the psychoneurotic patient, a study of psychologically protracted convalescence offers a contribution to the understanding of the total problem of rehabilitation.

### DISCUSSION

DR PERRY ROGERS, Chicago. Stopping of compensation sometimes serves as good treatment for a neurosis. It requires nice judgment to anticipate which patient it will make better and which patient it will make worse. The industrial doctor has an additional hurdle to get over before he can establish a satisfactory relationship with a patient arbitrarily sent him by an employer. The doctor can surmount this primary obstacle only by an additional amount of sympathy, by a more thorough examination and by more careful attention to all details of treatment than the workman has been accustomed to expect from the doctor of his own choice. It does not take a physician trained in psychiatry to spot the patient who needs this special kind of rehabilitation. The actual management of the treatment, the prescription and the supervision of the treatment require the most skilled psychiatrist, but the skill to select the proper patient may be developed by any doctor or nurse or claim adjuster or even by an inquirer. Dr Solomon's plan of treatment works. I have had him cure a sufficient number of my

patients most of them compensation claimants, to know that he is not fooling and to know that money spent on such treatment is saved many times in disability awards. Something new has been added in the field of analytic psychiatry. The modern psychiatrist can put his finger on the source of the disability in one or two consultations, with perhaps some further study as treatment proceeds. Under the direction of such a psychiatrist this type of rehabilitation can be effected outside of hospitals and with the assistance of technicians at relatively little cost.

DR B B REEVE, Chicago. What would you recommend with employees who have these tendencies? Is there anything you can do toward preventing further trouble?

DR ALFRED P SOLOMON, Chicago. Lump sum settlement is a form of psychotherapy. Patients do return to work when we settle their claims. In industrial practice psychoanalysis promotes the understanding by the patient of the reasons for his behavior. The physician must not react to the patient's hostility with anger, with contempt or with irritation. The doctor must recognize that the patient's behavior, including his symptoms, is a protest against something, and he must try to discover what that is and help the patient understand it. The doctor equipped with this understanding both of himself and of his relationship to the patient and the patient himself is ready to use such therapies as I have recommended, which include giving attention, interest, sympathy, understanding, exercise and recreative programs. The patient who is maladjusted at work because of grievances following an accident has to be handled individually. Hostility directed toward the employer is present in our social system and manifests itself in many other ways than in behavior after an accident.

MR THOMAS N BARTLETT, Baltimore. Have you been able to determine how length of treatment may be affected by the injury received?

DR SOLOMON. Often the most protracted convalescence follows a minor injury. If a person has a severe injury his gratification over the fact that he has recovered goes a long way, particularly when he has been given the necessary amount of adequate attention, toward rehabilitation. Whether it is possible to determine by a psychiatric interview how long it will take for the patient to return to work depends on several factors. It depends on the personality of the individual and whether the structure of his personality is such that he is a rehabilitable individual. Many of these patients are simply looking for justification of their behavior or for interest or consideration. If that is given to them they do very well. There are others whose emotional problems are so grave that the prognosis is not so good and, of course, this whole question is determined by psychiatric experience. Every physician is able to do this if he will begin early and approach all patients in this manner.

MR BARTLETT. What is the average period for recovery or is that too flexible?

DR SOLOMON. From six weeks to two months or three months has been adequate for the average case. Industrial people are not yet ready to spend a great deal of money or time on these cases.

DR DAVID NEILL INGRAM, Houston, Pa. Do you ignore entirely the constitutional adequacy of the patient whom you have to treat or do you take that into consideration too?

DR SOLOMON. Many patients of the type I am talking about come to us with a syndrome which could be classified psychiatrically as neurasthenia. The symptoms are fatigability, exacerbation of their complaints when they do work or even think of going to work, and because they are dependent individuals they tend to get weaker because they don't work. Individuals do differ in body build and endocrine makeup. I don't believe that the diagnosis of neurasthenia is a constitutional characteristic of an individual who does hard work.

#### Physical and Occupational Therapy in Rehabilitation

DR JOHN S COULTER, Chicago. Rehabilitation is the planned attempt through the use of all recognized measures under skilled direction, to restore those persons who because of disabilities do not assume to the greatest possible extent and at the earliest

possible time that place in the productive stream of society which they are potentially capable of assuming. This is the definition of rehabilitation that was approved by the Council of Rehabilitation which met in New York in 1942. This council meeting was attended by representatives from practically all the societies concerned in rehabilitation.

In the present war the Surgeon General of the Army has left the physical therapy of the injured soldier in charge of a female physical therapy aide. This work is ostensibly supervised by a board of regular army medical officers of the highest type but who have not had recent experience in physical and occupational therapy or in rehabilitation. A recent bill passed by the House of Representatives and the Senate and signed by the President gave to physical therapy aides in the army the same relative rank as nurses but omitted occupational therapy aides. Apparently there is nothing in the set up for a qualified medical officer to be in charge of rehabilitation.

Rehabilitation should start at the bedside of the injured patient and should include physical therapy, occupational therapy and later vocational rehabilitation. The injured patient who has received surgical treatment should be given physical and occupational therapy at the bedside. As soon as possible he should be sent to the department of physical therapy and to the curative workshop of the occupational therapy department. Rehabilitation of the patient starts at the bedside.

The yardstick for the evolution of surgical care should be the rehabilitation of the injured person, i.e. his restoration to the greatest possible extent and at the earliest possible time to that place in the productive stream of society which he is potentially capable of assuming.

The Manual of Physical Therapy originally published in *War Medicine* is now available as an American Medical Association pamphlet, price 25 cents. It was edited by the Council on Physical Therapy of the American Medical Association and the National Research Council. The Manual of Occupational Therapy soon to be published in *War Medicine* will likewise be published as a small pamphlet by the American Medical Association. It was written by a committee of the American Occupational Therapy Association and edited by the National Research Council and the Council on Physical Therapy of the American Medical Association. Physical and occupational therapy we believe are the first two steps in a rehabilitation program of the injured or sick person. The manuals discuss the use of physical and occupational therapy in strains, sprains, muscle injuries, dislocations, fractures, peripheral nerve injuries, head injuries, arthritis, infantile paralysis, heart conditions, tuberculosis, spastic paralysis and nervous and mental conditions.

The Council on Physical Therapy, aided by a committee of prominent surgeons and the American Association of Limb Manufacturers, recently published "A Manual of Amputations." Here again the value of physical and occupational therapy in amputations is shown.

The Council on Physical Therapy will shortly publish the fourth edition of the Handbook of Physical Therapy. This handbook emphasizes the place of physical therapy in the rehabilitation of the sick and the injured. It is used as a textbook in many schools for physical therapy technicians and in many medical schools.

The Council on Physical Therapy can supply mimeographed designs to make apparatus for electrotherapy and for exercises. The Council also publishes yearly a free pamphlet "Apparatus Accepted" which lists the apparatus which is safe and effective. Apparatus is not the important element in physical and occupational therapy in rehabilitation. Personnel is.

No program of rehabilitation either in our armed forces or in civilian life will be effective unless it is directed by a physician. He must be solely interested in the rehabilitation of the patient and not in furnishing to the insurance companies or courts reports on the patient's condition. The physician in charge of rehabilitation is in a most favorable position to study the human organism in its entirety, both as a living mechanism and as the essential element of human society. He and his technicians have time to discover and to help control the social influences detrimental to the sick and to the injured.

The Army is placing physical therapy physicians in charge of physical therapy departments but there is no provision for him to be in charge of rehabilitation. Few occupational curative workshops have been established. Physical and occupational therapy aides in the Army should meet the requirements set up by the American Registry of Physical Therapy Technicians at 30 North Michigan Avenue, Chicago, and the Registry of Occupational Therapy Technicians at 175 Fifth Avenue, New York. No rehabilitation program can be successful without the hands and brains of a good technician or aide.

#### DISCUSSION

DR JAMES H. BIRAM, Hartford, Conn. We return to work the next day 75 per cent of all patients with Colles' fractures and over 50 per cent of patients with Pott's fractures. We return to work on the same day, within an hour, 75 per cent of all of our patients with severed extensor tendons and the next day practically all of our patients with severed flexor tendons. The majority of our injured employees go back to work and work cheerfully and painlessly and have minimum disability as the result of physical therapy and occupational therapy.

DR HUSSEY. We have in Baltimore two curative workshops and physical therapy departments, one in the Johns Hopkins Hospital and one in the University Hospital, but we cannot get industrial injuries to those places for treatment.

DR D. J. GALBRAITH, Toronto. Rehabilitation starts immediately after the accident. In all serious accidents we attempt to have our rehabilitation officers get in touch with the patient as quickly as possible. Their interest and contact is maintained until the patient is back at work or has been retrained, reeducated and compensated for his remaining disability. We have perhaps a little advantage in that we can put the men back on a wage loss basis. We induce the employer to pay them their full wages, tell them how well they are doing their jobs, and we pay the employer the difference between what they earn and what their regular wages are. Early contact on the part of our rehabilitation officers does tend to prevent the development of a psychosis. Start early before the claimant begins to wonder how he is going to support his wife and family. We have set up a physical and occupational therapy division, treating about 150 patients along the lines Dr Coulter has indicated. We lack continuous control of the patients. We have to put them in boarding houses and so lose control from 5 o'clock at night until 8 o'clock the next morning, and that is a very important time in the handling of these cases. Many of them are not accustomed to the city. They find many ways of spending the time that are not beneficial to their health.

DR HUSSEY. I am impressed in Baltimore with a considerable amount of competition between the occupational therapists and the physical therapists. Is that something peculiar to our geographic location or is that something that one encounters generally?

DR JOHN S. COULTER, Chicago. In Chicago we have physical therapy and occupational therapy under the same doctor and we don't have competition. The Council on Physical Therapy thinks of occupational therapy as a part of physical therapy.

#### The Future of Rehabilitation

MR TERRY C. FOSTER, Washington, D. C. Few people are aware of the size of the problem of rehabilitation and its social and economic implications. There are in this country eight million people who have physical disability of such nature and degree as to cause them difficulty either in getting a job or in holding a job. Six million of them are normally in employment but two million for one reason or another are unemployed. Many drop permanently out of the labor market, but the pool is kept at a fairly constant level from a number of sources: (1) those currently disabled in industry, automobiles, home, other accidents, and from disease and congenital causes, (2) young disabled persons who reach employable age, and (3) those disabled as a result of military operations. The annual increment from these sources is now at the rate of well over a million persons a year. Thus the minimum job of a rehabilitation service

in this country is the rehabilitation of one million persons, to say nothing of another million from among the six million who are normally employed but who drop out for one reason or another. These two million persons not only are not producing, they are consuming approximately one billion dollars a year of the productive effort of others.

The vast majority of people in this country earn their living through work. The ability of a person to work and to get a job represents the economic foundation of his life. Any condition which affects the economic foundation of two million people affects the economic welfare of the nation. In the present manpower situation it is sheer folly not to make them employable and put them to work as quickly as possible.

The program which is now being considered by Congress would provide for those disabled in the military and naval services as well as for civilians. It would provide any service necessary to get a person into a job and keep him there. It would be a comprehensive program, and it would be one strong enough to meet present and future needs. But there are two obstacles which must be removed if any rehabilitation program, present or future, is fully to fulfill its potentialities as a social instrument. The first obstacle is attitude.

In the past, most employers have had the idea that a disabled worker is less efficient and more prone to accident than the physically normal and have taken on the handicapped only when the physically normal were unavailable. They have failed to realize that a disabled worker who is properly matched with a job is a safer risk than a physically normal worker improperly matched with a job. They have used physical examinations for the exclusion of the physically imperfect rather than as one of the measures for the proper placement of workers. The present manpower shortage is compelling the employment of the handicapped, but the idea of using physical examinations, tests of aptitude and personality inventories as a guide to putting the right man in the right job has not taken hold. Not only is there the inefficient use of labor but also large numbers of urgently needed workers in our war production industries are being injured and crippled.

If employers would accept the principle of proper matching of workers and jobs there could be no valid reason for the exclusion of handicapped workers. A properly placed handicapped worker is not handicapped in performing a job that is suitable to his physical condition, aptitudes and temperament. Obviously there are large numbers of the handicapped who are physically unfit and should not be accepted for employment. However, most of them can be made fit through proper rehabilitative procedures. That is the job of the rehabilitation service. Industrial surgeons should use their influence with management to establish a more scientific method of placing workers in industrial plants and a more receptive attitude toward the employment of the handicapped.

The second obstacle is the inequitable provisions of second injury clauses in workmen's compensation laws in most of the states. With few exceptions the alleged workmen's compensation laws in this country are nothing more than employer liability laws. Some of them, while quite liberal to employers and insurance carriers, are positively vicious in their effects on those injured in industry and on the other taxpayers in the community. The medical benefits are farcically small, the disability benefits are insufficient and, worst of all, the second injury clauses serve as effective barriers to reemployment.

In several states a handicapped worker has the choice of signing a waiver to his right to compensation in the event of a second injury or of not getting a job. In other states where employers might be willing to hire handicapped workers they cannot afford to do so because under the compensation laws they would be liable for the total results of a second injury, the cost of which in the event of permanent total disability would run into big money.

Do you see what these things mean to the injured worker and to the other taxpayers? First, when the medical benefits are small, the injured worker is obliged to expend a considerable part of his compensation benefits on medical care. When the remainder is gone his family or the taxpayers of his community

must take care of him because the second injury clause in his state workmen's compensation law establishes an effective barrier to his reemployment. Furthermore, in some states even where medical and compensation benefits are more nearly adequate there is neither encouragement nor incentive for the injured worker to accept the opportunity of rehabilitating himself—nor is there any penalty for failing to do so. The result is that many beneficiaries of workmen's compensation are simply pauperized.

My denunciation of the effects of these laws should not be interpreted as advocacy of their repeal. It is not. My plea is that they serve the purpose for which they were originally conceived—and I assure you that they were not conceived simply as a device for limiting the liability of the employer or insurance carrier. They were conceived for the conservation of the worker and as a means of distributing equitably the financial burden of industrial accident and disease.

The inequitable provisions of some of these laws in a number of states are seriously interfering with the recruitment of labor in war production plants. The legislatures of most of the states are now or will be in session during the next few months. May I urge that you interest yourselves and the employers with whom you may be associated in amending these laws in such a way that they will serve the purpose for which they were conceived. Let's make them real compensation laws, laws which not only will protect the employer and compensate the disabled worker but will encourage and give incentive to the injured worker to accept the opportunity to rehabilitate himself. If this is done it will contribute now to the war effort and it will greatly facilitate the rehabilitation of the thousands who are being injured in the war—a hundred thousand for each year of our participation.

Two years ago I made a proposal that the medical profession, the workmen's compensation agencies and rehabilitation officials appoint committees to get together and decide on a program in respect to the problems in which we have a common interest. I still think that it would be a good idea.

#### DISCUSSION

**DR. HUSSEY:** At one of the meetings of the International Association of Accident Boards and Commissions Mr. Foster presented a paper in which he summarized states in which the industrial accident commissions were cooperating with the vocational rehabilitation bureaus and those which were not. The ones that were cooperating in any effective manner were extremely few. My unfavorable remarks about Maryland a moment ago with reference to the use of the curative workshop clinics in physical therapy is just reversed about the vocational rehabilitation. We have in Maryland, in the industrial commission, a full time representative of the state vocational rehabilitation bureau. He reviews all the claims that come in, and he is able to follow these individuals from the very beginning. That is the type of work that the industrial commissions will have to do if we are going to have success in this program as far as industry is concerned.

**MR. EDWARD I. FRIEDMAN:** Providence, R. I. Prior to leaving Rhode Island to come here I was instructed by my director to promulgate two drafts of legislation to carry out some of the suggestions which have been made at this meeting. When I get back I shall have to draft a bill to set up a curative center fund and also a second injury fund. I have been vitally interested in these two particular propositions as an administrator. It has been one of the greatest problems that we have to deal with, particularly low back cases, head injury cases and maladjustment cases. Dr. Galbraith is too modest. He has a system of which he can be proud and that we should copy. When we attempt to set up this legislation, his jurisdiction is going to be our model. We are the first state in the United States to adopt a cash sickness fund, so that now when a person is unable to work by reason of unemployment, sickness or accident, in the state of Rhode Island, after April 1, 1943 we will see that he is taken care of. I hope that by the adoption of a second injury fund and a curative center fund we will further supplement the work that we have been doing.

JANUARY 13—MORNING

**DR. JAMES S. McLESTER,** Birmingham, Ala., Presiding

## SYMPOSIUM ON NUTRITION IN INDUSTRY

### Criteria for the Evaluation of Nutrition Experience in Industry

**DR. FRANKLIN C. BING,** Chicago. This article appears in full in this issue, page 813.

### Progress in the National Program on Nutrition in Industry

**DR. ROBERT S. GOODHART,** Washington, D. C. This article appears in full in this issue, page 823.

### Current Nutritional Activity in Industry: A Review and Appraisal

**DR. GEORGE R. COWGILL,** New Haven, Conn. This article appears in full in this issue, page 817.

#### DISCUSSION

**DR. L. B. PETT,** Ottawa, Ont. The question is "What is a suitable length of time for lunch in a large industrial plant?" I am concerned with nutrition in industry in Canada, and a survey of Canadian industries shows that lunch periods vary from twenty minutes at the shortest to an hour and thirty minutes at the longest. We have recommended that not less than half an hour should be the lunch period. There are circumstances, of course, that modify this. I think the most important one that we have found in Canada depends on the size of the plant and whether the workers eat in a cafeteria, bring their lunch boxes or go home for lunch.

**DR. GEORGE R. COWGILL,** New Haven, Conn. I have this question: "What is the relationship of adequate food and vitamins to industrial hazards such as benzene or lead?" I am not competent to discuss the benzene poisoning problem. Regarding lead, an important factor affecting the absorption of lead is the presence of calcium in the diet. Experiments indicate that a liberal supply of calcium in the diet tends to cut down on the absorption of lead. From that point of view, a food like milk should be valuable for preventing the absorption of lead by people exposed to that metal. Here is another question: Is it true that milk has no benefit as an antidote for lead poisoning?" As a preventive measure or something that would tend to cut down on the absorption of lead, I think that milk would be regarded as having some value because of the calcium content. Another question is "When should an employee on the 3-30 p.m. to 12 o'clock midnight shift eat his meals? Should he eat a heavy meal before going to bed at, say, 1 a.m.?" I think probably some of the industrial physicians who have had actual contact with that problem would be better able to answer this question. I should say that much would depend on whether the individual plans his eating of his meals with the entire day in mind. Dr. Bristol tells me that the telephone company frequently has trouble with young women employees who want to quit because they are on some unusual shift. They say they cannot eat right, and the problem is solved by educating those people in the matter of getting an overall proper intake of food. I should think that it would be difficult to lay down any definite rule here. If a person is going to work on that shift and eats heavy meals at the end of the day, as most of us do at the end of our day, then it would be logical to eat a heavy meal around 1 a.m., but I doubt if one can set up rules that will cover all cases.

**DR. L. B. PETT,** Ottawa, Ont. I am going to finish the questions that I have here. "Do you believe a survey in any given industrial concern of the food habits or nutritional status of the worker is essential prior to an educational nutrition program?" And along with that is a second question that is closely allied: "Of how great value would be a survey of foods eaten by workers as reported by them over a period of a week?" I will have to confine myself to certain dogmatic statements. I do believe that a survey prior to an educational nutrition program in industry is essential. It may not be essential in the given industry concerned, provided a survey has been conducted in a representative industry, but the method of procedure that we

are adopting in Canada is that a survey has to be made in order to influence as little as possible the food habits of the people. We find that a coal miner in Alberta, for example, a western province, has not the same dietary habits as a coal miner on the east coast, in Cape Breton, Nova Scotia, and one cannot educate him in nutrition on a sound basis, on a purely theoretical basis, unless one takes into consideration his food habits. The next question I have here is "What effects do caffeine containing foods have on workers?" We have to distinguish two aspects of this question. There is the implication of the effects due to caffeine and then there are effects due to other factors, such as sugar. There are certain other considerations that have to be given this question, such as whether the caffeine containing food, let us assume it is a beverage, is a warm or a cold beverage, and what differences will be noted in each case whether it is warm or cold. I have a suspicion that effects from caffeine containing foods are for the most part not due to the caffeine they may contain. That is not to say that caffeine would not have an effect in itself, but there are certain other effects associated that may have to be considered and in general I am inclined to believe that these are deleterious. They are injurious. I particularly mention the sugar that is consumed at the same time. Under certain circumstances in a diet otherwise marginal with respect to thiamine, there is no doubt that the consumption of sugar may actually increase rather than decrease fatigue. A final question is concerned with "The excessive use of alcohol in relation to nutrition and energy needed in industry." Perhaps because I come from Canada I may point out that we are launched on a campaign right now, officially sponsored by the government but not directly associated with my department, to reduce the consumption of alcohol specifically in industrial areas.

DR. RUSSELL M. WILDER, Rochester, Minn. Our chairman has given me a group of questions which can be answered together. One of these is "What are the objections to soda pop?" Dr. Pett has already given his objections. In connection with that subject the Council on Foods and Nutrition of the American Medical Association has recently published an article on the subject of sweets and carbonated beverages which represents the views of that council on this subject. The other questions are "What can be done to counteract the sales of nonvitamin soft drinks in my plants?" "Would it be desirable to maintain high levels of blood sugar during the day? Is there any good evidence that the taking of sugar between meals reduces fatigue?" and finally "What is the importance of an adequate breakfast and of what should it consist?" I propose answering those questions together.

There is a condition known as hypoglycemia, which is more or less the antithesis of diabetes. This low level of the blood sugar is poorly tolerated. There is a normal mechanism for maintaining a blood sugar level that does not go below 0.07 Gm per hundred cubic centimeters of blood and does not rise above 1.2 Gm per hundred cubic centimeters. When the blood sugar goes above this, as it does in diabetes, we may have some effects. If it goes higher than the threshold level of the kidney we find sugar in the urine. Moderate elevations of the blood sugar, as far as I can see, are of little harm, although the severe elevations that accompany diabetes represent something serious. Now the opposite to that, the low blood sugar, is definitely associated with weakness of the muscles and with increased irritability and, if it goes lower than that, with definite mental symptoms and finally loss of consciousness.

There is a disease that is associated with an increased supply of insulin to the body. It is represented by the development of minute tumors in the pancreas, tumors of the islands of Langerhans, producing excessive amounts of insulin, and that disease is a serious one because it is associated regularly with severe hypoglycemia. However, that disease is a relatively infrequent disease, and for every patient with that disease there are, I think, hundreds of patients who periodically have low blood sugars that are, you might say, functional in origin. There may be a nervous element to the production of some of these low blood sugars, but also that tendency to develop low blood sugars between meals is one that may be stimulated, I feel sure, by eating high carbohydrate meals. It has been shown definitely that if one gives two doses of sugar, one following the other, the

elevation of the blood sugar that is produced by the first dose is not observed in the second dose, and that the fall of the blood sugar after the dose of sugar is greater after the second dose. This hypoglycemia developing between meals is the reason that so many people I think, are turning to soft drinks and so many industrial workers are finding that feeding sugar between meals helps to tide these people along and to keep them more effective. The objection to giving sugar between meals that way is that one doesn't provide with it the vitamins that are needed for its own utilization. One throws on the rest of the day's intake of food the burden of providing those vitamins and increases the likelihood of the individual's suffering from a chronic or a mild hypovitaminosis. In some cases I think severe grades of hypovitaminosis have been produced by excessive consumption of sugar. Certainly the more of this drinking of soft drinks between meals or eating of rich carbohydrate foods such as candy bars, at those times of the day when one feels weak and empty, the more likely one is to need to continue to do so, and for that reason, as Dr. Pett said, there is some reason to think that eating sugar instead of correcting fatigue may lead ultimately to an increased sensitivity to fatigue. I agree with him in that statement.

We have found clinically at the Mayo Clinic, and others have made the same observation, that the best way to treat persons who have this tendency to low blood sugar between meals is to take them off a high carbohydrate diet and put them on a high protein, high fat diet, with rather considerable restriction of carbohydrate and particularly with restriction of sugar. They may have starches because starches are a little slower to digest. These ultimately may end up as sugar, it is true, but they enter the body less rapidly and they are associated with a less acute level of the blood sugar. They raise it less slowly than when sugar is taken as sugar and they raise it usually to a lower level, and the result is that the fall afterward is more gradual and to a less extremely low level. One of the reasons in my opinion why we are seeing more of the type of weakness in people occurring at 11 o'clock in the morning and at 4 o'clock in the afternoon and leading up to wanting something sweet to eat at those times is that the American people have gotten out of the habit of eating a good breakfast and a good lunch. The objections to eating, as so many women do and some men, a little carbohydrate in the form of fruit juice and then some jam on a piece of toast and a cup of coffee with sugar in it and letting that represent the breakfast as a whole are two. In the first place you throw sugar into the empty stomach and into the blood rapidly and you get this effect that I have described. In the second place, whenever you skimp on one meal you have to depend on the other meals to provide you with the vitamins and the other nutrients that you require for a balanced diet, and as many people not only skimp on their breakfasts but also skimp on their lunches, it throws the whole burden of taking care of the nutrition on the one evening meal, and unless you choose that meal with greater wisdom than most people possess, you are among those who are in this borderline of nutritional deficiency.

I was asked what I think a breakfast ought to contain. I think a breakfast ought to contribute its share of the various nutrients required for the day's nutrition. I think a breakfast ought to start off with a source of vitamin C and some sugar, if you wish, in the form of a fruit juice, a very satisfactory way of breaking the fast, true enough, but not a satisfactory breakfast as a whole. Then I think you ought to have your share of the B complex vitamins in that breakfast, which can best be obtained by having a satisfactory portion of a whole grain cereal, breakfast food or bread or lightly toasted bread remembering that heavy toasting destroys the vitamins in bread, lightly toasted bread or real wholewheat bread or enriched bread. With the carbohydrate that you get from the fruit juice or the tomato juice you ought to have some fat, because fat delays the emptying of the stomach and thereby prevents the sugar that you will get from those other sources from entering rapidly into the blood stream and, therefore, some butter or properly enriched oleomargarine with your toast or with your bread. Cream we could dispense with. It is a luxury food more or less. If you are not getting the butter, by all means have the cream, because it is a fat but more important than



cream is whole milk. The European habit of drinking *café au lait* is an excellent one because that is a way of consuming milk. Coffee in itself has little to be said for it as a nutrient. Then there should be some source of protein. I think that it is desirable to have an egg for breakfast, not only because of the fat but also because of the protein content, or an equivalent portion of meat is a desirable thing in the breakfast. Now then if to fill up you want to add some sugar to your coffee or some jam to your bread there is no harm in that at all, because you have the other things to take care of it and you are taking it with a meal so that it won't quickly enter the blood and produce this effect that I have talked about before. Such a breakfast will do much, I think to prevent this craving that people have for these sweet drinks between meals and will cut down the consumption of sugar between meals, particularly if such a breakfast is followed by a satisfactory lunch, a lunch which also contributes its share to the day's nutrient requirements. I think it is important that the wives of workers learn the type of breakfast they ought to serve their men.

Now there is one more question that I was asked to discuss. What can we reply to people who ask about the general distribution of vitamins in industry? I have rather felt that this question was answered in Dr. Bing's paper, in which he referred to another publication of the Council on Foods of the American Medical Association, which also can be obtained on request by writing to him, the Secretary of that Council, at the A. M. A. offices. At the present time the feeling generally among nutritionists and these advisory bodies that are dealing with these nutrition problems is that it is not wise to depend on vitamins alone to effect what we think ought to be done to the nutrition of workers, because there are other things besides vitamins that are lacking in these diets. On the other hand the subject is still open. There are certain things that are more likely to be missing in diets than others. Among them are vitamin B<sub>1</sub>, vitamin B or riboflavin, and I imagine no serious harm would be done by adding those to the workers' diets even though you added nothing else. On the other hand, that is not the purpose of our campaign, and it also is known that one may have an adequate supply of these vitamins and have other vitamins available synthetically and still suffer from symptoms that are similar to symptoms that develop when thiamine is missing. For instance, as Dr. Sydenstricker showed not long ago, a biotin deficiency produces signs and symptoms very like those resulting from a deficiency of vitamin B<sub>1</sub>, or a loss of thiamine, so that while it may be desirable under certain circumstances to administer vitamins generally to the workers in the plant, it is not the best way to go about the solution of the problem and it is very doubtful whether it will completely solve the problem.

DR. McLESTER: Dr. Wilder made out a case for protein because this foodstuff is absorbed more slowly and the boost we get from it is more sustained than from other foodstuffs. I would go him one better and make it two eggs at that breakfast.

DR. ROBERT S. GOODHART, Washington, D. C.: The first question that I have is "What are the criteria for judging the adequacy of a lunch for workers?" We have recommended a standard lunch, that is, a lunch that provides at least one third of the day's nutritive requirements. Those requirements that we refer to are the dietary allowances of the Food Nutrition Board of the National Research Council. That is general. Of course, I suppose what the questioner is interested in is a specific outline of how any individual physician could judge whether this diet is adequate or not. We might say that there are four foods which the inspector or the physician might look for on the lunch to see whether or not the diet is adequate. First is a meat or meat alternate, and a meat alternate includes all the varieties of meat and cheese, dried beans, soybeans and so on, the legumes. Second, two vegetables, one green or yellow. Third, milk either as a drink or as a milk dessert or milk as a soup. Fourth, the use of enriched or wholewheat bread and butter or fortified oleomargarine. A possible fifth—I make it possible—is a source of vitamin C on that diet.

We know that, according to the usual methods of the preparation of foods in mass feeding, cooked foods are not very dependable sources of vitamin C. I don't think we would be safe in relying on any cooked food as a rich source of vitamin C, therefore you would look for tomato juice, tomatoes, raw

cabbage or citrus fruit as sources of vitamin C. I made that a possible fifth item because that is one thing that most of us who take time for breakfast and can afford to do so manage to get largely in our breakfast or can get at home. However, it is unsafe for us to expect that the industrial worker will do that. We know that the great majority of workers take the inadequate breakfast that Dr. Wilder was talking about, perhaps toast and coffee, Danish pastries and coffee, or doughnuts and coffee. That is the workman's breakfast, and if you rely on his obtaining vitamin C in that breakfast you are going to find that he will develop evidences of inadequate intake of vitamin C.

We set up a standard of one third and then we did a little figuring on our own to find out how difficult it is to meet this one third, and we found that it is a very simple matter to make up diets which meet one third of the daily requirements. In fact the meals that we made up came closer in all respects to meeting one half, and we found that it is quite easy with two meals, that is, an adequate lunch and then a light refreshment period in the mid-afternoon and mid-morning, to meet two thirds of the daily food requirements in every respect except calories and even there it is not difficult to make up the extra calories. We are most anxious that plants shall not stick to the one third idea but approach the two thirds as nearly as possible, because we know that there are many conditions—let's take again some of these big plants, ordinance plants and aircraft factories that have been placed out in fields. The people have to go 30 or 40 miles to work. They cannot get a good breakfast. Perhaps they live in trailer camps or they live in a housing development and they cannot get good meals at home. The burden of providing good meals then falls on the plant. I have talked about a good hot meal. We have been emphasizing the fact that it is possible to get cold lunches which are just as good from a nutritive standpoint as a hot meal, and very often they can be much better. Where the proper care has not been taken in the preparation of hot meals, many of your nutritive factors are lost. This does not happen in the preparation of a good cold lunch, and owing to the fact that there is a great deal of difficulty in getting good cafeteria equipment we think that the nutritive value of cold lunches should be stressed as much as possible. There is nothing wrong with the properly prepared sandwich. Two sandwiches made with enriched bread or whole wheat bread and with a proper filling and spread with fortified oleomargarine or butter, plus a glass of milk or tomato juice, make a very good lunch, providing one third of all one's daily requirements.

The second question that I have is "In rationing the amount of coffee and ice cream available to industrial cafeterias, why has the arbitrary figure of 60 per cent of last year's consumption been taken regardless of the increased number of employees? Why not reduce past consumption to a rate per thousand employees and use that as a basis for rationing?" Of course coffee is not a food, it has no food value but it may be important from the standpoint of morale. The rationing of ice cream is not fundamentally a nutrition problem. Ice cream is a good food but it is not one of the most effective ways of consuming milk. However, this question is quite pertinent, and all I can say at present is that the government is working on a plan to assure that rationing will be on a per capita basis and not on a historical basis regardless of the increased number of people in a community or in a restaurant and that problem is being worked out just as this questioner believes it should be done.

The third question is "In many plants the 'Victory Plate' or 'Special Platter' is being offered at a reduced price—the worker paying about two thirds of the price usually asked. Does your division offer specific suggestions for the contents of such platters for a weekly offering? If not, where can such data be obtained?" We have on request distributed to plants a list of menus, that is, for two weeks, for both the hot and cold lunches, and we are preparing a master menu form which can be sent to all our regional people and our state and local nutrition committees, and it will also be available to all plants. However, as Dr. Pett has pointed out, food habits vary from one section of the country to another, and we know that it is not possible for us in Washington to fix up one standard diet that will be suitable for the whole country. This is one of the main reasons for our trying to get industry to use the services of the local bodies, of the state nutrition committees and of our regional offices because these state committees make up such diets based



on the available food supplies and food habits of their localities. We should like to refer questions of that nature to the state nutrition committee in the state where the plant is located.

Another question has been referred to me and that is "Is the efficiency of vitamin C in the prophylactic treatment of heat exhaustion of sufficient value to warrant its distribution with salt in industry?" There is a lot of work going on in this subject now, and all I can say at present is that the importance of the loss of vitamin C in sweat is still very much a moot point. The evidence seems to be accumulating that perhaps not a very important amount of vitamin C is lost in the sweat. The work that has been done on the importance of vitamin C in the prevention of heat prostration was done in the chemical industries and it was done in the rooms in which the employees were exposed to trinitrotoluene. The beneficial effects observed there may not have been due to the fact that these patients lost vitamin C in the sweat but to the fact that the increased temperature in these rooms brought about an increased vaporization of trinitrotoluene and an increased absorption of trinitrotoluene, so that the vitamin C acted as an effective agent in detoxifying trinitrotoluene. This problem has to be worked out in an industry where the individuals are not exposed to the effects of such chemical poisoning.

We know that vitamin C has two actions, one a physiologic one as a vitamin and the other that it has an action demonstrated repeatedly in experimental animals in detoxifying certain chemicals. This is a pharmacologic action and apparently is not related to its physiologic one as a vitamin.

If I may ask a question myself, I should like to ask Dr. Pett to discuss some observations he has made on the relation of the consumption of soft drinks in a plant to the consumption of milk.

DR L. D. BRISTOL, New York: I have been asked "Is it advantageous to have midshift rest periods with access to food?" The answer in general I think is "yes" and there are various examples in which industries are doing this. Some industries prefer to make available at their own expense midshift feedings, whereas other industries such as the Bell Telephone Company, in most of its larger locations, at any rate, have cafeterias open all through the day when employees may obtain foods at their own expense. I think we should keep in mind also that the lack of food often gives rise to fatigue, and fatigue isn't entirely a matter of work. It is partly a matter of hunger, and we believe that a certain portion of accidents may be prevented by keeping in mind the importance of this possibility of midshift rest periods with access to food.

Second, "How can we encourage employees to drink more milk?" and "Is there any such thing as drinking too much milk in a day?" and "Are chocolate milks a desirable food?" First of all I would say that it is largely a matter of education of the employees as to the value of milk, the fact that, after all, it is of all the foods perhaps the ideal food, and then see that it is made available at as low a cost as is consistent with the budget of the industry. If you can have milk available at a low figure as compared with some of the other drinks, you will have more milk consumed without any doubt. Then too I think we must educate our employees, particularly the women, that milk isn't necessarily fattening. For some reason or other no woman likes to drink much milk because she thinks it is going to make her fat, and our reply there is "Good nutrition means fitness and not fatness and that includes the use of milk." So far as drinking too much milk in a day is concerned, I would say there isn't very much danger along that line. The danger is altogether in the other direction.

"Is chocolate milk a desirable food?" Well, certain chocolate milks are better than most of the other soft drinks. The only difficulty is that most of these chocolate shakes and so on are frequently made with skimmed milk and you don't get the nutritive value and they have that additional sweet that Dr. Wilder has referred to.

Third, "Where can one obtain suitable advice about diet?" Well, first of all I should certainly say from your doctor. Don't forget your doctor in this whole program. He is trained, or should be trained, and perhaps he will refresh his training if he needs to do so to answer some of these questions. Secondly, I would say your doctor's organization, and that means largely the Council on Foods and Nutrition, where there is a vast amount

of information with reference to diet. Then briefly, other groups such as the local health department, the local medical society, local and state nutrition committees that have been mentioned, the agricultural colleges and universities, and at the federal level the agencies that have been referred to by Dr. Goodhart.

The next question is "If we have not up to this time laid such a basic understanding of diet and nutrition which will carry us through the present emergency, can we expect to accomplish results now in the relatively short time available commensurate with the use of manpower required for the effort?" I should say that by all means every effort we can put into this will pay returns in the war effort, but beyond that it seems to me we are laying a basis for nutrition education in this country that is going on through the period after the war. If World War I laid the basis for the venereal disease education and control, I am one who believes that World War II in the field of health will lay the basis for nutrition education and emphasis all through the coming years.

Then finally, this question that Dr. Cowgill referred to with reference to the relationship of meals to shifts. I think I cannot do better than just refer to our instructors' handbook that is used in connection with our nutrition course for employees.

DR HELEN S. MITCHELL, Washington, D. C.: One point that has not been brought up is the employees in the small plant of twenty to thirty or even fifty where inplant feeding is impossible and where they do have a third shift or work overtime if they have war orders today. That has come to my attention several times, particularly in Detroit, where there is a very large population of these small plants and where some of the employers have thought that something should be done toward offering that afternoon lift at 4 o'clock, for instance, when they bring their lunches and eat them at 12, work through to 8 or 10 at night and there is no stop between 12 and 8 for anything and there is no inplant feeding. They bring their lunches or eat out. The effort there has been thwarted in several cases by the fear of patronage, so again we are met with thwarted good intentions on the part of employers recognizing the need for doing something, and particularly in plants employing older workers, because a good many of these small plants have workers who have been with them twenty, thirty or forty years and they don't lay them off today when they are busy. They are keeping them on, but they are very fearful of their standing the gaff of a ten or eleven hour day, which is what is happening, and yet there is no adequate provision or effort or interest on the part of the employees collectively toward providing that ten minute period or even accepting it if the employer wishes to offer it. It creates a problem.

DR PETT: Dr. Goodhart's question concerned the problem of milk in relation to soft drinks in industrial plants, and since he has directed it to me I assume that it asks for our experience in Canada, because we have had some experience in decreasing the use of soft drinks in an industrial plant by various methods. The first method I shall mention had nothing to do with my office. The government put a tax on soft drinks of 1 cent a bottle. We observed the effects of that immediately, and I should like to add one interesting comment. Not only did milk sales jump considerably but this increase has been sustained for about seven months now. That is quite important. It wasn't a temporary change. However, there are some other methods that have been used in Canada with success. A second method is that the plant management—and this has been especially possible in a new plant—simply orders a limit of perhaps two bottles of soft drinks a day per employee. This may sound rather autocratic but it has been done and, indeed, we have plants in Canada where the average consumption has been as high as ten bottles a day and the plant management ordered it reduced to two bottles a day, a definite ration within the plant, and immediately the milk consumption increased enormously, and the interesting point is that in those plants at the present time the consumption of soft drinks is actually less than two bottles per employee daily. It is reduced below the ration set by the plant. This means that milk can hold its own once the habit is started. The third fact I should like to mention is that when access to a bottle of milk is made easy, that is, when it is easy to get, we have found that milk will more than hold its own in popularity as a beverage both between meals and at meals with soft drinks.

## DOCTORS AT WAR

Radio broadcasts of Doctors at War by the American Medical Association in cooperation with the National Broadcasting Company and the Medical Departments of the United States Army and the United States Navy are on the air each Saturday at 5 p. m. Eastern War Time (4 p. m. Central War Time, 3 p. m. Mountain War Time, 2 p. m. Pacific War Time). An exception is the Chicago area, where the broadcasts are heard by transcription at 8 p. m. Central War Time Saturdays on Station WMAQ.

The titles and speakers for the next four programs are as follows:

March 13 When To Call Your Doctor  
 March 20 Fit to Fight  
 Guest speaker: Major General Henry S. Aurand, Commanding General Sixth Service Command  
 March 27 War Worker Sleeps Here  
 April 3 The White Plague 1943  
 Guest speaker: Dr. Kendall Emerson, Managing Director, National Tuberculosis Association

April 10 Battle Stations at Home  
 Guest speaker: Col. George Brehr, Chief Medical Officer, Office of Civilian Defense

## BEFORE THE DOCTOR COMES

Beginning Thursday, March 4, the American Medical Association program on WLS entitled 'Before the Doctor Comes' will no longer be a part of the Homemakers' Hour but will be a separate program. It can be heard on Radio Station WLS (890 kilocycles) at 9:45 a. m. every Thursday up to and including May 27. Mrs. Harriet H. Hester will interview Dr. W. W. Bauer, Director of the Bureau of Health Education, or Dr. Austin C. Smith, Secretary of the Council on Pharmacy and Chemistry, on common home health problems. The titles of the next three programs are as follows:

March 18 The Child with Headache  
 (Bauer)  
 March 25 The Child with Tummy Ache  
 (Bauer)  
 April 1 The Child with Earache  
 (Bauer)

## MEDICAL LEGISLATION

## MEDICAL BILLS IN CONGRESS

**Changes in Status**—H. R. 812 has been favorably reported to the House providing for the issuance of documentary evidence of United States citizenship. There are many native born Americans who are unable to present evidence of citizenship because of the fact that at the time of their birth laws were not in effect providing for the registration of births. The reported bill provides a method by which such persons may obtain a certificate of citizenship. The House Committee on Military Affairs has begun hearings on H. R. 997, a bill proposing to amend the National Defense Act by eliminating the Medical Administrative Corps in the Medical Department of the Regular Army and substituting therefor a pharmacy corps. H. R. 1749 has passed the House extending the existing medical, hospital, domiciliary and burial benefits available to veterans of World War I to veterans of World War II. H. R. 1936 has been reported to the House, authorizing an appropriation of \$2,000,000 for expansion of naval facilities for hospitalization of dependents of Navy and Marine Corps personnel, to provide the types of hospital service which shall be available to such dependents, to include dependents of Coast Guard personnel while the Coast Guard is operating as a part of the Navy, and to authorize hospital service outside the continental United States and in Alaska to certain persons not in the naval service. S. 739 has passed the Senate and House providing that during the present war and for six months thereafter personnel of all components of the Army of the United States may be detailed as students at technical, professional and other educational institutions, or as students, observers or investigators at industrial plants, hospitals and other places. S. 786 has been passed by the Senate, providing for the rehabilitation of veterans disabled in the present war.

**Bills Introduced**—H. R. 2017, introduced by Representative Angell, Oregon, provides for the payment of annuities to blind persons. The annuity payable to a blind person, the bill provides, will be paid in monthly instalments which are mathematically sufficient, when added to any other income of such person, to provide him with an average monthly income of \$100, except that no such instalment will be for an amount in excess of \$50. The term 'blind person' is defined by the bill to mean a person who is 21 years of age or over, a citizen of and resident within the United States including its territories and possessions, and who has not more than 20/200 of visual acuity in the better eye with maximum correction or whose field of vision is limited to 20 degrees or less from the fixation point in all quadrants. H. R. 2041 introduced by Representative Keefe, Wisconsin, would authorize appropriations to the Children's Bureau for payments to states for medical, nursing and hospital, maternity and infant care for wives and infants of enlisted men in the armed forces of the United States of the fourth, fifth, sixth and seventh grades. The sum

of \$1,200,000 would be authorized for the fiscal year ending June 30, 1943 and for each fiscal year thereafter during the period of the present war and for six months following its termination but not in excess of a total of \$6,000,000. H. Res. 146 introduced by Representative O'Connor, Montana, contemplates the creation of a special committee of the House of Representatives composed of five members to be appointed by the Speaker to (1) investigate the hospital problem throughout the United States in order to determine the hospital beds available for marines, soldiers, sailors, coast guardsmen, members of the merchant marine and any or all persons engaged in warfare, (2) investigate the use of existing civilian hospital facilities, (3) study the hospital problem in the United States as a whole as affecting not only war industries but industries in general throughout the United States and (4) report in writing to the Congress the results of such investigations together with its recommendations. H. R. 1824, introduced by request by Representative Lesinski, Michigan, would direct the Administrator of Veterans Affairs to promulgate regulations pertaining to service connection containing additional provisions requiring that as to those veterans who are shown to have been engaged in combat with an enemy of the United States during the present war or who are shown to have been subjected to other arduous conditions of active military or naval service of extraordinary character, any subsequent disability resulting from an injury or disease which could have resulted by way of incurrence or aggravation traceable to such veteran's active military or naval service shall be adjudicated as directly due or aggravated by such service in line of duty. H. R. 1858 introduced by Representative Lane, Massachusetts, provides that in the administration of any laws and veterans regulations conferring rights, privileges or benefits on persons who served in the military or naval forces of the United States during the World War, their widows, children and dependent relatives, those persons who served as members of the United States Merchant Marine during the period of the World War and who have been honorably separated from such service shall be held and considered to be veterans of such war.

## STATE MEDICAL LEGISLATION

## Arizona

**Bill Passed**—H. 146 passed the house, March 1. It proposes to require every physician attending a pregnant woman to take a sample of her blood not less than ten days after the first visit and to submit such sample to an approved laboratory for a standard test for syphilis.

## Arkansas

**Bill Introduced**—S. 300, to amend the public welfare law, proposes to eliminate medical care and treatment for indigents. Only hospitalization would be furnished.

**Bill Passed**—H 432 passed the house, February 25 It proposes to prohibit the sale of appliances, drugs or medicinal preparations having special utility for the prevention of conception or venereal diseases without a license issued by the state board of pharmacy but excepts physicians and medical practitioners regularly licensed to practice medicine or osteopathy from the provisions of the proposal

#### California

**Bill Introduced**—A 1627, to amend the Business and Professions Code, proposes to authorize the renewal of professional licenses of persons who have served in the armed forces, if they possessed a current, valid and unrevoked license at the time of entry into such service and if they apply for renewal within sixty days after the termination of such service

**Bill Passed**—A J R 26 passed the assembly on January 29 and the senate on January 30 It requests Congress to enact S 216 or H R 997, either of which would create a pharmacy corps in the United States Army

#### Colorado

**Bill Passed**—H 525 passed the house on February 23 and the senate on March 3 It proposes to authorize the state board of medical examiners to grant and revoke license to practice chiropody, defined as the diagnosis and medical, surgical, mechanical, manipulative and electrical treatment of ailments of the human foot and leg, excepting amputation of the foot or leg or the administration of an anesthetic other than local or the reduction of dislocations or fractures Surgical treatment is further defined to mean the surgical treatment of all minor foot or leg ailments excepting surgery on the bony structure or ligamentous tissues of the foot or leg

#### Connecticut

**Bill Introduced**—Substitute for S 261, to amend the premarital examination law, proposes to allow the required certificate to be signed by a physician licensed to practice medicine or osteopathy in Connecticut or in any other state or territory of the United States or the District of Columbia

**Bill Passed**—S 261 passed the senate, February 25 To amend the premarital examination law, it proposes to permit the required certificate to be signed by a physician licensed to practice medicine in the state of Connecticut or any state or territory of the United States or the District of Columbia

#### Delaware

**Bill Passed**—S 49 passed the senate, March 1 It proposes to require all school children to be immunized against smallpox and diphtheria unless excused by a written statement by a reputable physician

#### Georgia

**Bills Introduced**—S 188 and H 552 propose the abolition of the State Boards of Medical Examiners, Chiropractic Examiners and Osteopathic Examiners and to create in their stead a State Commission of Medical Examiners, Georgia Commission of Chiropractic Examiners and State Commission of Osteopathic Examiners of Georgia The powers, duties and qualifications would be the same except that members appointed by the governor must be approved by the secretary of state and confirmed by the senate H 336 proposes that the unlicensed practice of chiropractic, medicine and osteopathy shall be a public nuisance which may be abated by use of the injunctive process The burden would be on the person charged to show that he has a validly issued license H 442 proposes to require every practicing physician to publish quarterly, in a newspaper of general circulation in the county wherein he practices, a list of the names and addresses of any patients who died during the preceding quarter while under his care and a statement of the cause of such death H 566 proposes to require all persons desiring to be married to present a certificate from a medical doctor showing freedom from venereal diseases of all kinds

#### Idaho

**Bill Introduced**—S 140, to amend the occupational disease act, proposes to authorize the industrial board to summon the medical panel to attend hearings and authorizes the members of such panel to question witnesses

#### Illinois

**Bill Introduced**—S 83 to amend the law relating to narcotic drugs, proposes to exempt therefrom the prescribing of certain attenuated narcotic preparations

#### Indiana

**Bills Introduced**—S J Res 7 proposes the adoption of a joint resolution memorializing Congress to pass legislation establishing a pharmacy corps in the army H 370 proposes regulations for the admission of patients to county tuberculosis hospitals

**Bills Passed**—S C R 14 passed the senate February 22 It proposes a resolution requesting Congress to enact necessary legislation to make available federal funds, after the war, for assistance to the several states in providing necessary and needed hospital facilities in industrial centers S 135 passed the house March 3 It proposes to prohibit school authorities from employing food handlers who are addicted to drugs or who have tuberculosis or syphilis in an infectious stage and to require all school employees to undergo a physical examination for tuberculosis at least once every three years by a duly licensed doctor of medicine H 413 passed the house February 22 It proposes that every person employed in a place serving food shall secure a certificate from the health officer showing freedom from contagious, infectious and communicable diseases and limits the health officer to a fee of \$2 for such certificate and examination

#### Iowa

**Bill Introduced**—H 407 proposes to require attending physicians to notify the department of public safety of the birth of any child and to require the department, or the hospital in which the child is born, immediately to take or cause to be taken footprints of such child

#### Kansas

**Bill Passed**—H 332 passed the house, March 3 It proposes to require every physician to take or cause to be taken a sample of blood of any woman whom he diagnoses as being pregnant such sample to be taken within fourteen days after the diagnosis is made

#### Maine

**Bill Introduced**—H 1211 proposes the enactment of a cash sickness compensation act

#### Maryland

**Bill Passed**—H 53 passed the house, February 24 It proposes to amend the insurance code by exempting from the provisions thereof any policy or contract granting solely and exclusively hospitalization insurance The present law exempts any policy or contract issued by a nonprofit association

**Bill Enacted**—S 84 has become chapter 59 of the Laws of 1943 It amends the medical practice act by eliminating the proviso that no two courses of medical lectures shall be either begun or completed within the same calendar year This amendment is for the purpose of enabling graduates of accelerated medical courses to obtain licensure in Maryland

#### Massachusetts

**Bill Introduced**—S 357 proposes to require the department of public health to provide for the care and treatment of dipsomaniacs and mebrates

**Bill Enacted**—H 1013 has become chapter 41 of the Laws of 1943 It provides that physicians shall report all cases of wounds from a BB gun to the commissioner of public safety and to the police authorities

#### Michigan

**Bills Introduced**—S 192, to amend the osteopathic law, proposes to authorize the Michigan State Board of Osteopathic Registration and Examination to modify by order the educational requirements prescribed by the present act during the present emergency H 176 proposes a revision and codification of the existing workmen's compensation law

#### Missouri

**Bills Introduced**—S 53 proposes to authorize cities of the third class acting through their city councils to levy and collect a license tax and to regulate physicians, chiropractors,

osteopaths hospitals, sanatoriums, health schools and many other businesses and occupations H 299 proposes the creation of a state board of examiners in the basic sciences to examine in the subjects of anatomy, physiology, chemistry, bacteriology and pathology any person desiring to practice any form of the healing art H 300 proposes to require a practitioner of medicine, surgery dentistry, optometry, osteopathy, chiropractic, chiropody and veterinary surgery, when using the prefix "Doctor" or "Dr" in connection with his name, to affix thereto suitable words clearly designating the degree held by such practitioner or the particular type of practice in which such person is engaged H 319 proposes the creation of a state board of naturopathic registration and examination and defines naturopathy as the method or science of treatment and prevention of human ailments through the use, method and application of such natural methods as among other agencies, physiotherapy (electro-therapy, hydrotherapy thermo therapy colon therapy, actino-therapy) phyto-therapy, biochemic cell salts dietetics food concentrates accessory food substances, hygiene sanitation, first aid, clinical laboratory procedures diagnosis x-ray as taught in the approved schools and colleges and institutions of naturopathy provided that nothing in the proposal shall authorize any naturopath to practice materia medica major surgery osteopathy, chiropractic or any other of the legalized forms of the healing sciences

#### Montana

*Bill Introduced*—S 172 to amend the medical practice act proposes to increase the penalty for practicing medicine without a certificate from a fine of not more than \$1000 or not less than \$250 or imprisonment in the county jail for not more than one year or not less than ninety days to a fine of not more than \$2000 or less than \$500 or imprisonment in the state prison for not more than three years or not less than one year

*Bill Passed*—H 118 passed the senate February 26 To amend the medical practice act, it proposes to authorize the board of medical examiners to prescribe and enforce reciprocity requirements current with changes in standards of the practice of medicine and surgery

#### Nebraska

*Bills Introduced*—Legislative bill 298 to amend the motor vehicle law, proposes to define the term "while under the influence of alcoholic liquor or any drug" Legislative bill 371, to amend the motor vehicle law proposes to authorize the admission in evidence of chemical analysis of the blood, breath, urine or other bodily substance of an accused person revealing the presence in the blood of the accused of 0.05 per cent or more by weight of alcohol

#### Nevada

*Bill Introduced*—A 141 proposes to authorize the board of medical examiners to grant qualified physicians a temporary license to practice medicine, surgery or obstetrics in any particularly specified part of the state for and during the period of time limited by the license The proposal would further authorize the board of medical examiners, from time to time, to restrict enlarge or change the territorial limits stated in such temporary license

#### New Jersey

*Bills Introduced*—S 68, to amend the compulsory vaccination law, proposes to make it mandatory instead of optional for the board of education to exclude from school any teacher or pupil who has not been vaccinated A 150 proposes to authorize the board of freeholders of any county of the second or third class to abolish the office of coroner and to create the office of chief medical examiner, such officer to be a licensed practitioner of medicine or surgery, resident in the county, of recognized ability and good standing in his community

#### New Mexico

*Bills Introduced*—H 182 proposes to repeal the basic science law enacted in 1941 H 219, to amend the law relating to school employees, proposes to prohibit the employment of teachers afflicted with syphilis and to require all school employees to present annually a certificate from a licensed physician showing freedom from any transmissible disease, which shall include tuberculosis and Wassermann tests

#### New York

*Bills Introduced*—S 851 and A 1144, to amend the workmen's compensation act, propose to authorize an injured employee to receive dental care and treatment, when necessary, and to select his own dentist to treat him S 884 proposes to prohibit scientific experiments or investigations on living dogs A 1125, to amend the medical practice act, proposes to postpone until July 1, 1944 the 1942 amendment exempting students, interns and resident physicians from the operation of the medical practice act A 1185, to amend the workmen's compensation law, proposes to authorize an injured employee to select the hospital to which he shall be sent for care and treatment

#### North Carolina

*Bill Introduced*—S 211 proposes to amend the law relating to the incorporation of nonprofit hospital service corporations so as to authorize the operation of nonprofit medical service plans as well The term 'hospital service plan' is defined as including the contracting for hospital care laboratory facilities x-ray facilities, drugs, appliances, anesthesia, nursing care operating and obstetric equipment, accommodations and any other services authorized or permitted to be furnished by a hospital under the laws of North Carolina and approved by the North Carolina Hospital Association or the American Medical Association The term 'medical service plan' is defined as including the contracting for medical, obstetric, surgical and any other professional services authorized to be furnished by a duly licensed physician

*Bills Passed*—S 254 passed the senate, February 26 It proposes the creation of a Hospital Authority to engage in hospital construction, maintenance and operation H 429 passed the house on February 25 and the senate on February 26 It proposes that any person having tuberculosis in a communicable form who fails to follow the instructions given him by an agent of the county board of health as to precautions which he should take shall be imprisoned in the Prison Department of the North Carolina Sanatorium

#### North Dakota

*Bills Passed*—S 77 passed the senate, February 22 It proposes to provide for the establishment maintenance and duties of a district board of health and provides that the district health officer appointed by such board shall be a physician and surgeon regularly licensed to practice medicine and surgery in the state H 229 passed the house February 23 It proposes a law for the organization and regulation of nonprofit hospital service plan corporations

#### Ohio

*Bill Introduced*—H 244, to amend the law authorizing the creation of corporations to conduct a medical service plan proposes that any physician in the armed forces shall be considered as residing and actively practicing in the county in which he resided and actively practiced at the time of his entrance into the armed forces, and proposes further that no certificate of authority or license to operate such a medical service plan shall be issued during the war emergency or within six months thereafter

#### Oregon

*Bill Introduced*—S 284 proposes to authorize the payment of compensation to employees disabled by an occupational disease

*Bills Passed*—H 103 passed the senate, February 26 To amend the law relating to the examination of handicapped children, it proposes to authorize examinations of the eyes of such children to be made and the findings certified to by qualified and licensed optometrists H 350 passed the Senate, February 26 It proposes to authorize commissioned medical officers of the army to execute the required certificate necessary under the state premarital examination law

#### Rhode Island

*Bill Introduced*—H 653 proposes to authorize the director of education to arrange for annual lectures to high school students on the problems of cancer and the means for its cure and control

## Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST SUCH AS RELATE TO SOCIETY ACTIVITIES NEW HOSPITALS EDUCATION AND PUBLIC HEALTH)

### ARIZONA

**Society News**—The Pima County Medical Society was addressed in Tucson, January 12, by Capt Robert J Stein, M C, U S Army, on "An Open Psychiatric Division in a General Hospital", Major Sigmund Mage, M C, U S Army, "Present Status of Surgery in Treatment of Gastrointestinal Ulcer," and Lieut Col William J Kennard Jr, M C, U S Army, "Personal Experiences in Action in Eastern Front"

### ARKANSAS

**Norman Baker Loses Again in Court**—Norman Baker former operator of alleged "cancer cure" hospitals in Arkansas and Iowa, serving a four year federal sentence on charges of using the mails to defraud, has lost a \$25,000 civil action in the Arkansas supreme court to one of his former associates, Rennie A Bellows, who died during pendency of the suit, according to the *Davenport Times*, March 2. Affirming a Carroll County chancery decree, the high tribunal ruled that Baker should pay this amount to the estate of Bellows to satisfy his alleged promise to give Bellows an interest in his hospital at Eureka Springs. Bellows had served as superintendent of the hospital

### ILLINOIS

**Society News**—Dr W Kress McIntyre, St Louis discussed "Cancer of the Rectum" before the Madison County Medical Society, Granite City, February 5.—Dr Isaac A Abt, Chicago, discussed "Sulfa Drugs in the Treatment of Children" before the Livingston County Medical Society, February 18, at Pontiac. A sound film on 'Peptic Ulcer' was also shown at the meeting

### Chicago

**Personal**—Dr Francis B Gordon has been promoted to associate professor of bacteriology at the University of Chicago School of Medicine.—Nathaniel Leverone was elected president of Goodwill Industries recently. One of the group's major projects for the coming year will be to formulate plans for training disabled soldiers

**Dr du Vigneaud Addresses Chemists**—At a dinner meeting of the Chicago Section of the American Chemical Society, March 18, Vincent du Vigneaud, Ph D, professor and head of the department of biochemistry, Cornell University Medical College, New York, will discuss "The Chemical Nature of Biotin". Following the dinner, group meetings will be held to discuss various subjects

**Annual Alpha Kappa Kappa Banquet**—The Alpha Kappa Kappa Fraternity chapters of the city held their annual tri-chapter banquet at the Chicago Athletic Club, March 12. Dr Herman L Kretschmer, treasurer of the American Medical Association, was toastmaster. The three participating chapters are Xi of Northwestern University Medical School, Nu of Chicago University School of Medicine and Eta of the University of Illinois College of Medicine. Allan Rogers of Northwestern was chairman of the tri-chapter banquet committee

**Dean David J Davis to Retire**—Dr David J Davis associated with University of Illinois College of Medicine for twenty-nine years will retire September 1 as professor and head of the department of pathology, bacteriology and public health and dean of the medical school. His successor has not yet been named. Dr Davis, who was born in Racine Wis in 1875, will reach the university's compulsory retirement age of 68 in August. Dr Davis graduated at Rush Medical College in 1904, taking his degree of doctor of philosophy at the University of Chicago in 1906. He became professor of pathology at Illinois in 1914 and dean in 1925

**Stieglitz Memorial Lecture**—Carl S Marvel Ph D professor of organic chemistry, University of Illinois Urbana Ill will deliver the third lecture under the Julius Stieglitz Memorial Lectureship on April 2 in Kent Theater, University of Chicago, on the subject "The Structure of Vinyl Polymers". The lectureship was established in 1940 under the auspices of the Chicago Section and the alumni of the chemistry depart-

ment of the University of Chicago to honor Julius Stieglitz Ph D, who at the time of his death in 1937 was professor of chemistry emeritus at the University of Chicago. Dr Stieglitz was a charter member of the Council on Pharmacy and Chemistry of the American Medical Association, serving continuously from 1905 to 1926, and chairman of its committee on rules and procedures

### INDIANA

**Outbreak of Smallpox**—Fifty-one cases of smallpox have been reported in a recent outbreak in Lake County. 40 cases being recorded in Gary alone. No deaths were reported

**Changes in Health Personnel**—Dr Paul W Ferry Kokomo, has been elected president of the Kokomo Board of Health.—Dr John H Green North Vernon, was recently named secretary of the North Vernon Board of Health.—Dr Robert O Scott, Charlottesville, has been chosen coroner of Hancock County.—Dr Everett A King Hardinsburg Ky, director of the tricity health unit of Breckenridge Hancock and Meade counties, Ky, has been named full time health director for Evansville and Vanderburgh County

**The Mann Lecture**—The second annual Frank C Mann Lecture was delivered by Dr Warren H Cole, professor and head of the department of surgery, University of Illinois College of Medicine, Chicago, on "Advances in Gastric Surgery". Dr Andrew C Ivy, director of the Naval Medical Research Institute Bethesda, Md, who was originally scheduled to give the lecture, had to cancel his engagement. The Frank C Mann Lectureship in Applied Physiology was founded and presented to the University of Indiana School of Medicine in 1941 by the Phi Beta Pi medical fraternity. The first lecture was delivered by Dr Mann, Rochester, Minn, in whose honor the lectureship was established

### IOWA

**State Medical Meeting in Des Moines**—The Iowa State Medical Society will hold its ninety-second annual session at the Hotel Fort Des Moines, Des Moines April 29-30, under the presidency of Dr Frank P Winkler Sibley. Out of state speakers will include Drs Harry L Smith Rochester Minn on "Coronary Disease Its Recognition and Management", Arthur W Proetz, St Louis "Practical Management of Headache" and Virgil S Counseller Rochester "Pelvic Surgery as Related to General Practice". Iowa physicians who will participate in the program will include

Dr Ralph E Gray Eldora Social and Medical Aspects of the Boy's Training School at Eldora  
Dr Harold E Farnsworth Storm Lake Care of the Premature Infant in General Practice  
Dr Andrew W Bennett Iowa City Malaria Epidemic in Iowa  
Dr Anthony C Pfohl Dubuque Surgery in Medical Emergencies  
Dr Raymond J Harrington Sioux City Intrathoracic Tumors as a Diagnostic Problem  
Dr James A Greene Iowa City Tropical Medicine in Iowa in the Postwar Era  
Dr Paul O Nelson Emmetsburg Early Diagnosis and Treatment in Tuberculosis  
Dr Elmer L De Gowin Iowa City Blood Banks in Iowa  
Dr Julian D Boyd Iowa City Body Measurements in Physical Diagnosis  
Dr Frank R Peterson Iowa City Management of Peptic Ulcers Requiring Surgery  
Dr Burton Raymond Weston Mason City A Surgical and Clinical Contribution to Right Sided Pain  
Dr Edmund S Donohue Sioux City Delayed Bone Grafts  
Dr John B Synhorst Des Moines Surgery of the Colon  
Dr Lewis M Overton Des Moines Use of Sulfonamides in Open Wounds (Clinical Study)  
Dr John W Dulin Iowa City Use of Stainless Steel Wire as Suture Material  
Dr Christian B Luginbuhl Des Moines Acute Pulmonary Conditions Simulating Abdominal Disorders  
Dr Earl C Montgomery Atlantic Intracocular Neuritis  
Dr Frank Harold Reuling Waterloo Glioma of the Optic Nerve  
Dr Kenneth C Swan Iowa City Abnormal Retinal Correspondence  
Dr John E Rock Davenport Staphylococcal Septicemia Tonsillar in Origin  
Dr Dean M Lierle Iowa City The Right to Hear

At the annual banquet Dr Walter A Sternberg Mount Pleasant will be the toastmaster. Virgil M Hancher LL D president, State University of Iowa, Iowa City, will deliver the principal address. Dr Winkler and Dr Lee R Woodward, Mason City, president-elect of the state society will also address the banquet. Groups meeting during the session of the state society include the State Society of Iowa Medical Women, Iowa Public Health Association and Iowa Anesthesiological Society. There will also be luncheons of alumni of Northwestern University Medical School Chicago, and the State University of Iowa College of Medicine Iowa City. The woman's auxiliary to the Iowa State Medical Society will hold its annual session April 29-30. The speakers will include Drs Ransom D Bernard Clarion, on "Present Trend of Medical Legislation" and Carl F Jordan Des Moines, "The State Board of Health and the Blood Donor Program"

## MARYLAND

**State Milk Regulations Amended**—The state department of health announced the following amendment to the state milk regulations

By January 1 1945 all milk and milk products consumed raw shall be from herds or additions thereto which have been found free from Bang's disease as shown by blood serum tests for agglutinins against *Brucella abortus* made in a laboratory approved by the director of health. All such herds shall be retested at least every twelve months and all reactors removed from the herd. A certificate identifying each animal by number and signed by the laboratory making the test shall be evidence of the above test.

According to preliminary figures of 48 cases of undulant fever reported in Maryland in 1942 47 occurred in the counties and one in Baltimore City. There were no deaths.

**Venereal Disease Council**—Baltimore *Health News* announces the organization of a new public health-social agency known as the Baltimore Venereal Disease Council. It was appointed under the auspices of the Baltimore Mobilization Committee and aims to project a modern attack on syphilis, gonorrhea and other venereal disease as a responsibility of community agencies as a whole rather than as one unit. Three study committees have been formed, one on legislation, one on rehabilitation and one on medicine, public health and pharmacy. Efforts will be made to assist military authorities in the current venereal disease control program but the major efforts will be toward a long range plan that will improve the venereal disease record of Baltimore.

## MASSACHUSETTS

**Tufts Alumni Dinner**—The Tufts Medical Alumni Association will hold its annual meeting and dinner on Wednesday evening March 31 at the Copley Plaza Hotel Boston. Hon. Paul V. McNutt, chairman of the War Manpower Commission, Washington, D. C. will be the guest speaker. Other speakers will be Leonard Carmichael, LL.D., president of Tufts College who will discuss "The Medical School and the War," Dr. Alonzo K. Paine, Boston, president of the association "Alumni Activities," and Dr. Frederick W. Maroney, Brooklyn College, New York, "The Twenty Five Year Class."

## MICHIGAN

**Discussion of Neuropsychiatry in Selecting the Armed Forces**—The Michigan Society of Neurology and Psychiatry is sponsoring a panel discussion on "Importance of Neuropsychiatry in the Selection of Men for the Armed Forces" at its meeting in Detroit, March 25. National and state directors of Selective Service and representatives of the armed forces will speak.

**Industrial Medical and Surgical Conference**—The committee on industrial health of the Michigan State Medical Society and the department of postgraduate medical education, University of Michigan, Ann Arbor, are cooperating in a postgraduate industrial medical and surgical conference to be held at the Horace H. Rackham Memorial, Detroit, April 8. Among the speakers will be:

- Dr. James G. Townsend, Bethesda, Md., "The Present Status of Medical Programs in War Industries"
- Dr. Roy D. McClure, Detroit, "Study on Minor Burns"
- Dr. Max R. Burnell, Flint, "The Employment of Women in Industry"
- J. J. Bloomfield, Bethesda, "Industrial Hygiene in the War Industries"
- Mr. Andrew T. Court, Labor Economics Section, General Motors Corporation, Detroit, "Industrial Illness and Disability Analysis"
- Dr. Herman H. Riecker, Ann Arbor, "Heart Disease in Industry"
- Dr. Louis Schwartz, Bethesda, "Dermatitis in Industry"
- Dr. Barney J. Hein, Toledo, Ohio, "Management of the More Common Industrial Fractures"
- Dr. Parker Heath, Detroit, "Traumatic Eye Injuries and Epidemic Keratoconjunctivitis"
- Dr. Carl E. Badgley, Ann Arbor, "Back Injuries—Medical Legal Complications"
- Dr. Frank F. Tallman, Lansing, "Mental and Psychological Problems Relative to Industrial Employment"
- E. P. Chester, director, bureau of rehabilitation service, state department of education, Hartford, Conn., "The Employment and the Evaluation of the Handicapped Worker in Industry"
- L. J. Carey, general counsel, Michigan Mutual Liability Insurance Company, Detroit, "Medicolegal Phases of Industrial Employment"
- John W. Gibson, chairman, Michigan Department of Labor and Industry, Lansing, "Viewpoint of the Michigan Department of Labor and Industry"
- John Lovett, general manager, Michigan Manufacturers Association, Detroit, "Viewpoint of the Employer"
- Dr. Carl M. Peterson, secretary, Council on Industrial Health, American Medical Association, Chicago, "Viewpoint of the Medical Profession"

At the banquet in the evening the speakers will be Gov. Harry F. Kelly, Lansing, and Charles F. Kettinger, Dr. Engring, vice president in charge of research, General Motors Corporation, Detroit.

## MINNESOTA

**Mayo Foundation Lectures**—Brigadier Walter Rowley Bristow, London, chief orthopedic surgeon, Royal Army Medical Corps, gave a Mayo Foundation Lecture in Rochester, February 8, on the "Management of War Casualties in British Forces." Dr. Harrison F. Ghippin, Philadelphia, gave a similar lecture, February 5, on the "Management of Pneumonia."

**Personal**—Dr. Wilburn O. B. Nelson has been named health officer of Fergus Falls to succeed the late Dr. William A. Lee—F. O. Hanson, D.D., for nearly ten years superintendent of Swedish Hospital, Minneapolis, has resigned his position to become director of appeal at Gustavus Adolphus College, St. Peter, where he will conduct a campaign for funds for a new college library, the *Journal Lancet* reports.

**Educational Program on Vaccination**—A campaign has been launched in Minneapolis to educate the public to the need of vaccination. "Before it's too late—vaccinate" is the theme of the program which is being carried out under the endorsement of the Minneapolis Civilian Defense Council and under the direction of the city health commissioner. An intensive publicity program is now under way. Victory Aides can pass every home with a booklet explaining the vaccination situation and urging the cooperation of the public.

## MONTANA

**Personal**—Dr. George B. Wright, Kalispell, has been named health officer of Flathead County to succeed Dr. Albert A. Dodge, Kalispell, who held the position for twenty one years, according to the *Journal Lancet*.

**Society News**—Dr. Sylvester A. Berens, Seattle, addressed the Silver Bow County Medical Society in Butte, February 23, on "Low Back Pain with Scatica."—Dr. Roger Anderson, Seattle, discussed "Treatment of Fractures" before the Mount Powell County Medical Society in Anaconda recently.

## NEVADA

**New Director of Maternal Health**—Dr. Julius B. Askev, formerly of San Francisco, has been appointed director of the division of maternal and child health and crippled children's services of the state department of health, Carson City. News papers report that under the appointment Dr. Askev will also serve as acting state epidemiologist. Dr. Frederica A. Keep, Wellington, has been named field physician for the division.

## NEW JERSEY

**The Martland Lecture**—Dr. Cornelius P. Rhoads, New York, will deliver the ninth Harrison Stanford Martland Lecture, March 17, of the Essex County Anatomical and Pathological Society of the Academy of Medicine of Northern New Jersey in Newark. His subject will be "Cancer and the Role Played by Vitamins and Endocrines."

## NEW YORK

**Only Emergency Cases Accepted at Hospital**—Only emergency cases will be accepted in the future at the Elizabeth A. Horton Memorial Hospital, Middletown, because of the critical nursing shortage, the *New York Times* reported on February 21. Elective cases not requiring immediate treatment will be turned down. The patient average at the hospital is 104 a day, it was stated.

**New Regulations Govern Blood Donors and Blood Derivatives**—The public health council of the state department of health has adopted regulations governing human blood donors, human whole blood, human plasma, human serum or other human blood derivatives used for transfusion purposes. It was announced on March 1. The new regulations are designed to safeguard all phases of blood transfusion, which has become increasingly important because of the widespread use of human blood products both in the armed services and in civilian practice, and will help meet the need for basic standards to insure the safety of human blood products which has been experienced by hospitals and laboratories engaged in processing human blood and in providing transfusion services. The requirements were adopted only after long deliberation by the council and a critical review by representatives of several hospitals, the National Institute of Health, the Office of Civilian Defense, the Medical Society of the State of New York and other interested agencies. The action is said to be the first begun by a state body to govern human blood plasma and other blood derivatives. The subject has been under consideration by the council since 1941, and in June 1942 a committee was appointed to study the subject and prepare a suitable amendment to the sanitary code.



## New York City

**Second Counseling Service**—The mayor's committee on wartime care of children opened its second information and wartime counseling service for working mothers in the Fort Greene Health Center, Brooklyn, February 21. The first service was opened in the Harlem Health Center on January 25.

**The Harvey Lecture**—Dr. Samuel W. Clausen, professor of pediatrics, University of Rochester School of Medicine, will deliver the sixth Harvey Society Lecture of the current series at the New York Academy of Medicine March 18. His subject will be "The Absorption of Vitamin A and Its Storage in the Tissues."

**Proposed Research Center in Zoological Park**—Science reports that the New York Zoological Society is planning to establish a research center in Zoological Park for the study of animal diseases in relation to human disease problems and for a conservation exhibit. The society will receive \$3,000,000 under the terms of a postwar program for the city, it was stated.

**Course for Physicians on Kenny Method**—On March 29 the New York University College of Medicine will conduct a course for physicians on the modern concepts of poliomyelitis. The course is designed to cover epidemiologic, pathologic and physiologic aspects of poliomyelitis together with a diagnosis of the disease and its treatment by chemical, serologic, orthopedic and physical therapeutic means including the Kenny method. A series of eight lectures at weekly intervals will be given by visiting lecturers from various medical schools throughout the country and demonstrations of the various techniques will be given in the hospitals. A practical course for training physical therapy technicians opened recently at New York University under the auspices of the school of education. Additional information can be obtained from the secretary, New York University College of Medicine, 477 First Avenue.

## NORTH CAROLINA

**Changes in Health Officers**—Dr. Samuel P. Burt, Louisville, has been named health officer of Franklin County to succeed Dr. Richard F. Yarborough, Louisville. Charles L. Williams Jr., New Bern, assistant surgeon U. S. Public Health Service, has been appointed officer of Lenoir County to succeed Dr. Zebulon V. Moseley, Kinston.

**Nathalie Gray Bernard Lectures**—The first Nathalie Gray Bernard Lectures were given in January by Lieut. Comdr. Albert R. Behnke Jr., M. C., U. S. Navy, on "The Military Environment Primarily in Relation to Changes in Barometric Pressure." The lectureship was established last summer by the students and faculty of Bowman Gray School of Medicine of Wake Forest College, Winston-Salem, and will be considered an annual event. Mrs. Bernard, for whom the lectures are named, has given many generous donations to the school.

**Anatomist Dies**—Francis Huntington Swett, Ph.D., since 1930 professor of anatomy at the Duke University School of Medicine, Durham, died of heart disease on February 10, aged 49. In 1922 Dr. Swett received his doctor of philosophy degree at Yale University, New Haven, Conn., where he had been a member of the faculty since 1919, first as assistant in zoology and later in anatomy. He was on the staff of Johns Hopkins University School of Medicine, Baltimore, from 1922 to 1925, when he joined Vanderbilt University School of Medicine, Nashville, Tenn.

## OHIO

**Frank E. Bunts Lecture**—Dr. J. Eastman Sheehan, New York, delivered the Frank E. Bunts Lecture at the Cleveland Clinic, February 26, on "Recent Observations of War Wounds in England and Their Care."

**Personal**—Dr. Benjamin R. McClellan, Xenia, formerly president of the Ohio State Medical Association, was recently presented with a scroll in recognition of his outstanding service to the community and to his fellowmen by the local Rotary Club of which he is a charter member and past president. Robert S. Shelton, Ph.D., has been promoted to the position of scientific director of the William S. Merrell Company, pharmaceutical manufacturers of Cincinnati, and will be responsible for activities relating to research and product improvement. Since 1934 Dr. Shelton has been organic research chemist with the Merrell Company and associate professor of organic chemistry at the Cincinnati College of Pharmacy. He received his degree of doctor of philosophy at Cornell University in 1933.

## OKLAHOMA

**Annual Meeting in Oklahoma City**—The 1943 meeting of the Oklahoma State Medical Association will be held in Oklahoma City, May 11-12. The theme of the two-day session will be adapted to the war effort as it pertains to the health of the public.

**Report on Trachoma Program**—The state department of health has issued a report on its program of trachoma control which was instituted July 30, 1941. Since its inception the program has been extended into sixteen counties in the eastern and southern part of the state. Ninety-one clinics were held during the period July 30, 1941 to Dec. 31, 1942. Of the 8,591 patients examined, 1,262 positive cases were found and given treatment.

## PENNSYLVANIA

**Typhoid Carriers**—Sixty-six chronic typhoid carriers were detected in Pennsylvania by the state department of health in 1942, according to *Pennsylvania's Health*.

## Philadelphia

**Personal**—After more than twenty-five years as medical superintendent of the Home for Consumptives, Dr. William J. Enders resigned recently. Dr. Enders, who is now living at Bushkill, Pa., is now consulting physician for the home. The honorary degrees of doctor of science were awarded by the Philadelphia College of Pharmacy and Science at its recent commencement to Drs. William A. Ferrer, director of the medical research laboratories of Sharp and Dohme Inc., and Harriet L. Hartley of the city department of health.

## Pittsburgh

**Chemical Award Goes to Dr. King**—At a dinner on February 18 in the University Club the Pittsburgh Award given annually for outstanding work in chemistry by the Pittsburgh Section of the American Chemical Society was presented to Charles Glen King, Ph.D., scientific director in charge of research of the Nutrition Foundation, New York. Dr. King is on leave of absence from the University of Pittsburgh as professor of chemistry. Speakers at the dinner included Dr. King, who spoke on recent developments in nutrition; Alexander Silverman, Sc.D., head of the department of chemistry; Charles F. Lewis, LL.D., director of the Buhl Foundation; and Henry J. Heinz II, president of H. J. Heinz and Company.

## TEXAS

**Changes in Health Personnel**—Drs. Charles M. Covington, Alto, was recently appointed epidemiologist of the Travis-Bastrop County Health Unit to succeed Dr. Hugh Shane Austin, who entered military service. George G. Howard passed assistant surgeon U. S. Public Health Service Reserve has been placed in charge of the Parker and Palo Pinto County Health Unit. Dr. William O. Funderburk, Elkhart, was recently named health officer of Anderson County, succeeding Dr. Fred E. Felder, Palestine. Dr. Funderburk formerly served as county judge.

## UTAH

**New Professor of Surgery**—Dr. Philip B. Price, who had been professor of surgery at the Cheelo University School of Medicine, Shantung, China, until the hostilities started, has been named head of the newly created department of surgery at the University of Utah School of Medicine, Salt Lake City. Recently Dr. Price has been associate in surgery at the Johns Hopkins University School of Medicine, Baltimore. The University of Utah School of Medicine has heretofore been a two-year school but under a reorganization during the past year has been added to the list of four-year medical schools.

## WEST VIRGINIA

**Cooperative Medical Education Program Approved**—Arrangements have been completed between the board of governors of West Virginia University and the board of visitors of the Medical College of Virginia, Richmond, for the enrollment each year at the latter institution of twenty West Virginia students who complete the two-year medical course at the West Virginia University School of Medicine, Morgantown. After the first year, forty West Virginia medical students will be enrolled at the Medical College of Virginia. The bill (S. B. 85) authorizing the action was passed unanimously by the senate February 23 and by the house of delegates March 3. It was sponsored by the West Virginia State Medical Association and marks the first time in the history of medical education that such an arrangement has been made.



between two medical schools in separate states. The courses of the two medical schools will be coordinated so that the students at West Virginia University will have the same pre-medical training as the students at the Virginia school. The bill further provides that no student shall be eligible to take the courses which may be established unless he has been a bona fide resident of West Virginia for at least five years, has completed the medical course at the university and has been chosen for the purpose by the president and faculty of the West Virginia University School of Medicine.

### WISCONSIN

**New Director of Health Service and Tuberculosis**—Dr Allan A. Filek, Green Bay, has been appointed director of the division of local health service and tuberculosis control of the state board of health. Dr Filek graduated at Rush Medical College, Chicago, in 1933 and for the past six years has been district health officer for the sixth sanitary district.

**Health Committee for Association of Commerce**—A new health committee has been named for the Green Bay Association of Commerce. The committee is now making a survey of the health department activities in the state during the past year, the results of which are to be entered in the national intercity health conservation contest sponsored by the American Public Health Association.

**Personal**—Dr Herman F. Weber, Newburg, was honored at a dinner February 3, to celebrate his seventy-fifth birthday. Dr Weber has been practicing in Newburg for the past forty-seven years.—Dr John J. Rehorst has been appointed health officer of Fond du Lac on a part time basis until a permanent full time appointment can be made, filling the vacancy that occurred when Dr Robert L. Dana obtained a leave of absence to enter military service.

**Special Society Election**—Dr Arnold S. Jackson, Madison, was chosen president-elect of the Wisconsin Academy of Surgery at its meeting in Milwaukee, January 27, and Dr Jaros F. Zivnaska, Milwaukee, was installed as president. Major Jerry W. McRoberts, Sheboygan, M. C., U. S. Army, was the retiring president. Other officers include Dr Gervase S. Flaherty, South Milwaukee, secretary, and Dr James G. Garland, Milwaukee, treasurer. The next meeting of the academy will be held in Madison, May 19.

### GENERAL

**Fellowships for Research on Quinine**—Two fellowships are offered by the Cinchona Products Institute of New York for chemical or pharmacologic research on quinine or the other alkaloids of cinchona. They carry a yearly stipend of \$2,000 plus necessary laboratory or routine expenses. Further details may be secured from Cinchona Products Institute, Inc., 10 Rockefeller Plaza, New York.

**New Executive Secretary of American Hospital Association**—Mr George Puffer Bugbee, superintendent of City Hospital, Cleveland, has been appointed executive secretary of the American Hospital Association, effective May 1. He will succeed Dr Bert Caldwell, who has been named secretary emeritus. Mr Bugbee has served as credit and office manager and assistant director of the University Hospital, Ann Arbor, Mich.

**Dr. Busch to Direct Red Cross for Eastern Area**—Dr John F. Busch, since 1937 associated with the division of tuberculosis control of the Georgia Department of Public Health, Atlanta, has been appointed director of medical and health service for the Eastern Area of the American Red Cross, with headquarters in Alexandria, Va. Dr Busch graduated at the Medical College of the State of South Carolina, Charleston, in 1927.

**Conference of Industrial Hygienists**—The sixth annual meeting of the National Conference of Governmental Industrial Hygienists will be held at the Hotel Seneca, Rochester, N. Y., May 24, followed by meetings of the American Industrial Hygiene Association and the American Association of Industrial Physicians and Surgeons, May 25-27. These sessions were originally scheduled for May 17-20 but because of conflict with other conferences the dates were changed, according to *Industrial Hygiene*. On May 26 a joint session of the three associations with the New York State Associated Industries will be held at the Eastman Theater.

**Examinations of Orthoptic Council**—The American Orthoptic Council announces that written examinations will be held at various cities in the country on September 9. Only those passing the written examination will be permitted to take the oral and practical tests in Chicago on October 9.

Applications on official forms must be received before August 1. All communications should be addressed to the American Orthoptic Council, 23 East Seventy-Ninth Street, New York. The council was organized in 1938 by a group of ophthalmologists, representing the Section on Ophthalmology of the American Medical Association, and the American Academy of Ophthalmology and Otolaryngology, to supervise the training of technicians.

**Pan American Congress of Ophthalmology**—The triennial meeting of the Pan American Congress of Ophthalmology will be held in Montevideo, Uruguay, November 4-9, 1943, under the presidency of Dr Harry S. Gradle, Chicago. A recent announcement states that in spite of the present world condition it was decided to go ahead with the organization and preparation of scientific work for the meeting. If by June 1943 the world situation still seems unfavorable, the meeting will be postponed until November 1944. The first day of the session has been designated as the "inaugural session." The second day will be given to a consideration of social ophthalmology, the morning session to cover 'Prevention of Blindness in the Americas' and the afternoon 'The Status of Trachoma in the Americas.' The third day will be devoted to research in ophthalmology, eight studies to be selected by the committee on arrangements. The fourth day of the session will be given over to excursions and festivities. The session will be concluded with a consideration of glaucoma, individual topics to be 'The Preglaucomatous State—Its Diagnosis and Treatment,' 'New Ideas on Glaucoma Derived from Gonioscopy,' 'Estimation and Mechanism of the Destructive Effects of Ocular Hypertension' and 'Surgical Intervention in Glaucoma—How Far Can Medical Treatment be Continued.'

**Few Fatalities Charged to Exposure to Cold**—Fatalities resulting directly from exposure to cold by actually freezing to death or suffering severe frostbite in homes inadequately or poorly heated are few and far between, according to a release from the Metropolitan Life Insurance Company. There is no indication that the fuel shortage will add materially to the toll this year, it was stated. Around 350 deaths each year on the average are charged to exposure to excessive cold. Where death actually occurs from this cause it is usually outdoors and the victim often is a person under the influence of liquor or mentally deranged, it was stated. Where death from exposure does occur in the home, past experience shows that the victim in most cases was either very old or a sick person, living alone and unable on account of an infirmity to tend the fire. A study covering the years 1933-1940 showed that some of the Eastern states critically affected this winter by fuel shortages registered death rates from cold below the general average of 28 per million observed in the United States as a whole. The rates were 16 in both New York and New Jersey, 19 in Massachusetts and 27 in Connecticut. Higher rates than the average occurred in Vermont, 31, and New Hampshire, 36, while the highest rates among those states affected by the wartime heating problem were recorded in Maryland, 43, Rhode Island 45 and Maine 66. The highest rates in the country prevailed in the mountain states of Nevada 240, Montana 149 and Wyoming, 144. North Dakota, 101 is the only other state with a rate exceeding ten deaths per million of population. The lowest rates were recorded in California 07, and the District of Columbia 06. Referring to an analysis made some years ago of the records of deaths ascribed to excessive cold among their company's industrial policyholders, it was stated that more than one third of the victims were reported as being either under the influence of intoxicating liquors or mentally deranged. These individuals were found in the open where they had been exposed to cold weather for long periods. A number of deaths occurred among persons who had fallen down and on account of age were unable to get up and were subjected to prolonged exposure to cold. Others succumbed on hunting or fishing trips when lost in a storm or while at work in the open.

### CORRECTIONS

**Mental Symptoms Following Use of Atabrine**—In the Current Comment under the foregoing title in THE JOURNAL, March 6, page 765, in the sixth line from the end the word "malaria" should be substituted for the words "quinine daily."

**Superficial Vascularization of the Cornea**—In the abstract of Dr. H. R. Sandstead's article in THE JOURNAL, February 20, page 624, entitled "Superficial Vascularization of the Cornea," the fourth line from the bottom of the second column should read "5 mg of riboflavin twice daily for forty nine days" or "10 mg daily."

## Foreign Letters

### LONDON

(From Our Regular Correspondent)

Jan 23, 1943

#### Infective Hepatitis in the War

Jaundice is one of the disorders of armies in the field. In the last great war a few of the outbreaks were traced to *Leptospira icterohemorrhagica* (spirochetal jaundice) but others defied investigation. The coincident prevalence of intestinal disease led to the view that the jaundice was due to ascending catarrh of the bile passages and many were labeled catarrhal jaundice, but in fatal cases the liver sometimes showed a focal necrosis, never involving the bile passages, which pointed to systemic infection. Except for one outbreak in Scandinavia in 1925-1927, no comparable outbreaks were seen until the disease appeared again in the British Expeditionary Force in 1939. However, it has now been noted among troops in the United Kingdom, the United States, northern Ireland, West Africa, Malta, Iceland and especially the Middle East. Its incidence in enemy occupied Europe is thought to be considerable.

In an army medical bulletin it is stated that new and valuable facts have come to light about infective hepatitis since 1936 when jaundice developed in a group of people inoculated several months before with yellow fever vaccine. Since then children and others passively immunized with mumps and measles convalescent serum have developed similar jaundice, which they have sometimes transmitted to contacts and laboratory workers handling serum from patients with the disease. American troops immunized with certain batches of yellow fever vaccine have also been affected, and jaundice has been discovered among the donors of the vaccine. It has been shown that at least one of the causative organisms of infective hepatitis can (1) pass through bacteria trapping filters, (2) withstand the action of phenol, freezing and drying and (3) be propagated in serum-tyrode chicken embryo medium. Thus it behaves as a virus and further examination is handicapped by the fact that it has not been transmitted to any animal.

The incubation period of the natural disease is about a month, but after serum as much as three or four months—a difference not explained. The general immunity appears to be high, only about 10 per cent of exposed persons show obvious jaundice and after injection of infected serum less than 30 per cent. It seems possible that the jaundice seen from time to time in those taking arsphenamine is due to the same virus attacking a liver damaged by the drug. The same may hold for the hepatitis attributed to trinitrotoluene and other industrial poisons. The diagnosis may be easy during an outbreak or after immunization but may be difficult in single cases. Leptospiral jaundice may be excluded by animal inoculation, serologic tests or the blood picture. The death rate is low and death is unusual before the second or third week.

#### Increased Food Restrictions to Save Shipping

In order to devote as much shipping as possible to the carriage of military supplies, the consumption of food is to be further scaled down. Lord Woolton, minister of food, says that in 1943 there will be a continuance of the tightening up process already in force in 1942. Restriction was achieved mainly by applying points rationing to several more foods and reducing on July 26 each consumer's points from 24 to 20 a month. At the same time the cheese allowance was doubled to the generous one of half a pound a week, which may have to be reduced soon. When the year 1942 opened points rationing was confined to canned meats, fish and beans. During the year rice, sago, tapioca, dried peas, beans and lentils, dried

fruits, canned fruits and vegetables, condensed milk, cereal breakfast foods, syrup and molasses, biscuits and rolled or flaked oats were added.

The Ministry of Food has made its contribution to shipping needs by trimming imports, mainly by bringing in concentrated foods, such as dried egg instead of eggs in the shell and by pushing the consumption of home produced foods such as potatoes, against those imported. The ministry helped to insure a cheap and plentiful supply of potatoes and tried by various means, including a rise in price, to discourage consumption of bread. Wheat makes up a large part of our food imports, and to reduce this amount the extraction of flour was increased from 75 to 85 per cent, and white bread disappeared for the duration of the war. Two additional ways of saving on grain imports remain. To increase the extraction of wheat to 90 per cent or more would encounter the same vigorous opposition as did the increase to 85 per cent, the addition of home produced oats and barley to the national flour has been decided on.

#### "Iatrogenic Disorders"

Sir Arthur Hurst has introduced into medicine the term "iatrogenic disorders," iatrogenic being derived from Greek words meaning "generated by the physician" but surgeons, radiologists and pathologists are included in his criticism. In a lecture delivered to the Medical Society of the Middlesex Hospital on the subject he began by pointing out that in hysteria the patients are so suggestible that the symptoms largely depend on or are the result of the method of examination. Investigating the diminution of the visual fields in a case of hysteria the physician will find as he moves around the clock that the field will become progressively narrowed in spiral fashion ending in practically no visual field. But if then he plots the field, moving the spot from the middle of the tiny field toward the periphery, asking the patient when he can no longer see the spot, he will be able to unwind the field until the normal visual field returns. Similarly paresthesia of the arm or leg in a hysterical paralysis is the patient's idea of what the physician ought to find in a case of organic paralysis.

The terms 'soldier's heart' and 'effort syndrome' when tentatively applied to cases, suggest things to the patient who becomes more likely to succumb to the malady. An example was a gardener who enjoyed perfect health until he was examined by a medical board for the army. Extrasystoles were found and thought to be of some significance. He was sent to London to be electrocardiographed and thence to a heart hospital for further investigation. He saw constantly around him the main clinical symptoms of cardiac cases and picked up the "atmosphere." Soon he was experiencing these same symptoms himself, his state being induced purely by suggestion and the initial fixation of his attention on his heart by frequent examinations and the flourishing of stethoscopes and other fearsome instruments. Sir Arthur warned his audience to be very careful about telling patients about their blood pressure as this often caused unnecessary introspection. He knew of a spa full of people worried about their blood pressure. Those with high pressure took the waters to get it down; those with low pressure took the waters to get it up!

Mucous colitis has always been regarded by Hurst as a mythical malady. He has pointed out that mucous membranes secrete mucus for their own protection. The clear mucus passed with scybala protects the colonic mucous membrane from mechanical injury, that passed with unformed stools after a purgative protect it from chemical injury. This mucus contains no inflammatory cells, endoscopy reveals a healthy mucous membrane. To diagnose mucous colitis is to create an anxiety neurosis. People will luxuriate in it and their chief aim in life becomes a minute examination of the proportion of mucus in their stools and how much can be coaxed out of the rectum.

gation Bowel neurosis is largely the product of physicians giving patients the impression that their bowels are swamps of putrid matter bearable only if constantly purged and swilled out with frequent and copious floods of water Radiologists are also responsible for mischief The x-ray report of "gastroptosis, translated to the patient as 'dropped stomach,'" con-jures up to him terrible things Treatment with a belt forces the stomach farther into the pelvis It is not borne in mind that some stomachs are longer than others, just as some people's noses are The x-ray diagnosis of 'duodenitis,' which is sometimes passed on to the patient, is purely iatrogenic

Surgeons who fall back on "chronic appendicitis" as a diagnosis are really admitting failure One of the almost constant signs of chronic cholecystitis is an appendix scar The diagnosis of adhesions to explain the recurrence of pain after appendectomy is another sign that the real trouble has not been reached

Finally, Sir Arthur dealt with a subject which he has made his own—peptic ulcer Here as in many other cases, the use of x-rays has made us slack in eliciting proper histories and physical signs before making a diagnosis, gastroscopy should be done in all cases diagnosed The process of a barium meal is liable to start a functional dyspepsia, and two barium meals are certain to People once assured that they have no ulcer should be prevented from trying to obtain a different diagnosis at another hospital Anastomotic ulcers and their serious complications are purely the result of surgery Partial gastrectomy in a straightforward case is so uncertain of producing permanent cure as to make it not warrantable Only total gastrectomy is certain of producing cure, and rigid medical treatment is the next best thing

#### The Health of Women War Workers

In its report, the Select Committee on National Expenditure deals with the health and welfare of women in factories It asks the government to secure a satisfactory medical service in all factories doing government work Greater use should be made of women doctors A central industrial health advisory committee should be set up to advise on all questions of industrial health and on the coordination of medical services to meet the requirements of the war effort Regional industrial health advisory committees should also be set up to advise the Ministry of Labor These committees, working in cooperation with medical organizations, could do much to reduce the incidence both of industrial disease and of general sickness among industrial workers

The estimated increase in the number of women in industry (excluding civil defense) in the first three years of the war is over a million and a half Taking munitions and certain essential industries and services together, the increase is nearly two million The number of recruits with no previous experience of factory life is large and there is a considerable proportion of married women with their own special problems Except in the case of ordnance factories and certain private undertakings there has been no selective examination on joining Had the necessary medical staff been available, the committee would have strongly recommended that this be done It draws attention to the waste of public money in transferring to factories away from home of women not physically fit for factory work In considering the most suitable length of the working day, regard must be paid to the time that women are often obliged to spend on domestic duties and shopping, as well as in travel to and from their place of work Many married women are now doing the equivalent of two full time jobs Instances are given of women working twelve hours a day, spending two or three hours in traveling and on top of this undertaking household duties It is obvious why under such circumstances sickness should be more frequent among women than among men workers

## TORONTO

(From a Special Correspondent)

March 1, 1943

### The Movement Toward Compulsory Health Insurance in Canada

In the speech from the throne, presented at the opening of Parliament a month ago, there appeared a clause which indicated that the government proposed to take action to provide a comprehensive national plan of social insurance, including health insurance For the past eighteen months an Advisory Committee on Health Insurance, set up within the Department of Pensions and National Health, has been studying proposals relating to health insurance, having in view the drafting of legislation, either federal or provincial or a combination of the two, to provide health insurance for the Canadian people Putting the two preceding facts together, there would appear to be every indication that health insurance legislation will be discussed in the Parliament of Canada this coming session

During the past fifteen years the Canadian Medical Association has given considerable attention to health insurance and allied problems Study committees were established throughout the Dominion The general secretary of the association was sent to Europe in 1937 to visit a number of countries where health insurance was in operation The Canadian Medical Association has long since gone on record with respect to the principles which should be incorporated in health insurance legislation when and if such legislation becomes effective The association had not, however, up until January 1943, expressed itself either in favor of or opposed to the inauguration of health insurance in Canada

Realizing that health insurance was apparently imminent and that a very high percentage of the people of our country were in favor of some such measure, the general council of the Canadian Medical Association was convened in special session in Ottawa on January 17 and 18 to resurvey its position in respect to the problem The attendance was seventy eight, with all the provinces well represented At the end of two days' discussion, the general council unanimously adopted the following resolution

WHEREAS The objects of the Canadian Medical Association are

- 1 The promotion of health and the prevention of disease
- 2 The improvement of health services
- 3 The performance of such other lawful things as are incidental or conducive to the welfare of the public and

WHEREAS The Canadian Medical Association is keenly conscious of the desirability of providing adequate health services to all the people of Canada and

WHEREAS The Canadian Medical Association has for many years been studying plans for the securing of such health services therefore be it

Resolved That

- 1 The Canadian Medical Association approves the adoption of the principle of health insurance
- 2 The Canadian Medical Association favors a plan of health insurance which will secure the development and provision of the highest standard of health services preventive and curative if such plan be fair both to the insured and to all those rendering the service

A select committee of the House of Commons has been established to study the matter Representatives of the Canadian Medical Association will appear before that committee and endeavor to interpret the views of the medical profession of Canada

Summing up, it may be said that the Canadian Medical Association takes this position in respect to the subject

1 That, in whatever plan or plans may be devised to provide health services to the people of Canada, a standard of service equal to or higher than that which now obtains should be guaranteed, and

2 That the financial arrangements which will be necessary to implement an ideal plan must be fair both to those who provide the services and to those who are served

## Deaths

**Joseph Francis Elward** • Washington, D C, Georgetown University School of Medicine, Washington 1919, specialist certified by the American Board of Radiology, Inc. also a pharmacist, formerly clinical instructor in radiology at the George Washington University School of Medicine and associate professor of roentgenology at his alma mater, in 1938 was elected secretary of the American Therapeutic Society, member of the American Roentgen Ray Society, Radiological Society of North America, Inc., American College of Radiology and the American Radium Society, served during World War I served as roentgenologist to the Sibley Memorial, George Washington University and National Homeopathic hospitals, formerly consultant in roentgenology to the U S Veterans Administration, aged 52, died, February 6, in Plains, Pa., of coronary thrombosis.

**Wilhelm Siegmund Frei**, New York, Georg August-Universität Medizinische Fakultät, Göttingen, Prussia, Germany, 1913 in 1911 served as an assistant at the Robert Koch Institute for Infectious Diseases in Berlin during World War I served in the Hamburg Bacteriological Laboratory and as an army medical officer, from 1919 to 1929 was an assistant at the University Clinic of Dermatology of Breslau, in 1923 was lecturer and in 1926 professor of dermatology at the Breslau University, in 1929 was made physician in chief of the dermatologic department of Berlin-Spandau Municipal Hospital, devised the diagnostic Frei test for venereal lymphogranuloma, in 1937 was appointed resident physician in dermatology holding this post until July 1, 1938 at the Montefiore Hospital, where he died, January 27, of tuberculosis, aged 57.

**Joseph Andrew Hyams** • New York, Columbia University College of Physicians and Surgeons New York 1905, specialist certified by the American Board of Urology, Inc. member of the American Urological Association, fellow of the American College of Surgeons, formerly associate professor of clinical urology at the New York Post-Graduate Medical School, Columbia University served as a lieutenant in the medical corps of the U S Army during World War I, attending urologist and director of the service of urology at the New York Post Graduate Medical School and Hospital and Dispensary, director of the department of urology at the Gouverneur Hospital, consulting urologist, All Souls Hospital, Morristown, N J., aged 58, died, January 26, of coronary thrombosis.

**Jefferson L. Angell**, Kingsville, Mo., Ensworth Medical College St Joseph, 1893, aged 85, died, January 7, in Kansas City of uremia.

**Gordon C. Anson**, Ironton, Mo., Homeopathic Medical College of Missouri, St Louis, 1900, aged 64, died, December 9 in Bonne Terre of angina pectoris.

**Charles Willett Austene**, Centraha, Mo., University of Missouri School of Medicine, Columbia, 1901, aged 66 died January 13, in a hospital at Fulton of pneumonia.

**John Carleton Bachop**, Sheakleyville, Pa., University of Michigan Department of Medicine and Surgery, Ann Arbor, 1883, aged 88 died, January 28, of coronary occlusion.

**William E. Barron** • Addison N Y College of Physicians and Surgeons, Baltimore, 1891, formerly served as mayor, past president of the Steuben County Medical Society, at one time surgeon for the Buffalo and Susquehanna Railroad, aged 76, died December 21, in the Veterans Administration Facility Bay Pines, Fla.

**Charles Bickel**, Trenton, Mo., Medico-Chirurgical College of Kansas City, Mo., 1902, aged 72 died, February 8, in the Cullers Hospital of cerebral hemorrhage.

**Henry Lyons Bienenfeld**, Brooklyn University of the City of New York Medical Department, 1884, for many years chairman of local school board number 20 in New York and at one time health officer of the Port of New York, aged 86, died, January 5, in the Israel Zion Hospital.

**Siegfried Blach**, Brooklyn, Universität Heidelberg Medizinische Fakultät, Baden Germany, 1923, member of the Medical Society of the State of New York, aged 42, died, December 11.

**Walter Ernst Boehm** • Richmond Hill, N Y Schlesische-Friedrich-Wilhelms-Universität Medizinische Fakultät, Breslau Prussia, Germany, 1922, aged 46, died, January 6, in the Flower and Fifth Avenue Hospitals of carcinoma.

**Jacques de Lorimer Bourgeois**, Montreal Que Canada, University of Montreal Faculty of Medicine, 1939, on Dec 1, 1940 was commissioned a surgeon lieutenant in the Royal

Canadian Naval Volunteer Reserve, aged 29, died, November 8, as the result of enemy shell fire while he was operating on an American soldier on board ship at Oran, North Africa.

**David Ritchey Braden** • Mission, Kan., St Louis University School of Medicine, 1920, member of the Missouri State Medical Association in 1921 was connected with the U S Public Health Service, for five years assistant medical director of the Illinois Life Insurance Company in Chicago, member of the Myers Clinic in Kansas City, Mo., from 1927 to 1937, aged 54 died suddenly, January 19, of coronary occlusion.

**George Cecil Browne**, Oakland, Calif. College of Physicians and Surgeons, Baltimore, 1899, member of the California Medical Association, served as medical adviser of draft board number 6 during World War I, recently examining physician for draft board number 59 on the staff of the Alameda (Calif.) Hospital, aged 66, died, January 20 of heart disease.

**Howard Sheldon Bulkeley** • Rhinebeck, N Y, University and Bellevue Hospital Medical College New York 1912 for several years town health officer, aged 56 died, January 17, in the Northern Dutchess Health Service Center.

**Benjamin Brabson Cates**, Knoxville, Tenn. University of Pennsylvania Department of Medicine Philadelphia 1888, member of the Tennessee State Medical Association formerly professor of principles and practice of surgery and clinical surgery at the Tennessee Medical College, served on the staff of the Knoxville General and St Mary's hospitals for many years, aged 77, died, January 21, of pneumonia and myocarditis.

**George Edwin Cecil**, Hazlehurst Miss. University of Tennessee Medical Department Nashville, 1893, served during World War I, aged 75, died in January.

**James Thomas Adam Clarke**, Winnipeg, Man. Canada Manitoba Medical College, Winnipeg, 1901, aged 69 died January 23, of coronary occlusion.

**William Hallett Cole**, New Germany N S, Canada Medical School of Maine, Portland, 1883, aged 87 died December 2.

**Asa Weston Collins**, San Francisco Cooper Medical College, San Francisco 1903, member of the California Medical Association, formerly adjunct professor of surgery at the College of Physicians and Surgeons of San Francisco was made a Chevalier of the Legion of Honor by the French government for many years' service as chief surgeon of the French Hospital served during World War I fellow of the American College of Surgeons, aged 67, died January 19 in Palo Alto Calif, of heart disease.

**William Edward Costello**, Dubuque Iowa State University of Iowa College of Medicine, Iowa City 1894, member of the Iowa State Medical Society, aged 76, died, January 17, of heart disease.

**Archibald Nelson Currie**, Kalispell, Mont., Rush Medical College, Chicago, 1899, aged 68, died recently of carcinoma of the lung.

**Edward Gates Davis**, Kansas City Kan. College of Physicians and Surgeons, Medical Department, Kansas City University, Kansas City, Kan., 1898, member of the Kansas Medical Society, aged 77, died, January 23 in the Bethany Hospital of arteriosclerosis.

**Madison Pope Deadwyler**, Maysville, Ga., Jefferson Medical College of Philadelphia, 1897, served as mayor of Maysville for many years, aged 69, died December 3, of diabetes mellitus.

**Cornelius J. Donovan**, Lovington, Ill., St Louis College of Physicians and Surgeons 1893, aged 72, died, January 15 in St Mary's Hospital, Decatur, of cerebral hemorrhage.

**John Clark Farr**, Hoboken, N J., Long Island College Hospital, Brooklyn, 1902, member of the Medical Society of New Jersey, formerly medical director of a sanatorium bearing his name, served on the staffs of the Hasbrouck Heights (N J.) Hospital, St Mary's Hospital, Hoboken, and the North Hudson Hospital, Weehawken, aged 73, died, January 24, of cerebral hemorrhage.

**James Vincent Foley**, Pocatello, Idaho, University of Tennessee College of Medicine, Memphis 1931, member of the Idaho State Medical Association, director of the Bannock County Health Unit, first lieutenant in the medical reserve corps of the U S Army not on active duty, aged 36 died January 11, in the Pocatello General Hospital of a subdural hemorrhage from a basal skull fracture incurred in a fall.

**Edmond Bland Ballard Fullham Jr**, Muscatine, Iowa Bennett Medical College, Chicago 1913, member of the Iowa State Medical Society formerly health officer of Muscatine,

served overseas in the medical corps of the U S Army during World War I, aged 51, died, January 10, in Fort Lauderdale, Fla. of cerebral hemorrhage

**Frederick Carl Gunkel**, Cincinnati Medical College of Ohio, Cincinnati, 1884, aged 83, died, January 22, of chronic valvular heart disease

**Flora Cornelia Moss Jackson**, Peoria, Ill., State University of Iowa College of Homeopathic Medicine Iowa City, 1895, aged 80, died, January 2 of acute cardiac dilatation

**Amelia R Keller**, Indianapolis Central College of Physicians and Surgeons Indianapolis 1893, at one time assistant professor of pediatrics at the Indiana University School of Medicine aged 72, died, January 28, in the Indianapolis City Hospital of coronary occlusion

**Henry Cowles Kent**, Indianola Miss, Vanderbilt University School of Medicine Nashville Tenn 1893, veteran of the Spanish American War and World War I aged 71 died January 15 in the Veterans Administration Facility, Memphis, Tenn. of coronary occlusion

**Robert McKee Lapsley** ♂ Keokuk, Iowa College of Physicians and Surgeons, Keokuk 1890 Rush Medical College Chicago 1891 at one time professor of ophthalmology otology and rhinolaryngology and treasurer of Keokuk Medical College member of the American Academy of Ophthalmology and Otolaryngology fellow of the American College of Surgeons aged 72 on the staff of the Graham Hospital president of the staff of St Joseph's Hospital, where he died, January 5, of military tuberculosis

**John Newton Franklin Latimer**, Atlanta Ga Meharry Medical College Nashville, Tenn 1908 aged 67, died, January 17 of septicemia

**David Edward Lenker**, Sunbury Pa Jefferson Medical College of Philadelphia 1888 served as Northumberland County jail physician aged 80 died December 25 in the Mary M Packer Hospital of cerebral hemorrhage

**Archibald Stuart Lewis**, Greensburg Ky University of Louisville (Ky) Medical Department 1885 aged 81 died January 4 of injuries received when struck by a truck

**Hiram John Lloyd** ♂ Mankato, Minn Chicago College of Medicine and Surgery, 1911 on the staffs of the Immanuel Hospital and St Joseph's Hospital, where he died December 14, of a cerebral accident aged 65

**Charles Allen Luce**, Amityville, N Y Bellevue Hospital Medical College New York 1890, member of the Medical Society of the State of New York served as acting assistant surgeon in the U S Public Health Service for many years president and at one time director of the First National Bank and Trust Company, aged 77, was found dead, January 21, of a self-inflicted bullet wound

**Harry Kenyon McCall**, Sioux City Iowa College of Physicians and Surgeons of Chicago School of Medicine of the University of Illinois, 1901, aged 66, died, January 12, of arteriosclerosis

**Albert Newton Mackey**, Aledo, Ill Bellevue Hospital Medical College, New York 1893, served during World War I, aged 79, died, February 11, of coronary thrombosis

**George Jefferson Mancill**, Indianola, Miss, Memphis (Tenn) Hospital Medical College, 1911, member of the Mississippi State Medical Association served as a first lieutenant in the medical corps of the U S Army during World War I, recently an examining physician for the Sunflower County Selective Service System and chairman of the county infantile paralysis foundation, aged 54, died January 15, in the King's Daughters Hospital, Greenville, of lobar pneumonia

**Freeman Simeon Messenger**, Middleton N S, Canada, University of the City of New York Medical Department, New York, 1893, served as mayor through two terms and for many years as a member of the town council a coroner for Annapolis County and a member of the provincial medical board aged 75, died, November 24

**Alexander J Nielson**, Salt Lake City George Washington University School of Medicine Washington, D C 1907 at one time a school teacher in the public schools, aged 71, died, January 16, of coronary occlusion

**William Henry Norrish**, Kenmore, N Y Niagara University Medical Department Buffalo 1890, aged 77, died December 27, of cerebral hemorrhage

**John Aloysius O'Mara** ♂ Spring Lake, N J, Georgetown University School of Medicine Washington D C, 1933, an associate obstetrician at the Fitkin Memorial Hospital Nep-

tune, member of the medical draft board number 6 Monmouth County, aged 36, died, January 20, of coronary thrombosis

**Kristinn Olafson**, Cando, N D, University of Manitoba Faculty of Medicine, Winnipeg, Man, Canada, 1933, member of the North Dakota State Medical Association, aged 40 died accidentally, December 2, of carbon monoxide poisoning

**Levon Papazian**, Nelson, B C, Canada, McGill University Faculty of Medicine, Montreal, Que, 1943, was granted a posthumous degree from McGill University on February 3 aged 23 died, December 24

**Frank Placide Perret**, Jeanerette, La, Tulane University of Louisiana School of Medicine, New Orleans, 1928 member of the Louisiana State Medical Society, aged 38, died, January 10, of hemorrhage and peptic ulcer

**Don Preston Peters**, Lynchburg Va University of Virginia Department of Medicine, Charlottesville, 1902, member of the Medical Society of Virginia, served during World War I, fellow of the American College of Surgeons, member of the visiting surgical staff, Virginia Baptist, Marshall Lodge Memorial Guggenheimer Memorial and Lynchburg General hospitals surgeon State Colony, Colony, aged 65 died, January 20, of coronary thrombosis

**George Franklin Porter**, Centerville, Kan, University Medical College of Kansas City Mo, 1910, member of the Kansas Medical Society served in the medical corps of the U S Army during World War I, aged 56, died, December 7, of acute cardiac dilatation

**Clarence Quinan** ♂ San Francisco, Calif Washington University School of Medicine, St Louis, 1897, lieutenant colonel in the medical reserve corps of the U S Army not on active duty, veteran of the Spanish American War and World War I from 1901 to 1908 instructor in medicine and assistant professor of pathology at the University of California Medical School, serving in the latter position and as acting head of the department 1909-1910, aged 72, died, December 9 in Los Gatos of cerebral hemorrhage

**Theron S Reynolds**, Bancroft, Mich Homeopathic Medical College of Missouri, St Louis, 1898, aged 74, died December 3 of heart disease

**Eugene Stanley Robbins**, New Bedford Mass Bellevue Hospital Medical College, New York 1894, member of the Massachusetts Medical Society, aged 70, died, January 18, in West Palm Beach, Fla, of cerebral hemorrhage

**William A Robertson**, St Joseph, Mo, Marion Sims College of Medicine St Louis 1897 formerly county physician aged 70 on the staff of the Missouri Methodist Hospital, where he died, January 10, of coronary occlusion and arteriosclerosis

**Solucius L Russell**, Yadkinville N C University of Tennessee Medical Department Nashville 1892 aged 84, died, January 17, of hypertensive heart disease with right hemiplegia

**Henry Middleton Rutledge IV** ♂ Laurens, S C Medical College of the State of South Carolina, Charleston 1936, aged 32 on the staff of the Laurens County Hospital, where he died, January 18, of pneumonia following injuries received in a traffic accident

**Charles Edward Scharf** ♂ Chicago Chicago College of Medicine and Surgery, 1913, served as physician for the health department of Chicago, aged 58, one of the original founders member of the board of directors and attending surgeon Belmont Community Hospital, where he died, January 25 of cardiorenal disease

**Irving Sherman** ♂ Brooklyn, Tufts College Medical School Boston 1924, specialist certified by the American Board of Pathology, Inc blood transfusionist and hematologist to the Israel Zion, Brooklyn Women's Adelphi and the Brooklyn Doctors hospitals, aged 43, died, January 24, of lympho sarcoma

**Edwin Dudley Smith**, Woodmere N Y, College of Physicians and Surgeons, New York, 1889, aged 74, died, January 16 of cerebral hemorrhage

**Ira Mason Smith**, Princeton W Va, Atlantic Medical College Baltimore, 1908, member of the West Virginia State Medical Association, aged 66, on the staff of the Mercer Memorial Hospital, where he died, January 10, of myocarditis and heart block

**James Ritchie Sparkman**, Spartanburg S C, Medical College of the State of South Carolina, Charleston, 1907 member of the South Carolina Medical Association, aged 58 died January 4 of hypertensive heart disease

**John Gurdon Steele**, Bristol, Pa., University of Pennsylvania Department of Medicine, Philadelphia, 1898, member of the Medical Society of the State of Pennsylvania, served in the medical corps of the U S Army during World War I, aged 68, died, January 27, in the Roseneath Farms Sanatorium, Philadelphia, of chronic myocarditis

**Robert G Steele**, Melmore, Ohio, Western Reserve University Medical Department, Cleveland, 1883, in 1933 a dinner was given by the Seneca County Medical Society in recognition of his fifty years in the practice of medicine, aged 85, died, January 15, of arteriosclerosis and acute enterocolitis

**Forrest Ray Stewart**, Ironton, Ohio, Ohio State University College of Medicine, Columbus, 1917, member of the Ohio State Medical Association, past president of the Lawrence County Medical Society, member of the state house of representatives 1941-1942 and elected again for 1943-1944, during World War I served overseas as a captain, U S Army, in the 145th ambulance corps, formerly health officer of Lawrence County, on the staff of the Lawrence County General Hospital, aged 53, died, January 18, of coronary thrombosis

**Edwin Pangman Stickney** Ⓢ Arlington, Mass., Harvard Medical School, Boston, 1892, member of the New England Pediatric Society, on the staff of the Symmes Arlington Hospital, aged 80, died, January 8, of cerebral hemorrhage

**Howard George Stimus**, Camden, N J., Jefferson Medical College of Philadelphia, 1902, member of the Medical Society of New Jersey, also a pharmacist, aged 67, died, January 17, in the Cooper Hospital of cerebral hemorrhage and hypertension

**Frank Montgomery Stites** Ⓢ Hopkinsville, Ky., University of Louisville Medical Department, 1889, aged 74, died, January 26, of coronary occlusion

**Frances Sumner Janney Stoddart**, Riverton N J., Woman's Medical College of Pennsylvania, Philadelphia, 1890, aged 76, died, January 26, of cerebral hemorrhage

**John William Stofer**, Gallup, N M., University Medical College of Kansas City, Mo., 1908, member and past president of the New Mexico Medical Society, past president and for many years secretary-treasurer of the McKinley County Medical Society, fellow of the American College of Physicians, local surgeon for the Atchison, Topeka and Santa Fe Railroad, member of the staff of St Mary's Hospital, aged 63, died, January 16, of cerebral hemorrhage

**David Owen Thomas** Ⓢ New Kensington, Pa., Baltimore Medical College, 1905, served overseas during World War I, colonel in the medical reserve corps of the U S Army not on active duty, served as head of the Office of Civilian Defense in New Kensington, aged 70, died, January 14, in the Veterans Administration Facility, Aspinwall, of myocarditis

**Samuel Gately Tracy**, New York, Bellevue Hospital Medical College, New York, 1890, aged 75, died, December 7, of heart disease and bronchopneumonia

**Hoyte Sale Trice**, Tupelo, Miss., Medical Department of Tulane University of Louisiana, New Orleans, 1910, aged 58, died, January 5, of congestive heart disease

**John Charles Tritch**, Findlay, Ohio, Homeopathic Hospital College, Cleveland, 1877, member of the Ohio State Medical Association, fellow of the American College of Surgeons, past president of the Hancock County Medical Society, served as a member of the board of education of Findlay and as coroner of Hancock County, consulting chief of staff and member of the surgical staff of the Findlay Hospital, where he died, January 21, of arteriosclerosis, aged 85

**Robert Carroll Walker**, Waycross, Ga., University of Pennsylvania School of Medicine, Philadelphia, 1914, member of the Medical Association of Georgia, past president of the Ware County Medical Society, served during World War I and as city physician, on the staff of the Ware County Hospital, aged 53, died, January 9, of pulmonary tuberculosis

**Charles Curtis Wallin**, Lewistown, Mont., University of Michigan Department of Medicine, Ann Arbor, 1902, member of the Montana State Medical Association, veteran of the Spanish-American War, health officer of Fergus County and of Lewistown, at one time county physician and deputy health officer of Meagher County, aged 67, died, January 5, in St Joseph's Hospital of acute leukemia and pneumonia

**Thomas Pinckney Waring** Ⓢ Savannah Ga., College of Physicians and Surgeons, New York, 1892, member of the House of Delegates of the American Medical Association in 1906, member of the Southern Surgical Association, fellow of the American College of Surgeons, medical director and owner of the Oglethorpe Sanatorium, formerly superintendent and surgeon in charge of the Telfair Hospital, served as visit-

ing surgeon to Savannah and St Joseph's hospitals, aged 75, died, January 8

**George Maxey Watkins**, Walnut Ridge, Ark., Memphis (Tenn.) Hospital Medical College, 1909, member of the Arkansas Medical Society, major in the medical reserve corps of the U S Army not on active duty, served with the same rank during World War I, aged 69, died, November 29, of cerebral hemorrhage

**Miles Weller**, Beverly Hills, Calif., Denver and Gross College of Medicine, 1904, at one time taught obstetrics at the Gross Medical College in Denver, aged 77, died, January 12, of cardiac asthma

**John W Wells**, Magnolia Ky., University of Louisville (Ky.) Medical Department, 1894, on the board of the T J Samson Community Hospital, Glasgow, aged 72, died, December 17, of angina pectoris

**Lightfoot A West**, Memphis, Tenn., Meharry Medical College, Nashville, 1907, surgeon on the staff of the Collins Chapel Connectional Hospital and formerly surgeon on the staff of the Mercy Hospital, aged 57, died, December 27, of myocarditis

**Fletcher Kindry White**, Sewickley, Pa., Western Reserve University Medical Department, Cleveland 1884, aged 84, died, November 27, in the Sewickley Valley Hospital of bronchopneumonia, arteriosclerosis and senility

**Frances Hulbert White**, Fairport, N Y., University of Michigan Department of Medicine and Surgery, Ann Arbor, 1896, member of the Medical Society of the State of New York, aged 72, died, January 3, of coronary thrombosis

**Walter Walton White Jr**, Baltimore, University of Maryland School of Medicine, Baltimore, 1896, served on the staffs of the Church Home and Infirmary, St Joseph's Hospital and the Maryland General Hospital, aged 67, died, January 2, of carcinoma of the spine

**Edward Watts Morris Whitehead**, Salisbury, N C., University of Pennsylvania School of Medicine, Philadelphia, 1924, had served as director of the old North Carolina Bank and Trust Company, aged 44, died, December 14, of coronary thrombosis

**Lanson C Wilson**, Hayward, Calif., Eclectic Medical Institute, Cincinnati, 1887, aged 83, died, December 31

**Harro Woltmann** Ⓢ Mansfield, Ohio, University of Michigan Department of Medicine and Surgery, Ann Arbor, 1905, fellow of the American College of Physicians, for many years actively interested in the work of the Richland County Tuberculosis and Health Association, serving as a member of the executive committee and chairman of the program committee of that organization, served as chief of staff, Mansfield General Hospital, aged 60, died December 27, of tuberculosis

**James Byron Young** Ⓢ Indianapolis, Medical College of Indiana, Indianapolis, 1901, served as a captain in the medical corps of the U S Army during World War I, member of the medical section of the American Life Convention and the Association of Life Insurance Medical Directors in 1920 became medical director and in 1934 elected a member of the board of directors of the Indianapolis Life Insurance Company, formerly chief of staff at St Francis Hospital, aged 64, died February 7, in St Vincent's Hospital of coronary occlusion and influenza

**Thomas A E Young**, Morristown, N Y., Trinity Medical College, Toronto, Ont., Canada, 1897, veteran of the Spanish American War, aged 66, died, January 22, in the A Barton Hepburn Hospital of chronic nephritis

#### DIED WHILE IN MILITARY SERVICE

**Joseph William Mendoza**, Pittsburgh, University of Pittsburgh School of Medicine, 1933, called to active duty April 1, 1941 as a captain in the medical corps of the Army of the United States, aged 31, was killed, January 2, in an aircraft accident somewhere near Newfoundland while serving as flight surgeon with the army air corps

**Abbott Kenyon Bailey**, Acting Assistant Surgeon, Lieutenant junior grade, U S Navy, Portsmouth, Va., Jefferson Medical College of Philadelphia, 1942, an intern at the Norfolk Naval Hospital, aged 25, died December 31, of a self-inflicted bullet wound



## Bureau of Investigation

### MISBRANDED PRODUCTS

#### Abstracts of Notices of Judgment Issued by the Food and Drug Administration of the United States Department of Agriculture

[EDITORIAL NOTE—These Notices of Judgment are issued under the Food Drug and Cosmetic Act and in cases in which they refer to drugs and devices they are designated D N J and foods F N J. The abstracts that follow are given in the briefest possible form: (1) the name of the product, (2) the name of the manufacturer shipper or consigner, (3) the date of shipment, (4) the composition, (5) the type of nostrum, (6) the reason for the charge of misbranding and (7) the date of issuance of the Notice of Judgment—which is considerably later than the date of the seizure of the product and somewhat later than the conclusion of the case by the Food and Drug Administration.]

**A Z Tablets**—A Z Sales Company Waterbury Conn. Distributors and Strong Cobb and Company Inc. Cleveland shippers. Shipped June 8 1940. Composition essentially potassium acid tartrate calcium gluconate ulfar podophyllum golden seal starch and a small amount of iron compound. Misbranded because labels and accompanying circular falsely represented the product to be efficacious in treating asthma asthmatic spasms bronchitis catarrh congestion of the upper respiratory system hay fever head colds and nasal irritations.—[D D N J F D C 491 September 1942]

**Errich**—Offered for sale by Vita Health Food Company Washington D C. Composition (according to labeling): Each fluid oz contains 600 mg peptonized iron 200 U S P units vitamin B<sub>1</sub> 100 micrograms vitamin B (riboflavin) rice bran extract (which contributes other factors of the vitamin B complex) manganese as the citrate calcium and sodium as the glycerophosphates. Two teaspoons of Errich 4 times daily furnish 99 milligrams of iron. Two teaspoons of Errich 4 times daily supply four fifths 80% of the entire day's needs (minimum U S standard). Misbranded because of false and misleading statements on an accompanying placard: New hope for folks over 40. This combination of iron and vitamin B<sub>1</sub> has helped to restore pep and vigor to thousands. If you suffer from low vitality neuritis nervousness or other nerve disorders stomach distress colitis or constipation loss of appetite pale cheeks lips eyelids or gums poor functioning iron poor blood cold hands or feet loss of vigor you may need more of the vital elements iron and vitamin B<sub>1</sub>. Errich benefits your blood nerves glands and every organ of your body if you lack iron and vitamin B<sub>1</sub>.—[D D N J F D C 496 September 1942]

**Dr. Carey's Marsh Root Prescription 777 Tablets and Dr. Carey's Marsh Root Laxative Pills**—Earle Soap Manufacturing Company Baltimore. Shipped Sept 13 1940. Composition: tablets consisted essentially of plant drugs including a laxative and an alkaloid-bearing drug with methyl salicylate sodium salicylate potassium nitrate sugar starch and talc; the pills were composed essentially of plant material including a laxative drug. Both products misbranded because their names falsely represented that they consisted essentially of marsh root whereas both contained therapeutically active ingredients other than this substance. Further misbranded because statements on and in the packages represented that the tablets would be efficacious as a diuretic a stimulant of the kidneys and urinary system and a cure preventive or mitigation of kidney diseases and that the pills would be effective as a tonic that they were gentle as Nature were not habit forming and were of value for sufferers with kidney or bladder troubles.—[D D N J F D C 500 September 1942]

**Dr. Shreve's Anti Gall Stone Remedy and Dr. Shreve's S and L Pills**—Dr. Shreve's Medicine Company Newton Iowa. Shipped May 11 1940. Composition: the first product was a liquid consisting essentially of lime water and a white sediment and was flavored with saffron; the pills contained plant material (including a laxative) and metallic mercury (equivalent to 0.68 grain of mercury with chalk per pill) and were coated with sugar and calcium carbonate. The Anti Gall Stone Remedy was misbranded because of false and misleading representations in the labeling and accompanying circular that it would be efficacious as a gallstone remedy would produce a chemical change in the gall and alter the secretions of the gallbladder liver kidneys and bladder and place the system in a better condition. Dr. Shreve's S and L Pills were misbranded because of false and misleading label representations that they would be efficacious in treating catarrh of the stomach or bowels dizziness nausea diarrhea or dysentery would promote digestion and assimilation restore tone to the system and be effective as a laxative for biliousness and sour stomach.—[D D N J F D C 493 September 1942]

**Knox Gelatine**—Charles B. Knox Gelatine Company Inc. Johnstown N Y. Shipped between March 20 and April 16 1941. Misbranded because of the following false and misleading claims on package and in accompanying literature: How Knox Gelatine works for you! For endurance. The Knox Gelatine diet is being adopted by men and women all over the country who report that it really works. Hundreds of people who have completed 28 day occupational group tests

have reported that Knox Gelatine has reduced fatigue to a significant degree. This is not theory. It is based upon carefully collected reports of men and women whose work makes strenuous demands on mental and physical endurance. How to take Knox Gelatine for more endurance—less fatigue. The latest research development—and the most wide spread—is the use of Knox Gelatine in building endurance and resistance to fatigue. Also misbranded in violation of the provisions of the law applicable to foods as reported in F N J No 2548.—[D D N J F D C 497 September 1942]

**No Wheez Cough Syrup**—No Wheez Corporation St. Charles Mo. Shipped between March 1 and May 24 1940. Composition essentially small amounts of pine tar menthol an emodin bearing drug chloroform sugar and water. Misbranded because falsely represented in labeling as effective for treating bronchitis whooping cough sore throat and similar conditions and preventing wheezing in these disorders.—[D D N J F D C 489 September 1942]

**Parisian Style Sage**—Ciroux Manufacturing Company Buffalo. Shipped March 29 1940. Composition essentially water alcohol glycerin and small amounts of resorcinol volatile oils and capsicum. Misbranded because of false and misleading representation that the product was effective to aid normal hair growth and for helping the natural growth of the hair. Also misbranded under provisions of the law applicable to cosmetics as reported in C N J No 66.—[D D N J F D C 508 September 1942]

**Robinson's for Rheumatism Arthritis Neuritis and Lumbago**—Albert J. Robinson Allentown Pa. Shipped May 29 1940. Composition essentially potassium iodide (44.8 grams per hundred cubic centimeters) and alcohol (5 per cent). Misbranded because of false and misleading label representations: For rheumatism arthritis neuritis lumbago. A foe to pain and statements in accompanying circular representing that the product would be effective in treating these conditions would lead and lure to normally helpless victims of such disorders would bring freedom from pain and distress and effect perfect health regardless of whether the disorder was of recent origin or had developed to a serious stage and would relieve suffering and disability.—[D D N J F D C 491 September 1942]

**Tongue River Apiaries Honey**—Tongue River Apiaries (E. C. Reed & Son) Rochester Mo. Shipped Oct 1 1940. Misbranded because the claims that the product was helpful for impaired digestion diabetes etc. and that a teaspoonful in warm water induces sleep and stimulates the heart were false and misleading since the use of this honey could not be depended on to fulfil such promise. Further misbranded because of false and misleading statements regarding its alleged efficacy in maintaining health treating heart weakness and heart failure and reviving heart action and its alleged value in cases of pneumonia and general physical repair also as to its alleged effectiveness in producing energy and a healthy complexion its purported usefulness as a cosmetic because of its claimed nourishing bleaching astringent and antiseptic effect on the skin. Also misbranded under provisions of the law applicable to foods as reported in F N J 2811.—[D D N J F D C 499 September 1942]

**Vitalex Perdiz**—Manuel Perdiz trading as Vitalex Laboratories Buffalo. Shipped May 16 1940. Composition: glycerophosphates of sodium and calcium small proportions of iron phosphate zinc phosphide and nuxvomica with indications of brewers yeast and extract of cod liver oil all in tablet form and coated with calcium carbonate and pink coloring. Biologic examination showed that it contained approximately 5 international units of vitamin B<sub>1</sub> per tablet. Misbranded because label statements: Recommended for tiredness loss of weight irritability and nervousness lack of appetite lack of energy and pale complexion when due to nutritional anemia and secondary anemia and it is recommended for fatigue loss of weight irritability and nervousness lack of appetite lack of energy and pallor of the face and anemia caused by nutritional deficiency were false and misleading since the product would not be efficacious for such purposes. Further misbranded in that the name Vitalex and the claim: This exceptional tonic is made of fine ingredients of recognized medicinal value combined with vitamins B and Active ingredients vitamin B. Dose 4 tablets a day were false and misleading since they represented and suggested that the preparation contained a therapeutic amount of vitamin B<sub>1</sub> whereas it did not and because the labeling failed to reveal the fact material in the light of such representations that the recommended total daily dosage 4 tablets would supply less than one thirtieth of the average therapeutic dose of vitamin B<sub>1</sub>. Also misbranded because the statement: It does not contain any injurious drugs was false and misleading since the product did contain nuxvomica and zinc phosphide drugs which might be injurious.—[D D N J F D C 497 September 1942]

**Wiel Garlic Tablets**—Wiel Laboratories Inc. Brooklyn. Shipped March 2 1940. Composition: a small amount of garlic flavored with peppermint and coated with sugar calcium carbonate and a starchy material. Misbranded because labeling falsely represented that the product would build better health stimulate digestion and reduce high blood pressure that garlic causes the relaxation and expansion of the tiny blood vessels and small arteries which have the direct and immediate effect of lowering blood pressure that it would act by stimulating peristaltic movement of the bowels and would aid in dispelling excessive flatulent gas and its disagreeable symptoms of nervous fatigue coated tongue and sleeplessness and that it would relieve that peculiar dizziness and headache which usually accompany high blood pressure and would help to overcome jumpy nerves due to ordinary constipation whereas it would not be efficacious for such purposes.—[D D N J F D C 498 September 1942]



## Correspondence

### INTRAVASCULAR AGGLUTINATIONS IN AVIAN MALARIA

To the Editor —In the January 23 issue of THE JOURNAL, under Current Comment you reviewed an article by Dr Arthur R Lack on Intravascular Agglutinations in Avian Malaria. In your review you credit to the University of Chicago the original and fundamental observations on circulatory changes in malarial malaria made by Dr Knisely and his co-workers. While your misunderstanding is a normal inference from Dr Lack's paper these observations were made, in fact, by Dr Knisely and his co-workers at the University of Tennessee during a two year period when Dr Knisely was on leave of absence from the University of Chicago.

T P LASH JR PH D, Memphis, Tenn  
Dean, University of Tennessee School  
of Biological Sciences

To the Editor —In the January 23 issue of THE JOURNAL you review an article by Dr Arthur Lack on the intravascular agglutination of blood in avian malaria. The original observations on the intravascular agglutinations and consequent sludging of the blood were made in *Macacus rhesus* monkeys infected with *Plasmodium knowlesi* malaria. These observations were made in the late summer and fall of 1940 at the University of Tennessee Medical School by Drs Warren Stratman-Thomas Theodore S Eliot and myself. A preliminary note on this work was published in the *Anatomical Record* (79:90 [March, supp 2] 1941). These studies have been carried on for the past two years at the University of Tennessee through the cooperation of the University of Tennessee, the Tennessee Valley Authority and the University of Chicago. These three institutions pooled facilities, equipment and manpower for the work. In addition to those mentioned Mr Edward H Bloch, Mr Robert Michler, Miss Lois Levy, Miss Louise Warner and, toward the end of the work, Dr Arthur Lack also worked on one or more of the problems involved.

The studies were carried on to learn progressive pathology of *Plasmodium knowlesi* malaria in monkeys, to learn the mechanisms by means of which the sludging of the blood causes symptoms and damage to the body, and to learn the details of the steps whereby the monkey destroys malaria parasites, how the parasite destroying mechanisms operate, how and why they fail, and to learn the effects of antimalarial drugs on these processes. Motion pictures were taken through the microscope of a number of the processes involved. Results of these studies are now being prepared for publication.

Dr Lack was trained in this type of study by the members of our group in order that he might proceed with such studies in other forms of malaria and in other diseases. No harm has been done because his preliminary paper on the sludging of blood in avian malaria has appeared before the publication of the more extensive reports of studies on monkey malaria.

At the end of the editorial comment it is stated, in reference to the intravascular agglutination of the blood in malaria that "the phenomenon presumably occurs in men." A few human patients with malaria have been studied. Every one had the intravascular agglutination. The intravascular agglutination has been seen in human beings with each of the three common species of human malaria. It has also been seen in acute alcoholism and in a variety of other human diseases. A preliminary note on this was published in the *Anatomical Record* (82:426 [No 3] 1942).

MELVIN H KNISELY PH D Chicago  
Assistant Professor of Anatomy University of Chicago

## Medical Examinations and Licensure

### COMING EXAMINATIONS AND MEETINGS

#### BOARDS OF MEDICAL EXAMINERS BOARDS OF EXAMINERS IN THE BASIC SCIENCES

Examinations of boards of medical examiners and boards of examiners in the basic sciences were published in THE JOURNAL March 6 page 784

#### EXAMINING BOARDS IN SPECIALTIES

AMERICAN BOARD OF ANESTHESIOLOGY *Oral Part II* Chicago June 6-7 Final date for filing application is 90 days prior to date of examination Sec Dr P M Wood 745 Fifth Ave New York

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY *Oral Part II* Pittsburgh May 19-25 Sec Dr Paul Titus 1015 Highland Bldg Pittsburgh

AMERICAN BOARD OF PATHOLOGY Chicago June 2-3 Final date for filing application is April 15 Sec Dr F W Hartman Henry Ford Hospital Detroit

AMERICAN BOARD OF PEDIATRICS *Written* Locally Oct 8 *Oral* New York Nov 20-21 Final date for filing application is Aug 1 Starting July 1 1943 Group I will be abolished Sec Dr C A Aldrich 707 Fullerton Ave Chicago

AMERICAN BOARD OF SURGERY *Written Part I* March 25 Sec Dr J Stewart Rodman 225 S Fifteenth St Philadelphia

### Virginia June Report

The Virginia State Board of Medical Examiners reports the written examination for medical licensure held at Richmond in June 1942. The examination covered 8 subjects and included 80 questions. An average of 75 per cent was required to pass. One hundred and thirty-nine candidates were examined, 138 of whom passed and 1 failed. The following schools were represented:

School	PASSED	Year Grad	Number Passed
George Washington University School of Medicine	(1942-3)		3
Howard University College of Medicine	(1941)*		1
Rush Medical College	(1941)		1
University of Chicago The School of Medicine	(1937)		1
Johns Hopkins University School of Medicine	(1942)		1
Washington University School of Medicine	(1942)		1
University of Nebraska College of Medicine	(1937)		1
University of Rochester School of Med and Dentistry	(1939)		1
Hahnemann Medical College and Hospital of Philadelphia	(1942)		1
University of Pennsylvania School of Medicine	(1942)		1
Medical College of Virginia	(1941)	(1942-57)	58
University of Virginia Department of Medicine	(1942-59)		59
Friedrich Wilhelms Universität Medizinische Fakultät Berlin	(1932)	(1936)	2
Medizinische Fakultät der Universität Wien	(1935)	(1938)	2
Regia Università degli Studi di Roma Facoltà di Medicina e Chirurgia	(1936)		1
Universität Bern Medizinische Fakultät	(1936)	(1938)	2
Universität Zürich Medizinische Fakultät	(1918)		1
Second Leningrad Medical Institute Leningrad	(1926)		1
School	FAILED	Year Grad	Number Failed
Schlesische Friedrich Wilhelms Universität Medizinische Fakultät Breslau	(1925)		1

Thirty-two physicians were licensed by endorsement of credentials from January 16 through July 14 1942. The following schools were represented:

School	LICENSED BY ENDORSEMENT	Year Grad	Endorsement of
George Washington University School of Medicine	(1935)		Maryland
University of Georgia Medical Department	(1929)		Georgia
Indiana University School of Medicine	(1937)		Indiana
College of Physicians and Surgeons of Baltimore	(1911)		Pennsylvania
Johns Hopkins University School of Medicine	(1923)		New York
(1939) Maryland			
Tufts College Medical School	(1936)		B M Ex
St Louis University School of Medicine	(1926)		Missouri
University of Nebraska College of Medicine	(1937)		Nebraska
Columbia University College of Physicians and Surgeons	(1903)		New York
Cornell University Medical College	(1935)		Minnesota
New York University College of Medicine	(1938)		B M Ex
Syracuse University College of Medicine	(1937)		New York
University and Bellevue Hospital Medical College	(1904)		U S Army
(1931) New York			
Duke University School of Medicine	(1936)		B M Ex
Ohio State University College of Medicine	(1932)		Ohio
University of Cincinnati College of Medicine	(1916)		Ohio
Western Reserve University School of Medicine	(1931)		Ohio
Temple University School of Medicine	(1939)		Pennsylvania
University of Pennsylvania School of Medicine	(1928)		North Carolina
(1930) Pennsylvania (1930) B M Ex			
Woman's Medical College of Pennsylvania	(1921)		Connecticut
McHarr Medical College	(1940)		(1941-2) Tennessee
University of Tennessee College of Medicine	(1931)		Tennessee
Medical College of Virginia	(1936)		(1941) North Carolina
Queen's University Faculty of Medicine	(1897)		New York

\* License has not been issued

## California July Report

The California Board of Medical Examiners reports the written examination for medical licensure held at Los Angeles, July 28-30, 1942. The examination covered 9 subjects and included 90 questions. One hundred and eleven candidates were examined, 105 of whom passed and 6 failed. The following schools were represented:

School	PASSED	Year Grad	Number Passed
College of Medical Evangelists	(1941)	(1942) 23	24
Stanford University School of Medicine	(1941)	(1942) 10	11
University of California Medical School		(1942) 15	15
University of Southern Calif. School of Medicine		(1942) 27	27
Loyola University School of Medicine	(1941)	(1942)	2
University of Illinois College of Medicine		(1942)	1
Boston University School of Medicine		(1942)	1
University of Minnesota Medical School	(1941)	(1942)	2
St. Louis University School of Medicine	(1940)	(1941) 2	3
Washington University School of Medicine	(1940)	(1941)	2
Creighton University School of Medicine	(1940)	(1941)	2
University of Nebraska College of Medicine		(1940)	1
University of Cincinnati College of Medicine		(1941)	1
University of Oregon Medical School		(1941)	1
University of Pennsylvania School of Medicine		(1941)	1
University of Alberta Faculty of Medicine		(1937)	1
University of Toronto Faculty of Medicine		(1938)	1
Friedrich Wilhelms Universität Berlin	Medizinische Fakultät	(1928)	1
Julius Maximilians Universität Würzburg	Medizinische Fakultät	(1920)	1
Medizinische Fakultät der Universität Wien		(1922) 2	7
(1928) (1929) (1932) (1935) (1937)			
School	FAILED	Year Grad	Number Failed
College of Medical Evangelists		(1942)	1
Hahnemann Medical College and Hosp. of Philadelphia		(1941)	1
Medizinische Fakultät der Universität Wien		(1925)	1
Pennsylvania Medical School (Medical Department of St. John's University) Shanghai		(1929)	1
Deutsche Universität Medizinische Fakultät Prag		(1923)	1
Julius Maximilians Universität Würzburg	Medizinische Fakultät	(1927)	1

## Bureau of Legal Medicine and Legislation

### MEDICOLEGAL ABSTRACTS

**Governmental Hospitals. Validity of Rule Forbidding Performance of Major Surgery Without Presence of a Staff Member.**—The Public Hospital of the city of Sterling, Ill., is as its name indicates owned and operated by the city of Sterling. Rules adopted by its board of directors make its facilities available to physicians who are staff members or who are associate staff members provided only that a 'major operation' may not be performed unless either the operating physician is a staff member or there is in attendance, prepared for assistance in the operation, one or more members of the staff in addition to a proper anesthetist. The plaintiff, Selden, an associate staff member, sought to enjoin the city and the hospital board from enforcing the rule limiting the right of associate staff members to perform surgery in the hospital. Apparently he based his right to relief on a section of the state statutes under the authority of which the hospital was established and operated by the city, which provides, in part, as follows:

All physicians who are recognized as legal practitioners by the Department of Registration and Education [the state agency issuing all licenses to practice any form of the healing art] shall have equal privileges in treating patients in such a hospital. Ill. Rev. Stat. 1941 C 24 §44.1

The trial court dismissed the bill of complaint for want of equity, and the plaintiff appealed to the appellate court of Illinois, second district.

Another rule of the hospital provided that associate staff members might become staff members on invitation after being recommended by the executive committee of the staff. Selden contended that this rule did not set up a standard capable of ready determination so as to enable a physician to know when he was eligible for staff membership. The apparent contention was that because there was no adequate standard for staff membership the other rule limiting the use of the hospital facilities for the performance of surgical operations was invalid. There is no merit to this contention, said the court. There is a specific hospital rule providing for admission to membership

on the associate staff by application and probation and to membership on the staff on invitation after being recommended by the executive committee. The recommendation of the executive committee is based on the observation of its several members of the applicant's qualifications as to his work and his ethics, and if they are good he is invited to become a member of the staff. What other provision would be necessary to constitute any more definite standards is not suggested. Further, more the rules adopted by the board of directors are those of standard hospitals. The rules governing admission to membership on the staff apply to all physicians alike and tend to maintain a high degree of skill and integrity in the membership. It is obvious that rules must be adopted to protect patients in major operations from unethical or unskilled practitioners, even though they are licensed physicians. The rule in controversy is fundamentally a provision for the public safety and the public welfare. It is in no sense for the personal benefit of the hospital or the board of directors except in maintaining the standard of excellence and proficiency contemplated by the statute and required by the welfare of the public. It insures the attendance and, if required, the assistance of a practitioner of experience and ability in case the operating physician should meet with a condition to which he is not equal, so that nothing may be left undone for the benefit of the patient. The section of the statute purporting to record equal privileges in hospitals operated by cities to all physicians recognized as legal practitioners by the department of registration and education was never intended to prohibit the board of directors of a public hospital from adopting rules that will inure to the benefit of hospital patients. The manifest object of the statute referred to was to prevent discrimination of which there is no evidence in this case. The decree of the circuit court dismissing the complaint was accordingly affirmed.

On a petition for rehearing the plaintiff argued that there was nothing in the rules of the hospital which provides that when a physician has attained a certain high degree of skill, based on a given amount of experience, that he shall then be recommended by the executive committee for membership on the staff. That is true, said the court. It is not possible, however, to prescribe by rule a standard of skill dependent on experience. Skillfulness may be, but is not always, brought about by experience. A physician with only limited experience may be a very skilful surgeon while one with many years of experience may be a bungler. The hospital rule here challenged is not in our opinion, an unreasonable rule. It applies alike to all physicians and cannot, on the evidence found in this record, be said to discriminate against the plaintiff. The petition for a rehearing was accordingly denied.—*Selden v. City of Sterling*, 40 N. E. (2d) 329 (Ill., 1942).

**Chiropractic Practice Acts. Validity of Law Abolishing Chiropractic Examining Board and Conferring Its Duties on Central Licensing Authority.**—Rasmussen was convicted of violating the chiropractic practice act of Washington on an information charging that without being licensed by the director of licenses to practice chiropractic he induced the belief that he was lawfully engaged in that practice. He appealed to the Supreme Court of Washington.

Rasmussen contended that the information on which he was convicted did not charge an offense under the laws of the state. His argument ran somewhat as follows: There is now no valid law limiting the practice of chiropractic to persons licensed to do so by the director of licenses. When the chiropractic practice act was enacted in 1921 it contained a section, which still exists as a law, prohibiting the practice of chiropractic and certain other related acts without complying with provisions of the act. In addition the 1919 enactment contained provisions creating a board of chiropractic examiners with power to examine and license applicants for licenses to practice chiropractic. In 1921 a legislative act (Laws 1921, chapter 7) abolished a large number of administrative boards and agencies among them the board of medical examiners and the board of chiropractic examiners, and vested the rights and duties of the boards and agencies abolished in a few stated agencies. By that law the powers and duties of the chiropractic board, among others, was vested in the director of licenses. The law complained of did not set out in full any of the acts affected by it but merely

referred by name to the agencies abolished. This 1921 law, the defendant argued, was invalid because it was an attempt to amend the preexisting chiropractic practice act without complying with that section of the Washington constitution which provides that "No act shall ever be revised or amended by mere reference to its title, but the act revised or the section amended shall be set forth at full length" (Constitution, article II, section 37). The defendant argued that since the law attempting to give the director of licenses power to license applicants for licenses to practice chiropractic and, in effect, attempting to make it unlawful to practice without a license from the director was invalid, there was no provision by which a person could be licensed to practice chiropractic, and hence he committed no offense in practicing, or inducing a belief that he was engaged in practice, without a license. A statute, said the Supreme Court in answer to this contention, must be sustained and enforced unless it is in clear and irreconcilable conflict with some express provision of the constitution. On the other hand, if the constitutional provision and the legislative enactment are so clearly in conflict that they cannot both stand, the statutory provision must, of course, fail. Provisions similar to the provision in the Washington constitution prohibiting revision or amendment by reference to title alone and requiring the act or section revised or amended to be set out in full are found in most state constitutions and at an early date the courts adopted the rule that a provision of this nature must receive a reasonable interpretation. In *People ex rel Drake v Mahoney*, 13 Mich 481, it was said:

This constitutional provision must receive a reasonable construction with a view to give it effect. The mischief designed to be remedied was the enactment of amendatory statutes in terms so blind that legislators themselves were sometimes deceived in regard to their effect and the public from the difficulty in making the necessary examination and comparison failed to become apprised of the changes made in the laws. An amendatory act which purported only to insert certain words or to substitute one phrase for another in an act or section which was only referred to but not republished was well calculated to mislead the careless as to its effect and was perhaps sometimes drawn in that form for that express purpose. But an act complete in itself is not within the mischief designed to be remedied by this provision and cannot be held to be prohibited by it without violating its plain intent.

Following this rule of reasonable interpretation, continued the court, the courts have designated certain statutes which refer to other statutes as "reference statutes" and not within the restriction contemplated by the constitutional provision. Reference statutes are of frequent use to avoid encumbering the statute books by unnecessary repetition, and, in the absence of constitutional restrictions, they have frequently been recognized as an approved method of legislation. *State ex rel Hunt v Taustick*, 64 Wash 69, 116 P 651.

The 1921 act, continued the court, which among other things abolished the board of chiropractic examiners and conferred its duties on the director of licenses, in no way changed or amended the law pertaining to the qualifications or requirements for chiropractors in this state. It merely abolished the state board of chiropractic examiners and transferred its duties to the director of licenses without in any way changing those duties. Legislatures have frequently passed laws abolishing offices or departments and conferring their duties and functions on newly created offices or departments. These statutes have generally been held to be constitutional under state constitutions similar to that of Washington. For instance, *In re Hadley*, 336 Pa 100, 6 A (2d) 874 the court said:

We have several times held that an act terminating given powers and duties in one agency and transferring them to another agency is not required to republish at length all the acts originally conferring such powers and duties.

The court accordingly held constitutional the 1921 act which abolished the board of chiropractic examiners and conferred its powers on the director of licenses.

The defendant contended next that the trial court committed error in admitting into evidence a telephone directory of the community in which the chiropractor lived in which he was listed as a chiropractor and in refusing to strike the testimony of the manager of the telephone company, who identified the directory, testified that the listing in the directory of the defendant as a chiropractor cost the defendant an additional charge of 50 cents a month, and that such a listing was made only at the request of the person listed and admitted that he per-

sonally had made no contract with the defendant for such listing. An investigator of the state department of licenses testified that he had called at the defendant's home on a stated date and that there was a sign on the porch bearing the legend "X-Ray and HIO Chiropractor," that on the front door was printed the defendant's name and office hours and that the defendant in conversation with him answered "yes" to the question as to whether or not he was practicing chiropractic and showed the witness that he had been admitted in one or two other states. The defendant contended that it was necessary for the state to prove that the insertions in the telephone directory were placed there at his request. It does not appear, said the court, that there was any direct evidence available regarding the insertion of the defendant's name in the telephone directory. However, circumstantial evidence was admissible to prove that fact and the testimony of the manager of the telephone company relative to the contents of the telephone directory and the directory itself were admissible in evidence when considered in connection with the testimony of the investigator from the department of licenses. The conclusion of the court in this regard found support in *State v Bennett*, 6 Wash (2d) 208, 107 P (2d) 344. In that case the defendant was convicted of the same offense as the defendant here. The only evidence introduced was that of two inspectors of the state department of licenses to the effect that the defendant's office had on the window the words "Palmer Graduate, X-Ray, Chiropractic", that on entering the office they found cards with the defendant's name and telephone number thereon, and that the defendant admitted that he was practicing. A telephone directory listing the defendant as a chiropractor was also received. There the court said:

We are of the view that upon the evidence the jury not only could have believed that appellant was engaged in the practice of chiropractic without having a license so to do but also was clearly warranted in finding as it did that appellant had induced a belief on the part of the general public that he was engaged in that profession.

It is true as appellant points out that the inspectors did not see the appellant actually performing any manual operation upon a patient and that no witness testified that he or she had been induced to believe that appellant was engaged in the practice of chiropractic. However it was not essential that the charge of inducing belief be established by direct evidence. A criminal case like any other may be proved by circumstantial evidence and reasonable inferences have the same probative effect as direct testimony.

It is a well settled rule of evidence that any inference which may be reasonably drawn from a fact testified to by a witness is as legitimate evidence as the fact itself.

The conviction of the chiropractor was accordingly affirmed.—*State v Rasmussen*, 128 P (2d) 318 (Wash., 1942).

## Society Proceedings

### COMING MEETINGS

Alabama Medical Association of the State of Birmingham April 20 22  
Dr Douglas L Cannon 519 Dexter Ave Montgomery Secretary  
American Gastro-Enterological Association Atlantic City N J May 3 4  
Dr J Arnold Borgen 102 Second Ave S W Rochester Minn  
Secretary  
American Neurological Association New York May 6 7 Dr Henry A  
Riley 117 East 72d St, New York Secretary  
American Society for Clinical Investigation Atlantic City, N J May 3  
Dr Wesley W Spink University Hospital Minneapolis Secretary  
Arizona State Medical Association Tucson April 30 May 1 Dr Frank  
J Milloy 112 North Central Avenue Phoenix Secretary  
Arkansas Medical Society Little Rock April 19 20 Dr W R Brook  
sher 602 Garrison Ave Fort Smith Secretary  
California Medical Association Los Angeles May 2 3 Dr George H  
Kress 450 Sutter St San Francisco Secretary  
Conference of State and Provincial Health Authorities of North America  
Washington D C March 22 25 Dr A J Chesley 469 State Office  
Bldg St Paul Secretary  
Florida Medical Association Jacksonville April 15 16 Dr Shaler Rich  
ardson 111 West Adams St Jacksonville, Secretary  
Iowa State Medical Society Des Moines April 29 30 Dr Robert L  
Parker 3510 Sixth Avenue Des Moines Secretary  
Maryland Medical and Chirurgical Faculty of Baltimore April 27 28  
Dr W Houston Toulson 1211 Cathedral St Baltimore Secretary  
Missouri State Medical Association St Louis April 18 20 Mr Ray  
mond McIntyre 634 North Grand Blvd St Louis Executive Sec  
re ary  
National Tuberculosis Association St Louis May 5 6 Dr Charles J  
Hatfield 7th and Lombard Sts Philadelphia Secretary  
New York Medical Society of the State of Buffalo May 3 6 Dr  
Peter Irving 292 Madison Ave New York Secretary  
Ohio State Medical Association Columbus March 30 31 Mr Charles  
S Nelson 79 East State St Columbus Executive Secretary  
Texas State Medical Association of Fort Worth May 3 6 Dr Holman  
Taylor 1404 West El Paso St Fort Worth Secretary

## Current Medical Literature

### AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1932 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (\*) are abstracted below.

### American Heart Journal, St. Louis

24 719-886 (Dec.) 1942

- \*Hypertension and Cardiac Rupture. Clinical and Pathologic Study of Seventy Two Cases in Thirteen of Which Rupture of Interventricular Septum Occurred. H. A. Edmondson and H. J. Hovie. Los Angeles —p. 719
- Effects of Repeated Administration of Lantoxin C on Myocardium of Dog. H. Roenblum, G. Biskind and H. E. Kruger. San Francisco —p. 734
- \*Syphilitic Coronary Stenosis with Myocardial Infarction. G. E. Burch and T. Winsor. New Orleans —p. 740
- Congenital Aortic and Mitral Atresia. Report of Case and Review of Literature. R. Walker and G. H. Klinck, Jr. Troy, N. Y. —p. 752
- Effect of Oxygen on Electrocardiograms of Cyanotic Patients. J. A. Edison. Brooklyn —p. 763
- Use of Heparin for Complications Which Follow Sclerosing of Varicose Veins by Massive Injection. S. H. Sedwitz. Youngstown, Ohio —p. 774
- Electrocardiogram After Standard Exercise as Functional Test of the Heart. A. M. Master, R. Friedman and S. Dick. New York —p. 777
- Hypoplasia of Aorta Without Transposition with Electrocardiographic and Histopathologic Studies of Conduction System. M. Lev and S. T. Killian. Chicago —p. 794
- Five Year Survival After Perforation of Interventricular Septum Caused by Coronary Occlusion. Histologic Study of Kidneys After Three Hundred and Fifty Injections of Mercurial Diuretics. F. C. Wood and Mary Miller Lieveze. Philadelphia —p. 807
- Effects of Posture on Velocity of Blood Flow from Arm to Tongue. M. Wilburne. Chicago —p. 816
- \*Use of Papaverine as Objective Measure of Circulation Time. S. R. Elek and S. D. Solatz. Chicago —p. 821

**Hypertension and Cardiac Rupture**—Among 25,000 consecutive necropsies performed during seventeen years the hearts of 865 (3.4 per cent) had one or more unhealed infarcts. Edmondson and Hovie state that among these 865 there were 72 with ruptured hearts; the ruptured hearts of only 19 (26.3 per cent) contained scars as compared to 58.4 per cent of those with unruptured hearts and unhealed infarcts. The 33 and 36 per cent incidence of rupture in the seventh and eighth decades closely paralleled the 33 and 28 per cent incidence of infarction in these decades. The difference shown in the eighth decade is not statistically significant. Of the 865 patients 601 were males and of the 72 with ruptured hearts only 40 were males. The seasonal incidence of rupture of the heart did not differ significantly from that of myocardial infarction and the frequency of obesity was practically the same in these two groups. In the ruptured hearts the infarcts tended to be smaller more completely necrotic and more heavily infiltrated with polymorphonuclear leukocytes. Of 100 consecutive patients whose nonfatal myocardial infarction was determined on convincing clinical and electrocardiographic evidence, 23 had a blood pressure of or above 140 systolic and 90 diastolic, the average was 125/78. Of 657 patients who had myocardial infarction that terminated fatally without rupture, 210 had a blood pressure of or above 140/90; the average being 128/81. In 39 of 62 patients who died of cardiac rupture the blood pressure was 140/90 and the average 148/90. The average calculated time between infarction and rupture was seven and four tenths days, 98 per cent occurred on or before the sixteenth day after infarction and 78 per cent between the third and twelfth days. Only 4 per cent of 368 patients whose hearts weighed 400 or more Gm and who had a blood pressure of less than 140/90 after infarction had cardiac rupture as compared to 25 per cent of the 28 whose hearts weighed less than 400 Gm and whose blood pressure was higher than 140/90.

**Syphilitic Coronary Stenosis with Myocardial Infarction**—Three patients with myocardial infarction secondary to syphilitic coronary thrombosis were found by Burch and Winsor in their review of the protocols of 6,225 consecutive necropsies at the Charity Hospital during the last five years. These 3 patients comprised 1.6 per cent of all cases of myocardial infarction. Nine similar cases are reported in the literature. The average age of the patients with syphilitic coronary stenosis was 45 years. Both arteries were usually involved. The white to Negro ratio was about 1.6 and the female to male ratio about 1.35. The blood Wassermann reaction was positive in 96.3 per cent. The average weight of the hearts with coronary stenosis alone was 413 Gm, whereas the average weight of the hearts of patients who had had coronary stenosis and aortic regurgitation, hypertension or both was 680 Gm.

**Papaverine and Circulation Time**—Elek and Solatz noticed a sudden, almost uniform deepening of respiration shortly after injection of papaverine hydrochloride. They adopted the following technique. The patient lies supine in a quiet room for at least five minutes before the test is performed. He is informed as to what will probably occur and is asked not to cough, sigh or take a voluntarily deep breath. The ante-cubital vein is used for injection and the arm is so placed on a pillow that the level of the site of injection will be about 10 cm above the posterior axillary line. About ten seconds are allowed to elapse between insertion of the needle and injection of the drug through a 2 cc. I.V. syringe and a 20 gage needle. The papaverine hydrochloride, 40 mg. is injected within one second and the circulation time is clocked. The end point is signaled by a sudden, deep inspiration, with employment of the abdominal muscles, which interrupts the usual phase of respiration and is at times accompanied by a sigh or gentle exclamation. This is commonly followed by flushing of the face or cheeks, a feeling of facial warmth, a sensation of throbbing in the temples, mild dizziness and less frequently, acceleration of the heart. The tachycardia lasts fifteen to sixty seconds with an average of about thirty seconds. The range of values for the circulation time with papaverine for 41 men and 9 women without subjective or objective signs of heart failure varied from fifteen and four-tenths to twenty-seven seconds, the average was twenty and eight-tenths seconds. Duplicate measurements were done of 24 at intervals of two to five minutes, the range of differences between any two measurements was zero to three seconds and the average was one and two-tenths seconds. The data on 6 patients with congestive heart failure and 4 with hyperthyroidism show that in those with heart failure the papaverine circulation time, as the sodium dehydrocholate time, was definitely prolonged. The papaverine circulation time in hyperthyroidism was shortened, but the deviation from normal was not as definite as its prolongation in heart failure. Indirect evidence suggests that papaverine hydrochloride may measure the arm respiratory center circulation time.

### Archives of Pathology, Chicago

35 1-206 (Jan.) 1943

- So Called Mixed Tumors of Salivary Glands. W. H. Sheldon. Boston —p. 1
- Gastrointestinal Involvement in Lymphatic Leukemia. F. Pearson, J. Stasney and P. Pizzolito. New Orleans —p. 21
- Elastic Tissue. III. Relations Between Structure of Aging Aorta and Properties of Isolated Aortic Elastic Tissue. G. M. Hass. New York —p. 29
- Adrenal Rests in Kidney. N. Mitchell and A. Angrist. Jamaica, N. Y. —p. 46
- Developmental Basis of Regenerative and Pathologic Growth in Uterus. P. Gruenewald. Chicago —p. 53
- \*Latent Primary Carcinoma. A. P. Gewanter, N. Mitchell and A. Angrist. Jamaica, N. Y. —p. 66
- Histologic Analogy of Bronchial Adenoma to Late Prenatal and Early Postnatal Structures. W. H. Harris, Jr. New Orleans —p. 85
- Acromegaly with Long Standing Tumor Infiltration of Cavernous Sinuses. C. Spark and S. B. Biller. New York —p. 93
- Effects of Radiation on Normal Tissues. S. Warren. Boston —p. 121
- Semen and Seminal Stains. Review of Methods Used in Medicolegal Investigations. O. J. Pollak. Taunton, Mass. —p. 140

**Latent Primary Carcinoma**—Gewanter and his collaborators report 25 cases of latent primary cancer encountered among 2,514 necropsies (391 were of cancer) between November 1935 and January 1941 at the Queens General Hospital. It is suggested that the term 'latency' be used only for cancer which

produces symptomatic precocious metastasis while it itself remains silent. Symptoms due to the primary involvement were present before death in only 3 of the patients. In 8 instances the primary site was not established at necropsy and in 2 there were double primary tumors. The latent primary cancers were found at nine separate sites: lung, stomach, pancreas, prostate, fundus, uteri, testis, male breast and ovary. In 2 the site could not be determined. The site of the precocious metastasis was the central nervous system: long bones, peritoneum, pleura, lung, liver, lymph nodes, intestine, ovary and adrenal. Metastasis in the central nervous system occasioned manifestation of obstructive hydrocephalus, hemiplegia, the cerebellar syndrome, increased intracranial pressure due to an expanding lesion and paraplegia associated with extradural spinal involvement. Bone involvement was evidenced by pain or pathologic fracture. Involvement of the peritoneum and pleura usually caused effusion, with pain or intestinal obstruction. The latency of any cancer is determined by its biologic growth processes, by its site and by chance. The location of metastasis will of itself condition the early or late appearance of clinical symptoms. The proximity of a tumor to large vascular structures will be determinative of catastrophic symptoms as compared with a similar lesion in the periphery of a relatively avascular organ. Some inherent biologic properties of individual neoplasms may play a determining role in their latency.

### Cancer Research, Baltimore

3 1-72 (Jan) 1943

- Effects of Water Soluble Carcinogen on Early Frog Development Janet Bloch Briggs and R W Briggs Philadelphia—p 1  
Inheritance of Susceptibility to Tumors Induced in Mice I Tumors Induced by Methylcholanthrene in Five Inbred Strains of Mice W J Burdette Baltimore and L C Strong New Haven Conn—p 13  
Genetic Analysis of Induction of Tumors by Methylcholanthrene IV Probable Remote Induction of Various Types of Gastric Lesions I C Strong New Haven Conn V J Collins Albany N Y and E A Durand New Haven Conn—p 21  
Experimental Gastric Tumors in Mice V J Collins Albany N Y W U Gardner and L C Strong New Haven Conn—p 29  
Skin Carcinogenesis by Single Application of 20 Methylcholanthrene W Cramer and R E Stowell St Louis—p 36  
Carcinogenesis After Multiple Irritation J Lauridsen and H E Eggers Omaha—p 43  
Reactions of Hybrid and Parahybrid Pseudohybrid Mice to Inoculations of Tumor C198 A M Cloudman Bar Harbor Maine—p 47  
Transplantable Squamous Cell Carcinoma in Rabbit H S N Greene New Haven Conn and W H Brown Princeton N J—p 53  
Comparative Effects of Estrogen Testosterone and Progesterone on Benign Mammary Tumors of Rat J Heimann New York—p 63

### Connecticut State Medical Journal, Hartford

7 1-78 (Jan) 1943

- Toxic Manifestations of Sulfonamide Therapy P H Long Baltimore—p 6  
II J G Irving Hartford—p 10  
Early Management of Poliomyelitis and the Kenny Treatment F R Ober Boston—p 16  
Presanatorium Tuberculosis P S Phelps and R C Edson Hartford—p 19  
Emotional Components of Illness J Romano Cincinnati—p 22  
Modern Treatment of Acute Hematogenous Osteomyelitis of Long Bones A O Wilensky New York—p 26  
Injuries of Genitourinary System C L Deming New Haven—p 31

### Florida Medical Association Journal, Jacksonville

29 251-290 (Dec) 1942

- Perforating Peptic Ulcer Experiences at Duval County Hospital M Mangels Jr and E Jelks Jacksonville—p 261  
Role of Physical Medicine in National Defense and During Active Warfare K Phillips and A M Phillips Miami—p 266  
Tuberculosis of Breast Report of Case L F Carlton H R Mills and C F Chunn Tampa—p 271  
Indications for Surgical Treatment of Duodenal Ulcer G W Morse Pensacola—p 274

### Georgia Medical Association Journal, Atlanta

31 437-478 (Dec) 1942

- \*A New Disease Entity (?) C D Bowdoin Atlanta—p 437  
A New Disease Entity?—Bowdoin reports the occurrence during August 1940 at Wiens Ga, of an outbreak of 35 cases of an unusual disease. The first patient became ill on August 1 and by August 21 the 35 patients had recovered or were recovering. The county health department made a study of 17. The

patients were males between 6 and 42 years of age and gave a history of sudden onset with severe predominantly frontal headache, postorbital pain, chilliness and sweating. About two thirds of the patients complained of nausea and many vomited. About two thirds complained of lumbar pain and pain in the legs, and one third complained of some pain in the joints. Epigastric pain was complained of by about one half of the patients and diarrhea by 2, but constipation was the rule. The most striking feature was a fine red rash chiefly over the anterior aspects of the legs; it was more predominant over the tibia. The rash was finer but not unlike that seen in measles. It remained only twenty-four to forty-eight hours and usually appeared around the fifth day. The acutely ill patients presented a rather dull facies with slight to moderate injection of the conjunctivas and some slight injection of the throat. The temperature ranged from 100.6 to 104.5 F and was accompanied by a pulse between 55 and 90. The only common etiologic factor was a small sluggish, little stream which pooled into an old swimming hole. Every patient had found relief from the summer heat in this dirty swimming hole. One technician was assigned to handle stool cultures and she became ill in about ten days. The author is convinced that she had a laboratory (secondary) infection of the same disease. Agglutination tests done on the convalescent serums of 22 patients, including the technician, were negative. Since bathing in the particular swimming hole was the only common factor, water transmission must be considered. It would appear that the disease is an entity probably due to an unknown causative agent, but the infection in the laboratory technician suggests its presence in the stool.

### Journal of Immunology, Baltimore

45 237-320 (Dec) 1942

- Hypothermic and Adrenohemorrhagic Effects of Bacterial Vaccines L Olitzki S Avinery and P K Koch Jerusalem Palestine—p 237  
Typhoid Vaccine Studies VI Production of Cross Immunity Between Members of Typhoid Paratyphoid Group of Micro-Organisms D Long fellow and G F Luppold Washington D C—p 249  
Cutaneous Reactions to Animal Plasma Proteins in Man G M Savage H L Taylor and A Keys Minneapolis—p 261  
Method for Titration of Influenza Hemagglutinins and Influenza Antibodies with Aid of Photoelectric Densitometer G K Hirst and E G Pickels New York—p 273  
In Vivo Titrations of Influenza Virus and of Neutralizing Antibodies in Chick Embryos G K Hirst New York—p 285  
Direct Isolation of Human Influenza Virus in Chick Embryos G K Hirst New York—p 293  
Effect of Ninhydrin on Rabbit Serum Protein and Antibodies A H Eggerth Brooklyn—p 303

### Journal of Pediatrics, St Louis

21 569-704 (Nov) 1942

- \*Studies on Air Borne Infection in Hospital Ward I Effect of Ultra violet Light on Cross Infection in Infants Ward Harriet E Sommer and J Stokes Jr Philadelphia—p 569  
\*Id II Effects of Ultraviolet Irradiation and Propylene Glycol Vaporization on Prevention of Experimental Air Borne Infection of Mice by Droplet Nuclei W Henle Harriet E Sommer and J Stokes Jr Philadelphia—p 577  
\*Diagnosis and Management of Severe Infections in Infants and Children Review of Experience Since Introduction of Sulfonamide Therapy II Hemolytic Streptococcus Meningitis A F Hartmann Dorothy Wolff Frances M Love and Barbara S Kendall St Louis—p 591  
Studies with Hemophilus Pertussis V Comparative Antigenic Analysis of Bacillus Parapertussis and Hemophilus Pertussis Phase I with Consideration of Clinical Significance E W Flosdorf A Bondi Harriet Felton and A C McGuinness Philadelphia—p 625  
Series of Substitutes for Milk in Treatment of Allergies L Z Wolpe and P C Silverstone Los Angeles—p 635  
Blood Level of Vitamin B<sub>1</sub> in Healthy Children and Its Relation to Urinary Thiamine R A Benson C M Witzberger L B Slobody and Liese Lewis New York—p 659  
Observations on Schick Test Reactions and Serum Antitoxin Titers After Injections of Toxoid B Benjamin G Fleming Montreal Canada and Mary A Ross Toronto Canada—p 665  
Fetal Toxoplasmic Encephalitis—Type of Congenital Cerebral Disease P M Levin and H Moore Dallas Texas—p 673  
Immediate Fatality Following Use of Mercupurin J Vaughn Santa Monica Calif—p 680

Irradiation and Air Borne Infection—Sommer and Stokes found that irradiation in an experimental ward had some beneficial effect on the air of a nonirradiated control ward because of an open corridor between the two wards. The irradiation reduced the number of air borne organisms in both the irradiated and the nonirradiated ward. It also may have

influenced the kinds of air borne organisms and the number of subclinical and clinical hospital infections. There was a suggestive reduction of pneumococcal cross infections contracted in the irradiated and in the control ward.

**Irradiation, Propylene Glycol Evaporation and Air Borne Infection**—The scanty data obtained in a clinical study prompted Henle Sommer and Stokes to use mice in determining the effect of ultraviolet irradiation and propylene glycol vaporization on air artificially contaminated with droplet nuclei derived from cultures of hemolytic streptococci of Lancefield's group C or the virus of influenza A and on cross infection in the animals. Groups of animals were placed in some cubicles while the cultures were atomized in one of the cubicles of a ward. Both organisms spread rapidly throughout the air of the ward. With heavy concentrations of more than 3000 of air borne streptococci per cubic foot of air most control mice died while propylene glycol vapor protected them completely and ultraviolet irradiation failed to prevent death only among the animals in the cubicle containing the atomizer. With low concentrations of the streptococcus (200 to 500 organisms per cubic foot) all mice survived and cultures from the lungs on the eighth or tenth day failed to reveal the streptococcus. However a carrier state was induced in the control animals but not in those protected by ultraviolet light barriers. Ultraviolet irradiation and propylene glycol vapor were similarly effective in preventing air borne infection with the virus of influenza A. All control mice died propylene glycol vapor protected the animals completely as did ultraviolet irradiation with the exception of a few mice in the cubicle containing the atomizer. Droplet and possibly dust borne infection may require different means of control.

**Severe Infections in Infants and Children**—Since the first case of meningitis was treated with sulfonamides in the St. Louis Children's Hospital 100 patients have been admitted with signs and symptoms sufficiently suggestive of bacterial meningitis. Hartmann and his co-workers review the 12 among the group with acute hemolytic streptococcus meningitis. The infection almost invariably is a complication of acute or neglected infection in the upper part of the respiratory tract and usually in the temporal bone. In 3 fatal cases of the series and in 26 others the involvement of the meninges was usually the result of direct extension of the infection from the middle or inner ear, the mastoid or petrous portion of the temporal bone or from the pericarotid veins in the carotid sheath. In the fourth patient who died postmortem examination revealed a generalized purulent leptomeningitis, an acute inflammatory process in the left mastoid antrum and bronchopneumonia of the right lower lobe. Complete recovery with little or no residua in 8 of the 12 patients is attributed to both early and accurate diagnosis, the administration of adequate amounts of sulfonamide, adequate supportive treatment of all types and to surgical drainage of accessible suppuration within the temporal bone. No chemotherapy had been employed in 2 of 3 patients who died until they were admitted to the hospital in a moribund condition. In the third patient it is questionable whether the amount administered was adequate, spinal fluid concentrations never exceeded 15 mg per hundred cubic centimeters.

### Missouri State Medical Assn Journal, St. Louis

40 1-28 (Jan) 1943

- Infiltrations of Transient Nature Easily Mistaken for Pulmonary Tuberculosis E E Glenn Springfield—p 1  
Prognosis in Pulmonary Tuberculosis H I Spector St. Louis—p 3  
Why Sanatorium or Hospital Treatment Is Necessary in Treatment of Pulmonary Tuberculosis A C Henske St. Louis—p 6  
Laboratory Aids in Diagnosis of Pulmonary Tuberculosis Especially Blood Examination H F Schwartz Koch—p 8  
Value of Tuberculin Test J A Stocker Mount Vernon—p 10

### Nebraska State Medical Journal, Lincoln

28 1-32 (Jan) 1943

- Postoperative Neurologic Complications H W Woltman Rochester Minn—p 4  
Endocrine Problems in the Male W O Thompson Chicago—p 9  
Fibrosis A F Tyler Omaha—p 13  
Trichobezoar W D Lear and R R Brady, Ainsworth—p 15

### New England Journal of Medicine, Boston

227 975 1012 (Dec 24) 1942

- Treatment of Arthritic Contractures of Knee J G Kuhns Boston—p 975  
Important Clues in Cardiovascular Diagnosis P D White Boston—p 980  
\*Use of Ether in Oil Intramuscularly in Treatment of Bronchial Asthma A J Maletta Winchester Mass—p 985  
The Sulfonamides Their Mode of Action and Pharmacology C A Janeway Boston—p 989

**Ether in Oil for Bronchial Asthma**—Maletta administered intramuscular injections of ether in oil to 11 patients with bronchial asthma. Much more clinical investigation is required for proper evaluation. Of the three types of asthma—acute bronchial asthma, chronic bronchial asthma and status asthmaticus—the first is the least important because, in an uncomplicated case, the symptoms generally respond to the usual medications. However, for the patient who responds favorably but not completely and in whom palliative medication must be continued for several days until relief is obtained an intramuscular injection of ether in oil repeated in four to six or twelve hours if necessary appears not only to aid the symptoms but also to render ephedrine and ephedrine more efficacious. Of 6 patients who had an attack of acute asthma from two to five days and who responded fairly but not satisfactorily to injections of ephedrine, ephedrine sulfate, aminophylline and phenobarbital, 4 received one intramuscular injection of ether in oil and 2 received two injections and within two hours their asthmatic symptoms were controlled. The patients became quieter, were able to breathe more easily and expectorated more freely. Of the 3 patients with chronic bronchial asthma, often for as long as thirty or forty years the intramuscular administration of ether in oil rendered expectoration much easier, the patients became more comfortable and as the mucus and cough diminished, they may become symptom free unless secondary changes (emphysema and bronchiectasis) or a fresh episode is encountered. The beneficial results may last for several months or longer. The dose is one or sometimes two injections a week and may be continued in conjunction with other approved treatment until the cough, wheezing and sputum are reduced to a minimum. Ether in oil intramuscularly is an adjunct to other therapeutic agents. Of the 2 patients with status asthmaticus so treated 1 received nine and 1 eleven injections and although they had chronic asthma and had never been completely free of their symptoms, 1 has remained symptom free for more than four and 1 for more than six months.

### Northwest Medicine, Seattle

41 401 432 (Dec) 1942

- \*Silicosis: General Considerations and Survey in Coeur d'Alene Mining District of Idaho P M Ellis M T Smith H I Bonebrake and I B Hunter Wallace Idaho—p 406  
Surgery of Colon H B Stone Baltimore—p 412  
Lower Half Headache: Symptoms and Treatment M Girling Longview Wash—p 419  
Actinomycosis of Lung, Minimal Infection H S Atwood Fort George Wright Wash—p 419

**Silicosis**—Beginning in 1935, one of the mining companies of the Coeur d'Alene region in Idaho started routine physical examinations of new employees and also examined those already working in the mine. In 1936 and 1937 most of the larger companies joined in this policy. Approximately 10,000 examinations were made by the Coeur d'Alene staff. Ellis and his co-workers tabulate 7,542 of the examinations. According to the histories, 1,299 had not been exposed to silica dust and 6,243 had been exposed for one to forty-five years. Of these 6,243 workers 31 per cent exposed for (an average) three and a half years had no silicosis on roentgen and clinical study, the roentgenograms of 32 per cent exposed for six and twenty-nine hundredths years showed excessive linear exaggerations (called presilicosis by many), 2.32 per cent exposed for more than eight and up to more than fifteen years had silicosis and tuberculosis, 0.24 per cent exposed for three years had tuberculosis without silicosis and the remaining 35 per cent exposed for eleven to nineteen and a half years had various grades of silicosis. The authors feel that disability from simple uncomplicated silicosis is not as severe as might be assumed from the roentgenograms alone. For determining disability exercise tests such as used



in life insurance examinations and those now used in examining draftees for the Army are sufficient for the average person when a careful history, physical examination and adequate roentgenograms are had. Superimposed infection is the greatest factor in increasing dyspnea, cough and disability to work. Tuberculosis is the most important; it tends to increase the susceptibility to silicosis. Diseases incident to advancing age must be considered. In many persons the treatment of silicosis is entirely that of prevention, and this is an engineering problem. Above all, the contact of the silicotic patient with tuberculosis must be avoided. A man who has worked long enough under present conditions for silicosis to develop is an experienced and valuable employee, especially in these times and he may be able to produce much more, if there is no superimposed infection, than an individual in perfect health with no experience. If this man's exposure to fine quartz particles is low enough to be safe, he in the light of present knowledge, may work productively with little further danger.

### Radiology, Syracuse, N. Y.

39 647-778 (Dec.) 1942

- \*Lung Abscess Secondary to Aseptic Pulmonary Infarction. E. M. Chester and G. R. Krause—p. 647.  
Traumatic Lipohemarthrosis of Knee. C. B. Peirce and D. C. Eaglehorn. Montreal, Canada—p. 655.  
Influence of Medium on Radiation Injury of Sperm. T. C. Evans, J. C. Slaughter, Iowa City; E. P. Little, E. Vetter, N. H. and G. Failla, New York—p. 663.  
Roentgenologic Irradiation in Acute Peritonitis and Its Effect on Cells of Normal Peritoneal Fluid in Guinea Pigs. F. J. Rigos, Rochester, Minn.—p. 681.  
\*Experimental Studies of Mechanism of Action of X-Ray Therapy on Infection. J. D. Bisgard, H. B. Hunt, O. A. Neely and P. Scott, Omaha—p. 691.  
Comparative Roentgenologic Study of Gallbladder by Intensified Cholecystography. M. Feldman, Baltimore—p. 697.  
Air Myelography for Demonstration of Cervical Spinal Cord. R. M. Lowman and A. Finkelstein, Philadelphia—p. 700.  
Roentgen Diagnosis of Lacerated Spleen. L. Solis Cohen and S. Levine, Philadelphia—p. 707.  
Roentgen Treatment of Inoperable Ulcerating Carcinoma of Breast. W. C. McCarty, Jr. and E. T. Luddy, Rochester, Minn.—p. 711.  
Medical Staff Conference on Parathyroid Gland Disease. F. S. Smyth, M. H. Soley, H. Lissner, L. Goldman, E. R. Miller and S. Lindsay, San Francisco—p. 715.

### Pulmonary Abscess and Aseptic Pulmonary Infarction

—Chester and Krause saw 11 cases of pulmonary abscess secondary to aseptic hemorrhagic pulmonary infarction. In some of the cases the symptoms and signs of pulmonary abscess so dominated the clinical picture that the underlying infarct was not suspected until it was disclosed at necropsy. Some or all of the usual signs and symptoms of pulmonary infarction (hemoptysis, chest pain, dyspnea, pleural friction rub and signs of consolidation) were present in every case in which a pulmonary abscess eventually developed. The distinguishing clinical feature was the occurrence of a foul purulent sputum some days or weeks after the onset of the infarct. It was usually accompanied by a secondary rise in temperature and an elevated leukocyte count. Patients with heart disease had an increase in the severity of the condition. The observations of previous authors as to the roentgen appearance of the infarct shadow have been confirmed. Roentgenologically the infarcts varied widely in appearance, depending on size, position, age and the presence of secondary infection, pleural effusion or passive hyperemia. The typical triangular appearance of the infarct seen at postmortem study was not demonstrated on the roentgenogram unless the central ray passed through the infarct at right angles to its long axis. (If oblique and lateral views are made this triangular shape will be seen more often.) In all cases the infarct became the site of the abscess. If the patient was first seen after the abscess had formed the secondary infection completely masked the underlying infarct. It is therefore important to consider the possibility of an infarct as the underlying cause of all pulmonary abscesses, especially if cardiac failure is present. When the patient was seen early in the course of his disease and serial roentgenograms were made the diagnosis of pulmonary abscess secondary to an infarct was relatively easy. Blood stream infection was excluded from the study so that the infarct of the patients can be presumed to have been aseptic at the time of onset.

**Mechanism of Action of X-Ray Therapy on Infection**—Bisgard and his colleagues state that their experimental studies indicate that in rabbits roentgen irradiation is followed by a significant and consistent reduction in the mortality from toxemia of bacterial origin and that this effect is produced by the liberation of an antitoxic factor. Inadvertently, studies designed to investigate certain aspects of peritonitis became a study of toxemia of bacterial origin and of the effect on it of roentgen rays. If a substance which neutralizes or minimizes the effect of toxins can be termed an antitoxic substance, then roentgen rays produced an antitoxic substance in the rabbits used in the experiments. Since this antitoxic factor was present in the blood stream, the protection from irradiation cannot be attributed to local factors inherent in the treated tissues such as hyperemia, increased or decreased permeability of the capillaries or lymphocytic infiltration as suggested in the literature. The following theory is offered to explain the results. Roentgen rays are destructive agents. In response to this insult the cells, or some group of cells, liberate a protective or antitoxic factor. This protective reaction to injury may be not unlike that evoked by various chemical agents such as snake venom and even bacterial toxins. Time is required for the protective mechanism to develop. In the authors' experiments it was present twenty-four hours after irradiation. Protection apparently developed too slowly to be of benefit to the rabbits irradiated after inoculation. It reached its peak of effectiveness in forty-eight hours and by the seventh day it was apparently entirely dissipated. Harvey, Meleney and Rennie reviewed the reported investigative efforts to establish peritoneal immunity and found that chemical irritants, such as aleuronate and starch mixtures are essentially as effective as vaccines, bacteriogens and serums in producing nonspecific immunity and that the more irritative the agent the greater the immunity. In this category the present authors believe that roentgen rays may be included as a physical agent of irritation and destruction. Porges has suggested that the source of the antitoxic agents of irradiation is the antibodies, ferments and other protective substances which are liberated from the leukocytes that are destroyed by the rays.

### Tennessee State Medical Assn. Journal, Nashville

35 455-500 (Dec.) 1942

- Clinical Results with Use of Buffered Acid Jelly. pp. 45 and Other Jellies of Varying pH in Gynecologic Infections. Study of 129 Cases. R. B. Chrisman, Jr., Camp Forrest—p. 455.  
Headaches. A. Weinstein, Nashville—p. 458.  
Some Significant Achievements in Public Health. W. S. Leathers, Nashville—p. 463.  
Treatment of Facial Fractures. W. M. Adams, Memphis—p. 469.

### Western J. Surg., Obst. & Gynecology, Portland, Ore.

50 597-650 (Dec.) 1942

- \*Presacral Neurectomy. Gynecologic and Obstetric Follow Up. R. N. Rutherford, Seattle—p. 597.  
Motor Dysfunction of Right Half of Colon of Congenital Origin in Children. Clinical and Diagnostic Study. W. H. Bueermann, Portland, Ore.—p. 607.  
Hernias Through the Pelvic Floor. C. W. Barrett, Chicago—p. 615.  
Use of Gravity and Wangenstein Tip in Miller-Abbott Intubation. D. Metheny and L. R. Hutchins, Seattle—p. 618.  
Vagitus Uterinus. J. L. Kitzmiller and W. B. Mitchell, Detroit—p. 620.  
Renal Aspects of Late Toxemias of Pregnancy. A. C. Corcoran, Indianapolis—p. 622.  
Educating Women to Seek Prenatal Care. Hazel Corbin, New York—p. 631.

**Presacral Neurectomy**—Dysmenorrhea may be secondary to obvious pelvic disease. Painful menstruation is an exaggeration of the physiologic vasoconstriction of pain-bearing nerves. Rutherford performed a presacral neurectomy on 23 patients in 1939 on 20 for primary dysmenorrhea and on 3 for endometriosis with its secondary or acquired dysmenorrhea. A two year follow-up has been completed for the 23 patients and 8 of them have undergone pregnancy. Labor was normal in 7, while in 1, because of pelvic disproportion cesarean section was necessary. Corrective procedures were combined with presacral neurectomy whenever indicated. In only 1 of the 23 was the result not worth while, pain was relieved 100 per cent in 12, 75 per cent in 7 and 50 per cent in 4.



## FOREIGN

An asterisk (\*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

## British Journal of Radiology, London

15 341-370 (Dec.) 1942

- Nontraumatic Occipitotantalocal Dislocation. Contribution to Radiology of Atlas. O. Engländer—p. 341  
 Technique in Mass Miniature Radiography. P. Kerley—p. 346  
 Tolerance Dose in Radiotherapy with 200 Kilovolt X Rays. F. Ellis—p. 348  
 Passing of the Cambridge Diploma. A. E. Barclay—p. 351  
 Combination of Radiation Fields in Deep X Ray Therapy. C. W. Wilson—p. 355  
 Very High Voltage X Ray Therapy (Supervoltage). I. G. Williams—p. 360  
 Calcification and Ossification of Spinal Tumors. E. D. Gray—p. 365

## British Medical Journal, London

2 627-654 (Nov. 28) 1942

- Outbreak of Smallpox in Glasgow 1942. A. Macgregor and R. J. Peters—p. 627  
 War Surgery of Eye. Removal of Magnetic Intraocular Foreign Bodies by Posterior Route. H. B. Stallard—p. 629  
 Long Survival After Total Gastrectomy. Brief Review with Report of Two Cases. C. A. Joll and D. I. Adler—p. 632  
 Preparation of Hands for Operation. W. A. Cochrane—p. 635

2 655-684 (Dec. 5) 1942

- \*Infected Wounds Involving Bone Treated with Sulfapyridine and Sulfathiazole. J. F. Heggie, A. W. Kendall and R. M. Heggie—p. 655  
 Venous Preure During Venectomy and Blood Transfusion. J. T. Loutit, M. D. Mollison and E. D. van der Walt—p. 658  
 Water Borne and Milk Borne Outbreak of Paratyphoid B Infection in Wiltshire. Potential Dangers of Run Water Supplies. S. C. Parry—p. 661  
 Fatal Phosphorus Poisoning from Explosive Bullet. A. J. Blackland—p. 664

**Sulfonamides for Infected Bone Injuries**—The Heggies and Kendall used sulfapyridine and sulfathiazole, in addition to the standard antiseptic and surgical measures, in the treatment of compound fractures caused by bomb splinters and other high velocity particles and chiefly infected with *Staphylococcus pyogenes*. From their observations they conclude that chemotherapy is a necessary supplement to the surgical treatment of these wounds. Sulfathiazole is more efficacious than sulfapyridine for these staphylococcal infections when the necessary blood concentration is obtained by oral or intramuscular administration. In established staphylococcal infection in bone combined oral and local administration of sulfathiazole at the time of surgical intervention, especially during radical surgical treatment is efficacious. Sulfathiazole applied locally alone and unsupported by simultaneous oral administration is of value in slight or moderate staphylococcal infection even after the bulk of the infected focus has been removed surgically.

2 685-714 (Dec. 12) 1942

- Pain Pathways in Migraine. G. F. Rowbotham—p. 685  
 \*Syndrome of Hemorrhagic Suprarenal Infarction. Doris V. Keele and K. D. Keele—p. 687  
 Herring as Source of Vitamins A and D. Collaborative Investigation. A. L. Bacharach, E. M. Cruickshank, K. M. Henry, S. K. Kon, J. A. Lovern, T. Moore and R. A. Morton—p. 691  
 Sick Absence Among Munition Workers. A. Massey and R. C. M. Pearson—p. 694  
 Sudden Death in Unsuspected Rheumatic Carditis. J. T. Quinlan—p. 695

**Syndrome of Hemorrhagic Adrenal Infarction**—The Keeles believe that the diagnosis of primary hemorrhagic infarction of the adrenals rests on the character of the pain, the severity of vomiting and the absence of 'shock'. In the patient (the senior author) whose history is reported the syndrome was produced by thrombosis of the adrenal vein with resulting hemorrhagic infarction of the adrenal gland. Other causes of hemorrhage into the adrenal are birth trauma in the newborn, meningococcal and other acute infections and as a part of a general hemorrhagic state. The pain, which at first was a 'stitch' and then a cramp, was gradual in onset and was accompanied by a feeling of coldness. It was localized (by tenderness) to a point to the right of the umbilicus. It was at first mild but steadily increased until it was of great severity. The pain was persistent and intractable to medication and was aggravated by any movement such as walking. The persistent and

repeated vomiting continued until operation. The operation had no effect on the pain. There was hyperalgesia of the skin in the tender region. Vomiting was the symptom which obscured diagnosis. It started about three hours from the onset of pain, it was copious without retching, almost projectile in character and repeated. There appeared to be little nausea between, when fluids were well taken. Dehydration was not pronounced. Its character and persistence suggested intestinal obstruction. The absence of 'shock' was contrary to expectations in a patient with adrenal disease. This clinical picture is confirmed when an analysis is made of the 10 available clinical records of similar cases. Exploratory laparotomy was performed in 4 of the 10 cases and in none was the diagnosis made. This, in the author's opinion, raises the most important feature of all. If at an exploratory laparotomy the usual sites of acute abdominal conditions are normal, the adrenals should be examined for infarction. The cause of the death of the senior author was diffuse bilateral pulmonary hemorrhage, in the other patients it presumably was acute adrenal insufficiency. In cases of Friedrichsen-Waterhouse syndrome pulmonary congestion is commonly mentioned and in view of the present case it would seem that adrenal insufficiency does produce some change in pulmonary circulation.

## Lancet, London

2 661-688 (Dec. 5) 1942

- Vitamin C and Repair of Injured Tissues. G. H. Bourne—p. 661  
 \*Infected Burns in Naval Personnel. R. M. Heggie and J. F. Heggie—p. 664  
 Postvaccinal Encephalitis. T. Anderson and P. McKenzie—p. 667  
 Encephalitis with Skin Eruption After Vaccination. Transfusion of Immune Blood. R. A. Price—p. 669

**Vitamin C and Repair of Injured Tissue**—Since it is most important to secure rapid repair of war injuries Bourne presents the available information on the value of vitamin C in accelerating the repair of injured tissue. In 1923 Ishido found considerable delay in the healing of experimental wounds in scorbutic guinea pigs. Work by others has shown that not only is the growth and migration of fibroblasts affected in healing wounds in vitamin C deficiency but phagocytosis also inhibited. In the first stages of the repair of bone cellular proliferation and production of fibers similar to collagen fibers are essential preliminary processes to calcification and therefore a deficiency of vitamin C would delay healing in bone. The changes in scorbutic animals have proved that the healing of fractures would be delayed in scurvy. In general, absorption of the fracture hematoma is delayed, fibroblast activity is reduced and the production of collagen is deficient. Bourne has shown that optimal formation of bone trabeculae in injured femurs of guinea pigs is brought about by the daily administration of 2 mg of vitamin C (probably equivalent to about 40 mg for a human being) and that anything less than 1 mg seriously retards the formation. Healing of a fractured bone calls for more vitamin C than the animal (guinea pigs and rabbits) is able to manufacture. If calcium ascorbate is injected into rats it accelerates the healing of holes previously bored in their femurs. Calcium gluconate was ineffective. To some extent this can probably be explained by the greater ionization of the ascorbate, which is presumably more effective in absorbing calcium from the subcutaneous tissues and possibly by its greater protein combining power. The double bond structure of ascorbic acid is retained in calcium ascorbate and therefore this substance is an antiscorbutic as well as a source of calcium. Deficiency of vitamin C inhibits the deposition of calcium in bones and in guinea pigs receiving daily injections of 2 mg of sodium alizarin sulfonate repair tissue stained strongly in those receiving 0.5 mg; it stained less intensely and not at all in those receiving no vitamin C. The work of Gould and Shwachman suggests that vitamin C may play some part in the deposition of calcium by means of its effect on the phosphatase system of bone. Therefore vitamin C in the regeneration of bone may promote the activity of the fibroblast cells and possibly their differentiation into osteoblasts, it may favor the attachment of the polypeptide chains to one another and it may aid in the precipitation of bone salts by its promotion of phosphatase activity. The clinical trial of calcium ascorbate for the treatment of fractures has not yet been tried.

**Infected Burns in Naval Personnel**—Of 30 patients severely burned with cordite and other high temperature flash burns, the Heggies state that 20 were treated with tannic acid spray and for 10 this therapy proved inadequate so dressings of cod liver oil were used. On admission 8 of the 20 were not infected, 4 were moderately infected and 8 were grossly infected, and of the 10, 5 were moderately and 5 were grossly infected. With infection the marginal rim loosens. Usually infection occurred from the marginal skin as a result of inadequate antiseptic measures. *Staphylococcus pyogenes* was the predominant organism. In a study of the faeces, skin and clothes of healthy personnel afloat the organism was found respectively in 20, 25 and 14 per cent, and hemolytic streptococci only in 5 per cent of the faeces. *Staph. pyogenes* was recovered from the burn in all cases of infection. Other organisms recovered were the nonhemolytic streptococcus, *Proteus vulgaris* and *Bacillus subtilis*. Chief among the causes for infection were inadequate initial tanning and antiseptic measures—in short inadequate first aid and next immediate treatment. Antiseptics should never replace surgical cleanliness, but some antiseptic must necessarily be applied to avert infection. Cleansing with spirit soap followed by sterile saline solution and then ether is insufficient and adds to shock by increasing loss of body heat. One of the nonirritant synthetic detergents, in aqueous solution, should replace the relatively inefficient commonly used soaps. Infection was not the only factor that delayed healing. Other factors were deeply affected tissue, too frequent changing of dressings, initial or continued protein loss, slow recovery from anemia and the like. When infection cleared up the healing time was similar in the oil and the tan treated patients.

### Schweizerische medizinische Wochenschrift, Basel

72 854-884 (Aug 8) 1942

- Physical Therapy of Accidental and War Wounds M Dubois—p 857  
\*Chronic Pulmonary Infiltration with Eosinophilia M Kartagener—p 862  
Value of Early Provision of Training Protheses in Leg Amputations: Description of Simple Wooden Stumps H Debrunner and C Petri—p 864  
Intestinal Hemorrhage in Obstruction of Vena Cava Inferior W Berlinger—p 869  
Intracutaneous Test on Arm in Dento-genic Focal Injection T Prader—p 870  
Autobiographic Notes of One Operated on for Cataract C Ladame—p 872  
\*Social (Economic) Indications for Sterilization of Marriage Partners G and R Reimann Hunziker—p 876

**Chronic Pulmonary Infiltration with Eosinophilia**—Kartagener points out that transient pulmonary infiltrations with eosinophils, which Löffler differentiated in 1931, have been verified by many investigators. The etiology has not been entirely clarified, probably because there is no uniform cause. The roentgenologic and physical signs and the eosinophilia are transient. The maximum eosinophilia usually appears a few days after the maximum roentgenologic changes. Earlier assumption that edema or atelectasis is the underlying anatomic change have been superseded by von Meyenburg's investigations. This author maintains that these infiltrations represent eosinophilic pneumonia. Transient infiltrations with eosinophils should be designated as eosinophilic infiltration of type Löffler. This type represents an acute process, but the degree of severity of the symptoms is no index of its acuity. The form described by Lohr and by Leon-Kindberg differs from Löffler's type in that the acute symptoms are severe, almost like those of a septic process, and that the process is extremely protracted, it persists for months. Kartagener describes a case which he regards as representative of a third type of eosinophilic infiltration. This form is characterized by chronicity and mildness of the symptoms. The patient, a woman aged 40, had never been seriously ill except for severe gonorrhea. She had never had asthma or bronchitis. She complained of indefinite back and chest pains. Examination demonstrated small foci of infiltration in the right upper lung field, which remained unchanged during fifteen months of observation. The increase in eosinophils persisted with great fluctuations. There were no signs of serious illness aside from intermittent subfebrile temperatures, nocturnal sweats and headaches. She was able to continue her work. Nothing definite can be said about the pathogenesis and etiology of her disorder. Constitutional eosino-

philia can be excluded, but the repeated demonstration of eosinophils in the sputum indicates a relationship between the blood eosinophilia and the pulmonary changes, particularly since asthma can be ruled out. Hodgkin's disease and echinococcus can be ruled out. A tuberculous infiltration cannot be definitely excluded, but in view of the considerable eosinophilia it must be regarded as unusual. Whether the three types of eosinophilic infiltrations represent three variants of the same disease or whether they are distinct entities is difficult to decide. The author suggests that allergic factors might be involved.

**Sterilization of Marriage Partners**—The Reimann-Hunziker discuss social or economic indications for sterilization of marriage partners. They stress that the two partners have the same rights and that the question arises which of the two should be sterilized. Since vasectomy in men is a less serious operation than tubal sterilization in women, sterilization of the male is preferable. The authors cite the following as reasons why, as a rule it is the woman who is being sterilized. 1. Historical development of the sterilization of women. 2. Obscure presentation of the indication for the sterilization the social indication is obscured by a fictitious medical indication. 3. The woman, who is directly responsible for the raising of the children, is usually more willing to undergo sterilization than the man. The authors made inquiries in the larger hospitals of Switzerland in order to determine the relative numbers of men and of women who were sterilized for economic reasons. The inquiry reveals a predominance of women. The authors inquired as to the late results with 12 men who had been subjected to a vasectomy at the Basel clinic. It was possible to examine 8 of these from one to six years after the operation. The men had no disturbances and were satisfied with the results. Roulet and Andina made microscopic studies of testes obtained by castration five years after vasectomy, they observed no secondary degenerative changes. There is a possibility of a successful restorative intervention on the vas deferens.

### Medicina, Madrid

10 253-338 (Oct) 1942 Partial Index

- \*Sudden Death in Starvation E de Salamanca—p 253  
Lathyrism R Martinez Almeida—p 264  
Treatment of Fractures of Surgical Neck of Humerus R Arandes Adan and J Cosp Caminal—p 285  
Duodenal Stenosis Following Lithiasis of Gallbladder and Pancreas M Ruiz—p 315  
Erythrocytic Sedimentation in Rheumatic Diseases J M Masson—p 319

**Sudden Death in Starvation**—De Salamanca observed a number of sudden deaths in starved persons who had eaten their first food after hospitalization with unusual voracity. Tachycardia and increase in the pulmonary artery tonus may be brought about by excitation of the stomach. The simultaneous stimulation of the vagus and the sympathetic may cause ventricular fibrillation, particularly in the presence of an already impaired ventricle. It is probable that overfilling of the stomach produces a vagosympathetic stimulation in an already defective heart and that this reflex mechanism causes ventricular fibrillation and sudden death. Another possible mechanism is that of an impaired liver not capable of absorbing certain products of digestion and with resulting hemoclastic shock. These causes or a combination of several of them may be responsible for the sudden death in the starved.

### Semana Medica, Buenos Aires

49 1005-1080 (Oct 29) 1942 Partial Index

- Diseases of Spinal Column: Erroneous Concept of Chronic Rheumatism of Spine Spondylopathies F Z Guerrini—p 1019  
Endocrine Disorders as Cause of Repeated Abortion: Clinical Case E Cantilo and C Fernandez Sponeri—p 1033  
\*Local Sulfanilamide in Trachoma H F Morate—p 1059

**Local Sulfanilamide in Trachoma**—Morate resorted to various sulfonamide compounds in the treatment of 18 cases of trachoma in children and adults. The drug was well tolerated by the conjunctiva and the cornea. The subjective symptoms rapidly disappeared regardless of the clinical form and duration of the disease. The therapy is simple, economic, painless, clean and hygienic. It resulted in a cure in 33 per cent of the cases and in amelioration of symptoms and in prevention of complications in the rest.

## Book Notices

**Blood Substitutes and Blood Transfusion** Edited by Stuart Mudd M A M D Professor of Bacteriology University of Pennsylvania School of Medicine Philadelphia and William Thalheimer, M D Director Human Serum Division Public Health Research Institute of the City of New York Inc. Fabrikoid Price \$5 Pp 407 with 94 illustrations Springfield Illinois & Baltimore Charles C Thomas 1942

This symposium-monograph contains contributions from seventy collaborating investigators under the editorship of Drs. Mudd and Thalheimer. The discussions concern thoroughly established facts as well as many aspects of blood substitutes and blood transfusion still controversial in nature. The first four chapters discuss the etiology and mechanism of traumatic shock, indeed, the word "shock" might have been included in the title. The contributions are uniformly of high quality even when discussing subjects on the borderline of present knowledge. The arrangement is satisfactory: a section on methods of preservation of plasma and serum by desiccation and by freezing follows the section on shock. The four other divisions are on hemoglobin serum albumin and casein digest as blood substitutes, blood substitutes in the world emergency, whole blood storage, transportation administration, including isoagglutinins and blood group specific substances, and therapeutic experiences with serum and plasma. The symposium is briefly summarized by Dr. Mudd in a chapter entitled "Recapitulation and Outlook." Concentrated research is rapidly adding to knowledge in the field of blood substitutes and blood transfusion, so that some of the material in this book is already dated. This symposium monograph is a valuable and timely contribution in a vital field.

**Microbiology of Meats** By L. B. Jensen A B M Sc Ph D Chief Bacteriologist Swift & Company Chicago Cloth Price \$4 Pp 252 Champaign Ill. Garrard Press 1942

The author has done extensive research in the field of bacteriology of meats and this book contains the results of much of his own research. The introduction and history in chapter 1 covers in a scholarly manner much interesting material from ancient times. The chapter on the gaseous fermentation in meat products by the genus *Bacillus* shows that these bacteria are capable of producing gas in meat containing sodium nitrate. Thiamine is a necessary, although incomplete, factor when meat is excluded. The chapter on green discolorations in meats gives a discussion of the action of oxidizing and sulfide producing bacteria in blood pigments. The chapter on ham souring shows how anaerobic bacteria entering the stick wound during slaughter cause spoilage of hams during curing. The chapter on bacon emphasizes the use of tongs in handling sliced bacon in order to reduce mold contamination. There is an adequate discussion on the control of micro-organisms in the packing plant.

The author has done well in discussing the controversial subject of the use of sodium nitrate in meat. Many will not agree with him that sodium nitrate produces aerobic conditions so that anaerobes such as *Clostridium botulinum* will not grow. McLeod's theory that anaerobes are killed by hydrogen peroxide, which is produced when these organisms are exposed to air, is not so generally accepted. Recent work indicates that oxygen acts indirectly by destroying the reducing potential. If the reducing tension is maintained, anaerobes are able to use measurable quantities of oxygen in their metabolism.

The discussion of the role of microbial oxidase and lipase in the rancidity of fats is ably discussed. Certain minor discrepancies were noted. The author says that bacteria growing on coconut oil agar with Nile blue sulfate as an indicator produce blue colonies when lipase is present. Knaysi, who has investigated the inhibition of growth produced by this dye, contends that the lipase diffusing into the medium coats the fat globules with soap which is colored blue by the dye. The unaltered fat globules remain red. The author believes that the dual acting bacteria producing both lipase and oxidase are responsible for the rapid lypolysis and rancidity in fats. Many readers will not agree completely, remembering that oxidative rancidity by bacteria is mainly a surface effect. Deep in the fat, where intense reducing conditions prevail, destruction of antioxidants will accelerate fat spoilage after the fat is processed and exposed to oxygen.

As in all new books, errors of omission and commission occur. For example, the last chapter on bacterial food poisoning contains, on page 231, an outline for analysis of samples. Directions for growing staphylococci on semisolid mediums in 20 per cent carbon dioxide are not given, although this point is mentioned on succeeding pages in a discussion of the relative merits of various methods of animal testing for enterotoxin. On page 234 is a statement attributed to Dack and Kelley "that bread in sandwiches had been found to be toxic but the filler of the sandwich was nonpoisonous." The filler was toxic. A number of mistakes were also noted in the bibliography.

**Text Book of Pharmacognosy** By Heber W. Lounghen A M Ph M Ph D Professor of Pharmacognosy and Biology in the Massachusetts College of Pharmacy Boston Fifth edition Cloth Price \$7.50 Pp 1038 with 511 illustrations Philadelphia Blakiston Company, 1943

The author defines pharmacognosy as the science which treats of the history, production, commerce, collection, selection, identification, valuation, preservation and use of drugs and other economic materials of plant and animal origin. The aim of the work is to supply a systematic textbook for students of pharmacognosy, either from the morphologic or from the taxonomic point of view. Pharmacognosy is so wide in scope that few students can master it because of its generality as well as its specificity. The study of pharmacognosy is now confined almost entirely to schools of pharmacy, and even here the time given to it is becoming restricted more and more. Medical students are but little exposed to it. Textbooks of pharmacology have found it expedient to restrict pharmacognosy to the mere essentials of such drugs as digitalis, ergot and quinine, and many students cannot recognize any of these. Ever since Dioscorides compiled the Greek Herbal, the study of plant pharmacognosy has gradually decreased, especially during the last century. There is adequate reason for this decline. Medical students simply do not have the time to spend on it. The action of active ingredients and the thousands of organic preparations are more important in medicine than the study of pharmacognosy. Medical educators must confine their teaching to fundamental principles and their action. To them the action of the opium alkaloids is of much more importance than the structure of the poppy capsule. This book, however, is worth the attention of medical students and practitioners, at least as a reference work. For the student of pharmacognosy it is excellent, as indicated by the publication of the fifth edition. The book presents (1) morphologic considerations of drugs, (2) taxonomic consideration of drugs, (a) drugs of vegetable origin, (b) drugs of animal origin, (c) microanalytic methods. It is well arranged. The printing and illustrations are excellent, the text is clear and the statements are definite. For the student of pharmacognosy it can be recommended, for the library of the more general reader it is a worthy addition.

**A Venture in Public Health Integration** The 1941 Health Education Conference of the New York Academy of Medicine Cloth Price \$1 Pp 56 New York Columbia University Press, 1942

This book contains the proceedings of the 1941 Health Education Conference of the New York Academy of Medicine. Contributors to the symposium were Edward J. Stieglitz, M D, Washington, D C, who spoke on "The Role of Health Education in the Promotion of Optimal Health and in the Retardation of Degenerative Diseases", Edward L. Bernays, New York, on "Barriers to Health Education," and Allen Freeman, M D, Baltimore, on "Health Education by the Private Practitioner, the Voluntary Agency and the Department of Health." To the experienced person in health education this material brings nothing new, but these three addresses taken together will give an excellent brief survey and introduction to the field of health education for the novice. The only serious criticism of the views expressed by these authors is their adherence to the prevalent lament, namely that the doctor is not sufficiently interested in health education and that medical ethics must be reinterpreted to give the doctor greater freedom as a health educator. The fact is, of course, that the Judicial Council of the American Medical Association and the House of Delegates have long recognized health education and have enabled and encouraged the physician to participate in it without violation of any principle of medical ethics. Another point often overlooked when the doctor is admonished for his lack

of participation in health education is that the primary responsibility of doctors is the care of the sick, but that in discharging this, their fundamental, obligation doctors perform day in and day out an incalculable amount of health education which can never be measured and charted because it is so intimately interwoven with diagnosis, therapeutics and the intangible doctor-patient relationships which enable the physician unobtrusively to guide his patient toward the way in which he should walk. If this is not health education, what is it?

**A Manual of Experimental Embryology** By Viktor Hamburger Cloth Price \$2.50 Pp 213, with 45 illustrations Chicago University of Chicago Press, 1942

Professor Hamburger's book is intended to be used as a laboratory guide in graduate or undergraduate courses in experimental embryology. It fulfils this function admirably by bringing together much information about operative procedures and the preparation of materials and of instruments which was previously not available in any single book. Clear step by step descriptions of all phases of operations on amphibian and chick embryos and on planarians (flat worms) are presented in such detail as to enable one not previously trained in this type of work to carry out successful experiments. There is a particular emphasis on simplicity of procedure and use of instruments which may be prepared in any laboratory. Thus, directions are given for the preparation of hair loops, glass needles, micropipets, microscalpels and microburners—instruments which suffice for the repetition of many classic operations. The more elaborate tools (iris knives, iridectomy scissors, watchmakers' forceps) are described and the places where they can be purchased are listed. There are excellent descriptive chapters on gastrulation in the amphibia and primitive streak formation in the chick, followed in each instance by a series of carefully thought out experiments. The illustrations are clear and numerous and serve to show instruments, operations and embryonic stages. Embryologists will find the normal series of stages of frog and salamander embryos particularly useful. Each chapter is followed by a short and well chosen bibliography. Methods of obtaining and caring for embryos of amphibian and chick are not overlooked. In summary, this book should serve as an excellent handbook for the use of those already working in this general field or of those who wish to begin transplantation experiments on the nonmammalian vertebrates.

**The Hand Its Disabilities and Diseases** By Condit W. Cutler Jr. M.D., F.A.C.S. Associate Surgeon Roosevelt Hospital New York. Cloth Price \$7.50 Pp 572 with 274 illustrations Philadelphia & London W. B. Saunders Company, 1942

The author has placed considerable emphasis on the anatomy of the hand and its relationship to methods of sound treatment. In addition to an excellent chapter on anatomy, the subject is brought up throughout the entire book and is enhanced by photographs of anatomic specimens and clearcut line drawings. The dangers of delaying adequate treatment of apparently minor infections until evidences of toxemia arise and the complications which may arise from the use of local and nerve block anesthesia in treatment of infections are emphasized. In the treatment of specific infections mention is not made of the use of tetanus toxoid, which is of special interest because of its use in the armed forces. Neither is anything said about the experimental drugs which may be the answer in the treatment of mycotic infections. The author's treatment of burns may find disfavor with some who do not care for the use of tannic acid, but his results appear to be good. Attention is called to the avoidance of delay in skin grafting of burns until an avascular scarred base is laid down. Fractures, compound and simple and dislocations, are concisely treated. In the majority of cases the most commonly accepted method of treatment is described and no attempt is made to introduce controversial material. The chapter on repair and reconstruction describes excellently the principles of skin grafting and nerve and tendon repair and could be read with profit by any one who may be called on to do such surgery on other parts of the body as well as on the hand. Congenital and acquired deformities, tumors and manifestations in the hand of constitutional diseases form the closing chapters. The relationship of the hand to the body as a whole is clearly defined and the necessity for systemic, as well as local,

treatment is emphasized. The works of others have been freely drawn on and due credit is given throughout as well as in references at the end of each chapter. Coupled with the material from the author's own vast experience, the book becomes one which should take a well deserved place on any physician's shelf.

**Diseases of the Gastro Intestinal Tract** By Asher Winkelstein M.D. B.S. Associate in Medicine and Physician in Charge of the Gastro Intestinal Clinic The Mount Sinai Hospital New York. Cloth Price \$2 Pp 195 New York Toronto & London Oxford University Press 1942

**Public Health and Preventive Medicine** By Morton C. Kahn M.A. Ph.D. D.Sc. Associate Professor of Public Health and Preventive Medicine, Cornell University Medical College New York. Volumes I and II. Cloth Price \$4 per set Pp 267 269 534 New York Toronto & London Oxford University Press 1942

**Urology** By William H. Mencher A.B. M.D. F.A.C.S. Associate Urologist Harlem Hospital New York. Cloth Price \$2 Pp 204 New York, Toronto & London Oxford University Press 1942

**Gynecologic Surgery** By Morris A. Goldberger M.D. F.A.C.S. Associate in Gynecology Columbia University New York. Cloth Price \$2 Pp 164 New York Toronto & London Oxford University Press 1942

These books are written in outline form and are officially designed for busy practitioners and medical students. They may be useful for the general practitioner who must look up quickly just enough information on which to "get by" on the treatment of some clearcut and relatively uncomplicated case. They may also be useful for the medical student studying for examination or for the physician whose formal medical training lies far in the background or who has specialized and who must review quickly fields other than his own in order to pass some state licensing examination.

**Atlas of Ophthalmic Pathology** Prepared at the Army Medical Museum Office of the Surgeon General U. S. Army from Material in the Registry of Ophthalmic Pathology By Elbert DeCoursey Maj. Medical Corps U. S. Army and others. Third edition. Paper Price \$5 Pp 142 with illustrations Omaha American Academy of Ophthalmology and Otolaryngology 1942

This is the third edition of the Atlas of Ophthalmic Pathology prepared at the Army Medical Museum from the material in the Registry of Ophthalmic Pathology by Col. J. E. Ash and Major Elbert DeCoursey. A new method of production enables this excellent atlas to be sold at a substantial reduction in cost and in larger quantities, so that the academy has now adopted it as a textbook for its home study course. There has been essentially no change in this new edition of the atlas from the previous edition, and it continues to be an excellent textbook for instructional purposes for both student and clinician.

**Germany's Master Plan The Story of Industrial Offensive** By Joseph Borkin and Charles A. Welsh With an Introduction by Thurman Arnold. Cloth Price \$2.75 Pp 339 New York Duell Sloan and Pearce 1943

Long before the beginning of World War II, German industry had been endeavoring to set up a system for worldwide control over electrical equipment, drugs, chemicals and basic war materials. Many of the facts regarding this system of control are here made available by writers who have been in intimate touch with the investigations on the subject. Joseph Borkin was for many years economic adviser to the Antitrust Division of the Department of Justice. Some of the facts regarding the relationship of the German drug industry to some portions of the American drug industry will come as revelations to American readers and indicate the need for control over international agreements of this type in the future.

**The Psychology of Supervising the Working Woman** By Dr. Donald A. Laird Industrial Consultant with the assistance of Eleanor C. Laird Research Librarian. Cloth Price \$2 Pp 202 with illustrations New York & London McGraw Hill Book Company Inc. 1942

The opening chapters are a consideration of the history of the employment of women in industry and the factors and motivating forces which have brought about an increase. The remainder of the book is a tedious discussion of the physiologic, physical, mental and emotional differences of men and women as they affect their working capacity. Whereas the title indicates that the book might be of value to the employer or supervisor of women, it actually falls far short of giving practical suggestions or methods outside of making women comfortable at work.

## Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT HOWEVER REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS BUT THESE WILL BE OMITTED ON REQUEST.

### SMALLPOX VACCINATION—DURATION OF PROTECTION

**To the Editor**—During this wave of enthusiasm in the Philadelphia area I have had occasion to vaccinate one large group against smallpox. The puncture method was used. This group consisted of 389 factory workers. The inspection of results of the procedure showed positive takes in 326 of the 389 and 63 negatives. This represents approximately 84 per cent of individuals who were probably not immune to smallpox. Since this interpretation of the result is generally accepted I am curious to know whether or not in the opinion of experts this is the case. Could it be that a more potent vaccine is being used at the present time than has been used heretofore? Are we to consider these positive takes with the typical vesicle and local inflammatory reaction appearing from four to seven days after the procedure as actually cowpox? In this group I patient gave a history and showed the results by pockmarked skin of having had smallpox approximately thirty years ago. She too gave a positive reaction. If we are to interpret these as positive takes it probably indicates that this large group of persons was susceptible to smallpox. In the case of an epidemic the seriousness of the situation should not be taken lightly since this is a cross section of our working population.

Abraham Cohen, M.D., Philadelphia

**ANSWER**—The duration of the vaccinal protection and the manner of its disappearance are certainly a most important part of the practical side of vaccination. This question must be considered for the purpose of determining when precautions should be taken to renew the protection which has become deficient. The answer is unfortunately a complicated one, since there is evidence to show that the duration of absolute immunity after a single vaccination extends no definite period of time, but that it is subject to great individual variations. After a single successful vaccination in childhood it has sometimes been observed that all subsequent attempts at vaccination failed and that the individual never acquired variola in spite of frequent exposure to the danger of infection. In these cases it is certainly justifiable to assume that the single vaccination has caused a permanent protection just as one attack of variola usually renders the individual immune to any subsequent invasion of the disease. What is the rule for variola, however, is unfortunately only the exception for a single vaccination. It much more frequently happens that the individual reveals a fresh susceptibility, at least to inoculated vaccinia, after a more or less lengthy period of time. Cases are sometimes encountered in which a revaccination is successful after the short space of two or three years, but such occurrences are even still more exceptional than the instances of a permanent protection. They are consequently no guides for either practical purposes or legislative action and this is especially true, since the corollary of a similarly early attack of variola after vaccinia is as yet wanting. The renewed susceptibility to inoculated vaccinia, nevertheless, always makes one fearful lest an infection with smallpox would have been possible in these cases if the variolous virus had found an opportunity to effect an entrance into the system. If a longer period of time has elapsed since the vaccination, a secure protection against variola is to be no longer counted upon the epidemics of smallpox in the nineteenth century sufficiently demonstrated that the number of cases in individuals vaccinated but once was far from infrequent. The individuals who were vaccinated in the first year of life were scarcely ever attacked until after the fifth year, and it was not until the tenth year was reached that the number of individuals attacked rapidly increased. It might be stated from these observations that the average duration of the protective effect of a single vaccination is about ten years, and that it certainly does not extend much beyond this period. The vaccination statistics confirm this view to a certain extent, since they show that after the tenth year about 60 per cent (and over) of all individuals vaccinated in early childhood show a renewed susceptibility to inoculated vaccinia which is more or less pronounced. (Nothnagel's Encyclopedia of Practical Medicine, American edition, Philadelphia, W. B. Saunders Company, 1908).

There is no reason to doubt that approximately 84 per cent of the persons revaccinated recently in a certain group of workers in Philadelphia showed a considerable amount of susceptibility to vaccinia and supposedly to smallpox also. This would be more likely to be true had these people previously been vaccinated only once and at an early time in life. The fact that a person who had had smallpox showed a positive

take" is not surprising, because it is well known that, while a recent successful vaccination protects against smallpox, an attack of smallpox does not always protect against inoculated vaccinia. The findings of Rivers, Ward and Baird (*J. Exper. Med.* 69: 857 [June] 1939) clearly show that the potency of a vaccine lymph used for revaccination makes a decided difference in the number of persons who show incomplete protection against smallpox. The physician doubtless used a potent virus.

### RADON SEEDS VERSUS TONSILLECTOMY

**To the Editor**—Recently I have heard many discussions regarding the application of radon seeds as a substitute for tonsillectomy. What is the consensus on this treatment? Can you refer me to some articles on the subject?

M.D., Massachusetts

**ANSWER**—Most of the reports concerning the substitution of radon seed application for tonsillectomy appear in the literature of the early 1920's and little is to be found since then. However, the otolaryngologists and radiologists appear to have reached certain conclusions in which most of them concurred and which apparently have changed little since then, namely the use of radon in case of hypertrophy or other nonmalignant diseases of the tonsils.

The methods employed consist in the use of surface application or the insertion of removable or permanent seeds directly into the tissues. Variations in technique are naturally manifold although they are all similar in their essentials. The details can be obtained from many of the articles hereinafter referred to.

S. Withers of Denver (*Laryngoscope* 32: 163 [March] 1922) favored the use of radon applications but felt that the experience up to that date was insufficient for forming a definite opinion.

C. F. Robinson (*Am. J. Radiol.* 9: 558 [Sept.] 1922) reported 75 cases (inoperable) which he treated with good results.

F. E. Simpson of Chicago (Radium Therapy, St. Louis, C. V. Mosby Company, 1922) stated that in selected cases radium (radon) treatment may be substituted for operative removal of hypertrophied tonsils.

B. R. Shurly (*THE JOURNAL* Sept. 8, 1923, p. 800) opposed the substitution although he had had no personal experience with radium or radon.

W. A. Wells of Washington, D. C. (*South. M. J.* 14: 907 [Nov.] 1921, *Laryngoscope* 33: 681 [Sept.] 1923) believed that we can produce atrophy which "we may liken to normal physiological atrophy and all physical evidences of disease are made to disappear."

F. H. Williams of Boston (*Am. J. M. Sc.* 168: 18 [July] 1924) reported 101 cases and advised the use of radon in selected cases.

J. W. Babcock (*Ann. Otol., Rhin. & Laryng.* 34: 834 [Sept.] 1925) opposed its use, although he himself had employed only x-ray therapy rather than radon. He reviewed 49 authors and found 28 to approve of 10 (including the author) who believed it was of little value, because he claimed that radon does not remove the tonsil as a potential focus of infection.

J. Coleman Scribner of New York (*Beth Israel Hosp. Bull.*, Nov. 2, 1924, *New York State J. Med.* 32: 198 [Feb. 15] 1932, *Laryngoscope* 42: 620 [Aug.] 1932) reported over 200 cases and favored the use of radon in inoperable cases. He had good results.

S. J. Crowe of Johns Hopkins, Baltimore (*Arch. Otolaryng.* 33: 618 [April] 1941), advised the use of surface radon applications for treating recurrence after having treated more than 100 cases.

The consensus seems to prefer the use of radon or radium to tonsillectomy in inoperable cases (whatever the cause) or in treating recurrent growths following initial tonsillectomy. In view of the potential danger of radon application anywhere in the body it would be advisable to consult with a radiologist skilled in radon therapy before employing this method of treatment. However, operative removal of the tonsils is still the method of choice in dealing with uncomplicated diseased tonsils.

### ALLERGY IN BUTCHER SHOP REFRIGERATOR

**To the Editor**—A patient with chronic sinusitis and rhinitis, a butcher apparently made worse by going in and out of the refrigerator. He had a vacation of six weeks last winter and his condition cleared entirely. Do you know of any means by which I could protect this man's nose from the cold air while in the refrigerator?

S. A. Olson, M.D., Glendive, Mont.

**ANSWER**—The data given in this inquiry suggest one of two possibilities. First, the patient may be sensitive to inhalants present in a higher concentration in the refrigerator than in the butcher shop. Either animal danders, meats (sensitive to

odors) or molds may be present in much higher concentration in the refrigerator than elsewhere in the patient's environment. If this diagnosis is tenable, the patient should have similar trouble all the year round on entering the refrigerator. Conditions, however (the type of meat or fowl stored), may be different in the winter than in the summer. If he is mold sensitive he should have symptoms in the summer, especially during humid or rainy weather. The possibilities suggested should be investigated by clinical exposure to the various antigens separately, i. e. the effect of entering a damp basement, the effect of inhalation of the various danders found in a butcher's refrigerator. Cutaneous tests with the different allergens may be used to aid in confirming the diagnosis. If the patient is clinically sensitive to an allergen or allergens that cannot be eliminated, gradual hyposensitization by injection may be tried.

Physical allergy (cold sensitivity) is the second possibility suggested by the history. If this explains the symptoms the patient should have similar trouble when he is exposed to comparable temperature changes as when entering the refrigerator, i. e. when going outdoors during a cold day with no more protection from the temperature change than when exposed to the refrigerator temperature. This should be tried for confirmation of the diagnosis. If the condition is classifiable as physical allergy, an attempt may be made to increase the patient's tolerance by gradually increasing exposure to cold (ice rubs over a wide surface of the body, increasing the time of exposure gradually, cold baths, gradually decreasing the temperature). In addition, daily injections of histamine diphosphate may be tried in increasing doses. It is advisable to start with a low dose (about 0.1 cc of 1:10,000 solution). This dilution may be given once or twice a day in increasing doses until 1 cc of 1:10,000 solution is tolerated. The 1:1,000 solution of histamine diphosphate is then used, starting with 0.1 cc and gradually increasing the dose to about 0.5 cc, if tolerated by the patient. When the dose of 0.2 to 0.3 cc of the 1:1,000 solution is reached, the injections may be spaced at three to four day intervals. If the patient responds favorably to this treatment, the maximum dose reached without untoward symptoms may be maintained at once every three days to once a week for as long a period as required.

#### SHORT WAVE DIATHERMY FOR ANGINA PECTORIS

To the Editor—Can you furnish me with any information concerning the use of short wave therapy in the treatment of angina pectoris?

E. B. Miller M.D. Manistee Mich.

ANSWER—Short wave diathermy has been employed extensively by various European workers for treatment of angina pectoris. Although these European workers have said that its value is generally recognized, it would seem difficult to evaluate the clinical results in this disease because of the variable course which it tends to follow.

The usual procedure has been to apply an electrode directly over the precordium and another somewhat larger electrode over the back, or to place a pancake coil directly over the precordium. It is argued that the direct heating of the cardiac musculature tends to improve the circulation in the coronary vessels and also to reduce the blood pressure, which effects would tend to be beneficial in the presence of angina pectoris. The procedure should be employed only cautiously under careful and expert observation by trained cardiologists.

Although more than twenty European writers have reported favorably concerning the value of applications of short wave diathermy to the cardiac area, none of them seem to have made any comparative studies concerning its clinical usefulness as compared with other forms of treatment.

It has been pointed out by William Bierman (The Medical Applications of the Short Wave Current, Baltimore: William Wood & Co., 1938) that in the treatment of angina pectoris by means of short wave diathermy one should record the blood pressure every two minutes. If the pressure tends to rise during the session, the application either is discontinued or is diminished in volume. Bierman cites the work of many European physicians in treating angina pectoris with short wave diathermy. He mentions that Seigen treated 770 patients suffering from angina pectoris, employing short wave in addition to other routine forms of therapy. He had the opportunity of reexamining many of these patients several months after treatment. The electrocardiograms taken at the end of the treatment showed surprising disappearance of all pathologic changes seen initially. Bierman points out that there appears to be unanimity of opinion among the workers in this field that caution should be exercised in the administration of short wave current for the treatment of angina pectoris. Bierman concludes: "It is

difficult to prove any special value to the use of short wave current in the treatment of angina pectoris because spontaneous remissions occur in this disease, and because rest and other measures are applied concurrently."

One may conclude then that to date there is no conclusive evidence that short wave diathermy is effective in the management of angina pectoris.

#### CONTINUOUS DRIP THERAPY OF GASTRODUODENAL ULCER

To the Editor—How long can a patient be medicated with a small stomach tube by way of the mouth or nose in an attempt to treat a stomach ulcer temporarily by means of the various new aluminum compounds and the milk bicarbonate treatment recently mentioned in *The Journal*? I was glad to see several articles recently on the management of gastroduodenal ulcer but it is not yet clear to me just how many days or weeks a tube might be allowed to remain. I have a patient who is extremely nonsensitive locally to the presence of the tube in either the nose or the mouth with remarkable emotional equanimity. He is so emaciated that he dreads an operation at the moment and wants to try the alkaline treatments before submitting to an operation which an excellent physician told him was out of the question—absolutely the wrong thing in his case. I realize that no definite limits can be established for things of that kind and I recall that many of us felt years ago that intravenous solutions, transfusions and the like ought to be given someday and could be given someday over hours and perhaps days by the bold surgeon who threw aside some of the popular notions of blood clotting and the like prevalent in those days. This man has had a nasal tube leading to the cardia inserted for over two weeks but for several hours (up to eight) in each twenty-four hours after the first few days the tube has been removed to avoid nasal and esophageal infection and ulceration; the patient meanwhile being allowed to amble about the hospital, sipping on occasion the same milk bicarbonate solution which was being used in the drip along with other milk and egg drinks and aluminum jells which could not easily pass through the tube. Information is desired as to the prevalent opinion in matters like this even though I believe I shall have to resort to surgical treatment because of the deep penetration of the lesser curvature ulcer. What is the longest record of nasal stomach or stomatogastric intubation with no withdrawals or with temporary ones as I am carrying out?

John P. Rankin, M.D. Elyria, Ohio

ANSWER—According to Palmer (chapter on peptic ulcer in *Diseases of Digestive System*, edited by S. A. Portis Philadelphia, Lea & Febiger, 1941) "the administration of food or antacid or both by means of a continuous drip into the stomach has much to recommend it in the treatment of gastroduodenal ulcer. The feeding is in effect a fistula feeding eliminating the potent cephalic phase of gastric secretion. More complete control of the acidity of the gastric content can be maintained by the day and night use of the drip method than by any other procedure." The continuous drip method is not usually maintained for more than seven to fourteen days, occasionally for three to five weeks.

Winkelstein, Cornell and Hollander (*THE JOURNAL*, Nov. 7, 1942, p. 743) have found that the majority of patients so treated experience little or no difficulty in retaining the intra-gastric tube especially when the soft latex tube is used. According to these authors, patients learn to administer the drip treatment to themselves and may continue this therapy at night for a period of many months and even for as long as two or three years. A possible disadvantage of the drip treatment is the associated dryness of the throat, which may lead to esophagitis or esophageal ulceration. This form of therapy is contraindicated in the presence of infections of the upper respiratory tract in order to avoid the development of pneumonic complications.

The ulcer of the lesser curvature described should heal completely or almost completely within three to four weeks of such therapy if it is benign. If healing is not proved roentgenologically or gastroscopically or both, a gastric resection is indicated because the ulcer may well be malignant.

#### WALKING ON TOES INSTEAD OF SOLES OF FEET

To the Editor—Will you please give me the significance or causes of a person's landing on his toes when walking instead of landing on the heel first as is usually done? Is this condition hereditary or is it acquired? I know of two persons who had this peculiar gait with no evidence of any present or past history of diseases or injury.

William Campbell, M.D., Valley City N. D.

ANSWER—In walking, sometimes normal persons will land on their toes instead of the sole of their feet. In Friedrich's disease (spinal heredoataxia) the foot becomes decidedly arched, shortened and stubby (pes cavus) and in walking the feet land on the toes. The condition is usually hereditary although it can occur in any disease in which there develops an excessive pull of the muscles attached to the foot. This is especially true in the pull of the muscles of the calf and sole. Thus infections in the foot and calf, injuries of the foot and leg, long continued posture as from a cast and spinal cord disease may result in such a type of walking.



## DESICCATED THYROID IN HEART DISEASE

*To the Editor*—Dr. Arnold Lorand of Carlsbad, Czechoslovakia, in his book *Old Age Deferred* states that thyroid can be given in certain forms of heart disease. He says it is practically as useful as digitalis and can be given simultaneously with it. The directions accompanying the product Proloid states that this substance should be given only under the supervision of the physician and its use is generally contraindicated in heart disease and in hyperthyroidism. I realize of course that it is contraindicated in hyperthyroidism but I would be pleased to know why thyroid is contraindicated in heart disease.

M D, Tennessee

**ANSWER**—The only indication for desiccated thyroid in heart disease is the presence of hypothyroidism or myxedema heart. In patients with myxedema heart the size of the heart is increased and its action weak. Edema, commonly generalized, is present. Improvement does not occur following the use of digitalis but promptly sets in when thyroid is administered. This condition is not common. When myxedema heart does not complicate hypothyroidism, some improvement in the heart's action may also follow its use. However, patients with heart disease should be given desiccated thyroid with great caution because it may precipitate the onset of coronary thrombosis.

## IDENTIFICATION OF FUNGI AND MOLDS

*To the Editor*—By means of which textbooks or by what authorities can the identification of a microscopic fungus be made? The organisms being homogeneous are present in large numbers on Sabouraud's medium contained in a Petri dish. They were obtained by exposure of the culture medium to the atmosphere of an anthracite coal mine. How can a photomicrograph of such a culture be made? Would the latter step be advantageous in the procedure of identifying the organism?

M D, Pennsylvania

**ANSWER**—A key to most of the genera of fungi is given in Clements and Shear's *The Genera of Fungi*, New York, H. W. Wilson Company, 1931. It refers to Latin descriptions in Saccardo, and these, or monographs dealing with the various genera, must be consulted in order to verify the identification. Short cuts are generally unsatisfactory either because they are misleading or because they omit most of the enormous number of genera of saprophytic fungi.

In identifying molds, the fungus must be isolated in pure culture and examined as soon as the characteristic spores are formed. The optimal time for examination varies widely. With two needles a bit of the mold from a suitable culture should be momentarily moistened in alcohol and then teased apart in a drop of 10 per cent sodium hydroxide or other mounting fluid on a glass slide. A cover slip is placed over the drop, and the specimen is ready for microscopic examination. The significant features are the size, shape, color and septation of the spores and the manner in which they are borne. A photomicrograph can be made in the usual way from this specimen but is helpful only as a record.

## HOME PASTEURIZATION OF MILK

*To the Editor*—Could you tell me the name of a simple home apparatus for the pasteurizing of milk? A small apparatus such as could be used for an ordinary household is what I have in mind.

Roy G. S. Dougall, M.D., Cobleskill, N. Y.

**ANSWER**—It does not appear that any special type of apparatus is necessary for home pasteurization of milk. The United States Public Health Service recommends that the milk merely be heated over a hot flame to 155 F., stirring constantly, then the vessel should be placed immediately in cold water and stirring continued until the milk is cool.

## ZOO ANIMALS AND PARASITIC INFECTIONS

*To the Editor*—Here as elsewhere the children delight in feeding the tame zoo animals by hand. The children's fingers come in touch at least with the animal's tongue and are thoroughly moistened by its saliva. I wonder if parasitic intestinal diseases cannot be transmitted that way particularly if the children eat as they doubtless often do without thorough cleansing of their hands possibly even out of the same popcorn box from which they have just been feeding the animals. The animals chiefly concerned are all more or less closely related to the deer family.

M D, Massachusetts

**ANSWER**—[This inquiry was referred to Dr. Herbert L. Ratcliffe, pathologist at the Penrose Research Laboratory, Philadelphia Zoological Garden, whose reply follows.]

Since 1936 we have had here a so-called Baby Pet Zoo, where children may feed and fondle small animals of all types.

During these years the average annual attendance has exceeded 50,000 and we have not had any indication that children may become infected with intestinal parasites from these animals. There is, of course, a minor danger in that cysts of intestinal protozoa might be transmitted from apes and monkeys to children, but the only protozoan of significance would be *Endameba histolytica*, and our animals have been examined for this organism.

There is a decidedly greater danger that our anthropoids may become infected from the children rather than the reverse. As far as deer and related animals are concerned, these rarely carry parasites that might be infectious to man by simple contact.

OBESITY OR FROHLICH SYNDROME IN INFANT—  
HORMONAL THERAPY

*To the Editor*—A woman has brought to me her boy aged 2 who even at this early age appears to be an example of the Fröhlich syndrome. May I ask you to give me an opinion on the following questions: Is it too early to begin treatment? Is there any gonadotropic substance which can be given orally? For treatment either oral or by needle is testosterone propionate recommended?

M D, Michigan

**ANSWER**—The diagnosis of the Fröhlich syndrome depends on demonstration of obesity plus genital dystrophy, usually this refers to hypoplasia of the genital organs. Unless this is demonstrably present in a 2 year old boy, the only safe clinical assumption is that one is dealing with obesity. It is never too early to begin appropriate dietary restrictions for the control of obesity.

There is no gonadotropic preparation which is active when administered orally. Testosterone propionate is not gonadotropic. It is substitution of a material believed to be the hormone produced by the interstitial cells of the testicle. Certainly it does not stimulate the testis, which is a requisite for a gonadotropic hormone. Testosterone propionate would not be used, therefore, in the treatment of a genital dystrophy unless it had been demonstrated that stimulation of the testis was impossible and substitution for testis activity is desirable. Such a situation is not believed to exist prior to the age of puberty.

## MUCOSA OF BRONCHI AND SINUSES IN ASTHMA

*To the Editor*—Will you please furnish me with information on the changes that take place in the bronchial epithelium in asthma? Do the same changes take place in the epithelium of the mucous membranous lining of the nose and paranasal sinuses?

H. D. Coles, M.D., Chicago

**ANSWER**—The characteristic changes found in the mucosa of the bronchial tubes and sinus mucosa of asthmatic patients are the static edema of the submucosa appearing almost like a hyalinization and the presence of numerous eosinophils. The changes in the epithelium itself will vary according to the degree and duration of secondary infection. Therefore one may see much more advanced destruction of the epithelium of the sinus mucosa than is present in the bronchial tubes. At any rate these changes are not characteristic, consisting of the increase in the number of goblet cells, destruction of ciliated epithelium and replacement with cuboidal or squamous cells. Hyperplasia is nearly always present, and in the sinuses one frequently finds cystic degeneration and polyp formation.

LOCAL OR GENERAL ANESTHESIA FOR ADULT  
TONSILLECTOMIES

*To the Editor*—To help settle an argument as to the relative merits of local or general anesthesia in tonsillectomies of adults only would you please answer the following: Given an adult with no complicating factors who presents himself for tonsillectomy, what is the trend today as to anesthesia? Is local or general anesthesia preferred?

Samuel Pritzker, Captain, M.C., A.U.S.

**ANSWER**—Local and general anesthesia with variations and refinements are both in use in the hands of capable surgeons for the removal of tonsils of adult patients. Each type of anesthetic has its merits and shortcomings. Furthermore local custom decrees to some extent which one is favored. It can be fairly said that there is no decided trend in a specific direction favoring one or the other. In New England the tendency remains to use general anesthesia. In other parts of the country, and particularly in the Middle West, local anesthesia appears to be the one most often chosen. All this applies only to normal situations as posed in the question.



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## THE CHOICE OF ANESTHESIA FOR SERIOUSLY WOUNDED PATIENTS

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BOSTON

The relationship of anesthesia to shock is a particularly close one in military surgery not only because of the frequency of the appearance of shock in warfare but also because anesthesia can be and often is the precipitating factor in the development of shock. Anesthesia can knock down the body's defenses and transform a compensated circulatory system into an inadequate one with the result that profound shock appears in an individual previously not in shock. Several mechanisms which function in this way are fairly well understood and although interesting, can scarcely be discussed here in detail, for my aim in this report is to set forth as clearly and as briefly as possible the considerations which determine acceptability or unsuitability of the common anesthetic agents for use in those who are seriously wounded. Emphasis is given to agents and technics which are suitable for use under circumstances of mobile warfare.

The material discussed here is limited to a consideration of the characteristics of real clinical importance as far as the several agents are concerned. The present report is not intended to be a review of the extensive literature on this subject. It is, on the contrary, a report based in large part on observations made in this clinic and laboratory. That the views expressed here reflect observations of others as well as our own goes without saying, since a considerable effort has been made to digest the many reports pertinent to the subject of anesthesia and shock.

Quite plainly definitive answers to all the questions that are asked on this subject cannot now be given, for information that is adequate to do so has not yet been obtained in many cases.

Unfortunately, many of the reports of the last war on this subject as well as reports coming out of this war have all too clearly been based on data obtained by men who were overwhelmed by routine duties so that careful observations could not be made. As a consequence of this it is not surprising that the net effect is one of confusion filled with contradictions. Final answers can come only from trained observers in the field. A few men reasonably free from routine duties could really settle some of these problems. Until they are more certainly settled than is now the case it would be folly to neglect experience gained in dealing with severely wounded patients in civil life.

Typical questions which urgently need complete answers from active military fronts are the following:

1 Is any agent better than ether for general surgery under field conditions? What are the limitations of ether? Where is it to be avoided if at all? By the use of a simple device<sup>1</sup> ether can be administered as simply as by "open drop" or cone methods and yet use only one-tenth the quantity of ether required by those methods. Does this have military value?

2 Does spinal anesthesia merit consideration for the seriously wounded, for the person in shock or in impending shock? (The majority of available reports are strongly against spinal anesthesia, yet it continues to be widely employed for the seriously wounded.) A carefully observed series based on objective data is an urgent need.

3 How much of the anesthesia load can the intravenous barbiturates carry in military surgery? What is their particular field of usefulness? What are their peculiar clinical limitations? Can they advantageously and safely supplement local anesthesia? Should the intravenous barbiturates supplant chloroform when a noninflammable general anesthetic must be used?

4 In the rare instances when cyclopropane will be available under military circumstances, does it have value adequate to justify great effort to make it available in base hospitals? How about its use for shocked individuals?

5 Can the anesthetic agents be used as therapeutic tools to delay or prevent shock?

At least partial answers to these questions emerge from the following consideration of the characteristics of the common anesthetic agents. No attempt is made to present here a well rounded pharmacologic or clinical discussion of these agents. The entire attention is focused on the qualities (of whatever nature) of these agents which suggest acceptance or rejection in the choice of the best agents for use under military circumstances.

### ETHER

(a) *Desirable Qualities*—The great potency of ether permits an adequate oxygen supply, even if only room air is available. Good muscular relaxation is provided. A great factor of safety is present under this agent if gross overdosage occurs, respiration fails (intake stops) while the circulation remains unimpaired. The great factor of safety is of importance when anesthesia is administered by the unskilled, as often must be the case under military circumstances. (Ether excels all other safe inhalation agents with regard to the aforementioned points.) The excellent tolerance of even the impaired circulatory system for prolonged ether anesthesia is well established in man. While the foundation for this statement is good as far as "organic" impairment is concerned and on the basis of much more limited experience appears to be true also of the circu-

From the Anesthesia Service at the Massachusetts General Hospital and the Anesthesia Laboratory of the Harvard Medical School at the Massachusetts General Hospital.

1 Beecher, Henry K. An Easily Transportable Apparatus for Anesthesia With or Without Compressed Oxygen. *War Med.* 2: 602-608 (July) 1942.

latory impairment encountered in shock more data for man are urgently needed on this point. Man in shock appears to tolerate ether far better than animals in shock.

(b) *Undesirable Qualities*—Under ether anesthesia there is some tendency toward acidemia. Considerable disturbance of carbohydrate metabolism occurs under this agent (the blood sugar level is elevated from 100 to 200 per cent). The agent is inflammable and explosive. Ether is "irritating" to the mucous membranes of the respiratory tract. No adequate demonstration has yet been made that this characteristic is of any importance in morbidity or mortality of postoperative pulmonary complications. On the contrary, there is much positive evidence that this so-called irritant quality is of no clinical importance.<sup>2</sup>

#### DIVINYL ETHER

While divinyl ether is easily transportable and swift in its action, it probably will have little value in military surgery because of the difficulty of using it satisfactorily without a closed rebreathing apparatus and also because of its tendency to cause laryngeal spasm, profuse salivation, muscular twitchings, even convulsions, and liver damage. These effects may be the result of breakdown products arising from its chemical instability. The agent has many of the other disadvantages of diethyl ether.

#### CHLOROFORM

(a) *Desirable Qualities*—Chloroform can be administered smoothly with little equipment. It is easily transportable. It will neither burn nor explode. Because of its great potency, only a low concentration is needed in the inspired air, thus adequate oxygen can be obtained from the atmosphere. Good muscular relaxation is produced by it.

(b) *Undesirable Qualities*—The effects of chloroform in producing death through ventricular fibrillation, central necrosis in the liver and destruction of the tubules of the kidney might be overlooked because of the urgency of other considerations in military surgery if it was not for the profoundly depressing effects of this agent on the circulation. The heart rate is slowed, the strength of contraction is weakened, the cardiac output falls, the blood pressure is depressed. Acidemia occurs.

It is true that the administration of high concentrations of oxygen in the inspired air will help to minimize the liver damage, as also will a diet high in protein and in carbohydrate. Unfortunately, these measures will not prevent the disastrous circulatory effects of this agent.

The only good reason for employing chloroform is its lack of inflammability, a matter of great importance on shipboard. It can be pointed out, however, that with the use of a new and exceedingly simple anesthesia apparatus<sup>3</sup> it is possible to administer "closed" ether with such economy that only a little need be at hand, with a resulting lessening of the ether fire hazard. This apparatus presents all the real advantages of the large cumbersome apparatus and yet in such a simple way that an orderly can administer the anesthesia under the direction of a surgeon. Particularly on shipboard, where a compact apparatus of this

kind may easily be available, it would seem to be possible to eliminate chloroform in favor of ether. However, naval officers, to the present time at least, have decided that chloroform is indispensable.<sup>4</sup> (See also the discussion in this connection of the intravenous barbiturates, and of local anesthesia, to follow.)

#### ETHYL CHLORIDE

Ethyl chloride is easily transportable and adequate for brief general anesthesia. It is occasionally useful for induction of more slowly acting anesthetic agents, like ether, but in general ethyl chloride has the same drawbacks as chloroform and in addition to them, is inflammable. Its usefulness in producing local anesthesia is fairly well limited to such trivial procedures as opening of boils, even so, the tissue damage produced by the freezing is considerable and does not justify its use when better methods are available.

#### NITROUS OXIDE ETHYLENE, CYCLOPROPANE

Nitrous oxide, ethylene and cyclopropane all require the use and transport of steel cylinders and the use of cumbersome apparatus and require compressed oxygen for their successful employment, since neither cumbersome apparatus nor tank oxygen will be available in most cases, these agents will doubtless have little or no usefulness at military fronts, except perhaps in a few base hospitals.

In the case of nitrous oxide and ethylene, few metabolic effects are produced provided adequate oxygen is maintained. It is generally impossible to provide adequate oxygen if a surgical level of anesthesia is required in the case of nitrous oxide, even if compressed oxygen is available, for such a high partial pressure of nitrous oxide must be used that there is little room for oxygen. The same is true of ethylene although to a lesser extent. Only poor muscular relaxation is produced with either of these agents.

Nitrous oxide is not inflammable or explosive. On the other hand, both ethylene and cyclopropane are exceedingly explosive.

Cyclopropane<sup>5</sup> produces deleterious cardiac effects and death occurs apparently from ventricular fibrillation in a relatively high number of cases. Aside from that effect, however, the circulatory system of animals in shock or in approaching shock appears to tolerate cyclopropane better than any of the other inhalation anesthetic agents (Evans and Beecher<sup>6</sup>) with the possible exception of ethylene. Whether this is true of man in shock is unknown. Both cyclopropane and ethylene have the further good quality that induction and recovery can occur in a matter of a very few minutes. Accordingly, when it is necessary to explore the abdomen rapidly of a patient in shock or approaching shock, as for example when it is necessary to investigate with-

<sup>2</sup> This is discussed by Beecher, Henry K. Some Controversial Matters of Anesthesia for Thoracic Surgery. *J. Thoracic Surg.* 10: 202-219 (Dec.) 1940. Beecher, Henry K. and Adams, Ralph. Ether Anesthesia in the Presence of Pulmonary Tuberculosis. *J. A. M. A.* 118: 1204-1209 (April 4) 1942.

<sup>3</sup> Without wishing to attempt to oppose their views I should like to point out, however (with the simple anesthesia machine just mentioned) how little ether need be carried on board at a time. Comdr. Frederick R. Hook, M. C. U. S. Navy, in the Transactions of the American Surgical Association 59: 135, 1941, says: "We may assume that the maximum number wounded on capital ships will be 15 per cent of the ship's complement. On one vessel carrying 2,000 men, 300 wounded might be anticipated in a given vessel engagement. If one third of the 1,000 required full general anesthesia as with ether for a major operation the total quantity of ether needed would only be about 100 ounces. Thus less than 10 pounds of ether would be adequate for a major encounter—no great problem as far as bulk or storage is concerned and as far as inflammability is concerned even if the severely wounded casualties were 100 per cent larger than those estimated for a given encounter the total quantity of ether required on board would seem to me to be negligible in comparison with the other inflammable and explosive materials aboard. The remarks are offered only for consideration and are not in any way intended to be placed in opposition to current practices. Certainly many naval factors are concerned in this choice of which I am not aware."

<sup>4</sup> Beecher, Henry K. An Appraisal of Cyclopropane. *editorial Surg., Gynec. & Obst.* 75: 797-799, 1942.

<sup>5</sup> Evans, Everett I. and Beecher, Henry K. Unpublished data.

out delay the question of internal hemorrhage or perforated viscus, these two agents if available should on the basis of present information, be ranked as first choice. In such a case any anesthesia is undesirable but if it must be used, the quicker its induction and the quicker the recovery from it, the better it will be for the patient.<sup>6</sup>

#### INTRAVENOUS BARBITURATES (EVIPAL, PENTOTHAL SODIUM)

The intravenous barbiturates have now been used widely enough to permit some comparison with other agents. When these agents are used for major as well as for minor surgery the death rate attributable to the agent varies from three to ten times higher (good to poor clinics) than it is for ether. In the Massachusetts General Hospital, where these agents are used almost entirely for short procedures (ten to twenty-five minutes) on able bodied young patients, the death rate appears to be low (8,000 cases with no deaths). So much for the ordinary cases. Early in this series we learned that bad risk patients tolerate these agents poorly unless very small quantities of the barbiturate are merely used as supplements to local or spinal anesthesia. Even then, in an adequate series of cases it was learned that the use of these agents to supplement spinal anesthesia was liable to produce a fall in blood pressure. Bad risk patients, particularly patients with circulatory impairment, tolerate full barbiturate anesthesia poorly. This statement can be made with emphasis on the basis of a large series of cases. Under circumstances in which it is imperative to have a non-inflammable agent, it is possible that the intravenous barbiturates would make a better choice than chloroform. This point requires further clinical study.

We have learned on the basis of laboratory studies of these specific agents that in addition to their cardiac depressant action there are two outstanding characteristics that make their use hazardous under conditions often encountered in patients.

First, there is a progressive loss, finally a complete loss, of sensitivity of the respiratory center to its normal chief stimulus, carbon dioxide. The blood content of carbon dioxide may rise to depressant levels under these agents. Second, with the normal respiratory drive either inadequate or lacking, the respiration is driven by anoxic stimulation of the peripheral chemoreceptors, carotid and aortic bodies chiefly. Anoxic stimulation of these bodies is as effective in deep anesthesia as in light.

These facts, simple as they are, point to strong reasons why these agents are tolerated poorly by patients in poor condition. The anesthetist relies almost entirely on the respiration to guide him as to depth of anesthesia. Under these barbiturates the respiration is a dependable guide only if the patient is breathing a high concentration of oxygen, for only then will the peripheral chemoreceptors remain inactive and the progressive depression of the respiratory center by the barbiturate

be evident. In other words low blood oxygen by stimulating respiration even during deep anesthesia masks the true depth of anesthesia. Presumably compressed oxygen will almost never be available in the field so it would seem that the use of intravenous barbiturates should be limited in military surgery to brief, minor procedures or possibly used as a supplement to local anesthesia. This conclusion is reached not only because of the difficulty of determining and controlling depth of anesthesia in the field but also because of the demonstrated poor tolerance of the bad risk patient for full anesthesia produced by these agents. Possibly intravenous barbiturates should supplant chloroform for major surgery when a noninflammable general anesthetic is required.

#### SPINAL ANESTHESIA

Several facts have emerged from observations of the effects of spinal anesthesia which are pertinent to the anesthesia and shock problem. The most important of these are the following:

- 1 Blood pressure has a tendency to fall under spinal anesthesia. This tendency is so great and so serious that spinal anesthesia was practically discarded as a clinical tool until it was demonstrated that this effect could in most cases be prevented by the use of vasoconstrictor agents.

- 2 Vasoconstrictor agents are inadequate in a high percentage of cases to maintain safe levels of blood pressure during spinal anesthesia of patients who have been subjected to trauma or to hemorrhage.

- 3 In spinal anesthesia the vasomotor fibers are the first to be paralyzed and the last to recover. The extent over which this occurs is greater than the area where the pain response is eliminated, for a lower concentration of anesthetic can interrupt vasomotor control than can interrupt pain sensation. In interrupting vasomotor control, spinal anesthesia breaks down an important defense against shock.

Notwithstanding these facts, it is rather often argued that spinal anesthesia is still a desirable agent to use for the seriously wounded patient. Gordon-Taylor<sup>8</sup> spoke for the best of English military surgery when he said recently "Spinal anesthesia spells certain euthanasia for the shocked abdomen."

It is difficult to understand why there are in this country as many as there are who advocate the use of spinal anesthesia for surgery of the seriously wounded and otherwise poor risk patient. Even now, with data coming in from our own fields of action, spinal anesthesia is not showing up well. In such cases the proponents are liable to hold that in these specific cases the spinal anesthetic was not properly administered. The following data are pertinent to this question.

It has been possible to obtain an interesting comparison of good and bad spinal anesthetics and of the relationship of spinal to ether anesthesia, as far as blood pressure lowering effects are concerned in the clinical data of the Massachusetts General Hospital (patients with perforated peptic ulcer). Part of these data were obtained under conditions in which the anesthesia was poorly administered and part in which it was well administered. It is interesting to compare the data from these two groups. It is strikingly demonstrated that under both good and bad circumstances the same ratio of blood pressure lowering (spinal anesthesia compared with ether) holds in the two cases, as shown in the table.

6 Speed of induction and speed of recovery are probably generally grossly overrated when a distinction is made between the three or four minutes required for cyclopropane and the ten minutes for ether. Occasionally, as in the aforementioned case, speed assumes real importance.

7 Others have reported these effects for other barbiturates. To the best of my knowledge the only two agents used to any extent for intravenous anesthesia had not been studied previously in this connection. Beecher, Henry A. and Moyer, Carl A. Mechanisms of Respiratory Failure Under Barbiturate Anesthesia (Evipal, Pentothal). *J. Clin. Investigation* 20: 549-566 (Sept.) 1941. Moyer, Carl A. and Beecher, Henry A. Effects of Barbiturate Anesthesia (Evipal and Pentothal Sodium) on the Integration of Respiratory Control Mechanisms. A Study Directed Toward Improvement of Methods for the Preclinical Evaluation of Anesthetic Agents. *J. Clin. Investigation* 21: 429-445 (July) 1942.

8 Gordon-Taylor, Gordon. The Changing Aspect of the Abdominal Surgery of Modern Warfare. *Practitioner* 147: 448-62 (July) 1941.

Patients undergoing suture of perforated peptic ulcer constitute a group good for study in the present connection for the following reasons. These patients are in our experience liable to go into shock. The group is composed chiefly of men (97 per cent). They are on the average able bodied and not old (average age about 44 years). These patients are seen usually within one-half to four hours of their injury. The reparative operation is more standardized probably than any other major one to be encountered: the abdomen is opened, a small hole in the stomach or duodenum repaired and the abdomen closed, anesthesia and operation require in almost all cases one hour.

In the years preceding 1934, little attention was given to anesthesia at the Massachusetts General Hospital. The anesthesia of this period can accurately be labeled as poor. In the nine year period 1925-1933, inclusive the records of 56 patients with perforated peptic ulcer contained enough data to permit inclusion here. In the nine year period 1934-1942 (September) inclusive 111 patients received ether or spinal anesthesia for repair of a perforated peptic ulcer. They are divided as shown in the table.

It is clear from these data that the number of serious falls of blood pressure is great under poor spinal anes-

*Results of Anesthesia of 167 Perforated Peptic Ulcer Patients at the Massachusetts General Hospital*

Patients	Anesthesia		Patients Showing a Fall of Blood Pressure to 70 Mm Hg or Below		Ratio of Serious Blood Pressure Falls	
	Number	Per Cent	Number	Per Cent	Spinal	Ether
Group 1 Poor anesthesia 1925-1933	36	Spinal 64	11	30.5	2	1
	90	Ether 36	3	10.0		
Group 2 Good anesthesia 1934-1942	71	Spinal 64	8	11.2	2	1
	40	Ether 36	2	5.0		

thesia and by no means negligible under well conducted spinal anesthesia. Improvement of anesthesia (the surgical procedure has remained the same) cut to one-third the number of patients showing a serious fall in blood pressure both under spinal and under ether. The ratio of twice as many patients showing a fall of blood pressure to shock levels under spinal as under ether anesthesia is strikingly constant in both groups.

Much further data could be marshaled to support the thesis that spinal anesthesia is a poor choice for surgery for the patient either in shock or in impending shock.

#### LOCAL ANESTHESIA

It is proper that local anesthesia should always be considered when it is important to have a noninflammable agent or when surgery is contemplated on the traumatized or exsanguinated patient and employed if the surgeon considers that it will be adequate for his task. The experience of the English in this war, however, has repeatedly shown that local anesthesia is poorly tolerated by the severely injured but conscious patient. Apparently the moderate discomfort occasionally associated with local anesthesia and the psychologic injury resulting from the knowledge that he is being operated on is adequate to produce enough bad reactions to cause many English surgeons to favor general anesthesia for treatment of the severely wounded person.

When local anesthesia is used, the following will minimize the not infrequently harmful circulatory effects

of too great or too rapid absorption of the local anesthetic agent.

1 The addition of epinephrine hydrochloride (1:200,000 optimum final dilution) to local anesthetic solutions will prolong fivefold the effect of a given dose of procaine hydrochloride. This use of a vasoconstrictor agent will obviously greatly reduce the total quantity of procaine needed. [Vasoconstrictor agents should not be employed in local anesthetic agents under the following circumstances: (a) When the local anesthetic agent is injected around the genitalia, fingers, toes, ears or nose. If used here, sloughs may result. (b) When the local anesthetic agent is to be supplemented by cyclopropane, chloroform, ethyl chloride or avertin with amylene hydrate anesthesia. Ventricular fibrillation may result. Vasoconstrictor agents in local anesthesia should be employed only with great care if at all for patients with organic circulatory impairment.]

2 It must be remembered that the toxicity from absorption of local anesthetic agents increases in geometric proportion with increase in dose. While for an able bodied person it is usually safe to employ 150 cc of 1 per cent procaine if administered over an hour's time it does not follow that 75 cc of 2 per cent can be used rather, only about 35 cc of 2 per cent can safely be used in this period.

The technical difficulties to be encountered in the employment of local anesthesia while actually not great, will in the hands of those lacking special training in this field be associated with a considerable incidence of failure or only partial success and are time consuming. These facts will probably minimize the use of local anesthesia under military conditions.

#### SUMMARY AND CONCLUSIONS

1 The most difficult anesthesia problems that arise are those concerned with seriously wounded patients. Whenever possible, anesthesia and operation are avoided for patients in shock or in impending shock, until the patient's condition has improved as much as it will without surgery.

2 Whenever anesthesia must be administered to severely wounded patients, local anesthesia is employed, if considered adequate for the task at hand. This will rarely be the case for major procedures. Experience has shown that local anesthesia is in general best restricted to rather phlegmatic or apathetic patients, for whenever even minor surgical procedures must be carried out on apprehensive and suffering, badly wounded patients, surgical intervention under local anesthesia may be tolerated less well than under general anesthesia. An appraisal of the patient must be made as to his probable tolerance for the possible inconvenience and occasional discomfort of local anesthesia. Local anesthesia is always to be considered when a noninflammatory, nonexplosive agent is needed.

3 For major procedures inhalation anesthesia is generally preferable. Ether anesthesia is the best all around single anesthetic agent for use when major surgery must be carried out. When, in the surgeon's judgment, great speed of induction and speed of recovery are of outstanding importance cyclopropane or ethylene is used, if available. This will probably rarely be the case.

4 Spinal anesthesia is poorly tolerated by severely wounded patients. Its use for such persons is often a major error.

5 Intravenous barbiturates (pentothal sodium, evipal soluble) are chiefly useful for producing general anesthesia for short procedures (twenty to thirty minutes) on robust young persons. They are often useful as supplementary agents when local anesthesia

proves to be inadequate. Intravenous barbiturate anesthesia appears to be preferable to chloroform for major surgical procedures when the use of a noninflammable, nonexplosive agent is imperative.

6 In studying the relationship of anesthesia to shock I have come to the following conclusions concerning clinical material

(a) Even in large civil hospitals where many accident cases are received the number of patients in shock or in seriously impending shock who must be operated on at once are far too few to permit any adequate civil study of the effect of the common anesthetic agents in shock. In the great majority of cases in civil life, when serious wounds are present, anesthesia and operation are properly deferred until the condition of the patient is so improved that he no longer constitutes a real test of the anesthetic agent in shock.

(b) Valuable and at present nonexistent data concerning the role of anesthesia in shock can be obtained with simple observations of the trend of the pulse and the blood pressure during operation under various anesthetic agents and their relationship to the appearance of shock. Accordingly, anesthesia is one of the few subjects in the field of shock which can profitably be investigated without hampering or delaying in any way the patient's treatment. Valuable anesthesia data can be obtained so simply that the confusion often attending the treatment of large numbers of seriously wounded men need not be increased by such studies. Probably few data of any real value can be obtained unless trained observers free from routine duties are on hand to get them. The conflicting reports from the active fronts have already demonstrated in this war as they did in the last one that catch-as-catch-can data obtained by busy clinicians whose primary duties lie in other fields are worse than useless—they are misleading.

(c) The shock problems fall sharply into two groups: (1) the complex, difficult, interesting problems which will only with great luck be solved in time to be of benefit in this war and (2) the simple, often dull, but urgent problems to which solutions are needed, and unlike those in 1, almost certainly can be solved. The requirement is an abundance of clinical material, far more than can be obtained in civil life (see first paragraph of summary). The best choice of anesthesia for various types of seriously wounded military patients has not yet been demonstrated. It can be determined only by trained observers under military conditions.

(d) In the entire consideration of shock, one of the few fields where we can be certain of effecting real improvements in current practices in time to be of benefit in this war is in the field of anesthesia and its relationship to shock. Little can be accomplished, even in this, unless far more clinical material is made available to trained observers than is now the case.

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**A Great Surgeon**—The mechanics of medicine and surgery can be acquired quickly by any reasonably intelligent person, but the morals of medicine and surgery can be acquired only slowly and require a painfully long period of training and preparation. If it can be said of any man that he is "an operating fool," the adjective "operating" is redundant. A great surgeon is not a man who has mastered the mechanics of a simple appendectomy or tonsillectomy or any other "ectomy," he is a man who knows not only how to operate but on whom an operation should be done and, more important, on whom an operation should not be done. Surgeons are great because they have sound judgment rather than mere mechanical skill.—Olson, *J G Time*, Oct 26, 1942, p 6

## THE EFFECT OF EXTERNAL TEMPERATURE ON SHOCK

AN EXPERIMENTAL STUDY

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AND

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Shock is a type of peripheral circulatory failure which causes a profound disturbance in the physiologic mechanisms of the body and leads to a syndrome exhibiting, among its manifestations, hemoconcentration, oligemia and a generalized peripheral vasoconstriction. In these unparalleled times, when injuries resulting in shock are not limited to our armed forces in combat zones all over the globe but may also occur *en masse* in our civilian population as a result of air raids or industrial accidents, a thorough investigation and careful appraisal of some of the methods employed in the treatment of shock are most timely. In the treatment of shock the application of heat is too much stressed. The public, as well as the physician, uses heat in abundance in the treatment of shock from whatever cause. In first aid instructions one is taught to apply hot water bottles, hot bricks or heated stones to the extremities and sides of an individual in shock.<sup>1</sup> That not only warmth but heat is recommended for the treatment of shock can be inferred from the warning expressed in books that great care must be taken to prevent the infliction of severe burns from the hot water bottles used on the person in shock.

In the light of our understanding of the physiologic principles involved in shock, this emphasis on the application of heat to shocked individuals made us interested in determining, experimentally, the influence of temperature on shock as well as the effect of heat on the survival time of shocked animals. From the evidence observed in our experiments, we learned that the application of heat or of cold greatly shortened the survival time of anesthetized animals in experimental shock, while the animals that were placed at room temperature and those placed on warm water bottles slightly above room temperature, after shock was produced, had a much longer survival time. An external temperature in the neighborhood of body temperature proved to be optimal. With the exception of a few of the animals that had to be killed after having survived beyond twenty-four hours, no attempt was made to apply any measure to prolong or to shorten the life of any of the animals used in this investigation.

In 1914 Mann<sup>2</sup> performed experiments involving exposure of abdominal viscera and demonstrated the significance of the loss of circulating fluid in shock. The effective circulating blood volume is decreased, and accompanying the decrease is a great reduction in volume flow. Blalock and Levy<sup>3</sup> demonstrated a sharp decrease in blood flow in hemorrhage and in intestinal trauma. Anoxia predominates whenever diminution of

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Mr Bob Koons assisted in this work.  
From the Indiana University School of Medicine, Bloomington and Indianapolis.

1 Owen H R. *The Treatment of Emergencies*. Philadelphia: W C Saunders Company, 1919, p 109. Currier A F. *How to Keep Well*. New York: Century Company, 1924, p 605. Boy Scouts of America. *Handbook for Boys*. Boy Scouts of America, 1940, p 133.

2 Mann F C. *The Peripheral Origin of Surgical Shock*. Bull Johns Hopkins Hosp 25:205-212, 1914.

3 Blalock Alfred and Levy S E. *The Effect of Hemorrhage Intestinal Trauma and Histamine on the Partition of the Blood Stream*. Am J Physiol 118:734-738 (April) 1937.

blood flow becomes severe. Aub and Cunningham<sup>4</sup> observed in shocked cats and Freeman, Shaw and Snyder<sup>5</sup> noted in shocked patients a decided decrease in the oxygen content of venous blood. The loss of plasma due to dilatation of the capillaries and increase in their permeability was attributed by Krogh<sup>6</sup> and by Landis<sup>7</sup> to anoxia. Blalock<sup>8</sup> rightly emphasizes the fact that diminution in circulating blood volume is the initial and most important alteration in shock. Brooks and Duncan<sup>9</sup> observed that the temperature of a part is of great importance in determining the survival period of ischemic tissue. Allen,<sup>10</sup> in a study of surgical considerations of temperature in ligated extremities, noted that shock is more likely to accompany constriction of the circulation of the thigh if the local temperature is high than if it is low. Lahz<sup>11</sup> states that the optimum temperature for exsanguinated tissues is much lower than for normal tissues and that the former can be severely damaged by heating agents. Blalock and Mason<sup>12</sup> studied the effects of heat and of cold on large dogs in which shock had been produced either by removal of about one third of the blood volume or by trauma to

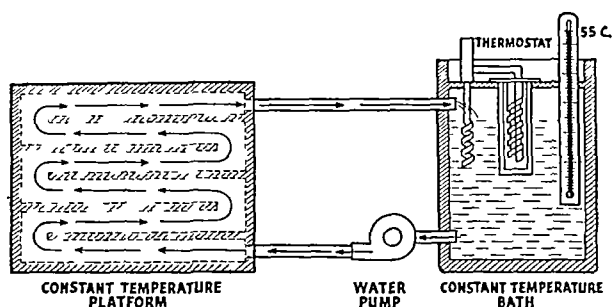


Fig 1.—Diagrammatic representation of the constant temperature platform, pump and thermostat

one of the posterior extremities. They concluded that significant elevations of temperature are more disastrous than depressions of similar degree.

#### METHODS

Dogs, rabbits, guinea pigs and rats were used in this study. Of each species, animals of practically the same weight (litter mates whenever possible) were selected and divided into six groups: a, b, c, d, e and f. Soluble pentobarbital was the only anesthetic used. The rat experiments in this communication were performed on black, hooded and albino litter mates unilaterally adrenalectomized four to five days previously. The rats and guinea pigs were anesthetized by subcutaneous

administration of 5 mg of soluble pentobarbital per hundred grams of body weight. The rabbits and dogs were anesthetized by intraperitoneal injection of 30 mg of soluble pentobarbital per kilogram of weight. In rats, shock was produced by either of the two commonly known methods, namely by traumatization of the posterior extremities or by exposure of the abdominal viscera and intestinal stripping. Since it was observed that trauma to the extremities did not produce a satisfactorily uniform shock in rats, exposure of the abdominal viscera and intestinal stripping was the only method used in producing experimental shock in the dogs, rabbits and guinea pigs included in this communication. After the production of shock, each animal of group a was placed on an ice bag at 5 C (41 F), each animal of group b was placed on a bag at room temperature, 25 C (77 F), each animal of group c was placed on a warm water bottle at 35 C (95 F), each animal of group d was placed on a warm water bottle at 45 C (113 F), each animal of group e was placed on a hot water bottle at 50 C (122 F), and each animal of group f was placed on a hot water bottle at 55 C (131 F). The bags used were ordinary clinical rubber bags of the same size shape and material and were wrapped in one layer of cloth while in use. After shock was produced the survival time of each animal of the six groups and the average survival time of each group were determined and tabulated. To determine the degree of hemoconcentration the amount of hemoglobin was determined at intervals by means of the Sheard-Sanford photometer<sup>13</sup> before and after shock was produced. All the large animals (rabbits and dogs) and some of the small ones were placed on a specially constructed constant temperature platform connected by means of an Eastern centrifugal pump (fig 1) to a thermostat set at the required temperature. The blood pressure of the large animals was recorded on a revolving kymograph by means of a mercury manometer connected to a glass cannula in the common carotid artery. A 3.5 per cent solution of sodium citrate was used to prevent coagulation in the arterial cannula.

#### RESULTS

**Rats**—The rats placed on hot water bottles at a temperature of 55 C after the production of shock, whether by intestinal stripping or by trauma to the extremities, died within a period of two hours. Their average survival time was 1.26 hours. The temperature of the water dropped from about 55 C to about 45 C in the first hour and to about 38 C by the end of the second hour. Most of the rats that were placed on an ice bag after shock was produced lived a little longer than those placed on the hot water bottle at 55 C. Their average survival time was 2.54 hours. The rats that were placed on a hot water bottle at 45 C after shock was produced had an average survival time of 3.36 hours. All the rats that were kept at room temperature or were placed on a warm water platform the temperature of which was maintained at 35 C survived much longer than either the group that was heated or the group that was chilled. The minimal survival time of the group that was kept at room temperature (25 C) was 14.83 hours. Several animals were killed after they had survived more than twenty-four hours. The average survival time of the rats that were exposed

4 Aub J C and Cunningham T D. Studies in Experimental Traumatic Shock. II. The Oxygen Content of the Blood. *Am J Physiol* 54: 408-415 (Dec.) 1920.

5 Freeman N E, Shaw J L and Snyder J C. The Peripheral Blood Flow in Surgical Shock. The Reduction in Circulation Through the Hand Resulting from Pain, Fear, Cold, and Asphyxia with Quantitative Measurements of the Volume Flow of Blood in Clinical Cases of Surgical Shock. *J Clin Investigation* 15: 651-664 (Nov.) 1936.

6 Krogh August. The Anatomy and Physiology of Capillaries. ed 2. New Haven Conn. Yale University Press. 1929.

7 Landis E M. Microinjection Studies of Capillary Permeability. III. The Effect of Lack of Oxygen on the Permeability of the Capillary Wall to Fluid and to the Plasma Proteins. *Am J Physiol* 83: 528-542 (Jan.) 1928.

8 Blalock Alfred. Principles of Surgical Care Shock and Other Problems. St. Louis C V Mosby Company. 1940.

9 Brooks Barney and Duncan G W. The Effects of Temperature on the Survival of Anemic Tissue. An Experimental Study. *Ann Surg* 112: 130-137 (July) 1940.

10 Allen F M. Surgical Considerations of Temperature in Ligated Limb. *Am J Surg* 45: 459-464 (Sept.) 1939.

11 Lahz R S. Notes on the Use of the Tourniquet. *M J Australia* 1: 463-466 (April 18) 1942.

12 Blalock Alfred and Mason M F. A Comparison of the Effects of Heat and Those of Cold in the Prevention and Treatment of Shock. *Arch Surg* 42: 1054-1059 (June) 1941.

13 Sanford A H, Sheard C and Osterberg A E. The Photometer and Its Use in the Clinical Laboratory. *Am J Clin Path.* 3: 405-420 (Nov.) 1935.

to 100m temperature was at least 232 hours. The average survival time of the group that was placed on the warm water platform the temperature of which was maintained at 35 C was 3552 hours. Table 1 gives detailed data on the individual rats used in each group.

TABLE 1—The Effect of External Temperature on Experimental Shock (Rats)

Rat	Environmental Temperature	Survival Time	Average Survival Time	Type of Shock
1a	Ice bag 5 C	1 16 hours	Group a 254 hours	Intestinal stripping
2a		6 50 hours		Intestinal stripping
3a		1 08 hours		Intestinal stripping
4a		2 33 hours		Intestinal stripping
5a		1 50 hours		Intestinal stripping
6a	Room temperature 25 C	2 00 hours	Group b 2320 hours	Trauma to extremities
7a		3 50 hours		Trauma to extremities
1b		2 50 hours		Intestinal stripping
2b		16 50 hours		Intestinal stripping
3b		24 00 hours		Intestinal stripping
4b		14 83 hours		Intestinal stripping
5b		24 00 hours		Intestinal stripping
6b		20 75 hours		Trauma to extremities
7b		28 08 hours		Trauma to extremities
1c	Warm water bottle 25 C	17 66 hours	Group c 3552 hours	Intestinal stripping
2c		48 16 hours		Intestinal stripping
3c		39 50 hours		Intestinal stripping
4c		30 00 hours		Intestinal stripping
5c		16 91 hours		Intestinal stripping
6c	Warm water bottle 45 C	49 16 hours	Group d 3336 hours	Trauma to extremities
7c		47 50 hours		Trauma to extremities
1d		1 50 hours		Intestinal stripping
2d		1 58 hours		Intestinal stripping
3d		10 25 hours		Intestinal stripping
4d		1 41 hours		Intestinal stripping
5d		2 41 hours		Intestinal stripping
6d		4 00 hours		Intestinal stripping
7d		2 41 hours		Intestinal stripping
1e	Hot water bottle 50 C	1 50 hours	Group e 2550 hours	Intestinal stripping
2e		2 41 hours		Intestinal stripping
3e		1 83 hours		Intestinal stripping
4e		3 50 hours		Intestinal stripping
5e		2 50 hours		Intestinal stripping
6e	Hot water bottle 55 C	2 66 hours	Group f 1226 hours	Intestinal stripping
7e		3 66 hours		Intestinal stripping
1f		1 08 hours		Intestinal stripping
2f		1 00 hour		Intestinal stripping
3f		1 08 hours		Intestinal stripping
4f		1 83 hours		Intestinal stripping
5f		1 25 hours		Intestinal stripping
6f		1 50 hours		Trauma to extremities
7f		1 08 hours		Trauma to extremities

The average hemoglobin value for the rats before the production of shock was 15.5 Gm per hundred cubic centimeters. The average hemoglobin value for the rats in shock from intestinal stripping was 21.2 Gm per hundred cubic centimeters, that of the animals in shock from trauma to the extremities averaged 16.9 Gm per hundred cubic centimeters. This difference in hemoglobin concentration of the rats in shock produced by intestinal stripping as compared with those in shock by trauma to the extremities is attributable to the loss of blood due to hemorrhage into the traumatized extremities.

**Guinea Pigs**—The guinea pigs that were shocked and placed on ice bags at 5 C had an average survival time of 0.93 hour, those placed at room temperature had an average survival time of 17.28 hours, those placed on warm water at 35 C had an average survival time of 18.14 hours, those placed on warm water at 45 C had an average survival time of 5.53 hours, those placed on hot water at 50 C had an average survival time of 3.18 hours, and those placed on hot water at 55 C had an average survival time of 1.70 hours. Table 2 gives detailed data on the individual guinea pigs used in each group.

Before shock, the guinea pigs had an average hemoglobin content of 16 Gm per hundred cubic centimeters of blood. Prior to death from experimental shock the

value for hemoglobin rose to an average of 20.2 Gm per hundred cubic centimeters.

**Rabbits**—The rabbits that were placed on ice bags at 5 C after shock was experimentally produced had an average survival time of 3.41 hours. Rabbits placed at room temperature after the production of shock had an average survival time of 7.62 hours, those which were shocked and placed on warm water at 35 C had an average survival time of 8.87 hours, those placed on water at 45 C after shock had an average survival time of 4.66 hours, those placed on water at 50 C after shock had an average survival time of 0.78 hour. One rabbit was shocked and kept on water at 55 C, it survived only 0.41 hour.

Before shock was produced the rabbits had an average hemoglobin content of 12.1 Gm per hundred cubic centimeters of blood. Prior to death in experimental shock the value for hemoglobin rose to an average of 16.6 Gm per hundred cubic centimeters.

The mean arterial pressure measured by a mercury manometer connected to the common carotid artery of the rabbits averaged 115 mm of mercury before shock and 65 mm of mercury immediately after the production of shock. Throughout the experiment the blood pressure gradually declined until it reached 0 at the time of death of the animal (fig. 2).

**Dogs**—The 2 dogs that were placed on an ice bag at 5 C after shock had been produced had an average survival time of 2.29 hours, 2 dogs that were placed at room temperature (25 C) had an average survival time of 14.25 hours, the 2 that were placed on warm water at 35 C had an average survival time of 16.58 hours, 2 dogs that were placed on warm water at 45 C had an average survival time of 10.91 hours, the 2 dogs

TABLE 2—The Effect of External Temperature on Experimental Shock (Guinea Pigs)

Guinea Pig	Environmental Temperature	Survival Time	Average Survival Time	Type of Shock
1a	Ice bag 5 C	0 41 hours	Group a 0 93 hours	Intestinal stripping
2a		0 75 hour		Intestinal stripping
3a		1 25 hours		Intestinal stripping
4a		1 33 hours		Intestinal stripping
1b	Room temperature 25 C	10 58 hours	Group b 17 28 hours	Intestinal stripping
2b		19 06 hours		Intestinal stripping
3b		28 16 hours		Intestinal stripping
4b		10 75 hours		Intestinal stripping
1c	Warm water bottle 35 C	14 50 hours	Group c 18 14 hours	Intestinal stripping
2c		0 75 hour		Intestinal stripping
3c		23 16 hours		Intestinal stripping
4c		15 08 hours		Intestinal stripping
1d	Warm water bottle 45 C	6 16 hours	Group d 5 53 hours	Intestinal stripping
2d		6 75 hours		Intestinal stripping
3d		5 16 hours		Intestinal stripping
4d		4 08 hours		Intestinal stripping
1e	Hot water bottle 50 C	3 50 hours	Group e 3 18 hours	Intestinal stripping
2e		2 25 hours		Intestinal stripping
3e		1 91 hours		Intestinal stripping
4e		5 08 hours		Intestinal stripping
1f	Hot water bottle 55 C	0 41 hours	Group f 1 70 hours	Intestinal stripping
2f		1 50 hours		Intestinal stripping
3f		2 08 hours		Intestinal stripping
4f		2 33 hours		Intestinal stripping

that were placed on hot water at 50 C had an average survival time of 3.87 hours, and the 2 that were placed on hot water at 55 C had an average survival time of 3.5 hours.

Before shock the dogs had an average hemoglobin content of 13.1 Gm per hundred cubic centimeters of blood. Prior to death in experimental shock the value for hemoglobin rose to an average of 20.1 Gm per hundred cubic centimeters.



The mean arterial pressure measured by a mercury manometer connected to the common carotid artery of the dogs averaged 150 mm of mercury before shock and 105 mm of mercury immediately after the production of shock. Throughout the experiment the blood pressure gradually declined until it reached 0 at the time of death of the animal.

The experiments on rats, guinea pigs, rabbits and dogs in shock yielded similar curves of survival time plotted against the various external temperatures employed in this study. Temperatures below that of ordinary room temperature and those above 45 C have deleterious effects on shocked animals. Figure 3 gives a composite picture of the influence on the survival time of the various external temperatures in contact with the body of animals in experimental shock.

In order to determine the effects of the various temperatures on normal anesthetized animals as compared with their litter mates under identical conditions, but in experimental shock, controls of the various species used were anesthetized and placed at the various temperatures that were used for the shocked animals. The controls for each group were kept at the specified temperature for a period equivalent to the average survival

individual. The reflex peripheral vasoconstriction is nature's protective mechanism to provide a decrease in vascular capacity as an adaptation to the decrease in blood volume, while the application of heat prevents the action of this reflex.

We have employed various gradations of external temperature in order to determine the ranges of temperature which are deleterious and those which are favorable aids in maintenance and survival of animals in shock. We found that external temperatures in the neighborhood of body temperature are favorable while anything below room temperature or much above body temperature is not only unfavorable but deleterious and hastens the fatal outcome. In fact Mann<sup>14</sup> was able to produce shock in animals by the use of excessive heat (60 C) or cold (ice water). Excessive heat will do harm to the shocked organism in several ways.

1 It will produce a widespread superficial vasodilatation and distribution of blood to nonessential parts and thus counteract the protective natural reflexes that brought about peripheral vasoconstriction in the skin and neighboring tissues which are not so vitally in need of blood during the emergency of shock. This protective superficial vasoconstrictor reflex was brought about

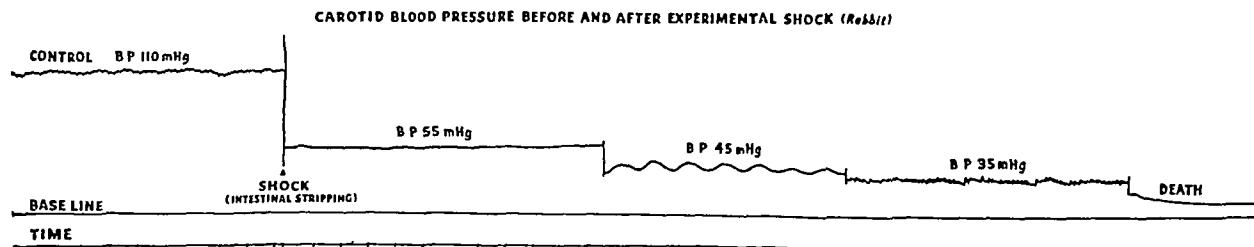


Fig. 2—Chronologic changes in arterial blood pressure during experimental shock. The temperature in contact with the animal's body was 50 C.

time of the shocked animals of that group. All the control animals anesthetized and placed at room temperature, at 35 C and at 45 C recovered from anesthesia and remained normal thereafter. Of the controls placed at 50 C, the dogs, rabbits and guinea pigs survived and remained normal thereafter, but 50 per cent of the rats died and the other 50 per cent survived and remained normal thereafter. Of the control animals placed on ice bags at 5 C, only the rats died, while the guinea pigs, rabbits and dogs survived and were normal thereafter. These control data indicate that both extremes of temperature, the ice bag at 5 C and the hot water above 50 C, have deleterious effects even on normal animals.

#### COMMENT ON THE PHYSIOLOGIC MECHANISMS INVOLVED

Among the physiologic mechanisms which nature calls into play to compensate for the decrease in blood volume during shock is an immediate generalized peripheral vasoconstriction which brings about a reduction in the capacity of the vascular tree. This reflex vasoconstriction manifests itself in the blanching of the skin and contributes to the sensation of cold experienced by the individual in shock. The blanching of the skin and the cold sensation associated with it caused many to be overzealous in applying excess heat in cases of shock. This is done without realizing that heat would merely work against the efforts of nature by bringing about, among other things, a peripheral vasodilatation and thus defeat the purpose of saving the shocked

to serve the purpose of narrowing the capacity of the vascular tree to cope with the diminished blood volume (oligemia and hemoconcentration) in shock. Bazett<sup>14</sup> states that simultaneous heating of the whole surface of the body would increase the blood content of the skin by about half a liter. Prinzmetal and Wilson<sup>15</sup> reported an increase in the blood flow in the arm from 17 cc per hundred cubic centimeters a minute in a bath at 24 C (75.2 F) to a flow of 149 cc in a bath at 45 C (113 F). This is due mostly to an increase in the cutaneous circulation. On immersion of the foot and leg in water at a temperature of 40 to 47 C (104 to 116.6 F) Benson<sup>16</sup> obtained an average increase of 276 per cent in the volume of the limb. In shock, in which the blood volume is significantly reduced and concentrated, heating the skin brings the blood to the heated body surface and thus reduces the blood flow to vital structures such as the central nervous system and myocardium. It thus becomes evident that heating the shocked patient defeats the purpose of trying to save him because a large part of his blood will go to the skin. However, we do not imply here that the patient should be left shivering on the roadside to die from cold, we mean he should not be overheated. We firmly believe in wrapping the patient up in blankets and

14. Bazett, H. C. The Effect of Heat on the Blood Volume and Circulation. *J. A. M. A.* 111: 1841-1845 (Nov. 12) 1938.

15. Prinzmetal, Myron, and Wilson, Clifford. The Nature of the Peripheral Resistance in Arterial Hypertension with Special Reference to the Vascular System. *J. Clin. Investigation* 15: 63-83 (Jan.) 1936.

16. Benson, Simon. Volume Changes in Organs Induced by the Local Application of External Heat and Cold by Diathermy. *Arch. Phys. Therap.* 15: 133-148 (March) 1934.

keeping him comfortable and warm but not hot. The evidence presented in this report indicates that it is better to err on less heat than on more heat in such circumstances.

2 Excessive heat will increase the metabolism and the oxygen requirement of tissues. Metabolic activities of tissues are chemical reactions, and it is a well known fact that, within certain limits, the greater the increase in temperature the faster the rate of the chemical reaction. In the presence of an already existing anoxemia in shock, overheating the patient necessitates the utilization of more oxygen and hence leads to a more severe anoxemia, which will increase capillary damage and capillary permeability and may terminate fatally. Landis<sup>17</sup> has definitely shown that vasodilatation increases capillary pressure and consequently the latter results in increased transudation through the capillary wall. The loss of fluid from the vascular system and its accumulation in the tissues will increase the edema. The rate of this transudation and edema formation will be hastened in the presence of a high temperature, and consequently the oligemia and hemoconcentration become worse. The subnormal temperature recognized as a part of the shock syndrome may act as a protective mechanism because it decreases the rate of metabolic activity of the tissues and consequently reduces the demand of the body for oxygen which is not sufficiently available. Blalock and Duncan<sup>18</sup> express the opinion that the favorable effects of the application of ice to injured extremities is due to a lowering of the metabolism of the part during the period of anoxia.

3 Excessive heat is likely to increase perspiration and consequently promote dehydration. The promotion of dehydration, in the presence of hemoconcentration and oligemia already existing in a state of shock, will create a vicious cycle the outcome of which will be a greater hemoconcentration, which is bound to lead to untoward effects.

4 The burns often produced when hot water bottles are applied to semicomatose patients are so familiar to the clinician that they need only be mentioned here.

The following are the physiologic mechanisms involved in the production of superficial vasodilatation as a result of application of heat to the skin.

1 The direct local dilator effect of heat on the blood vessels in the skin and neighboring tissue. This dilator reaction starts immediately and lasts as long as the heat stimulus remains in contact with the skin. Freeman<sup>19</sup> demonstrated the direct dilator effects of heat on blood vessels in normal and in sympathectomized hands. Trotter and Davies<sup>20</sup> showed such direct vasodilator effects of heat on the blood vessels in completely denervated areas of skin. Lewis<sup>21</sup> believes that heat increases the concentration of vasodilator substances in tissues and that this leads to vasodilatation in the heated areas.

2 Central hypothalamic inhibition of vasomotor tone induced by the rise of temperature of the circulating

blood. This takes place after the blood gets heated enough to stimulate the heat regulating center and persists until either the center fails or the heat is taken off and the temperature of the blood returns to normal. The central action is manifested by the delayed induction of vasodilatation in the vessels of the arm when the feet are placed in hot water for some time. This appears after the body temperature becomes elevated.<sup>22</sup> The impulses for such central action are transmitted through nerve tracts and are abolished from completely sympathectomized extremities.

3 Reflex inhibition of vasomotor tone. This includes the well known axon reflexes of the vessels of the skin and other types of reflexes.

All these points support the fact that the wisest thing to do with persons in shock is to avoid exposing them to cold by wrapping them in blankets but too much heat is contraindicated and the wholesale use of hot water bottles around the body of the patient in shock should be condemned. The room of the shocked patient should be kept around 85 F, which is sufficient

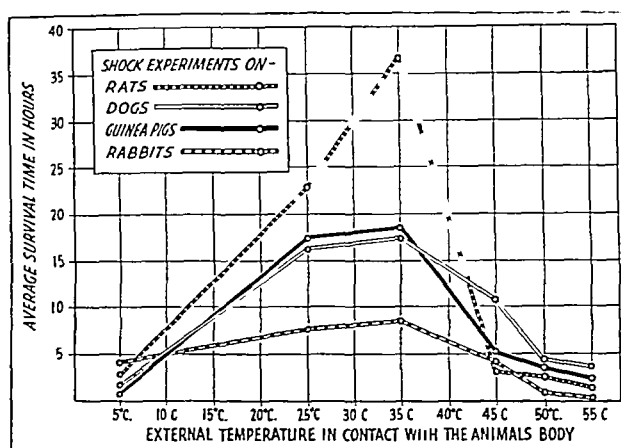


Fig 3—The average survival times of different species of experimentally shocked animals which were placed at various external temperatures.

to give him a comfortably warm environment. We firmly believe in wrapping up a shock person with blankets and in keeping him comfortably warm, but we strongly advise against chilling or overheating him. As long as whatever is lost, whether it is plasma or whole blood, is not replaced, overheating will counteract rather than work favorably with nature's protective reflexes.

#### SUMMARY

The effects of various external temperatures in contact with control and experimentally shocked animals were investigated. Cold and heat proved to be deleterious to the life of animals in shock. An external temperature in the neighborhood of that of the mammalian body seems to be optimal for the survival of shocked animals. These findings justify the conclusion that as long as whatever is lost, whether it is plasma or whole blood, is not replaced, heating or chilling shocked animals is harmful, while keeping them comfortably warm contributes favorably toward their survival.

22 Uprus V, Gavlor J B and Carmichael E A. Vasodilatation and Vasoconstriction in Response to Warming and Cooling the Body. A Criticism of Methods. *J Clin Sci* 2: 301-316 (Dec) 1936. Pickering G W. The Vasomotor Regulation of Heat Loss from the Human Skin in Relation to External Temperature. *Heart* 16: 115-135 (July) 1932.

17 Landis E M. Capillary Pressure and Capillary Permeability. *Physiol Rev* 14: 404-481 (July) 1934. Landis E M and Gibbon J H Jr. The Effects of Temperature and of Tissue Pressure on the Movement of Fluid Through the Human Capillary Wall. *J Clin Investigation* 12: 105-138 (Jan) 1933.

18 Blalock Alfred and Duncan G W. Traumatic Shock—A Consideration of Several Types of Injury. *Surg Gynec & Obst* 75: 401-409 (Oct) 1942.

19 Freeman N E. The Effect of Temperature on the Rate of Blood Flow in the Normal and in the Sympathectomized Hand. *Am J Physiol* 113: 384-398 (Oct) 1935.

20 Trotter W and Davies H M. Experimental Studies in the Innervation of the Skin. *J Physiol* 38: 134-246 1909.

21 Lewis Thomas. The Blood Vessels of the Human Skin and Their Responses. London: Shaw & Sons Ltd. 1927. p 149.

# USE OF ULTRAVIOLET RADIATION IN REDUCTION OF RESPIRATORY CROSS INFECTIONS

IN A CHILDREN'S HOSPITAL FINAL REPORT

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Following the installation in this hospital of a new operating room equipped with a battery of eight Westinghouse Sterilamps and an air changing system counts were made of the bacteria in the air of this room. Either of these agents reduced the number of air borne bacteria and the combination of the two was very effective.<sup>1</sup> This suggested the possibility of using similar means to reduce the number of cross infections in the infant ward.

In order to test the efficacy of various barriers to the spread of air borne bacteria, an experimental room was set up in the laboratory.<sup>2</sup> It consisted of a series of open door cubicles the entrances of which were 4 feet wide and 6 feet 2 inches high. Around the cubicle entrances, General Electric Ultraviolet Germicidal lamps (15 watt T8) were mounted with baffles in front and behind them so that a narrow curtain of ultraviolet radiation was thrown across the entrances. The number and arrangement of the lamps and the extent of the partitions at the sides of the cubicles were varied until a satisfactory combination was found. Their effectiveness was determined by spraying diluted cultures of *Bacillus prodigiosus* into the air and taking air samples with a Wells air centrifuge<sup>3</sup> in various parts of the room. An air changing system was also installed and the best positions for the supply and exhaust vents were similarly determined.

Very few organisms passed from one cubicle to another with the following arrangements:

1 Six ultraviolet lamps mounted around the cubicle entrances

2 Partitions above the entrances extending to the ceiling

3 Side partitions from floor to ceiling

4 An air inlet near the floor at the back and an exhaust on the ceiling near the front of each cubicle

Shorter partitions and fewer lamps were less effective.<sup>4</sup>

## RESULTS WITH ULTRAVIOLET RADIATION BARRIERS IN THE INFANT WARD

A room in the infant ward was then remodeled embodying the information obtained in this preliminary study. It provided accommodation for 6 infants under 6 months of age. The floor plan is shown in figure 1. Six ultraviolet lamps were mounted around the outer door which led into the vestibule used by the nurses,

6 more around the inner door which led into the room proper and 6 more around each of the cubicle entrances where there were no doors. The details of the position of the lamps and reflectors are shown in figure 2. The room was heavily insulated but since there was no cooling apparatus in the system there were great variations in the temperature and humidity. A small basin with foot controlled taps was installed near the front of each cubicle. A cubicle is shown in figure 3.

Before this ward was put into use, experiments were carried out to check the efficiency of the radiation barrier. The Wells test for sanitary ventilation was used, with *B prodigiosus* as the test organism, as described in a previous paper.<sup>5</sup> The efficiency of the lamps was found satisfactory when no air changing was used or when the air was changed four, six or nine times an hour. Nine air changes an hour were therefore used.

When the apertures of the boxes in which the ultraviolet lamps were mounted were 3 inches wide, the bactericidal effect was excellent but the nurses suffered from burning of the skin. The apertures were therefore reduced to 1½ inches. They were still effective but no longer caused burning provided the inside walls of the

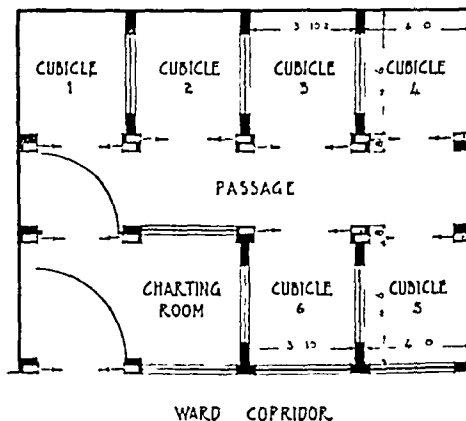


FIG. 1—Plan of room equipped with ultraviolet lamps. Arrows show direction of ultraviolet rays.

boxes were painted a dull black. The reflectors behind the lamps were made of aluminum.

Dr L R Koller of the Research Laboratory, General Electric Company, Schenectady, N Y, determined the amount of ultraviolet radiation in various parts of the room. At the back of the cubicle where the baby's cot was placed there was so little that it could not be measured. All members of the staff wore tinted glasses when working in this room. No other precautions were necessary for their protection. The nurses were instructed not to hold any infant near the doorway of the cubicle, and no case of burning or conjunctivitis occurred.

Four ultraviolet lamps, two on each side, were mounted in the air duct, which was 14 inches by 14 inches in cross section. This duct carried outside air into the room. The air passed the lamps at a rate of 218 linear feet a minute. To test the bactericidal power of these lamps, diluted broth cultures of *B prodigiosus* were sprayed directly into the duct 2 feet ahead of the first lamps. Samples of duct air before and after passing the lamps were then taken simultaneously with two Wells centrifuges. The results obtained in one test are shown in table 1.

Similar results were obtained in five other tests and it was concluded that the air entering the room through

From the Department of Pediatrics University of Toronto Faculty of Medicine and the Hospital for Sick Children under the direction of Alan Brown M D F R C P (Lond).

1 Robertson Elizabeth C and Doyle M Elizabeth. On the Control of Air Borne Bacteria in Operating Rooms and Hospital Wards. *Ann Surg* 111 491 (March) 1940.

2 Robertson Elizabeth C Doyle M Elizabeth Tisdall F F Koller L R and Ward F S. Air Contamination and Air Sterilization. *Am J Dis Child* 58 1023 (Nov) 1939.

3 Wells W F and Wells Mildred. Measurement of Sanitary Ventilation. *Am J Pub Health* 28 343 (March) 1938.

4 Much of the apparatus used in this work was either lent or donated by the Canadian General Electric Company or the General Electric Company and members of the research and engineering staffs of these companies assisted the authors on numerous occasions.

the air conditioning system was practically sterile. Previous Wells samples of outdoor air, taken at the level of the air intake showed 2 to 3 organisms per cubic foot. No recirculated air was used in this room, but the ultraviolet lamps were mounted in the ducts in case there were some leaks in the system.

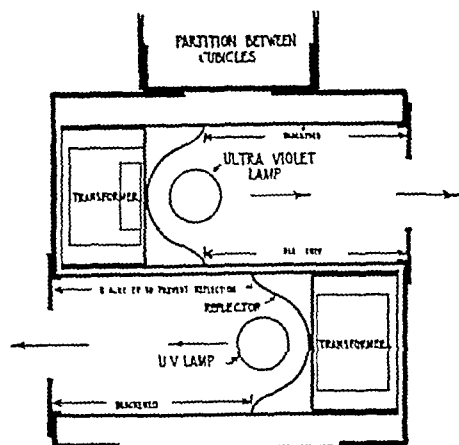


Fig 2—Mounting of ultraviolet lamps in posts between cubicles

To show whether this type of room was effective in practice we compared the incidence of respiratory cross infections among infants treated in it with that among similar infants in one of our usual unpartitioned rooms of the same size where the 6 cots were spaced around the walls. This room was ventilated by two windows and a transom over the door. This was called the first open control. The same physicians, nurses and maids worked in the two rooms. The nurses did not work elsewhere. After the babies in these two rooms were under observation for about five months, a second of the usual open rooms which accommodated 6 infants was used as another control. This was known as the second open control room. The babies in this room were nursed under the usual ward conditions which meant frequent changes of nurses.

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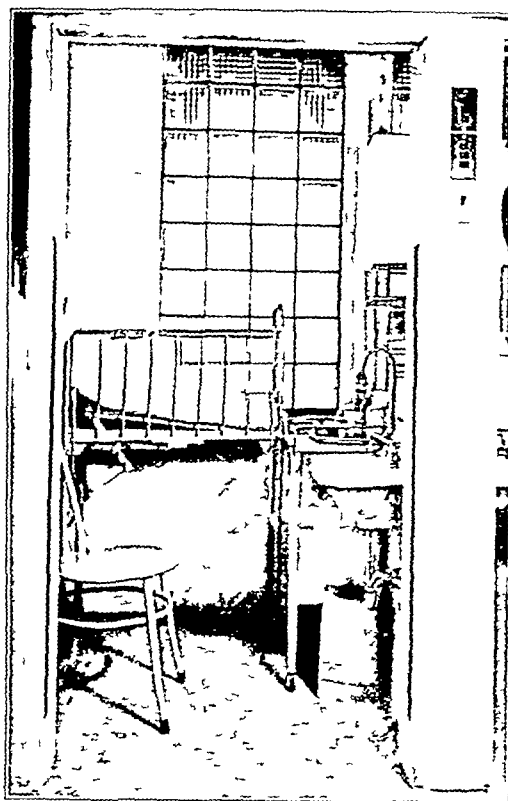


Fig 3—Cubicle in ultraviolet equipped room

ture. The prompt administration of sulfathiazole when symptoms of respiratory infection appeared may have been responsible for keeping the temperature at normal levels.

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The following precautions were in force throughout the whole ward. All members of the staff wore masks made of one layer of fine flannelet, and they washed and applied a hand disinfectant (Dettol) which had been tested and found effective before attending a baby. Visitors were not allowed in the rooms and the floors were invariably cleaned by washing (no sweeping).

SERIES 1—Comparison of Infections Occurring in Ultraviolet Equipped Room and Open Control Rooms. The clinical results of the first nine months are shown in table 2.

# USE OF ULTRAVIOLET RADIATION IN REDUCTION OF RESPIRATORY CROSS INFECTIONS

IN A CHILDREN'S HOSPITAL FINAL REPORT

ELIZABETH CHANT ROBERTSON, M D

M ELIZABETH DOYLE, M A

AND

FREDERICK F TISDALL M D

TORONTO

Following the installation in this hospital of a new operating room equipped with a battery of eight Westinghouse Sterilamps and an air changing system counts were made of the bacteria in the air of this room. Either of these agents reduced the number of air borne bacteria and the combination of the two was very effective.<sup>1</sup> This suggested the possibility of using similar means to reduce the number of cross infections in the infant ward.

In order to test the efficacy of various barriers to the spread of air borne bacteria, an experimental room was set up in the laboratory.<sup>2</sup> It consisted of a series of open door cubicles the entrances of which were 4 feet wide and 6 feet 2 inches high. Around the cubicle entrances, General Electric Ultraviolet Germicidal lamps (15 watt 18) were mounted with baffles in front and behind them so that a narrow curtain of ultraviolet radiation was thrown across the entrances. The number and arrangement of the lamps and the extent of the partitions at the sides of the cubicles were varied until a satisfactory combination was found. Their effectiveness was determined by spraying diluted cultures of *Bacillus prodigiosus* into the air and taking air samples with a Wells air centrifuge<sup>3</sup> in various parts of the room. An air changing system was also installed and the best positions for the supply and exhaust vents were similarly determined.

Very few organisms passed from one cubicle to another with the following arrangements:

- 1 Six ultraviolet lamps mounted around the cubicle entrances
  - 2 Partitions above the entrances extending to the ceiling
  - 3 Side partitions from floor to ceiling
  - 4 An air inlet near the floor at the back and an exhaust on the ceiling near the front of each cubicle
- Shorter partitions and fewer lamps were less effective.<sup>4</sup>

## RESULTS WITH ULTRAVIOLET RADIATION BARRIERS IN THE INFANT WARD

A room in the infant ward was then remodeled embodying the information obtained in this preliminary study. It provided accommodation for 6 infants under 6 months of age. The floor plan is shown in figure 1. Six ultraviolet lamps were mounted around the outer door which led into the vestibule used by the nurses,

6 more around the inner door which led into the room proper and 6 more around each of the cubicle entrances where there were no doors. The details of the positions of the lamps and reflectors are shown in figure 2. The room was heavily insulated but since there was no cooling apparatus in the system there were great variations in the temperature and humidity. A small basin with foot controlled taps was installed near the front of each cubicle. A cubicle is shown in figure 3.

Before this ward was put into use, experiments were carried out to check the efficiency of the radiation barrier. The Wells test for sanitary ventilation was used, with *B prodigiosus* as the test organism, as described in a previous paper.<sup>2</sup> The efficiency of the lamps was found satisfactory when no air changing was used or when the air was changed four six or nine times an hour. Nine air changes an hour were therefore used.

When the apertures of the boxes in which the ultraviolet lamps were mounted were 3 inches wide, the bactericidal effect was excellent but the nurses suffered from burning of the skin. The apertures were therefore reduced to 1½ inches. They were still effective but no longer caused burning provided the inside walls of the

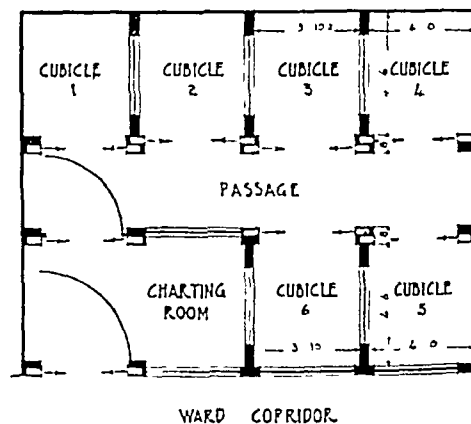


Fig. 1—Plan of room equipped with ultraviolet lamps. Arrows show direction of ultraviolet rays.

boxes were painted a dull black. The reflectors behind the lamps were made of aluminum.

Dr L R Koller of the Research Laboratory, General Electric Company, Schenectady, N Y, determined the amount of ultraviolet radiation in various parts of the room. At the back of the cubicle where the baby's cot was placed there was so little that it could not be measured. All members of the staff wore untinted glasses when working in this room. No other precautions were necessary for their protection. The nurses were instructed not to hold any infant near the doorway of the cubicle, and no case of burning or conjunctivitis occurred.

Four ultraviolet lamps, two on each side, were mounted in the air duct, which was 14 inches by 14 inches in cross section. This duct carried outside air into the room. The air passed the lamps at a rate of 218 linear feet a minute. To test the bactericidal power of these lamps, diluted broth cultures of *B prodigiosus* were sprayed directly into the duct 2 feet ahead of the first lamps. Samples of duct air before and after passing the lamps were then taken simultaneously with two Wells centrifuges. The results obtained in one test are shown in table 1.

Similar results were obtained in five other tests and it was concluded that the air entering the room through

From the Department of Pediatrics University of Toronto Faculty of Medicine and the Hospital for Sick Children under the direction of Alan Brown M D F R C P (Lond)

1 Robertson Elizabeth C and Doyle M Elizabeth. On the Control of Air Borne Bacteria in Operating Rooms and Hospital Wards. *Ann Surg* 111 491 (March) 1940

2 Robertson Elizabeth C Doyle M Elizabeth Tisdall F F Koller L R and Ward F S. Air Contamination and Air Sterilization. *Am J Dis Child* 58 1023 (Nov) 1939

3 Wells W F and Wells Mildred. Measurement of Sanitary Ventilation. *Am J Pub Health* 28 343 (March) 1938

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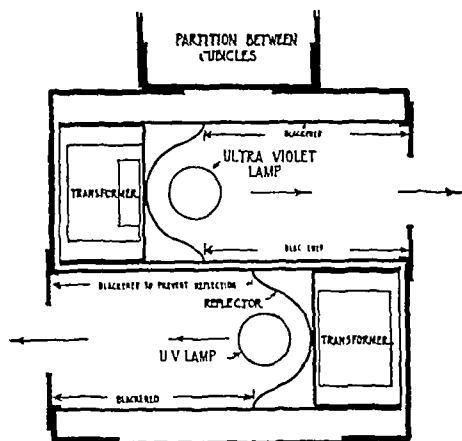


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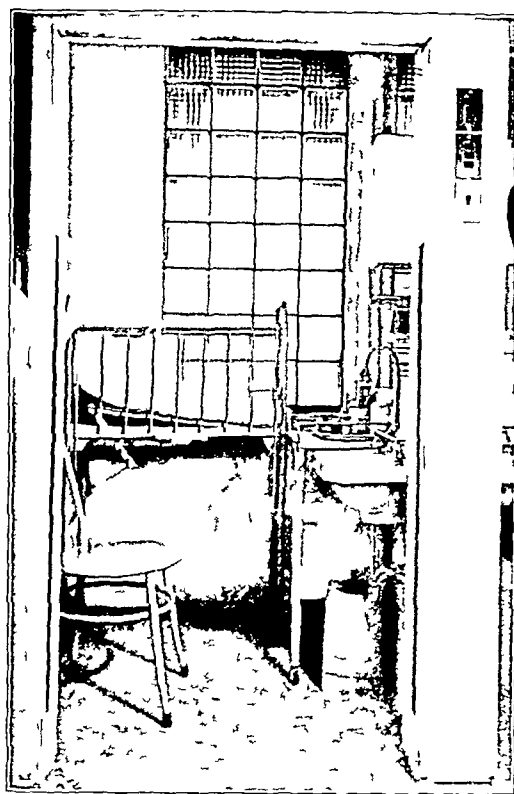


Fig 3—Cubicle in ultraviolet equipped room

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These infections were also classified as to their severity. A child who had a temperature of 100 F for two successive days or of 101 F for one day, but no signs of respiratory infection was classified as having pyrexia, provided a thorough physical and laboratory examination failed to reveal any other cause for the

TABLE 2—Number of Infections in Ultraviolet Equipped and Open Control Rooms

Type of Room	Date	Number of Babies	Number of Babies Developing Infections	Percentage of Babies Developing Infections
Ultraviolet equipped (complete partitions and air changing)	11/13/39 to 7/29/40	46	8	17
First open control	11/13/39 to 7/29/40	34	17	50
Second open control	3/1/40 to 7/29/40	23	12	52

TABLE 3—Severity of Infections in Ultraviolet Equipped and Open Control Rooms

Type of Room	Date	Severe	Moderate	Mild	Pyrexia
Ultraviolet equipped (complete partitions and air changing)	11/13/39 to 7/29/40	0	5	1	2
First open control	11/13/39 to 7/29/40	3	8	3	3
Second open control	3/1/40 to 7/29/40	2	3	4	3

fever. If he had signs of nasopharyngitis but no fever the infection was called mild. Babies who developed bronchitis, pneumonia, running ears or prolonged high fevers associated with symptoms of nasopharyngitis were classified as having severe infections. Less severe infections were called moderate. The severity of the infections occurring in the first nine months is shown in table 3.

TABLE 4—Number of Infections in Ultraviolet Equipped Partitioned and Open Control Room (July 29, 1940 to June 20, 1941)

Type of Room	Number of Babies	Number of Babies Developing Infections	Percentage of Babies Developing Infections
Ultraviolet equipped (complete partitions and air changing)	56	12	21
Partitioned control	63	31	49
Second open control	60	36	60

TABLE 5—Severity of Infections in Ultraviolet Equipped, Partitioned and Open Control Rooms (July 29, 1940 to June 20, 1941)

Type of Room	Severe	Moderate	Mild	Pyrexia
Ultraviolet equipped (complete partitions and air changing)	2	2	3	5
Partitioned control	9	10	9	3
Second open control	9	15	10	2

In this series the infants treated in the open control rooms had three times as many infections as those in the room equipped with ultraviolet lamps, and more of these infections were severe.

**SERIES 2—Comparison of Infections Occurring in the (1) Ultraviolet Equipped, (2) Partitioned and (3) Open Control Rooms.**—The figures in table 3 show that the babies in the room equipped with ultraviolet lamps had definitely fewer infections than those treated

in the open control rooms. Possibly the fewer infections in the room equipped with ultraviolet lamps were due to the partitions which were also present, and, in order to rule this out, partitions running up 8 feet from the floor were put in the control room, thus dividing it into six cubicles. The partitions were not run to the ceiling, which was 10 feet high, because artificial ventilation was not provided. There was only one sink in this room. The nursing personnel was still the same in this room as in the room equipped with ultraviolet lamps. This was called the partitioned control room (fig. 4).

The number of infections occurring in the room equipped with ultraviolet lamps, the partitioned control and the second open control room during the next eleven months are shown in table 4 and the severity of these infections in table 5.

More than twice as many infections occurred among the control babies as among those in the room equipped with ultraviolet lamps. The babies in the partitioned con-

TABLE 6—Number of Infections\* in Completely Partitioned Room with Air Conditioning, Partially Partitioned Room and Open Control Room (June 20, 1941 to April 6, 1942)

Type of Room	Number of Babies	Number of Babies Developing Infections	Percentage of Babies Developing Infections
Completely partitioned with air conditioning system	77	21	26
Partitioned control	71	26	37
Second open control	77	41	53

\*During 1941-1942 fewer babies developed infections and hemolytic streptococci and pneumococci were isolated less frequently than during the year 1940-1941.

TABLE 7—Severity of Infections in Completely Partitioned Room with Air Conditioning, Partially Partitioned Room and Open Control Room (June 20, 1941 to April 6, 1942)

Type of Room	Severe	Moderate	Mild	Pyrexia
Completely partitioned with air conditioning	4	7	9	1
Partitioned control	4	10	5	2
Second open control	9	9	6	2

trol room developed fewer infections than those in the second open control room. Partitions alone therefore seem to play some part in preventing these hospital infections. There were also fewer severe and moderate infections among the babies in the room with the ultraviolet lamps.

**SERIES 3—Comparison of Infections Occurring in Rooms with (1) Complete Partitions and Air Changing, (2) Partial Partitions and (3) No Partitions.**—The room equipped with ultraviolet lamps also had complete partitions and an air changing system, both of which the control rooms lacked. In order to determine what part the complete partitions and air changing had in the results obtained the ultraviolet lamps were turned out and for the next nine months the number of infections occurring (1) in the room with complete partitions and air changing, (2) in the room with partial partitions and (3) in the second open control room were compared. The results are shown in table 6 and the severity of these infections in table 7.

There were slightly fewer infections occurring in the room with the complete partitions and the air changing system than in the partially partitioned and the second open control room. The difference however was slight.



The much better infection records of the babies in the room equipped with ultraviolet lamps, completely partitioned and air changed in the first two series were therefore almost entirely due to the ultraviolet radiation barriers.

#### EVIDENCE OF TRANSFER OF BACTERIA

1 *Bacteriologic Investigation of Upper Respiratory Tract*—Cultures of both tonsillar areas and the posterior pharyngeal wall were taken of each infant on admission and at weekly intervals throughout his stay in the hospital. Nasal cultures were also taken if any nasal discharge was present. Frequent cultures (usually daily) were taken of any baby who showed a rise in temperature or signs of infection of the upper respiratory tract. Cultures were also taken whenever possible of any other infected areas. The throats of the staff, interns and nurses were swabbed as a routine once a week and whenever any respiratory infection developed.

The cultures were planted as soon as possible on moist human blood agar plates and incubated in an atmosphere of approximately 10 per cent carbon dioxide at 37.5 C for eighteen hours.<sup>5</sup> Colonies suspected of being pneumococci or hemolytic streptococci were picked to fresh plates for isolation. The pneumococci were identified by the bile solubility test and typed by agglutination. The hemolytic streptococci which fell into group A (Lancefield<sup>6</sup>) were typed.<sup>7</sup> To determine the group to which the strain belonged a method combining the techniques of Fuller<sup>8</sup> and Brown<sup>9</sup> was used. The typing serums<sup>10</sup> were prepared according to the method of Mueller and Klise,<sup>11</sup> and the technic of Neisser<sup>12</sup> was used in the preparation of the antigen for agglutination.

Over a period of twenty-nine months cultures were taken of 674 babies. Sixty-seven strains of group A hemolytic streptococci (all but seven of which were typable) and one hundred and four strains of pneumococci were isolated. Cultures were taken of 291 members of the staff. These yielded seventy-five strains of group A hemolytic streptococci (all but seven of which were typable) and thirty strains of pneumococci. If the same type was recovered more than once from an individual it was counted as only one in the figures given. If a person had two different types of streptococci (always on different days) this was counted as two. In all, 4,356 cultures, the great majority of which were from throats, were taken.

The interns and nurses frequently carried hemolytic streptococci, usually without any symptoms of infection. These organisms were rarely recovered from cultures taken of the staff physicians. The carrier rate reached a peak during the late winter months and fell to

practically zero during the summer. The prevalent type of streptococcus differed from time to time. For instance, toward the end of 1940 type 3 was very common and types 12 and 5 were only occasionally encountered. In the next three months type 3 persisted with fair frequency but type 12 became very common. A few weeks later type 5 became very prevalent and type 12 almost disappeared. Both streptococci and pneumococci were carried for months without any apparent ill effects. One intern harbored hemolytic streptococcus type 10 from December 1939 until June 1940, when he left the hospital. Another intern carried pneumococcus type XIX for over a year. This was the most common type of pneumococcus encountered, and this intern may possibly have been the source of infection of 2 infants in the open control room.

Of the two hundred and seventy-six strains of group A hemolytic streptococci and pneumococci which were isolated, only eighteen were passed from baby to baby, from staff to baby or from baby to staff. Therefore according to our technic this is a rare occurrence. One such transfer occurred in the room equipped with ultra-

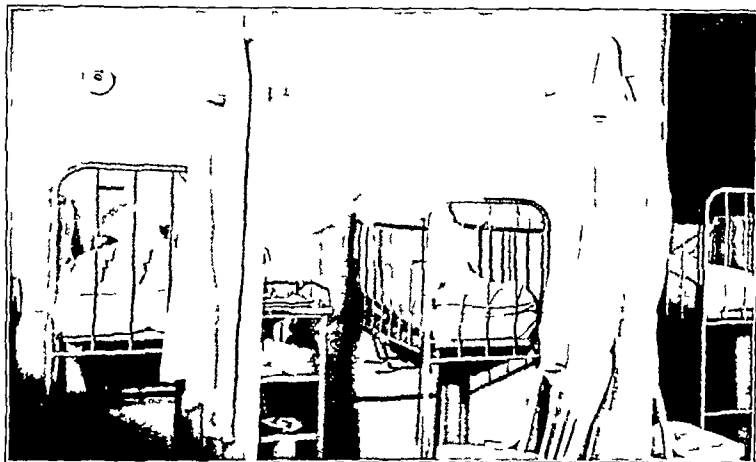


Fig. 4—Half of the partitioned control room.

violet lamps: two in the open control room, six in the partitioned control room (partial partitions) and nine in the second open control room. These are shown in table

TABLE 8—Transfer of Organisms

Type of Room	Date	From Baby to Baby	From Staff to Baby	From Baby to Staff	Total
Ultraviolet equipped (complete partitions and air changing)	November 1939 to June 1941 (19 mos.)	0	1	0	1
Partitioned control	August 1940 to April 1942 (21 mos.)	3	1	2	6
First open control	November 1939 to August 1940 (9 mos.)	0	2	0	2
Second open control	March 1940 to April 1942 (20 mos.)	6	3	0	9
Complete partitions and air changing	June 1941 to April 1942 (10 mos.)	0	0	0	0
Total		9	7	0	16

8. Transfer from baby to baby is the commonest mode of spread, and this appears to occur most frequently in the open control rooms although the figures are so

5 Auger, W. J. A New Method of Culturing Sputum on Solid Media Using Carbon Dioxide for the Isolation of Pneumococci. *Brit. J. Exper. Path.* 20: 439 (Dec.) 1939.

6 Lancefield, Rebecca C. A Serological Differentiation of Human and Other Groups of Hemolytic Streptococci. *J. Exper. Med.* 57: 571 (April) 1933.

7 Griffith, F. The Serological Classification of Streptococcus Pyogenes. *J. Hyg.* 34: 542 (Dec.) 1934.

8 Fuller, A. T. The Formamide Method for Extraction of Polysaccharides from Hemolytic Streptococci. *Brit. J. Exper. Path.* 19: 130 (April) 1938.

9 Brown, J. H. A Simplified Method for Grouping Hemolytic Streptococci by the Precipitin Reaction. *J. A. M. A.* 111: 310 (July 23) 1938.

10 Drs. Frieda Fraser and Helen Plummer of the Connaught Laboratories, University of Toronto, supplied the type cultures.

11 Mueller, J. H. and Klise, K. S. A Method for the Agglutination of Hemolytic Streptococci. *J. Immunol.* 22: 53 (Jan.) 1932.

12 Neisser, Hedwig. The Serological Typing of Streptococcus Pyogenes and Its Application to Certain Infective Conditions. *J. Path. & Bact.* 48: 55 (Jan.) 1939.

small that no definite conclusion is justifiable. Two instances of the transfer of organisms are reported here.

1 Baby T was admitted to the second open control room on October 7. No pathogenic organisms were found in his cultures until November 13 when a pure culture of type VI pneumococcus was isolated from his nose. The original source of this organism is not known. On November 20 Baby McC, who was in the same room, showed the presence of pneumococcus type VI in his throat culture. Baby McC had been in this room for six weeks and had never previously shown this organism. On November 26 Baby T, who had been in the same room nearly a month, developed an upper respiratory infection with type VI pneumococcus. Again this organism had not previously been found in his throat. The last two babies were evidently infected from Baby F.

2 Baby G was admitted on February 4 to the partitioned (partial partitions) control room and carried pneumococcus type XIX in his throat until his discharge on March 16. Baby H, who had been in the same room for three weeks, developed a respiratory infection on February 6 and type XIX pneumococci were cultured from his throat on February 16 and 23 and March 2 which he apparently acquired from Baby G.



Fig. 5—Room with ultraviolet irradiation of upper air.

Baby L, after more than five weeks in this room, contracted a type XIX infection on February 21, presumably from Baby G or Baby H.

In these studies 506 babies have been under observation and 188, or 37 per cent, of these contracted clinical infections. In only 16, or about 10 per cent of these, did we obtain evidence that these infections were due to bacteria. Assuming that the bacteriologic examinations were made sufficiently frequently, one would infer that virus infections were responsible for much of the disease of the upper respiratory tract encountered. Wells<sup>13</sup> and also Andrewes and Glover<sup>14</sup> have studied experimental air borne virus infection in ferrets. Wells<sup>15</sup> and Greene, Barenberg and Greenberg<sup>16</sup> have described epidemics of virus diseases which were

apparently air borne and which were controlled by ultraviolet radiation of the air.

2 Presence of Organisms in the Air—Counts were also made on numerous occasions from September 1940 to April 1942 of the number of bacteria in the air of the experimental rooms. Blood agar plates were exposed

TABLE 9—Bacteria in Air (September 1940 to June 1941)

	Ultraviolet Equipped Room	Partitioned Control Room	Second Open Control Room
Blood agar plates number of colonies per plate (average)	109	928	964
Wells centrifuge number of colonies per 10 cu ft (average)	7	171	16

for varying periods of time simultaneously in all three rooms, and 10 cubic feet samples of air were taken with the Wells air centrifuge. The average counts are shown in tables 9 and 10.

In table 9 it is seen that the plates exposed in the control rooms showed more than twice as many organisms as those exposed in the room equipped with ultraviolet lamps. The Wells centrifuge counts also showed that the air in this room contained fewer organisms. From table 10 it is evident that there is no significant difference between the air bacterial counts made in the completely partitioned room with air changing, the partially partitioned control room and the open control room.

#### RESULTS OF ULTRAVIOLET IRRADIATION OF THE UPPER AIR IN ROOMS

Encouraged by the previous results, a simpler method of indirect irradiation was tried out in three smaller rooms (12 by 8 by 10 feet). Three 36 inch 30 watt General Electric Germicidal lamps were hung in an aluminum reflector trough down the center of the room 3 feet 3 inches from the ceiling (see figure 5). The rays were deflected upward and provided a reservoir of clean air near the ceiling. No direct rays from the lamps reached the patients or the nurses and therefore precautions were not necessary to avoid burning of the skin or eyes. One of these rooms which usually contained four infants' cots or three larger cribs is shown

TABLE 10—Bacteria in Air (June 1941 to April 1942)

	Completely Partitioned Room with Air Changing	Partially Partitioned Control Room	Second Open Control Room
Blood agar plates number of colonies per plate (average)	134	193	116
Wells centrifuge number of colonies per 10 cu ft (average)	25	68	76

in figure 5. One of these rooms was used exclusively for premature babies and will be discussed later. The other two rooms, with similar control rooms without the ultraviolet lamps, were used for babies up to 2 years of age. In these rooms it was not possible to admit only babies free from respiratory infection. Many were admitted with such infections and discharged within a short time. Unless the infant remained in the hospital for two weeks following his recovery from his respiratory infection he was not included in these records. The doors

13 Wells W F and Henle W. Experimental Air Borne Disease. Quantitative Inoculation by Inhalation of Influenza Virus. *Proc Soc Exper Biol & Med* 48: 298 (Oct) 1941.

14 Andrewes C H and Glover R E. Spread of Infection from the Respiratory Tract of the Ferret. I. Transmission of Influenza A Virus. *Brit J Exper Path* 22: 91 (April) 1941.

15 Wells W F, Wells Mildred W and Wilder T S. The Environmental Control of Epidemic Contagion. I. An Epidemiologic Study of Radiant Disinfection of Air in Day Schools. *Am J Hyg* 35: 97 (Jan) 1942.

16 Greene David, Barenberg L H and Greenberg Bernard. Effect of Irradiation of the Air in a Ward on the Incidence of Infections of the Respiratory Tract with a Note on Varicella. *Am J Dis Child* 61: 273 (Feb) 1941.

and windows were frequently left open to improve the ventilation, and therefore the conditions in these rooms varied considerably. The clinical results in these rooms are shown in tables 11 and 12.

It is obvious that the ultraviolet lamps in these rooms did not reduce the spread of cross infection. The custom of leaving the corridor door open, resulting in a rapid movement of air past the ultraviolet lamps, may have been a factor in the unsatisfactory results.

**Premature Rooms**—A room used exclusively for 3 or less premature infants was also equipped with three General Electric Germicidal lamps as described. The temperature was kept between 77 and 85 F and the humidity at about 50 per cent. The doors and windows were always kept closed. A similar room without the lamps was used as a control. The same nurses worked in the two rooms. The number of infections occurring in these two rooms is shown in table 13.

TABLE 11—Number of Infections in Rooms with Indirect Irradiation and Control Rooms (March 1941 to March 1942)

Type of Room	Number of Babies	Number of Babies Developing Infections	Percentage of Babies Developing Infections
Ultraviolet equipped with indirect irradiation	58	22	38
Control	64	22	34

TABLE 12—Severity of Infections in Rooms with Indirect Irradiation and Control Rooms (March 1941 to March 1942)

Type of Room	Severe	Moderate	Mild	Pyrexia
Ultraviolet equipped with indirect irradiation	6	11	2	7
Control	5	9	6	2

TABLE 13—Number of Infections Among Premature Babies in Rooms with Indirect Irradiation and Control Rooms (March 1941 to March 1942)

Type of Room	Number of Babies	Number of Babies Developing Infections	Percentage of Babies Developing Infections
Ultraviolet equipped with indirect irradiation	28	8	29
Control	34	12	35

The premature babies in the control room had nearly twice as many infections as those in the room equipped with ultraviolet lamps. Unfortunately a small number of babies were admitted to these cubicles during the year owing to their long stay in the hospital. While the numbers are not large enough to draw definite conclusions, this method of irradiation reduced considerably the spread of cross infections among the premature infants.

Routine throat cultures of the children in these three rooms and their controls were made from April 12 to June 26 1941. No bacteriologic evidence of the spread of pathogenic organisms from one to another was encountered. However, in February 1942, in a special investigation undertaken when 2 of 3 premature infants in the control room developed severe respiratory infections on the same day, throat cultures were taken of these infants and the staff attending them. Cultures from both sick babies showed hemolytic streptococcus type 3 and pneumococcus type VI was isolated from

1 of them as well. An intern attending these babies showed a heavy growth of hemolytic streptococcus type 3 in her throat culture at this time, and it may be presumed that the 2 infants acquired their streptococcal infection from her. A nurse who had come on duty in the room when the infants were showing the first signs of the infection had a slight sore throat when

TABLE 14—Severity of Infections Among Premature Babies in Rooms with Indirect Irradiation and Control Rooms (March 1941 to March 1942)

Type of Room	Severe	Moderate	Mild
Ultraviolet equipped with indirect irradiation	0	4	4
Control	4	4	4

cultures were taken five days later, and at this time many colonies of pneumococci type VI were isolated from her. The nurse may have been responsible for the pneumococcus type VI isolated from the infant 01, conversely, she may have acquired it from him. The patient infected with only hemolytic streptococcus type 3 died.

#### BACTERIA IN THE AIR IN ROOMS WITH IRRADIATION OF THE UPPER AIR AND CONTROL ROOMS

The air in the irradiated rooms used for older infants contained as many bacteria as the air of the corresponding control rooms. In the rooms used for the premature infants the results are shown in table 15.

It is evident that the premature infants in the control rooms were exposed to three to four times as many air borne organisms as those in the irradiated rooms.

#### CONCLUSIONS

1 Infants treated in open six bed rooms or in a room with 8 foot partitions between the infants developed two to three times as many respiratory infections as babies in a room divided into cubicles with partitions running to the ceiling, a curtain of ultraviolet radiation across their entrances and an air changing system.

2 When the ultraviolet lamps were turned off and the progress of the babies in this room, which had complete partitions and an air changing system, was compared with that of other babies in the room with partial partitions, it was found that those in the latter room had only slightly more infections.

3 The curtains of ultraviolet radiation between the babies were therefore the major factors in the decided reduction of respiratory cross infections described in conclusion 1.

TABLE 15—Bacteria in Air in Rooms with Indirect Irradiation and Control Rooms (Premature Infants)

	Indirect Ultraviolet Irradiation	Control Room
Blood agar plates number of colonies per plate (average)	46	197
Wells centrifuge number of colonies per 10 cu ft (average)	22	63

4 Two hundred and seventy-six strains of group A hemolytic streptococci and pneumococci were recovered from the staff and the babies. In only 18 instances was the transfer of these organisms from patient to patient, from staff to patient or vice versa demonstrated.

5 Infants treated in rooms in which the upper air was irradiated showed approximately the same number of infections as babies treated in rooms similar but with-

out ultraviolet irradiation. The doors and windows in these rooms were frequently left open.

6 Premature infants treated in the regular premature room had nearly twice as many respiratory infections as similar infants in a room in which the upper air was irradiated. The doors and windows were kept closed in these rooms.

7 During the last two and one-half years the progress of 682 babies has been followed. Two hundred and fifty-eight or 38 per cent, have developed respiratory infections, many of which were mild.

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## VITAMIN B<sub>1</sub> THERAPY IN DIABETIC NEURITIS

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In a previous article<sup>1</sup> an attempt was made to determine the relationship, if any, between states of vitamin B<sub>1</sub> deficiency and diabetic neuritis. For this purpose a quantitative study of the vitamin B<sub>1</sub> content of the diet of patients with diabetic neuritis was made and found to be quite adequate as judged by the Cowgill formula. The evidence, clinical and pathologic, in favor of a vascular etiology in diabetic neuritis was mentioned, but the possibility that avitaminosis nevertheless played a role in producing the neuritic syndrome was not ruled out, since defective absorption or utilization of the ingested vitamin had still to be considered. Further evaluation of these factors it was stated at that time, was not feasible until tests for the metabolism of vitamin B<sub>1</sub> had been elaborated. Since then such a test has been introduced, and the results it has yielded will be discussed here.

The present study represents an attempt to tackle the problem of the relationship between avitaminosis and diabetic neuritis from a different angle, by observing the effects of vitamin B<sub>1</sub> therapy on the neurologic picture. Eleven cases were included at the outset, but in 4 of these cooperation was not sufficiently satisfactory to allow of regular and prolonged follow-up. A neurologic examination was made in each of the other 7 cases before therapy was instituted, then 10 to 15 mg of thiamine hydrochloride was given daily, and examinations were made again at intervals of a month. The average period of observation extended for five and a half months. The salient features of these cases are now presented.

### REPORT OF CASES

CASE 1—A. L., a man aged 69, who entered the Mount Sinai Hospital on Jan. 28, 1941, had been found to have diabetes mellitus five years previously, and it had been controlled by dieting. In October 1940 he began to complain of weakness and numbness of the hands. Shortly thereafter progressive weakness of the legs and paresthesias in the feet set in. During the period from Oct. 3 to Nov. 12, 1941 he received, according to his private physician, 28 cc of thiamine hydrochloride half intravenously and half intramuscularly, each cubic centimeter equal to 0.0333 Gm, eight injections of concentrated liver extract, four injections of 1 cc of a vitamin B preparation, each cubic centimeter equal to 0.006 Gm of thiamine hydrochloride, 0.050 Gm of nicotinamide, 0.0001 Gm of riboflavin and 0.0001 Gm of vitamin B<sub>6</sub>. Orally the patient received six tablets of yeast concentrate daily.

From the Neurological Service of Dr. I. S. Wechsler, Mount Sinai Hospital.

<sup>1</sup> Needles, William. Vitamin Studies in Cases of Diabetic Neuritis, *Arch. Neurol. & Psychiat.* 41: 1222 (June) 1939.

The physical examination disclosed cardiac enlargement and a systolic murmur at the apex of the heart. There was moderate sclerosis of the blood vessels. The blood pressure was 148 mm of mercury systolic and 88 diastolic.

Neurologic examination showed a shuffling gait and a positive Romberg sign, there was slight ataxia in all limbs, motor power was impaired in the upper and lower limbs, the arms and forearms showed some atrophy, the biceps, radial and ulnar reflexes and the patellar and ankle jerks were absent, the abdominal and cremasteric reflexes were absent, there were fibrillations in the muscles of the calf, pain, touch and temperature sensation were diminished over the lower limbs, the hands and forearms, vibration was diminished in the upper and lower limbs, and position sense was impaired in the fingers and toes. The muscles were tender to pressure.

The blood sugar was 230 mg per hundred cubic centimeters. The blood count and blood Wassermann reaction were negative. Free hydrochloric acid was present in the gastric analysis. The cerebrospinal fluid showed a 4 plus Pandy reaction and a total protein of 192 mg per hundred cubic centimeters, the dynamics were normal. Roentgen examination disclosed calcification in both posterior tibial arteries.

A tolerance test for vitamin B<sub>1</sub> was carried out but proved unsatisfactory owing to the fact that the patient had been receiving massive doses of the vitamin.

The condition was considered one of diabetic neuritis with some evidence of involvement of the spinal cord in addition.

On a diet of 100 Gm of carbohydrate, 80 Gm of protein and 80 Gm of fat the urine was free of dextrose.

He was given five tablets of yeast every four hours and 30 mg of thiamine hydrochloride intramuscularly every day. A week after this regimen there was diminution in tenderness of the muscles but no other change in the neurologic status. He continued to receive thiamine hydrochloride 30 mg a day orally after leaving the hospital. Neurologic examination at monthly intervals for a period of eight months disclosed no significant alteration in the findings. Weakness was more apparent and paresthesias persisted.

CASE 2—B. M., a woman aged 54, was observed in the diabetic clinic of the hospital in 1935, when diabetes mellitus was detected. Since that time the diabetes had been controlled by dietary regulation plus 10 or 20 units of insulin daily. She was admitted to the hospital in July 1938, at which time she showed moderate sclerosis of the blood vessels and a blood pressure of 110 systolic and 74 diastolic. The neurologic examination disclosed a somewhat broad based gait, there was some ataxia in the left lower limb, the right ankle jerk was feeble, the left ankle jerk, the hamstring reflexes and the reflexes in the upper limbs were not elicited, there was a glove and stocking distribution of hypalgesia, vibratory sense was absent at the knees and the left iliac crest, diminished at the feet and in the hands, position sense was impaired at the toes. She was considered to have diabetic neuritis.

When observed in the hospital in May 1939 her blood pressure was 180 systolic and 110 diastolic and she presented evidence of hypertensive and arteriosclerotic heart disease, as well as diabetes mellitus and diabetic neuritis.

A tolerance test for vitamin B<sub>1</sub> performed some time later yielded figures slightly below normal.

A neurologic examination in June 1941 disclosed the following positive findings. The deep reflexes in the upper limbs were absent, the ankle jerks were absent, even with reinforcement, there was bilateral calf tenderness, pain, touch and temperature sensation were diminished below the middle of the legs, vibratory sense was diminished at the feet and knees and absent at the iliac crests. Subjectively the patient complained of pains in the legs and a sensation of heaviness in the feet and hands. She was placed on the usual amounts of thiamine hydrochloride.

Periodic examination up to December 1941 showed no essential changes in the objective neurologic findings. The patient stated that she felt stronger generally and that the paresthesias were less troublesome. Tenderness of the calves persisted and was well defined.

CASE 3—M C, a woman aged 54, was discovered to be suffering from diabetes mellitus in October 1940. The diabetes had subsequently been controlled by dietary measures. A sensation of heaviness in the hands had appeared about six months prior to October 1940. The physical examination showed a blood pressure of 170 systolic and 100 diastolic, the second aortic sound was accentuated. Roentgen examination disclosed several calcified plaques in the right posterior tibial artery. A tolerance test for vitamin B<sub>1</sub> yielded normal results.

Neurologic examination in April 1941 showed that tenderness of the calves was present, the knee jerks were depressed but fairly lively after reinforcement, the ankle jerks were absent even with reinforcement, pain, touch and temperature sensation were diminished over the lower two thirds of the legs and the feet and over the hands, vibratory sensation was diminished at the feet and knees.

Therapy with thiamine hydrochloride was instituted June 1941 and the neurologic status was checked periodically up to December 1941. The objective findings remained in statu quo in all essential details, tenderness of the calves was diminished, however, and the paresthesias were less apparent.

CASE 4—S B, a woman aged 38, observed at the Mount Sinai Hospital in January 1941, had been suffering for several years from diabetes mellitus, which had been controlled by dietary measures. For the past year she had developed cramps in the legs when walking and tingling sensations in the toes. There was also a history of "hysterical" attacks of crying and screaming, and of nervousness since 1936. In 1940 menopausal symptoms had set in. The general physical examination at this time disclosed no significant findings. The patient was, however, emotionally unstable and very querulous. The neurologic examination showed absence of deep reflexes in the lower limbs, vibratory sense was diminished up to a level of the midlumbar spine. The blood sugar determination was 175 mg per hundred cubic centimeters. The urine was free of dextrose. The cerebrospinal fluid was normal. Free hydrochloric acid was present in the gastric contents.

A tolerance test for vitamin B<sub>1</sub> showed normal excretion.

The diabetes mellitus was controlled by a diet of 150 Gm of carbohydrate, 60 of protein and 80 of fat, with 20 units of insulin daily. Neurologic examination in June 1941 showed absence of the knee and ankle jerks, vibratory sensation was lost at and below the iliac crests, diminished at the hands and wrists, moderate tenderness of the calf muscles was present. Cutaneous sensibility was difficult to evaluate, there being an inconstant glove and stocking type of diminution, there was a tendency to veer in walking, and the Romberg test was positive when the eyes were closed. In view of the history of a psychoneurotic disorder and the reaction of the patient during the examination, a psychogenic basis for some of the abnormal findings could not be ruled out.

Treatment with thiamine hydrochloride was instituted and the patient was observed at monthly intervals up to January 1942. The neurologic findings, those which allowed of a psychogenic interpretation as well as those that did not, remained unaltered. Tenderness of the calf muscles persisted as heretofore. The paresthesias continued, but in a milder form.

CASE 5—S S, a woman aged 22 who developed diabetes mellitus at the age of 8 years, had been under constant observation at the hospital since that time. The diabetes was originally controlled by a diet of 65 Gm of protein and 100 Gm of fat. Later she received 100 Gm of carbohydrate, 60 Gm of protein and 60 Gm of fat with 50 units of insulin daily. She was admitted to the hospital in December 1939 after a convulsive episode.

The general physical examination disclosed no significant findings. The blood pressure was 120 systolic and 90 diastolic. The blood count was normal. The urine contained 6 per cent of dextrose. The blood sugar was 155 mg per hundred cubic centimeters. The spinal fluid and the electroencephalogram were normal. Roentgen study of the skull was normal. Neurologic examination showed absence of the right and diminution of the left ankle jerk, the knee jerks were diminished, the pupils were irregular, but equal and reactive. The fundi showed a few retinal hemorrhages and evidence of diabetic choroiditis.

The neurologic examination four months later showed the ankle jerks to be depressed and the knee jerks present only with reinforcement. In November 1940 the patient complained of tingling sensations in the hands and feet.

A tolerance test for vitamin B<sub>1</sub> showed normal figures.

Neurologic examination in June 1941 showed that the left knee jerk and both ankle jerks were absent, even with reinforcement, the right knee jerk was absent but fairly active with reinforcement, there was tenderness of the calf muscles, the right pupil was ovoid and was feeble in response to light stimulation.

Therapy with thiamine hydrochloride was instituted and the patient observed until October 1941 after which time she failed to cooperate. When last examined she did not feel subjectively improved. Tenderness of the calf muscles was exquisite. The paresthesias persisted. The knee and ankle jerks were absent, even with reinforcement. Pain, touch and temperature sensations were diminished below the ankles, vibratory sensation was diminished at the ankles and toes. There was evidence of progression of the neurologic syndrome during the period of thiamine hydrochloride therapy.

CASE 6—M L, a woman aged 58 was discovered to have diabetes mellitus in June 1941. For the preceding year she had suffered from weakness of the legs, paresthesias in the feet and pain in the calf muscles on walking. The general physical examination disclosed enlargement of the heart toward the left and a systolic murmur at the apical and aortic regions. The blood pressure was 182 systolic and 110 diastolic. A blood Wassermann test was negative. The diabetes was controlled by a diet of 120 Gm of carbohydrate, 80 Gm of protein and 100 Gm of fat with 10 units of insulin daily.

Neurologic examination in July 1941 showed that the knee jerks were decidedly depressed, even with reinforcement, the ankle jerks were feebly obtained but fairly normal with reinforcement. Vibratory sensation was diminished at the hands, feet and knees. The calf muscles were exquisitely tender. The patient was observed under a regimen of thiamine hydrochloride until December 1941. The paresthesias had disappeared, tenderness of the calf muscles was diminished, the reflex and objective sensory disturbances remained unaffected.

CASE 7—W B, a man aged 47, admitted to the Mount Sinai Hospital in September 1941, had been discovered to have diabetes mellitus eighteen months prior, and it had been controlled by a diet of 180 Gm of carbohydrate, 80 Gm of protein and 80 Gm of fat with 40 units of protamine zinc insulin every morning. Since July 1941 he had been troubled with pains in the legs and peculiar sensations in the feet and hands. The physical examination showed peripheral arteriosclerosis, there was a systolic apical murmur, the blood pressure was 110 systolic and 80 diastolic, the right dorsalis pedis artery was not palpable, there was bilateral purulent otitis media. Neurologic examination disclosed the middle ear type of deafness bilaterally, all deep reflexes were absent or greatly depressed, the abdominal and cremasteric reflexes were absent, there was tenderness of the calf muscles, hypalgesia of the glove and stocking distribution was present, vibratory sense was diminished in the lower limbs, diabetic retinopathy was evident in the fundi. The blood count, the blood Wassermann reaction and the cerebrospinal fluid findings were normal. The urine showed a trace of dextrose. The blood sugar was 85 mg per hundred cubic centimeters.

Soon after admission to the hospital he was given 50 mg of thiamine hydrochloride intramuscularly every day. The neurologic condition after two weeks of this regimen showed no improvement. Oral administration of the vitamin was continued after his discharge from the hospital. In November 1941 he showed no improvement either subjectively or objectively. Pain and weakness of the limbs persisted, the deep reflexes were absent and the cutaneous and vibratory sensory disturbances remained unaltered.

Four other cases could not be utilized because of faulty cooperation. In two of them the tolerance test for vitamin B<sub>1</sub> was carried out and in each case the results were normal.

## COMMENT

A survey of this group of cases leads to the conclusion that no amelioration of the neurologic syndrome was demonstrable objectively. In 2 of the 7 cases there was an increase in the neurologic involvement despite therapy with thiamine hydrochloride. Subjective improvement apparently occurred in 4 of the cases in that the weakness and the paresthesias remitted. Tenderness of the muscles of the calf was far from uniformly relieved.

These findings are distinctly at variance with those reported by Fein, Ralli and Jolliffe<sup>2</sup> after a similar study. These observers found significant improvement in all of their 9 cases, tenderness of the calf disappeared, the ankle jerks were restored and vibratory sensation reappeared following therapy with thiamine hydrochloride. They therefore concluded that  $B_1$  avitaminosis was the responsible factor in the production of the neuritic syndrome. Quantitative estimation of the vitamin  $B_1$  content of the diet of their patients showed it to be well above the minimal requirement substantiating in this respect my original findings. However, the therapeutic response of their patients to thiamine leads them to postulate that their patients indulged in dietary indiscretions to the degree that the adequate vitamin-caloric ratio no longer obtained. It should be pointed out that they concede at least a contributory role in the pathogenesis to vascular disease when they state that, owing to compromise of the blood supply to the peripheral nerves, a greater intake of vitamins might be needed to supply the tissues adequately than would otherwise be the case.

In seeking a possible explanation for the response to thiamine hydrochloride in their cases and the failure of the response in the present series, one feature claims attention. The degree of neurologic involvement was slighter in their group. In none of their cases were the knee jerks affected, in none were there significant disturbances of the cutaneous sensory modalities. One might contend that in these instances the disease process was milder, while in my group of cases it had produced irreversible and irreparable damage. The situation would then be similar to that in subacute combined degeneration of the spinal cord in pernicious anemia, in which therapy with liver is much more effective in preventing the onset of the condition than in clearing up neurologic signs that have already set in. This explanation would not, however, account for the progression that occurred in 2 cases of the series in which ample doses of thiamine were administered.

There are certain other considerations moreover, which militate against an avitaminotic etiology in diabetic neuritis. Pollack, Ellenberg and Dolger<sup>3</sup> have recently evolved a tolerance test for vitamin  $B_1$ . They established that normally, after an intramuscular injection of 0.001 Gm of thiamine hydrochloride, over 180 micrograms is excreted in the urine within four hours while in cases of vitamin deficiency less than this amount is excreted. The excretion rate of patients with diabetes mellitus in the vast majority of instances was normal. In only 13 out of 139 cases was the excretion level below normal, the percentage of cases with low excretion levels was smaller than in a large group of unselected patients. A normal level of excretion is

indicative of adequate absorption and utilization of the vitamin.<sup>4</sup> At this point it should be recalled that in 6 of my cases a tolerance test for vitamin  $B_1$  was carried out. In 1 the excretion was found slightly below normal, in the others normal figures were obtained.

Street and his co-workers<sup>5</sup> found that a diet chronically deficient in vitamin  $B_1$  will produce neurologic changes that are irreversible. They maintained dogs for three hundred and fifty-four days on a subminimal, partially deficient diet until neurologic signs of peripheral neuritis developed. They then administered large doses of vitamin  $B_1$  for a month. No significant changes occurred. Postmortem examination showed involvement of the peripheral nerves and anterior roots as well as of the posterior column of the spinal cord. They draw a distinction between acute and chronic disease from vitamin deficiency in the former vitamin therapy restores the animal to a normal condition within a few hours, presumably because the nervous disorder is merely functional, in the latter, permanent irremediable damage to the nervous structures results. Since dietary deficiency in man is much more likely to be partial than complete, they consider an experimental study of partial deficiency to resemble more closely the condition in man. This would certainly appear to be applicable to cases of diabetic neuritis, in which no sudden curtailment of diet occurs. So that, theoretically at least no improvement of a diabetic neuritis presumably due to  $B_1$  avitaminosis is to be expected from vitamin therapy.

The conclusions to be drawn from this study may appear unduly nihilistic. Hence I would add that in the present state of our knowledge no inferences drawn from the laboratory, no matter how cogent they may appear, should outweigh empirical findings at the bedside. Further study of diabetic neuritis particularly in the less advanced phase and with the benefit of the recently devised tests for vitamin  $B_1$  metabolism, should establish whether avitaminosis is a decisive factor, operating in all cases, or merely a coincidental factor to be found in some cases.

## CONCLUSIONS

Seven cases of diabetic neuritis were studied before and after therapy with thiamine hydrochloride. In none was any improvement noted, in 2 progression of the neurologic syndrome occurred.

Evidence indicates that in diabetic neuritis the metabolism of vitamin  $B_1$  does not vary significantly from the normal.

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4 Pollack, Herbert. Personal communication to the author.

5 Street, H. R., Zimmerman, H. M., Cowgill, G. R., Hoff, H. E., and Fox, J. C. Some Effects Produced by Long Continued Subminimal Intakes of Vitamin  $B_1$ . *J. Biol. & Med.* 13: 293 (Jan.) 1941.

2 Fein, H. D., Ralli, Elvira P., and Jolliffe, Norman. Peripheral Neuropathy Due to Vitamin  $B_1$  Deficiency in Diabetes Mellitus. *J. A. M. A.* 115: 1973 (Dec. 7) 1940.

3 Pollack, Herbert, Ellenberg, Max, and Dolger, Henry. Clinical Studies on Vitamin  $B_1$  Excretion Determined by the Fermentation Method. *Arch. Int. Med.* 67: 793 (April) 1941.

**Digestive Time of Food**—The digestion time of various foods is of the greatest importance because clinically many diseases manifest themselves by a delay or definite arrest in the evacuation of food from the stomach. We can ascertain much regarding motor function by gastric analysis. Not only do we observe the degree of food chymification as an index of gastric peristaltic function, but we also determine the evacuation time as a measure of the length of time necessary for the stomach to do its work. We can do this in two ways, either we can perform a complete fractional analysis throughout the entire digestion period or we can pass the tube at a stated interval after which a certain meal is normally digested noting whether or not the stomach is empty or whether there is an actual delay.—Rehfuess, Martin E. *Indigestion Its Diagnosis and Management*. Philadelphia, W. B. Saunders Company, 1943.

STUDIES ON THE ACTION OF  
QUINIDINE IN MANII INTRAMUSCULAR ADMINISTRATION OF A SOLUBLE  
PREPARATION OF QUINIDINE IN THE TREAT-  
MENT OF ACUTE CARDIAC ARRHYTHMIASMELVIN I STURNICK, MD  
JOSEPH E F RISEMAN, MD  
AND  
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BOSTON

Soluble preparations of quinidine sulfate for parenteral administration have not been readily available. Quinine dihydrochloride has been administered intramuscularly or intravenously<sup>1</sup>. Dilute solutions of quinidine sulfate in dextrose or water<sup>2</sup> and even suspensions of quinidine sulfate tablets in hot water and hydrochloric acid<sup>3</sup> have been administered in emergencies, but there are important objections to these procedures.

The necessity for a soluble preparation of quinidine suitable for parenteral administration in treating acute cardiac arrhythmias is obvious, especially when the abnormal rhythm is associated with vomiting, collapse, unconsciousness or other conditions in which absorption from the gastrointestinal tract is uncertain or delayed. A prolonged search of the American market for a soluble preparation has been unsuccessful. The Cinchona Products Institute, however, suggested that such a product might be obtained by adding urea and antipyrine to quinidine hydrochloride according to the following formula:

	Gm or Cc
Quinidine hydrochloride	15
Antipyrine	15
Urea	20
Distilled water	to make 100

So far as we have been able to ascertain, this preparation has not been used, although a similar solution of quinine has been employed in the treatment of specific infections<sup>4</sup>.

No difficulty was encountered in making this solution and, in contrast to other soluble forms of quinidine, the ingredients are readily available. The mixture results in a clear colorless solution with 0.15 Gm of quinidine hydrochloride in each cubic centimeter. Sterilization is best carried out by passage through a Berkefeld filter, after which the solution can be stored in ampules or rubber stoppered bottles available for emergency use. After several months this solution, like all quinine solutions, turns brown. This change in color occurs even when protected from the light, it is said to be due to the formation of a relatively small

amount of decomposition products and is not accompanied by any discernible change of potency or by adverse reactions.

The speed of response to intramuscular administration of this preparation in human subjects has been reported<sup>5</sup>. Our purpose in the present communication is to report observations in the treatment of 24 episodes of acute arrhythmias in a series of 20 consecutive patients.

## MATERIAL AND METHODS

The clinical characteristics of the patients studied are presented in the accompanying table. Electrocardiographic tracings confirmed the diagnosis in each instance before therapy was instituted. The response to treatment was gaged by the change in the heart rate at the apex, by disappearance of shock and other symptoms associated with the arrhythmias by improvement in the patient's general condition and, whenever indicated, by repeated electrocardiographic tracings. Blood pressure determinations were taken at frequent intervals.

Medication was administered intragluteally or in the lateral aspect of the thigh. The initial dose was 0.15 Gm in 1 instance, 0.3 to 0.45 Gm in 11 instances, 0.6 Gm in 9, 0.75 Gm in 2 and 1.05 Gm in 1. In accord with the studies previously reported,<sup>5</sup> the response to this initial dose was observed for one and one-half to two and one-half hours. If the rhythm failed to revert to normal during this period, additional medication was administered. The size of subsequent doses was increased if only a slight or moderate response to the initial dose was observed.

## RESULTS

The rhythm reverted to normal within three hours after medication in 15 of 24 instances (13 of 20 patients). In each instance the clinical response indicated that conversion to normal rhythm was due to this medication. This group included 5 instances of ventricular tachycardia, 9 of auricular fibrillation and 1 of auricular tachycardia. Nine of the patients had arteriosclerotic heart disease, 2 had rheumatic heart disease, 1 was a toxic reaction to medication and 1 was a postoperative reaction.

*Causes of Failure to Respond*—In the remaining 9 instances the condition failed to respond to therapy. Three of these patients had sinoauricular tachycardia (cases 4, 5 and 11), no response to quinidine was expected in these cases. One patient with nodal tachycardia (case 9) died of pulmonary edema before the drug had had sufficient time to exert its beneficial action. In 1 instance (case 12) it is probable that the medication was repeated too infrequently to result in adequate cumulative effect. In 3 cases conversion to normal rhythm took place during the night and the time of transition was not observed. The remaining case (20) failed to respond to quinidine despite adequate dosage.

*Optimum Size of Initial Dose*—The rhythm of only 1 of the 8 patients who received an initial dose of less than 0.45 Gm reverted to normal within two hours after the administration of the one dose. The rhythm of 1 of 3 patients who received an initial dose of 0.45 Gm reverted to normal on two occasions following this dose. The rhythm of 2 of the 9 patients who received an im-

Mr. Harry Brass, Ph.G., helped in preparing the injectable quinidine. From the Medical Research Laboratories of the Beth Israel Hospital and the Department of Medicine, Harvard Medical School.

1. Riseman J. E. F. and Lintelhal, Harry. Paroxysmal Ventricular Tachycardia. *Am Heart J* 22: 219 (Aug) 1941. Horine E. F. Treatment of Paroxysmal Auricular Tachycardia. Paroxysmal Auricular Flutter and Paroxysmal Auricular Fibrillation with Intravenous Injection of Quinine. *Internat Clin* 4: 185 (Dec) 1940.

2. Hepburn John and Rylert, H. E. The Use of Quinidine Sulfate Intravenously in Ventricular Tachycardia. *Am Heart J* 14: 620 (Nov) 1937. Wilson F. N. and Wishart, S. W. The Effects Produced by the Intravenous Injection of Quinidine and Other Drugs on the Mechanism of the Heart Beat. *Tr A Am Physicians* 41: 55 (1926). Maher C. C. Sullivan, C. P. and Scheribel, C. P. The Effect upon the Electrocardiogram of Patients with Regular Sinus Mechanism of Quinidine Sulfate. *Am J M Sc* 187: 23 (Jan) 1934.

3. Levine S. A. Personal communication to the authors.  
4. Zulzer G. Zur Scharlachfrage. *Berl Klin Wchnschr* 56: 1131 (1919). Chhn Bronner C. E. Die Behandlung der Lungenentzündung mit subkutanen Chinaminjektionen. *Ztschr f klin Med* 87: 292 (1919). Schwarze. Ueber lokale Behandlung des Keuchhustens. *Fortschr d Med* 64: 1014 (1926).

5. Sagall E. L., Horn C. D. and Riseman J. E. F. Studies on the Action of Quinidine in Man. I. Measurements of the Speed and Duration of the Effect of Oral and Intramuscular Preparations. *Arch Int Med* to be published.



tial dose of 0.6 Gm or more was converted to normal by this amount. Of the 15 patients whose rhythm reverted to normal within three hours after the administration of quinidine, 5 did not need more than a single injection. Three of these 5 patients received 0.6 to 0.75

Gm and the other 2 patients received 0.33 and 0.45 Gm. It appears, therefore, that an initial injection of 0.45 to 0.6 Gm is advisable.

**Toxic Effects**—When the medication was given intragluteally or in the lateral aspect of the thigh, pain

*Observations Made on Patients Treated*

Case	Age and Sex	Blood Pressure	Type of Heart Disease	Past History of Arrhythmias	Symptoms								
					Palpitation	Dyspnea	Pulmonary Edema	Pain	Con- gestive Failure	Shock	Coma	Sweat- ing	Vomit- ing
Paroxysmal Ventricular Tachycardia													
7 R A	♀ 70	170/80	Hypertensive and arteriosclerotic	Yes type unknown	0	+	0	0	+	++	++	+	+
1 I B	♂ 66	110/40	Arteriosclerotic recent infarct	None	0	0	0	+	0	0	0	±	0
15 L O	♂ 64	126/80	Arteriosclerotic recent infarct	Unknown	0	+	0	+	0	+	0	0	0
3 K S	♂ 67	110/70	Arteriosclerotic recent infarct	Yes paroxysmal ventricular tachycardia	0	0	0	0	0	0	0	0	0
14 C W	♂ 69	Unknown	Arteriosclerotic ? recent infarct	None	0	+	+	0	0	++	+	+	0
Nodal Tachycardia													
9 W J	♂ 68	110/40	Arteriosclerotic	None	+	+	+	0	0	+	0	±	0
Auricular Fibrillation													
8 M G	♀ 17	120/40	Rheumatic	?	+	+	0	0	0	0	0	0	0
					+	+	0	0	0	0	0	0	0
					+	+	0	0	0	0	0	0	+
13 R G	♀ 60	150/90	Toxic reaction to sulfadiazine	None	+	0	0	0	0	0	0	0	0
12* E L	♀ 43	110/40	Rheumatic	Yes paroxysmal auricular fibrillation	+	+	0	+	0	+	0	0	+
					+	+	0	+	0	+	0	0	0
7a* R A	♀ 70	170/80	Hypertensive	Yes	0	+	+	+	+	+	+	+	+
6 G S	♀ 68		Arteriosclerotic bronchopneumonia	0	0	+	+	0	0	+	+	+	0
19 E R	♀ 66	160/90	Arteriosclerotic old coronary	Fibrillation	++	0	0	0	0	+	0	+	0
17 A K	♂ 84	134/68	Arteriosclerotic	None	0	0	0	0	0	0	0	0	0
18 E S	♀ 30	140/80	Postoperative cholecystectomy	None	++	0	0	0	0	0	0	+	+
20 N S	♂ 70		Arteriosclerotic pneumonia ? myocardial infarction	None	0	+	0	0	0	+	+	+	0
Auricular Tachycardia													
2 S G	♀ 65	130/78	Unknown	Yes paroxysmal	+	0	0	++	0	+	0	0	0
16 G H	♂ 60	100/55	Arteriosclerotic ? recent infarct	None	+	+	0	+	0	++	0	++	0
10 J K	♂ 52	130/46	Metastatic carcinoma to heart	None	+	0	0	+	0	+	0	+	0
Sinoauricular Tachycardia													
4 M G	♂ 50	110/70	Arteriosclerotic recent infarct	None	0	+	0	+	0	+	0	+	0
5 J P	♀ 42	100/75	Rheumatic	Yes sinoauricular tachycardia	+	+	0	0	0	+	0	+	0
11 J M	♂ 49	140/90	Arteriosclerotic recent infarct	None	0	+	++	0	0	0	0	+	0

\* More than one episode of arrhythmia

slightly greater than that caused by the insertion of the needle was experienced, this continued for a few seconds only. There was no other local reaction, either immediate or delayed, and no induration at the site of injection.

One patient vomited one hour and forty minutes after the third injection of soluble quinidine when the rhythm became normal. This patient had a similar experience on one previous occasion when the rhythm was converted to normal by quinidine orally. One patient

### with Injectable Quinidine

Duration of Arrhythmia Before Intramuscular Therapy	Treatment and Response of Apical Heart Rate						Total Dose and Time	Duration of Arrhythmia After Last Dose
2 hours	Time 9:30 a.m. Dose 1.0 Gm Rate 100	11:00 190	11:05 1:30 Gm	12:00 n 120			1 hour 45 minutes 2.5 Gm	1 hour
3 hours	Time 11:00 a.m. Dose 0.6 Gm Rate 138	1:00 p.m. 0.8 Gm 134	3:30 4:20 1.0 Gm 76	6:00			5 hours 20 minutes 2.4 Gm	1 hour 40 minutes
1 hour 15 min	Time 9:45 a.m. Dose 0.6 Gm Rate 160-180	10:45 0.6 Gm	11:30 180	11:45 0.6 Gm	12:45 p.m. 100		2 hours 1.8 Gm	1 hour
1 hour 40 min	Time 11:40 a.m. Dose 0.6 Gm Rate 144	12:45 p.m. 0.6 Gm 144	1:30 0.6 Gm	2:30 80			1 hour 30 minutes 1.8 Gm	1 hour 35 minutes
5 hours	Time 10:00 a.m. Dose 0.4 Gm Rate 190	10:30 0.8 Gm	12:10 p.m. 0.6 Gm	1:40 60			2 hours 10 minutes 1.8 Gm	1 hour 30 minutes
1 hour ±	Time 1:45 p.m. Dose 0.4 Gm Rate 140	Died at 1:45 p.m.					0.4 Gm	
2 hours 5 min	Time 6:05 p.m. Dose 0.1 Gm Rate 182	7:00 0.3 Gm	9:00 130				55 minutes 0.4 Gm	2 hours
1 hour 45 min	Time 9:45 a.m. Dose 0.4 Gm Rate 160	11:15 120					0.4 Gm	1 hour 30 minutes
1 hour ±	Time 8:15 a.m. Dose 0.4 Gm Rate 180	9:45 110					0.4 Gm	1 hour 30 minutes
5 hours 30 min ±	Time 1:30 p.m. Dose 0.33 Gm Rate 100	2:00 80					0.33 Gm	30 minutes
3 weeks	Time 9:40 a.m. Dose 0.3 Gm Rate 160	10:15 0.4 Gm 80	11:15 80				35 minutes 0.75 Gm	1 hour
4 hours ±	Time 1:25 p.m. Dose 0.75 Gm Rate 184	6:05 0.9 Gm	10:20 1.0 Gm 130	10:00 a.m. Normal rhythm			9 hours 2.7 Gm	12 hours
1 hour	Time 5:30 p.m. Dose 0.3 Gm Rate 220	7:20 0.6 Gm	9:30 150	9:55 0.7 Gm	11:00 112	1:00 a.m. 7:00 120 80	4 hours 25 minutes 1.6 Gm	Less than 9 hours
1 hour ±	Time 10:15 a.m. Dose 0.6 Gm Rate 190	11:20 120					0.6 Gm	1 hour
2 hours	Time 8:20 p.m. Dose 0.6 Gm Rate 200	8:45 168	9:00 124	9:30 96	9:50 0.6 Gm 100	10:30 Normal rhythm	1 hour 30 minutes 1.2 Gm	1 hour
6 hours ±	Time 3:40 p.m. Dose 0.6 Gm Rate 118	4:00 110	4:30 118	5:00 116	5:30 118	6:00 80	0.6 Gm	2 hours 20 minutes
3 hours	Time 2:30 a.m. Dose 0.6 Gm Rate 120	3:30 108	4:00 84	4:30 96	5:00 normal rhythm 116		0.6 Gm	2 hours 30 minutes
	Time 1:00 p.m. Dose 0.6 Gm Rate 130	3:00 0.8 Gm 130	5:30 1.0 Gm 104	8:10 1.2 Gm 118	10:30 1.0 Gm 108	1:10 a.m. 1.0 Gm 112	12 hours 5.6 Gm	
1 hour	Time 9:30 p.m. Dose 0.3 Gm Rate 215	11:35 0.5 Gm 200	1:45 a.m. 200	2:10 0.4 Gm	4:30 80	6:00	4 hours 40 minutes 1.5 Gm	Less than 3 hours 50 minutes
3 hours 30 min ±	Time 9:30 a.m. Dose 0.3 Gm Rate 180	10:00 0.3 Gm	11:00 0.6 Gm	11:45 150	12:30 p.m. 1.1 Gm Normal rhythm		3 hours 2.2 Gm	45 minutes
8 hours ±	Time 8:30 p.m. Dose 0.4 Gm Rate 200	10:10 0.7 Gm 170	12:15 a.m. 1.0 Gm 106	3:55 1.2 Gm 112	9:00 Normal rhythm		7 hours 3.4 Gm	Less than 5 hours
3 days	Time 11:35 a.m. Dose 0.3 Gm Rate 160		2:00 p.m. 0.6 Gm				1 hour 30 minutes 0.9 Gm	
3 months	Time 2:00 p.m. Dose 0.6 Gm Rate 120-180	0.7 Gm	4:15 0.9 Gm				2 hours 15 minutes 1.8 Gm	
1 hour 15 min	Time 10:05 p.m. Dose 0.7 Gm Rate 144						0.7 Gm	

(case 20) had diarrhea after receiving 3.6 Gm within seven hours. There were no instances of tinnitus, dermatitis or other toxic manifestations following medication.

**Mortality**—Six patients died during their hospital stay. In no instances could death be attributed to the quinidine therapy. All of these patients were moribund when therapy was started. Four died twenty minutes to four days after conversion of the rhythm to normal (cases 14, 16, 7 and 10). 2 died without control of the arrhythmia (cases 9 and 20).

The prognosis for life when therapy was started was very poor in 14 instances, doubtful in 5 and favorable in 5. In 4, therapy appeared to be a life saving measure (cases 1, 15, 3 and 16). In 11 other instances therapy had a favorable influence on the symptoms and course of the disease.

**Comparison of Intramuscular with Oral and Intravenous Administration**—Four patients were vomiting at the time therapy was started, and it was obviously impossible to give medication by mouth.

Two patients previously had been treated for similar episodes by oral quinidine or intravenous quinine. In 1 patient (case 1) ventricular tachycardia was converted to normal rhythm twenty minutes after the fifth dose of quinidine sulfate by mouth (0.3, 0.5, 0.6, 0.6 and 0.6 Gm), a total of 2.63 Gm had been given within eight hours. Twelve days later a recurrence of ventricular tachycardia was converted to normal rhythm one hour and forty minutes after the third intramuscular injection. Quinidine was injected at intervals of two to three hours (0.6, 0.86 and 1 Gm), a total of 2.46 Gm was given within five hours and twenty minutes.

Patient 12 had numerous paroxysms of auricular fibrillation. On two occasions these were treated successfully with quinidine sulfate by mouth (0.3 Gm every two hours for five doses), but each time the patient had a severe diarrhea and was unable to continue with a maintenance dose of quinidine. On two other occasions quinine dihydrochloride was given intravenously (12 Gm given in the course of four hours and 3.1 Gm over a period of sixteen hours). In both instances the rhythm was controlled, but tinnitus and other severe toxic reactions to the drug developed.

Intramuscular therapy was used on two occasions. In 1 instance 0.73 Gm was given in two doses thirty-five minutes apart. The rhythm reverted to normal one hour after the second dose. On the second occasion 2.7 Gm was given in three divided doses at intervals of four hours. The rhythm became normal within twelve hours after the last dose. On neither occasion did the patient experience any gastrointestinal or other symptoms.

Two patients received injectable quinidine on more than one occasion. On one occasion (case 8) auricular fibrillation reverted to normal rhythm two hours after a total of 0.45 Gm had been administered intramuscularly in two divided doses, and on two other occasions the rhythm reverted one hour after a single intramuscular dose of 0.45 Gm. The rhythm of a second patient (case 12) reverted one hour after a total of 0.75 Gm was given intramuscularly in two divided doses thirty-five minutes apart, while on the second occasion it failed to revert after a total of 2.7 Gm in three divided doses given at intervals of four hours.

A third patient (case 7 and 7a) was treated successfully on one occasion for paroxysmal auricular fibrillation and at another time for paroxysmal ventricular tachycardia. A total of 1.65 Gm was given for the first arrhythmia in three divided doses over a period of four hours and twenty-five minutes, while in the latter instance a total of 2.5 Gm was given in two divided doses one hour and forty-five minutes apart.

It is evident that intramuscular quinidine is at least as effective as oral or intravenous preparations and is less likely to cause toxic symptoms. Intramuscular administration is of obvious value when the patient is vomiting or is in collapse and oral therapy is unsatisfactory. Undoubtedly other more soluble preparations of quinidine will be made available in the future. One such preparation, quinidine hydrochloride dissolved in propylene glycol, has been suggested by Dr. Mark Altschule and Mr. Harry Brass and is being investigated at the present time. The preparation of quinidine hydrochloride with urea and antipyrine used in these studies has the advantage of being available at the present moment and of proved value without untoward side reactions.

#### SUMMARY AND CONCLUSIONS

1 A soluble preparation of quinidine suitable for parenteral administration containing 0.15 Gm in each cubic centimeter can be made by the addition of urea and antipyrine to quinidine hydrochloride. The preparation of this solution is not difficult and the ingredients are readily available. Since this injectable quinidine can be stored in ampules, it is of practical value in the emergency treatment of acute cardiac arrhythmias.

2 Twenty-four episodes of acute cardiac arrhythmias in a series of 20 patients were treated by the intramuscular administration of this preparation. In 15 instances (13 patients) the rhythm was converted to normal. In 3 additional instances conversion to normal was probably due to this therapy. In 1 instance the dose used was too small. In the remaining 5 instances the drug failed to control the abnormal rhythm. Three of the 5 instances were attacks of sinoauricular tachycardia.

3 Toxic reaction to the drug (mild diarrhea) was experienced by only 1 patient. No local reactions were encountered.

4 The following appears to be a practical method for using the drug in the treatment of acute arrhythmias.

An initial dose of 0.45 to 0.6 Gm should be given intramuscularly.

The response to each dose should be observed for one and one-half to two and one-half hours. If conversion to normal rhythm does not occur in that time, additional medication is indicated.

A favorable response consists in definite slowing of the apical heart rate, a rise in blood pressure to above the shock level, decrease in symptoms or striking improvement in the patient's general condition. In such instances the initial dose may be repeated. If a favorable response is not observed, it is advisable to increase the size of the dose.

5 Injectable quinidine can be used whenever oral quinidine therapy is advisable. It is especially indicated when absorption from the gastrointestinal tract may be delayed or unreliable (vomiting, shock and the like) and when rapid therapeutic action is desired.

COUNTY ACCREDITATION PLAN FOR  
TUBERCULOSIS CONTROL

J ARTHUR MYERS, MD

MINNEAPOLIS

For a number of years the members of the Committee on Tuberculosis of the Minnesota State Medical Association have felt that tuberculosis has been reduced to such a degree in this state and the physician's commitment is now such that the time is ripe for an all out campaign against this disease.

In 1940 a questionnaire was sent to each of the state medical associations to determine what was being done in other states. We were somewhat surprised to learn that thirteen of the state medical associations did not have a tuberculosis committee in fifteen states such committees have been in existence for three years or less and in four states for three to five years, in the remainder the committees had been in existence for more than five years. In three states the tuberculosis work was done by a subcommittee of a public health committee. In most of the states the activities of the tuberculosis committees were of a general nature, and in less than six states was there an adequate program. However, in Hawaii and Alaska good programs were under way, but the best was found in Puerto Rico. Thus it appears that our state medical associations, as such have done little by way of organization or control tuberculosis. Our committee is of the opinion that state medical associations everywhere should play a leading role in tuberculosis control.

Our members surveyed the field with reference to the various methods of approach. We were cognizant of the fact that there are enthusiastic advocates for the examination of certain groups in a given community. For example, there are those who maintain that the examination of children is adequate, but there is abundant evidence to show that children prior to 12 years rarely have contagious pulmonary tuberculosis, therefore from the standpoint of actually finding cases of this type of the disease, not enough exist to justify the effort and expense. The administration of the tuberculin test to children of all ages has been found of great value for two reasons. First, whenever a child reacts characteristically to tuberculin there can be no doubt that he has had direct or indirect contact with a case of contagious tuberculosis, and a search for such cases among the reacting children's adult associates is always profitable if it is carefully done, despite the fact that not all sources are found in this manner. Second, every child who reacts to tuberculin should have routine, annual examinations when adulthood is reached.

In the high school age group the same facts obtain as in the grade school period, except that the reinfection type of chronic pulmonary tuberculosis becomes more prevalent, and therefore all high school students who react to tuberculin should have annual examinations for clinical pulmonary tuberculosis.

While the examination of preschool, grade and high school children as outlined is of great value, it is obvious that this alone is inadequate, since there is often contagious tuberculosis in homes where there are no children.

Another method that has been emphasized consists in the examination of the contacts of patients with contagious tuberculosis. By this method one procures from the health department the names and addresses of all persons reported as having clinical tuberculosis, and to this list are added the names of all persons whose death certificates state that they have died from tuberculosis during the past five or ten years. An attempt is then made to examine the contacts of the current patients as well as of those who have died from the disease. This our committee recognized as a good case finding method, but it was thoroughly cognizant of the fact that one could never hope to control the disease completely in a community by this method alone, because there are many persons who die from chronic pulmonary tuberculosis whose disease is first reported to the health department by death certificate. In some of our states this is true in as many as one fourth to one half of the cases. Thus, many persons with contagious tuberculosis are permitted to do all the harm that is possible, by way of dissemination of tubercle bacilli, without our knowledge of the existence of their disease. Obviously, therefore, the examination of so-called contacts only is not adequate. Moreover, there is a significant number of persons who have contagious tuberculosis and die from other major conditions and the tuberculosis is never recognized. Thus death certificates by no means reveal all those persons who have contagious tuberculosis at the time of death. Thus the persons exposed to such individuals cannot be included by the method of examining contacts only.

Other special groups, such as the personnel of school systems and hospitals, industrial workers, relief clients, pregnant women and elderly persons, may be examined with great advantage. As laudable as is such an undertaking in any community, it would not suffice to control tuberculosis adequately, since many contagious cases may exist among the groups not examined.

Our committee found that many physicians have been misled by the method that has heretofore been used in determining the cost of finding cases of tuberculosis. For example, if a thousand university students were examined and only 0.5 per cent, that is, 5 individuals, were found with demonstrable reinfection type of pulmonary lesions, the entire cost of the thousand examinations was charged to these 5 cases. To us this does not seem to be the proper conception of the cost of case finding, since if 20 per cent, or 200, of the thousand students react to tuberculin, one has, in the strict sense of the word, found 200 cases of tuberculosis. Moreover the cost of examining the entire thousand should not be charged only to the 200 cases, for it is of great value to know that the remaining 800 do not have tuberculosis in any stage of its development.

Every physician knows that tuberculosis is contagious and obviously, all contacts of contagious cases should be examined not only, once but periodically as long as no clinical disease is found. This would be an ideal method if all contagious cases were known. Our committee members came to the conclusion that the only way to find all cases of tuberculosis is to examine every

Read before the joint session of the Mississippi Valley Conference on Tuberculosis and the Mississippi Valley Trudeau Society in Chicago Sept 17, 1942.

1 Other members of the committee are Drs R A Barr, L V Berghs, H A Burns, S S Cohen, K A Danielson, C F Ewing, W H Feldman, L H Flancher, E K Geer, G A Hedberg, A J Henderson, R R Hendrickson, W S Hutchings, E A Meyerding, K H Pfuetez, C L Scofield, S A Slater and B B Souster.

one in the entire community or political division, for often this disease is found where it is least expected. Every community should determine its entire tuberculosis situation, it does not suffice to know only about those who have entered on the consumptive stage in the development of the disease. It is important to know how many and who are entirely free from tubercle bacilli, how many and who have these organisms in their bodies and those in the latter group who have or later develop demonstrable clinical disease that requires treatment.

Our committee members were cognizant of the fact that to undertake a complete campaign against tuberculosis in an entire state as an initial program was too great a step for one time. While this was recommended to all the medical societies in the state as a procedure to take under advisement, it was decided that a county should be selected where there was every reason to hope that an all out campaign would not only be instituted but would be completed by the local physicians and their allies. This county would become the demonstration center in which the various details of the campaign could be tested and which would later serve as a laboratory for the physicians of the other counties. Numerous counties were considered, and Meeker was chosen for several reasons, some of which are as follows:

- 1 The first mass tuberculin testing of human beings done in Minnesota was carried on in Meeker County in 1912 by the late Dr. H. G. Lampson of the Minnesota State Board of Health.
- 2 This county was the first in Minnesota to institute a county wide tuberculin testing campaign of its cattle. This program, which was begun in 1923, met with much opposition, in fact, it was carried to the Minnesota courts two or three times and finally to the United States Supreme Court. However, those in charge of the campaign were successful and the county was accredited in 1925. The other counties profited by this example and in 1935 all the counties were accredited and, thus, the entire state became an accredited area.
- 3 Meeker County still has a relatively high tuberculosis mortality rate and, thus, there existed an opportunity to demonstrate what can be done in controlling the disease in man.
- 4 The medical profession in this county is composed, without exception, of physicians with a modern point of view and a strong desire to control the disease in man at the earliest possible time.

The next step was to determine whether the local medical profession of Meeker County would be willing to undertake such a program. On Aug. 19, 1940 members of our committee met with the physicians in Meeker County. They were found to be unanimous in their desire to make their county the laboratory center for the state. Their chief interest was to control the disease as soon as possible. For several months thereafter the state committee met with the Meeker County Society, and after much discussion and careful consideration of various methods of procedure it was decided that the program should consist of the following procedures:

- 1 The tuberculin test should be offered to the entire population of 19,000 citizens.
- 2 X-ray film inspections of the chests should be made of all persons who reacted to tuberculin.

- 3 Careful clinical and laboratory examinations should be made of those whose x-ray films revealed shadows that might be caused by clinical pulmonary tuberculosis.

- 4 Arrangements should be made for adequate treatment and isolation, when necessary, of all persons found to have this type of tuberculosis.

It was decided that the intracutaneous (Mantoux) method of administering tuberculin is superior to all others and that Koch's old tuberculin should be employed since it could be supplied gratis, in the proper dilution to the physicians of the county, by the state department of health. Moreover, the local physicians agreed to administer and interpret the tuberculin test to every citizen of the county without any financial remuneration.

All the various methods of making x-ray film inspections of the chest were carefully considered by the local physicians and the members of the state committee. It was decided to use paper film of standard size in cut sheets because there was an abundance of evidence available to show that this film is equal to celluloid film in the detection of pulmonary lesions. Moreover, this film could be procured at a good deal less than one-half the cost of celluloid film. While the paper film is considerably more expensive than the miniature films (35 mm. and 4 by 5 inch) used in making photofluorograms, these miniature films were not considered equal to the paper film of standard size. Moreover, no outlay for new x-ray equipment was necessary for exposure and development of the paper film.

X-ray equipment was found to be available in the offices of four physicians and one hospital, and it was agreed that all x-ray work would be done with these five machines. The local physicians were most generous in volunteering to expose and develop the films with no financial consideration, but it was understood that the state committee would attempt to procure funds for the purchase of the unexposed films. The members of the committee were desirous that all work be done by the local physicians, several of whom were proficient in describing shadows seen on x-ray films. Therefore all films would be described by local physicians who were thoroughly cognizant of the fact that final diagnosis from x-ray shadows alone is a physical impossibility. In other words, the physicians of Meeker County looked on the x-ray film inspection only as a screen to determine those who have lesions in their lungs sufficiently large to cast shadows that can be seen with the naked eye and which might be due to tuberculosis. The two screens used to select persons who need examinations, namely the tuberculin test and the x-ray film, are simple and easily conducted phases of the examination, but the determination of etiology of the lesions which cast shadows is often attended with considerable difficulty. However, the physicians of Meeker County are fully capable of solving the most difficult diagnostic problems in their own offices and hospital.

This program actually began on May 1, 1941 and has proceeded in a most satisfactory manner. The physicians have worked diligently, and their enthusiasm has not waned. On May 1, 1942 5,412 persons had been tested with tuberculin, of whom 22 per cent reacted. Other phases of the examination of the reactors had led to the diagnosis of clinical pulmonary tuberculosis in 10 persons previously unsuspected of

having this disease. The contagious patients have already been taken out of their homes and isolated in institutions.

When the work is done by the local physicians and their allies, it is slower than it would be to import a large group of workers and special equipment. On the other hand, work done by the local group is far more satisfactory. The public comes to know that its local medical profession is capable of solving this problem. Moreover, the program will be perpetuated when the demonstration period is over. Thus, in Meeker County an all out campaign against tuberculosis is under way with the idea of sweeping clean, so that for the moment no patients with contagious tuberculosis will be permitted to spread the disease. It is the intention of the local physicians to retest the nonreactors to tuberculin periodically and to revaccinate as often as possible those who have become reactors as well as those found to be reactors on the first test, in order that those who subsequently develop clinical tuberculosis may have their disease detected before it becomes contagious or even causes illness.

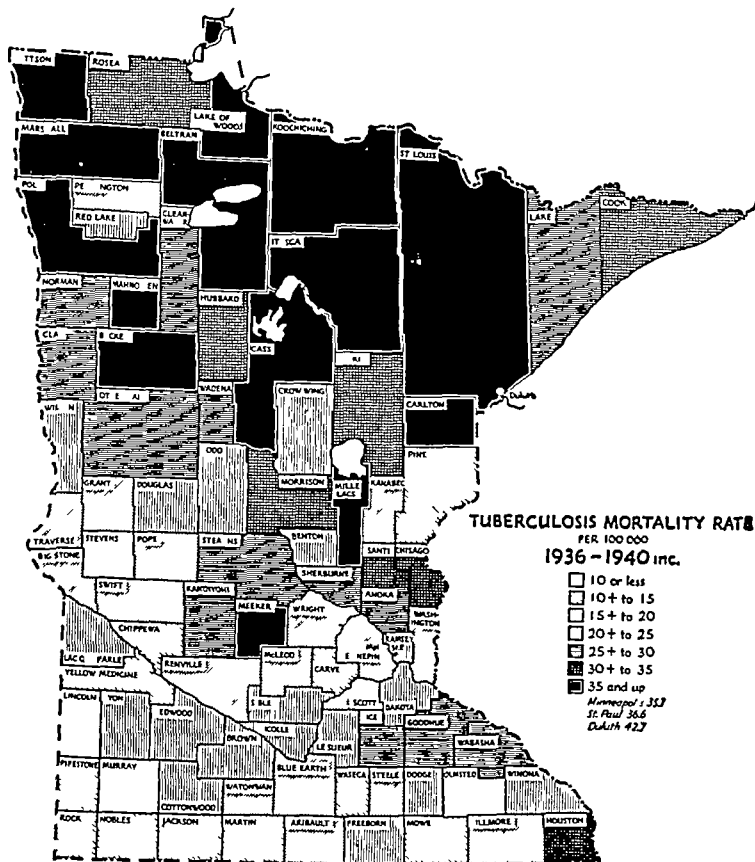
With the Meeker County demonstration well under way, the tuberculosis committee of the state medical association turned more of its attention to the remaining eighty-six Minnesota counties. The state department of health kindly provided the average mortality rate in each county for the previous five years. From this a map was prepared from which one could readily visualize the tuberculosis situation with reference to the mortality rate in each county. Immediately we saw that there exists a wide range in mortality, in fact, from 5.5 in one county to 68.2 per hundred thousand in another. The tuberculosis mortality rate for the entire state of Minnesota in 1941 was 26.6 and for the entire nation it was 44 per hundred thousand.

The members of the Tuberculosis Committee decided that some recognition should be given counties where a great deal of tuberculosis work had been done, with a satisfactory result, for two main reasons: (1) to call attention to the fine accomplishments in these counties and (2) to stimulate the physicians and their allies in other counties to intensify their tuberculosis control program. This idea was borrowed from the United States Bureau of Animal Industry, the United States Livestock Sanitary Board, the American Veterinary Medical Association, and state veterinary organizations which had cooperated and had so effectively controlled tuberculosis in cattle. As early as 1922 they had prepared county outline maps of the entire nation, showing the incidence of tuberculosis in cattle in the various counties of each state. This original map gave a basis for planning future work, since it highlighted the areas of disease concentration. This map was revised as the work progressed. Widely distributed, the map impressed the public as well as the veterinarians, for it focused attention on the situation throughout the nation. The veterinarians and their allies

considered this one of the most valuable parts of their educational program.

The United States Bureau of Animal Industry developed a standard by which counties could receive the designation of modified areas. Any county could qualify for this designation when careful testing of its cattle revealed that not more than 0.5 per cent reacted to tuberculin. The first list of counties to qualify under the modified accredited plan was reported on July 23, 1923. Indeed, on that date there were just seventeen such counties in the entire nation and they were limited to only four states.

This was the beginning of the most spectacular and practical control of tuberculosis in recorded his-



Tuberculosis mortality rate in Minnesota per hundred thousand 1936-1940 inclusive

It stimulated great interest everywhere, and such factors as local pride became important in the control of tuberculosis among animals. By Oct 1, 1928 all the counties of North Carolina had been accredited and on that date this was the first state in the nation to be designated as a modified accredited area. On May 1, 1929 the state of Maine received this designation. The veterinarians' program gained momentum, and on Nov 8, 1940 the last county in the United States became a modified accredited area and thus, the entire nation, together with its territorial possessions, was so designated. This, the greatest of all tuberculosis accomplishments in the recorded history of the world, was made possible only by the tuberculin test. All other procedures combined such as symptoms, physical signs, x-ray shadows and microscopic examinations of secretions and excretions, were not enough, it was only when the veterinarians had a delicate highly specific

and accurate biologic test to screen out all animals that had living tubercle bacilli in their bodies that such an accomplishment became possible

Our committee considered standards by which counties might qualify for accreditation with reference to tuberculosis in man. The first standard to be determined was a tuberculosis mortality rate of ten or less per hundred thousand. By this standard four counties qualified. The committee members were aware of the fact that many persons who have contagious tuberculosis die of other conditions without the tuberculosis being reported on the death certificate. The mortality rate is not the best criterion of the tuberculosis situation in a county. They are of the opinion that the incidence of the first infection type of tuberculosis, as manifested by the tuberculin reaction, is the only good available index. Therefore it was decided to adopt a second standard based on the incidence of tuberculin reactors at a given age level. It was decided that, if at least 80 per cent of all the senior students of the high schools of a county were tested and not more than 15 per cent reacted, a county might qualify for accreditation provided the average mortality rate for the past five years did not exceed 10 per hundred thousand. The medical societies of the four counties which qualified from the standpoint of the mortality rate were informed concerning the tuberculin reactor standard. Within two weeks of the date of receipt of this information, the physicians of Lincoln County, which had the lowest mortality rate, had tested practically all of the senior students in their high schools and reported that only 7.4 per cent reacted. Thus the first county in the state had qualified for accreditation.

It was then necessary to determine who should be responsible for the accreditation. The plan was submitted to the council of the state medical association, by which it was unanimously approved. It was then presented to the members of the Minnesota Department of Health with the same action. Governor Stassen was consulted and he agreed whole heartedly that the plan was good and expressed his willingness to sign the certificate of accreditation. A certificate form was prepared showing that the accreditation was granted by the state medical association, the state department of health, signed by the president of the state association, the executive secretary of the department of health and Governor Stassen. On Dec 11, 1941 the accreditation ceremonies were held in Tyler, when the main address was given by Dr. W. H. Feldman of the Mayo Clinic, and the certificate was presented to Lincoln County by Dr. B. J. Branton, president of the state medical association.

The physicians of Olmsted County promptly tested the senior students in their high schools and found that only 8 per cent reacted. Thus, together with an average mortality rate over the past five years of 8.7, qualified this county and the accreditation ceremonies were held in Rochester, Minn., on May 22, 1942, when Dr. C. A. Stewart, director of the department of pediatrics of the Louisiana State University, presented the main address. This meeting was attended by many prominent persons, and Dr. H. Z. Giffin of the Mayo Clinic and president of the Minnesota State Medical Association presented the certificate to Olmsted County.

In Murray County, where the average tuberculosis mortality rate for the past five years was 9.4 per hun-

dred thousand the physicians tested the senior students in the high schools and found that only 5.5 per cent reacted. Accreditation ceremonies were held at Slayton, Minn., Aug 28, 1942, when Governor Stassen presented a splendid address and Senator Webber participated in the program. Dr. Stephen H. Baxter, president-elect of the Minnesota State Medical Association, presented the certificate to Murray County.

In Stevens County, where the average mortality rate for the past five years was 9.2 per hundred thousand, the medical society found that only 7 per cent of the senior high school students reacted to tuberculin. The accreditation ceremonies are now being arranged.

It is often stated that the majority of senior high school students will not submit to the tuberculin test. Our experience to date has proved this statement to be erroneous. In fact, we have found the high school students eager to have the test administered. In no county to date has less than 90 per cent of these students accepted the test, and most of the remainder did not have it for such reasons as absence from school when the test was being administered. We believe that this success is due largely to informing the students and the community adequately concerning the value and practical significance of the test.

In most parts of the country the age at which persons die from tuberculosis is rapidly increasing and in some places it is well beyond middle life. Probably many of these older persons who die from tuberculosis have had the disease in chronic form for a long time, in fact, before the present campaign against the disease was really in effect. Therefore we should not allow mortality to discredit the fine work that has been done in recent years to protect children and young adults against tuberculosis and which seems to have been so successful, from the standpoint both of morbidity and of mortality, in the second and third decades of life.

In several sanatoriums and in a good many homes in Minnesota there are old persons with chronic tuberculosis who will die in the next few years, and their deaths will tend to keep the mortality rate high in some of our counties. Therefore it seems more fair to the tuberculosis workers of the state and at the same time it would reflect the excellent work done in the past decade or so if we discontinued the mortality standard and used tuberculous infection standards entirely.

The committee is considering a standard based on incidence of infection of children in the first grade, and another on incidence of infection among high school students. We believe that this will be more encouraging to our tuberculosis workers and will stimulate greater interest among them and among the public at large. With such accreditation standards every community should have a reason for striving to see that children are protected from contact with contagious persons, including those beyond middle life, and will attempt to seek out these persons and insist that they be institutionalized.

Those persons in Minnesota who are in the best position to know about the tuberculosis situation have informed us that the accreditation of counties, with reference to tuberculosis in man, has done more to stimulate interest and action than any other movement in the entire tuberculosis history of the state.



EPIDEMIC PLEURODYNIA IN BROOKLYN  
IN THE SUMMER OF 1942TASKER HOWARD, MD  
CHARLES A WEYMULLER, MD  
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BROOKLYN

In 1872 Daae<sup>1</sup> in Norway described an epidemic characterized by the sudden occurrence of violent pain in the lower part of the thorax without concomitant signs in the chest. The pain tended to spread to the abdomen on the same side and sometimes involved the back and limbs. With this there was fever. The attack lasted but a day or so, with a tendency to recurrence once or twice within a few days. Daae spoke of the disease as epidemic muscular rheumatism. Two years later Finsen reported having observed epidemics of this character in Iceland in 1856 and 1863 and was the first to speak of this disease as epidemic pleurodynia. But little further was heard of the disease in Europe until 1930, when Sylvest's paper about a similar epidemic in Bornholm aroused so much interest that the disease was made reportable in Denmark, and 10,000 cases were reported in the next two years. Since then many epidemics have been described in Scandinavia and in the British Isles. Meanwhile, in the United States the disease was repeatedly reported, beginning with Dabney's<sup>2</sup> account of an epidemic in Virginia. It was one of Dabney's patients who dubbed the disease "the Devil's grip."

In 1935 Harder<sup>3</sup> tabulated the American reports of epidemics which he considered to be this disease. These included the reports of Dabney (Virginia) 1888, Reilly (New York) 1899 and 1921, Payne and Armstrong (Virginia) 1923, Hangar, McCoy and Frantz (New York) 1923, Greene (New York) 1923, Torrey (Pennsylvania) 1924, Churchill, Landis and Glusker (Massachusetts) 1926, Richter and Levine (Massachusetts) 1933, Crone and Chapman (Massachusetts) 1933, Callaway (North Carolina) 1934 and Harder (Ohio) 1935.

Reports of other epidemics include Kirkwood and Stoll<sup>4</sup> (Illinois) 1934, Locke and Farnsworth<sup>5</sup> (Massachusetts) 1935, Hawkins and Harms<sup>6</sup> (Missouri) 1936 and Fulghum<sup>7</sup> (Georgia) 1940.

From the various accounts of these epidemics it is apparent that the diagnosis rests on the epidemic occurrence of the disease, that it affects children and young adults, that it occurs, in this country at least, only in the summer months, and that its clinical manifestations are fairly distinctive. The laboratory is of no positive help.

Perhaps the first description of the disease is still the best. In 1872 Daae<sup>1</sup> wrote:

As a rule the patient has a stitch in one side of the chest, most often without any precursory ailment, but sometimes after an attack of chills, the stitch is often accompanied by pains in the back, shoulders, epigastrium and abdomen, and these pains are described sometimes as oppressive or sticking, sometimes as shooting or aching, less frequently these pains are felt also in the back, neck, legs, arms and even out in the fingers. There is considerable difficulty in moving the affected parts, especially the chest, therefore the respiration is laborious sometimes to such an extent that the patient feels as if he were to be strangled. Usually the general condition is greatly affected. There is as a rule some headache, anorexia and thirst, the bowels usually are sluggish. The tongue is generally coated. The pulse is normal or a little frequent. There is seldom any cough, so cough does not appear to go with this disease. Physical examination of the chest reveals no abnormality.

There is a great difference in the severity of the attack in the various patients. Some have a fairly mild attack and have to rest only a very short time, in others the attack is so violent that one might expect them to die at any minute. In a few of the most severe cases the patients are thus confined to bed continuously for up to fourteen days.

As a rule the patients have got up and walked about just as soon as they have been able to do it. A good many of them have then had a relapse, sometimes repeatedly. No case has terminated fatally. Many of the patients are exhausted after the disease, emaciated and feeble, sometimes they feel a stitch or stabbing pain now and then for several weeks after they have been able to begin to work.

Cases of this disease began to appear in the Red Hook section of Brooklyn in July 1942. To date at the Long Island College Hospital we have observed 166 cases. Of these, 40 were admitted to the hospital. This epidemic tends to differ in some respects from others that have been reported. There is a much higher percentage of cases showing involvement of the central nervous system, frank encephalitis having been encountered a number of times, and many of the infants had convulsions. Encephalitis was noted once in one epidemic in Sweden<sup>8</sup> and was mentioned by Sylvest as having been reported by "a Danish physician" in another epidemic. MacDonald and his associates<sup>9</sup> noted that an epidemic of benign lymphocytic meningitis was occurring concomitantly with the epidemic myalgia in Cincinnati in 1935. These authors speculated on the relationship between these two groups of cases.

Many authors have commented on the absence of infection of the upper respiratory tract in these patients, but all of the infants in our series and about three fourths of the older patients showed some congestion of the pharynx. This is not altogether exceptional, however, since more than half of the cases reported by Attlee and his associates<sup>10</sup> in England in 1924 and all of Fulghum's<sup>7</sup> in the 1940 Georgia epidemic were said to present pharyngitis.

We have noticed some differences in the manifestations of this disease in adults and children in this epidemic. It seems wise to consider the two groups separately.<sup>11</sup>

From the Departments of Medicine and Pediatrics of the Long Island College of Medicine and the Long Island College Hospital.

<sup>1</sup> Quoted by Sylvest Einar. Epidemic Myalgia. English translation London: Oxford University Press, 1934.

<sup>2</sup> Dabney, William C. Am J M Sc 96:488-494, 1888.

<sup>3</sup> Harder F K. Am J M Sc 191:678-685 (May) 1936.

<sup>4</sup> Kirkwood Tom and Stoll C G. Illinois M J 69:29-33 (Jan) 1936.

<sup>5</sup> Locke E A and Farnsworth D L. Tr A American Physicians 51:399-406, 1936.

<sup>6</sup> Hawkins G W and Harms F L. J Missouri M A 34:121 (April) 1937.

<sup>7</sup> Fulghum C B. J M A Georgia 31:63-65 (Feb) 1942.

<sup>8</sup> Ljungstrom, C E. Nord med tidsskr 6:1190-1195 (Oct 7) 1933.

<sup>9</sup> MacDonald R R, Hewell Barbara and Cooper, M L. Am J Dis Child 53:1425-1434 (June) 1937.

<sup>10</sup> Attlee W, Amsler A M and Beaumont D C. Lancet 2:492-493 (Sept 6) 1924.

<sup>11</sup> Specimens of nasal washings, stools, spinal fluid and blood from many of these patients have been submitted to Dr. Karl Habel and Dr. Michael L. Furcolow of the National Health Institute, Bethesda, Md. for investigation as to the etiologic factor of this disease.

## ADULT CASES

Abstracts of a few cases will illustrate the typical course in adults

CASE 1—D McL, a girl aged 13, admitted July 1, 1942, suddenly had chilliness, fever and pain in the right upper quadrant four days before. The pain would follow coughing, laughing or raising the right shoulder. She had daily short recurrences of pain and fever. On the night of admission the pain was much more intense.

The temperature was 101.6 F, the pulse rate 100 and the respiratory rate 20. The pharynx was clear. There were a slight respiratory lag and moderate costovertebral tenderness on the right side and slight spasm and tenderness in the right

Laboratory examination revealed 7,800 white blood cells with 71 per cent polymorphonuclear leukocytes, the urine was normal. Culture of material from the throat showed gamma streptococci predominating and a few beta streptococci.

The next day she felt entirely well and was discharged after three days. Four days later she was readmitted to the hospital stating that for two days she had suffered from head ache, weakness, irritability, general aching pains, vertigo and sensitivity to noise. She had fainted immediately before admission.

The temperature was 101.1 F, pulse rate 88, respiratory rate 22 and blood pressure 102 systolic and 64 diastolic. She was lethargic, apathetic and acutely ill. There was photophobia. Her pharynx was slightly injected. There was pain in the

TABLE 1—Epidemic Pleurodynia—Adult Cases

Name Age	Pain	Fever	Head ache	Nausea and vomiting	Tenderness	Pharyn- gitis	Blood Count			Sedi- men- tation Rate mm	Dura- tion Days	Parox- ysms	Complica- tions
							White Blood Cells	Polymor- phonu- clears %	Spinal Fluid Cells				
D McL 13	Right upper quadrant moderate	101.6	0	0	Right upper quadrant moderate costo- vertebral	0	5,800	81	—	—	5	4	
C B 13	0	101	+	+	0	0	11,400	83	72	14	2	1	Encephalitis
N P 14	Epigastric moderate	102	+	+	Right lower quadrant moderate	+	12,500	81	—	—	7	1	Appendectomy
T S 14	Right upper quadrant severe	103.2	0	0	Right upper quadrant slight	+	9,600	7	0	81	6	3	
P I 15	Chest right lower quadrant severe	102	+	0	Left upper quadrant moderate	+	5,000	11	—	43	10	4	Pleuritis
E N 16	Chest severe	102.4	0	0	0	+	7,400	63	—	24	6	3	
J B 16	Chest moderate	99	0	+	Right upper quadrant moderate	0	8,000	48	—	70	16	2	Pleuritis
L F 17	Chest epigastric moderate	99.4	+	+	Epigastric moderate	+	8,000	51	—	6	4	1	
M S 17	Epigastric severe	100	0	0	Epigastric moderate	+	17,000	80	—	16	3	2	
H F 19	Lumbar severe	104.4	0	0	Left lower quadrant severe	0	11,100	81	—	—	8	5	
I I 20	Chest epigastric severe	100	+	0	Right upper quadrant moderate	+	6,600	50	—	3	3	2	
G K 21	Chest epigastric severe	99.8	+	0	Chest left upper quadrant moderate	+	7,400	74	0	30	2	1	Pleuritis
L N 21	Chest epigastric moderate	99.8	+	+	0	+	11,000	69	0	11	3	2	Encephalitis
J O 22	Chest moderate	99.8	+	0	0	+	7,800	71	261	65	3	1	Encephalitis
G R 22	Chest severe	98.6	+	+	Right upper quadrant severe	0	10,200	41	0	39	12	3	Encephalitis
B B 22	Chest epigastric moderate	101.4	+	+	Epigastric moderate	+	9,000	77	—	53	2	1	Urticaria
L S 22	Chest epigastric moderate	101.6	0	0	Epigastric severe	+	6,000	47	0	30	3	2	
I A 24	Chest severe	102	+	0	Right lower quadrant moderate	+	6,600	60	—	40	4	2	
M Van B 26	Chest epigastric moderate	104	+	+	0	+	8,400	60	57	72	3	1	Encephalitis
R B 26	Chest severe	100.6	0	0	0	0	12,000	71	—	6	6	1	
J L 27	Chest lumbar moderate	98.6	0	0	Chest lumbar mod- erate	+	8,400	40	—	2	0	1	
F C 29	Epigastric moderate	102.4	0	0	Epigastric moderate	0	9,500	79	—	—	0	1	Laparotomy suspected peptic ulcer

upper quadrant. Roentgen examination was thought to show a slight congestion in the right lung.

Laboratory examination revealed 5,200 white blood cells with 81 per cent polymorphonuclear leukocytes.

The temperature became normal and pain was relieved in sixteen hours. There was no further recurrence. Convalescence was rapid.

CASE 2—J O, a woman aged 22, admitted Aug 3, 1942, three days before admission began to suffer from pain in the right side of the lower part of the chest on respiration and to a lesser degree on the left side. She had chills and fever and aching of her back and legs. Her throat was dry and she was weak and dizzy.

The temperature was 99.8 F, the pulse rate 82, the respiratory rate 15 and the blood pressure 102 systolic and 60 diastolic.

She was profoundly prostrated and apathetic. Her pharynx and tonsils were moderately inflamed. Neurologic examination was negative.

occiput on extreme flexion of the neck. Abdominal reflexes were absent. The Brink's reflex was elicited on both sides.

Laboratory examination revealed 5,950 white blood cells with 54 per cent polymorphonuclear leukocytes. The sedimentation rate was 65 mm in one hour. The urine was normal. The spinal fluid, August 10 (tenth day of the disease), showed pressure of 240 mm of water, 261 cells with 97 per cent lymphocytes, a test for globulin was negative, the protein was 40 mg, sugar 62 mg and chlorides 679 mg per hundred cubic centimeters. August 15, spinal fluid showed a pressure of 60 mm of water and 41 cells, all lymphocytes, a test of the globulin was negative. August 26 it showed a pressure of 70 mm of water and 7 cells, all lymphocytes.

Her temperature was normal except for one slight rise on the fifth day. After two days she was normally alert and her photophobia and general discomfort had disappeared. Her convalescence was normal except for a recurrence of headache when she tried to sit up.

The child of a neighbor who lived in the same house as this patient was admitted to the Long Island College Hospital because of similar manifestations. J O had held the child in her arms during the interval that she was at home. An abstract of this child's illness is reported in the section on children (case 7, R B, aged 5 years).

CASE 3—T S, a girl aged 14 years, admitted Aug 8, 1942, two hours before admission, while at the movies, had a sudden intermittent stabbing pain in the right upper quadrant which was aggravated by respiration. She had a chill and fever.

The temperature was 103.2 F, pulse rate 120, respiratory rate 30 and blood pressure 104 systolic and 70 diastolic. The pharynx was slightly injected. There was a slight lag on the right side of the chest with diminished breath sounds and

He had headache and profuse perspiration. His temperature was 104 F. The next morning he was symptom free. Thirty-six hours later there was recurrence of pain in the left side of the lower part of the chest, fever, headache and sweating. This bout lasted thirty-six hours and was followed by sixteen hours of freedom from symptoms. All these symptoms recurred a third time some twelve hours before admission to the hospital.

The temperature was 102 F, the pulse rate 76, the respiratory rate 24 and the blood pressure 118 systolic and 78 diastolic. His pharynx was slightly inflamed. There was a slight lag in the left side of his chest and moderate tenderness of the left upper quadrant. Roentgen examination of the chest was negative.

Laboratory examination revealed 5000 white blood cells with 41 per cent polymorphonuclear leukocytes. The sedimentation rate was 43 mm in one hour.

TABLE 2—Epidemic Pleuodynia—Pediatric Cases

Name	Age	Pain	Fever	Convulsions	Labored Respirations	Vomiting	Diarrhea	Tenderness	Red Throat	Blood Count			Spinal Fluid	Duration Days
										White Blood Cells	Poly morpho nuclears per Cent	Lym phocytes per Cent		
O A	6 mos	+	100	+++	0	+	0	0		10 600	59	36	Negative	2
I H	10 mos	+	101.8	++ at home	++	0	0	+		8 000	57	42		1
G M	12 mos	+	103	++ at home	0	+	0	+	+	6 400	44	53	73 cells	1
C R	12 mos	0	100	++	+	+	0	0	+	10 200	43	53	Negative	2
W B	15 mos	+	100	++	0	+	0	0	+	10 200	76	23		3
P G	16 mos	0	104	++ at home	0	0	0	0	++	28 500	84	16	Negative	2
L D B	10 mos	+	103.8	++ at home	+	+	0	0	++	7 200	53	39		2
D C	22 mos	+	104	+++	++	+	0	++	++	16 800	60	29	Negative	3
R D	2½ yrs	+	102	0	++	+	0	0	++	21 100	83	17		2
H S	3 yrs	++ abdomen	106	++	+++	+	0	?	+	24 500	84	16	Negative	4
T S	4 yrs	+++ abdomen	100	0	++	++	0	+	+++	10 400	76	22		4
R B	5 yrs	+++ head back and abdomen	104	+	+	0	0	+	+	18 500	77	22	*	2
A F	7 yrs	++ abdomen and chest	104	0	+++	+	0	++ abdomen	++	10 500	80	18		1
J R	7 yrs	++ abdomen	100	0	++	+	0	++ abdomen	++	7 800	70	22		1
M M	8 yrs	+++ upper abdomen	103.4	0	+	+	0	++ upper abdomen	++	18 500	71	26		1
P T	10 yrs	+++ abdomen and chest	103.6	0	+	+	0	++ upper abdomen	+	5 600	29	67		1
R R	11 yrs	+++ abdomen and chest	102.6	0	+	+	0	++ upper abdomen	+	10 540	72	24		1
R K	11 yrs	+++ abdomen	101	0	0	+	0	++ upper abdomen	+	6 100	63	27	Negative	2

\* 8/8, 840 cells 67 % lymphocytes protein 45 8/10 60 cells lymphocytes 100 % 8/13 0 cells protein 23

slight tenderness in the right upper quadrant with some cutaneous hyperesthesia. Roentgen examination of the chest was negative.

Laboratory examination revealed 9,600 white blood cells with 73 per cent polymorphonuclear leukocytes. The urine was normal. The spinal fluid showed a pressure of 170 mm of water, no cells and a trace of globulin. The sedimentation rate was 91 mm in one hour.

The pain persisted for about eight hours. Her temperature was normal on August 11 but rose to 102.6 F the following day with the appearance of pain in both sides of the chest. On August 12 the temperature was normal and the patient was comfortable. On August 13 the temperature was 103.6 F and there was more pain in the neck, abdomen and lower part of the chest (corresponding to the pattern of diaphragmatic pain, as is true in so many of these cases). On August 14 the temperature was normal and a rapid convalescence followed.

CASE 4—P I, a youth aged 15 admitted Aug 26, 1942 five days before was suddenly attacked with severe pain in the right lower quadrant which was aggravated by respiration.

The symptoms and fever subsided on the second day. On the third day he had one further paroxysm of fever and at this time there was pain in the right side of the chest with a pleural friction rub. The pain and fever subsided in sixteen hours but the friction rub persisted for three days.

The boy's father suffered a similar attack with but one bout of symptoms nine days before the patient was taken sick. A brother aged 11 years had a single attack two days before.

#### PEDIATRIC CASES

CASE 5—A T, a boy aged 7 years, three days before admission to the Long Island College Hospital had severe pain high in the right side of the abdomen but no fever. After twenty-four hours he still had this pain, vomited and was moderately incapacitated. On the day of admission he had more severe abdominal pain, vomited and had a temperature of 104 F. He was decidedly prostrated and feverish and had labored grunting respirations and a definitely reddened pharynx. His abdomen was tender and splinted.

Laboratory examination revealed 10,850 white blood cells with 80 per cent polymorphonuclear leukocytes. The sedimentation rate was 18 mm in sixty minutes. The urine was normal. Culture of material taken from the throat yielded mixed pneumococci and hemolytic streptococci. Roentgen examination of the chest was negative.

He improved greatly in all respects after twenty-four hours—his temperature became normal and the pain in the abdomen and lower part of the chest disappeared. The pharynx paled and his convalescence was rapid and complete.

Seven other children aged from 2½ to 11 years were admitted because of an almost identical syndrome (table 2). There were 96 additional children seen in the accident room and in the outpatient department who were similarly affected but were cared for at home.

CASE 6—G M, a boy aged 12 months, admitted to Long Island College Hospital July 17, 1942, two days before had severe abdominal pain of intermittent character. He became progressively more ill with high fever, and a generalized convulsion of short duration developed while still at home.

On admission he was still twitching and had a temperature of 105 F, pulse rate 134 and respiratory rate 28. His pharynx was red and edematous and there was a purulent postnasal discharge. His abdomen was normal. His neck was not rigid.

Laboratory examination revealed 6,400 white blood cells with 44 per cent polymorphonuclear leukocytes. The urine was normal. Spinal fluid was clear, pressure was moderate and there were 73 cells. Culture of material taken from the throat yielded a large number of pneumococci.

There was a decided clinical improvement after twenty-four hours. There were no further convulsions. The temperature ranged between 99.9 F and 100.6 F during the second twenty-four hours, then it became normal. The abdominal pain disappeared and pharyngeal injection quickly subsided.

CASE 7—R B, a boy aged 5 years, became ill one day before admission with headache, chills and fever. His fever rose, severe pain in the back and neck developed and he was admitted to the hospital Aug. 8, 1942 with a temperature of 104 F. He was prostrated and decidedly drowsy, and there was twitching of his hands and feet. His neck was definitely rigid and there was extreme stiffness of his back. He did not have a convulsion. His throat was very red. His abdomen was tender particularly in the right upper quadrant and over the liver, which was felt one and one-half fingerbreadths below the costal margin.

Laboratory examination revealed 18,500 white blood cells with 77 per cent polymorphonuclear leukocytes. Culture of material taken from the throat yielded large numbers of hemolytic streptococci. The spinal fluid on admission showed moderately increased pressure, 840 cells with 67 per cent lymphocytes, a test for globulin was positive and sugar was 48 mg per hundred cubic centimeters. Two days later it showed 60 cells, all lymphocytes, the protein content was 45.6 mg. On the fifth day in the hospital it showed no cells, protein was 23 mg and sugar 81 mg. Cultures of all specimens of spinal fluid were negative.

After twenty-four hours his temperature was normal and remained so. His neck and back were stiff and troublesome for two to three days. The abdominal pain lasted three days but he was symptom free after seventy-two hours. No weaknesses or other abnormal symptoms remained.

This child had been in direct contact with adult J O (case 2), who had meningoencephalitic symptoms. This boy's obvious meningoencephalitic manifestations cleared up with extraordinary rapidity and without sequelae to date. The clinical course, the presence of the epidemic and the contact with adult J O appear to justify inclusion of case 7 in this report.

#### COMMENT

The prominent symptoms in adults were fever and severe pain in the upper part of the abdomen or lower part of the chest or both sufficient to make respiration painful and difficult. The abdominal symptoms were frequently so severe that surgical consultation was

sought. The recoveries were prompt, often within twenty-four to forty-eight hours, though recurrent paroxysms of pain and fever were frequent. Frank pleurisy was encountered three times. The Scandinavian writers consider this a rare complication, but in England it was not uncommon, and in one Massachusetts series reported by Locke and Farnsworth the incidence was 14 per cent.

Meningoencephalitis occurred in 5 of our adult patients. This was characterized by headache, apathy, vertigo and photophobia. There was mild nuchal rigidity in a few cases and a positive Babinski sign in 1 case. The spinal fluid usually showed a frank pleocytosis mostly lymphocytes. The patients all recovered promptly and no sequelae were noted. It is interesting to compare this finding with the high incidence of convulsions observed in the infants seen in this epidemic. Of the 18 children hospitalized with this presumptive diagnosis, 8 were under 2 years (the youngest 6 months) and all had generalized convulsions. None of the children of the 10 who ranged from 2 to 11 years had convulsions.

The pediatric cases depicted in table 2 had in common severe abdominal or chest pain or both, high fever usually of one to two days' duration, labored respirations, moderate vomiting but no diarrhea, severe pharyngitis and quick and complete recovery. Of the 8 under 2 years, all had generalized convulsions of alarming severity. R B (aged 5 years) alone of 11 older children had meningoencephalitic manifestations which included drowsiness, twitching, rigid neck and stiff back. He did not have a generalized convulsion.

The leukocyte counts were widely variable and the spinal fluid examinations were normal except that G M (aged 12 months) had 73 cells and R B had 840 cells when admitted.

Early in July 1942 the first cases among children were believed to be the usual so-called epidemic gastro-duodenitis or severe pharyngitis with abdominal pain so vividly described by Brunnemann and so common in pediatric practice. However, the case incidence was about 10 a day, at first all from the Red Hook Housing Project and then roughly fanning out from there. The abdominal pain was extraordinarily severe and constant, violent generalized convulsions were seen or reported in most of the infants and in many of the older children who came to the outpatient department or the accident room. This alarming syndrome quickly and completely cleared. There were numerous adult cases at this time with a symptom complex recognizable as epidemic pleurodynia. Only 1 child admitted to our hospital had definite pleuritic involvement, although one of us (C A W) saw an 11 year old girl with obvious pleuritic involvement accompanying the typical epidemic pleurodynia syndrome. So far there have been no recognizable sequelae.

These cases are being reported at the present time, even though the epidemic is still active, for the purpose of calling it to the attention of other observers in the East who may encounter this disease.<sup>12</sup>

#### CONCLUSIONS

1 Epidemic pleurodynia appeared in Brooklyn in July and August 1942. To date 166 cases have been observed, 40 of which were admitted to the Long Island College Hospital.

<sup>12</sup> Since submitting this paper for publication we have encountered only 5 further cases of epidemic pleurodynia. They were in adults 2 being over 30 years of age, 1 34 and the other 35.

2 An unusually high incidence of pharyngitis has been evident in this epidemic

3 Abdominal symptoms, as has been emphasized in the course of other epidemics, were sometimes severe enough to suggest an abdominal emergency of a surgical nature

4 In this epidemic an unusually high proportion of patients exhibited evidence of meningoencephalitis. Practically all of the infants had convulsions

5 As in other epidemics of this disease the symptoms have subsided quickly

6 So far no sequelae have been observed

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## CYTOPLASMIC MODIFICATION OF GENETIC TRENDS

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Does the condition of the mother influence the developing embryo? This question is one that comes up every so often and we are apt to dismiss it without much thought because we accept the textbook dictum that the development of the human embryo is strictly gene determined. But geneticists today are by no means as dogmatic as they were a decade ago. The vast bulk of the cytoplasm of the egg and its possible significance in modifying genetic trends is receiving more and more attention, and Porter's<sup>1</sup> experiments lend support to this idea.

The observations that we shall present are concerned wholly with the problem in the human being and are therefore based on statistical analysis on the one hand and on the demonstration that environmental impacts (weather as an example) can profoundly modify the bodily chemistry from day to day.<sup>2</sup> Modification of the condition of the maternal body fluids and tissues in which the early development of the embryo takes place leads to the realization of the importance therein implied in modifying genetic trends during the early and very critical stages of development.

The very simplest demonstration of the effect of season is evident in Li's<sup>3</sup> studies of the weight of newborn infants when examined on the basis of the month of conception. At a time when the maternal organism is relatively catabolic the infants conceived are light in weight, in the autumn, when anabolism is accentuated, infants conceived are relatively heavier (fig. 1).

If season, in other words, the cumulative effect of certain environmental situations (chiefly weather and light but integrated with diet and physical activity) can be causative in the fashion here indicated, we must be interested in related possibilities in two diverse directions: (1) the possible effects of long-range trends

in the meteorological environment that may be classified as climatic cycles—related in a rather definite way to periods of solar turbulence (sun spot cycles), (2) the possible reflection of shorter trends, namely the effect of individual weather episodes at about the time of conception. This involves the organic reaction to the constantly pendulating cyclonic atmospheric circulation with its brusque atmospheric fronts the so-called 'cold waves' or 'heat waves' with which we who live in the northern hemisphere are all familiar.

Will all the fluctuating chemical tides that are thereby initiated bring about changes in the developmental trend of embryos? The investigation of the possible effects on the human being have been extended in several directions and of these we briefly present the following.

*The Habitus of the Newborn*—That is the weight/length ratio which in turn may reflect either an anabolic or a catabolic trend established in the embryo.

*The Weight/Length Ratio of the Adult*—On the assumption that a trend once established in the embryo as observed in the newborn may persist to adult life.

*Malformations*—Geneticists accept the possibility that malformations may be induced by genetic or environmental factors. Our observations are therefore directed to the possibility that metabolic factors, initiated by the environmental forces that we have mentioned, may be concerned in the production of such variants.

*Sex Ratio*—Maleness being associated with an increased trend to catabolism (approximately 10 per cent increase in the consumption of oxygen), we have investigated the possibility that the condition of the ovum or the maternal metabolic status might condition the genetic balance and thus exert an influence on the sex ratio.

*Disease Susceptibility*—With resistance to disease, longevity, and so on, in part conditioned by habitus and by metabolic trends, the investigation was extended to the possibility that early conditioning of the embryo might find adult reflection in increased or decreased resistance to disease as finally determined by death certification.

Before proceeding it may be useful to examine these developmental possibilities in the form of a simple diagram (fig. 2). Assuming that the metabolic gradient of the milieu (we can think in terms of oxygen adequacy or inadequacy,  $p_{H_2}$  levels, potassium/calcium ratio, temperature hydration or any other organic balance that we may choose because they are all inter-related) pendulates between two poles the normal genetic trends proceed on a gene determined basis if the swing in either direction is within moderate limits.

If the amplitude of the biochemical swing becomes greater, then gene determined potential may be modified with a greater tendency to (1) maleness (2) slenderness, (3) predisposition to characteristic disease pattern (schizophrenic tuberculous) (4) malformation (due to lessened cell cohesion) when the trend is toward greater catabolism, lower  $p_{H_2}$  and an increase in permeability and so on or to (1) femaleness (2) broadness (3) manic-depressive psychosis (4) mal-

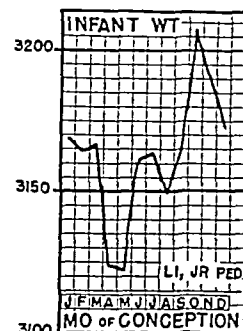


Fig. 1—Weight of newborn infants by months of conception 31 000 in the group (From Li<sup>3</sup>)

In the complete reprint of this paper a discussion of the statistical techniques employed has been provided.

From the Department of Pathology, Bacteriology and Public Health, University of Illinois College of Medicine.

Read before the Section on Pediatrics at the Ninety Third Annual Session of the American Medical Association, Atlantic City, N. J., June 10, 1942.

Because of lack of space, this article has been abbreviated for publication in THE JOURNAL. The complete article appears in the authors' reprints.

1 Porter, K. R. Diploid and Androgenetic Haploid Hybridization Between Two Forms of Rana Pipiens. Schreber Biol. Bull. 8: 238, 1941.

2 Petersen, W. F. and Milliken, Margaret E. The Patient and the Weather. Ann Arbor Mich. Edwards Brothers Inc. 1934. 1938. vols. 1-4.

3 Li, T. A. Seasonal Variation of the Birth Weight of the Newborn. J. Pediat. 8: 459 (April) 1936.

formation (due to increased cell cohesion or delay in separation) when the pendulum swings too far to the anabolic side at certain critical periods in development

#### HABITUS

Starting out on the basis of the observation that the weight of the newborn infant varies with the season of conception, we studied the weight/length ratio of newborn infants and made an examination of over 45,000 obstetric records from six Chicago hospitals, extending over a period of thirteen years. This study revealed striking long-range trends in body proportion of the newborn. The average weight/length<sup>3</sup> ratio of the newborn in each week was computed according to sex. The correlation between a series of ratios for male offspring and a series of ratios for female offspring was high (0.83), indicating that a factor common to all was operative to bring the week-to-week weight/length<sup>3</sup> ratio of the two sexes in harmony.

The curves reveal that broader habitus reached a crest for infants born in 1928-1929, this was followed by a rapid shift toward slenderness in 1930, then followed a reversal of trends to broadness for the years 1933 to 1938, followed by a renewed decline in 1939.<sup>4</sup>

*The Variability of Habitus*—When variability of the weight/length<sup>3</sup> ratio was computed by quartile deviation, it was noted that infants conceived in 1928 showed greater variability, then followed greater uniformity for the years 1931-1933 giving way in turn to a second crest of greater variability in 1937-1938.<sup>5</sup>

Thus it would appear that long-range trends in the habitus of the newborn do exist and that for the material presented the cycle was approximately ten years. The crests in variability corresponded to periods of greater sun spot activity.

#### THE RELATION TO THE WEATHER AT THE TIME OF CONCEPTION

Further analysis of the material with respect to possible causal relationships with barometric pressure<sup>6</sup> reveals striking consistency. It was found that the temperature and barometric pressure of a week or two after the possible conception was most closely related to the habitus of the newborn. The nature of the association between temperature and body stature was consistent from season to season. Regardless of season it was found that the heavier and shorter offspring were

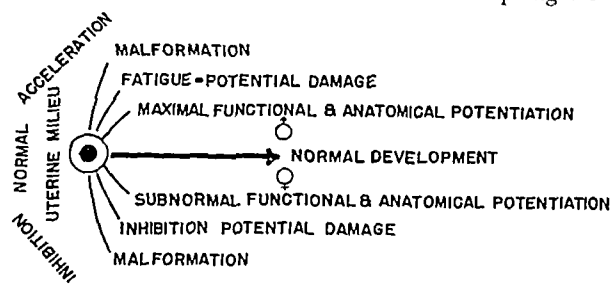


Fig 2—Possible modification of genetic trends by diverging trends in milieu with resulting modification of sex habitus, disease predisposition and anatomic defects.

associated more frequently with presumptive conception at higher temperatures.

#### MALFORMATIONS

A study of the temperature and barometric pressure movement at the probable period of conception of 1,114

cephalic malformations covering a twelve year period (individual records from death certificates of the Chicago Health Department) indicates that they were conceived under conditions dissimilar to those for normal conceptions. By means of statistical tests it is indicated that the frequency of malformed births under certain

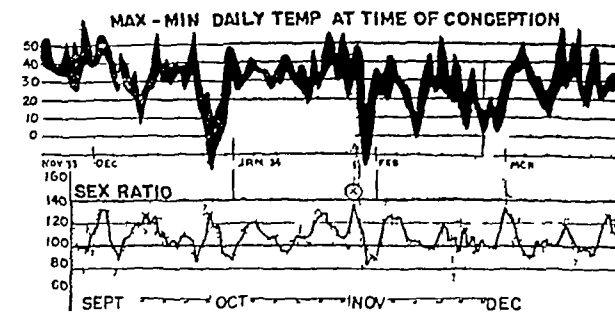


Fig 3—Lower curve, sex ratio of the newborn, Chicago births, September, October, November and December 1934. Dotted line, daily ratio. Solid line, five day moving average. Daily maximal and minimal environmental temperatures at conception superimposed.

temperatures and barometric pressures is sufficiently different from the frequency of normal births under similar conditions to warrant the conclusion that differences cannot be entirely attributable to chance.

#### SEX RATIO

When one graphs the day-by-day sex ratio of the newborn for a city population (we have made use of Chicago, Detroit and New York records) a most striking pendulation of the sex ratio (fig 3) becomes evident and when related to the environmental temperature of the presumptive time of conception (280 days before birth) it would appear that the trend to maleness is in some fashion related to periods of increasing cold and the trend to femaleness with periods of greater warmth.

Statistical tests indicate that in three of the four seasons—winter, spring and summer—the temperature deviation from normal and the sex ratio of births 285 days later are associated to an extent which cannot be entirely attributable to chance. In the winter months of conception we may expect that extreme cold or heat on the 285th day prior to birth will be associated with an increase in maleness. During the summer months the same pattern is observable with a tendency for greater temperatures to be associated more strikingly with the increase in maleness. In the spring months, however, the association is not clear. There appears to be a tendency for increased femaleness to be associated with extreme temperatures.

#### COMMENT

We have here presented evidence that environmental variability (weather, climatic cycles) reflected<sup>1</sup> in corresponding human biochemical and biophysical waves may be a factor in modifying genetically governed developmental trends. Such interference is presumably of significance in conditioning the cytoplasm of the ovum before fertilization or during certain early and critical stages of organic development.

The meteorobiologic integrations here touched on have been studied as part of a broad survey of human reaction to weather. The direct effects in the normal

12 Both the passage of a polar front as well as high temperature crests can be associated with a transient relative alkalosis and with this a relative anoxia in turn this will be followed by a relative acidosis.

17 In the organism such periodic impacts set up a series of corresponding biochemical waves which in turn may be negated or amplified by succeeding environmental impacts of like or diverse origin, undue sensitivity or reactivity of the individual organism either because of habitus inadequacy or other reasons will naturally modify the rhythm.

4 The graph figure 12 is included in the statistical study.

5 The graph figure 13 is included in the statistical study.

6 The barometric pressure was used here purely as an index with the definite reservation that it does not give a comprehensive picture of change in air mass.

and sick individual are as obvious today as they were to the hippocratic physician but, as happens not infrequently, the commonplace is apt to be ignored. The more subtle effects such as those that may involve conditioning of genetic trends here under discussion while not of immediate medical or pathologic interest, should be considered from the point of view of organic selection of adaptation and of human evolution.

Actually our observations merely confirm the earliest recorded statement on heredity, namely "wherefore it is natural to realize that generation, too varies in the coagulation of the seed and is not the same for the same seed in summer as in winter nor in rain as in drought" (Hippocrates: Airs, Waters, Places)

#### ABSTRACT OF DISCUSSION

DR ALVIN MAYNE, Chicago. The variations from day to day in sex ratios in the weight-length ratios and in the frequency of malformations cannot be attributed merely to chance but there exist factors that do influence the variations significantly. In many of these studies we have used a large population. For example, in our studies on sex ratio we have studied the births of over thirty thousand offsprings. In our study on weight-length ratio we used over 45,000 observations and in our study of malformations we compared a thousand malformations to a normal population of births of over thirty thousand. Hence, while the relationships to certain factors of environment may be slight because of the large numbers we have shown that they could not have been due to chance. There must be some factors common to the entire population, and one might have been the diet of the population. However, we have no records of the diet of the mothers at the time of conception, and we can almost rule out racial and heritage factors because these data are from the city of Chicago with a diverse racial population. The environmental conditions are common to nearly all of the population, that is, in general the mothers have been exposed to the variations in temperature and barometric pressure and air masses that pass over the city of Chicago. We have records on the weather in Chicago that we can date back to the probable time of conception. We have made use of this material principally because we feel that that is one of the common factors involved. I have broken up the sex ratio of 33,000 babies into four groups whether they were conceived in winter, spring, summer or autumn. We have fairly good evidence that about two hundred and eighty-five days before birth the temperature does have some effect on the sex ratio of the offspring. We can draw conclusions because the probability that such relationships as we have found exist merely through chance is small, and in each case in winter, spring and summer the probability is less than one out of a thousand, by using the latest statistical methods.

**Control of Body Weight**—We have seen that surplus calories of ingested food, whether taken in the form of protein, fat or carbohydrate, tend to accumulate in the form of body fat. And overfatness always means that the intake of food calories has been out of proportion to the expenditure of energy by the person concerned. There is more tendency to overweight in some people than in others, and undoubtedly this sometimes extends beyond the question of appetite to endocrine and perhaps other constitutional differences, yet the fact remains that for the individual the control of body weight is essentially a matter of a proper balance between what is ingested as food and what is oxidized in the energy metabolism. If one tends to become too fat, the remedy is to eat less or to burn more—Sherman, Henry C. *Chemistry of Food and Nutrition* New York, Macmillan Company, 1941

## Clinical Notes, Suggestions and New Instruments

### TANTALUM AS A METALLIC IMPLANT TO REPAIR CRANIAL DEFECTS

A PRELIMINARY REPORT

LIEUTENANT COMMANDER O HUGH FULCHER MC V (S) U S N R

Cranial defect in military surgery represents a most important problem because of the frequency of occurrence and because it renders a man unfit for military duty unless it can be adequately repaired. Therefore an adequate method of repair is urgent—one which can be performed by the general surgeon as well as by the neurologic surgeon in any ordinary general hospital wherever it may be located. Moreover, the repair should render protection to the intracranial structures against blows, changing atmospheric pressures and changing bodily positions which should approximate that afforded by the normal



Fig 1—The cranial defect destroys the left boss of the forehead



Fig 2—Cosmetically the defect involves a part of the face

cranium. The convalescence following the operative procedure should be brief to keep "as many men at as many guns as many days as possible."

#### REPORT OF CASE

R A P, aged 23 a fireman, second class attached to submarine duty, had received a compound depressed fracture of the left frontal region on May 5 1941 when struck by a closing compartment door of a submerged submarine. On regaining consciousness a few minutes later he found himself in the sick bay with his head bandaged. Two days later some cranial fragments were removed at a naval base hospital. Subsequently he was transferred to another naval base hospital where a second operation was performed which consisted of removing bony fragments. He was transferred to U S Naval Hospital, Washington D C, on October 15 for further treatment.

On admission the complaint consisted of annoying pulsation in the area of the cranial defect recurring attacks of frontal headaches, vertigo and a sensation of impending syncope on change of position. He was annoyed by the bulging of the area over the cranial defect on bending over and a concavity

Read before the Washington Academy of Surgeons April 10 1942.  
The tantalum used in this case was furnished by Finsteel Metallurgical Corporation North Chicago Ill.



of this area on standing. He feared crowds because of the curiosity and questions evoked by his appearance. He was mentally depressed because he had been advised that the cranio cerebral injury had rendered him unfit for further active military duty. He had lost 20 pounds (9 Kg) since the accident.

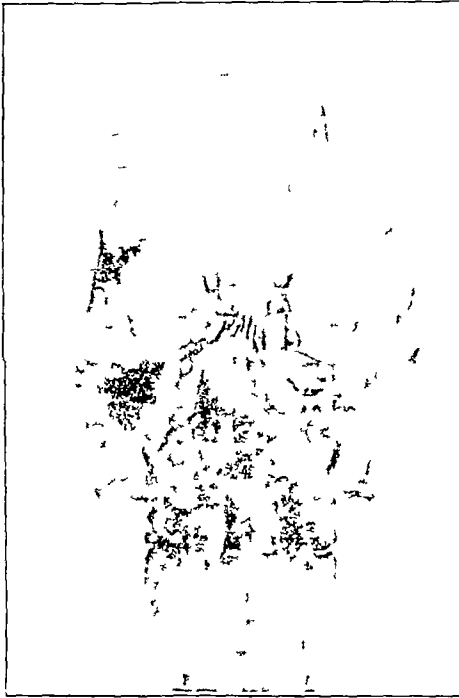


Fig. 3—The cranial defect measures 3 by 4 cm. There are some depressed bony fragments along the anterior margin.

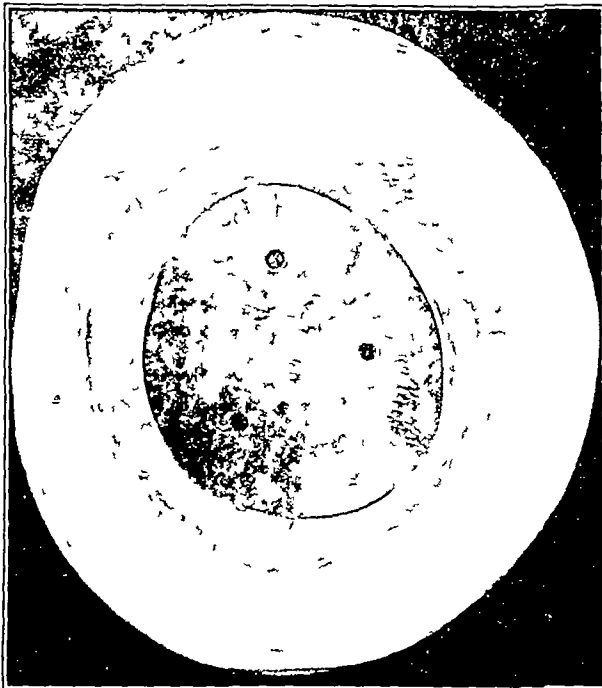


Fig. 4—The tantalum plate has been reduced to correct size by tin snippers, hammered into desired contour and fitted to mold. It is prepared for insertion.

Examination revealed that he was moderately well nourished with a conspicuous cranial defect involving the left frontal boss which measured about 4 cm in diameter (figs 1 and 2). The overlying soft tissue was depressed and pulsating and had

two vertical scars. When the patient strained or bent forward the overlying tissue would bulge, and the patient complained of vertigo, tinnitus and a sensation of fainting. In the prone position the overlying skin would also bulge. The temperature, pulse and blood pressure were within normal limits. The remainder of the physical and neurologic examinations revealed only normal conditions.

Röntgen studies of the cranium revealed a large rounded defect about 3 by 4 cm in the left frontal region several centimeters above the orbit. The anterior edge showed a shelving margin which projected inward about 2 cm and which represented depressed fragments of bone (fig 3).

Another surgical procedure was deemed necessary to remove the remaining depressed fragments of bone and to repair the cranial defect. Furthermore, the cranial defect involved the face, and the patient was anxious to have the facial symmetry restored.

Capt F. R. Hook of the Medical Corps suggested the use of a tantalum plate to repair the cranial defect. He had used tantalum plates in orthopedic procedures and had demonstrated by reoperating eight months after the insertion of the plate that bone during regeneration would incorporate the metal and that soft tissues would adhere to it. Mr. I. R. McCall,



Fig. 5—Tantalum plates snugly placed in situ covering the cranial defect five days after operation.

A metallurgist determined by experiment that the plate should be 25 mills thick to render adequate protection. Dr. C. C. DeFord of the dental corps prepared a mold of the cranial defect. The plate was then cut approximately to the correct size by means of tin shears and hammered to the desired contour, which could be determined by the mold and by adjusting the plate over the right frontal boss of the patient. Following this the plate was further trimmed to the perfect size. Three perforations were made to permit the escape superficially of any serum that might collect beneath the plate in situ (fig 4). It was sterilized by boiling.

On November 24 the cranial defect was explored under local anesthesia by excising the lateral vertical scar present. The dura appeared intact but there were two depressed fragments of bone along the medial border of the cranial defect which were removed. The pericranium about the border of the cranial defect was elevated, the prepared tantalum plate laid in place and its size marked by means of a sharp knife. The plate was then removed and a bed prepared by the use of a chisel and a motor driven emery wheel. The depth of this bed was equal to the thickness of the tantalum inlay so that there would be no elevation or depression at the junction of the bone and metal. The plate was then dropped in place, the available pericranium placed over its border and the skin closed with fine dermal sutures (fig 5). The patient remained in bed only two days, and the convalescence was uneventful.

On November 29 the sutures were removed and about 4 cc of bloody fluid was aspirated. On December 10 he was granted a leave for four weeks to visit his home, during which time his activities were not restricted and he was entirely free of all symptoms. The cosmetic result was satisfactory (figs 6 and 7) and the plate offered ample protection to the intracranial structures.

The patient returned from his sick leave on Jan 8, 1942, anxious to return to active duty. He was mentally alert, liked social life and was completely adjusted. On January 13 and 14 a thorough examination was made to determine his qualification for submarine duty, which included his ability to withstand an air pressure of 50 pounds to the square inch. He passed this test satisfactorily and on January 16 was returned to submarine duty on a North Atlantic patrol.

#### COMMENTS

This patient was completely rehabilitated within two months of the operation for repair of the cranial defect. Thus a highly trained submarine fireman who could not have been replaced immediately was retained on active duty. Moreover, he had been rehabilitated socially to the extent that he had regained his former personality. He possessed his normal appearance, with the exception of two scarcely visible vertical scars in the region of the left side of the forehead.

It is not necessary to make a bed in the cranium to receive the plate as it was placed on the bony border about the defect in another case with equally good result. A bed for the metallic inlay was desirable in this case for cosmetic reasons. Otherwise there would have been a slight elevation about the border of the plate.

In 1939 Grant and Norcross<sup>1</sup> reviewed the literature on the methods used for repairing cranial defects and reported their experience with the craniopericranial graft. A study of their excellent work clearly demonstrated that there existed

no adequate method for repairing cranial defects at that time. Since then Lipscomb and Grover,<sup>2</sup> Geib,<sup>3</sup> Peyton and Hall<sup>4</sup> and Beck<sup>5</sup> have reported the use of vitallium plates with good results. However, vitallium is an alloy which must be cast and will not lend itself to hammering; it cannot be cut or bent. Since the mold for casting is made over the soft tissues and since the soft tissues do not accurately represent the cranial contour or defect, the plate rarely fits snugly and usually requires a compromise in adjustment. Furthermore, casting is frequently impracticable in some military hospitals.



Fig 6—Appearance sixteen days after operation.

Tantalum is element 73 of the periodic table. It has approximately the physical properties of cold rolled steel and the chemical properties of glass. It can be secured in plates or sheets of any size desirable, and the thickness should be

25 mills. It is inert and can be cut, bent or hammered, and of course it can be sterilized by boiling or by any recognized chemical method. It will give protection at the thickness of 25 mills, which will approximate that of the normal cranium.

Lieut (j g) R H Pudenz of the Medical Corps has demonstrated by animal studies and by biopsy of the scalp of one of my patients that soft tissues will adhere to tantalum to the extent that it has to be removed by a periosteal elevator, which corroborates the observations of Captain Hook. Thus it may be possible in many instances to repair the cranial defect by the use of a tantalum plate at the time that the bony fragments are removed immediately following injury. If this is done, sulfanilamide powder should be "dusted" into the wound and on each side of the plate. Complete hemostasis is imperative.

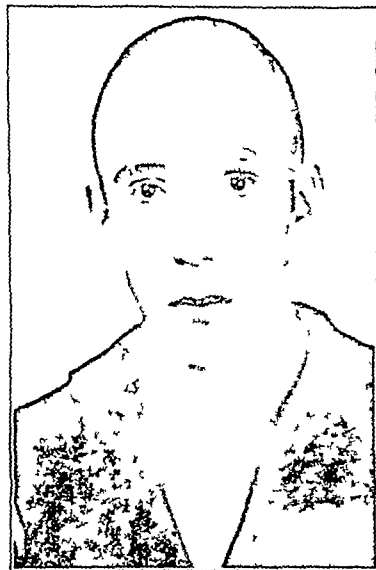


Fig 7—Note symmetrical contour of forehead.

Tantalum plates of 25 mill thickness for repair of cranial defects should be included in the surgical supplies of every general military hospital.

#### CONCLUSION

The method described of repairing a cranial defect involving a part of the face by the use of a tantalum implant has afforded protection to the intracranial structures approximating that offered by the normal cranium. The convalescence in my case was brief and the normal facial contour was restored.

#### RECURRENT INTRACRANIAL HEMORRHAGES IN A PATIENT WITH HEMOPHILIA

SAMUEL BAER, MD, HAROLD L. GOLDBURGH, MD,  
AND BEATRICE PEARLSTINE, MD, PHILADELPHIA

Surprisingly little has been added to our knowledge of the etiology and pathogenesis of hemophilia since it was first described as a distinct clinical entity by Otto in 1803. There is still some discussion concerning the essential clinical features of the condition. Most observers, however, agree that hemophilia is a blood dyscrasia occurring almost exclusively in males and transmitted according to mendelian laws of inheritance by the female. The disease is characterized by a history of repeated hemorrhages, a prolonged clotting time and a normal bleeding time.

Trauma almost invariably precedes hemorrhagic episodes according to Eley.<sup>1</sup> A fracture, contusion, laceration or surgical procedure of even the most minor degree may start the bleeding. Approximately 75 per cent of the cases present orthopedic complications (hemarthroses) of some sort.<sup>2</sup>

All are agreed that hemorrhage into the central or peripheral nervous system is very unusual. In a complete review of the literature prior to 1911 Bullock and Fildes<sup>3</sup> found only 19 cases of hemophilia in which there were neurologic complications. In 14 of these intracranial hemorrhages were noted. From 1911 to 1930 Seddons<sup>4</sup> found mention of only 1 case

From the Medical Service of Dr. Harold L. Goldburgh, Jewish Hospital.

<sup>1</sup> Eley, R. C. Hemophilia. *M. Clin. North America* 21: 373 (March) 1937.

<sup>2</sup> Sturgis, C. C. Isaacs, Raphael, Goldhammer, S. V. and Bethell, F. H. Review—Blood. *Arch. Int. Med.* 64: 162 (July) 1939.

<sup>3</sup> Bullock, W. and Fildes, Paul. Hemophilia in Treasury of Human Inheritance. London, 1911.

<sup>4</sup> Seddons, H. J. Hemophilia as a Cause of Lesions in the Nervous System. *Brain* 53: 306 (Oct.) 1930.

<sup>1</sup> Grant, F. C. and Norcross, A. C. Repair of Cranial Defects by Cranioplasty. *Ann. Surg.* 110: 448-512 (Oct.) 1939.

<sup>2</sup> Lipscomb, W. R. and Grover, C. G. Cast Metal Plate for Closing Defect in Skull from Communited Fracture. *Dental Digest*, April 1941.

<sup>3</sup> Geib, F. W. Vitallium Skull Plates. *J. A. M. A.* 117: 812 (July 5) 1941.

<sup>4</sup> Peyton, W. T. and Hall, H. B. Repair of Cranial Defect with Vitallium Plate. *Surgery* 10: 711-715 (Nov.) 1941.

<sup>5</sup> Beck, C. S. Repair of Defects in Skull by Ready Made Vitallium Plates. *J. A. M. A.* 118: 798-799 (March 7) 1942.

of damage to nerve tissue by hemophilia. Of the 29 cases of Seddon's series only 2 presented neurologic lesions and none intracranial bleeding.

It can be seen, therefore that intracranial bleeding occurring in a hemophiliac is a rather rare complication. Our patient exhibited at least two and possibly four episodes of such hemorrhage.



Fig 1—Large clots attached to under surface of dura

#### REPORT OF CASE

*History*—W R was born May 27, 1920 and until his death at the age of 22, his history was characterized by repeated hospitalizations.

When circumcision was performed ten days after birth he bled for twelve hours. Transfusions were required to help stop the bleeding.

His first admission to the Jewish Hospital was at the age of 15 months. A known hemophiliac, he was admitted for treatment of bleeding gums. Hospitalization occurred again in 1923 at the age of 3 years. The diagnosis on admission was meningismus. Continuous vomiting had been present for three days. Examination revealed nuchal rigidity, a positive Kernig sign, a positive Babinski sign and some hyperesthesia. Spinal puncture was not performed.

In 1924 he was admitted a third time for treatment of continuous bleeding resulting from a laceration of the lip. Three years later he was hospitalized for bleeding following the accidental loss of a tooth.

At the age of 13 he was again referred to the Jewish Hospital, this time for treatment of a spontaneous subarachnoid hemorrhage. It was discovered at this time that he had been treated for a similar episode at another hospital two years previously. Two spinal taps were grossly bloody, and laboratory studies revealed a moderate hypochromic anemia, a bleeding time of three and one-half minutes and coagulation time varying from nine to nineteen and one-half minutes.

His sixth and final admission occurred Sept 1, 1942 at the age of 22. He was admitted to the medical service of Dr Harold L. Goldburgh complaining of severe headache and vomiting of three days' duration. One convulsion had occurred the day prior to hospitalization. Examination revealed a heart rate of 50 and evidence of multiple joint deformities (hemarthroses). Neurologic examination revealed hyperactive deep tendon reflexes and a positive Babinski sign on the right side. Spinal fluid was grossly bloody. Laboratory studies were consistent with the diagnosis of hemophilia (bleeding time two and three-fourths minutes, clotting time thirteen and one-half minutes, normal vitamin C level and normal prothrombin time).

Evidence of increased intracranial pressure persisted. The headache became worse, the temperature rose to 104-105 F,

nuchal rigidity was severe and inequality of pupils was present. Stupor became deeper and severe opisthotonos and facial asymmetry became apparent. A cerebral cry was almost constantly present.

Treatment was wholly ineffective. Transfusions had to be discontinued because of the development of autoagglutinins. Widespread hemorrhages occurred in the skin and at various points of pressure. Death occurred on September 16, sixteen days after admission.

*Autopsy*—Examination three hours post mortem revealed emphysema, patchy pneumonitis at the right base and gastric and retroperitoneal hemorrhages. There was a left parieto-frontal encephalomalacia and a large subdural hematoma. A detailed neuropathologic examination was made by Dr N W Winkelman, whose report is here given.

*Gross Examination* The brain was small and extremely bloody. The outstanding feature was the presence of well organized clots under and attached to the dura on both sides. This was especially noticeable on the left side, where the clot reached a thickness of almost 4 cm (fig 1). This point was reached in the form of a nodule which was in the superior parietal area. It had compressed the underlying brain structure so that it was flattened; it acted in the same way as an overlying meningioma. The clot on the left side was ragged and irregular but larger than the one on the right which was much thinner and had not greatly compressed the underlying cortical tissue.

There was blood not only in the subdural space bilaterally but also in the subarachnoid space. It was not however primarily subarachnoid bleeding but apparently had broken through the arachnoid. While the entire soft meninges were blood stained they were not overfilled with blood. Only in relation to the large blood nodule was there an excess amount of blood filling the convolutional interspaces.

At the base of the brain there was an excessive amount of blood and the structures stood out clearly. The blood vessels were small, bluish and not sclerotic.

Sections through the pons, medulla and cerebellum showed no gross evidences of bleeding or any other gross lesions. There was, however, considerable congestion.

Section through the brain showed no ventricular dilatation. There was only moderate congestion. There was no intra-cerebral bleeding. The left parietal lobe beneath the large blood clot was seen to be compressed and distorted (fig 2). The tissue beneath was necrotic but not hemorrhagic. This area of necrosis occupied the posterior part of the inferior

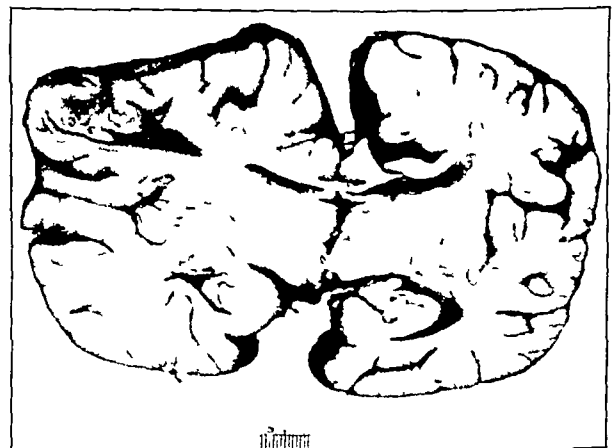


Fig 2—Note the compression of the left parietal lobe by the large blood clot

parietal lobe and extended into the occiput. The compression caused by the blood clot had compressed the lateral ventricle and shifted the structures slightly past the midline. A great deal of blood was present in the subarachnoid space in relation to this large subdural clot.

*Gross Diagnosis* There were massive subdural hematomas (especially on the left side), moderate subarachnoid hemorrhage, compression and degeneration of the left parieto-occipital areas.

## COMMENT

This case presents a number of unusual features. A spinal puncture was not done at the second admission in 1923 but in the light of our present knowledge the history is certainly suggestive of a subarachnoid hemorrhage. At the age of 11, the patient probably had another episode of intracranial bleeding treated at another institution. At the age of 13 and again at 22 he exhibited the classic symptoms of sudden spontaneous intracranial bleeding. With none of these attacks was there any history even suggestive of preceding trauma.

In view of the usually unsatisfactory response to treatment (including transfusions) noted so frequently in cases of hemophilia, it is amazing that this patient weathered three attacks of intracranial bleeding. Harper<sup>5</sup> has reported recovery from a cerebral hemorrhage in a hemophilic patient aged 4 years.

Little if any mention is made in the various neurologic textbooks<sup>6</sup> of intracranial bleeding in hemophilia. Priest<sup>7</sup> has reported a case of acute spinal compression in hemophilia. Arbuse and Locascio<sup>8</sup> discussed the neurologic manifestations of hemophilia. They stated that hemorrhages were usually single and post traumatic but might be multiple. Bleeding was generally from the pial vessels, and central hemorrhages were more common than peripheral lesions.

It seems logical to conclude that this patient not only suffered a spontaneous intracranial hemorrhage as a complication of hemophilia but apparently survived three such crises. The final episode was characterized by massive spontaneous bilateral subdural hematomas.

## SUMMARY

A hemophilic patient had multiple bilateral spontaneous intracranial hemorrhages. Death at the age of 22 was preceded by recovery from at least one and possibly three attacks of spontaneous subarachnoid bleeding.

6300 Rising Sun Avenue—1932 Spruce Street

SHOCK IN PHYSICALLY INDUCED FEVER THERAPY  
TREATED WITH BLOOD PLASMA

LIEUTENANT ARTHUR M. PRUCE  
MEDICAL CORPS ARMY OF THE UNITED STATES

This report on the use of plasma in the treatment of secondary shock following physically induced fever is presented because our armed forces have instituted a rapidly expanding program of fever therapy to treat venereal diseases. Shock is one of the more dangerous complications which may occur during or several hours after sustained high temperature rises induced by physical means. There are no significant differences in the picture of secondary shock whether caused by trauma, surgery or fever therapy. Although plasma has been widely and successfully utilized to combat shock from other causes, this appears to be the first report to describe its use in shock following fever therapy.

## REPORT OF CASE

Private J. D. M., a Negro aged 20, was sent for fever therapy because of a chronic sulfonamide resistant gonorrhea of five months' duration. He had a moderately profuse urethral discharge. The prostate culture and urethral spread were positive. It was intended that he receive eight hours of therapeutic fever of between 106 and 106.7 F. The usual prefever routine was carefully observed. This routine included a thorough survey of the heart, lungs, kidney function, complete blood count and blood chemistry including determination of blood

sugar, nonprotein nitrogen and chlorides. Premedication consisting of the administration of 16 Gm of sulfathiazole, 4 Gm of calcium gluconate and 150 mg of ascorbic acid in divided doses was started three days prior to treatment. A final clinical check was made by a medical consultant, and the patient was accepted for treatment. Four cc of paraldehyde was given orally in the morning one hour before treatment was started.

At the onset of the treatment the only abnormality was a rapid pulse, 104 a minute. With a mean hypertherm cabinet temperature of 115 F, the patient's body temperature had attained the therapeutic level of 106 F in seventy-two minutes.

After three and one-half hours of fever at the therapeutic level of between 106 and 106.6 F by rectum, there was onset of headache and restlessness. The patient had taken fluids by mouth poorly and had vomited repeatedly—five times in the preceding two hours. To replace the fluid lost in vomiting and combat fluid loss in perspiration, 3,000 cc of 5 per cent dextrose in isotonic solution of sodium chloride was given intravenously during these three and one-half hours.

Oxygen was administered intermittently for the headache and restlessness, which are so often found to accompany this type of treatment and are the result of cerebral anoxia. During the following two hours of treatment the patient's restlessness increased. At the end of five and one-half hours of treatment his blood pressure fell to 78 systolic and 44 diastolic and the pulse rate rose to 156 and projectile vomiting developed. The sudden rise in the pulse rate and the fall in blood pressure indicated impending vascular collapse. This, together with continued evidence of cerebral irritation, forced discontinuance of the treatment.

To combat the impaired peripheral circulation and the possible cerebral edema, 40 cc of 50 per cent dextrose intravenously was twice given and continuous oxygen with the Boothby-Lovelace-Bulbular mask was used. The blood pressure responded to this by a rise to 92/60 and the pulse dropped to 112. When the patient returned to his ward, his temperature was normal.

In the subsequent six hours in the ward his blood pressure rose to 110/60 and his pulse was regular, but the vomiting persisted. To combat this loss of fluids and chlorides by mouth he received 2,000 cc of saline solution intravenously. That evening at 9 o'clock, six hours after discontinuance of treatment, the patient went into shock, and his temperature fell to 96.7 F rectally. He became confused and then stuporous. The blood pressure fell to 80/52 and the pulse became thready and rose to 140 beats a minute. His respiratory rate jumped to 32.

Oxygen, with the patient in antishock position, 1,000 cc of 5 per cent dextrose in isotonic solution of sodium chloride intravenously and two doses of 50 cc of 50 per cent dextrose together with warm blankets were unsuccessful in relieving the shock. At this point trial use of blood plasma was advised. Two hundred and fifty cc of plasma was administered intravenously in fifteen minutes. A rapid change occurred in the clinical picture within the next twenty minutes. The patient's sensorium cleared, his blood pressure rose to 106/64, the pulse became regular and strong and fell to 80 beats a minute. His respiratory rate became normal and the rectal temperature rose to 98.6 F. This appears to be the first case in which plasma was used successfully to combat shock following physically induced fever therapy. Interestingly enough, the patient was cured of gonorrhea in spite of only five and three-quarters hours of therapeutic fever.

## SUMMARY

Shock following physically induced fever therapy was successfully treated by the intravenous injection of 250 cc of blood plasma after the usual accepted antishock measures including intravenous isotonic solution of sodium chloride and hypertonic dextrose and oxygen had failed. This appears to be the first report on the use of plasma in shock from this form of treatment and emphasizes the importance of the use of plasma in the treatment of secondary shock from all causes.

5 Harper W. W. Cerebral Hemorrhage in a Hemophilic. *South M J* 11: 232 (March) 1918.  
6 Grinker R. R. *Neurology*, ed 2. Springfield, Ill. Charles C. Thomas Publisher, 1937. Wechsler Israel. *Clinical Neurology*, ed 4, Philadelphia W. B. Saunders Company, 1939. Wilson S. A. and Bruce, A. M. *Neurology*, Baltimore. William Wood & Co. 1940.  
7 Priest W. M. Epidural Hemorrhage Due to Hemophilia. *Lancet* 2: 1289 (Dec 7) 1935.  
8 Arbuse D. S. and Locascio W. R. Neurological Manifestations in Hemophilia. *M Rec* 146: 377 (Nov.) 1937.  
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## Special Clinical Article

### MANSON'S SCHISTOSOMIASIS

CLINICAL LECTURE AT ATLANTIC CITY SESSION

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SAN JUAN, PUERTO RICO

There are important reasons why physicians in all parts of North America should devote increasing attention to diseases of the tropics. First, many of those who in less tragic times would almost certainly never have seen service in tropical lands will sooner or later be confronted with such a contingency. Second, there can be little doubt that some of these diseases will be contracted by our soldiers and brought back with them as they return to the homeland on furlough or definitely.

As regards schistosomiasis, the problem with homecoming troops will probably be one mainly of diagnosis for the physicians of this country who may be called on to take care of such cases. From the public health point of view, no difficulties should perhaps be expected, for of the known planorbid of the United States none have yet been proved, to my knowledge, capable of acting as intermediate host. One cannot, however, until an exhaustive survey is made, be certain that none of them can act in that capacity.

Of the three forms of schistosomiasis—the Oriental or Japanese, the vesical or urinary and the mansonic or so-called intestinal—I shall limit my discussion to the last named.

#### GEOGRAPHIC DISTRIBUTION

Manson's schistosomiasis is a disease of extended geographic distribution and of great importance as a morbidity and mortality factor in those regions in which it occurs endemically.

Africa, northern South America and the Caribbean region are the great endemic foci. In northern Africa it is found in the lower Nile Valley, particularly in the Delta, and in the Sudan. It is present along the East African coast from Zanzibar to below the Zambezi River, and in the island of Madagascar. In central Africa it occurs throughout parts of Tanganyika, the Belgian Congo and Rhodesia. To a limited extent it is present in Natal and the Transvaal. In West Africa it is seen in Senegal, French Guinea and, sparsely, as far as Lake Chad. Cases have been found in Liberia, Sierra Leone, Algeria, Harar (Ethiopia), Eritrea, southern Tunisia and Cyrenaica, but in these regions no important endemic zones have been encountered. There is a small endemic focus in Yemen, Arabia. In Egypt alone Scott<sup>1</sup> estimated in 1937 that there were 3,000,000 cases of Manson's schistosomiasis.

In the New World it occurs in parts of northern and northeastern Brazil, with a variable incidence which in one locality of the state of Minas Geraes has reached 85.18 per cent.<sup>2</sup> Total figures for Brazil are unknown. In Venezuela its distribution so far seems restricted to a limited part of the north central zone, where

according to Scott<sup>3</sup> 60 to 80 per cent of the population in the valleys near Caracas are infected. The disease is fairly common in Dutch Guiana.

Among the islands of the Caribbean, schistosomiasis is present in Puerto Rico, Vieques, St. Martin, St. Kitts, Nevis, Monserrat, Antigua, Guadeloupe, Martinique and St. Lucia. In Puerto Rico, 14.6 per cent of the autopsies performed in San Juan, a nonendemic center with a population of about 170,000, have presented evidences of the disease.<sup>4</sup>

Its incidence is greatest among those in the second and third decades of life, but it affects the two sexes to about the same extent except in regions in which occupation or habits may result in more chances of exposure on the part of members of one sex.

#### LIFE CYCLE OF PARASITE

For the completion of the parasite's life cycle a specific intermediate molluscan host is necessary. In Puerto Rico, as in most of the endemic foci of the Western Hemisphere, the snail concerned is *Australorbis glabratus*. Given suitable climatic and hydrographic conditions, a miracidium is hatched when the human feces containing ova of *Schistosoma mansoni* reach the water. It swims about until it finds a snail of the appropriate species which it penetrates and parasitizes. Within the snail the miracidium undergoes morphologic alterations and great multiplication resulting, at the end of twenty-two to thirty-one days, in the emergence of large numbers of fork-tailed cercariae.

The disease is acquired through exposure to cercariae, usually while bathing in infected streams or working in irrigation canals, but infection can also take place through the buccal mucosa while drinking. The body of the cercaria penetrates by boring through the epithelium of either the skin or the mucous membrane, the tail dropping off as soon as the body secures a firm hold. After penetration, and until maturity is reached, the parasite is referred to as a metacercaria.

#### PREVENTION

From what has so far been said of the life cycle and mode of infection, it is clear that spread of the disease can be avoided by (1) curing all who are affected with it, so that no more viable ova will pass with their feces, (2) preventing the contamination of bodies of water with human excreta, (3) exterminating the snails or cercariae, and (4) keeping the people away from the sources of infection. One or more or all of these methods may be applicable with success in a few communities, particularly in small ones, but in the larger endemic foci the density of population and extent of infested territory make these methods unpractical at the present time. Truly tangible results will perhaps not be forthcoming until education of the masses is much more advanced than at present, until medical care in tropical countries is more widespread and efficient and until the standard of living of the average individual in those areas is materially improved.

#### PATHOGENESIS, EXTRUSION OF OVA AND PATHOLOGY

The usual route of penetration is through the skin. Since the metacercariae are next found in the lung, it is clear that in the derma they must enter either lymphatics or veins. In experimental inoculations of

From the Department of Pathology, School of Tropical Medicine, Read in the General Scientific Meetings at the Ninety Third Annual Session of the American Medical Association, Atlantic City, N. J. June 8, 1942.

1 Scott J. Allen. The Incidence and Distribution of the Human Schistosomes in Egypt. *Am. J. Hyg.* 25: 566 (May) 1937.

2 Martins A. Vianna and Dos Anjos W. Versiani. Schistosomose mansoni no norte de Minas Geraes. *Brasil med.* 52: 812 1938.

3 Scott J. Allen. Schistosomiasis in Irrigated Mountain Valleys of Venezuela. *Am. J. Hyg.* Sect. D 31: 1 (Jan.) 1940.

4 Koppisch Enrique. Studies on Schistosomiasis Mansonii in Puerto Rico. VI. Morbid Anatomy of the Disease as Found in Puerto Ricans. *Puerto Rico J. Pub. Health & Trop. Med.* 16: 395 (March) 1941.

white rats with *Schistosoma japonicum* Watarai<sup>5</sup> saw the parasites within both blood vessels and lymphatics. In the rabbit on the other hand, in an examination of more than 3,500 serial sections of skin taken from one to fourteen hours after exposure, at intervals of one hour, I<sup>6</sup> found parasites only in lymphatics (fig 1) of the dermis. For man it is not exactly known which of the two routes is usually selected, but it is generally taken that they pass into veins.

The course followed by the metacercariae seems at all times to be strictly intravascular. Those which are not caught and destroyed in the pulmonary circulation reach the left side of the heart, whence they are ejected with the arterial blood to all organs and tissues. Some of them obstruct capillaries, giving rise to petechial hemorrhages, and a great many are undoubtedly lost during the period of wandering. Finally, those which reach organs and tissues whose venous drainage is by way of the portal vein seem to be the only ones that survive and establish a foothold in the mammalian host. By passing from the arterial to the venous side in organs like the spleen, pancreas, liver, stomach and small and large intestine, they reach intrahepatic portal branches, where they attain maturity. It seems probable that some of the parasites may pass through the liver and lungs more than once.



Fig 1—Cercaria in lymphatic next to a hair follicle of an experimentally infected rabbit four hours after exposure ( $\times 400$ ). Originally published in the Puerto Rico Journal of Public Health and Tropical Medicine.<sup>6</sup>

Mature or almost mature males and females wander against the blood current and copulate in the larger venous tributaries of the portal vein, showing a strong and unexplained preference for the lower colonic and

rectal branches. For deposition of the ova, the females wander on, usually alone, into visceral venules which they fit snugly, thus usually taking place in the large intestine.

The mechanism by which ova pass from the blood vessels in which they are deposited into the tissues has been the subject of much controversy. With variations

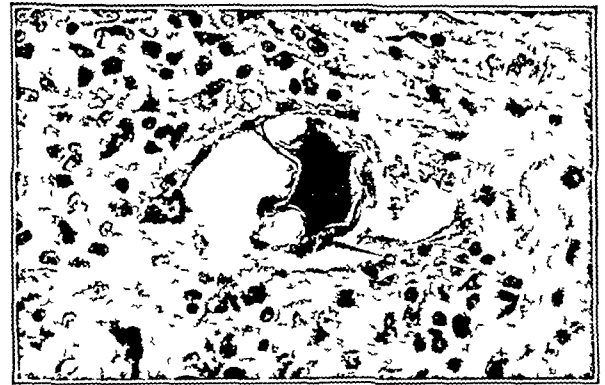


Fig 2—Extension of endothelial lining of venule about schistosome ovum. Experimentally infected monkey ( $\times 450$ ). Originally published in the Schweizerische Zeitschrift für Pathologie und Bakteriologie.<sup>11</sup>

in certain details, most of the interpretations have been to the effect that the process is one of progressive accumulation of ova in a blood vessel the wall of which is ultimately ruptured thereby,<sup>7</sup> of forceful ejection by pressure exerted by the blood,<sup>8</sup> of ejection by the pressure exerted by movements of the tissues of the host,<sup>9</sup> or of tearing of the wall by means of the spine of the ovum.<sup>10</sup> According to our observations,<sup>11</sup> conducted on properly selected human and animal tissues sectioned serially, the ovum comes to lie against the endothelial lining of the venule in which it is laid or, in the case of the liver, to which it is carried with the blood stream. Immediately after this the endothelial cells extend from all sides by multiplication and cover the ovum completely, thus excluding it from the circulation (fig 2). An inflammatory reaction, to a minor extent exudative and mainly proliferative (pseudo-tubercle formation), then develops about the ovum, and the venule is either pushed aside or obliterated. The way in which it passes into the lumen of the intestine is not explained by these observations. It is possible that only ova that are laid immediately beneath the epithelium can ever reach the outside through areas of ulceration or of accidental abrasion, aided perhaps by the intestinal movements and the passage of the feces. My observations help me to understand why ova with a terminally placed spine (*Schistosoma haematobium*) and others with practically no spine (*S. japonicum*) leave blood vessels as readily as those of *S. mansoni* with its well developed lateral spicule.

It is probable that in man most of the damage is accomplished by the ova. The characteristic mode of reaction of the tissues in all organs to the presence of these structures is by the formation of a pseudo-tubercle. First polymorphonuclear leukocytes surround the ovum, if the embryo is still present (fig 3). Fre-

7 Blanchard R. Traite de zoologie medicale. Paris 1889 vol 1 p 648.  
8 Letulle M. Arch de parasit 9 392 1905.  
9 Lortet and Vialleton. Ann Univ Lyon 9 1 1894.  
10 Manson Bahr Philip and Farley, N. H. Parasitology 12 33 (Jan.) 1920.  
11 Kohlschütter E. and Koppisch Enrique. On the Mode of Extrusion of Schistosome Ova from Blood Vessels into the Tissues. Schweiz Ztschr f Path u Bakt 4 357 1941. Koppisch.

5 Watarai Jiro. Studies on the Skin Reaction Caused by *Schistosoma japonicum* Cutaneously Applied on the Animals. Jap J Exper Med 14 1 18 (Feb 20) 1936.  
6 Koppisch Enrique. Studies on Schistosomiasis *Mansoni* in Puerto Rico. IV. The Pathological Anatomy of Experimental Schistosomiasis *Mansoni* in the Rabbit and Albino Rat. Puerto Rico J Pub Health & Trop Med 13 1 (Sept) 1937.

quently, however, the embryo has died and been absorbed by the time extrusion has taken place, and then the lymphocyte seems to be the first cell to appear about the egg shells. Soon after that, epithelioid and foreign body giant cells develop. The whole constitutes a microscopic nodule or pseudotubercle about the periphery of which lymphocytes, eosinophils and monocytes in variable proportions form a zone of infiltration. A peripheral layer of concentrically disposed fibroblasts next appears, and by the progressive broadening and condensation of this capsule the pseudotubercle is ultimately converted into a spherical fibrous nodule averaging 200-250 microns in diameter. The series of changes is shown in figures 4 to 6. These nodules are extremely helpful in histologic surveys of tissues in suggesting the presence of the disease, and careful examination will often disclose the faded remnants of a schistosome shell in their center. In endemic foci, minor grades of fibrosis of the portal spaces, especially when accompanied by eosinophilic infiltration, are likewise a signal for directing a careful search for pseudotubercles and ova. An easier and more certain way of establishing the presence of the disease post mortem in very light infections is to digest portions of the liver and wall of the rectum in 3 to 10 per cent sodium or potassium hydroxide diluting with water after digestion centrifuging and searching for the egg shells in the sediment.<sup>12</sup>

The presence of ova leads to progressive fibrosis of portal spaces and of the submucosa of the colon with ultimate development, if ova continue to be deposited in sufficient numbers over several years, of a portal cirrhosis and splenomegaly. As part of the cirrhosis there is portal obstruction, resulting in development of a collateral circulation of which an important complication is the formation of esophageal varices that not infrequently give rise to fatal hemorrhage. The heightened blood pressure in the splenic vein favors the development of sclerotic changes in its wall at times with calcification, and in a few cases thrombosis supervenes. In my material<sup>4</sup> ova have been found microscopically in only 0.8 per cent of spleens in cases of schistosomiasis. This leads me to believe that ova



Fig. 3.—Section of human liver showing infiltration of polymorphonuclear leukocytes about ovum ( $\times 450$ ). Originally published in the Puerto Rico Journal of Public Health and Tropical Medicine.<sup>4</sup>

play no predominant part in the splenic enlargement which is probably due to two main factors—obstruction to the portal circulation by the cirrhosis, and a general response to the infection on the part of the reticulo-endothelial components of the organ.

In animals like the rabbit, on the other hand we have shown the important role played by the maturing and adult schistosome worms (in contradistinction to ova), in the development of certain pathologic changes, such as polypoid endophlebitis of the intrahepatic portal branches and pulmonary arteritis. These

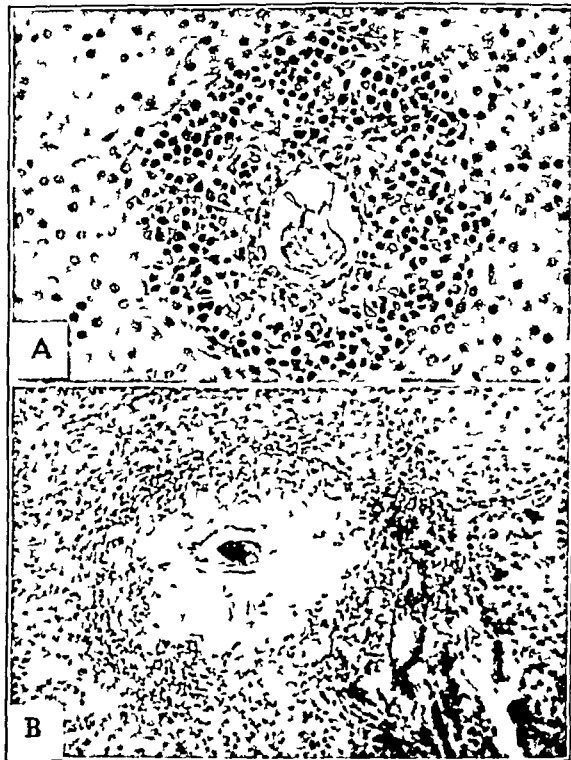


Fig. 4.—Sections of human liver. A, ovum in center beginning proliferation of epithelioid cells, peripheral infiltration with eosinophils, lymphocytes and monocytes ( $\times 240$ ). B, well developed pseudotubercle with ovum in center surrounded by epithelioid cells ( $\times 100$ ). Originally published in the Puerto Rico Journal of Public Health and Tropical Medicine.<sup>4</sup>

changes are readily demonstrable for many days before the beginning of oviposition.

Exceptional aberrant localizations of worms and ova may produce a myelitis,<sup>13</sup> salpingitis, oophoritis<sup>14</sup> or pulmonary arteritis<sup>15</sup> as a dominant part of the clinical or pathologic picture in man at any given time but in the great majority of cases the fundamental pathologic triad in this disease, when fully developed, consists of colitis, portal cirrhosis and splenomegaly. Jaffe<sup>16</sup> of Caracas reports the finding of bilharzial myocarditis in his Venezuelan material, but I have as yet not encountered that complication in Puerto Rico nor do I find it mentioned in the literature from Africa and the remainder of South America.

In the gastrointestinal tract besides the colitis fistulas to the perineum and colonic and anal polyps may develop. Ova and pseudotubercles not infrequently will be found in the appendix and it seems as if in some cases this would give rise to symptoms referable

13 Muller H. R. and Stender A. Bilharziose des Rückenmarkes unter dem Bilde einer Myelitis dorso-lumbalis transversa completa. Arch. f. Schiffs u. Tropen Hyg. 3:4 527 (Oct.) 1930. Espan. J. Mielitis producida por huevos de Schistosoma mansoni. Rev. Policlín. Caracas 10: 245 (July-Aug.) 1941.

14 De la Pila Iglesias M. Un caso quirúrgico de Schistosomiasis de las trompas de Falopio y del ovario. Memoria de la Facultad de la Clínica Quirúrgica del Dr. Pila Ponce P. R. 1: 11 1928.

15 Clark E. and Graef I. Chronic Pulmonary Arteritis in Schistosomiasis Mansonii Associated with Right Ventricular Hypertrophy. Report of a Case. Am. J. Path. 11: 693 (July) 1935.

16 Jaffe R. Sobre la bilharziosis en niños y jóvenes (hasta los veinte años). Rev. de la Policlínica Caracas No. 49 December 1939.



to that organ. In other cases ova are laid in large numbers in the mesentery or mesocolon, resulting in massive fibrosis and edema of those parts with formation of a tumor-like mass which may produce intestinal obstruction, it is fortunate that such cases are rare for they are very puzzling from the diagnostic point of view and quite hopeless from the therapeutic

#### CLINICOPATHOLOGIC FEATURES

The manifestations of the disease, both clinical and anatomic, may conveniently be grouped into three stages (1) an early period comprising penetration of the cercariae, migration within blood vessels and maturation in intrahepatic portal branches, (2) an intermediate period of progressive accumulation of ova in various organs and tissues and (3) a late period of frank visceral damage, mainly cirrhosis and splenomegaly.

*Early Period*—I am not aware of any pathologic studies describing the changes in the human host prior to the onset of oviposition, so one must try to surmise what happens in man from what obtains in animals experimentally infected. In the rabbit,<sup>6</sup> changes are slight except in hyperinfections, in which event the animal may die prior to the onset of oviposition. Penetration produces a mild dermatitis of brief duration and an acute adenitis of the inguinal and axillary nodes, probably due to the passage of the metacercariae but conceivably also to bacteria brought in by the pene-

of rupture, petechiae develop and are found during the period of migration in all tissues but are always more numerous in the lung. Should the migrating parasite undergo extravasation in the lung, there is formed a limited area of eosinophilic and lymphocytic infiltration with or without foreign body giant cells. During the first week of infection the rabbit's spleen

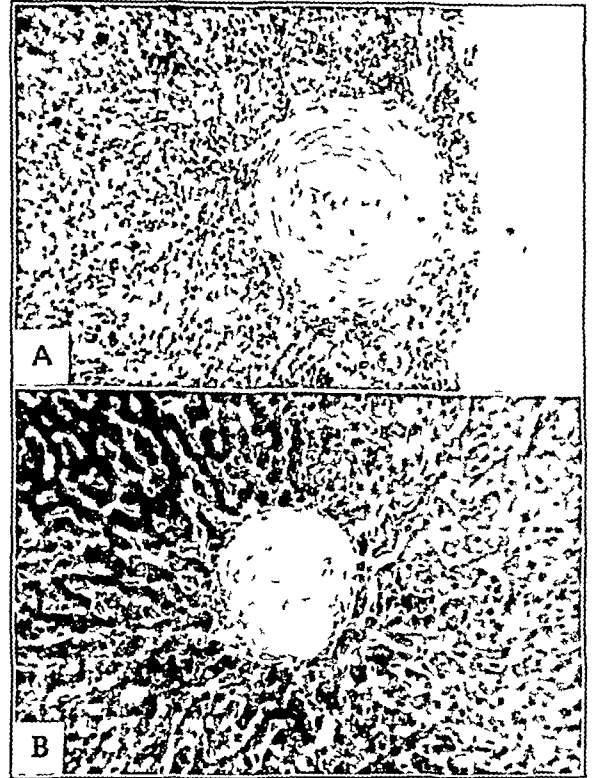


Fig. 6—Sections of human liver. *A* pseudotubercle almost completely fibrosed, note eggshell in center ( $\times 100$ ). *B* fibrous nodule marking final stage in healing of a pseudotubercle ( $\times 100$ ). Originally published in the Puerto Rico Journal of Public Health and Tropical Medicine.<sup>4</sup>

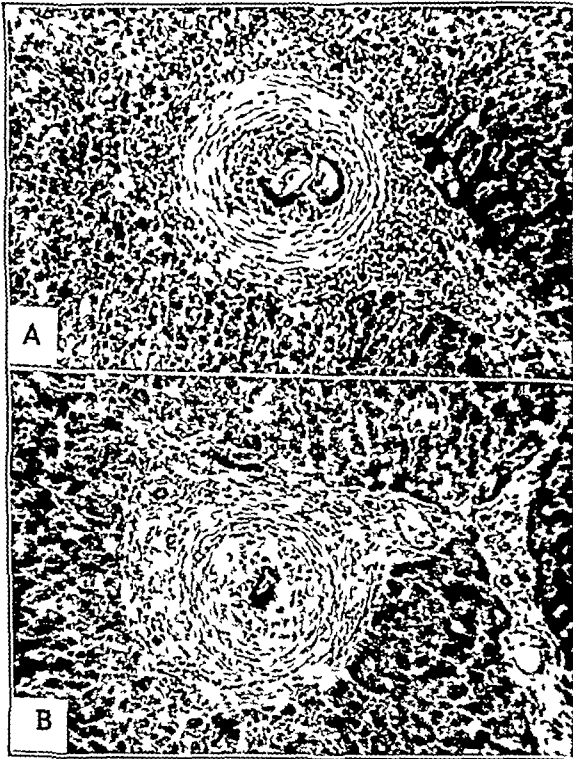


Fig. 5—Sections of human liver. *A* regressing pseudotubercle well developed capsule, note large giant cells and reduction of zone of epithelioid cells ( $\times 100$ ). *B* regressing pseudotubercle. Note eggshell in center ( $\times 100$ ). Originally published in the Puerto Rico Journal of Public Health and Tropical Medicine.<sup>4</sup>

trating cercariae. As the metacercariae pass through the pulmonary circulation, some capillaries become obstructed and even ruptured. In the former case a small focus of congestion and infiltration with eosinophils and a few round cells will result. In the case

reacts with congestion and pseudoeosinophilic infiltration. The liver, before the deposition of any ova, shows a portal phlebitis with round cell and eosinophilic response in the intima of these vessels and in the surrounding connective tissue, these alterations are diffuse but more pronounced about worms. Comparisons between different species are hazardous, however, and in later stages, at least, the hepatic alterations in the rabbit are rather different from those in man.

In man this early period usually is asymptomatic, exception being made of itching for a few hours over the parts exposed to the infested water. A history of well defined itching after falling into or bathing in, a stream should always bring to mind this disease, and if the stream is known to be infested such a history should be taken as strong presumptive evidence of infection having actually taken place. According to Pons,<sup>17</sup> some patients complain of anorexia, weakness, loss of weight, headache, nausea, vague intestinal symptoms, looseness of the bowels and either feverishness or short accessions of high fever. These symptoms have their onset a few days to two weeks after exposure, and not all of them may be present at a given time. Unfortunately, these manifestations have so far been

<sup>17</sup> Pons J. A. Studies on Schistosomiasis Mansonii in Puerto Rico. V. Clinical Aspects of Schistosomiasis Mansonii in Puerto Rico. Puerto Rico J. Pub. Health & Trop. Med. 13: 171 (Dec) 1937.

studied in but few cases and, furthermore, it seems probable that they are present in the heavier infections only. Before ova begin to pass with the feces, there are no sure means of establishing the diagnosis.

*Intermediate Stage*—This is taken to begin with the onset of oviposition on or about the fortieth day after exposure. By this time all predestined wandering through the body has come to an end, and the worms have reached maturity.

The first well defined symptoms of this stage, and of schistosomal infection as a whole, begin at different times, according to different authors. Pons sets the beginning at thirty-nine to forty-five days after exposure. Girges<sup>18</sup> at twenty-one to thirty-five and Lawton<sup>19</sup> at twenty-eight to eighty-four days. The symptoms have an abrupt onset with fever, accompanied or not by a chill, having a remittent or intermittent course and reaching 102 or as high as 104 F daily. The duration is at least two or three weeks, probably longer when not cut short by treatment. The fever is accompanied by the usual symptoms of a febrile process by generalized or localized abdominal discomfort, with or without pain, which may be colicky, by nausea, vomiting, abdominal distention, dysenteriform manifestations, urticaria and cough, which can be hacking and persistent. Physical examination may disclose patchy areas suggestive of bronchopneumonia and enlargement of the spleen and liver. There may be severe eosinophilia with a low, normal or elevated leukocytic count.

Faust, Jones and Hoffman<sup>20</sup> found that ova of *S. mansoni* begin to appear, in the stools of monkeys experimentally infected, thirty-seven to forty-two days after exposure. In the rabbit and white rat I first encountered ova in sections of the liver on the fortieth day. As Pons<sup>17</sup> well points out, the onset of the fever in his cases coincided quite precisely with the beginning of oviposition. From this time on large numbers of ova with their contained embryos are being deposited in the intestine and being carried to the liver. While some reach the intestinal lumen, many others are retained in the tissues, the embryo soon dies, often even while the ovum is still within a blood vessel, and the ova provoke an inflammatory reaction. The febrile period of this stage of the disease is best explained as part of the host's response to the ova and to the humoral phenomena, probably of allergic nature, incidental to the death and disintegration of large numbers of embryos. It is also highly probable that in cases in which these manifestations are present worms are passing to the lungs and giving rise to patchy areas of pneumonia.

Girges and Lawton set the onset of the febrile period at an earlier date than Pons, but this discrepancy might well be of no fundamental importance, for it is to be expected that in some cases, especially in the more heavily infected, the symptoms of the early stage may be so severe as to blend with those of the stage under discussion. The late onset given by Lawton, as up to the eighty-fourth day after exposure, is not readily explainable.

After the initial febrile period which does not occur in all cases, the clinical course is variable. If the infection has been slight symptoms are very mild or altogether lacking. Other patients will go through irregular periods of abdominal discomfort, of more or less severe, more or less prolonged diarrhea, often with blood in the stools. There may be further febrile accessions. The diarrhea may be accompanied by tenesmus and may alternate with periods of constipation. During times of quiescence both the diarrhea and the abdominal discomfort or pain may be provoked by dietary excesses or indiscretions, or by the ingestion of spirituous liquors. Frequently there is nothing very characteristic about the disease during the early part of this stage, and the spleen and liver may not be palpable for a number of years after onset. However, given the geographic possibility of infection having taken place in a given case, diarrhea with blood in the stools and obscure abdominal symptoms call imperatively for inclusion of the disease in the differential diagnosis. In this stage of the disease eosinophilia is a very frequent finding and of great value in calling the observer's attention to a parasitic illness.

Not enough emphasis can be laid on the importance of establishing the diagnosis at this stage and the earlier the better. Failure to do so and to carry on treatment will seal the patient's fate or condemn him to prolonged ill health.

During this time a chronic colitis with alternating phases of acuteness and quiescence is being established. The mucosa may show extensive superficial ulceration, and sometimes polyps or fistulas will form. The ova which are being swept from intestinal venules into the liver are caught in the portal venules and do their damage in the portal spaces. The splenic enlargement at this stage is due to congestion secondary to the portal fibrosis, and to reticuloendothelial hyperplasia.

The gravity of the symptoms and the outcome of the disease depend on how heavy the infection has been and on whether oviposition can be stopped through treatment by destroying the adult worms before the hepatic fibrosis has developed into a true cirrhosis. It is usually a matter of ten or twelve years before frank cirrhosis develops.

*Late Stage*—This has been previously defined as the stage of frank visceral damage. It is obvious that, for a given case, the classification will depend on what the observer would consider frank damage. According to my conception of this disease, the main criterion in the average case of schistosomiasis should be the question of whether or not hepatic cirrhosis is already present. Aberrant localizations of ovipositing worms may at any time give rise to such frank visceral damage as oophoritis or salpingitis, but these are complications which may appear quite early in the course of the disease and, if diagnosed in time, should be amenable to treatment. The colitis itself, which may constitute a prominent part of the clinical picture from very early in the course, should not, unless grossly misdiagnosed and neglected, decide the outcome of the disease. Bilharzial pulmonary arteritis and bilharzial myelitis are grave but rare manifestations and constitute complications rather than an integral part of the natural history of the malady. The average patient with uncomplicated schistosomiasis in the late stage will as a rule succumb to hepatic cirrhosis, and it is the condition of the liver that decides the prognosis.

18 Girge Rameses Schistosomiasis (Bilharziasis) London, John Bale Sons and Danielsson Ltd. 1934. The Clinical Aspects of Schistosomiasis Mansoni. Puerto Rico J. Pub. Health & Trop. Med. 13: 171 (Dec.) 1937.

19 Lawton F. B. Schistosomum Mansoni. Early Clinical Features of the Disease. publication by Commonwealth of Australia Department of Defense. 1917. p. 11.

20 Faust E. C. Jones C. A. and Hoffman W. A. Studies in Schistosomiasis Mansoni in Puerto Rico. III. Biologic Studies. 2. The Mammalian Phase of the Life Cycle. Puerto Rico J. Pub. Health & Trop. Med. 10: 133 (Dec.) 1934.

In the late stage the clinical picture is dominated by the manifestations of cirrhosis with splenomegaly, ascites, anemia and cachexia. Diarrhea may still occur in bouts, but it may be altogether absent for long periods. Vague abdominal symptoms and pain of variable intensity referred to some part of the colon usually persist. At any time during this stage there may come recurrences of fever lasting from a few days to several weeks. Eosinophilia may persist in some cases while in others it is lacking. Ova are often absent from the stools, not so much in our opinion, because of fibrosis of the intestinal wall as because by this time the disease has lasted for many years and the number of ovipositing worms has become greatly reduced. The clinical picture may be the exact duplicate of Laennec's cirrhosis or it may mimic the Banti syndrome when, as not infrequently happens, there is anemia with leukopenia. Hematemesis is of frequent occurrence and may be the first indication of cirrhosis, not infrequently it is the immediate cause of death.

The diagnosis at this stage depends on the clinical history, on the presence of eosinophilia, on repeated search for ova in the stools utilizing methods of concentration and, lastly, on exploratory laparotomy with biopsy of the liver. Fairley's complement fixation<sup>21</sup> and cutaneous<sup>22</sup> tests, as well as Tahaferro's precipitin test,<sup>23</sup> hold great promise as aids in diagnosis. It is unfortunate however, that since they have not yet been applied in large numbers of cases their limitations and pitfalls are not fully known.

Once cirrhosis is well developed, it is probable that the establishment of the diagnosis becomes of little more than academic interest. Certainly, some symptoms like those of colitis may be very favorably influenced by judicious treatment even in the far advanced cirrhotic case, but practically no effect will be exercised on the hepatic process, which will continue to progress relentlessly even after the parasites are destroyed.

Pathologically, the cases in the late stage usually present but little evidence of acute colitis. This will depend on how active the infestation was at the time of death. If, as obtains in many cases, there had been no recent reinfections, and ten or fifteen years had elapsed since the last one, the number of worms encountered will be small or preponderantly of one sex, with the result that the number of ova reaching the large intestine has by this time become greatly reduced. Some fibrosis of the submucosa in the sigmoid and rectum will, however, usually be demonstrable and ova or empty egg shells, some of them calcified, will be found microscopically, mainly in the mucosa and submucosa.

The liver may be large, small or normal in size. It is always dense and pale with a surface that is usually finely nodular and only exceptionally coarsely nodular. On section the principal characteristic is the concentration of the fibrosis about the larger portal branches. When this feature is well developed there are distinct collars of white or pink connective tissue about these veins—the so-called pipestem type of cirrhosis of Symmers<sup>24</sup>. Once I encountered, in a man aged 24,

a greatly deformed liver with all the external appearances of a hepar lobatum. Yet in this case there was no indication that syphilis was present, so that the possibility that schistosomiasis may at times duplicate the gross external appearance of late syphilis of the liver ought to be kept in mind. Microscopically, there is diffuse scarring of portal spaces with formation of pseudotubercles about ova, diffuse and focal infiltration with lymphocytes, plasma cells and eosinophils and more or less pigmentation of Kupffer's cells and phagocytes in the periportal tissues, with finely divided brown pigment which is opaque when viewed with the compound microscope without Nicol prisms.

The spleen may not be enlarged, even when there is advanced cirrhosis, but this is exceptional, splenomegaly being the rule. The spleen in cases in the late stage is characterized by a diffuse fibrosis of the pulp which ultimately results in great reduction in the number of cells in Billroth's cords and a diminution in the size

TABLE 1—Visceral Distribution of Ova

Organ	Minimal		Moderately Advanced		Severe	
	Cases	Number	Cases	Number	Cases	Number
	Examined	Positive	Examined	Positive	Examined	Positive
Liver	94	64	21	18	12	12
Rectum	57	36	12	11	6	5
Colon*	42	20	12	10	12	12
Small intestine	42	4	13	6	8	6
Lungs	94	4	21	5	11	7
Mesenteric lymph nodes	30	1	8	2	5	3
Stomach	26	0	9	0	4	1
Testis	47	0	14	0	5	1
Pancreas	83	7	20	0	11	2
Gallbladder	11	0	1	0	7	1
Spleen	97	0	21	0	12	1
Retroperitoneal tissues	1	0	0	0	2	2
Urinary bladder	17	1	4	0	0	0
Appendix	8	2	2	1	1	0
Adrenal	71	1	16	0	10	0

\* Parts other than rectum

and number of lymphoid follicles. Brown pigment is usually found in the reticuloendothelial cells of the organ.

This pigment is elaborated by the adult worms from the hemoglobin of the blood they ingest and is excreted into the portal blood. It is, therefore, taken up first, and in larger quantities by the reticuloendothelial components of the liver and also by similar cell elements in the spleen, bone marrow and mesenteric lymph nodes. The pigment cannot be differentiated by its location appearance under the microscope or microchemical constitution from malarial pigment. We believe that if due caution is exercised in ruling out the presence of malaria, the presence or absence of pigment, especially in the liver, can be utilized as a valid criterion in post-mortem studies as to the presence or absence of living worms and the degree of activity of the schistosomal infection at the time of death. If found, it must mean that there still were living worms within the host, but it cannot be interpreted as meaning that oviposition was still taking place, for the worms remaining in the late cases may all belong to the same sex. The only criterion for activity of oviposition is the finding of embryos within ova.

The distribution of schistosome ova in the various viscera in which they were encountered by microscopic examination in 147 cases of the disease is given in table 1, based on a table from a previous work.<sup>4</sup> The

21 Fairley, N. H. A Preliminary Report on an Investigation of the Immunity Reactions in Egyptian Bilharziasis. J. Roy. Army M. Corps 32: 243-267, 1919.

22 Fairley, N. H., and Williams, F. E. M. J. Australia 2: 811 (Dec. 10) 1927.

23 Tahaferro, W. H., Hoffman, W. A., and Cook, D. H. A Precipitin Test in Intestinal Schistosomiasis (S. Mansoni), J. Prev. Med. 2: 395-414 (Sept.) 1928.

24 Symmers, W. St. Clair. Note on a New Form of Liver Cirrhosis Due to the Presence of the Ova of Bilharzia Haematobia. J. Path. & Bact. 9: 237, 1904.

cases appear subdivided into three groups: minimal, moderately advanced and severe. The minimal cases had had very light infections. The moderately advanced correspond to the intermediate stage of the present classification and the severe to the late stage. The last mentioned group, however, includes 2 fairly early cases (no frank cirrhosis) of extremely heavy infection, and 1 in which death was due either to treatment with fuadin or to pulmonary bilharziasis or both. With the method used (search for ova in routine microscopic sections) the liver, colon and rectum were found to contain ova in about the same proportion in all cases. From what is known of the habits of oviposition of the worm and to a lesser extent from actual observation of sections it seems certain, however, that more ova are present in the large intestine in a given case than in the liver. Second, when the infection is older and heavier, ova are invariably found in both the liver and the colon and furthermore, they appear in viscera that are not involved when the infection is lighter or of shorter duration. This is natural, for the longer the duration and the heavier the infection, the larger the number of ova that will accumulate and the greater the chances for wandering of worms or sweeping of ova by the blood stream to unusual situations.

Thus in some instances ova will be encountered in the urinary bladder, ovary, fallopian tube, uterus, testes

TABLE 2—Cause of Cirrhosis Found at Autopsy

Number of consecutive autopsies	1,000
Cases with gross cirrhosis	70
Idiopathic	43 (57.5%)
Schistosomal	26 (34.0%)
Obstructive biliary	3 (4.0%)
Syphilitic	2 (2.6%)
Hemot. s.	1 (1.3%)

or prostate. The known intercommunications existing between the inferior hemorrhoidal vein plexus and the various pelvic plexuses explain the possibility of such localizations. Through the inferior hemorrhoidal plexus also parasites and ova may be taken up the inferior vena cava to the right side of the heart and lungs. For the schistosomal myelitis that has been described in a few instances, the explanation is not very apparent. Muller and Stender,<sup>13</sup> who saw 1 case, believe that the parasites pass from the vesical to the pelvic vein plexus and thence, by way of the lumbar, azygos and hemiazygos veins, to the veins of the anterior portions of the spinal cord. Espin,<sup>13</sup> on the other hand, believes that in his case the parasite or parasites passed from the liver by way of the hepatic artery, celiac trunk and abdominal aorta to a lumbar artery, through which the anterior spinal artery was reached. The question must remain unanswered until additional cases afford a better opportunity for analysis. It seems to me, however, from what is known about the habits of the parasite, that prolonged sojourn in arteries other than the pulmonary is probably not possible for this parasite and that a prolonged journey against the strong arterial current seems highly improbable. From the pelvic plexuses of veins the parasites ought to be able to pass rather readily to the vast vertebral plexus<sup>2</sup> from where they could reach the tissues of the spinal cord for oviposition, much as in the abdominal organs.

In our postmortem material the ultimate cause of death was hematemesis due to a ruptured esophageal varix in one third of the advanced fatal cases, cachexia due to cirrhosis in another third and complications in the remainder. The fatal complications were hyperinfection, partial intestinal obstruction from schistosomal fibrosis of the mesocolon, colloid adenocarcinoma of the cecum, fistula of the ascending colon with formation of a large retroperitoneal abscess, and pulmonary bilharziasis.

The importance of the role played in Puerto Rico by schistosomiasis as an etiologic factor of hepatic cirrhosis is well demonstrated by the analysis made in table 2 of consecutive autopsies performed in San Juan which, as previously mentioned, is not an endemic focus of the disease.

It is thus seen that schistosomiasis was the cause of the cirrhosis in fully one third of the cases.

There are certain differences between the clinical picture of this disease, as I have briefly described it from what I have seen of it in Puerto Rico, and the descriptions of Manson's schistosomiasis in Egypt. I refer particularly to the relative prominence in that country of papillomatous formations, especially in the lower part of the rectum and of symptoms of colitis without cirrhosis. In the first place I am fairly certain that in Puerto Rico, with the exception of small groups of the population in a few endemic foci, the infection on the average is milder than in Egypt. This seems due to differences in the habits of the population and in certain socioeconomic factors between the two countries. In other words, the chances of infection and repeated reinfection with heavy doses seem to be much greater in the case of the Egyptian fellahs than in that of the Puerto Rican jíbaro. Such being the case one can expect intestinal manifestations to be more severe and prominent in Egypt than in Puerto Rico and the intermediate stage to be more frankly dominated by symptoms of colitis. If to this is added the greater difficulty encountered in Egypt for case finding and follow-up, because of the vastly larger numbers of the population that are infected in the Nile Delta as compared with those in Puerto Rico, one can well imagine that the number of patients who go untreated or insufficiently treated must be greater than in Puerto Rico.

#### COMMENT

I have endeavored in the course of this presentation to emphasize certain aspects of the disease that seem to me of considerable importance. First, my view that as regards the final outcome of the average case of Manson's schistosomiasis the all important indication is to establish the diagnosis and institute treatment before the onset of cirrhosis. Second, even though at a given time in the course of the disease the presenting symptoms may be mainly referable to some organ (colon, lung, spleen) other than the liver, ova are constantly accumulating in the latter organ and producing a fibrosis which will in time give rise to an irreversible cirrhosis. Third, schistosomiasis should be thought of whenever, in an individual who has lived or sojourned in an endemic focus of the disease, there are abdominal complaints of any kind, hepatosplenic enlargement, fever with eosinophilia, evidences of cirrhosis or a Banti syndrome. Lastly, it may require a searching history, repeated fecal examinations by methods of concentration and even exploratory laparotomy with biopsy of the liver for the presence or absence of the disease to be firmly established.

2. Batson, O. V. The Role of the Vertebral Veins in Metastatic Processes. *Ann. Int. Med.* 16: 38 (Jan.) 1942.

## Council on Foods and Nutrition

THE ENRICHMENT OF FLOUR AND BREAD RECOMMENDED BY THE FOOD AND NUTRITION BOARD OF THE NATIONAL RESEARCH COUNCIL AND IN THE CASE OF FLOUR NOW RECOGNIZED OFFICIALLY BY THE FEDERAL FOOD AND DRUG ADMINISTRATION FOLLOWS CERTAIN POLICIES WHICH PREVIOUSLY WERE ADOPTED BY THE COUNCIL (ANNUAL MEETING OF THE COUNCIL ON FOODS AND NUTRITION THE JOURNAL AUG 19 1939 P 680). THE COUNCIL FOR SOME TIME COGNIZANT OF THE DISADVANTAGE IN THE LOSS TO THE DIET OF THIAMINE (VITAMIN B<sub>1</sub>) BROUGHT ABOUT BY THE EXTENSIVE USE OF HEAVILY MILLED WHITE FLOUR ANNOUNCED IN 1939 THAT IT WOULD REGARD WITH FAVOR THE RESTORATIVE ADDITION OF THIS AND OTHER VITAMINS TO WHITE FLOUR. IT THEREAFTER HAS BEEN PLEASED TO SET THE SUCCESSFUL APPLICATION OF THIS POLICY IN THE RAPIDLY EXTENDING USE OF ENRICHED FLOUR AND ENRICHED BREAD. LATE REPORTS INDICATE THAT NO LESS THAN 70 PER CENT OF ALL FAMILIA GRADE WHITE FLOUR AND BAKERS WHITE BREAD HAD BEEN ENRICHED BEFORE THE END OF 1942. AN ORDER OF THE RECENTLY CREATED FOOD DISTRIBUTION ADMINISTRATION REQUIRED ENRICHMENT OF ALL BAKERS WHITE BREAD AFTER JANUARY 18 1943.

SUBSTITUTION OF ENRICHED FOR UNENRICHED WHITE BREAD INCREASES THE THIAMINE INTAKE PROVIDED BY THE 'AVERAGE' DIET OF 2500 CALORIES FROM SOMETHING LESS THAN 0.9 TO APPROXIMATELY 1.3 MG PER DAY (HANE R J JOHNSON ELIZABETH AND WILLIAMS R R J NUTRITION 23 613 [JUNE] 1942). IF LIQUID SKIMMED MILK IS USED IN PLACE OF WATER IN MAKING BREAD OR AS HAS BECOME A COMMON BAKERS PRACTICE IF 6 PARTS OF DRIED SKIMMED MILK SOLIDS FOR EACH 100 PARTS OF FLOUR IS ADDED TO THE DOUGH THE RIBOFLAVIN CONTENT OF THE RESULTING BREAD COMPLIES WITH PROPOSED STANDARDS FOR ENRICHED BREAD.

EVIDENCE OF THE NUTRITIONAL SIGNIFICANCE OF THESE SMALL ADDITIONAL DAILY INCREMENTS OF THIAMINE AND RIBOFLAVIN IS PRESENTED IN THE FOLLOWING SPECIAL ARTICLE AUTHORIZED FOR PUBLICATION BY THE COUNCIL.

FRANKLIN C BING Secretary

### EVALUATION OF NUTRITIVE CONTRIBUTION OF ENRICHED WHITE FLOUR

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The nutritive contributions of diets in which the bread component was made of enriched white flour plain white flour and whole wheat flour respectively have been studied, with particular reference to satisfaction of human requirements for thiamine and riboflavin. We have not had experience with the analytic methods for determination of niacin—also a constituent of enriched flour—and consequently were limited to noting the presence or absence of symptoms of abnormality attributable to deficiency of niacin in deciding whether requirements for niacin were satisfied. The standard diet when the flour used was plain white flour, provided approximately 0.22 mg of thiamine, 0.35 mg of riboflavin and 2.5 mg of niacin per thousand calories. This degree of restriction of thiamine, riboflavin and niacin is probably not greater than obtains frequently in the diets of certain population groups of the United States.

#### METHODS OF STUDY

Women who volunteered were transferred to the nutrition division of the hospital and provided with a diet supplemented so that satisfactory tissue stores of thiamine and riboflavin and of other members of the vitamin B complex were assured. During this foreperiod the subjects received their preliminary examinations and were familiarized with the routines and procedures of the ward. After this period of preliminary observation seven of the women were chosen for

study. Selection was made on the basis of absence of significant physical or emotional defects, absence of evidence of abnormal nutrition, and willingness and ability to cooperate. Moderate supervised activity was permitted—such as housekeeping, laundering and sewing.

The standard diet was composed of foods which commonly appear on American tables. The flour in the diet of 2 subjects (1 and 2) was plain, unenriched white flour—flour 1. The diet of these subjects contained by analysis approximately 0.22 mg of thiamine and 0.35 mg of riboflavin per thousand calories. The flour in the diet of 3 subjects (3, 4 and 5) was the same flour which had been enriched by the addition of 2.5 mg of thiamine, 18.0 mg of niacin and 27.3 Gm of nonfat milk solids<sup>1</sup> per pound (454 Gm)—flour 2. The diet in which the flour was thus enriched contained by analysis approximately 0.45 mg of thiamine and 0.45 mg of riboflavin per thousand calories. The flour in the diet of the last two subjects (6 and 7) was a whole grain wheat flour—flour 3—which by analysis contained 2.19 mg of thiamine and 0.66 mg of riboflavin per pound of flour (flour 3). The diet of these subjects contained by analysis approximately 0.45 mg of thiamine and 0.45 mg of riboflavin per thousand calories.

The calories of the diet approximated 2250, the carbohydrate 327 Gm, the protein 67 Gm and the fat 75 Gm. Flour contributed about 30 per cent of the calories, and sucrose and other vitamin free constituents about 15 per cent. Caloric intake was adjusted to the requirement of the individual subject by giving fractions or multiples of the diets. By this method the ratios of thiamine to calories and of riboflavin to calories were maintained nearly constant.

No supplementary provision was made for any part of the vitamin B complex, but to assure adequacy of calcium, phosphorus, iron, ascorbic acid, vitamin A and vitamin D these nutrients were provided daily as tribasic calcium phosphate 0.6 Gm, ferrous sulfate 0.2 Gm, ascorbic acid 80.0 mg and halibut liver oil fortified with irradiated ergosterol 0.2 Gm (providing 10,000 U S P units of vitamin A and 4,000 U S P units of vitamin D).

Our methods of study of thiamine and riboflavin nutrition have been presented in earlier reports. Briefly, physical and neurologic examinations, determinations of proteins, calcium and phosphorus in the serum, blood counts, determinations of pyruvic acid<sup>2</sup>, lactic acid<sup>3</sup> and dextrose<sup>4</sup> in the blood after oral administration of dextrose (Eaton-Rose dextrose tolerance test)<sup>5</sup> and basal metabolic rates were made during a period of preliminary observation, again at intervals during an experimental period and finally during an after period. Electrocardiograms were taken approximately every two months. Estimates of gastrointestinal

1 A common practice of commercial bakers is to add 6 pounds of dry defatted milk solids to each hundred pounds of flour. (This amount of milk provides enough riboflavin to make the riboflavin content of the mix near to that of a mix made of whole wheat flour.) Enriched bread complies with proposed standards for riboflavin content when it is made with this amount of flour containing skim milk solids.

2 Williams R D, Mason H L and Smith B F. Induced Vitamin B<sub>1</sub> Deficiency in Human Subjects. Proc Staff Meet Mayo Clin 14 787-793 (Dec 13) 1939. Williams R D, Mason H L, Wilder R M and Smith B F. Observations on Induced Thiamine (Vitamin B<sub>1</sub>) Deficiency in Man. Arch Int Med 66 785-799 (Oct) 1940. Williams, Mason, Smith and Wilder.<sup>11</sup>

3 Bueding Ernest and Wortis Hermin. Stabilization and Determination of Pyruvic Acid in the Blood. J Biol Chem 133 585-591 (April) 1940.

4 Barker S B and Summerson W H. The Colorimetric Determination of Lactic Acid in Biological Materials. J Biol Chem 138 535-554 (April) 1941.

5 Miller B F and Van Slyke D D. A Direct Microbiration Method for Blood Sugar. J Biol Chem 114 383-395 (July) 1936.

6 Eaton W G and Rose A R. The One Hour Two Dose Dextrose Tolerance Test. Am J Clin Path 4 381-399 1934.

motility were made by taking roentgenograms a half, one two, three and five hours after administration of a meal of barium sulfate. During determination of gastrointestinal motility the subjects were maintained in the postabsorptive state and in the sitting or standing position for the period of five hours.

Urine was analyzed for content of thiamine by the thiochrome method of Hennessy<sup>7</sup> and for riboflavin by the fluorometric method of Ferrebee<sup>8</sup> each week. An excretion of less than 100 micrograms of thiamine in twenty-four hours was considered indicative of an unsatisfactory intake of thiamine.<sup>9</sup> In the study here reported a test dose of 1.0 mg of thiamine hydrochloride and 2.0 mg of sodium riboflavin was injected subcutaneously once every month with determination of excretion for the ensuing four hours. These tests were performed with the subjects in the postabsorptive state. Excretion of less than 200 micrograms of thiamine in four hours after injection of a test dose of 1 mg was

by the fact that they were essentially relieved by later administration, May 16 to 31, of thiamine only. Physical evidence of deficiency of riboflavin or of niacin was not detected. However, the tongue of 1 subject (1) became somewhat reddened after four months, although the subject did not complain of soreness.

#### OBSERVATIONS ON SUBJECTS RECEIVING ENRICHED WHITE FLOUR (SUBJECTS OF GROUP 2)

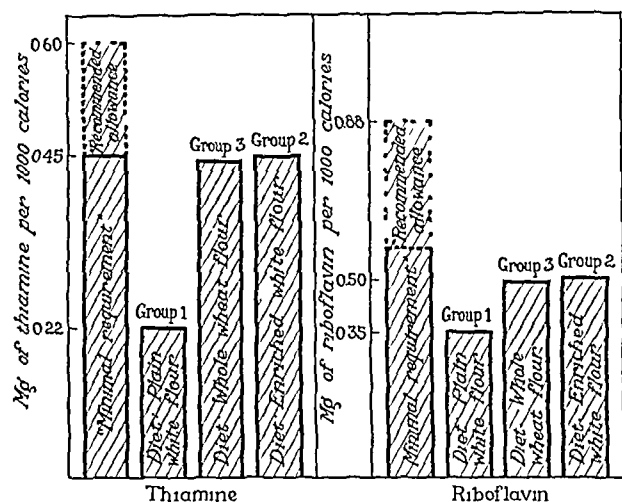
The period of maintenance on the basal diet began Sept 12, 1941 and ended May 31, 1942 (263 days). Signs or symptoms of nutritional deficiency disease were never clearly in evidence among subjects of this group. However, in subjects 3 and 5 low excretions of thiamine for twenty-four hours and somewhat unsatisfactory excretions of test doses of thiamine were encountered. In periods when excretions were lowest, mild complaints of soreness and weakness were voiced and the subjects occasionally were somewhat irritable and quarrelsome. Additional evidence that the intake of thiamine was not enough for entirely satisfactory nutritional status appeared from moderately abnormal elevations of pyruvic acid in the blood after administration of dextrose. That this mild abnormality was caused by deficiency of thiamine is indicated by the fact that administration of 15 mg of thiamine hydrochloride daily in the period May 16 to May 31, 1942 was associated with its correction. The presence of mild metabolic defect, excretions of less than 100 micrograms in twenty-four hours and excretions of less than 200 micrograms in four hours after administration of a test dose of 1 mg of thiamine constitute evidence which as we have discussed in another paper,<sup>10</sup> suggests that 0.45 mg of thiamine per thousand calories is something less than a satisfactory intake of this vitamin.

Likewise the excretions of riboflavin for twenty-four hours and for four hours after a test dose of 2 mg of riboflavin were somewhat low, indicating some degree of depletion of tissue stores of riboflavin. However, abnormalities of the skin, the eyes and the tongue characteristic of riboflavin deficiency did not develop.

#### OBSERVATIONS ON SUBJECTS RECEIVING WHOLE WHEAT FLOUR (SUBJECTS OF GROUP 3)

The period of maintenance on the basal diet began Sept 12, 1941 and ended May 31, 1942 (263 days). One subject (6) complained of weakness and mild loss of appetite after 100 days. These conditions were associated with some reduction of activity. At about this time excretions of thiamine fell to less than 100 micrograms in twenty-four hours and excretions after the test dose of thiamine fell to less than 200 micrograms. At about the two hundredth day this subject complained of numbness and tingling of the medial surfaces of the legs. The condition did not progress during the ensuing sixty days. That the complaints had basis in biochemical defect is indicated by values for pyruvic acid in the blood after administration of dextrose. The biochemical defect was corrected when 15 mg of thiamine hydrochloride daily was provided in the period May 16 to May 31, 1942.

The nutritional status of the second subject of this group (7) continued better throughout the period of study than that of the other subject of this group, and also better than that of subjects of group 2. The ordinary excretions of thiamine and riboflavin were higher and excretions after test doses of thiamine and riboflavin indicated that depletion of tissue stores of thiamine and of riboflavin was minimal. Possible



A comparison of intakes of thiamine and riboflavin by experimental subjects with minimal requirements (suggested by our own data) of thiamine and riboflavin and with allowances recommended by the Food and Nutrition Board of the National Research Council (dotted line).

considered indicative of depletion of tissue stores of this vitamin.<sup>10</sup> We are as yet not ready to make comparable evaluations for excretions of riboflavin.

#### OBSERVATIONS ON THE SUBJECTS RECEIVING PLAIN UNENRICHED WHITE FLOUR (SUBJECTS OF GROUP 1)

The period of maintenance on the basal diet began Sept 12, 1941 and ended May 31, 1942 (263 days). Signs, symptoms and metabolic defects suggestive of deficiency of thiamine developed within 100 days. The deficiency syndrome was not essentially different from the syndrome of chronic, moderate restriction of thiamine which we previously have described.<sup>11</sup> That the signs, symptoms and metabolic defects observed were caused principally by deficiency of thiamine is indicated

<sup>7</sup> Hennessy D J. Chemical Methods for Determination of Vitamin B<sub>1</sub>. *Indust & Engin Chem (Analyst Ed)* **13**: 216-218 (April 15) 1941.

<sup>8</sup> Ferrebee J W. The Urinary Excretion of Riboflavin. *Fluorometric Method for Its Estimation*. *J Clin Investigation* **19**: 251-256 (Jan) 1940.

<sup>9</sup> Mason H L and Williams R D. The Urinary Excretion of Thiamine as an Index of the Nutritional Level. *Assessment of the Value of a Test Dose*. *J Clin Investigation* **21**: 247-255 (March) 1942.

<sup>10</sup> Williams R D, Mason H L and Wilder R M. The Minimum Daily Requirement of Thiamine of Man. *J Nutrition* **25**: 71-97 (Jan 11) 1943.

<sup>11</sup> Williams R D, Mason H L, Smith B F and Wilder R M. Induced Thiamine (Vitamin B<sub>1</sub>) Deficiency and the Thiamine Requirement of Man. *Further Observations*. *Arch Int Med* **69**: 721-738 (May) 1942.



explanations are better initial stores of thiamine and riboflavin lower requirements for them or better utilization of ingested vitamins. This subject was the youngest and most robust of the subjects of all three groups.

#### COMMENT AND SUMMARY

Adult human subjects were maintained for a period of nearly nine months (263 days) on a diet which contained 170 Gm (6 ounces) of ordinary white flour, which provided approximately 0.2 mg of thiamine and 0.35 mg of riboflavin per thousand calories. It was constructed of foods which commonly appear on American tables. Every subject received each day lean beef 100 Gm or beef 75 Gm and cottage cheese 35 Gm, canned carrots or beets or corn 50 to 75 Gm, lettuce or celery 30 Gm, tomatoes 75 Gm or lemon juice 20 Gm, canned pineapple 80 Gm or applesauce 100 Gm or dried sulfured apricots 30 Gm, butter 45 Gm, cream (35 per cent butterfat) 75 Gm, flour used in bread, cake or for other purposes 170 Gm and sugar as such or used in cake, jelly or candy 100 Gm. The calories closely approximated 2,250, the carbohydrates 327 Gm, the protein 67 Gm and the fat 75 Gm. The flour contributed about 30 per cent of the calories, and the sugar and other vitamin free constituents about 15 per cent. Thiamine deficiency disease developed, evidenced by clinical signs and symptoms, low excretions of thiamine and abnormal elevations of pyruvic acid in the blood after oral administration of dextrose.

Other subjects maintained on a regimen which was identical in every respect to the diet described, with the exception that the quota of flour was an enriched flour, to which furthermore 6 parts of skim milk solids was added for each 100 parts of flour—a common bakers' practice—maintained a nutritional status which was reasonably satisfactory. Signs, symptoms and metabolic defects suggestive of thiamine deficiency of an exceedingly mild degree were, however, observed. These subjects as far as could be determined, at the end of the period of study were in as good a physical status as the subjects of a third group who received the same diet, with the exception that the quota of flour was a whole grain flour.

The clinical courses, the excretions of thiamine and riboflavin and the apparent biochemical status of subjects who received either the flour with thiamine, niacin and nonfat milk solids added or the whole grain flour were very much better than the courses and status of the subjects who received the ordinary white flour.

The conclusion seems to be fully justified that a flour which contains, as a minimum, 20 mg of thiamine and 150 mg of niacin per pound (454 Gm) with 6 parts per hundred of nonfat milk solids is nutritionally a satisfactory food.

A further comment appears justified. Estimates based on disappearance of flour in the United States, exclusive of exported flour, indicate that the average per capita consumption of flour daily approximates 6.5 ounces (185 Gm) and that this contributes about 25 per cent of the calories of the average diet. Similar estimates based on disappearance of sugar indicate that the consumption of sugar per capita daily approximates 3 ounces (85 Gm) and that sugar thus contributes from 13 to 17 per cent of the calories of the average diet. In the diets used in the experiments here reported, the contribution of flour, sugar and other vitamin free constituents to the total calories approxi-

mated 30, 10 and 5 per cent respectively. From these estimates and from the experimental results it would appear that the average American diet, when its flour quota is plain, unenriched white flour, provides an insufficient amount of thiamine except when its foods other than its content of flour and sugar are selected with greater care than probably is customary. Restorative enrichment of white flour with thiamine to whole wheat levels helps greatly to correct this defect, whereas comparable enrichment with riboflavin, namely to whole wheat levels, will not correct the deficiency of the average diet in riboflavin (as shown in the accompanying chart). Our experiment was not designed to provide similar information about nicotinic acid (niacin).

## Council on Pharmacy and Chemistry

### NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

AUSTIN E. SMITH, M.D., Secretary

**OVARIES** (See New and Nonofficial Remedies, 1942, p. 373)

The following dosage form has been accepted:

**THE LAKESIDE LABORATORIES, INC., MILWAUKEE**

**Solution of Estrogens (in oil)** 10 cc rubber stoppered vials. Each cubic centimeter contains the equivalent of 20,000 international units of estrone and 0.5 per cent of chlorobutanol as a preservative in sesame oil.

**NIKETHAMIDE** (See the Supplement to New and Nonofficial Remedies, 1942, p. 17)

The following dosage form has been accepted:

**THE LAKESIDE LABORATORIES, INC., MILWAUKEE**

**Ampul Solution of Nikethamide 25% W/V** 1½ cc 0.5 per cent chlorobutanol added as a preservative.

**PYRIDOXINE HYDROCHLORIDE** (See New and Nonofficial Remedies, 1942, p. 563)

The following dosage forms have been accepted:

**THE UPJOHN COMPANY, KALAMAZOO, MICH.**

**Tablets Pyridoxine Hydrochloride** 10 mg

**Ampoules Sterile Solution Pyridoxine Hydrochloride** 50 mg in 2 cc

**JOHN WILEY & BROTHER, INC., PHILADELPHIA**

**Tablets Pyridoxine Hydrochloride** 25 mg

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**RIBOFLAVIN** (See New and Nonofficial Remedies, 1942, p. 559)

The following dosage forms have been accepted:

**THE WALKER VITAMIN PRODUCTS, INC., MOUNT VERNON, N. Y.**

**Tablets Riboflavin** 1 mg and 5 mg

**SODIUM MORRHUATE** (See New and Nonofficial Remedies, 1942, p. 290)

The following dosage forms have been accepted:

**GEORGE A. BREON & COMPANY, INC., KANSAS CITY, MO.**

**Solution of Sodium Morrhuate 5% with Benzyl Alcohol 2%** 5 cc vials. Each cubic centimeter contains sodium morrhuate 0.05 Gm (¾ grain) and benzyl alcohol 0.02 Gm (⅓ grain) in aqueous solution.

**BURROUGHS WELLCOME & CO., INC., NEW YORK**

**Hypoloid (Ampoule Solution) Sodium Morrhuate 5%, 2 cc.** Each cubic centimeter contains sodium morrhuate 0.05 Gm and 0.5 per cent of phenol as a preservative.



# THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY MARCH 20 1943

## THE SAFETY OF POOLED HUMAN PLASMA

In a discussion of the toxicity of human plasma a few months ago,<sup>1</sup> THE JOURNAL called attention to the results of observations on the intravenous injection of unpooled plasma by Levine and State.<sup>2</sup> Their work dealt with unpooled or monovalent plasma, the conclusion that there is "a correlation between skin sensitivity to the plasma and reactions after plasma transfusions" is not applicable therefore to pooled plasma. The authors themselves state that "it is not known what pooling of plasmas will do toward the elimination of transfusion reactions."

In the meantime the excellent results in the clinical use without preliminary tests, of plasma indicate that pooling under standard requirements, perhaps by mere dilution, inactivates substances—antigens, haptens, antibodies—that may be present in individual samples of plasma. Possibly also the introduction from without of harmful substances is prevented by the method of preparing pooled plasma. It should not be overlooked that general reactions may follow almost any kind of intravenous injection, e. g. saline solution of dextrose, owing perhaps to the presence of nonspecific, pyrogenic substances. Polayes and Squillace<sup>3</sup> attributed chill and shock in a woman with postpartum hemorrhage to the intravenous injection of a solution of dried human plasma. While it is not absolutely certain that the plasma used was or was not pooled, account was not taken of the injection of 1,000 cc of 10 per cent dextrose in saline solution shortly before the plasma was given. The conclusion that the reaction was due to plasma is open to challenge because it may have been caused by the dextrose solution.

1 Toxicity of Human Plasma editorial J A M A 120 206 (Sept 19) 1942

2 Levine Milton and State David Skin Sensitivity to Human Plasma Science 96 68 (Jul 17) 1942 A and B Substances as a Cause of Reactions Following Human Plasma Transfusions J A M A 120 275 (Sept 26) 1942

3 Polayes S H and Squillace J A Near Fatal Reaction to Transfusion with Dried Human Plasma Solution J A M A 118 1050 (March 28) 1942

From a careful analysis of extensive data, Thallmer<sup>4</sup> concludes that in pools of plasma or serum, agglutinins are reduced to such a low level "that no danger can result to patients from the injection of even large doses of these pools." Large amounts of pooled plasma are given safely without any preliminary tests for compatibility. The demonstration of the surpassing value of pooled human plasma in shock has been designated "a major medical victory."

## PROPAMIDINE IN CHRONIC WOUND INFECTION

A series of aromatic diamidines prepared by Ewins was found by Lourie and Yorke<sup>1</sup> to possess activity against protozoal organisms as well as antimicrobial action. From the consideration of the chemical structure of these compounds it was expected that their antibacterial effect would not be inhibited by p-aminobenzoic acid as is the case with the sulfonamides. Thrower and Valentine<sup>2</sup> point out that sulfathiazole in a minimal concentration of 1/32,000 exerted an antibacterial effect and that this effect was completely inhibited by the addition of 1/10,000 to 1/1,000,000 of p-aminobenzoic acid. Propamidine, however, was unaffected by the p-aminobenzoic acid in the same dilutions and exerted an antibacterial effect at the minimal effective concentration of 1/128,000 in both cases.

In vitro experiments indicated that 4,4'-diaminodiphenylpropane dihydrochloride (propamidine) possesses a bacteriostatic activity against *Staphylococcus aureus* of the same order as sulfathiazole. The bactericidal activity of this drug appears to be equal to its bacteriostatic activity. Effective concentrations of this substance did not inhibit phagocytosis or cause hemolysis, and the bactericidal effect was not seriously lessened by the presence of pus. Clinical application of propamidine in 50 cases demonstrated that a concentration of 0.1 per cent of the drug in a 4.5 to 5 per cent strength of a watery methyl cellulose jelly will clear an infected area of dangerous organisms within ten days. Long application may lead to a mild superficial necrosis and to a relapse in the bacteriologic picture. The general efficacy of the preparation was demonstrated by the rapid improvement noted in all the cases. The wounds treated had often remained infected for months—sometimes for more than a year. The regular response to the application of the jelly could not have been due to chance.

McIndoe and Tilley<sup>3</sup> report 11 cases of persistent hemolytic streptococcus infection in which other methods had failed and in which 0.1 per cent propamidine

4 Thallmer William Intravenous Injections of Pooled Normal Plasma or Serum J A M A 120 1262 (Dec 19) 1942

1 Lourie E M and Yorke Warrington Studies in Chemotherapy—The Trypanocidal Action of Certain Aromatic Diamidines Ann Trop Med 23 289 (Dec 30) 1939

2 Thrower W R and Valentine F C O Propamidine in Chronic Wound Sepsis Lancet 1 133 (Jan 30) 1943

3 McIndoe A H and Tilley A R Propamidine in Chronic Streptococcal Infection of Raw Surfaces Lancet 1 136 (Jan 30) 1943

in a water soluble jelly base controlled the infection within four to ten days. Cases with persistent streptococcal infection in wounds constitute a constant danger in an open ward from the point of view of cross infection. Elimination of the responsible organism, therefore, is of the highest importance. The new drug seems to offer the possibility of eliminating this danger and should therefore be useful in a plastic unit.

Morley and Bentley<sup>4</sup> report encouraging results with propamidine in a small number of cases of burns. They suggest that the drug applied as 0.1 per cent propamidine with 1 per cent amyllocaine hydrochloride in a Mumford base (a Linette wax) may prove an ideal first aid preparation in burns. Almost all their cases have shown on culture a profuse growth of *Proteus vulgaris* and *Pseudomonas aeruginosa* and diphtheroids. These growths have been so profuse that they may have obscured any streptococci and any other organisms present. However, absence of systemic reaction and speedy healing of the burned areas without relapse suggest that streptococcal and staphylococcal infection is effectively controlled. Before grafting is to be contemplated it is necessary, after a period of treatment with propamidine, to eradicate *Proteus vulgaris* and *Pseudomonas aeruginosa*, which are both pus producers.

Kohn, Hall and Cross<sup>5</sup> treated 8 cases of infected wounds and found that Thiersch and pedicle grafting was made possible much earlier with the use of propamidine than with any other method they had used before.

The investigations here summarized seem to indicate that the therapeutic armamentarium against infected wounds is now extended by a product with some virtues not evident in the sulfonamides. Obviously more extended studies are needed to determine under well controlled conditions its relative advantages and limitations. Sulfonamides, penicillin, gramicidin and now propamidine constitute a remarkable list of products useful against infection.

#### NEW YORK PRESCRIBES STANDARDS TO SAFEGUARD USE OF HUMAN BLOOD PRODUCTS FOR TRANSFUSION

Requirements have been prescribed by the Public Health Council of the State of New York, effective March 1, governing the methods of preparation, distribution and use of human whole blood, human plasma, human serum and other human blood derivatives for transfusion purposes. These requirements, having the effect of law in all areas of the state except New York City, represent, it is believed, the first regulatory action taken by a state body in a field that is growing rapidly in importance not only in relation to war needs but to

civilian emergencies as well. In the Boston night club disaster 1,000 units of plasma was used, representing 300,000 cc of human blood.

The new regulations provide that all laboratory tests required as an aid in determining that blood donors are free from communicable disease, including malaria and syphilis and tests for sterility required to determine that the blood plasma, serum or any derivative is suitable for purposes of transfusion must be made in an approved laboratory. Blood processing laboratories and hospitals must submit to the commissioner of health statements of processing procedures and must keep accurate and complete records. A circular giving detailed instructions for the use of the product must accompany each final container, copies of which are required to be filed with the state health commissioner. Each package must be labeled with the dosage unit value in standard units and the expiration date. Premises, equipment, procedures, records and circulars of instruction must be open to inspection by the state commissioner of health or his authorized representative.

Complete and accurate records must be kept of transfusions by the institutions in which they are performed, the details of which all set up in the new regulations vary according to the substance used, whether human blood, human plasma, human serum or other derivatives. If unstored human blood is used for instance, certification from a physician licensed in New York must be recorded showing that a physical examination of the donor was made within the preceding thirty days, that the donor is free from communicable disease, including malaria and upper respiratory infection, and that the blood of the donor has a hemoglobin content of at least 11 Gm per hundred cubic centimeters of blood. The results of serologic tests for syphilis and of tests to determine the blood group to which both the recipient and the donor belong must be recorded. If human blood plasma, human serum or other derivatives are used for transfusion the records must show the kind of product used, the name and address of the producing laboratory or hospital, the specimen or lot number or other identification of the product and its expiration date.

These new requirements were prescribed after careful and deliberate study by the New York Public Health Council and after a critical review by representatives of several hospitals, the National Institute of Health, the Office of Civilian Defense, the Medical Society of the State of New York and other interested agencies. They follow realization of the possible dangers incident to the use of improperly prepared or stored human blood products for transfusion. This initial effort by a state agency to safeguard a procedure that may be vital in the preservation of human life is commendable.

<sup>4</sup> Morley C. H. and Bentley J. P. Propamidine in Burns. *Lancet* 1 138 (Jan 30) 1943.

<sup>5</sup> Kohn F., Hall M. H. and Cross Clara D. Propamidine at an Ems Hospital. *Lancet* 1 140 (Jan 30) 1943.

## Current Comment

### SELECTIVE SERVICE PHYSICAL EXAMINATIONS

From the Selective Service System, March 1, has come a new circular to guide physicians and dentists in the preliminary physical examination of registrants. Most of this circular appears under the heading of Medicine and the War in this issue of THE JOURNAL. The character of the Selective Service physical examination was changed from a complete medical examination to a preliminary "streamlined" physical examination to hasten the actions of the local boards and to compensate to some extent for the shortage of physicians. Moreover, final authority for physical examination rests with the armed forces; it has seemed undesirable to submit the selectee to two complete duplicate physical examinations. The circular emphasizes that an actual inspection of the selectee must be made. Unfortunately some local draft boards have not even examined men in the nude or in action so that boys with only one leg, with draining fistulas or with severe deformities of the spine were sent to induction stations. When the requirements for teeth were changed, some local examiners neglected to inspect the mouth of the selectee. The circular points out that inspection of the oral cavity is still an integral part of the examination and severe dental defects should be sufficient to disqualify the registrant for military service. Finally, the circular emphasizes that the examination must be given by a physician and cannot be delegated to any one less qualified. The details of the examination, as published elsewhere in this issue, should be most carefully studied by every physician whether or not now associated with the Selective Service System. Future developments may require his participation; in some instances he may be called for advice either by the selectee or by others concerned with the decisions of the local board.

### CURRENT MORTALITY ANALYSIS

The increased importance at this time of information on public health conditions stimulated the Bureau of the Census to revise its procedure. Certain statistics of national mortality are made available many months in advance of the time formerly possible. This information will be published under the heading "Current Mortality Analysis" and will appear each month approximately seven weeks after the close of the month in which the deaths occur. The first issue, which is concerned with the mortality analysis during the fall months of 1942, has just appeared. During the autumn and early winter of 1942, this report states, surprisingly good health conditions prevailed in the United States. "Current Mortality Analysis" is especially designed for a limited distribution among persons whose work demands that they observe public health trends in the United States during the war. Those making request to the Bureau of the Census may receive this publication without cost.

### BULK ETHER

THE JOURNAL and the Council on Pharmacy and Chemistry have commented previously on the use of bulk ether.<sup>1</sup> These are times when restrictions and savings have a special significance. The use of bulk ether may be a contribution to conservation in the war effort. The U. S. Pharmacopeia XII states that "ether to be used for anesthesia must be preserved in tight containers of not more than 3 Kg. capacity." Therefore it would be illegal to ship ether labeled For Anesthesia in containers which hold more than this amount. The Food and Drug Administration feels that the caution statement in U. S. P. XII is applicable to such ether as is "to be used for anesthesia, not to all ether. Accordingly, all ether intended for anesthesia is to be packed in containers of not greater capacity than 3 Kg., all other ether also is required to be packaged in such containers except that it may be shipped in bulk from manufacturers or wholesale distributors when intended for manufacturing or for subsequent repackaging by the dispenser or retail distributor." Under the circumstances, manufacturers or distributors of ether shipped in bulk for purposes other than anesthesia may avoid possible misunderstanding by labeling such ether "Ether Not for Anesthesia" or, if desired, "Ether U. S. P. Not for Anesthesia." U. S. P. XII ether may therefore be shipped in any size container provided it is appropriately labeled.

### COLOR BLINDNESS

Newspaper publicity given recently to an alleged cure for color blindness seems to emanate from one J. H. Lepper, optometrist, of Mason City, Iowa. In reply to inquiries concerning his procedure for correcting color blindness, a form letter is sent in which it is stated "YES, YOUR CASE OF COLOR BLINDNESS CAN BE CORRECTED IF WE DO NOT, IT WILL BE THE FIRST CASE." The statement also suggests that cases take from two to three weeks for correction. If the patient comes to Mason City, \$5 a day is charged. If the prospect finds it impossible to come to Mason City, Lepper says he can send the same equipment, involving two pairs of special colored glasses and one color vision test book, for a total of \$25. A lamp with a reflector and a 60 watt bulb and a flasher if obtainable are also required for home treatment. The form letter is accompanied by a list of testimonials, none of them signed by the writer's full name. Color blindness is a congenital defect. Despite unsubstantiated claims to the contrary, methods of correcting this condition are unknown. Many letters sent to the headquarters of the American Medical Association indicate that men who have had difficulty in gaining entrance to the navy or the air force have been given false hopes by this wholly unwarranted publicity for an unestablished procedure.

<sup>1</sup> Gold, Harry. The Use of Bulk Ether in Anesthesia. J. A. M. A. 120: 44 (Sept. 5) 1942.

# MEDICINE AND THE WAR

*In this section of The Journal each week will appear official notices by the Committee on War Participation of the American Medical Association, announcements by the Surgeon Generals of the Army, Navy and Public Health Service, and other governmental agencies dealing with medicine and the war and such other information and announcements as will be useful to the medical profession*

## SELECTIVE SERVICE SYSTEM

### GUIDE TO PHYSICAL EXAMINATION OF REGISTRANTS (MEDICAL CIRCULAR NO 3)

March 1, 1943

The purpose of this circular is to guide physicians and dentists in the preliminary physical examination of registrants to the end that all selectees will be physically examined and processed locally in like manner. The following pages furnish the reasons for the adoption of the present system of examination by Selective Service, the instructions covering the preliminary physical examination, section 623.33 (revised) of the regulations, and revised List of Defects (DSS Form 220). It is hoped that each examining physician and dentist will study carefully his personal copy of the circular—familiarize himself thoroughly with the details of the examination, as well as with the lists, and then adhere rigidly to the regulations. The objective is to disqualify all registrants locally who have manifestly disqualifying defects and forward all qualified registrants to the examining and induction station.

This Medical Circular No. 3 affords the welcomed opportunity to express to the examining physicians and dentists of the Selective Service System the appreciation of this headquarters for their loyal and valuable professional service which has proved of the utmost importance in helping the nation to meet its wartime needs.

LEWIS B. HERSHEY, Director

MEDICAL CIRCULAR NO. 3  
PRELIMINARY  
PHYSICAL EXAMINATION

NATIONAL HEADQUARTERS  
SELECTIVE SERVICE SYSTEM  
WASHINGTON, D. C.  
FEB 15, 1943

The purpose of the Selective Service physical examination of registrants is to dispose of locally and classify into IV-F all registrants manifestly unfit for military service, thereby saving the time of such unfit registrants, the expense incident to travel and the time of the physicians and dentists at the joint induction stations.

The character of the Selective Service physical examination was changed from a complete medical examination to a preliminary physical examination because of the great increase in manpower needed by the armed forces, because of accruing shortage of physicians, and because final authority for physical examination is vested with the armed forces. Now additional demands are being placed on local boards and examining physicians through the discontinuance of recruitment. Executive Order No. 9279, dated Dec. 5, 1942, and LBM No. 178 route through Selective Service channels all men between 18 and 38 years of age who enter the armed forces.

It seems timely to call attention to the present regulations dealing with the character of the examination and to the occasional mistakes on the part of the local board examining physi-

cians which have been due largely to failure to adhere strictly to the regulations. In some instances registrants have been forwarded to recruiting and induction stations with only one leg, with a draining urinary fistula or with deformities of advanced Pott's disease.

Several of these cases were photographed and the pictures forwarded to the War Department constituting incontrovertible evidence that Selective Service Regulations were not followed in these instances and that the registrants had not been examined in the nude and in action. The preliminary physical examination will not be effective unless the registrant is examined in the nude (stripped of all clothing) as prescribed and unless the regulations which apply to the physical examination are rigidly followed (sec. 623.33).

Inspection of the oral cavity is still an integral part of the physical examination. Its purpose is to disclose dental defects which would manifestly disqualify a registrant for military or naval service, as specified in DSS Form 220. As a matter of clinical and statistical interest as to whether or not the registrant is acceptable, the examining physician or dentist should record any unusual anomalies or any pathologic lesions observed during the examination.

The preliminary physical examination as outlined in the Selective Service Regulations should be given only by a physician. Unfortunately, some have erroneously contended that because it consists solely of inspection this examination may be given just as effectively by a lay member of the local board and that it does not call for the professional judgment of a physician. This attitude, no doubt, is partially responsible for the mistakes that have been committed. However, it should be obvious that only a physician is capable of understanding the medical terminology involved in DSS Form 220, that only a physician can supply the professional judgment called for in DSS Form 220, and that only a physician, through a careful and rigid inspection, is capable of determining the existence of many of the physical defects, deficiencies, disorders and diseases listed in DSS Form 220.

The very adoption of this preliminary physical examination reflects the great confidence of Selective Service in its examining physicians. Enthusiastic acceptance by the examining physicians is essential to the success of this program—enthusiasm such as is reflected in the following excerpt from a letter of one of our Selective Service examining physicians who writes the following:

"Many of the examining physicians who are members of my Board of Examining Physicians and who have in their practice of modern, streamlined medicine allowed the inspection phase of physical examination to be supplanted by the X-ray and other laboratory diagnostic measures are beginning to develop their skill of diagnosing defects by an ever improving inspection ability. My examining physicians participating in this present screening type of physical examination have become enthusiastic in playing the game of 'spotting pathology'. Examining physicians who are really interested in this type of examination owe a debt for the privilege of participating in this refresher course which is making them more alert and is developing their senses of sight, hearing and touch in the detection of physical defects."

To meet the present needs Selective Service has revised the regulations pertaining to this preliminary physical examination and the List of Defects. In addition, Selective Service has listed in DSS Form 220 those defects, deficiencies, disorders and diseases which, though not manifest in character, do nevertheless disqualify registrants if properly certified by affidavit filed as prescribed in section 623.33 of the Selective Service Regulations. However the character of the physical examination remains unchanged.

The three requisites to complete success of this preliminary physical examination are:

1. Enthusiastic acceptance of the program
2. Thorough familiarity with the revised regulations, section 623.33 and with the revised List of Defects (DSS form 220)
3. Strict adherence to the regulations

### Section 623.33—Selective Service Regulations

*Physical examination by examining physician*—(a) The director of Selective Service from time to time, will issue a list of defects (form 220) which will set forth defects which manifestly disqualify the registrant for military service.

(b) A registrant shall personally appear before the examining physician and shall be examined in the manner provided in paragraph c of this section except when the examining physician or the local board is convinced that the appearance of the registrant for physical examination before the examining physician will be injurious to the registrant's health or the health of those who might be brought in contact with him. When the registrant appears before the examining physician his physical examination should be held in a well lighted well heated place. It should be held while the registrant is in the nude.

(c) The physical examination should consist of observing the registrant while walking toward standing before and walking away from the examining physician. The registrant may be required to go through calisthenics to determine the mobility of joints or to furnish a basis for determination of his alertness, intelligence, understanding of commands, postural tensions, tendencies to incoordination and tremors. If peculiarities are noted, simple questions should be asked in an effort to bring out replies bearing on the mental health and personality characteristics of the registrant. The examining dentist or if he is not available, the examining physician will examine the mouth of the registrant. The examining physician will take blood from the registrant for a serologic test. The blood specimen will be collected in a container furnished by the state health officer and will be forwarded to the state laboratory or other laboratory designated by the state director of Selective Service, together with the accomplished form prescribed within the state for such purpose. If the report on the first serologic test of the registrant is other than truly negative the examining physician shall take additional blood for further serologic tests until he is satisfied that the blood is truly negative, truly doubtful or truly positive. Additional blood for further serologic tests will not be taken if distance or circumstances over which the local board or the registrant has no control make it impracticable for additional tests to be taken. Serologic tests will be accomplished without expense to the Selective Service System, unless such expense is specifically authorized by the director of Selective Service. No other laboratory procedures will be undertaken as a part of this physical examination.

(d) Local boards, with the assistance of the examining physician and such agencies as may be designated by the state director of Selective Service, should seek from any source possible information bearing on a history of mental disease in the family of the registrant or social maladjustment, poor work record, other mental or personality disorders of the registrant or any physical condition which might cause the armed forces ultimately to reject the registrant. This information may be secured from local social agencies, school systems, state hospitals, training schools for defectives and any other sources. The local board shall submit lists of registrants whose physical

qualifications are being considered to such agencies as the director of Selective Service or state director of Selective Service may specify to assist in securing this information. The examining physician shall review the information thus received, and the local board shall forward this information or an abstract thereof to the induction station in accordance with arrangements mutually agreeable to the state director of Selective Service and the induction station for the transmittal of such information. When such information is being forwarded, a notation to that effect will be entered under "Remarks," item 25 of the Report of Physical Examination and Induction (form 221).

(e) The examining physician may report to the local board that a registrant is suffering from a condition listed in the List of Defects (form 220) basing his report on one or more of the following: (1) the physical examination of the registrant while he is before him; (2) his personal professional knowledge of the registrant's physical condition; (3) an acceptable affidavit from a reputable physician to the effect that such physician has personal professional knowledge of the registrant's physical condition provided such affidavit is filed with the local board; or (4) an official statement from a government or state agency concerning the physical condition of the registrant (including a statement concerning a registrant who has been cared for in St. Elizabeths Hospital, Washington, D. C. or in a Veterans Administration facility), provided such statement is filed with the local board.

(f) The examining physician shall procure from the registrant the necessary information and shall complete items 22 and 23 of the Report of Physical Examination and Induction (form 221).

(g) The examining physician shall enter in item 24 on the Report of Physical Examination and Induction (form 221) the result of the serologic tests as "Truly Negative," "Truly Doubtful" or "Truly Positive."

(h) The examining physician will enter in item 25 on the Report of Physical Examination and Induction (form 221) any pertinent remarks which he deems advisable for the benefit of the examiners at the induction station.

(i) The examining physician in item 26 on the Report of Physical Examination and Induction (form 221), shall complete the answer to the following question:

Do you find that the above named registrant has any of the defects set forth in the List of Defects (form 220)?

If the examining physician's answer is "Yes," he shall describe the defects in order of their significance. If the examining physician entertains a doubt as to whether he should answer "Yes" or "No," his answer shall be "No." No other information should be included under item 26.

NATIONAL HEADQUARTERS  
SELECTIVE SERVICE SYSTEM,  
WASHINGTON, D. C.  
Jan 16, 1913

### List of Defects

Registrants having any of the following physical defects are disqualified for service in any branch of the armed forces and shall be classified in class IV-F.

#### ALPHABETICAL LIST

Abscess of the lung  
 Achondroplasia  
 Acromegaly or gigantism if markedly disfiguring or if associated with other symptoms of severe pituitary dysfunction  
 Actinomycosis  
 Acute rheumatic fever  
 Adhesions of the lids to each other or to the eyeball  
 Albino  
 Amputation of an arm or leg or complete or partial loss of a hand or a foot  
 Amputation of the penis if the resulting stump is insufficient to permit normal function of micturition  
 Anus fistula of  
 Anus paralysis of the sphincter of  
 Aphonia  
 Alopecia universalis  
 Arch transverse of foot obliteration of associated with permanent flexion of the small toes (claw toes) or with symptom

- Arm amputation of
- Arthritis chronic with deformity disabling or with symptoms
- Asthma chronic
- Atresia of one or both external auditory canals
- Atrophic rhinitis chronic with offensive odor (ozena)
- Atrophies and dystrophies muscular, which are obviously disqualifying
- Auditory canals external atresia of one or both
- Blindness total
- Bone diseases or deformities of which seriously interfere with the weight bearing function with the full use of the limbs or which would prevent the performance of full duty as members of the armed forces
- Bone tuberculosis of
- Brain disease of
- Breathlessness in circulatory failure
- Bronchitis chronic with emphysema
- DSS Form 220 (Revised 1 16 43)
- Canals auditory external atresia of one or both
- Carcinoma or other malignant disease of any organ or part of the body
- Cardiovascular syphilis
- Cerebrospinal syphilis
- Chest wall tuberculosis of
- Chronic pemphigus
- Circulatory failure evidenced by definite symptoms such as a combination of breathlessness cyanosis and edema
- Cleft palate with or without prosthetic appliance
- Clubfoot if marked in degree or which interferes with the wearing of a military shoe
- Coloboma of iris severe
- Contraction of muscle or paralysis which disturbs function to the degree of interference with service
- Contraction spastic of the muscles of the neck if sufficient to prevent free rotation
- Cornea ulcer of
- Cretinism
- Curvature of spine if greater than 3 inches in lateral deviation or kyphosis or lordosis severe enough to prevent wearing of equipment or uniform
- Cyanosis in circulatory failure
- Deafness total
- Deformities congenital or due to fracture injury or disease which seriously interfere with function and weight bearing power
- Deformities of the nose throat and mouth which interfere with the mastication of ordinary food with speech or with breathing or that create an unsightly condition
- Deformities postural associated with disease of the sacroiliac and lumbosacral joints obviously associated with muscular spasm and limitation of motion in the lumbar region of the spine and if malingering is definitely excluded
- Dermatitis herpetiformis
- Dilatation of heart and hypertrophy evidenced by displacement of the apex impulse to the left of the midclavicular line or below the sixth rib
- Disease malignant of any organ or part of the body
- Dislocations old unreduced
- Dwarfism
- Dystrophies and atrophies muscular, which are obviously disqualifying
- Edema in circulatory failure
- Elephantiasis
- Emphysema
- Empyema
- Enlargement of thyroid from any cause associated with toxic symptoms or not associated with toxic symptoms but of sufficient size to interfere with wearing of uniform or equipment
- Epidermolysis bullosa
- Epilepsy
- Epispadias if of a degree to interfere with normal micturition
- Esophagus destructive lesions of
- Exophthalmic goiter
- Exostoses of skull large which will prevent the individual from wearing headgear of any branch of the armed forces
- Extremity loss of
- F eyelid or eyelids conditions of such as inversion or eversion of such degree that forcible closure fails to cover the eyeball or in which there is a resultant conjunctival inflammation corneal irritation or a restriction of the rotation of the eyeball
- Eyes abnormal conditions of due to disease of the brain
- Eyes disfiguring scars of
- Feces incontinence of
- Fingers loss of more than three entire fingers of one hand
- Fistula urinary abdominal osseous or postoperative
- Fistula of the anus
- Flat feet if accompanied by marked symptoms and deformity
- Foot complete or partial loss of
- Fractures of the vertebrae or pelvic bones with associated disqualifying rigidity
- Fractures ununited
- Frohlich's syndrome if severe
- Fungoides mycosis
- Gigantism or acromegaly if markedly disfiguring or if associated with other symptoms of severe pituitary dysfunction
- Glaucoma
- Goiter exophthalmic
- Goiter nontoxic but of sufficient size to interfere with wearing of uniform or equipment
- Hallux valgus (displacement of great toe toward the other toes) if severe and associated with marked exostosis or bunion especially when there are signs of irritation above the joint
- Hand complete or partial loss of
- Heart dilatation or hypertrophy of evidenced by displacement of the apex impulse to the left of the midclavicular line or below the sixth rib
- Hemiplegia
- Hemorrhoids external or internal associated with prolapse of the rectum
- Hermaphroditism
- Hernia complete operable or inoperable
- Hernia of the brain
- Hip diseases of which seriously interfere with function and weight bearing power
- Hodgkin's disease
- Hydrocephalus or monstrosity of the head
- Hypertrophy and dilatation of the heart evidenced by displacement of the apex impulse to the left of the midclavicular line or below the sixth rib
- Hypospadias when opening is proximal to coronal sulcus
- Hysterical paralysis
- Idiocy
- Imbecility
- Immaturity as manifested by infantilism or failure of development of secondary sex characteristics Recheck in six months
- Impetigo chronic
- Incontinence feces or urine
- Insanity with commitment or history of commitment or with authentic medical history of treatment for insanity without commitment
- Jaundice in a degree and kind beyond any question of doubt Recheck in six months
- Jaws diseases of and of associated structures which are likely to incapacitate the individual for satisfactory performance of duty Extensive loss of oral tissue in an amount that would prevent replacement of missing teeth by a satisfactory denture
- Joint tuberculosis of
- Keratitis
- Knee diseases of which interfere with function and weight bearing power
- Kyphosis of a degree sufficient to prevent wearing of uniform and equipment
- Lagophthalmos if associated with signs of hyperthyroidism
- Laryngeal paralysis due to any cause
- Larynx destructive lesions of
- Leg amputation of
- Leprosy
- Leukemia of any type
- Lordosis if of sufficient degree to prevent wearing of uniform or equipment
- Lumbosacral and sacroiliac joints disease of obviously associated with muscular spasm postural deformities or limitation of motion in the lumbar region of the spine and if malingering is definitely excluded
- Lung abscess of
- Lungs tuberculosis of active or authentic history of treatment for within preceding five years
- Lupus vulgaris
- Lymph nodes enlargement of in leukemia or Hodgkin's disease
- Lymph nodes tuberculous
- Lymphosarcoma
- Malignant disease of any organ or part of the body
- Metallic poisoning chronic except argyria
- Monstrosity of the head or hydrocephalus
- Mouth destructive lesions of
- Mouth gross abnormalities which interfere with mastication of food with speech or with breathing or create an unsightly condition
- Multiple sclerosis
- Muscle contraction or paralysis of which disturbs functions to the degree of interference with service in the armed forces
- Muscular atrophies and dystrophies which are obviously disqualifying
- Muscular spasm associated with disease of the sacroiliac and lumbosacral joints obviously associated with postural deformities or limitation of motion in the lumbar region of the spine and if malingering is definitely excluded
- Mutism
- Mycosis fungoides
- Myxedema
- Neck enlargement of lymph nodes of in leukemia or Hodgkin's disease
- Neck spastic contraction of the muscles of if sufficient to prevent free rotation
- Nephritis acute or chronic
- Nose destructive lesions of
- Nose deformities of which interfere with mastication of ordinary food with speech or with breathing or which create an unsightly condition
- Orbit any tumor of
- Osteoarthritis complete or partial of the spinal column
- Osteomyelitis active of any bone or a substantiated history of osteomyelitis of any of the long bones within the past five years
- Overweight excessive which is greatly out of proportion to the height if sufficient to interfere with normal activity or with proper training
- Ozena chronic atrophic rhinitis with offensive odor
- Paget's disease (osteitis deformans)
- Palate cleft with or without prosthetic appliance

- Paralysis hysterical  
Paralysis laryngeal due to any cause  
Paralysis or contraction of muscle which disturbs function to the degree of interference with duty  
Paralysis sphincter of the anus  
Paraplegia  
Parkinsonian syndrome marked  
Pellagra  
Pelvic bones healed fractures of with associated disqualifying rigidity  
Pemphigus chronic  
Penis amputation of if the resulting stump is insufficient to permit normal function of micturition  
Peripheral vascular diseases with manifest pathologic changes  
Pes planus if accompanied by marked symptoms and deformity  
Poisoning metallic chronic except argyria  
Postural deformities accompanying disease of the sacroiliac and lumbosacral joints obviously associated with muscular spasm and limitation of motion in the lumbar region of the spine and if malingering is definitely excluded  
Prolapse of the rectum  
Ptosis of eyelids interfering with vision  
Purpura  
Rectum prolapse of  
Rheumatic fever acute or chronic or history of recurrent attacks  
Rhinitis atrophic chronic with offensive odor (ozena)  
Ribs tuberculosis of and other parts of the chest wall  
Sacroiliac and lumbosacral joints disease of obviously associated with muscular spasm postural deformities or limitations of motion in the lumbar region of the spine and if malingering is definitely excluded  
Scars adherent of skin or soft tissue of a degree which seriously interfere with function  
Scars disfiguring to such an extent as to be unsightly or which interfere with function of a limb or part to such a degree as to prevent satisfactory performance of service in the armed forces  
Sclerosis multiple  
Sinus of the abdominal or chest wall  
Skin adherent scars of or soft tissues to a degree which seriously interfere with function  
Skin chronic ulcers of, if severe in degree or associated with varicose veins  
Skull deformities of of any degree associated with evidences of diseases of the brain spinal cord or peripheral nerves  
Skull depression of of a serious degree  
Skull exostoses large which will prevent the individual from wearing headgear of any branch of the armed forces  
Spasm muscular with disease of the sacroiliac and lumbosacral joints obviously associated with postural deformities or limitation of motion in the lumbar region of the spine and if malingering is definitely excluded  
Sphincter of the anus or urethra paralysis of  
Spinal column osteoarthritis of partial or complete  
Spine curvature of if greater than 3 inches in lateral deviation  
Kyphosis or lordosis severe enough to prevent wearing of uniform or equipment  
Spleen great enlargement of from any cause  
Spondylitis disabling or deforming  
Stammering or stuttering to such a degree that the registrant is unable to express himself clearly or to repeat commands  
Strabismus permanent or well marked  
Syphilis cerebrospinal cardiovascular visceral  
Sycosis (barbers itch or other types) Reconsider after recovery
- Throat destructive lesions of  
Throat gross abnormalities of which interfere with mastication of food with speech or with breathing or create an unsightly condition  
Thumbs loss of both  
Thyroid enlargement from any cause associated with toxic symptoms or not associated with toxic symptoms but of sufficient size to interfere with wearing of uniform or equipment  
Total deafness  
Tracheostomy  
Trachoma  
Transverse arch of foot obliteration of associated with permanent flexion of the small toes (claw toes) or with symptoms  
Tuberculosis active of any part of the body  
Tuberculosis healed of any portion of the vertebral column  
Tumor of brain  
Tumor of orbit  
Ulcer of cornea  
Ulcers chronic of skin if severe in degree or if associated with varicose veins  
Urinary fistula  
Varicose veins, if severe in degree or associated with edema or with present or previous ulcer of the skin  
Vascular diseases peripheral with manifest pathologic changes  
Veins varicose if severe or associated with edema or with present or previous ulcer of the skin  
Vertebrae healed fractures of with associated disqualifying rigidity or deformity  
Vertebral column tuberculosis of any portion healed  
Viscera syphilis of  
Weight excessive overweight which is greatly out of proportion to height if sufficient to interfere with normal physical activity or with proper training  
Xerophthalmia

Conditions which may not be manifest but which may be certified as disqualifying a registrant for service in any branch of the armed forces and classified as IV-F, when they are known to the examining physician in accordance with section 623.33(c), as amended, of the regulations

- Acute diseases other than venereal Reconsider after recovery  
Addison's disease  
Alcoholism, chronic to such a degree that it interferes with earning a living in civil life  
Anemia pernicious necessitating the constant parenteral administration of liver extract  
Diabetes insipidus moderate or severe  
Diabetes mellitus if severe or if necessitating the constant administration of insulin  
Drug addiction  
Enuresis continuous from childhood  
Epilepsy  
Hypoglycemia chronic persistent to such a degree that it interferes with earning a living in civil life  
Insanity with commitment or history of commitment or with authentic medical history of treatment for insanity without commitment  
Nephritis acute or chronic  
Peptic ulcer active confirmed by x-ray examination  
Rheumatic fever acute or chronic or with history of recurrent attacks  
Sex perversion  
Tuberculosis of any part active within five years

## TREATMENT OF FRACTURES OF HANDS AND FINGERS CAUSED BY GUNSHOT WOUNDS

V. GUSYNIN

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(The following article was received by cable from the Soviet Scientists' Antifascist Committee.—Ed.)

Fractures of hands and fingers caused by gunshot wounds are frequent war injuries. The correct treatment is fixation and stretching the fingers over a solid cylindric body. This gives the fingers the physiologic half contracted position. Fixation on a cylindric splint should be centralized on the fractured bone and pressure exerted on the point of fracture. This pressure prevents the bone fragments from moving so that they heal and remain in position. A fixing bandage is applied with turns of the bandage crossing behind the broken bone at the point of fracture. The bandage passes between the fingers according to the position of the fracture in the direction of the wrist, around which transverse turns are made in both directions. The usual wide absorbent bandage is applied over the sterilized fixing

bandage and is changed whenever it becomes saturated. The fixing bandage is not changed unless absolutely essential but is occasionally soaked with iodine. Healthy fingers must be left absolutely free.

I have also proposed the use of a so called "drum splint," consisting of a wooden cylinder fixed to the split end of a flat splint. The flat splint is placed on the palm side of the forearm and injured fingers are placed around a cylinder. When necessary, the fingers are stretched by elastic bands fastened to the flat splint in a centripetal direction.

Fixation of fingers in a functionally essential position may also be carried out by use of a simple wooden roller.

In field conditions, a bottle 6 or 7 cm in diameter may be used as a cylindric splint for fingers. The bottle is convenient because it can be used for physiotherapeutic heat treatment, the bottle being filled three or four times a day with warm water.



## CIVILIAN DEFENSE

### DR BAEHR TO VISIT HAWAII

Dr George Baehr, chief medical officer, Office of Civilian Defense, Washington, D. C., will leave San Francisco shortly for Hawaii. At the invitation of the governor of the territory, Dr Baehr will confer with local authorities on civilian defense activities which are being recognized now that the government of the islands is in the process of being transferred from the Army to civil authorities. He will remain in the islands about two weeks. En route to Hawaii Dr Baehr will confer with Emergency Medical Service officers in California and will speak at the war conference of the California Hospital Association, Berkeley, on "Recent Observations in England and Scotland" and "Hospital Participation in the Emergency Medical Service."

### EMERGENCY DISTRIBUTION OF BLOOD PLASMA

The Office of Civilian Defense, Washington, D. C., on February 15 issued additional details concerning Circular Medical Series No 27, which is as follows:

1 The U. S. director of civilian defense has made arrangements so that the Civil Air Patrol will fly blood plasma supplies into stricken areas in the event of emergencies.

2 In instances in which, owing to bombing fire tornado or other cause it becomes necessary to supplement stocks of blood plasma in stricken areas, and when other methods of transportation are not available or are inadequate, the regional medical officer of civilian defense should contact the appropriate wing commander of Civil Air Patrol and request emergency air transportation for the plasma. Wing commanders have been authorized to accept such requests only from the regional medical officers.

3 In such event, give the wing commander complete details as to where the plasma is to be picked up and delivered. Arrangements should then be made by the regional medical officer to deliver the plasma to and from the airports.

4 These arrangements will apply for all states except those located within the jurisdiction of the Western Defense Command. In those states it is understood that the Western Defense Command has sufficient nontactical airplanes available to furnish such transportation.

5 Appropriate instructions, which will insure the efficient operation of this transportation facility, will be furnished to state and local chiefs of Emergency Medical Services by their regional medical officers.

6 The current list of wing commanders, Civil Air Patrol, is being furnished to the regional medical officers.

## MISCELLANEOUS

### PUBLIC HEALTH UNDER HITLER

*Nieuwe Rotterdamse Courant* of Dec 2, 1942 gives details of the increasing diphtheria epidemic. There were 12,225 cases in 1942 (there were 1,273 in 1939) and during the last few months there have been twice as many cases as during the first months of the year. There were 1,095 cases in August and 2,156 cases in October, about 250 cases a week in August and 650 a week in October. The greatest increase has been in North Holland, South Holland and Utrecht, and the smallest has been in North Brabant, Gelderland and Limburg, the very provinces where diphtheria has for a long time been prevalent and from which the illness has been spreading all over the country. It has been generally noted that older people have been the most affected by the disease. In 394 of the 1,034 municipalities young people under 14 have been vaccinated this year against diphtheria. The Rijkseruminstituut (National Serum Institute) is working under heavy pressure in order to be able to supply the necessary serum.

*Reichs-Gesundheitsblatt*, Berlin, of Dec 23, 1942 contains a decree by the minister of the interior ordering the closing down of the Jewish lunatic asylum at Berndorf-Sayn. The Jewish hospital in Iranische Strasse, Berlin, will have a special mental ward which will serve as a substitute for the closed institution.

To insure economy in the use of quinine, the following points for doctors were published in *Reichs-Gesundheitsblatt*, Berlin, Dec 16, 1942. Quinine must not be given as a prophylactic against grip or as a tonic. It is to be replaced by the sulfonamides in the treatment of bronchopneumonia and by aminopyrine in the treatment of general infections, sepsis and typhus, where it has sometimes been used to bring down the temperature. When necessary, it may still be prescribed together with synthetic drugs in the treatment of malaria.

According to *Uj Nemzedek* of Dec 9, 1942, the government asked the alispán of Pest County (Iaszo Endre) to set up a temporary isolation hospital equipped with 1,000 beds to counteract the epidemic of influenza, which is on the upgrade. The alispán answered that the means of the county were insufficient to set up a hospital and that for this reason those localities in which a large number of influenza cases occurred must themselves set up temporary hospitals.

The *Swiss Democrat* of January 22 reports that not only Chiasso but all the communes in the Canton Ticino all along the Swiss-Italian frontier have adopted strict precautionary measures against the dangers from the typhoid epidemic on the Italian side of the frontier.

According to *Upsala Nya Tidning* of January 5 at least 2,000 "inferior" Norwegians will be sterilized according to a new law.

*Universal* of January 7 reports that the Ministry of Education ordered medical students to examine all Rumanian school pupils on January 11. Infected pupils will be kept under observation.

### ARMY-NAVY PRODUCTION AWARDS

Brig Gen John M. Willis, commanding general at Camp Grant, Ill., presented the Army-Navy E award to the president of Parke, Davis and Company, Dr. A. W. Lescohier, at Detroit February 26. The insignia, an E pin, which every employee is entitled to wear, was presented by Lieut. E. B. Williams, senior medical officer of the Detroit Naval Armory, to Mr. John Tighe, who represented the employees. Dr. Edgar H. Norris, dean of Wayne University College of Medicine, presided. Among the guests were Capt. R. T. Brodhead and Comdr. A. M. Cohan of the Navy, Col. C. F. Shook and Major Roscoe Cavell of the Army Medical Corps, Mayor Edward J. Jeffries of Detroit, Dr. W. D. Barrett, president-elect of the Wayne County Medical Society, Dr. Bruce H. Douglas, health commissioner of Detroit, Dr. W. B. Cooksey, medical director, Detroit Section, the American Red Cross, Albert R. Pisa, president of the Detroit Retail Druggists Association, Dean R. T. Lakey of the College of Pharmacy of Wayne University, Dean E. P. Stout, College of Pharmacy, Detroit Institute of Technology, J. H. Webster of the Detroit Board of Education and Warren E. Bow, superintendent of Detroit public schools. Mr. Joseph Roberts and Miss Lillian Payne, who have been employed by Parke, Davis and Company since 1892 and 1896 respectively, were among the honored guests.

Sharp & Dohme, Inc., pioneers in the development of dried plasma and producers in their Philadelphia and Glenolden laboratories of many other medical supplies for the armed forces, were awarded the Army-Navy E for excellence in production on February 10. The E pennant was presented by Brig. Gen. Hugh Jackson Morgan, chief consultant in medicine, Office of the Surgeon General, U. S. Army, Washington, D. C., and the individual E pins were presented by Commander E. L. Bortz, U. S. N. R., of the Naval Hospital, Philadelphia, to representatives of the employees of the company.

The Army-Navy E Production Award was presented to the men and women employed by the Ciba Pharmaceutical Products, Inc. of Summit, N. J., February 19, for excellence in war production.

# ORGANIZATION SECTION

## OFFICIAL NOTES

### DOCTORS AT WAR

Radio broadcasts of Doctors at War by the American Medical Association in cooperation with the National Broadcasting Company and the Medical Departments of the United States Army and the United States Navy are on the air each Saturday at 5 p m Eastern War Time (4 p m Central War Time, 3 p m Mountain War Time, 2 p m Pacific War Time). An exception is the Chicago area where the broadcasts are heard by transcription at 8 p m Central War Time Saturdays on station WMAQ until March 27, after which they will be heard at 10 30 p m Central War Time. Unless otherwise indicated each program is summarized by Dr W W Bauer, Director, Bureau of Health Education.

The titles and speakers for the next four programs are as follows:

March 27 War Worker Sleeps Here!  
April 3 The White Plague 1943  
Speaker Dr Kendall Emerson, managing director, National Tuberculosis Association

April 10 Battle Stations at Home  
Speaker Col George Biehr, Chief Medical Officer, Office of Civilian Defense  
April 17 Stratosphere Flight  
Speaker Brig Gen David N W Grant, Air Surgeon, United States Army

### BEFORE THE DOCTOR COMES

The American Medical Association program on radio station WLS (890 kilocycles) entitled "Before the Doctor Comes" will be on the air every Thursday up to and including May 27 at 9 45 a m. This program is intended to be helpful to the mothers of young children. Dr W W Bauer, Director of the Bureau of Health Education, will be interviewed by Mrs June Merrill on common home health problems. The titles for the next four programs are as follows:

March 25 The Child with Tummy Ache  
April 1 The Child with Ear Ache  
April 8 What To Do About Cuts and Scratches  
April 15 What To Do About Bad Bumps

## MEDICAL LEGISLATION

### MEDICAL BILLS IN CONGRESS

*Changes in Status*—S 786 has passed the Senate and has been favorably reported to the House, a bill providing for the rehabilitation of disabled veterans of World War II. H R 1749 has passed the House and Senate a bill granting hospitalization, domiciliary care and burial benefits to veterans of World War II. H R 1975 has passed the Senate a bill to provide deficiency appropriations for the fiscal year ending June 30, 1943. The bill retains the provision providing that during the existing war, and for six months thereafter any commissioned officer of the regular corps of the Public Health Service may be appointed to higher temporary grade with the pay and allowances thereof without vacating his permanent appointment and that reserve officers of the Public Health Service may be distributed in the several grades without regard to the proportion which at any time obtains or has obtained among the commissioned officers of such service. The bill appropriates for the use of the Public Health Service an additional amount of \$85,500 for disease and sanitation investigations, and an additional amount of \$428,500 for emergency health and sanitation activities. The limitation on the amount which may be expended for the procurement and establishment of reserves of blood plasma or serum albumin is increased from \$420,000 to \$499,500. The bill was amended in the Senate to authorize an appropriation of \$1,200,000 for the fiscal year 1943, for use by the Children's Bureau in making grants to the states to provide medical, nursing and hospital maternity and infant care for wives and infants of enlisted men in the armed forces of the United States of the fourth, fifth, sixth or seventh grades. S 785 has been reported to the Senate, authorizing an appropriation of \$2,000,000 to provide for the expansion of facilities for hospitalization of dependents of naval and marine corps personnel and for hospitalization, outside of the continental limits of the United States, of officers and employees of any department or agency of the federal government and employees of any contractor with the United States or his subcontractor, and the dependents of such persons and, in emergencies, of such other persons as the Secretary of the Navy may prescribe.

*Bills Introduced*—The President has submitted to Congress the Report of the National Resources Planning Board, to be made available as H Doc 128. This report, among other things, recommends an extension of the social security program to include permanent and temporary disability insurance, immediate action by the federal government in cooperation with the

medical profession to enable every person to budget medical expenses over a reasonable period, and federal aid in developing an adequate system of regional and local hospitals, maternal and child care and other measures to assure "adequate medical and health care for all, regardless of place of residence or income status." S 762, introduced by Senator Danaher, Connecticut, proposes to amend the Soldiers' and Sailors' Civil Relief Act of 1940 as amended to afford relief in the case of certain leases made by corporations or partnerships. S 838, introduced by Senator La Follette, Wisconsin, provides for vocational rehabilitation of persons disabled in war industries or otherwise. S 847, introduced by Senator Bilbo, Mississippi, provides for certain payments to needy blind individuals. H R 1826, introduced, by request, by Representative Lesinski, Michigan, provides for presumption of soundness at enlistment after six months active service in the armed forces during the present war. H R 1978 introduced by Representative Maas, Minnesota, directs the director of the Selective Service System to award and cause to be issued to each registrant who has been rejected for active military service or deferred because of physical condition or essential work in the defense industry a suitable lapel button or pin to indicate that the individual is unable to enter the military service through no fault of his own. H R 1981, introduced by Representative Johnson, Indiana, proposes to amend the National Service Life Insurance Act so as to provide benefits for permanent total disability. H R 2100, introduced by Representative Patman, Texas, a bill to mobilize the scientific and technical resources of the nation, and to establish an Office of Scientific and Technical Mobilization. H R 2102, introduced by Representative Abernethy, Mississippi, a bill to exclude from gross income, for purposes of federal income taxes, amounts received as compensation for active service in the military or naval forces of the United States.

### STATE MEDICAL LEGISLATION

#### Arkansas

*Bills Introduced*—S 363 proposes to authorize the creation, operation and maintenance of county boards of health in counties having a population of 100,000 or over. H 382 proposes that all school teachers, school bus drivers, school cafeteria employees, school janitors and other school employees shall present a certificate of health including skin test for tuberculosis issued by a regularly licensed physician or a regularly

constituted health authority, not longer than three months prior to an application for a position in the school system. Such certificate shall be renewed each three years and the county and city health officers who issue same shall do so free of charge.

**Bill Passed**—H 432 passed the senate, March 6. It proposes to prohibit the sale of appliances, drugs or medicinal preparations having special utility for the prevention of conception or venereal diseases without a license issued by the state board of pharmacy but would except physicians and medical practitioners regularly licensed to practice medicine or osteopathy.

**Bill Enacted**—H 103 was approved, March 5. It provides for the appropriation of \$15,000 to purchase pneumothorax equipment and to pay the fees of physicians for administering pneumothorax treatment to patients certified by the superintendents of the tuberculosis sanatoriums.

### California

**Bill Introduced**—S 650, to amend the school code, proposes to authorize the school authorities to grant temporary exemption to pupils attending school during the time such pupils are working in industries, business, or in agricultural pursuits essential to the war effort, and further authorizes the superintendent of public instruction to set minimum health and physical fitness standards which each pupil shall be required to meet before being granted such temporary exemption.

**Bill Enacted**—A. J. R. 26 has become Resolution Chapter 50 of the Laws of 1943. It resolves that the assembly and senate of the state of California endorse the pharmacy corps bill, S 216 and H. R. 997, and request the Congress to enact the same into law.

### Colorado

**Bill Introduced**—S 333 proposes to authorize the state board of health to declare emergency areas and to authorize all full time state, county and municipal public health officers who are graduates of medical schools approved by the state board of health and who possess licenses to practice their profession from the appropriate licensing authorities of Colorado or any other state to engage in the practice of medicine in Colorado, regardless of whether or not they hold licenses so to do from the licensing authorities thereof, until such time as the state board of health shall declare the emergency at an end. Such health officers shall charge the usual fees for services prevailing in the community and remit them to the state department of revenue.

### Connecticut

**Bill Introduced**—Substitute for H 1073 proposes to authorize a jailer who has under his supervision a person whom he believes to be mentally ill to have such person examined by a reputable physician and, on recommendation of such physician, transferred to a state hospital for mental illness.

**Bill Passed**—S 261 passed the house, March 4. To amend the premarital examination law, it proposes to permit the required certificate to be signed by a physician licensed to practice medicine in the state of Connecticut or any state or territory of the United States or the District of Columbia.

### Delaware

**Bill Introduced**—House substitute for H 66 proposes the creation of a state board of examiners in optical dispensing, defines optical dispensing as the filling or compounding of physicians' prescriptions for lenses and other optical devices, the surveying and measuring of external features of the face and head for the proper fitting of such lenses, and the fitting of such lenses to the user, and further proposes that the services and appliances relating to optical dispensing shall be dispensed, furnished or supplied to the intended wearer or user thereof only on prescription issued by a physician or an optometrist.

### Georgia

**Bill Introduced**—H 141-194 A proposes a resolution urging the Congress of the United States to give its full and earnest support to the passage of H 997 and S 216, either of which would establish a pharmacy corps in the United States Army.

### Idaho

**Bill Enacted**—S 140 has become chapter 134 of the Laws of 1943. To amend the occupational disease act, it authorizes the industrial board to summon the medical panel to attend hearings and authorizes the members of such panel to question witnesses.

### Illinois

**Bills Introduced**—S 95 proposes the creation of a chiropractic board by the director of registration and education and defines chiropractic as the science of palpating and adjusting the articulations of the human spinal column, correcting interference with nerve transmission and expression to restore health, without the use of drugs or surgery. S 167 proposes the creation of a state board of health to take over the duties of the department of public health.

**Bill Passed**—S 21 passed the senate, March 10. To amend the traffic laws, it proposes that a person shall be deemed, *prima facie*, to be operating a motor vehicle under the influence of intoxicating liquor whose blood, urine, saliva or alveolar breath contains more than certain stated percentages of alcohol as determined by a chemical test of such breath or body fluid.

### Indiana

**Bills Passed**—S 4 passed the house, March 4. It proposes the enactment of a law to license and regulate nursing homes. H 66 passed the senate, March 6. It proposes the enactment of a law regulating the operation of plants for the cold storage of food in individual lockers. Among other things the bill proposes that all employees of such locker plants shall undergo a semiannual health examination by a physician and requires the employer to keep such health certificates on file at all times. Furthermore, the bill proposes to prohibit any person suffering from a communicable disease, including any communicable skin disease or with infected wounds, and any person who is a "carrier" of a communicable disease from being employed in any capacity in such locker plant.

**Bill Enacted**—S 134 has become chapter 222 of the Laws of 1943. It provides regulations for the sanitation of places in which food is made or handled and provides further that no person shall be employed in any such place who is affected with any venereal disease, smallpox, diphtheria, scarlet fever, yellow fever, tuberculosis or consumption, bubonic plague, Asiatic cholera, leprosy, trachoma, typhoid fever, epidemic dysentery, measles, mumps, German measles, whooping cough, chickenpox or any other infectious or contagious disease.

### Kansas

**Bill Introduced**—S 167 proposes an act relating to state boards and commissions. Among other things, it would require the state board of medical examiners to make biennial rather than annual reports to the governor at least ten days prior to each regular session of the legislature and to make typewritten reports to the governor in the odd numbered years. In addition to biennial and annual reports, each state agency covered by the proposed bill may have printed such other reports, pamphlets, books and material as pertain to its activity and which are within the terms of a specific legislative authorization or appropriation.

**Bills Passed**—H 120 passed the senate, March 6. It proposes to excuse physicians in the military service from renewing their licenses annually and prohibits revocation of such license during such period. H 121 passed the senate, March 6. To amend the medical practice act, it proposes to eliminate the requirement that no two of the required four six month periods which must be spent in the study of medicine and surgery may be given within the same twelve months. The purpose of this bill is to enable graduates of accelerated medical courses to obtain licensure in Kansas. H 325 passed the house, March 5. It proposes to provide for treatment of nonresidents who have been diagnosed as having active tuberculosis.

### Nevada

**Bill Passed**—A 141 passed the assembly, March 5. It proposes to authorize the board of medical examiners to grant qualified physicians a temporary license to practice medicine, surgery or obstetrics in any particularly specified part of the

state for and during the period of time limited by the license. The proposal would further authorize the board of medical examiners, from time to time, to restrict, enlarge or change the territorial limits stated in such temporary license.

#### New Jersey

*Bill Passed*—A 93 passed the senate, March 8. It proposes to amend the medical practice act by granting an extension of two years within which a licensee must furnish proof of his actually having become a citizen.

#### New Mexico

*Bills Introduced*—H 223 proposes to repeal the existing law relating to the practice of chiropody. H 247, to amend the basic science law, proposes to exempt therefrom persons engaged in the practice of the religious tenets of any church in the ministrations to the sick or suffering by mental or spiritual means. H 252 proposes to require every practitioner of medicine and surgery to register annually and fixes the fee for resident physicians at \$2 and for nonresident physicians at \$10.

#### New York

*Bill Passed*—A 1125 passed the assembly, March 8. To amend the medical practice act, it proposes to postpone until July 1, 1944 the 1942 amendment exempting students, interns and resident physicians from the operation of the medical practice act.

#### North Carolina

*Bill Passed*—S 254 passed the house, March 6. It proposes the creation of a Hospital Authority to engage in hospital construction, maintenance and operation.

*Bills Enacted*—H 429 was ratified, March 1. It provides that any person having tuberculosis in a communicable form who fails to follow the instructions given him by an agent of the county board of health as to precautions which he should take shall be imprisoned in the Prison Department of the North Carolina Sanatorium. H 476 was ratified, March 4. It provides that persons serving in the armed forces or merchant marine shall be exempt from liability for any and all license taxes levied by the state or by any county or city in the state for the privilege of engaging in or carrying on any trade or profession in which such person was engaged before entering the service and further provides that such person during the period of service shall be exempt from paying any license fees to any licensing board or commission or to the state of North Carolina in which the payment of such license fee is by law required as a condition to the continuance of the privilege of engaging in any trade or profession. H 513 was ratified, March 4. It authorizes the state board of optometry to make use of the injunctive process in restraining the illegal practice of optometry.

#### North Dakota

*Bills Passed*—S 58 passed the house, March 4. It proposes to amend the premarital examination law by authorizing the required laboratory test for syphilis to be performed by the state department of health or by any other state public health laboratory approved by the state health officer. S 77 passed the house March 4. It proposes to provide for the establishment, maintenance and duties of a district board of health and provides that the district health officer appointed by such board shall be a physician and surgeon regularly licensed to practice medicine and surgery in the state. H 229 passed the senate, March 4. It proposes a law for the organization and regulation of nonprofit hospital service plan corporations.

#### Ohio

*Bills Introduced*—H 181, to amend the sales tax law, proposes to exempt therefrom the sales of "patent" and prescription medicines. H 306, to amend the workmen's compensation act, proposes to authorize the furnishing of orthopedic appliances and artificial limbs to injured employees, in addition to any other compensation received.

*Bill Passed*—S 46 passed the senate, as amended, March 2. To amend the criminal code, it proposes that any person not being lawfully authorized to do so who shall mutilate or destroy any portion of the dead body of any person shall be

guilty of a felony. The existing law already authorizes medical schools to obtain bodies for dissection purposes.

#### Oklahoma

*Bills Introduced*—S 98, to authorize the performance of postmortem cesarean sections on the body of a female who is the victim of death and who at the time of accidental death is in the advanced stages of pregnancy with possibilities of viable child was amended in the senate to provide that such operation shall not be performed over the protest of those in whom the law has recognized a legal right to the possession of the body of the deceased. S 144 proposes to require every physician making an examination of a person infected with a venereal disease to have a standard serologic test made of such person's blood. S 253 proposes to provide for the commitment, custody, care and treatment of persons so far addicted to the intemperate use of stimulants as to have lost their power of self control or persons subject to dipsomania or inebriety. H 249 proposes the creation of a special indemnity fund out of which employees would receive compensation for disability resulting because of the employee being a physically impaired person, defined to be a person who has suffered the loss of the sight of one eye, the loss by amputation of some member of his body, or the loss of the use, or partial loss of the use, of a specific member such as is obvious and apparent from observation or examination by an ordinary layman, that is, a person who is not skilled in the medical profession.

*Bills Passed*—S 98 passed the senate March 4. It proposes to authorize a physician legally qualified to practice in the state of Oklahoma to perform a postmortem cesarean section when the physician has reason to believe that the child is viable in the mother. In the performance of such operation, the physician shall not be liable either civilly or criminally, provided only that the operation is performed in good faith and with due skill and without unnecessary injury or mutilation. H 37 passed the house, March 1. It proposes that state and local officers, or their authorized deputies who are physicians, be empowered to detain and examine persons suspected of being infected with a venereal disease and authorizes the detention of such persons until the results of an examination are known. The examination must be made by a health officer or, at the option of the person to be examined by an approved licensed physician.

#### Oregon

*Bills Passed*—S 284 passed the senate on March 4 and the house on March 5. It proposes to authorize the payment of compensation to employees disabled by an occupational disease. H 229 passed the senate, March 9. It proposes to reenact and extend the existing law providing for state reimbursement to hospitals for services rendered victims of motor vehicle accidents so as to cover nurses and operators of ambulances. A provision also including services rendered by doctors was eliminated by the house. H 103 passed the senate February 26. To amend the law relating to the examination of handicapped children, it proposes to authorize examinations of the eyes of such children to be made and the findings certified to by qualified and licensed optometrists. H 350 passed the senate, February 26. It proposes to authorize commissioned medical officers of the army to execute the required certificate necessary under the state premarital examination law. H 371 passed the house February 26. It proposes an appropriation to pay for medical, surgical, corrective and other services and facilities for crippled children or children who are suffering from conditions which lead to crippling.

*Bills Enacted*—S 175 was approved March 4. It increases the annual registration fee for physicians from \$5 to \$10 for the period beginning Jan 1, 1944. H 101 has become chapter 187 of the Laws of 1943. It amends the law relating to cosmetic therapy by proscribing the removal of warts, moles or other blemishes by an electrologist. H 245 has become chapter 178 of the Laws of 1943. It requires persons maintaining a hospital for the treatment of persons with mental disorders or mental defects to obtain a license from the state board of health.

**Pennsylvania**

*Bills Introduced*—S 195, to amend the act relating to coroners, proposes that in all counties where a coroner or deputy coroner receives a salary and himself makes an autopsy or postmortem examination authorized to be made by him he shall be entitled, if he is a duly licensed physician or surgeon, to extra compensation from the county for making the same in such amount as the commissioners of the county shall fix. S 244 proposes that for the duration of the war a minimum of nine months shall constitute the necessary training for an intern in a hospital approved for intern training to qualify for admission to an examination for licensure by the osteopathic surgeons' examining board to practice major surgery in Pennsylvania. H 459, to amend the law relating to the practice of optometry, proposes that nothing in such law shall prevent the employment by any person, firm or corporation of a registered optometrist to be in charge of or to practice optometry in an optical department or store owned, controlled or conducted by a corporation. H 504 proposes to exempt physicians in the armed forces or merchant marine from being required to renew their licenses during the term of such service and to authorize such persons to apply for renewal thereof at any time within one year after their discharge. H 540 proposes the creation of a board of chiropractic examiners and defines chiropractic as the science of palpating and adjusting the articulations of the human spinal column. The proposal would further provide that nothing in the act should be construed to prevent any regularly licensed chiropractor, physician or surgeon of the commonwealth who has procured a license to practice chiropractic in accordance with the provisions of the proposal from practicing both medicine, surgery and chiropractic.

*Bill Passed*—S 103 passed the senate, March 2. It authorizes counties to create a medical clinic, composed of a psychiatrist, a psychologist and such investigators and clerical help as might be needed, which medical clinic shall pass on the mental and physical condition of all persons convicted of all crimes who are first offenders, obviously mental cases convicted of sex offenses or alcoholic or narcotic cases.

**South Carolina**

*Bill Enacted*—S 17 has become Governor's Act No 24 of the Laws of 1943. It eliminates from the medical practice act the requirement that the necessary four full courses of lectures of at least twenty-six weeks each must have been given in four different calendar years. The purpose of this law is to enable graduates of accelerated medical courses to obtain licensure in South Carolina.

**South Dakota**

*Bill Passed*—S 129 passed the senate on February 26 and the house on March 4. As amended by the senate, it would exempt from the basic science act persons engaged in the practice of hydrotherapy. The original proposal also exempted persons acting as an assistant or under the supervision and direction of one holding a basic science certificate and teachers of physical education as taught in regular grade and high schools of the state.

*Bills Enacted*—S 186 was approved, March 1. It provides for an appropriation for the purchase and installation of hydrotherapy equipment in the state hospital for the insane. S 202 was approved, March 4. It makes it unlawful to give for use as a beverage any intoxicating liquor to any person under the age of 18 years unless it is done in the immediate presence of a parent or guardian of such minor or by prescription or direction of a duly licensed practitioner or nurse of the healing art for medicinal purposes. H 84 was approved, February 24. It amends the workmen's compensation act by adding necessary first aid treatment to the services to be furnished by an employer. H 206 was approved March 8. It authorizes the sterilization of inmates of the state hospital on recommendation of the superintendent when it is shown that the inmate suffers from certain mental diseases, perversion or diseases of a syphilitic nature and that the person is capable of procreation. The law also makes provision for the voluntary sterilization of any inmate.

**Texas**

*Bills Introduced*—H 529 proposes the creation of a state board of examination and registration for physicians and surgeons of the osteopathic school of medicine. Osteopathy is not defined, but the proposal would provide that each applicant who successfully passes the required examination shall be issued a license to practice as a physician and surgeon of the osteopathic school of medicine according to the provisions of the act and further provides that each license would give the holder thereof the unlimited right to practice medicine and surgery. It is further proposed that physicians and surgeons of the osteopathic school of medicine should have the same rights, privileges and immunities and stand charged with the same public duties and obligations as the duly licensed physicians and surgeons of any other school of medicine. Licentiates should observe and be amenable to all state and municipal laws, rules and regulations pertaining to reporting births and deaths and all matters pertaining to public health, public sanitation, the control of infectious diseases, the compilation of vital statistics, health insurance, workmen's compensation, care of the indigent, and care of mothers and infants, with the same rights thereunder as duly licensed physicians and surgeons of any school of medicine and reports of licentiates would be accepted by the officers of the state and municipal departments to which the same are made. Each licentiate would have the same rights with respect to the treatment of individuals and cases, the same right to register under the laws of the United States governing narcotics, the same right to hold public office and public employment and the same right to practice in state county and municipal hospitals as is conferred by any license that may be issued to any other licensee of any other school of medicine. Duly licensed physicians and surgeons of the osteopathic school of medicine and the duly licensed physicians and surgeons of other schools of medicine would be accorded equal and uniform privileges and opportunities in all state county and municipal hospitals and in all institutions supported, maintained or operated in whole or in part by the state of Texas or any political subdivision thereof for the treatment of human disease, infirmity or ailment and in all hospitals which are tax exempt by reason of their charitable nature. H 540 proposes to repeal the existing medical practice act and to enact a new medical practice act amending the existing law by, among other things, excluding therefrom licensed osteopaths and chiropractors who confine their practice strictly according to the definition thereof which may in the future be authorized by law, decreasing the personnel of the state board of medical examiners from twelve to six members requiring licentiates to present a certificate from the board of examiners in the basic sciences and repealing the provision requiring annual registration of licenses. H 591 proposes to change the method of applying for admission to the state tuberculosis sanatorium.

*Bill Passed*—H 20 passed the house, March 4. It proposes the creation of a separate state board of examiners for chiropractors and defines chiropractic to be the science of analyzing and adjusting the articulations of the human spinal column and its connecting tissues without the use of drugs or surgery.

**Utah**

*Bills Introduced*—S 202 proposes the enactment of what appears to be the uniform narcotic drug act. S 203 to amend the law relating to narcotic drugs, proposes to exempt therefrom the sale and administration of certain attenuated narcotic preparations.

*Bill Enacted*—House concurrent memorial No 1 was adopted February 26. It resolves that the legislature of Utah endorse and recommend to the Congress of the United States the enactment of H R 997 or S 216, either of which would establish a pharmacy corps in the regular army.

**Vermont**

*Bills Introduced*—H 88 proposes that any person who has sexual intercourse while infected with gonorrhea or syphilis in a communicable stage shall be imprisoned for not more than two years or fined not more than \$500. H 167 proposes to authorize the board of health to detain and examine persons suspected of being infected with a venereal disease likely to infect or to be the source of infection of another person.

**Bills Passed**—S 16 passed the senate, February 26. It proposes to authorize the institutionalization and treatment of persons who violate the criminal laws or who are guilty of gross immoral conduct because of mental deficiency, insanity or psychopathic personality. The latter term is defined as the existence in any person of such conditions of emotional instability or impulsiveness of behavior, lack of customary standards of good judgment or failure to appreciate the consequences of his acts as render him irresponsible for his conduct with respect to sexual or other criminal behavior and thereby dangerous to other persons. S 34 passed the senate March 9. It proposes that any person who maintains or operates a maternity hospital shall first obtain a license so to do from the department of public health. The term maternity hospital is defined as any hospital institution or place in which pregnant or parturient women and the newborn infants receive care or treatment. H 131 passed the senate March 9. To amend the osteopathic act, it proposes to authorize a recognized school of osteopathy to give a course of thirty six months rather than a four year course or at least five months in each year. H 151 passed the house March 4. To amend the premarital examination law, it proposes to authorize the execution of the required certificate by an osteopath and by a member of the medical corps of the army, navy or public health service.

#### Washington

**Bills Introduced**—H 179 proposes to prohibit any person from establishing or maintaining, outside the corporate limits of any town or city, a nursing home, rest home, home for aged or infirm persons or other similar institution without the permission of the county commissioners and authorizes the county commissioners to make rules and regulations relating to the establishment, maintenance and licensing of such institutions. H 380 proposes to prohibit the maintenance of any rest and nursing home and institution without a license from the county or city commissioners wherein the institution is located. The term rest and nursing home and institution when used in the proposal are defined as meaning any home or private institutions except hospitals approved by the American College of Surgeons or the American College of Physicians for the care and housing of aged, infirm, ill persons or children. H 408 proposes the creation of a sanipractic physicians examining board and defines sanipractic as the science and art of applied prophylactic and therapeutic sanitation which enables the physician to direct, advise, prescribe or apply food, water, roots, herbs, light, heat, exercises, active and passive manipulation, adjusting tissue, vital organs or anatomic structure by manual, mechanical or electrical instruments or appliances, or other natural agency, to assist nature to restore a psychologic and physiologic interfunction for the purpose of maintaining a normal state of health in mind and body. This proposal has been reported as being dead for the remainder of the current session.

**Bills Passed**—S J R 9 passed the house, March 2. It proposes a resolution to Congress to pass legislation establishing a pharmacy corps in the army. S 218 passed the house, March 3. It proposes to authorize the director of licenses, during the present emergency, to grant temporary certificates to practice medicine and surgery to physicians duly licensed and qualified to practice under the laws of some other state and proposes that such temporary license shall be valid from the date of issuance until the next regular examination given by the board of examiners. S 301 passed the senate, March 6. To amend the law relating to dentistry, it proposes that x-ray diagnosis and examination of the normal and abnormal structures, parts or functions of the human teeth, the alveolar process, maxilla, mandible or soft tissue adjacent thereto be declared to be the practice of dentistry.

#### West Virginia

**Bills Introduced**—S 238 proposes that no druggist shall fill any prescription containing strychnine or strychnine drug, arsenic, or arsenious oxide or "arseine" compounds or where arsenic is "pentavalent" or neurotic or any poisonous drugs so defined by the Pharmacopeia or by the United States American or National Standard Dispensatory unless the person requesting the prescription shall first fingerprint it. Com-

mittee substitute for H 120 proposes to permit the organization of nonprofit, nonstock hospital service corporations and to authorize such corporations to furnish medical service and hospital service to subscribers. The medical service shall consist of medical and surgical care as specified in the subscriber contract issued by the corporation and shall be provided by duly licensed doctors of medicine.

**Bills Passed**—H 120 passed the senate, March 9. Prior to passage the proposal was amended to provide that hospital service corporations shall be declared to be scientific nonprofit institutions and exempt from taxation. H 230 passed the house on March 3 and the senate on March 10. It proposes among other things to require every physician who examines or treats a person having syphilis, gonorrhea or chancroid to instruct such person in measures for preventing the spread of the disease and to inform such person of the necessity of taking treatment until cured. If the person fails to report for treatment the physician must make a report of such fact to the local health officer.

#### Wisconsin

**Bills Introduced**—S 208 proposes to authorize a court to admit in evidence in prosecutions for operating a motor vehicle while under the influence of intoxicating liquor, testimony concerning the amount of alcohol in the accused's blood as shown by a chemical analysis of his breath, urine, or other bodily substance. S 196 proposes to authorize the state department of public welfare to establish clinics for the diagnosis of mental illness and to authorize such clinics to accept patients for hospitalization therein on written application by such person or a relative, judge, sheriff or health officer accompanied by a medical certificate, signed by two physicians licensed to practice medicine and surgery, to the effect that the person mentioned in the application shows symptoms of mental illness other than alcoholism, inebriety, or drug addiction and appears to be in need of hospitalization. The proposal would further exempt any physician signing such a certificate from civil liability for so signing. A 33, to amend the law relating to the formation of cooperative associations, proposes that nothing therein shall interfere with the organization of voluntary associations or with contracts for medical or hospital service or both on the basis of a stipulated sum to be paid periodically. A 60 to amend the income tax law proposes to authorize the deduction to the extent not compensated by insurance or otherwise of amounts paid for professional services rendered by a doctor of medicine, dentist, osteopath or chiropractor for medicine and therapeutic treatment and amounts paid for hospitalization and care by a registered nurse other than in a hospital. A 73 to amend the income tax law proposes to authorize the deduction of payment for expenses for hospital, nursing, medical, surgical, dental and other healing services and for drugs and medical supplies incurred by the taxpayer on account of sickness or of personal injury to himself or his dependents. A 263 to amend the workmen's compensation act proposes to require that an employee who submits to an examination at the request of his employer shall be furnished with a detailed report in writing of the examining physician's findings and conclusions. A 297 proposes that every person in the practice of medicine, surgery, osteopathy or dentistry should make and maintain a written record of professional services rendered to any person who has served in the United States army, navy or marine corps or any branch thereof and shall keep such records for not less than six years after the service is rendered. A 305 proposes to require the annual registration of every person licensed to practice medicine and surgery, osteopathy or osteopathy and surgery. A 312 proposes to make counties having more than a certain population liable for medical care rendered by a physician and surgeon to certain persons entitled to such care at public expense. A 324, to amend the law relating to chiropractors, proposes that one duly licensed to practice chiropractic shall be known and designated as 'Doctor of Chiropractic' written after his name or as Doctor (his name) chiropractor or the abbreviations of either of such titles. A 327 proposes a law relating to the establishment and administration of a system of health insurance. Under the proposal the term physician would mean any person licensed to practice medicine or surgery in the state.



## Medical News

(PHYSICIANS WILL CONFERR A FAVOR BY SPENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST SUCH AS RELATIVE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH)

### CALIFORNIA

**Personal**—Dr George D Lyman, San Francisco, was recently elected president of the California Historical Society and Dr Morton R Gibbons, San Francisco, was elected a member of the board of directors—Dr Junius B Harris, Sacramento, was recently chosen president of the California Academy of Medicine

**Popular Medical Lectures**—Stanford University School of Medicine, San Francisco, announces its sixty-first course of popular medical lectures to be given at Lane Hall. The schedule will be: Drs Jacob C Geiger on "Food Rationing and Civilian Health," April 2, Alfred C Reed "Tropical Diseases Menace United States at War," April 16, Loren R Chindler, "Health Service to the Public During the Emergency," April 30, and John K Lewis, "Protection of Health and Fitness in Flying Personnel," May 14. All are of San Francisco.

**New Mental Clinic**—A mental clinic known as the Los Angeles Psychiatric Service has been set up in the Cedars of Lebanon Hospital, Los Angeles, through a special grant of Community Chest funds authorized by the Community Welfare Federation. Established on a one year demonstration basis, the unit is said to be the community's first psychiatric clinic for adults. It will be operated by a volunteer board of directors composed of business, professional and civic leaders interested in social welfare, of which Dr Glenn E Myers, Los Angeles, is chairman.

### CONNECTICUT

**Dr Thorn Gives Alpha Omega Alpha Lecture**—Dr George W Thorn, Hersey professor of the theory and practice of physic, Harvard Medical School, Boston, gave the annual Alpha Omega Alpha Lecture in Brady Memorial Laboratory, Yale University School of Medicine, New Haven, February 11. His subject was "Clinical Aspects of Disturbances in Sodium Chloride Metabolism."

### ILLINOIS

**Society News**—Dr Harry L Huber, Chicago, discussed problems in allergy before the Will-Grundy County Medical Society at Joliet March 19—The Kankakee County Medical Society was addressed, March 9, by Dr Albert Vander Kloot, Chicago, on "The Anemias."

#### Chicago

**The Lewis Linn McArthur Lecture**—Dr Chester M Jones, Boston, will deliver the nineteenth Lewis Linn McArthur Lecture of the Frank Billings Foundation on April 23 at the Palmer House. His subject will be "The Relationship Between the Nervous System and Pain Perception with Particular Reference to the Gastrointestinal Tract."

**Dr William Petersen Resigns at Illinois**—Dr William F Petersen recently resigned as professor of pathology at the University of Illinois College of Medicine. It is reported that Dr Petersen will devote his time to private research on the weather and its effect on human beings, a field in which he has already carried on considerable work. He was a member of the staff at Vanderbilt University School of Medicine, Nashville, Tenn., from 1914 to 1917, when he joined the medical corps of the U S Army. He joined the Illinois faculty in 1919 and in 1924 was named to a full professorship.

### INDIANA

**Hospital News**—A three story hospital, including seven wards with a normal capacity of 180 beds, has been opened at the Indiana State Prison. The arrangement has been planned to meet the special requirements and problems confronting the medical services of a correctional institution.

**Changes in Health Personnel**—Dr James Carl Freed Attica, has been named health officer for Attica—Dr Earle C McBride, Terre Haute, was elected president of the city board of health—Dr James E McMeel, South Bend was elected president of the South Bend Board of Health recently, succeeding Dr George F Green, who has gone into military

service—Dr Hugh A Cowing was elected president of the Muncie Board of Health January 15. Dr Herbert D Fair was elected vice president and Dr John H Bowles was elected secretary. Dr Ferrell W Dunn and Mrs Alfred N Davis are members of the board.

### LOUISIANA

**University News**—Franklin Bliss Snyder, LL D, Evanston, Ill., president of Northwestern University, gave the commencement address at the Louisiana State University School of Medicine, New Orleans, March 10, on "An Incident in the History of Fort Ticonderoga."

**Physician Donates Rare Collection to Library**—Dr Henry W C Walther, New Orleans, recently presented to the Howard-Tilton Memorial Library at Tulane University of Louisiana, New Orleans, a 700 volume collection of rare first editions, including the works of prominent English and American authors. Dr Walther graduated at Tulane's school of medicine and later served there as professor of urology.

**Kenny Treatment Center**—The division of crippled children of the Louisiana State Board of Health and the Charity Hospital of New Orleans are now operating a joint project in the hospital for treating acute paralytic poliomyelitis. The new service will be known as the Kenny Method Treatment Center. It will be considered a special orthopedic pediatric service treating cases of acute paralytic poliomyelitis under isolated conditions as employed in infectious diseases according to the *Bulletin* of the New Orleans Parish Medical Society. The management of patients will be carried out by members of the faculties of the Louisiana State University School of Medicine and the Tulane University of Louisiana School of Medicine, New Orleans, and the hospital staff.

### MASSACHUSETTS

**Physician Chosen President of Winthrop Subsidiary**—Dr Bruno Thurber Guild, Boston, has been chosen president of Fairchild Brothers and Foster, a subsidiary of Winthrop Chemical Company, it was announced on February 10. Fairchild Brothers and Foster manufacture enzymes and other pharmaceutical products. Dr Guild is a past president of the Dorchester Medical Society, consultant of the Council on Pharmacy and Chemistry of the American Medical Association and counselor of the Massachusetts Medical Society.

### MICHIGAN

**Epidemic Keratoconjunctivitis Now Reportable**—The state council of health at a meeting January 7 added epidemic keratoconjunctivitis to its list of reportable diseases. All cases or suspected cases shall now be reported to the local health officer within twenty-four hours after diagnosis.

**Changes in Health Officers**—Dr Frederick A Musacchio, Crowley, La., has been named director of the St Joseph County Health Department—Dr Albert C Edwards, White Cloud, director of the Fifth District health department has resigned to become head of the St Clair County Health Department—Dr Fred T Andrews has resigned as director of the health department of Bay County to become associated with the Fisher Body Division of the General Motors Corporation in Lansing—Dr George C Stucky, Charlotte, health officer of Eaton County, was recently placed in charge of the Barry County Unit. The two units were combined for the duration.

**Tri-State Medical Association Meeting**—The Northern Tri-State Medical Association comprising the states of Indiana, Ohio and Michigan, will hold its annual meeting at the Rackham Building, University of Michigan, Ann Arbor, April 13 under the presidency of Dr Howard H Cummings, Ann Arbor. The program includes the following speakers from the medical school at Ann Arbor:

- Dr Cyrus C Sturgis The Clinical Significance of Leukopenia
- Dr Frank N Wilson The Diagnosis and Treatment of Coronary Artery Disease
- Dr Herman H Riecker Differential Diagnosis and Management of Hypertension
- Dr Richard H Lyons The Management of the Edematous Patient
- Dr Russell N De Jong Headaches: Diagnosis and Treatment
- Dr Carl D Camp Emotional Influences on the Gastrointestinal Tract
- Dr Arthur C Curtis The Treatment of Tinea Infections
- Dr Frederick A Coller Fundamental and Clinical Consideration of Traumatic Shock
- Dr Jack Matthews Farris The Use of Reduced Temperatures in the Management of Peripheral Vascular Disease
- Dr Reed M Nesbit Present Status of Hormone Therapy for Cancer of the Prostate
- Dr F Bruce Fraclik Discussion and Questions Commonly Asked About the Eyes by Patients
- Dr Albert C Furstenberg Complications of Acute Upper Respiratory Infections
- Dr Norman F Miller Caudal Anesthesia in Obstetrics



## NEBRASKA

**State Meeting Canceled**—The Nebraska State Medical Association will not hold an annual session in 1943. A meeting of the house of delegates will be held in Lincoln May 4. Members wishing to attend this session will be welcome.

## NEW YORK

**Changes in Hospital Management**—Newspapers recently reported that St. Mary's Infant Asylum and Maternity Hospital, Buffalo, will be converted into a hospital for infants and children only and that the Central Park Hospital, Buffalo, was to be taken over, February 1, by the Sisters of St. Francis. It was also reported that the Providence Retreat, Buffalo, for the treatment of mental and nervous disorders will be used exclusively for maternity cases in the future. Both the Retreat and St. Mary's hospitals are owned and operated by the Sisters of Charity; the report stated. The name of the Providence Retreat will be changed. The shifting of these facilities was carried out because of the need for an additional maternity hospital in the area.

## New York City

**Meeting of Hispanic-American Medical Society**—The annual meeting of the Hispanic American Medical Society of New York will be held at the New York Academy of Medicine on March 23. A symposium on hypertension will make up the program with Dr. Irvine H. Page, Indianapolis, presenting a paper entitled, 'Is Essential Hypertension of Renal Origin?' Dr. George J. Heuer, 'Value of Surgery in the Treatment of Hypertension' and Domingo M. Gomez, formerly of Paris University, Paris, France, 'Hemodynamics and Mean Pressure'.

**New Committee on Psychosomatic Medicine**—The Kings County Medical Society and the Academy of Medicine of Brooklyn have announced the organization of a committee on psychosomatic medicine to arrange a teaching program in psychosomatic medicine for practicing physicians and to establish in local hospitals personnel trained in psychosomatic medicine who will be available for therapy and research. The committee consists of a chairman who is an internist with a psychoanalytic orientation, two psychiatrists, a cardiologist, a urologist, a gastroenterologist and a gynecologist. Others will be added as the need arises. Members include Drs. A. Nathaniel Rosen, Brooklyn, chairman; Irving J. Sands, Brooklyn, and Howard W. Potter, psychiatry; Alfred C. Beck, Brooklyn, obstetrics and gynecology; Leo S. Drexler, Brooklyn, urology; Henry F. Kramer, Brooklyn, gastroenterology; and Louis H. Sigler, Brooklyn, cardiology.

**Goldwater Fund for Fellowship in Hospital Administration**—Under the will of the late Dr. Sigismund S. Goldwater, a sum of money was left to Mount Sinai Hospital which, together with gifts from Mrs. Goldwater and friends of Dr. Goldwater, will provide an income of \$1,000 annually to establish a fellowship in hospital administration and will be known as the Dr. S. S. Goldwater Memorial Fund. Recipients will receive the stipend of \$1,000 during the year of appointment and be provided with residence in the hospital if an unmarried person. It will be made available to serious students and workers in hospital administration and should prove of most benefit to some one already in the field in a junior and even senior position. Previous hospital background and experience would provide an important foundation for the fellowship which should prove especially useful to junior hospital administrators with a present hospital connection, who can secure a year's leave of absence if selected and who can return to their positions. The fellows' daily activities will be fitted to his own needs for hospital training and to his own capacities. Applications are now being accepted, since funds for the stipend are now available; the selection to be made by the board of trustees of the hospital. The benefits of the fellowship will not be limited to Mount Sinai Hospital.

## OHIO

**Dr. Mann Gives Alpha Omega Alpha Lecture**—Dr. Frank C. Mann, professor of pathology and experimental physiology, and surgery, University of Minnesota Graduate School, Rochester, Minn., delivered the Alpha Omega Alpha Lecture in the Institute of Pathology, Cleveland, March 12 on "The Value of Research in Medical Education."

**Annual Meeting of State Society**—"Medicine on the Home Front" will be the theme of the ninety-seventh annual meeting of the Ohio State Medical Association at the Neil House, Columbus, March 30-31. Dr. Edward J. McCormick, Toledo, president of the association, will speak on "Adjustment of the Physician to Civilian Needs in Wartime." One

session on "Medicine and the War" will be addressed by Drs. Robert Conard, Wilmington, Elmer L. Henderson, Louisville, Walter F. Donaldson, Pittsburgh, and Harold S. Diehl, Minneapolis. There will be general sessions on "Keeping them Working," featuring a symposium of subjects pertaining to industrial health with the following speakers:

Ralph Christopher Ieggio, Columbus, surgeon, U. S. Public Health Service Reserve, director, industrial hygiene service, state department of health, Present Day Influences in Industrial Health.

Dr. Carl M. Peterson, Chicago, Secretary, Council on Industrial Health, American Medical Association, Essentials and Organization of Industrial Health Services.

Dr. Henry Close Hesselstine, Chicago, Women in Industry—Present and Future Problems.

A general session devoted to "Keeping them Healthy" will be addressed by Drs. Tom D. Spies, Cincinnati and Birmingham, Ala., on 'Importance of Optimum Nutrition for the Civilian Population in Wartime' and John A. Toomey, Cleveland, 'Importance of Immunization of the Civilian Population in Wartime.' All sessions of the Women's Auxiliary to the state medical association will be held at the Deshler-Wallick Hotel on March 30.

## VIRGINIA

**Institutes on Industrial Medicine**—The department of clinical and medical education and the committee on industrial health of the Medical Society of Virginia are cooperating in a series of five one-day institutes on industrial medicine in the Tidewater area. Meetings are being arranged at Newport News, March 22; Norfolk, March 23; Portsmouth, March 24; Suffolk, March 25; and Petersburg, March 26, under the sponsorship of the Peninsula Academy of Medicine, Elizabeth City County Medical Society, Norfolk County Medical Society, Portsmouth Medical Association, James City County Medical Society and the Fourth District and Southside Virginia medical societies. The program will include the following speakers:

Dr. Orlen J. Johnson, Chicago, Industrial Medicine Today.

Dr. Hark L. Stephenson, Richmond, Compensation.

Drs. Everett L. Evans and Milton J. Hoover, Jr., both of Richmond, Trauma Shock and Burns.

Dr. William I. Weaver, Richmond, Industrial Medicine.

John E. Dunn, Jr., passed assistant surgeon, U. S. Public Health Service, Bethesda, Md., Dermatitis.

## WASHINGTON

**Changes in Health Officers**—Dr. Arthur L. Ringle, Portland, Ore., has been appointed district health officer with headquarters at Walla Walla to succeed Dr. John A. Kahl. Dr. Willis E. Smick, Seattle, has been named health officer of Cle Elum.

**Society News**—The Walla Walla Valley Medical Society recently was guest of the Veterans Administration Facility at Old Fort Walla Walla. Dr. Oliver M. Warner, Walla Walla, discussed Diaphragmatic Hernia and Lieut. Karl W. Pleissner, M. C. U. S. Army, "Protection in Gas Warfare and Treatment of Casualties." Dr. Robert D. Forbes, Seattle, discussed 'Progress in Abdominal Surgery' before the King County Medical Society, March 1. The society will be addressed, April 5, by Drs. Julius A. Weber on 'Atelectasis of the Lungs: Postoperative and in the Newborn,' and Thomas W. Blake, 'Some Nontuberculous Pulmonary Conditions,' both are of Seattle.

## WISCONSIN

**Appointments to State Board of Health**—New members of the Wisconsin State Board of Health are Drs. Albert E. Rector, Appleton, to succeed Dr. Joseph Dean, Madison; Dr. Ira F. Thompson, Racine, to succeed Amalia C. Baird, R.N., Eau Claire; Dr. Gunnar Gundersen, La Crosse, to succeed Dr. Cornelius A. Harper, Madison, who resigned as state health officer and is member of the board; and Dr. William T. Clark, Janesville, to succeed Dr. Robert L. McCormack, Whitehall. Dr. Carl N. Neupert, Madison, is the new state health officer (THE JOURNAL, January 30, p. 364).

**Mickle Fellowship Awarded to Dr. Tatum**—The Charles Mickle Fellowship for 1942 at the University of Toronto, Canada, has been awarded to Dr. Arthur L. Tatum, since 1928 professor of pharmacology, University of Wisconsin, Madison. The award went to Dr. Tatum as the member of the medical profession who has done most during the preceding ten years to advance sound knowledge of a practical kind in medical art or science. Dr. Tatum received his degree at Rush Medical College, Chicago, in 1914, having earned his Ph.D. at the University of Chicago in 1913. He has served as professor of pharmacology at the University of South Dakota and as assistant professor of pharmacology at the University of Chicago. In 1937 he was chosen president of the American Society of Pharmacology and Experimental Therapeutics.

## GENERAL

**Association of Anatomists**—The 1943 meeting of the American Association of Anatomists scheduled to be held at McGill University Faculty of Medicine, Montreal, has been canceled. As first vice president of the association Dr J Parsons Schaeffer, Philadelphia, assumes the responsibilities of president of the association to succeed the late Edgar Allen PhD New Haven, Conn., and Dr Elton R Clark, Philadelphia has been named secretary-treasurer to succeed the late Francis H Swett PhD, Durham, N C. Sectional meetings of the association will be held in Philadelphia and Chicago in April.

**Dr Bing Joins Institute of Baking**—Israel M C Bing, PhD, Secretary of the Council on Foods and Nutrition of the American Medical Association Chicago, has been appointed director of the American Institute of Baking Chicago effective March 15. Dr Bing was born in Montgomery County near Philadelphia Dec 29 1902. He received his doctor of philosophy degree at Yale University New Haven Conn in 1930. Prior to joining the American Medical Association in February 1936 Dr Bing had been a member of the staff of the department of biochemistry at Western Reserve University, Cleveland. He is assistant professor of physiology at Northwestern University Medical School and a member of the Food and Nutrition Board of the National Research Council Washington, D C.

**Conference of State and Provincial Health Authorities**—The forty-eighth annual Conference of State and Provincial Health Authorities of North America will be held at the District Medical Society Building Washington D C March 23, under the presidency of Dr Carl V Reynolds Raleigh N C. Among the speakers will be

Drs Stanley H Osborn Hartford Conn John T Phair Toronto Ontario and James G Townsend Bethesda Md Industrial Health  
Dr Frederick W Jackson Winnipeg Manitoba Wilton L Halperin Sacramento Calif George Bruch Washington and Albert S McCown Washington National Defense and Disaster Relief  
Drs George W Cox Austin Texas and Malcolm R Bow Edmonton Alberta John K Hoskins Cincinnati Environmental Sanitation  
Drs John F Kendrick Raleigh Gregoire F Amyot Victoria B C and William H Schrell Jr Bethesda Nutrition  
Dr Elmer Dr Roland R Cross Springfield Ill A W Fuchs C F Washington and Ollie E Reed MS Washington Milk  
Drs Henry Hanson Jacksonville Fla Antonio Ferns-Isern San Juan P R and Kolff F Dyer Bethesda Tropical and Subtropical Diseases

A feature of the meeting will be the presentation of honorary life membership to Dr Cornelius A Harper Madison, recently retired as health officer of Wisconsin. Meetings for which a program is not available will be those called by Dr Thomas Parran, surgeon general of the U S Public Health Service, Washington, on March 24, and by Katharine F Lenroot LL D, chief of the Children's Bureau Washington, March 25.

**Board of Orthopedic Surgery Revises By-Laws**—The American Board of Orthopaedic Surgery announces that under a revision of its by-laws now under way the examination will be divided into parts I and II. Applicants who have completed a rotating internship and one or two years of resident training in orthopedics or their equivalent in military service will be eligible for part I of the examination. This part will cover the basic sciences, fundamentals of surgery and elementary principles of orthopedic and fracture treatment with oral interviews and written examination. Tentative plans provide that part I may be given during the fall months in four different centers, probably in New York, Chicago, New Orleans and San Francisco. Part II of the examinations will probably be given as heretofore only once a year in connection with the meeting of the American Academy of Orthopaedic Surgeons. Applicants for part II must have completed their full requirements for eligibility, including their practice periods. The written examination and oral interviews will include advanced operative technique, standard orthopedic procedures, reviews of the literature and case records. Certification by the board will follow successful completion of part II of the examination. In order that the committee on eligibility may have adequate data for evaluation of the training of applicants who have served with the armed forces a plan will be set up whereby all who are assigned to orthopedic services will be provided with an orthopedic service record. This record must indicate the character and amount of orthopedic work performed at each post to which prospective applicants are assigned. The fee schedule is also being revised. The board announces the revised rulings will be published and distributed by July 1943 so that prospective candidates may be governed accordingly. The dates of future examinations will be published at the same time. Dr Guy A Caldwell, 3503 Prytania Street New Orleans, is secretary of the board.

**Report of American Red Cross**—The expanded services of the American Red Cross to meet the needs occasioned by the United States' participation in World War II are outlined in the organization's annual report for the year ended June 30, 1942. Since the organization of the first camp and hospital service council at Fort Dix in July 1941 the program has been extended during the year to seventy-three councils representing 817 chapters and approval was given to about thirty-five additional councils. Full time representation was made available at eighteen regional offices out of fifty-three served and additional services will be developed as the need increases. On July 1, 1941 the personnel of services to the armed forces totaled 641 while on June 30 1942 the total was 3088 an increase of 381 per cent. On June 30 1942 the hospitals in continental United States were staffed with 527 workers as follows: 178 medical social psychiatric social and other social workers, 166 recreation workers and 183 clerical personnel. The bureau of army affairs handled 18780 cases as compared with 4289 for the previous year the increase caused mainly by inquiries from families of service men concerning their welfare after Pearl Harbor. Information was requested from the War Department on 6758 service men as compared with 737 similar requests during the previous year. Tremendous increases were also noted in similar services by the bureau of naval affairs.

From July 1, 1941 to June 30 1942 the Red Cross extended relief in 172 disasters in forty-two states. In all 72434 persons were aided at a total expenditure of \$1233292.37. Disasters in continental United States for the year number fifteen more than the peak year of 1938-1939, when the total reached 157. Though most of the disasters were minor in point of numbers of families affected the large number of operations necessitated an expenditure for disaster relief of \$286668.81 in excess of the \$946,626.56 spent during the previous year. The largest single operation was necessitated by a series of destructive tornadoes which struck during the week of March 15 1942 in fifty-two counties of Mississippi, Tennessee, Alabama, Kentucky, Indiana and Illinois. The Red Cross provided rehabilitation assistance for 1077 families out of a total of 2249 affected. Ninety per cent of the assistance was given to farm families. One hundred and fifty-one persons were killed, 600 were seriously injured and 500 received minor injuries. Of the 442 hospitalized only seventeen remained in hospitals June 1 1942. Thirty-eight disasters were caused by tornadoes and floods in Arkansas, Colorado, Illinois, Indiana, Kansas, Missouri, Minnesota, Nebraska, North Dakota, South Dakota, Oklahoma, Texas, Wisconsin, Iowa and Michigan the largest number of disasters for a like number of days in the history of the Red Cross. The greatest disaster of the year in a single community occurred in Pryor Okla. April 27 when a tornado killed 44 persons and injured 277. Hospitalization was necessary for 225 of the injured. From April 20 to 22 thirteen counties in the central part of east Texas were affected by the heavy rise in waters of the Trinity River and its tributaries. The Red Cross assisted 2034 with emergency and rehabilitation relief of the 3430 families affected.

During the year 778 Red Cross public health nurses, paid in full or in part from chapter funds have cared for 242052 patients, requiring a total of 897260 visits to homes to physicians and to agencies in behalf of patients and to individuals receiving health supervision. 306 chapters sponsored 441 nursing services. More than 348 nurses gave a total of 3093½ days of service in thirty-one disaster relief operations.

In its participation in the development of blood donor service, the Red Cross has centers in New York, Philadelphia, Baltimore, Buffalo, Rochester, N Y, Indianapolis, Detroit, Pittsburgh, St Louis, Cincinnati, Brooklyn and Washington, D C.

During the year 1731 chapters with a staff of 16093 nutritionists and instructors offered the standard nutrition and canteen courses. The organization has cooperated with state nutrition committees in providing refresher courses, the activities of the Red Cross in this field being primarily educational. A total of \$25309738.17 was expended by the American Red Cross in carrying out its various programs of aid and maintenance of organization.

## CORRECTION

**School of Tropical Medicine of the University of Puerto Rico**—In the item concerning the Ashford General Hospital in the Medicine and the War section of THE JOURNAL February 20 page 599, the year in which the School of Tropical Medicine of the University of Puerto Rico was established was erroneously given as 1936. This school was opened in September 1926 (THE JOURNAL, July 31, 1926, p 332).

## Foreign Letters

### LONDON

(From Our Regular Correspondent)

Feb 6, 1943

#### Cancer Research

Like most of our ordinary activities, cancer research goes on notwithstanding the war. At the nineteenth annual meeting of the British Empire Cancer Campaign reports from twenty-four research departments or branches in this country and from eleven overseas were announced. The finding by Bittner in the milk of female mice of high cancer strain a factor concerned in the development of spontaneous breast cancer gave rise in the department of experimental pathology and cancer research of the University of Leeds to a study of the effects of estrogenic stimulation on male mice. The newborn of high breast cancer were at once transferred to mothers of low breast cancer strain, and vice versa. After weaning injections of triphenylmethane were made and continued until death. The results showed an almost complete reversal of the expected incidence of cancer. Of the mice which died only 1 mouse suckled by a low breast cancer foster mother developed breast cancer whereas all but 3 of the low breast cancer mice suckled by a high breast cancer foster mother died of breast cancer. In another laboratory, at Newcastle on Tyne the incidence of breast cancer in mice of low cancer strain was raised from 5 to 60 per cent by fostering them on females of high cancer strain.

The clinical research committee of the campaign has analyzed 473 cases of cancer of the esophagus registered in London hospitals during 1938 and 1939. In 67 per cent the first symptom was dysphagia in the remainder misleading symptoms led to mistaken diagnosis. Radical surgery was possible in only 5 cases. Exploratory operations had a high mortality. Radium treatment was disappointing. Of the 473 cases 399 were fatal in the first year, 19 in the second and 5 in the third. Sixty-five cases of postcricoid carcinoma were also analyzed there were 56 deaths in the first year from the beginning of treatment 3 in the second year and 1 in the third. Two of the remaining patients are known to be still alive and 3 are untraced. A curious sex difference was found between the two groups. Of the patients with postcricoid cancer 54 (83 per cent) were female, whereas of the 473 with esophageal cancer only 76 (16 per cent) were female. The mean age of the postcricoid patients was 65 years for males and 55 for females. Of the esophageal patients 64 for males and 61 for females.

#### The Royal College of Physicians and Housing Schemes

Before the war the health authorities were engaged in a housing effort which was producing over three hundred thousand houses annually. This had to be suspended because of the war, after which there will be an accumulated deficiency. Steps are already being taken to start again on the cessation of hostilities. The Ministry of Health has appointed a central advisory committee which is drawing up a program. At its request the Royal College of Physicians has given advice on features which have a bearing on health. A committee of the college states that in planning the importance of sunshine, warmth, light and air must be considered. In cottage estates the rooms most commonly used, at least one of which should be a bedroom, should face south to southeast. In block dwellings the major axis should run from north to south so that the majority of flats face east and west. 'Wells' which overshadow one block by another should be avoided.

The main health feature of structure is complete protection from dampness. Care should be taken to prevent noise and the siting of windows should be governed more by the calls of

health than by external symmetry. The college does not regard as adequate the present standards of floor space and area of rooms. It recommends that in a house of three bedrooms no room used for sleeping should be smaller than 100 square feet and that the second bedrooms, presumably to be used for children, should be as large as the first. A local authority should reject plans of a new house or extension of a house unless baths with a piped supply of hot and cold water and a sink with hot and cold water are provided. A living room in which neither cooking nor washing is carried out is essential, and three bedrooms should be the minimum for all families of two or more persons, except aged couples. In the reconstruction of cities there are great opportunities for providing open spaces.

The college, being concerned for the protection of children from traffic dangers, the promotion of community health centers and community feeding, and services for social health, recommends that housing estates should be grouped on a community basis. In populous areas at any rate provisions should be made for cheap, wholesome meals. All the services for preventive medicine including infant welfare, school health services and supervision of adolescents and industrial workers, should be brought together as a health center under one roof.

#### The Wartime Increase of Tuberculosis

A recent report of the Medical Research Council shows an increase of deaths from tuberculosis since the beginning of the war in all age groups. The report states that under war conditions primary infection among those who have reached adult life uninfected has probably increased. It therefore urges that physicians should pay special attention to all cases of pleurisy, erythema nodosum and phlyctenular conjunctivitis. Such cases, as well as those of hemoptysis without apparent cause should be referred to the tuberculosis officer for full investigation, follow up examinations and search for source of infection within their families. The importance of this is shown by a survey of 2,000 patients with tubercle bacilli in their sputum. Of these, 27 per cent had a history of untreated pleurisy or hemoptysis three or four years before a diagnosis of pulmonary tuberculosis was made. Physicians are also asked to refer cases of suspected glandular, abdominal and other nonpulmonary tuberculosis to the tuberculosis officer for radiography of the chest, so that search for contacts may be made.

#### The Functions of the Pyloric Canal

At a meeting of the Section of Anatomy and Physiology of the Royal Academy of Medicine in Ireland, Dr. J. W. Millen drew attention to the importance of the pyloric canal as a distinct region of the stomach which differed in anatomy, mobility and function from the other parts. In the normal stomach three parts could be recognized: (1) a region for reception and storage, which was present in all but the lowest invertebrates, (2) a terminal closing mechanism—the pyloric sphincter—which assisted in the maintenance of storage, and (3) an active milling region—the pyloric canal—for the trituration and fine subdivision of food. The storage region comprised the body and fundus and the more or less well defined pyloric antrum for the active filling of the pyloric canal.

Roentgenograms of the stomach of a young adult showed that in the early stages of canalization by an opaque meal the food did not at once enter the pyloric canal. When a small amount of the meal was manually pressed into the pyloric canal, the longitudinal folds of the mucous membrane could be seen in the canal and the pyloric sphincter was well defined. After about half a pint of the meal had been given, further roentgenograms showed that the pyloric canal had become rounded and globular but was still a separate region filled from the pyloric antrum by deep peristaltic waves which traversed it. But in about a third of dissecting room subjects examined no pyloric canal could be defined, the whole stomach being a single cavity.

In the remaining two thirds the normal subdivisions as described were found. The absence of a pyloric canal in the former group might be due to its incorporation in the proximal part of the stomach and represent a shift toward the single chamber of adult carnivores.

The pyloric canal therefore had two functions—as an active milking region and in the emptying of the stomach, either as an active or as a passive region coordinated with the body of the stomach. Congenital hypertrophic stenosis of the pylorus was a hypertrophy of the pyloric canal not of the pyloric sphincter. It might therefore be due to the pyloric canal functioning as a mill but failing to act in harmony with the proximal part of the stomach in its function as part of the emptying mechanism.

#### Cooperation of Rheumatism Specialists and Orthopedic Surgeons

Rheumatism in its various forms is so prevalent as to be a national problem. The Empire Rheumatism Council and the British Orthopedic Association have agreed that their mutual cooperation in the diagnosis, prevention and treatment of crippling conditions would be of great service to the community. They aim at a close liaison between the physician specializing in rheumatism and the orthopedic surgeon seeking to enlist the cooperation of the general practitioner, the public health services and social workers generally. They hold that orthopedic hospitals and orthopedic departments of general hospitals should have on their staffs a physician with special knowledge of rheumatic diseases and that rheumatism centers should have on their medical staffs an orthopedic surgeon. Since the application of methods of physical and occupational therapy for orthopedic and rheumatic patients is largely identical a joint outpatient clinic should, wherever practicable, serve for both classes of patients.

In view of the growing appreciation of the regionalization of medical services, the scheme for the rheumatism treatment centers should be planned to fit into such schemes as may be arranged for the future. This has already been done in orthopedic schemes, in which the development of the centers is based on the legal requirements of the notification of certain crippling diseases and on the public responsibility for the provision and payment for their treatment. So in rheumatic diseases a similar responsibility should be assumed by the state and the local authority. Provision for the training of young physicians and surgeons in research, diagnosis and treatment should be associated with suitable encouragement to make the study of rheumatic disease a life work. To put into effect the agreed plan of cooperation a joint standing committee of eminent rheumatism specialists and orthopedic surgeons, under the chairmanship of Lord Horder, has been appointed.

#### Road Accidents in 1942

The road accidents for December were the highest of any month of 1942: 780 killed and 12,842 injured compared with 1024 killed and 18,300 injured in December 1941. Since the war the December accident peak has been more pronounced because of the blackout accidents. Last December nearly three fourths of the pedestrians killed, other than children, lost their lives during the hours of darkness. Fatalities to children, including cyclists numbered 109, and 1,650 were injured.

The number of deaths on the roads of Great Britain in 1942 was 6,926. This is a decrease of nearly a fourth compared with 1941, but not so great as might have been expected considering the fewer vehicles on the road. Early in 1941 the danger of road accidents was increased by the heavy enemy night raids and consequent hurry to get home.

During 1942, 1,315 children were killed, against 1,462 in 1941. A possible cause of the high proportion of accidents to children is that many persons are engaged in war work and cannot exercise the supervision they would give in normal times.

#### BRAZIL

(From Our Regular Correspondent)

Feb 26, 1943

#### The Work Against Yellow Fever in Brazil

The 1941 annual report of the National Yellow Fever Service of Brazil contains interesting information. Up to 1930, when the Vargas regime began in Brazil, the control of yellow fever was the duty of various authorities and this continued until Dec 31, 1941, when the government obtained the cooperation of the International Health Board of the Rockefeller Foundation. The work was then reorganized and unified, with the creation of a new organization under the name of National Yellow Fever Service. This is an extensive single organization dealing with an important health problem particularly since the discovery of the widespread sylvatic form of the disease. The practical results of the new organization were such that several countries of South America followed the example of Brazil, putting all the control measures of yellow fever under the technical guidance of Dr Fred L. Soper of the Rockefeller Foundation, with Rio de Janeiro becoming the coordinating center of the whole work. In 1932 a complete code of the control measures was approved by the Brazilian federal authorities, and such a code has been lately adopted by several foreign governments, as those of Argentina, Bolivia, British Guiana, Colombia, Ecuador, Paraguay, Peru and Venezuela. The Brazilian service has functioned as a training school for medical officers and technicians from the United States as well as from Argentina, Bolivia, British Guiana, British colonies of Africa, Belgium, Colombia, Cuba, France, Germany, Peru and Venezuela. For the first time in campaigns against yellow fever, a technique of intensive specific measures has been created against *Aedes aegypti* (Stegomyia), that resulted in the eradication of this species of mosquito from extensive areas. For a few years there have been no stegomyias in six of the twenty states of Brazil and the Federal District (Rio de Janeiro city), and in the rest of the country the stegomyia index (percentage of water deposits presenting larvae and pupae) is very low. For the control of *Aedes aegypti*, more than 338 million inspections of dwellings and almost 2 billion inspections of water deposits have been done between 1932 and 1941. The service expects that Brazil with its 3,228,000 square miles and 45 million inhabitants will be free of the stegomyia mosquito within a few years. From 1941 to the present, no more cases of stegomyia transmitted yellow fever have been registered.

But the control of the stegomyia is important only in urban and suburban areas, because for a decade it has been known that many cases of illness occurring in the forested areas were true cases of the same urban yellow fever, but the infection was not transmitted by *Aedes aegypti*. Evidence has accumulated that the mosquitoes *Aedes leucocelaneus*, *Hemagogus capricornius* and *Sabethinus* are responsible for the transmission of the disease in the jungles, where any mosquito control work is impracticable. The control of the sylvatic form of the disease depends on the extensive use of viscerotomy and of vaccination (THE JOURNAL, Jan 10 1942, p 159). There are now more than 1,500 localities where the service of viscerotomy is performed as a routine measure, and more than 30,000 samples of liver have been examined by the pathologic laboratory annually since 1938. To help in the epidemiologic investigations, more than 9,000 samples of blood serum have been used annually since 1939 in the performance of the white mouse protection test. The most effective measure to protect the rural population against yellow fever is immunization. The report shows that 158,034 vaccinations were performed in 1941 thus raising to more than 2 million the total of persons vaccinated against yellow fever since 1938. The annual number of jungle cases of the disease has been 263 in 1938, 130 in 1939, 172 in 1940 and only 19 in 1941. According to the latest information just a few cases have been recognized during the year 1942.

## Deaths

**John Finch Barnhill**, Miami Beach, Fla. Central College of Physicians and Surgeons, Indianapolis, 1888, practiced in Indianapolis since 1888 and specialized in surgery of the head and neck, since 1930 professor emeritus of surgery of the head at the Indiana University School of Medicine, where he had been professor of otology, laryngology and rhinology and later professor of surgery of the head and neck. In 1927 retired after thirty-eight years service as a teacher at the university and its predecessor, continuing in an advisory capacity. Was an honorary professor of anatomy at the University of Southern California School of Medicine, Los Angeles, specialist certified by the American Board of Otolaryngology, secretary of the Section on Laryngology and Otology, 1901-1903 and chairman in 1903-1904 of the American Medical Association and member of its House of Delegates in 1905 and in 1920 vice president of the American Ear, Throat and Nose Association in 1908, charter and honorary member of the Indianapolis Ophthalmological and Otolaryngological Society, member and in 1931 president of the American Academy of Ophthalmology and Otolaryngology, member and in 1928 president of the American Laryngological Rhinological and Otolological Society, member and in 1937-1938 president of the American Laryngological Association, member of the American Otolological Society, Inc., fellow of the American College of Surgeons, served as ear, nose and throat consultant at the City and Deaconess hospitals, Indianapolis, on the editorial board of the *Archives of Otolaryngology*, author of a textbook on Nose, Throat and Ear, co author of *Principles and Practice of Modern Otolaryngology*, 'Surgical Anatomy of the Head and Neck' and other books, received the LL.D. from his alma mater and the Indiana University in 1929, aged 78, died March 10.

**William Anderson Snodgrass** ♂ Little Rock, Ark., Arkansas Industrial University Medical Department, Little Rock, 1897, emeritus professor of surgery at the University of Arkansas School of Medicine, at one time professor of principles of surgery and clinical surgery at the College of Physicians and Surgeons, Little Rock, past president and for many years a member of the State Medical Board of the Arkansas Medical Society, past president of the Pulaski County Medical Society, fellow of the American College of Surgeons, formerly secretary of the board of health of Pulaski County, at one time city physician, veteran of the Spanish American War, organized and accompanied the Red Cross Hospital Unit T to England, served as a major in the medical corps of the U. S. Army during World War I and received the Distinguished Service Medal for bravery during the battle of the Marne, formerly secretary and general medical manager of the College of Physicians and Surgeons Hospital, on the staffs of the Little Rock General Hospital, Children's Hospital and the Baptist State Hospital, where he died, January 4, of myocarditis and hypostatic pneumonia, aged 68.

**James Alexander Clarke Jr.** ♂ Philadelphia, Jefferson Medical College of Philadelphia, 1918, specialist certified by the American Board of Internal Medicine, associate in medicine at his alma mater, assistant in medicine at the Columbia University College of Physicians and Surgeons, New York, 1918-1919 and assistant in clinical pathology from Feb. 1, 1919 to June 30, 1919, member of the American Association for the Study of Allergy and the Philadelphia College of Physicians, past president of the Society for the Study of Asthma and Allied Conditions, chief of the allergy service at the Germantown Dispensary and Hospital, formerly on the staffs of the Vanderbilt Clinic and the Roosevelt Hospital, New York, and the Seaside Hospital of St. John's Guild, Staten Island, since Sept. 27, 1922 on the staff as consultant in allergy at the Veterans Administration Facility for many years, assistant physician on the staff of the Philadelphia General Hospital, chief clinical assistant in the department of applied immunology at the Jefferson Hospital, where he died, January 31, of carcinoma, aged 51.

**Lorenzo Nelson Grosvenor**, Huron, S. D., Chicago Homeopathic Medical College, 1889, Rush Medical College, Chicago, 1902, member of the House of Delegates of the American Medical Association in 1931, member and in 1930 president of the South Dakota State Medical Association, fellow of the American College of Surgeons, past president and secretary of the Huron District Medical Society, specialist certified by the American Board of Ophthalmology, at one time practiced in Chicago, where he had been instructor of ophthalmology at Rush Medical College, on the staff of the Illinois Charitable Eye and Ear Infirmary and a member of the Chicago Ophthalmological Society, superintendent of the

Beadle County Board of Health, aged 74, died recently in Rochester, Minn., of coronary occlusion and hypertrophy of the prostate.

**Edward Henry Risley** ♂ Loma Linda, Calif., American Medical Missionary College, Chicago, 1904, Medical Department of the University of California, San Francisco, 1911, dean, professor of chemistry, member of the board of trustees and past president of the College of Medical Evangelists, instructor in chemistry, 1905-1906, and professor of chemistry from 1906 to 1910 at the American Medical Missionary College, Battle Creek, Mich., president of the San Bernardino County Medical Society, on the staff of the Loma Linda Sanitarium and Hospital, co author of 'The Food Question,' 'Foods Nutrition and Clinical Dietetics' and 'Home Physician and Guide to Health' aged 61, died, February 7, of cerebral hemorrhage and arterial hypertension.

**William Pitt Baker**, Pine Bluff, Ark., Arkansas Industrial University Medical Department, Little Rock, 1891, graduated from the West Point Military Academy in 1887 and joined the Tenth Infantry at Fort Union, New Mexico Territory, in the same year, was active in organizing the First Infantry of the Oklahoma National Guard, served during the Spanish American War, the Boxer Rebellion in China and World War I, was chief surgeon and chief of the Information Division of the Philippine Islands Constabulary, formerly professor of medical chemistry and toxicology at his alma mater now known as the University of Arkansas School of Medicine, mayor of Roshoro for six years, aged 79, died, December 11.

**Sylvester James McNamara**, Brooklyn, Long Island College Hospital, Brooklyn, 1892, member of the Medical Society of the State of New York, past president of the South Brooklyn Medical Society and the Brooklyn Gynecological Society, fellow of the American College of Surgeons, consultant at the Kings Park (N. Y.) State Hospital and the Coney Island Hospital, consulting obstetrician and gynecologist at the Kings County Hospital, consulting obstetrician and gynecologist and for many years secretary of the council of the Long Island College Hospital, where he died, January 31, of coronary thrombosis, aged 73.

**Margaret Schulze** ♂ San Francisco, University of California Medical School, San Francisco, 1916, specialist certified by the American Board of Obstetrics and Gynecology, Inc., member of the Pacific Coast Society of Obstetrics and Gynecology, fellow of the American College of Surgeons, assistant professor of obstetrics, gynecology and pathology at her alma mater, visiting pathologist, obstetrician and gynecologist, University of California Hospital, assistant visiting obstetrician and gynecologist, San Francisco Hospital, visiting gynecologist, Laguna Honda Home, aged 48, died, February 7, of acute hemorrhagic pancreatitis.

**Caswell C. Turner** ♂ Glasgow, Ky., University of Louisville Medical Department, 1910, president elect of the Kentucky State Medical Association, served as president and secretary of the Barren County Medical Society and for two terms as the councilor of the Third District, during World War I served as a captain in the medical corps of the U. S. Army, in charge of internal medicine at the Samson Community Hospital, a member of the board of the Glasgow Library Association and chairman of the Barren County Board of Health, aged 59, died suddenly, February 28, of angina pectoris.

**Samuel Stanley Dorrance**, Albany, N. Y., Albany Medical College, 1938, Dorrance Fellow in medical research, Johns Hopkins University, 1941-1942, served as assistant professor of physiology and pharmacology and associate in medicine, Albany Medical College, since September 1942, employed by the Transcontinental and Western Air, Inc., as a flight surgeon for a contract carrier operating under the Army Air Transport Command, aged 30, was killed in an air transport crash, January 15, in Dutch Guiana while on his way to conduct a medical survey in South America and Africa.

**Willard Geist Mengel** ♂ Camden, N. J., University of Pennsylvania School of Medicine, Philadelphia, 1921, assistant professor of ophthalmology at the Medico-Chirurgical College, Graduate School of Medicine, University of Pennsylvania, Philadelphia, specialist certified by the American Board of Ophthalmology, member of the American Academy of Ophthalmology and Otolaryngology, for many years on the staff of the Wills Hospital, Philadelphia, ophthalmologist on the staff of the Camden County General Hospital, Grenloch, aged 46, died, January 7, of coronary occlusion.

**Francis Normer Andrews Branchville**, S. C., Medical College of the State of South Carolina, Charleston, 1925, member of the Medical Society of the State of North Carolina, served during World War I, aged 43, was killed, January 19, when his automobile overturned.

**William A Applegate**, Washington, D C, Harvard Medical School, Boston, 1882, in 1937 retired as chief surgeon of the Southern Railroad after holding the position for thirty-two years, aged 85, died, December 18

**Eugene Hiram Ash**, Canton, Mo., Fort Wayne (Ind) College of Medicine, 1901, aged 70, died, December 5, in Iowa City of hemorrhage of the stomach

**Willis Alonzo Bird**, Herdland Ala., Chattanooga (Tenn) Medical College, 1895, aged 76, died, January 12

**Daniel Heister Bradley**, Pittman, N J., Hahnemann Medical College of Philadelphia, 1872, aged 93, died, January 30, of senility

**Arthur Richard Braunlich**, New York, College of Physicians and Surgeons, New York, 1894, formerly associated with the department of health as a diagnostician and consulting physician at the City Hospital, for many years attending physician on the staff of the Riverside Hospital, the Willard Parker Hospital and St Francis' Hospital, where he died, January 8, aged 74

**Daniel William Collins**, Wilkes-Barre, Pa., College of Physicians and Surgeons, New York, 1888, aged 76, died, January 8

**William Wilder Cook**, Quincy, Mass., Tufts College Medical School Boston 1910, practiced at Maracubo, Venezuela, and in the Panama Canal Zone for many years, aged 56, died, January 23, of coronary occlusion

**William E. Crotcher**, Fort Myers, Fla., University of Louisville (Ky.) Medical Department, 1891, aged 77, died, January 4 of heart disease, nephritis and hypertension

**Alan Morgan Davis**, Portland Ore., University of Oregon Medical School, Portland, 1938, a first lieutenant in the medical reserve corps of the U S Army not on active duty, aged 29, died, December 18, in San Francisco of Hodgkin's disease

**Theodore Benjamin Davis**, Newnan Ga., College of Physicians and Surgeons, Baltimore, 1881, aged 85, died recently

**Wayland Whitten Deering**, Shenandoah, Iowa, Eclectic Medical Institute, Cincinnati, 1898, aged 70, died recently of coronary thrombosis

**Thomas Sewell Fuson**, Cumberland Gap, Tenn., Hospital College of Medicine, Louisville, Ky., 1906, served during World War I, aged 65, died, February 13, as the result of a cerebral hemorrhage which occurred in September 1942

**Henry Walter Gilley**, Ottawa, Kan., Detroit Homeopathic Medical College, 1872, member of the Kansas Medical Society, served on the staff of the Ransom Memorial Hospital, aged 92, died, November 18

**Thomas Edward Griffiths** \* Chicago, Chicago Medical School, 1921, served with the Scottish Highlanders during the Boer War, physician for Armour and Company's Thirty-First Street Auxiliary, aged 57, died January 6, in St Luke's Hospital of acute coronary thrombosis

**Lewis Scott Hay**, Rock Hill, S C., Medical College of the State of South Carolina, Charleston, 1910, member of the South Carolina Medical Association, served as a first lieutenant in the U S Navy Air Corps during World War I, member of the staffs of the York County and St Philip's Mercy hospitals, aged 55, died, January 22, in the Veterans Administration Facility, Otten, of pulmonary tuberculosis

**Holm Holmson**, Anaheim, Calif., Rush Medical College, Chicago, 1906, aged 69, died, December 24, in the Queen of Angels Hospital, Los Angeles, of internal hemorrhage as the result of an automobile accident

**Julius Jungmann**, New York, College of Physicians and Surgeons, New York, 1895, aged 90, died, December 31

**Michael Bernard Kelly**, Wheeling, W Va., College of Physicians and Surgeons, Baltimore, 1903, member of the West Virginia State Medical Association, fellow of the American College of Surgeons, past president of the Ohio County Medical Society, served on the staff of Wheeling Hospital, served during World War I, aged 70, died, December 10, in Charleston

**Martin N. Lehmayer**, York Pa., Hahnemann Medical College and Hospital of Philadelphia, 1886, president of the Pennsylvania Tool and Manufacturing Company, formerly director of the Farmers Bank and Guardian Trust Company, aged 78, died, December 11

**John Joseph Maney**, Lawrence, Mass., Baltimore Medical College 1900, aged 67, died, December 11, in the Burke Memorial Hospital of chronic myocarditis

**Robert Mann**, Memphis, Tenn., Memphis Hospital Medical College, 1904, member of the Tennessee State Medical Association, on the staff of the Baptist Memorial Hospital, aged 62, died, January 1

**Charles Bradford Mayberry**, Wayne, Pa., Harvard Medical School, Boston, 1887, member of the Medical Society of the State of Pennsylvania and the American Psychiatric Association formerly physician in charge of the Hospital for Insane, Retreat, aged 80, died, December 27, in the Bryn Mawr (Pa.) Hospital of pulmonary edema

**Alexander Murray**, Lord's Cove, N B., Canada, Jefferson Medical College of Philadelphia, 1892, Northwestern University Medical School, Chicago, 1893, aged 84, died in December

**James T. Musselman**, Paris, Ill., Louisville (Ky.) Medical College, 1879, member of the Illinois State Medical Society, past president of the Aesculapian Society of Wabash County for many years director of the First National Bank, surgeon for the New York Central Railroad for fifty-nine years, a member of the first pension board of Edgar County, aged 88, died December 17

**Harlan Forest Nelson**, Brooken Minn., University of Minnesota Medical School, Minneapolis, 1935, aged 35, died December 6, in an automobile accident

**John Adna Peterson**, Hingham, Mass., University of Vermont College of Medicine, Burlington, 1896, formerly a medical examiner of the Fifth Plymouth District, aged 72, died, December 26

**John Plunkett**, Freeport, N Y., University of the City of New York Medical Department, New York, 1892, aged 82, died December 21

**James R. Priest**, Houston, Miss., Memphis (Tenn.) Hospital Medical College, 1903, member of the Mississippi State Medical Association, aged 65, died, December 5

**Edmund Houghton Sawyer** \* Pasadena, Calif., Harvard Medical School, Boston 1908, aged 61, died recently in San Francisco of rheumatic heart disease

**John Henry Stidham**, Safford Ariz., College of Physicians and Surgeons, Little Rock 1910, served during World War I, aged 65, died, December 26, in the Morris-Squibb Hospital of injuries received in an automobile accident

**Charles Samuel Strahan**, Galesburg, Kan. (licensed in Kansas in 1908), aged 81, died, December 12, of heart disease

**Albert E. Swartz**, Chicago, College of Physicians and Surgeons of Chicago, 1895, formerly a school doctor, aged 67, died, February 4, in the Wesley Memorial Hospital of lobar pneumonia and uremia

**Charles Abram Van der Beek**, Rochester, N Y., University of the City of New York Medical Department, New York, 1889, member of the Medical Society of the State of New York, aged 79, died, December 15, in the Genesee Hospital

**Lilian Barbara M. Yeomans**, Manhattan Beach, Calif., University of Michigan Department of Medicine and Surgery, Ann Arbor, 1882, aged 81, died, December 9, of arteriosclerosis and heart block

## DIED WHILE IN MILITARY SERVICE

**Joseph Lewis Stettauer**, Chicago, College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1901, member of the Illinois State Medical Society, commandant of the aviation cadet examining board at Winston-Salem, N C., began active service in February 1941 as a lieutenant colonel in the U S Army and was a medical inspector of the thirty-third division at Camp Forrest, Tenn., at one time a captain of the 108th medical regiment of the thirty-third division of the Illinois National Guard, for two years served as chief of the staff of the Rotunda Lying-In Hospital, Dublin, Ireland, served on the staffs of the Jackson Park Hospital and St Luke's Hospital, where he died, January 3 while on a ten day leave, of acute coronary thrombosis, aged 60

**Harry Charles Nash** \* University Heights, Ohio, Western Reserve University School of Medicine, Cleveland, 1922, had been senior assistant visiting surgeon at the St Vincent Charity Hospital Cleveland, began active duty as a captain in the medical corps of the United States Army Air Forces in September 1942, aged 45, stationed at Teague Texas, where he died January 3 of coronary disease



## Correspondence

### EVOLUTION OF OUR KNOWLEDGE OF TUBERCULOSIS

*To the Editor*—In an editorial in *THE JOURNAL*, Nov 18, 1939 on the "Evolution of Our Knowledge of Tuberculosis" there appears the following. It is said that William Stark who was studying the pathology of phthisis in London under the renowned John Hunter died of tuberculosis as the result of a wound received in the morgue. Baillie the successor of Stark also developed an infection of the hand after performing a necropsy and died of tuberculosis but not until his years of study had clarified the knowledge of the tubercle."

I have been unable to find this story about William Stark, although I have consulted the Dictionary of National Biography, Smyth's Introduction to Stark's work 1788 and the account of his illness and death in the same volume. Also I am unable to find any connection between Baillie's infection of the hand from a slight wound while dissecting a putrid body and his death many years after of the "consumption."

Can you tell me where this information can be obtained? I have read a number of lives of Mathew Baillie including that of James Wardrop and find it hard to explain how Baillie, born in 1761 became Stark's successor. Stark having died in 1770 Mathew Baillie worked under William Hunter so that I am quite confused. Could you give me the sources for these observations?

W. L. HOLMAN, M.D., Toronto

*COMMENT*—The questions raised were sent to Dr. Lewis J. Moorman, on whose paper in the *Journal of the Oklahoma State Medical Association* of June 1939 page 204, the editorial was based.

"The story about William Stark appears in Dr. Lawrence F. Flick's 'Development of Our Knowledge of Tuberculosis' published by the Wickersham Printing Company, Lancaster, Pa. in 1925 p. 190. With reference to the statement that Mathew Baillie was Stark's successor may I call attention to the fact that in my original article I merely state that Mathew Baillie having recently graduated in medicine, received an appointment in St. George's Hospital to work in the autopsy room where Stark had received his fatal infection. No doubt Baillie was inspired by the work of young Stark and sought the opportunity of pursuing the latter's pathological researches under his famous uncle John Hunter. This does not necessarily imply that Baillie was Stark's immediate successor. Flick points out the fact that Baillie followed his postmortem studies at St. George's Hospital for eighteen years. John Hunter received his appointment at St. George's Hospital in 1768 and was on duty at St. George's when he died in 1793.

"Referring to the question about Baillie's autopsy wound, I again quote from the original article which gave rise to the editorial. He [Baillie] also received an infection of the hand while performing an autopsy but died of advanced pulmonary tuberculosis at the age of 62. This may be misleading but the author did not mean to imply that the advanced tuberculosis had any relationship to the autopsy wound.

"My information with reference to John Hunter and his brother William came chiefly from Benjamin Hutchinson's 'Biographia Medica,' published in 1799. Even though Baillie worked with William Hunter, it is my impression that he and Stark both pursued their pathologic studies under Dr. John Hunter."—ED

### VACCINATION AGAINST SMALLPOX

*To the Editor*—During the recent outbreak of smallpox in Pennsylvania, mass prophylactic cowpox vaccination was begun in Philadelphia. I myself have had the unpleasant experience of having additional vaccinations on both thumbs, which are requiring surgical attention besides that self inoculated on my left arm. In view of this experience I think it advisable to offer the following suggestions to prevent such occurrences in other physicians who may be called on to carry out inoculations on a large scale.

1 Adhesive strip tapes on the tips of the fingers, particularly the thumb and index finger of both hands.

2 The use of full rubber gloves or finger cots, which are inexpensive. Should the rubber tear, additional protection will be had by the under covering adhesive tape. Rubber protection is advised in order to prevent alcoholic dehydration of the skin of the finger tips with subsequent fissuring, which renders accidental inoculation and secondary infection more likely.

3 The absolute mark filing of the glass enclosed vaccine and needle tubes. This is done in order to prevent glass splintering. Despite the fact that the biologic brochures advise only simple finger breaking of the glass tubes, the foregoing is advisable. Breaking of the glass tubes in gauze or cotton is an added precaution.

In addition, in order to save vaccine, two or three inoculations might be obtained from one tube. I might add that other physicians and assistants have had such occurrences and I trust that my experience will be of help in preventing these.

PHILIP R. TROMMER, M.D., Philadelphia

### COOLING IN SHOCK

*To the Editor*—I was interested in the editorial on cooling in shock (*THE JOURNAL*, February 6, p. 432). My own thoughts have been similar to those which you express. I think you will be interested to hear of observations told me by a nurse with a British surgical unit in hospital Spain during the war there. She said that they were up front in two heavy attacks, one in the mountains in the winter and one in the dry plains in the summer. Troops, diets and injuries were comparable. That the degree of shock, especially for lesser injuries, was so much greater in the summer fighting with repeated fatalities from minor wounds, was the subject of repeated and prolonged staff conferences, without reaching any conclusions. Under war conditions dehydration complicates the analysis of the effect of temperature alone. According to her description, the temperature contrasts were pronounced, as both cold and heat were intense.

ISABELLA H. PERCY, M.D.,  
University of California Medical School,  
San Francisco

### CONTINUOUS CAUDAL ANALGESIA IN OBSTETRICS

*To the Editor*—There has been misunderstanding regarding the cost of "continuous caudal anesthesia for painless childbirth" proposed by Hingson and Edwards. Comment by radio, magazine and newspaper reviewers contains the statement "Cost of the new method, it is estimated should average about \$3 per patient." This "cost" refers only to cost of materials and not average charge which will be made for the administration of continuous caudal anesthesia.

PAUL M. WOOD, M.D., New York  
Secretary, American Society of Anesthetists



## Council on Medical Education and Hospitals

### CONTINUATION COURSES FOR PRACTICING PHYSICIANS

In accordance with the plan of the Council on Medical Education and Hospitals advance information concerning continuation courses for practicing physicians available in the various centers is published quarterly. The following list consists of courses beginning during the period April 1, 1943

June 30 1943. It is hoped that this material will be useful to physicians seeking opportunities for postgraduate work. Physicians called on to assume new responsibilities because of the war and physicians who are returning to practice may find here listed courses which will be of help to them. Since many of the classes are necessarily limited, those who contemplate enrolling in any of these courses are urged to communicate as early as possible with the proper executive officer.

H. G. WEISKOTTE, M.D.  
Secretary, Council on Medical Education and Hospitals

#### Continuation Courses for Practicing Physicians—April 1 1943–June 30, 1943

Institution	Schedule of Course	Title of Course	Number of Students Accepted	Registration Fee and/or Tuition
<b>ALLERGY—See also Dermatology &amp; Syphilology</b>				
American College of Physicians 4700 Line Street Philadelphia Pa. Write to E. R. Loveland Executive Secretary	April 1943 2 weeks, full time	Allergy	Limited 10	
Columbia University Faculty of Medicine at the New York Postgraduate Medical School 305 East 20th Street New York City Write to Director of the School	March 29 April 16 1943 6 Full time	General Course	45	\$150 1
University of Pennsylvania Graduate School of Medicine 21 Medical Laboratories Philadelphia Pa. Write to Dr. R. C. Buerki Dean The Medico-Chirurgical College	Arranged 4 weeks, about 40 hours	Allergy	Individuals 2	\$150
Drs. Vaughan and Graham 201 West Franklin Street Richmond Va. Write to Dr. Warren T. Vaughan	1 year course every 6 months	Training in Allergy	Limited	
<b>ANATOMY—See also Otolaryngology Surgery</b>				
New York Medical College Flower and Fifth Avenue Hospitals 5th Avenue at 105th Street New York City Write to Dr. J. A. W. Hetrick Dean	Arranged 60 hours	Applied Anatomy of Ear, Nose and Throat		\$150 17
	Arranged 90 hours	Applied Anatomy of Pelvis and Abdomen		\$750
	Arranged 60 hours	Applied Anatomy of the Urogenital System		\$150 17
	Arranged 160 hours	Surgical Anatomy		\$250
<b>ANESTHESIOLOGY</b>				
Columbia University Faculty of Medicine at the New York Postgraduate Medical School 305 East 20th Street New York City Write to Director of the School	Arranged 12 sessions	Regional Anesthesia	24 2	\$75 4
	Continuously 2 weeks	Anesthesia	12	\$50 4
Harvard Medical School 25 Shattuck Street Boston Mass. Write to Dr. Frank R. Ober Assistant Dean Courses for Graduates	Monthly Days and hours arranged	Clinical Anesthesia	3	\$30
New York Polyclinic Medical School and Hospital 345 West 50th Street New York City Write to Dr. F. H. Dillingham Executive Officer	April 1 June 30 Full time	Regional and Spinal Anesthesia	4	\$500 24
New York University College of Medicine 477 First Avenue New York City Write to Dr. John H. Mulholland Assistant Dean	Arranged Part time for 3 weeks	Inhalation Anesthesia	5	\$150
	Arranged Part time for 3 weeks	Regional Anesthesia		\$700
<b>BACTERIOLOGY—See also Ophthalmology Otolaryngology Pathology Public Health</b>				
Columbia University Faculty of Medicine at the New York Postgraduate Medical School 305 East 20th Street New York City Write to Director of the School	April 8 9 1 month part time	Bacteriological Service in Medicine and Surgery	520	\$25 4
	May 8 9 1 month full time	Practical Technique of Medical Bacteriology	2	\$100 14
<b>BIOCHEMISTRY</b>				
Harvard Medical School 25 Shattuck Street Boston Mass. Write to Dr. Frank R. Ober Assistant Dean Courses for Graduates	Arranged	Research in Biological Chemistry		Arranged 14
<b>BRONCHOSCOPY—See Otolaryngology</b>				
<b>CANCER</b>				
Tufts College Medical School 30 Bennett Street Boston Mass. Write to Dr. Samuel Proger Chairman Postgraduate Division	On request	Cancer	Minimum 4	Arranged 14
United States Public Health Service National Cancer Institute at approved institutions Write to Surgeon General Washington D. C.	Arranged Full time	Diagnosis and Treatment	Individuals	Varies 29
<b>CARDIOLOGY</b>				
Columbia University Faculty of Medicine at the New York Postgraduate Medical School 305 East 20th Street New York City Write to Director of the School	2 months weekly class beginning April 5	Cardiology	415	\$50
	3 weeks in June	Cardiovascular Diseases	Minimum 4	\$75
	April 8 9 4 weeks part time	Electrocardiography	Minimum 4	\$0 4
	May 8 9 Full time	Advanced Electrocardiography	Minimum 3	\$50 1
Columbia University Faculty of Medicine 630 West 165th Street New York City at Mount Sinai Hospital Write to Dean	April 5 May 1 8 Full time	Intensive Course in Cardiovascular Diseases	Minimum 10	\$100
New York Medical College Flower and Fifth Avenue Hospitals 5th Avenue at 105th Street New York City Write to Dr. J. A. W. Hetrick Dean	Arranged 16 em weekly sessions	Cardiology and Electrocardiography		\$100
New York State Department of Health Cardiac Service Write to New York State Reconstruction Home West Haverstraw N. Y.	Arranged 3 months	Rheumatic Cardiac Diseases	Limited 1	None 9
Tufts College Medical School 30 Bennett Street Boston Mass. Write to Dr. Samuel Proger Chairman Postgraduate Division	May 10 14	Electrocardiography		\$25 14
University of Pennsylvania Graduate School of Medicine 237 Medical Laboratories Philadelphia Pa. Write to Dr. R. C. Buerki Dean The Medico-Chirurgical College	Weekly 5 days about 30 hours	Electrocardiology and Cardiac Roentgenology	Individuals 2	\$50
<b>CYSTOSCOPY—See Obstetrics &amp; Gynecology Urology</b>				

## Continuation Courses for Practicing Physicians—April 1, 1943–June 30, 1943—Continued

Institution	Schedule of Course	Title of Course	Number of Registration Students Accepted	Fee and/or Tuition
<b>DERMATOLOGY &amp; SYPHILOLOGY—See also Obstetrics &amp; Gynecology</b>				
Columbia University Faculty of Medicine at the New York Postgraduate Medical School 300 East 20th Street New York City Write to Director of the School	Arranged 6 weeks or 3 months part time	Clinical Dermatology and Syphilology	20	\$10 \$10 <sup>4</sup>
	Arranged 6 weeks or 3 months, part time	Practical Instruction in the Diagnosis and Management of Syphilis	3	\$10 \$75
	Arranged 6 weeks or 3 months part time	Diagnosis and Treatment of Syphilis	6	\$20 \$10 <sup>4</sup>
	Arranged 6 weeks or 3 months part time	Practical Instruction in Physical Therapy as Applied to Diseases of the Skin	3	\$40 \$75 <sup>4</sup>
	Arranged 6 weeks or 3 months part time	Practical Instruction in Dermatological Allergy and Immunology	3 <sup>2</sup>	\$10 \$75 <sup>4</sup>
	Arranged 3 or 6 months or 1 year part time	Practical Instruction in the Pathological Histology of Diseases of the Skin	12 <sup>2</sup>	\$75 \$125 \$150 <sup>4</sup>
	Arranged 6 weeks or 3 months part time	Practical Instruction in Mycology and Animal Parasitology as Related to Diseases of the Skin	3 <sup>2</sup>	\$10 \$75 <sup>4</sup>
	Arranged 6 weeks or 3 months part time	Practical Instruction in Minor Dermatological Surgery	2	\$10 \$10 <sup>4</sup>
	May 15 <sup>6</sup> 1 full time	Seminar in Practical Dermatology and Syphilology for General Practitioners	Minimum 12	\$30 <sup>4</sup>
	Monthly 1 month part time	Dermatology		\$10
Harvard Medical School 25 Shattuck Street Boston Mass Write to Dr Frank R Ober Assistant Dean Courses for Graduates	Arranged 1 full time	Skin Ward Work	Limited <sup>2</sup>	Arranged \$50
	Arranged Part time for 2 months	Clinical Mycology	6	
	May 1 <sup>6</sup> 1 part time	Occupational Dermatology		\$10
New York Polyclinic Medical School and Hospital 34 West 50th Street New York City Write to Dr I H Dillingham Executive Officer	April 1 year full time	Dermatology and Syphilology	Limited <sup>2 12</sup>	\$500
	First of any month 6 weeks 3 months part time	Dermatology and Syphilology		\$50 \$75
Tufts College Medical School 80 Bennet Street Boston Mass Write to Dr Samuel Proger Chairman Postgraduate Division	May 17 21 1 full time	Diagnosis and Therapy of the Commoner Diseases of the Skin	Minimum 6	\$20 <sup>4</sup>
<b>DIETETICS</b>				
Tufts College Medical School 80 Bennet Street Boston Mass Write to Dr Samuel Proger Chairman Postgraduate Division	On request	Dietetic	Minimum 4	Arranged <sup>14</sup>
<b>ELECTROCARDIOGRAPHY—See Cardiology</b>				
<b>ENDOCRINOLOGY—See also Medicine Obstetrics &amp; Gynecology</b>				
Columbia University Faculty of Medicine at the New York Postgraduate Medical School 300 East 20th Street New York City Write to Director of the School	Once weekly 2 months Begins April 5	Diseases of the Thyroid and Other Endocrine Glands and Nutrition	Minimum 4	\$50
Tufts College Medical School 80 Bennet Street Boston Mass Write to Dr Samuel Proger Chairman Postgraduate Division	May 21 25 1 full time	Recent Advances in Endocrinology		\$50 <sup>14</sup>
<b>ENDOSCOPY—See Obstetrics &amp; Gynecology Surgery</b>				
<b>EPIDEMIOLOGY—See Military Medicine Public Health</b>				
<b>FORENSIC MEDICINE</b>				
New York University College of Medicine 477 First Avenue New York City Write to Dr John H Mulholland Assistant Dean	Oct May 17 months part time	Forensic Medicine		\$20 \$100
<b>GASTROENTEROLOGY—See also Proctology</b>				
Columbia University Faculty of Medicine at the New York Postgraduate Medical School 300 East 20th Street New York City Write to Director of the School	Once weekly 2 months Begins April 5 May 5 July 21 1 part time April 5 May 1 1 full time	Gastroenterology	415	\$50
Columbia University Faculty of Medicine 630 West 168th Street New York City at Mount Sinai Hospital Write to Dean	1 part time	Castroscopy	14	\$75
Columbia University Faculty of Medicine 630 West 168th Street New York City at Presbyterian Hospital Write to Dean	1 full time	Relation of Gastroenterology to Internal Medicine and Abdominal Surgery	Minimum 10	\$100
Hahnemann Medical College and Hospital 230 North Broad Street Philadelphia Pa Write to Dr William A Pearson Dean	Arranged 2 months part time	Gastrocopy	1 <sup>2</sup>	\$200
New York Medical College Flower and Fifth Avenue Hospitals 5th Avenue at 100th Street New York City Write to Dr J A W Hetrick Dean	Monthly 1 month full time	Gastrocopy	2	\$200
New York Polyclinic Medical School and Hospital 34 West 50th Street New York City Write to Dr F H Dillingham Executive Officer	Arranged 10 sessions	Castroscopy		\$100 <sup>12</sup>
	Arranged 5 sessions	Peritoneoscopy		\$50 <sup>12</sup>
University of Pennsylvania Graduate School of Medicine 237 Medical Laboratories Philadelphia Pa Write to Dr R C Buerki Dean The Medico Chirurgical College	April 1 <sup>6</sup> 3 months	Clinical Gastroenterology	10	\$50 <sup>4</sup>
<b>GASTROSCOPY—See Gastroenterology Otolaryngology</b>				
<b>GYNECOLOGY—See Obstetrics and Gynecology</b>				
<b>HEMATOLOGY—See also Medicine</b>				
New York Medical College Flower and Fifth Avenue Hospitals 5th Avenue at 100th Street New York City Write to Dr J A W Hetrick Dean	Arranged 8 weeks part time	Physical Diagnosis and Hematology		\$100
<b>INFANTILE PARALYSIS</b>				
University of Minnesota Medical School Minneapolis Minn Write to Dr Harold S Diehl Dean	Arranged 6 days full time	Kenny Treatment of Acute Poliomyelitis	25 <sup>14</sup>	\$20
<b>INDUSTRIAL MEDICINE</b>				
National Conference of Government Hygienists Rochester N Y Write to Dr Wm A Sawyer Chairman 343 State St Rochester, N Y	May 24 27 1 full time	War Conference		None
<b>LARYNGOLOGY—See Otolaryngology</b>				
<b>MEDICINE</b>				
American College of Physicians 4200 Pine Street Philadelphia Pa at Boston Write to E R Loveland Executive Secretary	April 2 weeks full time	General Medicine	Limited <sup>10</sup>	
American College of Physicians 4200 Pine Street, Philadelphia Pa Write to E R Loveland Executive Secretary	April 2 weeks full time	Internal Medicine	Limited <sup>10</sup>	
American College of Surgeons 40 Erie Street Chicago Ill at Boston Write to Dr Bowman C Crowell, Director	April 5 10 1 full time	Internal Medicine	25 60	\$70 <sup>1</sup>

## Continuation Courses for Practicing Physicians—April 1, 1943–June 30, 1943—Continued

MEDICINE—(Continued)	Institution	Schedule of Course	Title of Course	Number of Students Accepted	Registration Fee and/or Tuition
Columbia University, Faculty of Medicine at the New York Postgraduate Medical School 380 East 29th Street New York City Write to Director of the School		April 5 2 months full time	Internal Medicine		\$200
		April 5 1 or 2 months, full time	Seminar in Internal Medicine	4 10	\$125 \$200 +4
		April 5 Once a week 2 months	Arthritis and Allied Rheumatic Disorders	Mini mum 4	\$35
		April 5 Once a week 2 months	Clinical Interpretations of Laboratory Data	Mini mum 4	\$15
		April 5 Once a week 2 months	Problems in Diagnosis	4 10	\$35
		April 5 Once a week 2 months	Acute and Chronic Diseases of the Chest	4 15	\$25
		April 5 Once a week 2 months	Diseases of the Liver and Biliary Tract	Mini mum 4	\$25
		April 5 Once a week 2 months	Diseases of the Spleen and Clinical Hematology	Mini mum 4	\$20
		April 5 Once a week 2 months	Diabetes Mellitus Nephritis and Hypertension	Mini mum 4	\$35
		April 5 Once a week 2 months	Psychologic Aspects of Internal Medicine	Mini mum 4	\$ 5
		April 5 Once a week 2 months	Peripheral Vascular Diseases	4 15	\$25
		May 17 25 Full time	Recent Developments in Diagnostic Procedures	4 10	\$10
		June 5 days full time	Diseases of the Liver and Biliary Tract	Mini mum 4	\$25
		June 5 days full time	Clinical Interpretations of Laboratory Data	Mini mum 4	\$25
		Florida Medical Association Inc Write to Dr T Z Canon Chairman Medical Postgraduate Course 2033 Riverside Avenue Jacksonville Fla	Arranged 2 weeks or more full time	General Medicine	10
Harvard Medical School 25 Shattuck Street Boston Mass Write to Dr Frank R Ober Assistant Dean Courses for Graduates	Continuously Part time	Diabetes		None	
Maine Medical Association 142 High Street Portland Maine Write to Dr Frederick R Carter Chairman Committee on Graduate Education	April May 14 months full time	General Course in Internal Medicine		\$150	
	Arranged Part time	Home Study Course	Limited 7	None	
New York Medical College Flower and Fifth Avenue Hospitals 5th Avenue at 16th Street New York City Write to Dr J A W Hetrick Dean	Arranged 5 weeks part time	Endocrine and Metabolic Disturbances, including Diabetes Mellitus		\$100	
New York Polyclinic Medical School and Hospital 34 West 50th Street New York City Write to Dr F H Dillingham Executive Officer	Arranged 6 weeks 3 months full time	Course for General Practitioners		\$100 \$150 +	
Philadelphia County Medical Society 301 South 21st Street Philadelphia Pa Write to Dr Rufus S Reeves Director Postgraduate Institute	April 9 Full time	Treatment of Medical Emergencies (8th Annual Postgraduate Institute)		\$5	
Tufts College Medical School 30 Bennett Street Boston Mass Write to Dr Samuel Proger Chairman Postgraduate Division	May 2 78 Full time	Internal Medicine		\$50 14	
University of Maryland School of Medicine Lombard and Green Streets Baltimore Md Write to Dr Robert U Patterson Dean	Arranged	Subject Optional	Individuals	Arranged	
University of Pennsylvania Graduate School of Medicine 237 Medical Laboratories Philadelphia Pa Write to Dr R C Buerki Dean The Medico Chirurgical College	Arranged 2 4 weeks 75 hours	Diabetes Mellitus	Individuals 2	\$150	
MILITARY MEDICINE					
American College of Surgeons 40 Erie Street Chicago Ill Write to Dr Bowman C Crowell Director in 20 centrally located cities	March 1 April 30 1 day full time	War Sessions			
Harvard Medical School 25 Shattuck Street Boston Mass Write to Dr Frank R Ober Assistant Dean Courses for Graduates	To be announced 2 weeks full time	Military Medicine and Surgery	Limited 9		
Navy Department Washington D C Write to Bureau of Medicine and Surgery	6 times yearly 8 weeks full time	Aviation Medicine (Aviation Medical Examiner)	Limited 8	None	
	Every five months 5 months full time	Aviation Medicine (Flight Surgeon)	Limited 8	None	
	1 time a year 8 weeks full time	Basic Instruction	Limited 8	None	
	Twice yearly 6 months full time	Deep Diving	4 12 8	None	
	Twice yearly 6 months full time	Epidemiology	8-20 8	None	
	Monthly 170 hours full time	Basic Course for Officers Exemplary Course	500 8 125 8	None None	
War Department Washington D C Write to Training Division Office of the Surgeon General United States Army	Arranged 1 month 145 hours	Maxillo Facial and Plastic Surgery	12 8	None	
	Arranged 1 3 months	Officer Pool 14 General Hospitals	700	None	
	Undetermined	Officer Pool Gulf Coast Air Corps Training Center	200 8	None	
	Undetermined	Officer Pool Medical Field Service School	150 8	None	
	Arranged 1 3 months	Officer Pool Medical Replacement Training Center	200 8	None	
	Undetermined	Officer Pool Medical Supply Depots and Medical Section-General Depots	50 8	None	
	Arranged 2 weeks full time	Photoroentgenology	20 8	None	
	Monthly 170 hours	Special Course for Division Officers	100 8	None	
	Continuously	Specialized Surgical Team Training	Limited 8	None	
NEUROLOGY—See Psychiatry and Neurology					
OBSTETRICS & GYNECOLOGY—See also Pathology					
The Chicago Maternity Center 1336 South Newberry Avenue Chicago Ill Write to Dr Beatrice L Tucker Medical Director	May 9 4 months	Practical Obstetrics		\$10	

## Continuation Courses for Practicing Physicians—April 1, 1943–June 30, 1943—Continued

Institution	Schedule of Course	Title of Course	Number of Students Accepted	Registration Fee and/or Tuition
<b>OBSTETRICS &amp; GYNECOLOGY—Continued</b>				
Columbia University Faculty of Medicine at the New York Postgraduate Medical School, 300 East 20th Street, New York City. Write to Director of the School.	April 9, 12 or 3 months	Seminar in Gynecology	46	\$120, \$220
	Arranged 4 weeks part time	Diagnosis and Office Treatment (Gynecology)	6	\$10, \$40
	Arranged 5 weeks part time	Cystoscopy and Endoscopy	6	\$10
	April 5, 12 or 3 months	Gynecology		\$12, \$220
	Arranged 8 weeks part time	Gynecological Endocrinology	4	\$100
Columbia University Faculty of Medicine, 670 West 166th Street, New York City, at Margaret Hague Maternity Hospital. Write to Dean.	Arranged 4 weeks or longer part time	Gynecological Pathology		Arranged
	Arranged 4 weeks part time	Surgical Anatomy as Applied to Operative Gynecology (Cadaver)	2	\$100
	Monthly 2 months	Internship Training, Observation Course in Obstetrics		\$50, \$100
Florida Medical Association Inc. Write to Dr. T. Z. Cason, Chairman, Medical Postgraduate Course, 203 Riverside Avenue, Jacksonville, Fla.	Monthly 1 month	Cynecology	5	\$5
	Continuously 2 weeks or more full time	Obstetrics	5	\$5
Harvard Medical School, 25 Shattuck Street, Boston, Mass. Write to Dr. Frank R. Ober, Assistant Dean, Course for Graduates.	Continuously 2 weeks or more full time	Cynecology	4	\$75 a month
	June 9, 1 month or more part time	Clinical Obstetrics	5	\$120
	Monthly 1 month or more full time	Conorrhca in Women	10	\$10
Indiana University Medical Center, 1040 1232 West Michigan Street, Indianapolis, Ind. Write to Dr. C. J. Clark, Chairman, Department of Postgraduate Instruction.	Monthly 10 (over) 15 full time	Obstetrics		\$10
Louisiana State Board of Health, Maternal and Child Health Service, 213 Civil Courts Bldg., New Orleans, La. Write to Director.	April 12-24, May 31-June 15	Refresher Course in Obstetrics	Unlimited	
Maine Medical Association, 149 High Street, Portland, Maine. Write to Dr. Frederick R. Carter, Chairman, Committee on Graduate Education.	Arranged	Home Study Course	Unlimited	None
New York Polyclinic Medical School and Hospital, 340 West 50th Street, New York City. Write to Dr. F. H. Dillingham, Executive Officer.	April 1, 2 month full time	Clinical and Operative Obstetrics and Gynecology	6	\$20
	April 1, 2 months full time	Obstetrics and Gynecology	Minimum 2	\$20
North Carolina State Board of Health, Raleigh, N. C. Write to Dr. G. M. Cooper, Director, Maternal and Child Health Service.	Weekly 3 days full time	Obstetrics and Pediatrics	4	None
Tulane University of Louisiana, School of Medicine, 140 Tulane Avenue, New Orleans, La. Write to Dr. H. W. Kostmayer, Director, Department of Graduate Medical Studies.	April 19-2, full time	Obstetrics and Gynecology		
University of Illinois College of Medicine, 1833 West Polk Street, Chicago, Ill. Write to Mr. George Moon, Assistant to the Dean.	Arranged 2 weeks full time	Obstetrics and Pediatrics	Unlimited	None
<b>OPHTHALMOLOGY</b>				
Children's Memorial Hospital, 707 Fullerton Avenue, Chicago, Ill. Write to Miss Meyer, Secretary.	May 2, 6 days full time	Neuromuscular Anomalies of the Eye	Unlimited	\$1
Columbia University Faculty of Medicine at the New York Postgraduate Medical School, 300 East 20th Street, New York City. Write to Director of the School.	Arranged 10 sessions	Funduscopy, Histology and Pathology of the Eye	Unlimited	\$1
Civil Memorial Eye, Ear and Throat Hospital, 711 South Water Street, Roanoke, Va. Write to Dr. F. C. Cull, Medical Director.	April 11, full time	Ophthalmology and Otolaryngology		
New York Eye and Ear Infirmary, 218 Second Avenue, New York, N. Y. Write to Mabel R. Stewart, Registrar.	Monthly 1 month part time	Anomalies of the Ocular Muscles	5	\$10
	Monthly 1 month part time	Bacteriology of the Eye	4	\$10
	Monthly 1 month part time	External Diseases of the Eye	6	\$10
	Monthly 1 month part time	Ocular Injuries	6	\$10
	Monthly 1 month part time	Operative Surgery of the Eye	4	\$10
	Monthly 1 month part time	Ophthalmoscopy	4	\$10
	Monthly 1 month part time	Perimetry	6	\$10
	Monthly 3 months part time	Physiological Optics	5	\$10
	Monthly 3 months part time	Refraction	8	\$10
	Monthly 1 month part time	Slit Lamp Course	6	\$10
	April 9, 6 weeks part time	Clinical Eye Course	10	\$10
	April 19, 6 weeks part time	Refraction	10	\$100
	April 19, 3 months part time	Ophthalmology Clinics	10	\$10
	April 19, 3 months part time	Operative Course (Cadaver)	10	\$10
	Monthly 1 month part time	External Eye Diseases	Unlimited	\$10
Tufts College Medical School, 30 Bennett Street, Boston, Mass. Write to Dr. Samuel Proger, Chairman, Postgraduate Division.	April 19, 9 months part time	Ophthalmology	Unlimited	\$10
	Arranged 8 weeks part time	Ocular Refraction	Individuals	\$20
	Arranged 8 weeks part time	Ophthalmic Histology and Pathology	Individuals	\$200
University of Pennsylvania Graduate School of Medicine, 2100 Locust Street, Philadelphia, Pa. Write to Dr. R. C. Buerki, Dean, The Medical College.	Arranged 2 weeks part time	Ophthalmic Operations (Cadaver)	Individuals	\$10
<b>ORTHOPEDICS—See also Surgery</b>				
Columbia University Faculty of Medicine at the New York Postgraduate Medical School, 300 East 20th Street, New York City. Write to Director of the School.	May 3-25, 8 or 9 Part time	Orthopedics in General Practice	10-20	\$10
	May 2-24, 4 or 5 Part time	Functional Anatomy in Relation to Orthopedics	10	\$10

## Continuation Courses for Practicing Physicians—April 1, 1943–June 30, 1943—Continued

Institution	Schedule of Course	Title of Course	Number of Students Accepted	Registration Fee and/or Tuition
<b>OTOLARYNGOLOGY—See also Ophthalmology</b>				
Columbia University, Faculty of Medicine at the New York Postgraduate Medical School 305 East 20th Street New York City Write to Director of the School	Arranged 4 weeks or longer part time	Diagnostic Procedures in Otolaryngology	6	\$0.25
	Arranged	Dissection of the Head and Neck	Minimum 2 Limited	Arranged
	Arranged 15 ses	Embryology, Histology and Pathology of the Ear Nose and Throat	26	\$75.00
	Arranged	Surgical Anatomy as Applied to Otolaryngology (Cadaver)	26	Arranged
Columbia University, Faculty of Medicine, 630 West 168th Street New York N. Y., at Presbyterian Hospital Write to Dean Gill Memorial Eye Ear and Throat Hospital 711 South Jefferson Street Roanoke Va Write to Dr L G Gill Medical Director	Arranged	Surgical Anatomy as Applied to Rhinology and Laryngology (Cadaver)	26	Arranged
	Arranged April 3 weeks	Instruments and Technique of Bronchoscopy	Limited	\$25.00
	April 30 Full or part time	Spring Graduate Course (Ophthalmology and Otolaryngology)	50	\$0
	May 2 weeks full time	Histopathology of the Nose and Throats	Limited	\$100.00
Harvard Medical School 25 Shattuck Street Boston Mass Write to Dr Frank R Ober, Assistant Dean, Courses for Graduates	April 1 month full time	All Day Course	Limited	\$150.00
	April 1 month full time	Anatomy and Operative Surgery of the Temporal Bone	Minimum 6	\$150
	Arranged 2 weeks full time	Bronchoscopy and Esophagoscopy	Limited	\$150
	Monthly 1 month full time	Clinical Otolaryngology	25	\$50
Indiana University Medical Center 1040 1232 West Michigan Street Indianapolis Ind Write to Dr C J Clark Chairman Department of Postgraduate Instruction	Arranged 2 weeks full time	Physiology of the Cochlea and Vestibular Apparatus	2	\$50
	Arranged	Technique of Submucous Resection of the Nasal Septum	Limited	\$150 for 5 exercises
	April 12 24	Otorhinolaryngology		\$150.00
	Monthly 4 weeks, part time	Anatomy of the Ear	41	\$15.00
New York Eye and Ear Infirmary 216 Second Avenue New York City Write to Mabel R Stewart, Registrar	Monthly 1 month or more part time	Bacteriology of the Ear	41	\$40.00
	April May 2 to 6 weeks full or part time	Bronchoesophagology	41	\$70.00
	Monthly 1 month part time	Clinical Otolaryngology	41	\$40.00
	Monthly 1 month part time	Operative Surgery of the Ear and Nasal Accessory Sinuses	41	\$110.00
New York Polyclinic Medical School and Hospital 345 West 50th Street New York City Write to Dr T H Dillingham Executive Officer	April 3 months full time	Combined Eye Ear Nose and Throat Course	10	\$400.00
	April 6 weeks full time	Clinical Eye Ear Nose and Throat Course	10	\$100.00
	April 6 weeks part time	Clinical Ear Nose and Throat Course	10	\$75.00
	April 30 hours Full time	Advanced Otolaryngology Bronchoesophagology and Gastroscopy	42	\$250.00
Temple University School of Medicine, 3400 North Broad Street Philadelphia, Pa Write to Prof Chevalier L Jackson Director	April Full time			\$250.00
Tufts College Medical School 30 Bennet Street Boston Mass Write to Dr Samuel Proger, Chairman Postgraduate Division	Monthly Part time	Otolaryngology		\$30.00
University of Illinois College of Medicine 183 West Polk Street Chicago Ill Write to Mr George Moon Assistant to the Dean	April 9 months full time	Otolaryngology	Limited	\$700
University of Pennsylvania Graduate School of Medicine 237 Medical Laboratories Philadelphia Pa Write to Dr R C Buerki Dean The Medical College	Arranged 2 weeks full time	Bronchoesophagology Gastroscopy and Laryngeal Surgery	Individuals 2	\$250
	Arranged 2 weeks part time	Otologic Operations (Cadaver)	Individuals 2	\$250
	Arranged 2 days part time	Rhinolaryngologic Operations (Cadaver)	Individuals 2	\$150
	Arranged	Otolaryngology		
<b>PATHOLOGY—See also Obstetrics &amp; Gynecology Ophthalmology</b>				
Columbia University Faculty of Medicine at the New York Postgraduate Medical School 305 East 20th Street New York City Write to Director of the School	April May 2 weeks part time	Gross and Microscopic Pathology	36	\$50.00
	April June 2 weeks part time	Surgical Pathology	36	\$175.00
	April 20 June 25 part time	Surgical Pathology	Minimum 4	\$150
	Monthly Hours arranged	Pathology	4	\$10
Columbia University Faculty of Medicine 630 West 168th Street New York City, at Mount Sinai Hospital Write to Dean	Monthly 1 month full time	Pathology of Obstetrics and Gynecology	22	\$125
	Arranged	Research in Pathology		Arranged
	Arranged	Pathology and Bacteriology (Practical Laboratory Instruction)		Arranged
	Arranged			
Harvard Medical School 25 Shattuck Street Boston Mass Write to Dr Frank R Ober Assistant Dean, Courses for Graduates	Monthly 1 month full time			
	Arranged			
	Arranged			
	Arranged			
<b>PEDIATRICS—See also Obstetrics &amp; Gynecology</b>				
Columbia University Faculty of Medicine at the New York Postgraduate Medical School 305 East 20th Street New York City Write to Director of the School	April 5 weeks	Seminar in Pediatrics	312	\$125.00
	May June 1 month full time	Clinical Pediatrics	35	\$100.00
	April 4 weeks part time	Clinical Pediatrics	39	\$40.00
	Continuously 2 weeks or more full time	Pediatrics	5	\$5
Florida Medical Association Inc Write to Dr T Z Cason Chairman Medical Postgraduate Course 2031 River Side Avenue Jacksonville Fla	Arranged	Home Study Course	Limited	None
Maine Medical Association 142 High Street Portland Maine Write to Dr Frederick R Carter Chairman Committee on Graduate Education	Arranged			
New York Polyclinic Medical School and Hospital 345 West 50th Street New York City Write to Dr F H Dillingham Executive Officer	Arranged 4 weeks part time	Pediatrics	10	\$50
<b>PERITONEOSCOPY—See Gastroenterology</b>				
<b>PHYSIOLOGY—See also Public Health</b>				
Columbia University Faculty of Medicine at the New York Postgraduate Medical School 305 East 20th Street New York City Write to Director of the School	June 7 11 Full time	Pathological Physiology Functional and Chemical Aspects	Minimum 4	\$50.00
	Arranged	Research in Physiology		Arranged
	Arranged			
	Arranged			
Harvard Medical School 25 Shattuck Street Boston Mass Write to Dr Frank R Ober Assistant Dean Courses for Graduates	Arranged			

## Continuation Courses for Practicing Physicians—April 1, 1943–June 30, 1943—Continued

Institution	Schedule of Course	Title of Course	Number of Students Accepted	Registration Fee and/or Tuition
<b>PHYSIOTHERAPY</b>				
Columbia University Faculty of Medicine at the New York Postgraduate Medical School 30½ East 20th Street New York City Write to Director of the School	April 5 <sup>o</sup> 6 <sup>o</sup> 9 <sup>o</sup> Full time	General Course	Minim 4	\$30 <sup>1</sup>
New York Polyclinic Medical School and Hospital 34½ West 50th Street New York City Write to Dr F H Dillingham Executive Officer	April 10 <sup>o</sup> 4 weeks part time	General Course	6	\$100 <sup>21</sup>
<b>PROCTOLOGY</b>				
New York Polyclinic Medical School and Hospital 234 West 50th Street New York City Write to Dr F H Dillingham Executive Officer	April 1 6 weeks part time	Clinical Proctology and Gastroenterology	10	\$200
	April 9 6 weeks part time	Clinical Proctology, Medical and Operative	10	\$10 <sup>1</sup>
	April 9 6 or 12 weeks full time	Combined Course in Proctology, Gastroenterology and Allied Subjects	10	\$700 <sup>1</sup>
	April 9 10 lessons April 1 5 weeks part time	Operative Proctology (Cadaver) Proctology Clinics	10 10	\$200 <sup>1</sup> \$10 <sup>1</sup>
Tufts College Medical School 30 Bennet Street Boston Mass Write to Dr Samuel Proger Chairman Postgraduate Division	April 26 May 1 1 full time May 23 Part time	Proctology I Proctology II	21	\$20 <sup>21</sup> \$100 <sup>21</sup>
<b>PSYCHIATRY &amp; NEUROLOGY</b>				
Boston Psychoanalytic Institute Psychiatry Clinic 82 Marlborough Street Boston Mass Write to Director	Arranged	Civilian War Neuroses and Their Treatment	40	None
Columbia University Faculty of Medicine at the New York Postgraduate Medical School 30½ East 20th Street, New York City Write to Director of the School	April May 1 month or longer	Clinical Neurology	16	\$20 <sup>1</sup>
	April 9 4 weeks, full time	Neurology and Psychiatry in General Practice	46	\$100 <sup>1 21</sup>
Harvard Medical School 2½ Shattuck Street Boston Mass Write to Dr Frank R Ober Assistant Dean Courses for Graduates	Arranged	Neuroanatomy Neurophysiology Neuropathology Clinical Neurology or Neurosurgery		Arranged
	May June 1 month full time	Neurology	Minim 4	\$20
	April May 6 weeks part time	Neuropathology	Limited	Arranged <sup>21</sup>
	Arranged	Psychiatry General Course or Special Fields	Indiv iduals	Arranged
Institute for Psychoanalysis 43 East Ohio Street Chicago Ill Write to Helen Rose Administrative Director	On demand 2 weeks, part time	Research in Neuropathology Clinical Discussions of War Neuroses	50	None
	Continuously 12 weeks part time	Application of Psychoanalysis to the Study of Psychiatric Problems and of the Psychoses		\$70
The Menninger Clinic Topeka Kansas Write to Dr Karl Menninger Chief of Staff	Quarterly 1 year full time	Psychoanalytic Instruction	41	None
	Quarterly 1 year full time	Resident Training	41	None
	Arranged Full time	Short Courses		\$100
University of Pennsylvania Graduate School of Medicine 237 Medical Laboratories Philadelphia Pa Write to Dr R O Buckle Dean The Medico-Chirurgical College	Arranged 6 weeks or more	Clinical Psychiatry	Indiv iduals 2	\$100
	Arranged 10 weeks part time	Clinicobiologic Neurology and Psychiatry	Indiv iduals 11	\$100
<b>PUBLIC HEALTH</b>				
Johns Hopkins University School of Hygiene and Public Health 615 North Wolfe Street Baltimore, Md Write to L J Reed Dean	April 15 June 11 <sup>o</sup> Part time	Public Health Laboratory Practice	411	Arranged
	April 15 June 11 <sup>o</sup> Part time	Chemistry of Metabolism	Limited 11	Arranged
	April 15 June 11 <sup>o</sup> Part time	Elements of Statistical Analysis	Limited 10 11	Arranged
	April 15 June 11 <sup>o</sup> Part time	Genetics	Limited 11	Arranged
	April 15 June 11 <sup>o</sup> Part time	Epidemiology Seminar	Limited 11	Arranged
	April 15 June 11 <sup>o</sup> 1 art time	Filterable Viruses A Study of a Representative Group of Virus Diseases	21 11	Arranged
	April 15 June 11 <sup>o</sup> Part time	Bacterial Parasitic Diseases	Limited 11	Arranged
	April 15 June 11 <sup>o</sup> Part time	Malariaology	Limited 11	Arranged
	April 15 June 11 10 <sup>o</sup> Part time	General Principles of Physiology	Limited 11 4	Arranged
	April 15 June 11 <sup>o</sup> Part time	Public Health Administration Field Studies	8 11	Arranged
Loyola University School of Medicine 706 Wolcott Avenue Chicago Ill Write to Miss McGowan Secretary Department of Preventive Medicine, Public Health and Bacteriology	April 15 June 11 <sup>o</sup> Part time	Public Health Administration Health Education	Limited 11	Arranged
	Continuous 2 months	Advanced Clinical Work in Venereal Disease	Limited 11	Arranged
	April 2 months part time 9 <sup>o</sup>	Clinical Work in Venereal Diseases	Limited 10	Arranged
	Quarterly 10 <sup>o</sup>	Courses in Administration Laboratory Education Mental Hygiene and Sanitation	Indiv iduals	Arranged
New York State Department of Health at Albany Medical College 47 New Scotland Avenue Albany N Y Write to Extension Course Office Albany Medical College	Arranged 1 year	Extension Course in Public Health	Limited 5	\$40
University of Minnesota Medical School Minneapolis, Minn Write to Dr Harold S Diehl Dean	June 9 3 months, part time	Bacteriology Public Health		
	March 28 June 12 <sup>o</sup>	Epidemiology		
	March 28 June 12 <sup>o</sup>	Food Sanitation		
	March 28 June 12 <sup>o</sup>	Public Health Administration Problems		
<b>RADIOLOGY—See also Cardiology Military Medicine</b>				
Columbia University Faculty of Medicine at the New York Postgraduate Medical School 30½ East 20th Street New York City Write to Director of the School	March 23 June 18 10 <sup>o</sup> Full time	Basic Diagnostic Roentgenology and Technique	48	\$200 <sup>1</sup>
Columbia University Faculty of Medicine 60 West 168th Street New York City at Mount Sinai Hospital Write to Dean	March 29 June 18	Basic Diagnostic Roentgenology and Technique	Limited 1	
	March 29 June 18	Clinical Radiation Therapy	Limited 1	

## Continuation Courses for Practicing Physicians—April 1, 1943-June 30, 1943—Continued

Institution	Schedule of Course	Title of Course	Number of Students Accepted	Registration Fee and/or Tuition
<b>RADIOLOGY—Continued</b>				
Columbia University, Faculty of Medicine 630 West 168th Street New York City at affiliated hospitals Write to Dean	March 29 June 18 <sup>a</sup> Full time	Clinical Radiation Therapy	48-	\$250
	Monthly 1 month full time	General Roentgenology	34	\$100
	Monthly 1 month full time	General Roentgenology	21	\$100
Harvard Medical School 2, Shattuck Street Boston Mass. Write to Dr Frank R Ober, Assistant Dean, Courses for Graduates	Monthly 1 month full time	General Roentgenology	Limited 1	\$50
	April <sup>a</sup> 12 exercises Monthly 1 month, part time	Radiological Physics Roentgenology in Diseases of the Eye Ear, and Accessory Sinuses	3	\$10 \$35
New York Eye and Ear Infirmary 218 Second Avenue New York City Write to Mabel R Stewart Registrar	Monthly 6 6 weeks part time	Ophthalmic and Otologic Roentgenology	Limited 1	\$10 10
New York Polyclinic Medical School and Hospital 34, West 50th Street, New York City Write to Dr I H Dillingham Executive Officer	Monthly 6 weeks or 3 months full time	Diagnostic Roentgenology and Radiotherapy (Advanced)	10 -	\$1.00 \$500 4
<b>RHINOLOGY—See Otolaryngology</b>				
<b>SURGERY—See also Anatomy Military Medicine Obstetrics &amp; Gynecology Ophthalmology Otolaryngology Pathology</b>				
	Arranged 8 sessions	Blood Transfusion Blood and Plasma Bank	18	\$75 4
	June <sup>a</sup> 9	Diagnosis and Treatment of Trauma	30	\$50 4
	Arranged 12 sessions	Discussion and Surgical Anatomy	Mini- mum 2	\$125 4
Columbia University Faculty of Medicine at the New York Postgraduate Medical School 305 East 20th Street New York City Write to Director of the School	April 5 <sup>a</sup> 6 weeks or 3 months full time	Seminar in General Surgery	500	\$100 4 24
	April 26 May 7 <sup>a</sup> 9 Full time	Seminar in Traumatic Surgery	30	\$10 4
	Arranged 5 sessions	Surgical Anatomy as Applied to Colon and Rectal Surgery (Cadaver)	2	\$10
	Arranged 12 sessions	Surgical Anatomy as Applied to Thoracic Surgery (Cadaver)	26	\$125 4
Florida Medical Association Inc Write to Dr T Z Cason Chairman Medical Postgraduate Course 2033 Riverside Avenue Jacksonville, Fla	Continuously 2 weeks or more full time	Orthopedic Surgery	10	\$5
	Monthly 1 month part time	Clinical Orthopedic Surgery	1 or more	\$50
	Monthly Hours arranged	Endoscopy	2	Arranged
	May <sup>a</sup> 1 month part time	General Surgery of Children	Limited	\$50
Harvard Medical School 2, Shattuck Street Boston Mass. Write to Dr Frank R Ober, Assistant Dean Courses for Graduates	April June <sup>a</sup> 1 month or more part time	Genito Urinary Surgery	44	\$15 per month
	Arranged 1 month full time	Minor Surgery Designed for Practitioners	Mini- mum 8	\$150
	May <sup>a</sup> 2 weeks full time	Plastic Surgery	Limited 2	\$150
	June <sup>a</sup> 2 weeks, full time	Surgical Technique	3-1	\$700
Maine Medical Association 142 High Street Portland Maine Write to Dr Frederick R Carter Chairman Committee on Graduate Education	Arranged	Home Study Course	Limited 7	None
New York Medical College Flower and Fifth Avenue Hospitals 5th Avenue at 105th Street, New York City Write to Dr J A W Hetrick Dean	Arranged 60 hours	Surgical Technique (Dog)		\$2.00 17
	April <sup>a</sup> 3 months full time	Combined Surgical Course	10	\$3.00 4
	April <sup>a</sup> 6 weeks full time	Operative Clinic and Lecture Course	10	\$100 4
	May <sup>a</sup> 4 weeks, full time	Plastic Reparative Surgery	10	\$250 4
Tufts College Medical School, 30 Bennet Street Boston Mass. Write to Dr Samuel Proger, Chairman Postgraduate Division	May 3 15 Full time	Applied Surgical Anatomy (Cadaver)	Limited	\$175 14
<b>SYPHILOLOGY—See Dermatology &amp; Syphilology</b>				
<b>TROPICAL MEDICINE</b>				
Columbia University Faculty of Medicine at the New York Postgraduate Medical School 305 East 20th Street New York City Write to Director of the School	May 24 28	Tropical Medicine	Mini- mum 4	\$50
<b>TUBERCULOSIS</b>				
California Tuberculosis Association 4, Second Street San Francisco Calif Write to Mr Wm F Higby Secretary	April <sup>a</sup> 3 days full time	Graduate Assembly		None
	Arranged 1 week	Tuberculosis	Indi- viduals	None 5
	On request 2 months part time	Comprehensive Course in Tuberculosis	Mini- mum 20	None
City of Chicago Municipal Tuberculosis Sanitarium 2049 Washington Blvd, Chicago Ill Write to Department of Clinics	Continuously Part time	Tuberculosis		None
Mississippi State Sanatorium Sanatorium Miss Write to Dr Henry Boswell Supt	Arranged 2 weeks or more	Clinical Medicine and Chest Diseases		None
New York Medical College Flower and 5th Avenue Hospitals 5th Avenue at 105th Street New York City Write to Dr J A W Hetrick Dean	Arranged 1 month full time	Diagnosis and Treatment		\$100
<b>UROLOGY—See also Surgery</b>				
Columbia University Faculty of Medicine at the New York Postgraduate Medical School 305 East 20th Street New York City Write to Director of the School	Arranged	Short Courses in Special Subjects	Indi- viduals	Arranged 4
Harvard Medical School 2, Shattuck Street Boston Mass. Write to Dr Frank R Ober, Assistant Dean Courses for Graduates	April, May 1 month or more full time	Urology		\$75 per month
Joint Committee on Post Graduate Education 1313 Bedford Avenue Brooklyn N Y at the Long Island College of Medicine Write to Dr Simon R Blattes Chairman	Monthly 1 month or more part time	Urology	3	\$25 per month
University of Pennsylvania Graduate School of Medicine 237 Medical Laboratories Philadelphia Pa Write to Dr R C Buerki Dean The Medico-Chirurgical College	Arranged 6 weeks part time	Cystoscopy, Chromoureteroscopy and Pyelography	Indi- vidual	\$200



## Continuation Courses for Practicing Physicians—April 1 1943–June 30 1943—Continued

Institution	Schedule of Course	Title of Course	Number of Registration Students Accepted	Fee and/or Tuition
<b>VENEREAL DISEASE CONTROL—See also Public Health</b>				
Institute for the Control of Syphilis University of Pennsylvania Hospital 3400 Spruce Street Philadelphia Pa Write to Dr John H Stokes Director	Arranged 3 or 10 days Arranged 1 month or more Continuously	Management of Syphilis and Other Venereal Diseases Management of Venereal Diseases Practical Seminar in the Diagnosis Treatment and Control of Venereal Disease	Individuals	\$25 \$50 per month None
New York City Department of Health Bureau of Social Hygiene 125 Worth Street New York City Write to Dr Theodore Rothenthal Director				
United States Public Health Service Medical Center Hot Springs National Park Ark Write to Dr Austin V Deibert Medical Officer	4 weeks, full time	Management of Venereal Diseases	200	None

- Physicians who have had adequate preliminary training and/or experience
- Specialists
- Limited to applicants approved by the instructor department head etc
- Male physicians only
- Physicians licensed to practice in the state
- Physicians who wish to specialize
- Members of the organization
- Officers of the United States Army Navy or Naval Reserve on active duty
- Medical Reserve Officers of the United States Army
- Fellows and Junior Candidates of the college
- A faculty course for staff members of mental institutions
- Microscope required
- A temporary license to practice medicine in the state is required
- A registration fee of \$5 covers all courses taken within the year
- Plus a laboratory fee
- Plus a matriculation fee and/or incidental fee
- If two or more students register for the course at the same time a reduction in the fee will be made
- If taken in conjunction with the next course above/below (Castroscopy/Peritoneoscopy) the fee for the combined course will be \$125
- Includes a subscription to the organization's publication
- No fee for members of the organization
- No fee for physicians in military service

- Half fee for physicians in the military service
- Returned on satisfactory completion of the course
- Grants may be made from a scholarship fund
- Per diem and/or maintenance provided
- A monthly stipend is paid
- Assistantships Internships residences available
- Register two to six weeks in advance
- Repeated
- Longer courses arranged in units of 12 sessions each
- Given at separate hospitals for Negro and white physicians
- Applicants must not be over 36 years of age
- For service in the outpatient department
- Part of the course may be taken at a reduced fee
- Physicians recommended by directors of state or city health departments
- Physicians in the local area
- Registration fee of \$1 applied on tuition
- For M.D.s under 40 years of age
- Fifty dollars for M.D.s in armed forces
- Continuation of preceding course
- Students working for degree given preference
- Taken in conjunction with Physiology I at Medical School
- Limited to special venereal disease students
- Including two meals
- Offered in alternate years
- Except July and August

## Medical Examinations and Licensure

## COMING EXAMINATIONS AND MEETINGS

NATIONAL BOARD OF MEDICAL EXAMINERS  
EXAMINING BOARDS IN SPECIALTIES

Examinations of the National Board of Medical Examiners and Examining Boards in Specialties were published in THE JOURNAL, March 13 page 885

## BOARDS OF MEDICAL EXAMINERS

- ALABAMA Montgomery June 15 16 Sec, Dr B F Austin 519 Dexter Ave Montgomery
- ARIZONA Phoenix April 6 7 Sec Dr J H Patterson 826 Security Building Phoenix
- ARKANSAS Medical Little Rock June 3 4 Sec Dr D L Owens Harrison Eclectic Little Rock June 3 4 Sec Dr C H Young 1415 Main St Little Rock
- COLORADO Denver April 7 9 Endorsement Denver April 6 Final date for filing application is March 20 Sec Dr J B Davis 831 Republic Building Denver
- CONNECTICUT Endorsement Hartford, March 23 Sec to the Board Dr Creighton Barker, 258 Church St New Haven
- DELAWARE Dover April 13 15 Sec Medical Council of Delaware Dr Joseph S McDaniel 229 S State St Dover
- DISTRICT OF COLUMBIA Washington May 10 11 Sec Commission on Licensure, Dr George C Ruhland 6150 E Municipal Bldg Washington
- FLORIDA Jacksonville, June 21 22 Sec, Dr William M Rowlett, Box 786 Tampa
- GEORGIA Atlanta March 23 24 Sec State Examining Boards Mr R C Coleman 111 State Capitol Atlanta
- HAWAII Honolulu, June 12 15 Sec Dr J A Morgan 55 Young Building Honolulu
- IDaho Boise, July 13 Director Bureau of Occupational Licenses Mrs Lett D Painter, 355 State Capitol Building Boise
- ILLINOIS Chicago April 6 8 Superintendent of Registration Department of Registration and Education Mr Philip M Harmon Springfield
- INDIANA Indianapolis Sept 14 16 Sec Board of Medical Registration & Examination Dr W C Moore 301 State House Indianapolis
- KANSAS Kansas City May 19 20 Sec Board of Medical Registration and Examination Dr J F Hassig 905 N Seventh St Kansas City
- LOUISIANA New Orleans May 6 8 Sec Dr R B Harrison 1507 Hibernia Bank Bldg New Orleans
- MARYLAND Medical Baltimore March 23 26 Sec Dr J T O'Mara 1215 Cathedral St Baltimore Homoeopathic Baltimore June 15 16 Sec Dr J A Evans 612 W 40th St Baltimore
- MICHIGAN Ann Arbor and Detroit June 11 13 Sec Board of Registration in Medicine Dr J Earl McIntyre 100 W Allegan St Lansing

- MINNESOTA Minneapolis March 22 24 Sec Dr J F DuBois 230 Iowa Medical Arts Bldg Minneapolis
- MISSOURI St Louis March 23 25 Sec State Board of Health Dr James Stewart State Capitol Bldg Jefferson City
- MONTANA Helena April 6 7 Sec Dr Otto G Klein First National Bank Bldg Helena
- NEW JERSEY Trenton June 15 16 Sec Dr F S Hallinger 28 W State St Trenton
- NEW MEXICO Santa Fe April 12 13 Sec Dr Le Grand Ward 145 Santa Plaza Santa Fe
- NORTH CAROLINA Raleigh June 14 18 Sec Dr W D James Hamlet
- NORTH DAKOTA Grand Forks July 6 9 Sec Dr G M Williamson 41 S Third St Grand Forks
- OHIO Endorsement Columbus April 6 Sec Dr H M Platter 21 W Broad St Columbus
- OKLAHOMA Oklahoma City May 10 Sec Dr J D Osborn Jr, Frederick
- RHODE ISLAND Providence April 12 Chief Division of Examiners Mr Thomas B Casey 366 State Office Bldg Providence
- SOUTH CAROLINA Columbia March 22 24 Sec Dr A Earle Booser 505 South Ave Columbia
- SOUTH DAKOTA Pierre July 20 Dir Medical Licensure State Board of Health Dr J F D Cook Pierre
- TEXAS Memphis Nashville March 24 27 Sec Dr H W Qualls 130 Madison Ave Memphis
- UTAH Salt Lake City June Dir Department of Registration Mr C V Billings 324 State Capitol Bldg Salt Lake City
- VERMONT Burlington March 25 27 Sec Dr T J Lawless Richford
- VIRGINIA Richmond March 24 27 Sec Dr J W Preston 30 1/2 Franklin Rd Roanoke
- WISCONSIN Milwaukee March 30 April 1 Sec Dr H W Shutter 425 E Wisconsin Ave Milwaukee

\* Basic Science Certificate required

## BOARDS OF EXAMINERS IN THE BASIC SCIENCES

- DISTRICT OF COLUMBIA Washington April 19 20 Sec Commission on Licensure Dr George C Ruhland 6150 E Municipal Bldg Washington
- FLORIDA DeLand June 9 Final date for filing application is May 24 Sec Dr J F Conn John B Stenson University DeLand
- IOWA Des Moines April 13 Dir Division of Licensure & Registration Mr H W Grefe Capitol Bldg Des Moines
- MINNESOTA Minneapolis April 6 7 Dr J C McKinley 126 Millard Hall Univ of Minnesota Minneapolis
- NEBRASKA Omaha May 4 5 Dir Bureau of Examining Board Mrs J Crawford 1009 State Capitol Building Lincoln
- OKLAHOMA Oklahoma City April 5 Sec Dr J D Osborn Jr Shattuck
- RHODE ISLAND Providence May 19 Chief Division of Examiners Mr Thomas B Casey 366 State Office Building Providence
- SOUTH DAKOTA Aberdeen June 4 5 Sec Dr G M Evans Yankton
- WISCONSIN Madison April 3 Prof Robert N Bauer 152 W Wisconsin Ave Milwaukee

## California June Report

The California State Board of Medical Examiners reports the written examination for medical licensure held at San Francisco June 30 through July 2, 1942. The examination covered 9 subjects and included 90 questions. An average of 75 per cent was required to pass. Two hundred and thirteen candidates were examined, of whom 211 passed and 2 failed. The following schools were represented:

School	PASSED	Year Grad	Number Passed
College of Medical Evangelists	(1942)	(42)	6
Stanford University School of Medicine	(1933)	(41)	18
(1942 36)			
University of California Medical School	(1934)	(41)	81
(1942 79)			
University of Southern California School of Medicine	(1942)	(40)	10
(1942 10)			
George Washington University School of Medicine	(1942)		1
Georgetown University School of Medicine	(1941)		1
Northwestern University Medical School	(1941), (1942)	(4)	5
Rush Medical College	(1936)	(39)	2
University of Chicago The School of Medicine	(1941), (2)		3
(1942)			
University of Illinois College of Medicine	(1941)		1
State University of Iowa College of Medicine	(1941)		1
Louisiana State University School of Medicine	(1942)	(2)	2
Tulane University of Louisiana School of Medicine	(1941)		1
Johns Hopkins University School of Medicine	(1939)	(2)	2
Harvard Medical School	(1938)	(41)	(1942) 3
Wane University College of Medicine	(1942)		1
University of Minnesota Medical School	(1942)		1
St. Louis University College of Medicine	(1941)	(3)	3
Washington University School of Medicine	(1938)		10
(1941 3) (1942 6)			
Creighton University School of Medicine	(1941)	(4)	(1942) 5
Columbia University College of Physicians and Surgeons	(1941)		1
New York Medical College Flower and Fifth Avenue Hospitals	(1941)		1
University of Cincinnati College of Medicine	(1942)		1
Western Reserve University School of Medicine	(1941)		1
University of Oregon Medical School	(1941 5)	(1942 2)	7
Temple University School of Medicine	(1941)		1
Woman's Medical College of Pennsylvania	(1941)		1
Medical College of the State of South Carolina	(1941)		1
University of Tennessee College of Medicine	(1941)		1
Medical College of Virginia	(1940)		1
Marquette University School of Medicine	(1942)		1
University of Manitoba Faculty of Medicine	(1935)		1
McGill University Faculty of Medicine	(1940)		1
Karl Franzens Universität Medizinische Fakultät Graz	(1935)		1
Medizinische Fakultät der Universität Wien	(1924),		
(1927) (1928) (1933)			4
University of Sofia Faculty of Medicine	(1933)		1
Universita Karlova Fakulta Lekárska Praha	(1928)		1
Albert Ludwigs Universität Medizinische Fakultät Freiburg	(1917)		1
Albertus Universität Medizinische Fakultät Königsberg	(1923)		1
Friedrich Wilhelms Universität Medizinische Fakultät Berlin	(1912)	(1924)	2
Ludwig Maximilians Universität Medizinische Fakultät München	(1924)		1
Schlesische Friedrich Wilhelms Universität Medizinische Fakultät Breslau	(1925)		1
Magyar Királyi Pazmany Petrus Tudományegyetem Orvosi Fakultása Budapest	(1927)		1
Regia Università degli Studi di Roma Facoltà di Medicina e Chirurgia	(1937)		1
School	FAILED	Year Grad	Number Failed
University of Nebraska College of Medicine	(1942)		1
Universität Bern Medizinische Fakultät	(1939)		1

From June 24 to September 10, 44 physicians were licensed to practice medicine by reciprocity and 16 so licensed by endorsement of credentials. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad	Reciprocity with
College of Medical Evangelists	(1939)		Tennessee
Georgetown University School of Medicine	(1933)		Kansas
Rush Medical College	(1932) Washington	(1934)	Illinois
The School of Medicine of the Division of Biological Sciences	(1937) Minnesota	(1938)	
University of Illinois College of Medicine	(1933)	(1935)	
(1939 2) Illinois			
State University of Iowa College of Homeopathic Medicine	(1906)		Iowa
State University of Iowa College of Medicine	(1928)		
(1935 2) Iowa			
University of Kansas School of Medicine	(1937)	(1940)	Kansas
University of Louisville School of Medicine	(1936)		Kentucky
Tulane University of Louisiana School of Medicine	(1932)		Louisiana
(1937) Mississippi			
Johns Hopkins University School of Medicine	(1933)		Maryland
Harvard Medical School	(1934) Massachusetts	(1935)	Maine
University of Michigan Medical School	(1936 2)		Michigan

University of Minnesota Medical School	(1940)	Maryland
St. Louis University School of Medicine	(1933)	Missouri
University Medical College of Kansas City	(1897)	Missouri
Washington University School of Medicine	(1936)	Missouri
Creighton University School of Medicine	(1932)	Kansas
(1937) Nebraska		
University of Nebraska College of Medicine	(1938)	Nebraska
Columbia University College of Physicians and Surgeons	(1934)	New York
Long Island College Hospital	(1921)	New York
New York University College of Medicine	(1915)	New York
University of Rochester School of Medicine and Dentistry	(1938)	Ohio
Ohio State University College of Medicine	(1939)	Ohio
Western Reserve University School of Medicine	(1918)	
(1932) Ohio		
Meharry Medical College	(1938)	Tennessee
Vanderbilt University School of Medicine	(1940)	Tennessee
University of Wisconsin Medical School	(1935)	Hawaii
Julius Maximilians Universität Medizinische Fakultät Würzburg	(1917)	Illinois

School	LICENSED BY ENDORSEMENT	Year Endorsement of
College of Medical Evangelists	(1939) (1940)	(1942) \ B M Ex
University of Southern California School of Medicine	(1941)	(1941) \ B M Ex
University of Colorado School of Medicine	(1941)	(1925) U S Navy
(1941) \ B M Ex		
Yale University School of Medicine	(1940)	\ B M Ex
Northwestern University Medical School	(1927)	\ B M Ex
Harvard Medical School	(1928) U S Navy	(1936) \ B M Ex
University of Michigan Medical School	(1931)	\ B M Ex
University of Nebraska College of Medicine	(1932)	\ B M Ex
New York University College of Medicine	(1940)	\ B M Ex
University of Pennsylvania Department of Medicine	(1902)	U S Army
University of Manitoba Faculty of Medicine	(1933)	\ B M Ex

Bureau of Legal Medicine  
and Legislation

## MEDICOLEGAL ABSTRACTS

**Dinitrophenol Blindness Attributed to Use of Drug**  
—Cecilia Wennerholm and her husband sued the Stanford University School of Medicine, the Stanford University Hospital the Lane Hospital, the Board of Trustees of Leland Stanford Junior University and several individuals for damages for the loss of the wife's eyesight, purportedly due to the use by the wife of dinitrophenol, manufactured and distributed by one of the defendants, for relief from obesity. The original and first four amended complaints filed by the plaintiffs were framed on a theory of negligence. The defendants, it was charged in those complaints, caused articles to be published in medical journals and elsewhere to the effect that dinitrophenol was harmless. These statements were read and relied on by the plaintiffs and by the physician who attended the wife and prescribed the drug, and the defendants knew or should have known of the dangerous character of the drug but negligently failed to disclose that fact in the articles referred to. The plaintiffs abandoned the theory of negligence and filed a fifth amended complaint predicated on fraud alleging that (1) the defendants manufactured and distributed to retail outlets dinitrophenol, (2) the defendants falsely stated and represented in effect, in articles which were caused to be printed in newspapers, pamphlets, circulars and medical journals that dinitrophenol was a harmless drug which could be taken internally by human beings and would reduce excessive weight and alleviate obesity without causing physical harm, (3) as a matter of fact, the defendants well knew that dinitrophenol was poisonous and deleterious to the human body, was inherently dangerous to human life and limb and was liable to cause blindness, and (4) the wife, reading and relying on various statements caused to have been published by the defendants and being ignorant of the falsity of those statements to reduce obesity purchased and took internally amounts of dinitrophenol daily from March 9 to Dec 30, 1934 and by reason thereof became blind. The trial court sustained demurrers interposed by the defendants to the complaint and the plaintiffs appealed to the district court or appeals first district division 1 California

which affirmed the judgment of the trial court (*Wennerholm v. Stanford University School of Medicine*, 113 P. (2d) 736 (Calif., 1941), J. A. M. A. 119 903 [July 11] 1942). An appeal was then taken to the Supreme Court of California.

The sole question before the court was whether or not the fifth amended complaint stated a cause of action. If it did, the trial court was in error in sustaining the demurrers. The defendants contended that the complaint did not state a cause of action because it did not specifically allege that the false representations alleged to have been made were made with an intent to deceive the plaintiffs. The court believed, however, that the intent to deceive sufficiently appeared by the facts alleged in the complaint, from which it may be inferred that the alleged false statements were made with the intention of inducing the public to purchase the drug. One who intends to defraud the public, said the court, or a particular class of persons, is deemed to have intended to defraud every individual in the class who is actually misled. The court therefore concluded that while the complaint was somewhat martistically framed, it did state a cause of action for fraud.

The defendants next argued that the allegations in the earlier complaints that dinitrophenol had been taken on the prescription of a physician which allegation was omitted from the amended complaint under consideration, must be read in that complaint and that if such an allegation is read into the last complaint the complaint on its face will conclusively show that the plaintiff did not act in reliance on the representations of the defendants. Even granting, said the court, that the allegation that the plaintiff took the drug on the advice of her physician must be read into the fifth amended complaint, that complaint sufficiently alleges reliance by the plaintiff on the defendants' representations. In actions for fraud it is not required that a defendant's representations be the sole cause of the damage. If they are a substantial factor in inducing the plaintiff to act, even though he also relies in part on the advice of others, reliance is sufficiently shown. In this case there was no allegation in the earlier complaints that the plaintiff relied solely on the advice of her physician, in fact it is alleged in the second amended complaint that "plaintiff and her said physician believed and accepted the recommendations of defendants and relied on the same and the said physician, in reliance thereon, prescribed for plaintiff, and the said plaintiff in reliance thereon and upon the advice of her physician, formed upon such recommendation of the defendants, used said dinitrophenol." In the fifth amended complaint it is alleged that the plaintiff "relying upon the aforesaid representations of said defendants, and not otherwise purchased and took internally" the said drug. Accepting this statement as qualified by the allegations with respect to the physician in the earlier complaints, it sufficiently alleges that plaintiff relied, at least in substantial part, on the representations of the defendants. The mere fact that a physician prescribed the drug does not establish, as a matter of law, a lack of reliance on the part of the plaintiff which would absolve the defendants from liability. The court did not regard as reasonable the contention advanced by the defendants that in circumstances such as those alleged here a prescribing physician must accept sole responsibility for the treatment which he chooses for his patients. It seems a more reasonable view to us, said the court, that one who manufactures and sells a drug dangerous to life and health, knowing it to be dangerous, should be liable where, as here alleged, both physician and patient rely on the representations made concerning the drug.

The defendants next contended, in support of the trial court's sustaining of the demurrers, that the cause of action is barred by the statute of limitations since the fifth amended complaint, charging fraud while the complaint and the first four amended complaints merely charged negligence, states a new and dif-

ferent cause of action from that alleged in the original complaint. Unless the amended complaint, answered the court, sets forth an entirely different cause of action from the original the amended complaint, for the purposes of the statute of limitations, must be deemed filed as of the date of the original complaint. The modern rule, when an amendment is sought after the statute of limitations has run, is that the amended complaint will be deemed filed as of the date of the original complaint so long as recovery is sought in each complaint on the same general set of facts. A mere change in legal theory will not subject the amended complaint to the bar of the statute of limitations. In the present case the only substantial difference between the factual situations set forth in the original and in the fifth amended complaint is that the former charged that the representations were negligently made while the latter charges that they were made with knowledge of their falsity. Despite the change in legal theory from an action for negligence to one for fraud, it cannot be said that an entirely different cause of action is stated. Therefore the fifth amended complaint, the one under discussion, is not barred by the statute of limitations.

The court accordingly reversed the judgment of the trial court sustaining the demurrers interposed by the defendants—*Wennerholm v. Stanford University School of Medicine*, 128 P. (2d) 522 (Calif. 1942).

## Society Proceedings

### COMING MEETINGS

- Alabama Medical Association of the State of Birmingham April 20 22 Dr Douglas L Cannon 519 Dexter Ave Montgomery Secretary
- American Association on Mental Deficiency New York May 12 15 Dr Neil A Dayton Mansfield Training School Mansfield Depot Conn
- American Gastro-Enterological Association Atlantic City N J May 3 4 Dr J Arnold Bargen 102 Second Ave SW Rochester Minn Secretary
- American Neurological Association New York May 6 7 Dr Henry A Riley 117 East 72d St New York Secretary
- American Psychiatric Association Detroit May 10 13 Dr Winfred Overholser St Elizabeth's Hospital Washington D C Secretary
- American Society for Clinical Investigation Atlantic City N J May 3 Dr Wesley W Spink University Hospital Minneapolis Secretary
- American Surgical Association Cincinnati May 13 14 Dr Warfield M Firor Johns Hopkins Hospital, Baltimore Secretary
- Arizona State Medical Association Tucson April 30 May 1 Dr Frank J Millos 112 North Central Avenue Phoenix Secretary
- Arkansas Medical Society Little Rock April 19 20 Dr W R Brookshier 602 Garrison Ave Fort Smith Secretary
- California Medical Association Los Angeles May 2 3 Dr George H Kress 450 Sutter St San Francisco Secretary
- Conference of State and Provincial Health Authorities of North America Washington D C March 22 25 Dr A J Chesley 469 State Office Bldg St Paul Secretary
- Florida Medical Association Jacksonville April 15 16 Dr Shaler Richardson 111 West Adams St Jacksonville Secretary
- Georgia Medical Association of Atlanta May 11 14 Dr Edgar D Shanks 478 Peachtree St N E Atlanta Secretary
- Iowa State Medical Society Des Moines April 29 30 Dr Robert L Parker 3510 Sixth Avenue Des Moines Secretary
- Maryland Medical and Chirurgical Faculty of Baltimore April 27 28 Dr W Houston Toulson 1211 Cathedral St Baltimore Secretary
- Mississippi State Medical Association Jackson May 11 13 Dr T M Dye Clarksdale Secretary
- Missouri State Medical Association St Louis April 18 20 Mr Raymond McIntyre 634 North Grand Blvd St Louis Executive Secretary
- National Tuberculosis Association St Louis May 5 6 Dr Charles J Hatfield 7th and Lombard Sts, Philadelphia Secretary
- New Hampshire Medical Society Manchester May 11 12 Dr Carleton K Metcalf 5 South State St Concord Secretary
- New York Medical Society of the State of Buffalo May 3 6 Dr Peter Irving 292 Madison Ave New York Secretary
- North Carolina Medical Society of the State of Raleigh May 10 12 Dr Roscoe D McMillan Red Springs Secretary
- North Dakota State Medical Association Bismarck May 10 11 Dr L W Larson 221 Fifth Street Bismarck Secretary
- Ohio State Medical Association Columbus March 30 31 Mr Charles S Nelson 79 East State St Columbus Executive Secretary
- Oklahoma State Medical Association Oklahoma City May 11 12 Dr Lewis J Moorman 210 Plaza Court Bldg Oklahoma City Secretary
- Texas State Medical Association of Fort Worth May 3 6 Dr Holman Taylor 1404 West El Paso St Fort Worth Secretary

## Current Medical Literature

### AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1932 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (\*) are abstracted below.

### American Journal of Medical Sciences, Philadelphia 204 781-928 (Dec) 1942

- Nonspecificity of Glomerular Lesions of Kidney H A Christian  
Brookline Mass—p 781
- \*Nonspecific Effect of Certain Kidney Extracts in Lowering Blood Pressure O Schales E A Stead Jr and J V Warren Boston—p 797
- Hormone Effects on Male Gastrointestinal Mucosa R H Abrahamson  
R Church and J W Hinton New York—p 809
- Two Dose Glucose Tolerance Test E Wayburn and H Gray San  
Francisco—p 823
- Pyruvic Acid Metabolism in Diabetes Mellitus E Bueding H Wortis  
and H D Fein with technical assistance of Dorothy Esturonne New  
York—p 838
- Role of Physical Therapy in Rehabilitation of Disabled Soldiers R  
Pemberton Philadelphia—p 846
- \*Studies of Biotin Metabolism in Man Part I Excretion of Biotin in  
Human Urine Part II Relationship Between Biotin Content of  
Diet and Its Output in Urine and Feces III Excretion of Two  
Biotin-like Substances in Urine T W Oppel New York—p 856
- Effect of Various Steroids in Intact Male Rats H Selye and S Albert  
Montreal Canada—p 876

**Effect of Kidney Extracts on Blood Pressure**—Schales, Stead and Warren injected intramuscularly prepared kidney extracts into the buttocks of 7 patients with arterial hypertension. The patients were hospitalized but were ambulatory throughout their hospitalization. The blood pressure was determined twice a day and the temperature was recorded at least four times a day. The severity of the local reactions was graded from 1 to 4 plus, depending on the amount of induration, erythema and tenderness. Roentgen examination of the heart, electrocardiograms and blood and urine studies were obtained at various times throughout the hospitalization. Four of the 7 patients had malignant hypertension and 3 had a more chronic or benign variety. Of the 2 male patients, both with malignant hypertension, treated for two and three weeks the blood pressure did not show a significant variation nor was there any definite symptomatic change. Only minimal soreness and induration at the site of injection occurred. In the remaining 5 female patients the daily intramuscular injection of kidney extract produced a significant decline in arterial pressure. The initial injections were followed by slight tenderness and pain at the site of injection, but after two to ten days a more severe type of reaction occurred. Several hours after injection the site was surrounded by an area of pronounced induration, which usually involved the entire buttock and frequently spread over the sacral and lumbar regions. The skin was red and hot, and often an erythematous confluent macular eruption occurred, which involved not only the skin of the injected buttock but also the skin of the sacrum and the lateral and anterior aspects of the thigh parallel to and just below the inguinal ligament. Associated with this severe local reaction there were various constitutional symptoms of fever, chills, sweating, anorexia and lethargy. A significant lowering of the arterial pressure appeared to be related to the fever, sweating, weakness, anorexia and severe local reactions. Injection of extracts poor in hypertensinase produced a fall in arterial pressure similar to that produced by the unmodified extract. The conclusion is that the decrease in arterial pressure was produced by a nonspecific effect of the renal extracts on the body rather than by specific interference with a renin-hypertensin system.

**Biotin Metabolism in Man**—In his study of the excretion of biotin in the urine of man, Oppel found that normal subjects on unrestricted diets excreted from 7 to 89 micrograms of biotin (as measured by yeast growth stimulation) per liter of urine.

With ordinary diets the biotin elimination varied daily and throughout the day. There was a striking increase immediately after a large dose of crude biotin was ingested. The biotin excreted in the urine of those who ate well was greater than of those whose intake of food was poor. It was relatively constant for those who ate the same food every day. The biotin excretion of patients with various diseases showed the values to be within the normal range and even during periods of starvation the excretion was not abnormally low. A study of a small group of hospital patients on diets of known biotin content revealed that if the daily biotin intake was constant the biotin excretion also was constant for each subject. When diets containing 35 and 65 micrograms of biotin were taken on alternate days, the urine showed corresponding daily fluctuations. The average daily biotin content of the feces appreciably exceeded the biotin content of the diet. The total biotin output in the urine and the feces was three to six times as much as the dietary intake. The material in the urine which gives the biotin test by the yeast growth assay can be separated into an avidin combining and a non-avidin combining fraction, both fractions have been found in the urines of the human being, dog, rabbit and rat. The avidin combining fraction is probably biotin. Its excretion in the urine varies with the amount of biotin in the diet. Small amounts of it were excreted by patients taking diets containing large amounts of egg white and none in the urines of 2 biotin deficient rats. The non-avidin combining fraction has been found in all urine tested and its quantity was not changed by the biotin content of the food or by oral doses of biotin. Only minute amounts of the non-avidin combining fraction were found in diets and feces.

### Am J Roentgenol & Rad Therapy, Springfield, Ill 48 715-868 (Dec) 1942

- Vertebral Vein System as Mechanism for Spread of Metastasis O V  
Batson Philadelphia—p 715
- Tuberculosis of Greater Trochanter and Its Bursa M S Donovan and  
M C Sosman Boston—p 719
- Renal Osteitis M L Sussman and M H Poppel New York—p 726
- Hurler Pfaundler Syndrome (Gargoylism) Review of Literature with  
Report of Additional Case R M Harvey Philadelphia—p 732
- \*Survey of Deaths and Unfavorable Sequelae Following Administration  
of Contrast Mediums E P Pendergrass G W Chamberlin E W  
Godfrey and E D Burdick Philadelphia—p 741
- \*Ocular Test for Sensitivity to Diodrast Prior to Intravenous Urography  
V W Archer and I D Harris University Va—p 763
- Hypersensitivity to Diodrast as Determined by Skin Test S A  
Robins Boston—p 766
- Value of Excretory Urography in Interpretation of Renal Function K  
Kornblum and T R Fetter Philadelphia—p 770
- Cystic Disease of Upper Urinary Tract Pyelitis Cystica and Ureteritis  
Cystica A E Bothe and D S Cristol Rochester Minn—p 787
- Multiple Sacular Aneurysms of Aorta Report of Three Cases M  
Wilburne and H K Taylor New York—p 797
- Roentgen Diagnosis of Appendical Fecaliths J Jackman Cleveland  
—p 803
- Roentgen Ray Dosage During Routine Diagnostic Studies M I  
Smedal Boston—p 807
- Roentgen Therapy of Primary Cancer of Nasopharynx M Lenz New  
York—p 816

**Unfavorable Sequelae After Injection of Contrast Mediums**—The death of a patient following the intravenous administration of 3,5 diiodo 4 pyridone-N-acetic acid and diethanolamine (diodrast) for a urographic study prompted Pendergrass and his associates to send questionnaires to radiologists and urologists. The latter returned information on 220,000 urograms and the former on 441,800. An analysis of the data showed that there were 26 deaths in addition to the 11 already reported in the literature. Ten deaths were immediate, the result of hypersensitivity or idiosyncrasy to the drug injected or to colloidal shock, and 16 deaths were delayed, presumably because of preexisting major renal damage. All immediate deaths were of patients who had received diodrast and were preceded by symptoms of anaphylactic shock, although they may not have been due to an "anaphylactoid reaction." Overdosage may have been the cause. The contrast medium in the delayed deaths had not been proved to be an etiologic factor. Toxic reactions may occur especially in patients with previous renal damage and urea reduction. No immediate deaths have been reported following retrograde pyelography with contrast mediums. Instances of nonfatal hypersensitivity, simulating anaphylactic shock, have occurred following the intravenous use of contrast mediums. Contrast mediums are contraindicated.

cated in patients with severe hepatic disorders, nephritis, exudative diathesis (in children), allergy and severe uremia. They should be used with caution in pulmonary tuberculosis, hyperthyroidism, in patients in whom a reduction of blood pressure would be dangerous and in patients who have had repeated injections of contrast mediums. To prevent anaphylactic reactions the oral, intravenous, intradermal and conjunctival tests are helpful. However, their use will not warn adequately against the toxic reaction. Therefore, with the increased use of contrast mediums, radiologists and physicians should be on the alert so that its use, which has permitted such great advances in diagnosis, and its users will not fall into disrepute.

**Test for Contrast Medium Sensitivity.**—Archer and Harris outline an ocular test for discovering a patient's sensitivity to diodrast. The test is accurate, quick and simple and has been used in more than 600 cases, sometimes even in the face of historical contraindications such as allergy, hypertension, previously administered sulfonamides and iodides. The eyes are examined for comparison and a drop of the dye is placed directly on the conjunctiva of one eye. The patient closes his eyes as in sleep for one and a half minutes after which the eyes are examined (daylight is preferable) and then again two minutes later. The reacting eye is compared with the control. The injection of the vessels of the sclera and conjunctiva is the criterion of the test. The reactions are divided into minimal, moderate and decided types. In a minimal reaction the dye may have no effect, or the patient states that he has a hot flash and some nausea. Patients with moderate injection react to intravenous injection with nausea, vomiting, vasomotor dilatation and occasionally generalized pruritus, urticaria and some slight swelling of the membranes of the upper part of the respiratory tract. The reactions are temporary with no sequelae. In decided injection the vessels are engorged from the iris to the periphery. This absolutely contraindicates the intravenous use of the dye. These dangerous reactions have included vasomotor and respiratory collapse, laryngeal edema, severe asthma, generalized urticaria, pruritus and even (delayed) dermatitis. As some patients complain of temporary burning in the tested eye they should be forewarned so that they will not rub the eye, thus producing a false positive reaction. The reaction in the muddy sclera of Negroes is harder to read, but a unilateral difference is readily discernible. There should be no alcohol on or in the needle of the syringe, as with the dye it causes a decided reaction.

## Annals of Otol, Rhin and Laryngology, St. Louis

51 891-1184 (Dec.) 1942 Partial Index

- Developmental Anatomy of Human Stapes B. J. Anson and E. W. Cauldwell Chicago—p. 891
- Functional Aphonia L. H. Clerf Philadelphia and F. J. Braceland Chicago—p. 905
- Impaired Hearing in Children and Size of Adenoids in Relation to Some Anthropometric Data and to Condition of Teeth Ella Langer Baltimore—p. 931
- \*Local Use of Sulfonamides Gramicidin (Tyrothricin) and Penicillin in Otolaryngology J. E. Bordley S. J. Crowe D. A. Dolowitz and K. L. Pickrell Baltimore—p. 936
- The Sulfonamide Drugs in Treatment of Acute Otitis Media H. G. Tobey Boston—p. 945
- \*Effect of Androgen Therapy on Voice and Vocal Cords of Adult Women J. L. Goldman and U. J. Salmon New York—p. 961
- Effect of Experimentally Altered Air Pressure in Middle Ear on Hearing Acuity in Man W. E. Loch Baltimore—p. 995
- Earache: Common Causes and Probable Nerve Pathways G. E. Tremblay Montreal Canada—p. 1017

**Bacteriostatic Compounds in Otolaryngology.**—The experience that Bordley and his colleagues have had with bacteriostatic agents indicates that many of the complications of secondary infections of the sinuses, ears and lymphoid tissue and much of the discomfort of acute coryza or nasopharyngitis may be prevented by spraying the nasal passages and pharynx with a 2.5 per cent sulfadiazine triethanolamine solution at least eight times a day during the first two days and five or six times a day for the next two or three days. The results of a rigidly controlled experiment in 30 student nurses who reported for treatment in an average of twenty-four hours after onset of acute coryza or nasopharyngitis show the spray to be most efficacious. Without their knowledge the nose, nasopharynx and pharynx of alternate patients were sprayed with the solvent (triethanolamine) and of the others with the solvent plus 2.5 per

cent sulfadiazine. Two of the 16 treated patients had slight clouding of one antrum on transillumination, which cleared without local treatment, while in the control group 7 of 14 patients had complicating infection of accessory nasal sinuses. One patient had had acute sinusitis with each cold during the past four years, and six such attacks during the previous winter required irrigation of an antrum. During the past winter the absence of sinus infection was attributed to the use of the sulfadiazine spray. Gramicidin was most valuable when used to supplement surgical operation. Postoperative fever, swelling, pain and irrigation or frequent dressings may all be prevented by painting the entire operative area with gramicidin and packing the wound with gauze saturated with gramicidin. This result is obtained only when the infecting organisms are sensitive aerobic or anaerobic streptococci or some type of pneumococci. The strength of the gramicidin suspension must not exceed 1 mg. per cubic centimeter. Sterile penicillin (the filtrate) is suitable for local application in infected wounds and for irrigation of the middle ear or accessory nasal sinuses. Penicillin is superior to gramicidin in that it is soluble in water, penetrates tissues and is neither toxic nor irritating to mucous membranes. It is especially effective for staphylococci and bactericidal for aerobic and anaerobic streptococci and pneumococci. As with gramicidin, certain strains of these organisms may be resistant. Therefore their intelligent use necessitates careful bacteriologic study of each patient.

**Effect of Androgen Therapy on the Voice of Women.**—According to Goldman and Salmon in 23 of more than 400 patients receiving androgen therapy for various endocrinopathic gynecologic disorders, symptoms of hoarseness, huskiness and masculine pitch associated with structural alterations of the vocal cords were observed. The vocal cords, on indirect mirror laryngoscopy, showed a characteristic picture of generalized suffused swelling with injected blood vessels. A pale off-white color with caudal extension of the swelling making the subglottic surfaces of the cords visible, was a consistent laryngeal feature. The vocal disturbance and physical alterations persisted for varying periods, up to two and a half years after androgen therapy was withdrawn in 11 cases. The study suggests that there is a striking similarity between the vocal and laryngeal changes in women who receive androgen therapy and the physiologic development of the voice and larynx in boys at puberty. To avoid the changes in women receiving androgen therapy the dose must be kept below the threshold for these phenomena. For the average woman this threshold is approximately 500 mg. of testosterone propionate per month. As an additional safeguard against androgen overdosage is the taking of weekly vaginal smears and the discontinuance of therapy if the effects of androgen appear in the smear.

## Archives of Surgery, Chicago

46 1-166 (Jan.) 1943

- \*Treatment of Burns with Chemotherapeutic Membranes W. D. Andrus W. F. Nickel New York and F. C. Schmelle Belleville N. J.—p. 1
- Chillstone Ileus P. R. Hinchev Salem Mass.—p. 9
- \*Pulmonary Embolism: Clinical and Experimental Study W. J. Potts Oak Park Ill. and S. Smith Orlando Fla.—p. 27
- Wound Healing: Effect of Sterile Abscess on Fibroplasia in Wound Healing G. B. Sanders and W. S. Carrison Philadelphia—p. 40
- Fate of Procaine in Human Body After Subarachnoid Injection A. Goldberg H. Koster and Rose Warshaw Brooklyn—p. 49
- Thoracoabdominal Gunshot Wounds: Review of Eighty-Four Cases H. G. Hardt Jr. and J. Seed—p. 59
- Progress in Orthopedic Surgery for 1941: Review Prepared by an Editorial Board of American Academy of Orthopedic Surgeons—p. 74
- Review of Urologic Surgery (concluded) A. J. Scholl Los Angeles I. H. Hannon San Francisco A. von Lichtenberg Mexico D. F. Mexico A. B. Hepler Seattle R. Gutierrez New York G. J. Thompson J. T. Priestley Rochester Minn. E. Wildholz Berne Switzer land and V. J. O'Connor Chicago—p. 138

**Treatment of Burns with Chemotherapeutic Membranes.**—Andrus and his associates used preformed hydrated chemotherapeutic membranes (eschars) in the treatment of second degree burns of 10 patients. The membranes contained 10 per cent sulfanilamide and buffer, with and without azo chloramid. If after their application excessive oozing threatens to disintegrate the film a second or third layer can be applied over the first. Also by mounting these films on gauze they can be made into sheets large enough to encircle the torso of an adult. The longest elapsed time required for complete healing

(return to work) was twenty-one days, this was in a case in which extensive burn about the head involved all the hair and eyebrows. The following technic was used. The burn was first debrided and thoroughly cleansed with saline boric acid or azochloramid solution. All dead skin was removed and the preformed membrane was applied directly to the raw oozing surface. A dry sterile dressing was placed over the membrane and held by a plain gauze bandage. Given a large number of burns (on board ship for instance) the membrane can be applied quickly and easily by any one trained in first aid and can be held in position by the dry dressing. If its removal is necessary it is moistened with sterile water or saline solution. Since submitting their paper the authors have treated 10 additional patients who had severe second degree burns, their average healing time was nine days. The burn of 1 patient involved 55 and of 1 patient 35 per cent of the surface of the body. Healing in both was complete in twelve days.

**Pulmonary Embolism**—Potts and Smith studied the value of exercise in lessening the incidence of pulmonary thrombosis. Their material consists of 837 private patients who have carried out the exercises the evening of the operation and each morning and evening thereafter and a control group of 124 patients with fractures which required immobilization and 150 surgical patients who did not carry out the postoperative exercises. The exercises consisted of fifteen deep breaths and active flexing of the legs with each breath. There has been no phlebothrombosis or pulmonary embolism among the 837 private patients. In the first control group there were 5 instances of phlebothrombosis, 4 were followed by pulmonary infarction, and pulmonary embolism was found in 1 at postmortem examination. The origin of the emboli could not be found. Among the surgical control group 4 patients had phlebothrombosis, in 2 the thrombosis followed drainage of an appendical abscess, in 1 the release of a mechanical intestinal obstruction and in 1 the abdominoperineal resection of the rectum. Experimentally the authors have produced thrombosis in the femoral vein of a dog after double partial ligation.

### Bulletin New York Academy of Medicine, New York 19 1-74 (Jan) 1943

- Principles of Treatment of Closed Head Injury D. Denny Brown Boston—p. 3  
Use of Vitamins in Clinical Neurology C. D. Auring Cincinnati—p. 17  
Speech Disorders and Their Treatment S. Cobb Boston—p. 34  
Prevention and Treatment of Convulsive Disorders W. G. Lennox Boston—p. 47  
Some Medical Problems of Vesicant Chemical Warfare Agents as Affecting Civilian Populations L. Goldman Cincinnati—p. 57

### Journal of Pharmacology & Exper Therap, Baltimore 76 295-400 (Dec) 1942 Partial Index

- Local Anesthetic Properties of Cinnamylphenedrine F. H. Schultz Jr. and P. H. Barbour Jr. New Haven Conn.—p. 295  
Some New Aspects of Morphine Action: Effect on Stomach D. Slaughter A. B. Goddard and W. M. Henderson Dallas Texas—p. 301  
Pyretic Action on Rats of Small Doses of Morphine J. B. Herrmann New Haven Conn.—p. 309  
\*In Vitro and In Vivo Studies of Gramicidin Tyrothricin and Tyrocidine H. J. Robinson and O. E. Graessle Rahway N. J.—p. 316  
Study of Similarities of Several Representative Types of Bismuth Preparations Used in Therapy of Experimental Syphilis N. M. Clausen B. J. Longley R. E. Green and A. L. Tatum Madison Wis.—p. 338  
\*Metabolism Toxicity and Manner of Action of Gold Compounds Used in Treatment of Arthritis IV. Studies of Absorption Distribution and Excretion of Gold Following Intramuscular Injection of Gold Thioglucose and Gold Calcium Thiomalate W. D. Block O. H. Buchanan and R. H. Freyberg Ann Arbor Mich.—p. 355  
Trypanocidal Action of 3-Amino-4-Hydroxyphenyl Arsenious Oxide (Mapharsen) Administered Orally with Glutathione S. M. Rosenthal Bethesda Md.—p. 358  
Nature of Emetic Action of Digitalis Bodies and Related Compounds H. F. Haney and A. J. Lindgren Portland Ore.—p. 363

**Studies of Gramicidin, Tyrothricin and Tyrocidine**—In their *in vitro* and *in vivo* studies of the bactericidal activity of gramicidin, tyrothricin and tyrocidine Robinson and Graessle found that the last two appear to exert a decided bactericidal action on aerobic and anaerobic gram positive bacteria in the absence of blood or serum, under similar conditions gramicidin appears to be primarily bacteriostatic. When blood or serum is present tyrocidine and tyrothricin lose their bactericidal properties whereas gramicidin retains its bacteriostatic properties,

under these conditions tyrothricin becomes primarily bacteriostatic. *In vivo* results indicate that gramicidin and tyrothricin intraperitoneally in infected mice are active whereas tyrocidine is not. Gramicidin or tyrothricin are effective only when given in direct contact with the infecting bacteria. Oral, subcutaneous or intravenous treatment did not protect mice infected peritoneally. Likewise, mice infected by vein were not protected by intraperitoneal treatment.

**Distribution and Excretion of Gold in Arthritis**—Following the intramuscular injection into the white rat of oil suspensions of gold calcium thiomalate and gold thioglucose Block and his associates found the rate of absorption of the gold to be somewhat faster in the case of the latter compound. Larger amounts of gold were present in the kidneys and liver than in other tissue studied. Excretion occurred through the kidneys and the gastrointestinal tract. The chief route of excretion of the soluble gold thioglucose was the kidneys while gold was excreted primarily in the feces following the administration of the insoluble gold calcium thiomalate.

### Journal of Urology, Baltimore 48 563-800 (Dec) 1942 Partial Index

- Papillary Carcinoma of Right Kidney Report of Case with Atypical History and Findings H. A. Fowler Washington D. C.—p. 563  
Certain Capsular and Subcapsular Mixed Tumors of Kidney Herein Called Capsuloma S. H. Colvin Jr. Rochester Minn.—p. 585  
Carcinoma of Kidney and Pregnancy A. E. Vitt and W. F. Melick St. Louis—p. 601  
Intravenous Urography During Renal Pain from Ureteral Stricture J. F. McCahey and J. S. Fetter Philadelphia—p. 622  
Osteitis Pubis Report of Case in a Woman S. Kleinberg New York—p. 635  
Analysis of Urinary Calculi Through Use of Polarizing Microscope A. Randall 4th Boston—p. 642  
Pancreatic Lesions Confusing Urologic Diagnosis Report of Three Cases J. K. Ormond G. H. Wadsworth and H. V. Morley Detroit—p. 650  
Intersexuality Operation and End Results Case F. L. Senger and E. K. Morgan Brooklyn—p. 658  
Studies in Malignant Testis Tumors VIII. Tumors in Pseudohermaphrodites Review of Sixty Cases and Case Report J. B. Gilbert Schenectady N. Y.—p. 665  
\*Castration for Carcinoma of Prostate Report of Immediate Results E. P. Alvey and A. F. Henderson Durham N. C.—p. 673  
\*Experiences in Treatment of Carcinoma of Prostate with Stilbestrol and with Castration by Technic of Intracapsular Orchiectomy R. Chute A. T. Willets and J. P. Gens Boston—p. 682  
Technic for Castration in Carcinoma of Prostate E. Hess Erie Pa.—p. 703  
\*Eight Year Results of Castration for Cancer of Prostate A. Randall Philadelphia—p. 706  
Introduction of Solution into Tubuloalveolar System of Prostate Gland New Method Useful in Diagnosis and Therapy H. R. Trattner Cleveland—p. 710  
Diagnosis and Prognosis of Male Infertility Study of Forty Four Cases with Special Reference to Sperm Morphology L. Portnoy New York—p. 735  
Excretion of Halogenized Phenols and Their Use in Treatment of Urogenital Infections Percutaneous Chemotherapy B. Zondek Jerusalem Palestine—p. 747  
Action of Testosterone Propionate on Kidneys of Rats Dogs and Men J. K. Lattimer New York—p. 778

**Castration for Carcinoma of Prostate**—Alvey and Henderson discuss the immediate response to castration of 40 patients with carcinoma of the prostate. The procedure was carried out on all during the past year. Contact was made with all but 1 for this first follow-up, 4 died (1 one day postoperatively from shock, 1 one month postoperatively from heart disease, 1 four months postoperatively from cerebral hemorrhage and 1, the 1 unsatisfactory case, recently from carcinomatosis), 30 returned to the clinic for reexamination and 5 answered the authors' questionnaire by mail. The early results show that their general improvement was astounding. All claimed to feel better than they had in years with decided improvement in appetite, energy and well being. The only adverse results have been the loss of libido and potentia in all but 1 and hot flashes in 3. The hot flashes have been controlled by small doses of diethylstilbestrol for three to five days at a time. The relief of pain from metastasis was most remarkable. In 1, such pain with extension of the disease returned after eight months of comfort. Changes in the primary growth following castration were evident clinically and at necropsy. Roentgenograms show the healing of bone in metastatic areas after castration and in 4 in disappearance of a metastatic tumor in the lungs after castration.



**Treatment of Carcinoma of Prostate**—In treating their last 27 cases of inoperable carcinoma of the prostate Chute, Willets and Gens employed castration, estrogen or a combination of the two in 21. Clinically only 1 patient was not decidedly benefited by the treatment. In a few cases the improvement almost suggested cure. The most immediate and striking effect was rapid relief from severe pain due to metastasis, if present, and then great improvement in appetite and general health with gain in weight and a reduction in the size and induration of the prostate with an improvement in the ability to urinate. The quickest and most satisfactory results were obtained by castration followed by the injection of 10 mg of diethylstilbestrol a day for five to ten days. After castration, libido and the power of erection usually disappeared; there were no other harmful effects. No beneficial effect was observed on bony metastasis. Roentgenograms taken over a period of more than six months showed apparent progress as usual.

**Castration for Cancer of Prostate**—Randall presents the histories of 5 patients with carcinoma of the prostate who were castrated seven, eight and nine years ago in the hope of influencing their inoperable carcinoma. Of these patients none were cured of the malignant process. Urinary obstruction, in addition to the malignant process, was present in all. The microscopic sections in the 4 patients who have since died have been reviewed and the diagnosis has been reaffirmed. It has been especially difficult to trace any record of clinical benefit. They lived respectively for seventeen months, three and a half years, forty-three days and eight months. In 2 at least there was definite clinical improvement, but this the author believed was due probably as much to the prostatic resection as to the castration. The one living patient is now 70 and was castrated six and a half years ago. Now his referring physician writes that the patient was in good health, free from pain or urinary difficulty until April 1941, when he complained of pain in the lower part of his back and of pain of the right hip and the inability to move his right leg. Roentgen examination revealed massive metastasis of the dorsolumbar spine. Three courses of epidural and subdural procaine injections relieved all pain, with eventual recovery of the function of the right leg. After the use of diethylstilbestrol and several courses of roentgen therapy to the prostate the patient is now free from all pain and voids well enough to dispense with a catheter. The prostate is hard and of relatively normal size. His appetite is good, his weight is constant and his general condition is good. The author points out that he does not present these cases as an argument against the trend of present day therapy but only as an experience of several years standing that stands as a fact and should be recorded before a wave of enthusiasm (and of castration) passes over this country.

## Public Health Reports, Washington, D. C.

57 1963-2002 (Dec 25) 1942

Ornithodoros Ticks as Medium for Transportation of Disease Agents. R. R. Parker—p. 1963

Variations in Rat Infestation on Vessels. R. Olesen and G. C. Sherrard—p. 1966

Incidence of Cancer in Denver, Colo. 1939. H. J. Sommers—p. 1971

58 1-32 (Jan 1) 1943

Coccidioidomycosis in Wild Rodents: Method of Determining Extent of Endemic Areas. C. W. Emmons—p. 1

Bacteriostatic Action of Sulfonamide Compounds on Clostridia. S. M. Rosenthal—p. 5

\*Treatment of Young White Mice Infected with Leptospira Icterohemorrhagiae with Immune Serum. C. L. Larson—p. 10

\*Herpes Simplex Virus Recovered from Spinal Fluid of a Suspected Case of Lymphocytic Choriomeningitis. C. Armstrong—p. 16

**Immune Serum for Leptospira Icterohemorrhagiae in Mice**—Larson tested the value of specific immune leptospirosis serum and the concentrated fraction of this serum in the treatment of groups of 24 mice infected with Weil's disease. The materials were given one, three, five and six days after infection. Both materials were effective when administered on the third day of infection, only about 50 per cent of the animals survived when treatment was instituted on the fifth day and none survived if serum was withheld until the sixth day. As a control, 0.3 cc of normal rabbit serum was administered intra-

peritoneally to 24 infected mice twenty-four hours after infection had been induced. All but 1 of the animals died and presented typical signs and symptoms of leptospirosis. The method of determining the efficacy of the material included titration of the infective agent, titration of the specific protective antibodies in the specimen of serum or plasma tested and their inoculation into infected mice.

**Herpes Simplex Virus in Spinal Fluid in Lymphocytic Choriomeningitis**—Armstrong reports the isolation of a strain of herpes simplex virus from the spinal fluid of a Negro of 15 suspected of having lymphocytic choriomeningitis. Blood drawn during the attack did not protect mice against herpes infection, while a sample drawn after recovery had protective properties. Demonstrable antibodies against choriomeningitis were absent from all samples tested. The evidence suggests that herpes simplex virus may in rare instances be the causative agent of some aseptic or lymphocytic meningitis for which the cause is otherwise undeterminable.

## Quarterly J. Studies on Alcohol, New Haven, Conn.

3 347-530 (Dec.) 1942

Acetoin Not a Product of Metabolism of Alcohol. L. A. Greenberg. New Haven, Conn.—p. 347

Some Factors Influencing Intoxicating Effect of Alcoholic Beverages. H. W. Newman and M. Abramson. San Francisco—p. 351

Influence of Intravenously Administered Alcohol on Emptying Time of Stomach. J. A. Greenberg, G. Lolli and Miriam Rubin. New Haven, Conn.—p. 371

Alcohol and Public Opinion. D. Anderson. New York—p. 376

Religion and Church in Relation to Alcohol Addiction. I. Religious Resources in Treatment of Alcohol Addiction. O. R. Rice. New York—p. 393

Id. II Aspects Other Than Therapeutic. S. Hiltner—p. 400

Study of Personalities of 289 Abnormal Drinkers. W. Fleeson. Minneapolis and E. F. Gildea. St. Louis—p. 409

Legal Regulation of Alcohol Education. Anne Roe. New Haven, Conn.—p. 433

Death from Alcoholism in the United States in 1940. Statistical Analysis. E. M. Jellinek. New Haven, Conn.—p. 465

## Yale Journal of Biology and Medicine, New Haven

15 139-294 (Dec.) 1942

Feline Virus Pneumonia and Its Possible Relation to Some Cases of Primary Atypical Pneumonia in Man. F. G. Blake, M. E. Howard and H. Tatlock. New Haven, Conn.—p. 139

Toxicity and Potential Dangers of Aliphatic and Aromatic Hydrocarbons. W. F. von Oettingen. Bethesda, Md.—p. 167

Cerebral Hemorrhage in Hemophilia. Case Report with Necropsy Findings. P. F. Mark. New Haven, Conn.—p. 185

Effect of Cholinergic Drugs on Recovery of Function Following Lesions of Central Nervous System in Monkeys. A. A. Ward Jr. and Margaret A. Kennard. New Haven, Conn.—p. 189

Salmonella Javiana Food Infection. R. D. Allen and M. Pijoon. Albuquerque, N. M.—p. 229

Study of the Stability of Vaccinia Virus. J. M. Hale. New Haven, Conn.—p. 241

Patent Ductus Arteriosus Complicated by Subacute Bacterial Endocarditis. Report of Case Successfully Treated by Chemotherapy and Surgery. A. B. Davison and G. E. Lindskog. New Haven, Conn.—p. 259

Effect of Exercise on Production of Typhoid Agglutinins. S. E. Wedberg. New Haven, Conn.—p. 263

The Early New England Doctor: Adaptation to Provincial Environment. M. S. Benfield. Brooklyn—p. 271

**Feline Virus and Atypical Human Pneumonia**—Blake and his collaborators record the occurrence of an illness on Nov. 7, 1941 in a young farmer which resembled primary atypical pneumonia of the type which has been increasingly prevalent since 1934. The history revealed not only that 2 other members of the household had recently had a similar illness and that 1 was sick at present but also that 8 of 12 cats on the farm had died of a respiratory disease during October and that 2 of the remaining 4 cats were sick with the same illness. The possibility that the afflicted members of the family and the cats were infected with the same agent suggested itself and an attempt to isolate an etiologic agent by transmission experiments in cats and mice was carried out. A virus capable of producing a similar pneumonia in cats was recovered from the lungs of 1 of the cats. Kittens appeared to be more susceptible to the virus than were full grown cats. The virus failed to infect mice and therefore appears to differ from most viruses causing infections of the respiratory tract. The evidence so far obtained suggests, but does not establish, the fact that the respiratory infection in the patients may have been caused by the virus causing the illness in the cats.



## FOREIGN

An asterisk (\*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

## Brain, London

65 233-342 (Sept.) 1942

Effect of Prolonged Increased Cerebrospinal Fluid Pressure on Venous Pressure in Superior Longitudinal Sinus of Dog T H B Bedford —p 233

Effects of Striatal Injury T A Mettler and Cecilia C Mettler —p 242

\*Electroencephalographic Studies in Epilepsy Critical Analysis K H Finley and J B Dynes —p 256

Intracranial Conditions After Closed Head Injuries A A McConnell —p 266

Repair of Large Gaps in Peripheral Nerves F K Sanders —p 281

**Electroencephalographic Studies in Epilepsy**—In the course of obtaining 4,500 electroencephalographic tracings of patients with a wide variety of neuropsychiatric disorders, Finley and Dynes were impressed by the variation of abnormal patterns within any given clinical group and by the similarity of many patterns in many diverse clinical disorders. An analysis of the electroencephalograms of 626 unselected epileptic patients shows that 86 per cent of the tracings were borderline or abnormal and 14 per cent were normal. Many of the patterns obtained from these patients were also found in other neuropsychiatric conditions. The spike and wave patterns usually furnished by epileptic patients occurred in less than 10 per cent. Less than half of these spike and wave patterns were from patients with petit mal epilepsy. Because of the foregoing, the use of clinical terminology in describing the brain wave patterns of epileptic patients is misleading. The electroencephalogram can continue to be of practical value to the neuropsychiatrist in the diagnosis of epilepsy if used as an adjunct to other laboratory data, the history and the clinical signs and changes.

## British Journal of Ophthalmology, London

27 1-48 (Jan.) 1943

Possible Fallacy in Use of Cross Cylinder F A Williamson Noble —p 1

Deficiency of Malar Bones with Defect of Lower Lids Ida Mann and T P Kilner —p 13

Id Case I L Johnstone —p 21

Unilateral Involvement of Optic Nerve in Head Injuries F C Rodger —p 23

Voluntary Convergence W R Mathewson —p 34

Hole at Vitula Due to Looking at the Sun Case C A Pittar —p 36

## British Journal of Surgery, Bristol

30 89-188 (Oct.) 1942

\*Abdominal Surgery of Total War' G Gordon Taylor —p 89

\*Nonpenetrating Injuries of Abdomen Reports on Two Cases D O Callaghan —p 107

\*Further Contributions to Causation and Treatment of Duodenal Ulcer and Its Complications T H Somervell —p 113

Pelvic Dislocations R G Taylor —p 126

Report of Four Cases of Esophageal Carcinoma Treated by Excision P R Allison —p 132

Successful Removal of Thoracic Esophagus for Carcinoma Two Cases R H Franklin —p 141

Cardioesophageal Resection for Tumor of Cardia Report of Successful Case R C Brock —p 146

Aneurysm of Splenic Artery Account of Example Complicating Gaucher's Disease Sheila P V Sherlock and J R Learmonth —p 151

Lingual Thyroid Report of Case with Unusual Histology H Wapshaw —p 160

**Abdominal Surgery of "Total War"**—Gordon-Taylor reviews the six hundred operations on the abdomen for injuries that he has encountered after more than two and a half years of conflict. The series includes abdominal injuries received in naval warfare, civilians damaged by air bombardment and certain army casualties from the flotsam and jetsam of the "Dunkirk miracle" and the evacuation of northern France, and others from the Royal Air Force who were brought down during the epochal "Battle of Britain." These cases, representing various types of injury from numerous missiles, have been collected haphazardly and afford no criterion for estimating the percentage of the total abdominal casualties for which surgery can be profitably employed. Despite the gravity of the wounds and the frequent association of multiple injuries, approximately 50 per cent of the patients with abdominal injury for whom

operation was possible survived. The present military situation permits of no information as to the percentage of these casualties for which operation has been possible. The percentage of recoveries for injuries to the stomach, the small intestine, the rectum and the spleen is higher than in 1914-1918, the recovery rate for injuries to the large intestine is the same. Few patients with extensive intestinal resections have survived, the successful cases have been mainly dealt with by suture. Exteriorization resections of the large intestine have not figured prominently among successful resections of the colon. The employment of the sulfonamides, locally and orally, has proved of inestimable value. The liberal transfusion of blood or blood derivatives has permitted operation on a host of patients who would otherwise have died. The abdominal surgery of 'total war' is really successful.

**Nonpenetrating Injuries of Abdomen**—O'Callaghan reports 2 instances of nonpenetrating injuries of the abdomen with visceral damage that occurred in civil life but that are not unlike those that can and do occur under wartime conditions. The injury in 1 was retroperitoneal rupture of the duodenum associated with laceration of the liver. The other patient had a laceration of the pancreas with tearing of the splenic vein. Both recovered following operation. In these patients shock was hardly evident at first but became serious following operation. Postoperative shock may be the serious danger, this was stressed by Mullally. Nonpenetrating injury to the abdomen may be produced in one of several ways: by impaling viscera against the bony structures of the body, by crushing of viscera against the vertebral bodies by puncture of viscera by fragments of fractured bone and complete rupture of the stomach when it is full at the time of the accident. Most authors accord a poor prognosis to these cases and blame the high mortality to errors in diagnosis and the inability to control associated shock. Most of the prognostic conclusions are based on results of some twenty to thirty years ago and therefore do not consider the effect of modern antishock treatment.

**Etiology and Treatment of Duodenal Ulcer**—After an experience of twenty years with some 4,000 operative cases of gastric and duodenal ulcer, Somervell believes that the operative treatment of duodenal ulcer should be stabilized on a firm and scientific basis, especially in India with its poor class of patient "whose stomach must be fitted for curry and rice in the shortest possible time," which depends largely on objective data and less on the personal opinion of the surgeon than has heretofore been the case. The effect of vitamin deficiency on the cause of duodenal ulceration is discussed by him and his belief is that deficiency of vitamins A and B<sub>12</sub> is the main dietetic cause of this condition in South India and possibly elsewhere. Roentgen examination and the fractional test meal if operation is decided on, enable the surgeon to have a good idea before the abdomen is opened as to the best type of operation to perform. The advantages of ligation of gastric arteries in place of gastrectomy are set forward. Rapid reduction in gastric acidity is obtained by the ligation of a sufficient number of the arteries of the gastric wall. This enables the simple gastroenterostomy to be done instead of the more serious gastrectomy preferred by many surgeons in the past. Gastrojejunal ulcer is perhaps the most serious of all late sequelae of gastroenterostomy. Its treatment depends on the acidity, the general condition of the patient and the liability to recurrent ulceration as shown by the presence of more than one ulcer. Considering these three items, the best operation for any particular case can be decided soon after the abdomen is opened.

## Edinburgh Medical Journal

49 721-788 (Dec.) 1942

Development of Materia Medica in Edinburgh Inaugural Address J H Gaddum —p 721

Sarcoidosis Review Based on a Case of the Disease C Cameron and E K Dawson —p 737

Influence of Atropine on Complete Heart Block Transient and Intermittent R A Miller —p 757

Studies on Stored Blood X Complement Isoagglutinins and Agglutinogens A Crosbie and H Scarborough —p 766

Incidence of Bromide Medication Study of 1,026 Admissions H Todd —p 773

**Gastroenterologia, Basel**

67 113-168 (No 3) 1942

Clinical and Roentgenologic Description of a Case of Jejunoileic Fistula Secondary to a Malignant Tumor of Descending Colon R. Crismer —p 113

\*Gastroscopic Observations in Anacidity with Special Consideration of Connection Between Clinical Symptoms and Condition of Mucosa V. T. Christiansen —p 125

Gastroscopic Observations After Abdominal Operations Internal Condition of Stomach After Cholecystectomy L. von Friedrich —p 132

\*Intestinal Autointoxication as Cause of Chronic Blepharoconjunctivitis V. L. Szerdahelyi —p 147

**Gastroscopic Observations in Anacidity**—Christiansen reports results obtained by gastroscopy in 52 cases of histamine refractory achylia. All presented a normal roentgenologic picture. Gastroscopy disclosed a normal mucosa in 12 cases, superficial gastritis in 15, atrophic gastritis in 15, hypertrophic gastritis in 7, single erosion in 2 and complete atrophy in 1. These observations suggest that gastritis is the most common lesion in achylia. A considerable number of cases of achylia exhibit no anatomic signs of anacidity. Complete atrophy is rare. The condition of the gastric mucosa in anacidity, with the exception of total atrophy, is identical with that found in the presence of normal or increased acidity. In order to ascertain a possible relationship between the clinical symptoms and the condition of the mucosa in anacidity the cases were divided into 3 groups. In the first group, of 12 cases, dyspepsia was absent. In the second group, comprising 23 cases atypical dyspepsia was present. In the third group, of 17 cases, there existed a true pyloric syndrome. In groups 1 and 2 both normal mucosa and gastritis were found, in group 3 no normal mucosa was found, but only gastritis. The incidence of gastritis in anacidity seems to run parallel with the intensification of the clinical symptoms.

**Intestinal Autointoxication as Cause of Chronic Blepharoconjunctivitis**—Szerdahelyi cites reports from the literature which suggest that intoxication of intestinal origin plays a pathogenic role in many general symptoms and in disorders of the type of uremia, liver cirrhosis, pernicious and other anemias, ileus, chronic dysentery, chronic arthritis, many forms of neuritis, vasomotor rhinopathy, certain allergic manifestations, eczemas, bronchial asthma and the like. The author's patient had a chronic mucous colitis and chronic blepharoconjunctivitis. Intestinal intoxication was probably responsible for both, because the eye symptoms improved or got worse simultaneously with the intestinal disorder. Vaccination with lactose nonfermenting bacteria of the patient's intestinal flora cured the intestinal disorder and the blepharoconjunctivitis.

**Medicina Española, Valencia**

5 317-428 (Oct) 1942 Partial Index

General Therapy of Dyspepsia E. Vidal Colomer —p 317

Modern Treatment of Myasthenia A. Subirana —p 341

\*Heart Disease Electrocardiographic Prognosis J. Almela Guillen —p 356

Therapy of Hypogalactia by Combined Action of Blood and Urine of Pregnant Women J. Uranga Gortia —p 372

**Heart Disease**—Almela Guillen discusses the prognostic value of the electrocardiogram in heart disease. Sinus arrhythmia, sinus bradycardia and sinus tachycardia are signs of an angioneurotic, vagotonic and vasolabile constitution respectively. These changes are of no pathologic significance. Extrasystoles which appear in the course of infections indicate myocardial infection. Auricular extrasystoles suggest myocardial damage. They appear frequently before a total arrhythmia. Ventricular extrasystoles are frequent in various diseases other than heart disease and in various physiologic states such as pregnancy. Extrasystoles which appear early in the administration of digitalis indicate acute myocardial lesions and contraindicate further administration of the drug. Extrasystoles with multiple foci of origin indicate myocardial lesions. Electrocardiograms with recurring alterations (Gallavardin's sign of alarm) indicate grave heart disease. Changes in the electrocardiograms of nervous youths and in persons who smoke excessively show functional disorders of the heart. Paroxysmal supraventricular tachycardia is of no pathologic significance whereas ventricular tachycardia is grave. It is frequently followed by fatal ven-

tricular fibrillation. Paroxysmal tachycardia in persons over 50 years of age indicates myocardial degeneration. The changes in the electrocardiogram which show auriculoventricular dissociation, elongation of the PQ segment in the acute period of an infection, the thickening and hooks in the main wave of the ventricular complex, changes showing bundle branch block, especially the auriculoventricular block, lowering of the ST segment below the isoelectric line and the inversion of the T wave are of grave prognosis. A low voltage of progressive lowering indicates diminution of the myocardial energy. The changes of the Q wave, especially in the third lead, are of prognostic significance when they are associated with other changes in the electrocardiogram showing myocardial infarct, coronary sclerosis, pericarditis or alterations in acute articular rheumatism. Electrocardiograms of patients with angina pectoris and with myocardial infarct are typical and of diagnostic rather than of prognostic significance. However, when the typical electrocardiograms of angina pectoris and of myocardial infarct show changes due to extrasystoles of multiple foci or a QS space of normal width, the prognosis is grave.

**Revista Medica de Chile, Santiago**

70 735-828 (Oct) 1942 Partial Index

Duodenal Diverticula F. Donoso A. Donoso and E. Montero —p 735

Errors in Treatment of Varices M. Crisnueira A. Velasco and E. Acevedo —p 741

\*Allergy to Catgut and Production of Adhesions Experimental and Clinical Studies H. Vaccaro and J. Cabezas V. —p 750

Intestinal Amebiasis A. Donoso Infante —p 782

Lobectomy for Infected Localized Bronchiectasis A. Alonso H. Ales and P. Garcia I. and F. Cincinato —p 785

Case of Acute Hemolytic Anemia Caused by Sulfathiazole A. del Solar and G. Duerich —p 798

Electrocardiographic Studies in Two Surgical Interventions for Wounds of the Heart A. Garreton S. L. Herve L. and O. Fuenzalida C. —p 793

**Allergy to Catgut and Adhesions**—Vaccaro and Cabezas V. investigated the capacity of catgut to sensitize animals and human subjects, its specificity relations with other organic materials, its absorption in the tissues, the development of aseptic inflammatory processes and the production of the Arthus phenomenon. They were able to demonstrate the antigenic and sensitizing character of catgut. Allergy to catgut appears regularly in guinea pigs and rabbits that have undergone preparative treatment with this material. The intradermal reaction to the antigen catgut becomes positive from four to eight weeks after the preparative cutaneous or peritoneal injection. In animals sensitized to horse or sheep serum or to human serum the intradermal reaction to catgut is persistently negative. Absorption experiments in nonsensitized animals proved the total absorption of peritoneally introduced catgut without late peritoneal reactions, nodules and adhesions. Animals sensitized to catgut show the Arthus phenomenon by aseptic inflammation, production of fibrous nodules, adhesions and chiefly by osseous degeneration. Catgut introduced into the peritoneum of rabbits sensitized with either horse or sheep serum is only partially and slowly absorbed, and late peritoneal reactions develop in the form of nodules and adhesions. In animals in which the cutaneous Arthus phenomenon has been produced with sheep serum and which have also been allergized to catgut, the absorption of catgut is extremely slow or negative and is accompanied by severe peritoneal inflammation and by adhesions. In non-allergic persons who have not been operated on, intradermal reaction gave 5 per cent of positive results to meat and to serum of sheep and 3 per cent to extract of catgut. The positive intradermal reactions increase progressively when the test is made on allergic persons, on those operated on and on those who have a history of allergy and of surgical intervention. Persons with cutaneous sensitivity to extract of meat or serum of sheep may have no allergy to catgut but sensitivity to catgut is found always in persons with positive reactions to the other antigens mentioned. In persons without a history of surgical interventions it is possible to interpret positive intradermal reactions to catgut as a sensitivity acquired by the digestive tract to the meat of sheep because the two antigens have a common origin. The authors recommend preoperative tests for sensitivity to catgut and replacement of catgut by nonabsorbable suture materials without antigenic properties.

## Book Notices

**Gas Warfare A Monograph for Instructors** Compiled by W. K. Fitch  
Published by the Pharmaceutical Society of Great Britain Paper Price  
2s. 6d. Pp. 103 London Pharmaceutical Press 1942

This booklet represents an attempt to give a brief but well balanced survey of the whole field of gas warfare within the limits of a hundred small but closely printed pages. It is described as "a monograph for instructors" in the civilian defense and other similar organizations. One of its main purposes (as stated in the preface) is to give to the instructor a background which will enable him to "get the trainee to view the gas menace through the eyes of the chemist as something that need arouse no anxiety." With this purpose the reviewer is most heartily in sympathy. And the booklet is, on the whole, well designed to attain the object in view. It is well seasoned with interesting historical details, and the distribution of emphasis is on the whole just (one chapter devoted to tactics, seven chapters devoted to defense). The twenty page chapter entitled "General Properties of War Gases" is much too detailed. No less than twenty five toxic agents, some of them completely obsolete, are discussed at length. Ten would have been ample. Some of the data given are, moreover, inaccurate. The booklet may be recommended not only to the instructors for whom it is intended but to any one with a rudimentary scientific training who wishes to acquaint himself, by two or three hours of reading, with the general subject of gas warfare. The reviewer is not sufficiently well acquainted with other publications of the same nature to venture on a comparison.

**Fundamentals of Immunology** By William C. Boyd Ph.D. Associate Professor of Biochemistry Boston University School of Medicine Boston  
Cloth Price \$5.50 Pp. 446 with 45 illustrations New York Interscience Publishers Inc. 1943

The purpose of this book is "to serve as introduction to immunology for medical students, chemists, biologists and others interested in an understanding of the basic principles of the science." The chapter headings will show the scope and plan of the contents: immunity and immunology, antibodies and antibody specificity, antigens, blood groups, antibody-antigen reactions, complement and complement fixation, anaphylaxis and allergy, allergy and immunity (bacteria, viruses, parasites), practical use of artificial immunity, laboratory and clinical technique. At the end of each chapter are references to "the latest and most pertinent literature." The last chapter, the longest, deals with immunologic methods and their application to certain diseases. The emphasis in the earlier chapter is on the basic principles as presented from the point of view of the chemist. It is assumed "that the reader has a slight previous acquaintance with organic chemistry and bacteriology." More than a slight acquaintance with chemistry would be needed to understand the discussion of conjugated antigens, the influence of optical activity and the preparation of synthetic antigens. The book meets its general purpose well but may be better suited for the chemist and the investigator than for the medical student, especially now when the medical course is shortened.

**The Application of Absorption Spectra to the Study of Vitamins Hormones and Coenzymes** By R. A. Morton D.Sc. Ph.D. F.I.C. Department of Chemistry The University of Liverpool Second edition Cloth Price \$6.50 Pp. 226 with 82 illustrations Boston Jarrell Ash Co. London Adam Hilger Ltd. 1942

The value of absorption spectroscopy in the isolation of natural products and the determination of their chemical structure is well illustrated by this timely revision of a useful volume the first edition of which appeared in 1935. The increased size and scope of the present book is an index of the tremendous advances which have occurred in the application of absorption spectrum data to the elucidation of the structure of complex molecules. The style of the first edition has been retained. Each section is a chronological treatment of the detection, concentration, isolation, structural determination and, in many cases, synthesis of a particular natural product, with the emphasis on the part played by absorption spectrums in each stage of progress. Thus the volume not only provides spec-

troscopic data for the various subjects presented but is, in addition, an excellent summary of our present knowledge of the topics discussed. Numerous references to the original literature and tables of spectrums with accompanying structural formulas are provided throughout.

A brief introductory chapter discusses the standardization of spectrometric apparatus provides a definition of the notation used in the following chapters and includes a bibliography of recent books and review articles on spectrophotometry. The chapter on steroids, provitamins and vitamin D and hormones has been greatly expanded and provides an excellent survey of structural determinations in this field. Since the first edition appeared, the chemistry of provitamins and vitamin A has been elucidated, a comprehensive review of this progress is now included. The status of spectrographic determinations of vitamin A is discussed as are the results of collaborative studies in this field. The chemistry and spectrums of vitamin E are clearly stated, and the subject of antioxidants which is of current interest is discussed briefly. Chapters on vitamin K, vitamin P, vitamin B complex, purine and pyrimidine derivatives, proteins and enzymes and coenzymes represent additions not present in the first edition.

The volume should be highly useful to the worker who may be called on occasionally to make use of absorption spectrum data, as well as to the trained spectroscopist.

**Obstetrical Practice** By Alfred C. Beck M.D. Professor of Obstetrics and Gynecology Long Island College of Medicine Brooklyn Third edition Cloth Price \$7 Pp. 938 with 1064 illustrations Baltimore Williams & Wilkins Company 1942

The appearance of a third edition of this book in seven years is an indication that it is popular. The new edition contains eighty more pages and twenty three more illustrations than the second edition. There are five more chapters in the new book, but this is because the author separated the material on operative obstetrics into six chapters. Many illustrations have been redrawn, and most of those in the section on operative obstetrics have been enriched by the addition of color. However the reproductions of roentgenograms are so poor that they should not have been printed.

Throughout this edition, as in the previous two, there is abundant evidence of the author's extraordinary ability as an obstetrician and as a teacher. In view of Beck's contribution to the technique of the low cervical cesarean section this operation is described and illustrated in great detail. Furthermore the details of the use of local anesthesia for this operation are given.

It is surprising and perhaps unfortunate that the author did not see fit even to mention the classification of the toxemias of pregnancy advocated by the committee appointed by the American Committee on Maternal Health. One of the purposes of this classification was to have a standard by which comparisons of different forms of treatment of the toxemias could be made.

About sixty pages are devoted to references, and many lists are disproportionately large. For example, seven pages of references are devoted to the fetal membranes and eight to the changes in the maternal organism but only one and a half pages of references are assigned to the management of pregnancy, only one page to the management of labor, only one page to combined placenta previa and accidental hemorrhage and only two and a half pages to the toxemias of pregnancy.

The author still speaks of "medical complications of pregnancy" when referring to the occurrence of pregnancy in women with heart disease, pulmonary tuberculosis and diabetes. In these associations it is the pregnancy which is the complication of the illness and not vice versa. There is a full page illustration of the Walcher position in spite of the fact that James Young and others have proved by radiographic means that this position does not enlarge the pelvic inlet, as was formerly believed.

In spite of these criticisms the book is an excellent textbook of obstetrics. It is well written, the type is clear and, except for the roentgenograms, the illustrations are highly instructive. The popularity of the book is deserved and the volume will undoubtedly retain its place as one of the leading textbooks on obstetrics.

**Psychologic Care During Infancy and Childhood** By Ruth Morris Bakwin B.A. M.A. M.D. Assistant Clinical Professor of Pediatrics New York University College of Medicine New York and Harry Bakwin B.S. M.D. Associate Professor of Pediatrics New York University College of Medicine Cloth Price \$3.50 Pp 317 with 31 illustrations New York & London D Appleton Century Company Incorporated 1942

This is a book written by two pediatricians rather than by orthopsychiatrists, and consequently the point of view is modified by the failure of the authors to understand some of the more deep seated psychologic factors. In general, however, the book covers a vast amount of data, some of which would be of value to the pediatrician, some of value to the psychologist and much of a great deal of value for the physician who has the task of caring for children and their parents. There are thirty-four chapters, which means that such important topics as poor sleep is given only three pages, the adjustment of the child to nursery school is given less than one page and parental overprotection, which is the problem most frequently met in child guidance clinics, has only one page, so that the whole field of child psychology is covered widely but not deeply. The first six chapters of the book deal with basic principles, history taking and the diagnosing of psychologic problems. The next six chapters cover special psychologic considerations such as emotions and mentality, while the remainder of the book consists of scattered topics some of which deal with special problems such as lateral dominance, special types of mental deficiency, disturbances associated with physical states and other more general topics such as play training or school problems or the sick child's psychology. Some of the material, such as that of lateral dominance and left-handedness, is not consistent with general beliefs on the subject, and much more emphasis is placed on mental deficiency than is needed in a book of this sort. The chief defect of the book is an overemphasis of a multitude of specific features and an underemphasis of dynamic considerations in causes of maladjustment of the child in the home, in the school and under the care of the physician. Nevertheless this is the kind of book for a person who needs a complete survey as an introduction to deeper, more comprehensive and perhaps more useful books on child psychiatry and developmental psychology.

**Atlas of Ovarian Tumors** By Gemma Barzilai M.D. Preface by Fred W. Stewart M.D. Pathologist Memorial Hospital for the Treatment of Cancer and Allied Diseases New York City Cloth Price \$10 Pp 261 with 258 illustrations on 58 plates New York Grune & Stratton 1943

This is an atlas of microscopic diagnosis. As stated in Dr Stewart's preface, it is timely and complete. The illustrations are good. The morphology, genesis and other features of each ovarian neoplasm are described systematically in the text, but the literature is not reviewed except that helpful lists of synonyms are given. Treatment is not discussed in detail. The statements about radiotherapy are only general and are sometimes vague. Writing about dysgerminoma (p 97) the author says that "the tumor is extremely radiosensitive and the destroying dose is about one third of the dose usually needed to control a cancer." We are not told, however, what the controlling dose of cancer is. The publisher's part is well done. The paper and the print are first class, the plastic binding works smoothly, but much space is wasted in wide margins and empty backs of plates. The atlas will be of valuable service to clinicians and pathologists in their work with ovarian neoplasms.

**The Horses of the Sun** By Dr Kathryn M. Whitten Cloth Price \$2 Pp 314 Boston Meador Publishing Company 1942

This is a novel written by a physician which deals with the life of a spinsterish New England girl who first goes into nursing and then, after showing her executive ability and medical ingenuity when the survivors of a train wreck are brought into the hospital where she is working, is encouraged to go into medicine. The work not only deals with the seamy side of her life before her entry into the medical profession but also tells of her struggle against some of the less prepossessing members of the profession, particularly those whose ethics are definitely below par. Dr Whitten's style is somewhat stilted. It probably would be of more interest to the layman than to the physician, but the physician would realize that most of the unsavory characters are not typical of the medical profession.

**Religion and Health** By Seward Hiltner Cloth Price \$2.50 Pp 292 New York Macmillan Company 1943

It might appear on first inspection that this book had been improperly titled. Such an impression would be erroneous, because the author is referring to "total health." He has realistically recognized and stressed the fact that mental and physical health cannot be treated as separate entities. Although the major contributions of the book are related to psychologic problems, the physical, particularly the physical which is closely related to the psychologic, has not been neglected. In some respects this is a difficult book to evaluate. Parts of it are exceptionally good, while other parts are vague and sometimes misleading. For example, the author states on page 23:

"mental hygiene is not to be equated with science. It is more nearly akin to technology, but it contains certain assumptions which are more closely related to religion than they are to science." While the author attempts to show proof for this statement, the proof appears entirely unconvincing. There are other equally challenging statements relative to religion and mental hygiene which the reader must study and evaluate for himself. In spite of these criticisms the book can do no harm and may well prove of great value, especially if it reaches even a small minority of an all too extensive public that is almost completely uninformed regarding our present knowledge of psychologic and sociological problems. It is obvious that the author has considerable insight into the psychologic and sociological problems of our present society. His attempt to transmit his information and insight to the clergy and the parish is both ambitious and praiseworthy. How much success will attend his efforts only time will tell. The pages which he devotes to psychosomatic research alone are worthy of wide publicity. This comparatively new and extremely important field for investigation should be publicized by every humanitarian. The author could well have included more recent findings and reports in this and other allied fields, but interested readers will find this book and the reference material, which is carefully listed, as excellent groundwork for further study. The book is well written in language that is easily understood. Psychiatric jargon is either eliminated or carefully defined. Although the author must have read considerable psychoanalytic literature, the contributions of psychoanalysis to the understanding of human behavior have been given small credit. In fact there are references to psychoanalytic contributions as products of the mental hygiene movement. While this may be confusing to the psychiatrically oriented reader, it does not detract from the value of the book.

**Diet Manual Mount Sinai Hospital Philadelphia** Third edition Loose Leaf Paper Price \$2.50 1p 71 Philadelphia 1942

This gives a complete list of therapeutic diets as used in a modern hospital. The diets are given in actual food portions as well as in caloric units, and sample menus are included. A section on the feeding of children has been added. A valuable feature of the volume is the inclusion of some general considerations on the procedures and principles of particular dietary practices. References to the medical literature indicate the original sources of information. This collection should be of interest and use to other institutions and to private practitioners in the construction of diets for use in the home. However, its present multigraphed and paper covered format makes it somewhat difficult to read and handle.

**Essentials of Nutrition** By Henry C. Sherman and Caroline Sherman Lanford Columbia University New York Second edition Cloth Price \$3.50 Pp 442 with 34 illustrations New York Macmillan Company 1943

Since the publication of the first edition of this book, a national nutrition program has been outlined by the National Research Council has set up its recommended daily allowances for specific nutrients. The new edition of this book reflects this progress. Moreover, there have been additions to the known vitamins, especially in the field of the so called vitamin B complex. The present edition calls attention to these additions and makes available references to the periodical literature on the subject.

## Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT HOWEVER REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS BUT THESE WILL BE OMITTED ON REQUEST.

### BILIARY COLIC OR CORONARY OCCLUSION

**To the Editor**—A man aged 52 Italian had an appendectomy in April 1942. Perusal of the chart shows that the appendix was gangrenous and perforated at the tip and that there was a small abscess around the tip. Drainage was maintained for about two weeks and the wound closed thereafter without further complications. A nurse once made a remark about irregular pulse in her notes but nothing further is known to either the surgeon or his associates. The man resumed his strenuous occupation as chef of a big restaurant almost immediately after his dismissal. He felt entirely well until September when he began to complain of much 'gas' and occasional pain in the epigastrium at the same time he also commenced feeling increasingly tired. On November 7 he suddenly experienced excruciating pain in the upper epigastrium. The pain was sharp and cramplike and did not radiate. The attack lasted four hours. A few hours later the patient was found to be jaundiced. I did not see him until November 10 at which time he still showed mild jaundice and bile was found in the urine. The stools were not claylike. The icteric index was 17. The urine also contained albumin 2 plus a trace of sugar and a few red blood cells and white blood cells. The white blood count was 14,000. Clinically the heart was definitely enlarged to the left. Its action was rapid and entirely irregular. No murmurs were heard. The blood pressure was 130 systolic 85 diastolic. The liver was just palpable below the costal margin. There were no tenderness or evidence of fluid anywhere in either the thoracic or the abdominal cavity and no edema. The pulse was 114 entirely irregular. Respiration was 20 a minute. A cardiogram showed auricular fibrillation. The patient was placed on a fat free diet with medication of bile salts and was digitalized at the same time. One week later the jaundice had disappeared the liver was no longer palpable and there was no dyspnea. The ventricular rate had fallen to 84. Fibrillation is of course still present. The patient is now entirely free from complaints and wishes to return to work. I should deeply appreciate an opinion as to the most probable diagnosis and prognosis further treatment and how long the patient should be kept away from work. M D Massachusetts

**ANSWER**—Before the prognosis and management of this case can be appraised, a more definite diagnosis is necessary. The attack of November 7 sounds much like biliary colic. The correctness of this diagnosis should be confirmed by a cholecystogram. Another possibility to be considered is that the attack of November 7 might have been coronary occlusion. Judging from the description given, the jaundice was out of proportion to the other symptoms present and hence much more suggestive of biliary colic than of coronary occlusion. However, the cardiac findings given suggest that occlusion might have occurred. Serial electrocardiograms would be helpful in this regard. If cholelithiasis is found, it may be assumed that the attack of the 7th was biliary colic. The enlargement of the heart, fibrillation and probable cardiac decompensation would then be ascribable to some other cause, perhaps arteriosclerotic heart disease. If gallstones are found, the question arises as to whether operation should be advised. The patient probably would survive such an operation. However, if this was the first attack of biliary colic, the more conservative procedure might be to defer operation until further attacks occur. If no gallstones are found coronary occlusion is the most likely diagnosis. In this circumstance it would be well to advise the patient to remain away from work for a total period of three months if possible and then return to light work. The administration of digitalis should be continued.

The trace of sugar in the urine is probably not significant and could be checked by additional urine examinations and a fasting blood sugar. The albumin may well be due to the cardiac decompensation. The few red and white blood cells are probably not significant.

### IMMUNIZATION OF STUDENT NURSES TO SCARLET FEVER

**To the Editor**—What is the present status of the question of immunizing student nurses in a general hospital against scarlet fever?

William E Bayley M D La Crosse Wis

**ANSWER**—Testing for susceptibility and immunization of susceptibles against scarlet fever in the student nurses has been adopted as a routine procedure in a number of the larger general hospitals located in climates where scarlet fever is prevalent.

### RESORCINOL DYES AND RESORCIN DERMATITIS

**To the Editor**—I am a practicing surgeon and for the past years have been having frequent attacks of what has been diagnosed by capable dermatologists as contact dermatitis due to resorcin. I have no resorcin in my office and come in contact with none at the hospital. Is it possible that resorcin is used as a dye in upholstered furniture or in clothing and could I be getting my contact dermatitis from such exposure? If so could you tell me in what type or color of clothing or upholstering resorcin may be used as a dye?

M D Iowa

**ANSWER**—Resorcin is an ingredient in a number of dyes. The following is a list of dyes in which resorcin is one of the chemicals used in manufacture.

1 Resorcine Brown, also known as Aceko Phosphine G, Tropeoline NRN, Orange Special AP and Resorcine Brown G. The components used in the manufacture of this dye are sulfanilic acid, meta-xyldine and resorcinol. This dye is used mainly for dyeing leather but it will also dye wool.

2 Resorcine Dark Brown, also known as Fast Acid Brown, Amacid Fast Brown, Resorcine Brown RN and Aceko Dark Brown RD Fast Brown. The components used in manufacturing this dye are naphthionic acid and resorcinol. It is used for dyeing wool.

3 Resorcine Yellow, also known as Phosphine Substitute, Chrysoine, Yellow T, Pure Yellow for wool N, Gold Yellow, Tropaeoline O, Acme Yellow, Chryseoline and Orange RL. The components of this dye are sulfanilic acid and resorcinol. It is used mainly for dyeing silk and leather.

4 Nitroso Blue MR, also known as Resorcine Blue, Nitroso Base M and Tannoxymodophenol. The components of this dye are resorcinol, p-Nitrosodimethylamine, hydrochloride and tannin. It is used in calico printing and also dyes cotton.

5 Fluorescent Blue, also known as Resorcine Blue and Iris Blue. The components are resorcinol, nitroso resorcinol and brominate. It is used for dyeing silk and to some extent for dyeing wool.

6 Resorcine Brown 5 G, an azo acid dye made by du Pont.

7 Resorcine Brown 3 R, an azo acid dye made by du Pont.

8 Resorcine Green No 1.

As can be judged from this list, resorcin may be an ingredient of dyes used in silk, wool, cotton and leather.

Resorcin is a phenol, and if one is sensitive to resorcin it is possible that one may also be sensitive to carbolic acid or materials containing it.

The resorcinol used in the manufacture of the dyes mentioned is supposedly completely combined with the other components, forming an entirely new chemical compound. It is possible, but not probable, that in some batches of these dyes the resorcinol is not completely combined or is in excess. In such cases it would be possible for one hypersensitive to resorcinol to develop a dermatitis from contact with fabrics containing such imperfect resorcinol dyes.

### STEAM RADIATORS AS POSSIBLE CARRIERS OF INFECTIONS

**To the Editor**—I have often wondered if steam radiators might be possible carriers of infectious diseases including the common cold in apartments, offices and schools and if so has any thought been given to this problem? When the heat is on, the radiators and their connecting pipes contain steam and the condensation moisture which returns to the heating unit. When the heat is discontinued or diminished as happens at night, air from the room is drawn in through the radiator valve to occupy the space the steam has vacated. When the steam pressure is increased, air is expelled through the radiator valve. Naturally allowance must be made for the size of the heating unit space heated, distance from the heating unit and if height is sufficient to require a steam pump. Does the expelled air represent the same air which was drawn from the room or is it a mixture of air from other heated spaces? This withdrawn air and the expelled air are not heated other than possibly that portion in direct contact with the steam. Would this be a possible carrier? Some radiators have traps on them but many do not.

George P Nicholson M D Chicago

**ANSWER**—There is no information available as to whether steam radiators might become carriers of infectious diseases under the conditions described. Such a possibility would be limited largely to one-pipe steam heating systems installed in inexpensive homes and apartment houses. The system is generally undesirable for other reasons, particularly noise ('water hammer') and offensive odors in the air discharged into the room from the air valves. Whether organisms can live long in the pungent and humid atmosphere inside the radiators is another question.

Large buildings are heated by vapor or vacuum systems which have no radiator air valves. The air is vented in the basement or discharged outdoors.

### LIGHT WORK FOR PATIENT WITH OCCASIONAL TUBERCLE BACILLI IN SPUTUM

*To the Editor*—Would it be advisable for a young physician to engage in part time (institutional) work while having an occasional sputum specimen positive for tubercle bacilli? The patient has been in a tuberculosis hospital continuously for the past thirty months. On admission the diagnosis was bilateral infiltrative lesions with endobronchial tuberculosis. No evidence of cavitation was ever found on repeated examinations (including laminography). Endobronchial lesions have been found to be (1) a granuloma which cleared up (2) ulceration also now cleared and (3) tubercle also cleared up. In spite of negative bronchoscopic findings there has been an occasional positive sputum specimen (every third month). Parenchymal lesions have been checked. As these findings of positive sputum have been present for the past fifteen months without any apparent reasons for them the patient would like to know if he couldn't work three to four hours a day so as to keep his mind occupied as now he is repeatedly becoming depressed and discouraged (also because of his lack of interest in things in general as the only diversions opened to him at the institution are reading and the radio).

M D New Jersey

*ANSWER*—When it is advisable for a tuberculous patient to resume work is dependent on several factors. A considerable number of patients who have their disease brought under control so as to have no clinical manifestations and whose lesions appear to be well stabilized continue to have tubercle bacilli recovered occasionally from the sputum. Others who apparently have no sputum have bacilli revealed in gastric washings; indeed this is true of a good many persons who have been adequately treated and discharged from hospitals and sanatoriums. It is not surprising when one considers that no present method of treatment destroys tubercle bacilli and that they may remain alive in large numbers in old apparently well controlled lesions the entire lifetime of the individual. More accurate methods of examining for tubercle bacilli and more frequent examinations are bringing to light the fact that tubercle bacilli are occasionally eliminated in many so called arrested cases of tuberculosis. This may occur with no evidence of reactivation of old lesions or appearance of new ones. Unfortunately, one is never certain as to the exact source of the tubercle bacilli and therefore one is likely to be suspicious of nondemonstrable spread of an area of disease or the development of a new lesion still so small or so located that it cannot be demonstrated by present methods of examination.

It appears that an excellent therapeutic result is being obtained in the case of this young physician. This is particularly true of the endobronchial lesions. However, there remains the possibility that other lesions beyond the areas visualized by the bronchoscopist may not be as well controlled as those seen and therefore may be responsible for the tubercle bacilli occasionally found in the sputum. Moreover, there may still be small areas in the region of the parenchymal disease which are still eliminating tubercle bacilli. After thirty months of excellent institutional care with such an apparently good clinical result and with no evidence to the contrary it would seem safe to institute graduated exercise in the form of light work about the institution under most careful observation, using the necessary precautions to protect fellow workers and patients against possible infection.

### PRIMARY TUBERCULOSIS COMPLEX

*To the Editor*—A patient has just been rejected in the army draft for tuberculosis pulmonary primary complex unstable. The meaning of primary complex unstable is unknown to me. Does this mean an active or an inactive tuberculous lesion? I presume the lesion is in the parenchyma.

Nina C Wilkerson M D Sturgis Mich

*ANSWER*—In the majority of persons with primary tuberculous complexes the only evidence of its existence during life is the reaction to tuberculin. There are no symptoms, physical signs or x-ray shadows to aid the physician in determining the location of the lesions. This may be because (1) the lesions do not attain sufficient size to cast shadows visible on the x-ray film, (2) the lesions may be located in that 25 per cent of the lung which is not visualized on the film and (3) the primary lesions may be located in parts of the body other than the lungs. However, in such persons lesions can be found when sufficiently careful postmortem examinations are made.

In a smaller number (usually not exceeding 30 per cent) of persons with primary tuberculosis complexes, evidence may be found of calcium deposits in the pulmonary parenchyma the hilus region or both by fluoroscopic or x-ray film inspection. Obviously not all of such deposits represent tuberculous lesions, since there are other causes of calcifications in the lungs.

In an extremely small number (3 to 5 per cent) of persons with primary tuberculosis complexes evidence of the lesions appears in the parenchyma of the lung about the time the tissues become allergic. There may or may not be temperature elevation but, if so it usually does not persist for more than one to three weeks. If other symptoms are present they are not unlike those of a common cold or influenza. Usually there are no abnormal physical signs. The red blood sedimentation rate may be increased for a few weeks. When the lesion is located in that part of the lung which is visualized by the x-ray film it casts a dense, homogeneous shadow which varies in size from one barely large enough to be seen to one involving an entire lobe. This is due either to (1) collateral inflammation around the primary lesion in the lung or (2) atelectasis as the result of occlusion of a bronchial ramification caused by enlarged regional lymph nodes. If the former the shadow may remain unchanged for many months after which it slowly disappears. By the time the original shadow is no longer visible or at some later time there may appear one or more small, sharply outlined dense shadows which represent calcium deposits that began as microscopic areas and gradually attained macroscopic proportions. Throughout this period there usually is enlargement of the hilus shadows on the same side probably because of the tuberculous lymph nodes which have become a part of the primary tuberculosis complex. As the primary lesion in the parenchyma subsides, the regional lymph nodes become smaller and calcium deposits may be visualized in them about the same time as they are seen in the lung parenchyma. Apparently the patient's condition belongs to this small group in which the primary parenchymal lesion is found while the collateral inflammation is present or the regional lymph nodes are large enough to obstruct a bronchial ramification.

To determine that the lesion is tuberculous required the presence of a characteristic tuberculin reaction. Tubercle bacilli may also have been found in the sputum or gastric washings, or several x-ray film inspections were made of the chest to demonstrate the chronicity of the lesion.

When the disease was found to be tuberculous there must have been a record of repeated tuberculin tests previous to the complete examination to justify a diagnosis of primary disease. In other words this patient must have been known to be a nonreactor to tuberculin and to have become a reactor about the time the examination was made. By single x-ray film inspection it is impossible to differentiate between primary and reinfection types of lesions. Moreover it is not possible to differentiate between tuberculous and nontuberculous lesions since there is no absolutely characteristic shadow of any disease. If tubercle bacilli were found in the gastric contents they may have emanated either from a primary or a reinfection type of lesion since in this manner bacilli may be recovered in about 25 per cent of persons with primary lesions in the pneumonic stage.

To determine that the lesion is unstable required a period of observation. Primary tuberculous lesions change so slowly that a single examination including all its phases does not suffice to determine their stability.

The words active and inactive with reference to tuberculous lesions should be used exclusively in connection with the reinfection type of tuberculosis. Primary pulmonary lesions differ so much in their behavior from the reinfection type of lesions that they could easily be regarded as an entirely different disease entity. Indeed primary lesions begin to develop on tissues that are not sensitized to tuberculo-protein and therefore the reactions to them are nonspecific, in fact no different during the first few weeks than the reactions of the tissues to such inanimate objects as particles of silica. Therefore, in the early stages of their development primary lesions are extremely benign. Even when a lesion is decreasing in extent it may be considered pathologically active. However, the usual conception of the word activity is that it indicates progressive clinical disease. Progressive primary pulmonary lesions apparently are extremely rare. Most of them gradually recede and never present clinical manifestations.

### SASSAFRAS TEA SUBSTITUTED FOR COFFEE

*To the Editor*—Is there any evidence to support the belief that substitution of sassafras tea as a beverage for coffee would prove harmful?

Joseph H Kinnaman M D Ponca City Okla

*ANSWER*—There has not been any evidence found to support the belief that sassafras tea would be harmful when substituted as a beverage for coffee.



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## CONDITIONS CAUSING CONFUSION IN THE DIAGNOSIS OF RHEUMATIC FEVER IN CHILDREN

ANALYSIS OF DIAGNOSES MADE BY PRACTICING  
PHYSICIANS IN 271 RHEUMATIC SUBJECTS

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The protean symptomatology of rheumatic fever undoubtedly, in many instances, accounts for the difficulty encountered by physicians and medical students in the correct diagnosis of this disease. The fact that textbooks mention as many as fifty different clinical conditions whose manifestations are such that they might, under certain circumstances, be considered in making a differential diagnosis of rheumatic fever<sup>1</sup> tends to make more complex rather than to simplify the arrival by physicians at the correct diagnosis. Because early recognition and treatment comprise at the present time our most effective weapon in combating this devastating disease of childhood, confusion and delay in correct diagnosis may have far reaching and serious results.

The belief that a practical approach to this problem might lie in a study of the disorders which are most frequently confused with rheumatic fever by the practicing physician prompted me to review the diagnoses made by physicians referring to the University of Minnesota Hospitals all children who later proved to have rheumatic fever. This procedure was facilitated by the fact that all patients admitted to this hospital must present a letter or note from their physicians wherein diagnosis and reason for referral are given. The majority of these physicians are general practitioners, although a considerable number of children are referred by pediatricians. This report presents and summarizes the diagnostic possibilities given by the referring physician and those made by the admitting intern and resident staff for the 271 children with rheumatic fever under 16 years of age observed in the outpatient cardiac disease clinic and the inpatient service of the Department of Pediatrics of the University of Minnesota Hospitals during the years 1928 through 1941.

Of the 271 children with rheumatic fever who were referred to the hospital and outpatient clinic, the admitting and final diagnoses agreed essentially in 181 instances. As regards the other 90 cases, the admitting diagnosis was inadequate or disagreed entirely with that

finally made. I realize, of course, that in many instances it was only because of the advantages of the longer periods of observation and our better laboratory facilities that the diagnoses were able to be made with considerable certainty. In 20 of these, however, the referring statement mentioned several of the predominant symptoms, in most of these cases, the diagnosis of rheumatic fever could well have been made. Failure to do so was probably due to the fact that the physician did not wish to commit himself to a specific diagnosis. It probably is worth while to emphasize that, when such symptoms as "growing pains, leakage of heart," "heart murmur, growing pains, low grade fever," "fever, fast pulse pain and weakness in legs," "arthritis of hands, elbows and knees," "stiffness of legs and hips," "swollen and stiff joints," "joint pains," "heart case following pneumonia," "anemia, poor heart, infection," "pains and stiffness in hands gas pains" and "nervousness, purposeless movement" are given, the diagnosis of rheumatic fever should be readily suspected and more exact diagnostic statements made.

To facilitate presentation of the information obtained regarding the conditions which most frequently were found to have caused confusion in the diagnosis of rheumatic fever, the data are presented in tables 1 to 6 according to several of the major groups of manifestations of the disease. The findings here reported in these tables do not refer to the relative frequency with which the various manifestations of rheumatic fever were found to occur under these conditions but simply to the types of manifestations which appeared to cause confusion in making the original diagnosis on the part of the physicians at the time these patients were referred to the hospital.

The most common symptom which appeared to cause difficulty in the diagnosis of rheumatic fever in this series of cases was pain in the abdomen. In 19 instances the inability to make the diagnoses undoubtedly resulted because of the prominence of this symptom. The diagnoses given in these cases are summarized in table 1.

It is well known that abdominal discomfort or real pain frequently occurs in patients who have active rheumatic infections, however, it is rather surprising that the pain could be so confined to this region as to cause appendicitis to be suspected in so many instances (table 1). This fact serves to emphasize that, in any differential diagnosis involving abdominal pain in children of school age, rheumatic fever must be considered as a possible cause. On several occasions in these subjects my associates and I have felt somewhat embarrassed to advise removal of an appendix only to have polyarthritis or choreic symptoms become prominent shortly after. The diagrammatic representation of the course of events in a 14 year old boy who illustrates such a type of case is presented in the accompanying chart. This child had had abdominal pain and vomiting for two days before admission to the hospital and on

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1. Hansen, Arild E. The Differential Diagnosis of Rheumatic Fever in Children. Nebraska M. J. 26:159-163 (May) 1941.



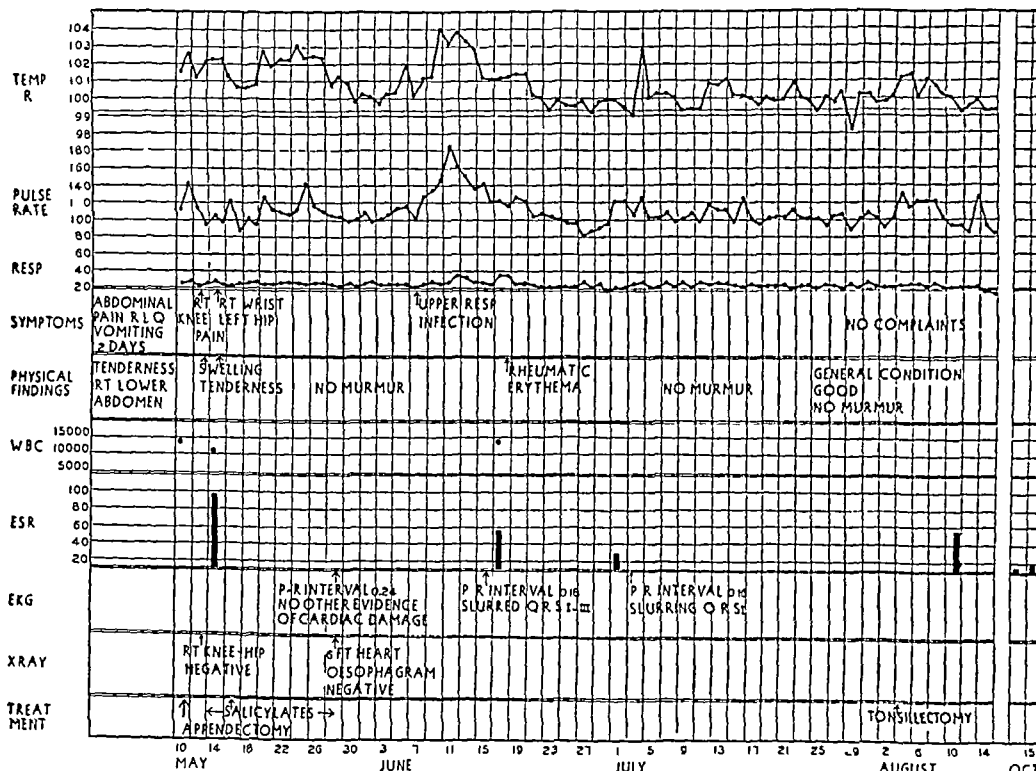
examination was found to have tenderness in the right lower quadrant of the abdomen. Appendectomy was performed shortly after his arrival but no inflammation of the appendix, mesenteric lymph nodes or intestine was found and no Meckel's diverticulum was present. Polyarthritis developed the day following operation and he continued to have evidences of activity of the infection for the next three months. On the other hand, in 1 instance acute suppurative appendicitis actually was present in a child with an active rheumatic infection. Therefore, if any doubt exists as to the possibility of an acutely inflamed appendix, operative intervention is fully justified to avoid the consequences of rupture with peritonitis.

As regards the subjects who had symptoms referable to the joints and extremities in whom the diagnosis of rheumatic fever was not made, the conditions mentioned

due to the desire on the part of the physician or parents for the patient to obtain early treatment by the Sister Kenny method, which is being carried on in these institutions. Conversely, we have seen a number of other patients suffering from infantile paralysis who were actually diagnosed as having acute rheumatic fever and treated for it. In certain instances the differential diagnosis between these two conditions may be difficult early in the course of the disease, which situation is especially true in the presence of an epidemic of poliomyelitis. One may well say from a practical point of view, therefore, that another of the important conditions which may cause confusion in the differential diagnosis of rheumatic fever is poliomyelitis.

It is not surprising that acute osteomyelitis may be considered a likely diagnosis in certain cases of acute rheumatic fever as occurred in 3 instances in this study

(table 2). As in poliomyelitis the opposite situation also arises quite frequently, namely that the patient with acute osteomyelitis is thought to have acute rheumatic fever. This seems to be one of the more difficult differential diagnoses to make even for experienced resident physicians. But 1 patient was thought to be suffering from a tuberculous joint. As regards the other conditions included under miscellaneous diagnoses in those patients having pain in the extremities as a prominent feature there seems to be little reason why the diagnosis of rheumatic fever should not have been made when "heart murmurs, growing pains, low



Diagrammatic representation of the course of events presented by a 14 year old boy who was referred to the University of Minnesota Hospitals with the diagnosis of acute appendicitis. For the two days preceding admission he suffered from abdominal pain and vomiting and on examination was found to have tenderness and rigidity in the right lower quadrant of the abdomen. Exploratory operation revealed no inflammation present in the region of the appendix, mesenteric lymph nodes or intestine. No Meckel's diverticulum was present. The day following operation pain swelling and tenderness developed in the right knee and the next day the right wrist and left hip were similarly involved. Electrocardiographic signs of myocarditis developed and evidences of the activity of the rheumatic infection persisted for three months. This case is quite typical of those subjects with rheumatic fever who have abdominal pain as a prominent symptom of rheumatic fever.

in the referring statements for the 13 patients in this group are listed in table 2.

Although only four referring physicians gave poliomyelitis as the diagnosis (table 2), on careful study of the histories of a number of other patients it was found that infantile paralysis was suspected early in the course of the disease. In 1 other instance the working diagnosis probably was poliomyelitis in view of the statement submitted on admission as regards the reason for referral, namely "fever, fast pulse, pain and weakness in legs." Recently at both the University of Minnesota Hospitals and the Minneapolis General Hospital, several patients not included in this study have been sent in with the diagnosis of poliomyelitis. The fact that more of these cases whose symptoms are such as to suggest poliomyelitis are now being seen is probably

grade fever," "swollen and stiff joints" and "leakage of heart, growing pains" were the symptoms present. On the whole, when the symptom of pain in the region of the joint was present in the cases studied, the diagnosis of rheumatic fever was readily made.

The skin manifestations of 3 patients were sufficiently prominent to cause difficulty in diagnosis (table 3). Rocky Mountain spotted fever, allergic dermatitis and symptomatic purpura were the diagnoses given.

The diagnosis of acute nephritis was given in 3 cases (table 3). It is well known that evidences of nephritis occur fairly frequently in patients with rheumatic fever. Only 1 child was thought to have pyelitis, and this seemed to be an exclusion diagnosis in that the patient had prolonged fever, and a few clumped leukocytes were found in the urinary sediment.

When carditis occurred as the first manifestation of rheumatic fever, the diagnosis was quite frequently missed. In examining the records of a number of such cases, the diagnosis of "flu" was frequently made early in the course of the disease. Such diagnoses as septicemia, acute septic endocarditis, as mentioned in the referring diagnoses (table 4) indicate that patients with acute rheumatic fever may present a clinical picture which simulates that of sepsis. None of the 6 patients who were believed to have subacute bacterial endocarditis actually were suffering from this condition.

In 3 instances the diagnosis of pneumonia was made, and, in a fourth, heart disease was believed to have complicated a previous attack of pneumonia (table 4). In 1, acute bronchitis was given as the diagnosis, in another, pleurisy with effusion. Even though the manifestation of undulant fever may simulate rheumatic fever, this condition was mentioned only once in the referring diagnoses.

Regarding the miscellaneous diagnoses made by the referring physicians in such cases when "low grade fever," "anemia, poor heart" were given as the diagnoses, the diagnosis of rheumatic fever may well have been made. In spite of the frequency with which the tonsils are blamed for causing various symptoms, it is rather remarkable that "infected tonsils" was given

TABLE 1—*Diagnoses Made and Symptoms Mentioned by Referring Physicians of Nineteen Children with Rheumatic Fever Who on Admission Had Pain in the Abdomen as the Most Prominent Symptom*

	Number
Appendicitis	12
Acute	6
Acute with generalized peritonitis	1
Subacute	2
Recurrent	2
Possible	1
Acute abdominal pain leukocytosis fever	1
Abdominal pain and vomiting (old rheumatic)	1
Pain in right lower quadrant, vomiting, headache, pains in legs, high temperature	1
Abdominal pain	2
Abdominal pains of unknown origin	1
Gas pains, pain and stiffness in hands	1

as the diagnosis on only 2 occasions (table 5). Although epistaxis occurs frequently in rheumatic fever, in only 1 case was this the most prominent symptom. Emotional upsets may occur in rheumatic fever patients even though chorea minor is not present. In 1 "irritable, restless" and another "old sinusitis" were mentioned in the letter, and a third was believed to be a psychiatric case. One child was believed to have a possible deficiency disease. Of all the rheumatic subjects referred to the hospital, in only 3 was the diagnosis considered to be congenital heart disease.

The data regarding the diagnosis of chorea are presented in somewhat more detail to show that this condition is correctly diagnosed in a high proportion of cases (table 6). In 96 of 271 subjects studied, chorea was manifest on admission to the hospital and there was agreement in the diagnosis in 73 instances. On 3 occasions the diagnosis was given as rheumatic fever alone and in 1 no diagnosis was given. On the other hand, in 5 instances the admitting diagnosis of chorea was made, but this was not confirmed by the hospital staff. In these cases the choreic symptoms may have subsided by the time the patient came to the hospital. Of the other 19 cases of chorea, "nervousness" was mentioned as the prominent symptom in 4 instances and in 1 of these "nervousness and purposeless movements" was the statement given. The presence of emotional dis-

turbance seemed to be the major evidence in but 1 case, whereas in 1 other "difficulty in hearing and speech" was the most noticeable feature. One type of case was encountered which was equally perplexing to both the practicing physician and the hospital staff, namely that

TABLE 2—*Diagnoses Made and Symptoms Mentioned by Referring Physicians of Thirteen Children with Rheumatic Fever in Whom the Major Symptom Was Pain in the Extremities*

	Number
Acute anterior poliomyelitis	4
Fever, fast pulse, pain and weakness in legs	1
Acute osteomyelitis	3
Miscellaneous	0
Possible tuberculosis of left ankle joint	1
Joint pains	1
Swollen and stiff joints	1
Leakage of heart, growing pains	1
Heart murmur, growing pains, low grade fever	1

TABLE 3—*Diagnoses Made by Referring Physicians of Seven Children with Rheumatic Fever Having Skin Manifestations or Having Symptoms Referable to the Kidneys and Bladder*

	Number
Skin manifestations	3
Allergic dermatitis	1
Rocky Mountain spotted fever	1
Symptomatic purpura	1
Symptoms referable to kidneys and bladder	4
Acute nephritis	3
Possible pyelitis	1

in which there are choreiform movements but the chronicity of the condition does not speak for the so-called rheumatic encephalitis. Although there may be variations in the intensity of the symptoms, their persistence over a period of five to ten years leads one

TABLE 4—*Diagnoses Made by Referring Physicians of Fifteen Patients with Rheumatic Fever Whose Chief Manifestation Was Such as to Suggest Acute Rather Than Fulminating Infection Yet the Diagnosis of Rheumatic Fever Was Not Made*

	Number
Septicemia	1
Acute septic endocarditis	1
Acute bacterial endocarditis	1
Subacute bacterial endocarditis	6
Pneumonia	2
Heart case following pneumonia	1
Pleurisy with effusion	1
Acute bronchitis	1
Undulant fever	1

TABLE 5—*Miscellaneous Diagnoses and Symptoms Mentioned by Referring Physicians of Thirteen Children with Rheumatic Fever*

	Number
Infected tonsils	2
Low grade fever of undetermined origin	1
Cervical myositis	1
Old sinusitis	1
Hemorrhage from left nostril	1
Irritable and restless	1
Anemia, poor heart, infection	1
Possible deficiency disease	1
Possible psychiatric case	1
Congenital heart disease	3

to suspect the possibility of some other disorder. Three such cases have been observed in our clinic during the past twelve years and in none of these was there evidence of acute encephalitis, birth trauma or other neurologic conditions which, if noted, would tend to refute the diagnosis of chorea minor. Probably the most surprising fact is that in 4 children with chorea, appen-

ditis was the admitting diagnosis. I have referred already to the prominence of the symptom of abdominal pain in rheumatic fever.

Although this study shows that the diagnosis of chorea minor was accurately made by the practicing physician in a high proportion of cases, more detailed

TABLE 6—*Summary of Diagnoses Made and Symptoms Mentioned by Referring Physicians and Resident Staff Members of Ninety-Six Children Who Had Chorea Minor as a Manifestation of Rheumatic Fever*

	Number
Diagnosis confirmed	73
Diagnosis not given	1
Diagnosis rheumatic fever not chorea	3
Miscellaneous	19
Nervousness	1
Nervousness, headaches, fever	1
Nervousness, purposeless movements	1
Heart disease, nervousness	1
Difficulty in hearing and speech	1
Tic (eye examination requested)	1
Hysteria	1
Tetany	1
Acute general neuritis	1
Lead poisoning	1
Fever accompanying chills	1
Infected tooth	1
Possible deficiency disease	1
Heart trouble	1
Congenital heart disease	1
Appendicitis	4
Diagnosis of chorea made not confirmed	5

review of the case histories revealed that in many instances the diagnosis could well have been made earlier in the course of the disease. To facilitate early diagnosis especially in the mild cases, the physician should be thoroughly familiar with the main clinical features of this encephalitis of rheumatic origin. The presence of dystonia, muscle weakness, personality change and emotional disturbances in children of school age leads one to suspect chorea. In addition to help in early diagnosis, part of the physician's routine examination should consist in subjecting patients to one of the finer tests for choreic activity. A number of procedures are used to detect evidences of disturbance in finer movements, the one used in this clinic was popularized by Dr. Irvine McQuarrie. The patient while sitting comfortably is asked to place his hands palm downward lightly on the hands of the examiner which are held palm upward, and to place his tongue gently between the lips without biting and to remain very quiet for a few moments. Evidences of uncontrolled movements may be readily detected in this way. Even the 5 or 6 year old is able to be very still for several moments under these conditions. Muscle weakness and instability can be detected by asking the child to squeeze steadily the fingers of the examiner. Pointed questions directed to the mother regarding the emotional status of the subject often will give one informative clues in making the diagnosis of chorea. Such a routine is especially valuable for patients who have had previous attacks of rheumatic fever or for those with a history of rheumatic fever in the family.

#### COMMENT

The fact that rheumatic infections may involve so many tissues and vary to such a great extent in intensity makes it rather surprising that a wider variety of conditions was not mentioned by the practicing physicians when these rheumatic subjects were referred to the hospital. Of interest is the fact that at no time did such conditions as pyogenic arthritis, syphilis, scurvy, serum sickness or trichinosis, which are commonly mentioned as likely to be confused with rheumatic fever,

cause difficulty in diagnosis in these cases. Judging from the nature of the symptoms mentioned, with a little more care at least 15 of the 90 cases not diagnosed as rheumatic fever could well have been so diagnosed. We may say then that real difficulty was encountered in about 75 cases. The findings as regards the conditions which caused distinct confusion in diagnosis are summarized in table 7. Probably most significant from a practical point of view is the fact that in 19, or one fourth of the total in which the wrong diagnosis was made, the presence of abdominal pain was the outstanding symptom which interfered with making the correct diagnosis. In the past two months 3 additional patients have been referred to the University Hospital with the diagnosis of acute appendicitis, each of whom on further study was found to have acute rheumatic fever. The causes of pain in the abdomen are numerous, but this study should emphasize the importance of rheumatic infection as being one which must be considered in the differential diagnosis of appendicitis.

In patients having pain in the extremities as an outstanding symptom, acute polyomyelitis and acute osteomyelitis are disorders which may be difficult to differentiate from rheumatic fever. The objective evidence of erythematous and purpuric lesions as well as findings of nephritis occur frequently enough in rheumatic fever to call to mind the possibility of rheumatic fever when those conditions are present. The fact that rheumatic fever may manifest itself as a severe or even an acute fulminating infection should be borne in mind by those who are called on to see children. It may be pointed out again that subacute bacterial endocarditis occurs far less frequently in children than in older subjects. As regards the miscellaneous conditions listed, probably more would have been diagnosed as rheumatic fever if the physician had been fully aware of the nature of the nonspecific constitutional or general symptoms that occur in children with mild rheumatic infections. A high percentage of cases of chorea minor are diagnosed correctly by the practicing physician, and the failure to do so seemed to occur when the symptoms were mild. Unquestionably chorea minor could be diagnosed earlier and more frequently if the physician routinely subjected the child of school age to one of the finer tests for muscle tonus.

TABLE 7—*Summary of Conditions Which on Admission to the Hospital and Outpatient Clinic Appeared to Cause Real Confusion in the Diagnosis of Rheumatic Fever from a Study of the Diagnoses Made by Physicians in Referring 271 Children Who Proved to Have Rheumatic Fever*

	Number
A. Pain in abdomen (appendicitis in 13)	19
B. Pain in the extremities (polyomyelitis in 4, osteomyelitis in 3)	9
C. Skin manifestations	2
D. Kidney and bladder (nephritis 2)	4
E. Acute febrile illness—severe infections	14
F. Mild rheumatic infections	11
G. Various symptoms of chorea minor	18

Another approach to the problem of the differential diagnosis might be made by studying the records of patients with various conditions to determine whether or not rheumatic fever had been considered in the differential diagnosis during the course of the disease. There are certain disorders which may have a number of features which are very similar to those found in patients having rheumatic infections. For example, our experience in confusing leukemia with rheumatic fever has been duplicated a number of times. About

four years ago a previously well 5 year old boy was admitted to the University Hospital because of an acute febrile illness of about one week's duration. He continued to have fever up to 103 and 104 F and complained of pain in the legs. He had slight epistaxis, and a faint systolic murmur was elicited. For a period of three weeks the diagnosis of acute rheumatic fever seemed to be entirely in keeping with the clinical and laboratory findings. Finally the spleen became enlarged and evidences of immaturity of the lymphocytes developed. Leukemia had been suspected but no conclusive indications developed until almost four weeks after the onset. Detailed case reports presenting similar phenomena have been reported by various workers.<sup>2</sup> Meningococcemia also may produce a clinical picture which simulates rheumatic infection. Dyson<sup>3</sup> recently reported that a boy aged 10 years suffered for nearly four weeks with polyarthritis, which appeared to be typical of the type seen in rheumatic fever. Blood cultures revealed meningococci just about the time slight rigidity of the neck developed, that is, one month after the onset. The response to sulfonamides was prompt. The fear of using sulfonamide compounds in acute rheumatic fever because of the possibility of accentuating the symptoms prevented the earlier use of the drug. Undoubtedly a number of other conditions may produce symptoms which suggest rheumatic fever in that this disease has such a wide variety of manifestations. In fact, in view of the great variety of symptoms which may be present in rheumatic fever it could almost be said for rheumatic fever, as has been said in the past for syphilis, "to know medicine, know syphilis."

#### SUMMARY AND CONCLUSION

In the attempt to determine which disorders in children tend to be confused diagnostically with rheumatic fever, a study was made of the diagnoses given by practicing physicians and resident staff members with regard to 271 children with rheumatic fever who were admitted to the inpatient and outpatient cardiac disease clinic of the Department of Pediatrics of the University of Minnesota from 1928 to 1941. There was essential agreement in diagnosis in two thirds of the cases. Review of the records of the remaining cases revealed that the conditions which caused most difficulty in the diagnosis of rheumatic fever under these conditions were

- 1 Abdominal pain with possible appendicitis (about one fourth of the cases studied)
- 2 Acute anterior poliomyelitis
- 3 Acute osteomyelitis
- 4 Erythematous or purpuric skin eruptions
- 5 Evidences of acute nephritis
- 6 Acute fulminating illnesses (sepsis, pneumonia, subacute bacterial endocarditis)
- 7 Low grade infections
- 8 Nervousness in mild chorea minor

In order that the advantages gained by the early diagnosis and treatment of rheumatic infections in children may be realized to the fullest extent, the physician who is called on to care for children should be thoroughly familiar with the various and diverse manifestations of rheumatic fever.

2 Sutton, Lucy Porter and Bosworth Olive. Lymphatic Leukemia Resembling Rheumatic Fever in a Child. *J. Pediat.* 5: 61-67 (July) 1934.  
Pate, G. A. and Ronsin, Mme. Leucémie aigue a cellules indifferentes debut algique. *Bull. Soc. pediat. de Paris* 36: 638-644 (Nov.) 1938.  
Poynton, F. J. and Lightwood, R. C. Lymphatic Leukemia with Infiltration of Periosteum Simulating Acute Rheumatism. *Lancet* 1: 1192-1194 (June 4) 1932.

3 Dyson, James Everett. Des Moines, Iowa. Personal communication to the author.

## AN EPIDEMIC OF RHEUMATIC FEVER IN A CHILDREN'S INSTITUTION

FOLLOWING AN OUTBREAK OF ACUTE TONSILLITIS

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During the later part of 1940 and early part of 1941 an unusually large number of cases of acute tonsillitis occurred in McLean County in the vicinity of Normal, where the Illinois Soldiers' and Sailors' Children's School is located. It was noted that an abnormally high incidence of acute rheumatic fever developed coincidentally or after a latent period of several weeks. The incidence of the two diseases assumed epidemic proportions in the school, where 88 children (15 per cent of the total population of 561) contracted acute rheumatic

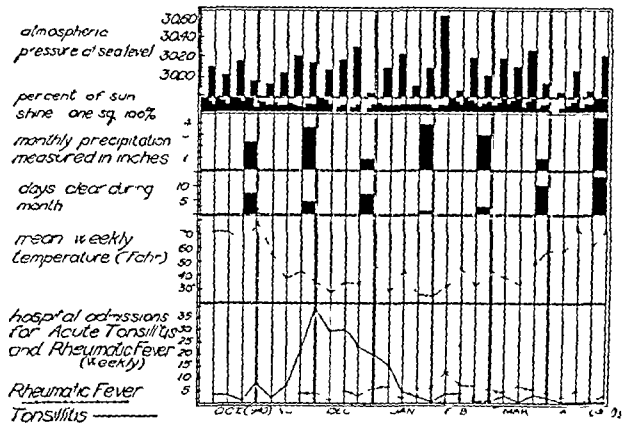


Fig. 1—Comparison of hospital admissions for tonsillitis and rheumatic fever (fixed population 561 children) with correlation of meteorologic data.

fever. This epidemic presented an opportunity to study the relation of tonsillitis to rheumatic fever, the influence of familial predisposition, age, sex, and meteorologic conditions and the significance of the patient's previous history.

At the time of the epidemic there were 561 children, 210 girls and 351 boys, living at the school. They were housed according to age and sex in twenty-six cottages. The 561 children came from 202 families. The siblings, because of differences in sex and age, lived, in most instances, in different cottages.

For the purpose of study the patients admitted to the hospital with a diagnosis of rheumatic fever were divided into three groups: (1) those with severe polyarthritis associated with fever and rapid sedimentation rates, accompanied in some instances by rheumatic erythema, nodules and carditis; (2) those with moderate or subacute polyarthritis associated in some instances with rheumatic erythema nodules and carditis; and (3) a group of younger children with cardiac manifestations.

From the Illinois Soldiers and Sailors Children's School Hospital, Normal, Ill.

In addition to the resident staff, the patients were studied by a consulting staff consisting of an internist, two pediatricians, a roentgenologist, and two bacteriologists. The bacteriologic studies of routine throat cultures revealed in some instances *Streptococcus epidemicus*. Bacteriologic studies were performed by Drs. I. Adore Pilot and D. J. Davis of the University of Illinois College of Medicine.

associated with continued fever, elevated sedimentation rates, rapid pulse, epistaxis, leg aches, abdominal pain and pallor

RELATIONSHIP OF THE OCCURRENCE OF RHEUMATIC FEVER AND HEMOLYTIC STREPTOCOCCUS INFECTIONS OF THE THROAT

Two hundred and forty-one children (42 per cent) contracted hemolytic streptococcus infection of the throat. Eighty-eight children (15 per cent of the total population) contracted acute rheumatic fever (table 1). In 51 of the 88 (57 per cent) the rheumatic manifestations developed following a follicular tonsillitis, 23

A review of the medical histories in these cases revealed that 12 children in the present series had a history of acute rheumatic fever in 1937 while living at Normal. Thirty-one of the 88 rheumatic children (35 per cent) had had a combination of the three symptoms suggestive of a rheumatic infection—attacks of fever with severe growing pains, epistaxis and abdominal discomfort. Fifty-three (60 per cent) of the children had had growing pains. In 61 cases (70 per cent) heart murmurs had been recognized prior to the epidemic of rheumatic fever, in 16 of these there was no past history of rheumatic manifestations other than the heart murmur (table 2).

The average age at onset of the primary attack was 7.6 years in those patients from whom a history of previous attack could be elicited (table 2). An average age at onset between 5 and 6 years has been reported by other observers.

**Sex and Age**—Sex did not play an important role as a predisposing cause. Boys were affected as compared to girls in the ratio of 1.8 to 1, a difference not considered significant, since the normal ratio of boys to girls in the institution was 1.69 to 1. The most susceptible age group appeared to be that in which ages ranged from 9 to 14 years.

**Familial Incidence**—Table 3 shows that in 63 families, a total of 173 children represented in the epidemic, 88 children (50 per cent) had manifestations of acute rheumatic fever, 30 (17 per cent) had evidence of inactive heart disease, 44 had murmurs of questionable significance and 11 had no evidence of organic heart disease. Twenty families had 2 or more children evidencing acute rheumatic manifestations.

**Meteorologic Factors**—Figure 1 attempts to correlate the meteorologic data with the incidence of rheumatic fever. We notice that the peak occurred during February, although the incidence in December and January was almost as high.

The highest incidence of rheumatic infection occurred when the outdoor temperature was lowest. The percentage of sunshine and the number of clear days per month were less and the incidence of rheumatic infection was higher during the three months from December to March than during the other months. Barometric pressure changes were also more pronounced during the peak of these infections.

The incidence of symptoms and of physical and roentgen abnormalities are shown in table 4. Rashes and joint manifestations were more prevalent in children above 10 years of age, while the younger children were more prone to exhibit only the signs of carditis or chorea. Only 3 children did not show evidence of carditis. The high percentage of children having the murmurs of mitral stenosis is probably accounted for by the fact that many of the children had their primary attacks previously. Forty-eight children (51 per cent) showed an abnormality of the contour of the heart on roentgen examination, while 11 children (12 per cent) showed pronounced deviation of the esophagus, indicating left auricular enlargement.

**Comment**—The epidemiology of streptococcal infections and rheumatic fever are closely related. In England, Schlesinger<sup>1</sup> in 1930 described the occurrence of cases of acute rheumatic fever developing in a convalescent cardiac home following an epidemic of tonsil-

TABLE 1—The Relationship of the Incidence of Rheumatic Fever and Tonsillitis per Cottage Group

Village	Cottage	Age Distribution	Average	Sore Throat	Rheumatic Fever
RO		7-14	10	5	2
WA		8-13	11	11	3
BE		5-14	10	15	6
SH		7-11	8	8	3
DEL		7-9	8	7	5
DE		10-12	11	10	2
ROS		4-8	6	8	2
FR		4-6	6	1	0
Girls Row					
LI		7-15	11	13	6
FI		8-16	10	13	4
GR		9-16	11	11	
LO		7-15	12	11	2
WO		12-16	14	3	2
YA		8-16	13	8	4
OG		7-15	11	13	4
ILL		16-19	17	8	5
SH		15-18	16	8	0
Boys Row					
RO		12-15	13	18	3
WI		14-20	17	9	3
PE		11-18	12	2	3
CA		14-19	15	4	3
BE		13-16	15	8	2
LA		12-16	14	14	5
CT		11-16	14	8	3
HH		12-16	12	19	10
HA		12-17	12	7	
Total				241	88

TABLE 2—Past History

Number of Patients with	Age at Onset of Primary Attack			Growing Pains
	Number of Patients	Average Age of Onset	Murmurs Elicited Previously	
Previous attack	31	7.4	29	29
Suggestive history	27	7.8	16	24
History not elicited	30		16	0

of these following a latent period of ten to twenty-three days. In 21 (23 per cent) of the 88 cases of rheumatism the onset followed an infection of the upper respiratory tract, not tonsillitis. In 16 of the 88 rheumatic children (18 per cent) no history of a preceding infection of the upper respiratory tract could be obtained. The onset of the epidemic of rheumatic fever occurred six weeks after the onset of the attacks of tonsillitis, and the peak of the incidence of rheumatic fever admittances lagged eight weeks behind the peak incidence of throat infections (fig. 1).

**Past History**—Most of the children at Normal come from families in the lower economic levels. They are the children of former soldiers and sailors. In many instances they come from "broken homes." A history of malnutrition, poor living conditions and inadequate medical care is usual.

<sup>1</sup> Schlesinger, B. The Relationship of Throat Infection to Acute Rheumatism in Childhood. Arch. Dis. Childhood 5: 411 (Dec.) 1930.

Itis Sheldon<sup>2</sup> observed a similar occurrence. Bradley<sup>3</sup> and Glover and Griffith<sup>4</sup> reported the occurrence of cases of rheumatic fever in schools in which epidemics of tonsillitis had occurred. Madsen<sup>5</sup> in Denmark reported a summer epidemic of rheumatic fever following a series of milk borne hemolytic streptococcus infections of the throat. In this country, similar studies have been made by Coburn and Pauli,<sup>6</sup> Zuger<sup>7</sup> and Hiller and Graef<sup>8</sup>. Atwater<sup>9</sup> and Rosenau<sup>10</sup> have called attention to the fact that rheumatic fever was more likely to occur during a year when streptococcal infections were prevalent. Schlesinger was among the first to call attention to the latent period between an acute streptococcal infection and the occurrence of a rheumatic infection.

The incidence of rheumatic infections following hemolytic streptococcus infection in institutions depends on the type of persons composing the population. In some institutions 6 to 14 per cent of those who had Streptococcus hemolyticus infection developed signs of rheumatic fever.<sup>11</sup> In institutions housing a rheumatic population the incidence of rheumatic fever following Streptococcus hemolyticus infection was much higher.<sup>12</sup> Of 241 children in our institution who had acute tonsillitis, 51 (21 per cent) contracted acute rheumatic fever. In such an epidemic, rheumatic fever may occur following a throat infection which was not recognized. Coburn believes that the attack of a hemolytic streptococcus infection is an expression of faulty immunity to the streptococcus on the part of the rheumatic patient.

Various observers state that a positive past history of rheumatic fever may be obtained in 50 to 75 per cent of patients with rheumatic heart disease. Sixty-five per cent of the children in our series gave a definite to suggestive history of a previous attack. Growing pains had been present in 60 per cent of the children. The past history of many of these children suggests that the presence of murmurs in children should not be dismissed as of little significance but should be observed. Some of the children in whom murmurs were thought to be functional later showed signs of definite valvular disease.

J. F., a white boy born Sept. 9, 1927, was admitted to the institution April 5, 1934, at which time no abnormality was noted on physical examination. One brother aged 10 has a mitral insufficiency with a history of a recent rheumatic episode. Another brother aged 18 has a loud systolic murmur at the apex transmitted to the axilla and not accompanied by a cardiac enlargement. The patient had a myositis in 1937, possibly of

rheumatic origin. He was admitted to the hospital Sept. 19, 1940 because of acute tonsillitis. Several days later an otitis media developed and a transient systolic murmur was noted for the first time. At first the murmur was variable, would disappear with a change in position and was heard best at the base. Because of a persistent elevated sedimentation rate associated with a low grade fever, the condition was treated as endocarditis. The murmur became more pronounced and was transmitted. A soft diastolic murmur could be elicited for the first time on December 13. Since then the boy has had several minor recurrent rheumatic episodes. An electrocardiogram at present

TABLE 3—Familial Incidence of Patients Having Acute Rheumatic Fever

	Number of Siblings in Institution						
	0	2	3	4	5	6	7
Only one child with acute rheumatic fever in each family group	11	16	7	8	0	0	1
Additional siblings with old inactive rheumatic heart disease	0	8	3	9	0	0	2
Additional siblings with heart murmur significance undetermined	0	7	11	11	0	0	4
Two siblings with acute rheumatic fever in each family group	0	5	4	5	1	0	0
Those siblings with old inactive rheumatic heart disease	0	0	1	5	0	0	0
Murmur significance undetermined	0	0	0	4	2	0	0
Three siblings with acute rheumatic fever in each family group	0	0	0	2	3	0	0
Additional siblings with old inactive rheumatic heart disease	0	0	0	0	2	0	0
Murmur significance undetermined	0	0	0	2	3	0	0

TABLE 4—Analysis of Symptoms, Physical Signs and Roentgenograms

	Age 5-10 (22 Children)	Age 11-15 (6 Children)
Symptoms		
Edema	1	3
Epistaxis	5	7
Arthritis (4 plus)	2	24
Arthritis moderate	8	31
Nagging leg aches	2	5
Erythema multiforme	0	2
Erythema nodosum	0	1
Erythema annulare	1	15
Chorea	4	1
Nodules (generalized)	2	0
Stiff neck	1	2
Pleuritic pain	0	11
Precordial pain	2	16
Abdominal pain	5	2
Physical Signs		
Mitral insufficiency	15	36
Mitral insufficiency and stenosis	7	20
Aortic insufficiency	0	3
Combined mitral and aortic lesion	0	4
None	0	3
Roentgenograms (abnormal contour)		
Right ventricular enlargement	10	10
Left ventricular enlargement	13	21
Positive esophagram	4	4
Normal configuration	9	31

\* One had normal anteroposterior view.

shows left axis deviation with a prolonged PR interval. A roentgenogram of the heart is beginning to show a prominence at the pulmonary conus region. His cardiac findings at present are consistent with a mixed mitral and aortic lesion.

The high familial incidence of rheumatic fever has been stressed by many observers.<sup>13</sup> Studies show that

13. Cheadle W. B. Lectures on the Practice of Medicine to Which Are Appended the Harveian Lectures on the Rheumatism of Childhood. Revised and Corrected up to Date. London: Smith, Elder & Company, 1900. p. 227. Read F. E. M. Ciocco Antonio and Tausig H. B. The Frequency of Rheumatic Manifestations Among Siblings, Parents, Uncles, Aunts and Grandparents of Rheumatic and Control Patients. *Am J Hyg* 27: 719 (May) 1938. Gauld R. I. Ciocco Antonio and Read F. E. M. Further Observations on the Occurrence of Rheumatic Manifestations in Families of Rheumatic Patients. *J Clin Investigation* 18: 213 (March) 1939. Gauld R. L. and Read F. E. M. Studies of Rheumatic Disease. III. Familial Association and Aggregation in Rheumatic Disease. *ibid* 19: 393 (March) 1940. St. Lawrence William. The Family Association of Cardiac Disease. Acute Rheumatic Fever and Chorea. *J A M A* 79: 2051 (Dec. 16) 1922. Cahlan J. M. Rheumatic Infection in Families. *M Rec* 53: 441 (June 18) 1941.

2. Sheldon, W. On Acute Rheumatism Following Tonsillitis. *Lancet* 1: 1337 (June 20) 1931.

3. Bradley, W. H. Epidemic Acute Rheumatism in a Public School. *Quart J Med* 1: 79 (Jan.) 1932.

4. Glover J. A. and Griffith F. Acute Tonsillitis and Some of Its Sequels. Epidemiologic and Bacteriologic Observations. *Brit M J* 2: 521 (Sept. 19) 1931.

5. Madsen, Thorvald. Lectures on the Epidemiology and Control of Syphilis, Tuberculosis and Whooping Cough and Other Aspects of Infectious Disease. Abraham Flexner Lectures Series 5. Baltimore: Williams & Wilkins Company, 1937. pp. 123-171. Madsen Thorvald and Kalbak K. Investigations on Rheumatic Fever Subsequent to Some Epidemics of Septic Sore Throat (Especially Milk Epidemics). *Acta path et micro biol Scandinav* 17: 305, 1940.

6. Coburn A. F. and Pauli R. H. Studies on the Relationship of Streptococcus Hemolyticus to the Rheumatic Process. I. Observations on the Ecology of Hemolytic Streptococcus in Relation to the Epidemiology of Rheumatic Fever. *J Exper Med* 56: 609 (Nov.) 1932. Coburn, A. F. The Factor of Infection in the Rheumatic State. Baltimore: Williams & Wilkins Company, 1931.

7. Zuger Bernard. Group Infection and Immunity During a Scarlet Fever Epidemic in a Boys' School. *Am J Hyg* 21: 588 (May) 1935.

8. Hiller R. I. and Graef I. An Epidemic of Rheumatism at a Cardiac Camp. *Am Heart J* 3: 271 (Feb.) 1928.

9. Atwater R. M. Studies in the Epidemiology of Acute Rheumatic Fever and Related Diseases in the United States. Based on Mortality Statistics. *Am J Hyg* 7: 343 (May) 1927.

10. Rosenau M. J. Epidemiology of Rheumatic Fever. *J A M A* 90: 2136 (June 30) 1928.

11. Bradley<sup>3</sup>, Glover and Griffith<sup>4</sup>, Coburn and Pauli<sup>6</sup>, Coburn<sup>6</sup>, Zuger<sup>7</sup>.

12. Schlesinger<sup>1</sup>, Sheldon, Hiller and Graef<sup>8</sup>.

rheumatic fever patients are more than twice as apt to have another member of the family with rheumatic manifestations as not

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Although environment no doubt plays an important factor, there is evidence to believe that tissue susceptibility is a determining factor. In our study, the rheumatic families had a greater incidence of recurrent cases than the nonrheumatic families. The K family described here is representative of 20 families in our group in which 2 or more children had manifestations of acute rheumatic fever.

It is stressed that the majority of the siblings lived in different cottages, which would seem to accentuate the importance of tissue susceptibility.

#### THE K FAMILY

**CASE 1**—L K, a well developed and well nourished white girl born March 20, 1926 and admitted into the institution on June 9, 1937, had rheumatic fever in 1936 and was hospitalized for several weeks. The admission examination did not reveal any abnormalities, but during January 1940 a systolic murmur was heard over the sternum only in the supine position.

The patient did not have any illness until Aug. 16, 1940, when she was admitted to the hospital because of pain and edema in both ankles. The heart was enlarged to the left and extrasystoles were present. A systolic murmur was not elicited until the following day. Polyarthritides and signs of decompensation developed. For ten days the temperature was septic in nature, it gradually settled to a low grade febrile response associated with an elevated pulse rate and increased sedimentation rate.

Roentgen examination of the heart at that time was negative. On December 27 a diastolic murmur could also be elicited at the apex, associated with a mitral contour on roentgen examination (fig 2).

Since then the patient has had several exacerbations of the rheumatic process. At present she has systolic and diastolic murmurs at the apex and base and is well compensated.

**CASE 2**—J K, a red haired boy born on Feb. 12, 1929, was admitted to the institution on June 9, 1937. Abnormalities of the heart were not noted on his admission examination. A systolic murmur was noted for the first time on March 11, 1940.

On December 13, 1940 the boy was admitted to the hospital because of a purulent otitis media. Physical examination

revealed that the patient was pale and had a systolic and diastolic murmur at the base and apex. A history was then obtained of a rheumatic infection during 1938 and also of recent complaints of fatigue and epistaxis. The boy had a persistent temperature of 100 to 102 F associated with a pulse rate of 110. A pronounced secondary anemia developed. Repeated blood cultures were negative. A roentgenogram taken on March 28, 1941 showed enlargement of the heart (fig 3). On April 24, 1940 the patient had had an infection of the upper respiratory tract, and this apparently caused an acute exacerbation of the rheumatic process. Purpura and a septic temperature developed. He began to cough and appeared dyspneic. He was put on sulfathiazole and digitalis medication but went progressively downhill, exhibiting a picture of cardiac decompensation. The patient died on May 10, 1941.

Postmortem examination showed myocardial hypertrophy with dilatation and a rheumatic aortic and mitral valvulitis.

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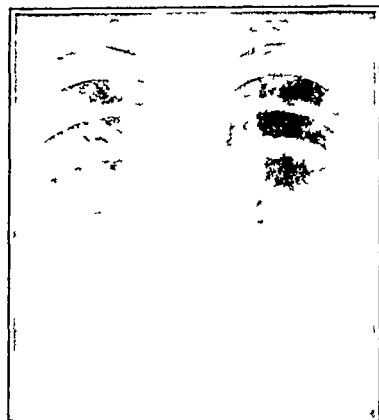


Fig. 2 (case 1)—Mitral configuration on Oct. 22, 1941.



Fig. 4 (case 3)—Esophagram illustrating left auricular enlargement. The heart is enlarged in the anteroposterior view with an abnormal contour. Passive congestion is present.

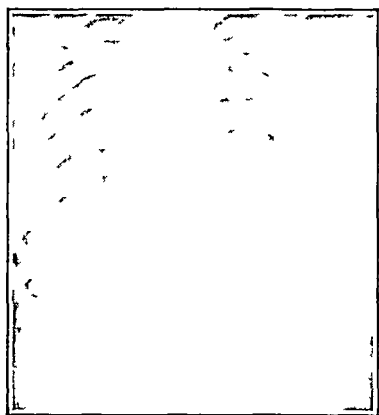


Fig. 3 (case 2)—Heart enlarged on March 28, 1941. An esophagram showed a definite deviation of the esophagus.

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<sup>15</sup> Newsholme, Arthur. *The Epidemiology of Rheumatic Fever*. Practitioner 66: 11, 1901.

<sup>16</sup> Roesler, Hugo. *Clinical Roentgenology of the Cardiovascular System*. Springfield, Ill: Charles C Thomas, Publisher, 1937.

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A depth charge is a steel drum containing several hundred pounds of high explosive with a suitable spring-plunger-trigger detonating mechanism which, when set for a certain depth, operates by water pressure developing on a constant scale as it sinks into the ocean. The explosion may give some manifestation in the air by blowing surface water up, but its chief effect is attained by the sudden commotion caused within a radius of several hundred yards. The surrounding water is set in motion in all directions producing currents powerful enough to weaken the seams of steel sheathed vessels within its zone of effectiveness. Men trapped aboard a sinking vessel or, more usually, those who have abandoned ship by going overboard clothed

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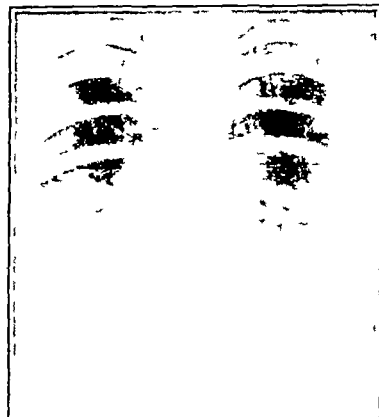


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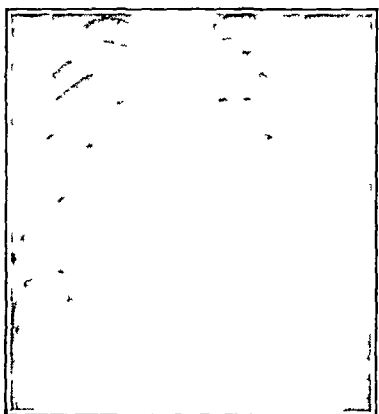


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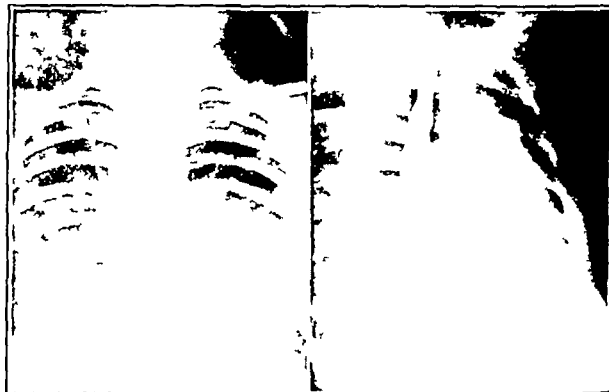


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A depth charge is a steel drum containing several hundred pounds of high explosive with a suitable spring-plunger-trigger detonating mechanism which, when set for a certain depth, operates by water pressure developing on a constant scale as it sinks into the ocean. The explosion may give some manifestation in the air by blowing surface water up, but its chief effect is attained by the sudden commotion caused within a radius of several hundred yards. The surrounding water is set in motion in all directions, producing currents powerful enough to weaken the seams of steel sheathed vessels within its zone of effectiveness. Men trapped aboard a sinking vessel or, more usually, those who have abandoned ship by going overboard clothed

From a hospital in a naval advanced base, South Pacific Area. Captain Joel J. White, MC, U S Navy, Medical Officer in Command. This article has been released for publication by the Division of Publications of the Bureau of Medicine and Surgery of the U S Navy. The opinions and views set forth in this article are those of the writers and are not to be considered as reflecting the policies of the Navy Department.

in life jackets and swimming free or clinging to life rafts or bits of floating wreckage are subject to the water pressures generated. If the man is within a radius of 100 yards of the exploding charge the chances of survival are very slim, although we have seen cases in which a distance of less than 100 yards was reported with eventual rescue.

#### THE CLINICAL SYNDROME

The usual story is one in which the man, floating in the water, feels a sudden compression of his abdomen with sharp pain and a sensation of fullness followed by cramps. Either immediately following the blast or within half an hour several violently expulsive bowel movements take place with the passage of liquid stools into the sea. The man is usually surprised by this and, although the movements are not involuntary, they are nevertheless uncontrollable. Severe gripping cramps are present and the performance may be repeated over a period of several hours. The man is frequently profoundly shocked and may be in a stuporous state, recovering spontaneously at varying intervals, floating about meanwhile in an aimless manner as a result of the efficient buoyancy of his life jacket. The following case is illustrative of the usual course of events.

CASE 1—After abandoning ship following torpedo hits, a seaman swam from the sinking destroyer and was about 200 yards from the fast disappearing hull, whose bow still showed when several blasts in quick succession took place under water. The disturbance in the water about him caused him to be submerged several times, and while being tossed about he felt a severe compression pain in his abdomen and lower chest which made breathing difficult. At the same time he felt an influx of sea water into his bowel through the anus, producing severe diffuse abdominal pain with a sensation of inordinate fullness. Without losing consciousness he nevertheless realized that for some minutes he was aimlessly floating about and could not control his direction. Some minutes later he began to have wavelike cramps in his abdomen similar to those following the administration of an enema and then had several urgent bowel movements in rapid succession followed by continuing intestinal cramps. He was in the water for about nine hours before being picked up and he was subsequently treated for shock, submersion and abdominal compression. He was considerably dehydrated. He maintained a moderate degree of bowel irritability for the next ten days, although his immediate reaction of pain, tenderness and spastic abdominal rigidity wore off within a few hours after being put to bed. No vomiting occurred and no further evidence of peritoneal irritation developed. He was well within two weeks after the incident.

Although this was a typical instance of mild reaction and course of the illness following acute hydraulic abdominal concussion there are many bizarre variations, some of which will be briefly detailed. On account of military restrictions the names, dates, places and details of identification are omitted in all these case reports. Although in most cases rather complete studies were made including blood, urine, spinal fluid and other laboratory examinations, there were many who did not receive complete x-ray and other studies because of the exigencies of the situation in which these patients were found. Some were treated at front line field stations, others at evacuation or base centers. The opportunity to perform complete scientific analyses was not always available or practicable, but all patients received the best clinical care and best therapeutic measures possible at the hands of a group of hard pressed, capable and enthusiastic, though often handicapped, medical officers.

Nausea and vomiting with signs of intraperitoneal irritation or injury frequently occurred. Such signs were usually accompanied by shock, the result of exposure and submersion, and sometimes of other injury either following shrapnel or bullet fire or trauma incidental to activity in leaving a sinking ship or blows from material in the water. The following case is illustrative.

CASE 2—A chief petty officer was thrown from the raft on which he had climbed, after abandoning his sinking ship, when the first "ashcan" went off. He was bruised on head and shoulder and had just managed to orient himself sufficiently to attempt regaining a hold on one of the hand lines when two more depth charges exploded in rapid succession at a distance of perhaps 150 yards, followed later by others with effects of less intensity. He was tossed about and felt a severe compression pain about his trunk and a sensation of forceful introduction of water into his bowel. After recovering his bearing he was unable to reach the life raft and floated about for about six hours before being picked up by rescue boats. He had an uncounted number of liquid stools while in the water, marked by great urgency and severe cramps. The nausea and vomiting, which continued for three days, did not begin until several hours after the blast incident and apparently had no relation to swallowed sea water, which was minimal.

He was treated for shock and submersion and contusions of the head and shoulder. The abdominal wall was rigid, painful and tender both on direct and rebound examination. Intravenous clises were regularly administered and only sips of water were permitted for several days. (Although operation was considered, no surgery was undertaken in view of the experiences with several other cases to be described.) Intestinal irritability was present for about a week and then gave way to constipation. At the end of two weeks the gradually diminishing abdominal tenderness and rigidity had disappeared, normal appetite had returned and during the next week the liberal administration of liquid petrolatum enabled the man to regain his former bowel habit. At the end of five weeks he was well, although he had occasional episodes of minor abdominal distress which were not disabling.

#### INTRA-ABDOMINAL PATHOLOGIC FINDINGS

The rescue of many of these men who, in addition to symptoms of shock and submersion, also showed definite signs of intra-abdominal injury with incontrovertible evidence of severe peritoneal irritation, posed a recurrent problem which required the exercise of delicate judgment. Unlike the experience of individuals immersed in the icy waters of the North Atlantic and the Arctic oceans, the warm temperatures of the Pacific near the equator permitted them to be afloat for periods of six to fifteen hours without the severe effects seen in colder regions although the effects of such prolonged immersion even in warm sea water should not be minimized. Some of these men did indeed suffer greater injury than ordinarily was expected, and the combination of underwater blast with submersion was unquestionably fatal for many whose bodies were not recovered as well as for those which were.

CASE 3—A postmortem examination performed on the body of a man who died while floating in the water after his ship was sunk revealed that, in addition to the multiple military hemorrhages throughout his bowel and several areas of grosser subserosal ecchymosis, he had also suffered a longitudinal tear in the ascending colon just above the cecum. The abdomen contained fecal material diluted with sea water, and evidence of early peritoneal inflammation.

CASE 4—A seaman brought ashore after a typical episode was in severe shock. Following his reaction from the experience, the persistence of abdominal pain, rigidity, direct and rebound tenderness of increasing severity and severe prostration

made operation imperative. It was found that he had a longitudinal tear in the transverse colon with overwhelming contamination of the peritoneum. Despite all efforts, he died.

CASE 5—Another seaman who had been afloat for about nine hours prior to his rescue exhibited incontrovertible evidence of intestinal perforation with peritonitis. At operation he was found to have a longitudinal tear in the upper sigmoid with early abscess formation. Exteriorization and drainage with supportive measures resulted in his subsequent evacuation, in a serious condition, but with good chance of recovery.

The findings in these and other cases at first seemed to indicate that early operation in all cases showing severe symptoms and signs might be indicated. Surgery was followed out in a number, some of which showed small pinpoint perforations, although the usual perforating lesion was a longitudinal tear in the colon at a distance from the anus and rectal ampulla. These were reminiscent of the tears seen in the practical joke injuries involving the application of compressed air outlets to the anus by workmen using air compressors with flexible hose attachments. There were, however, several instances of lesions involving the bowel wall without perforation which demonstrated that even in the absence of peritoneal contamination these patients did not do well following operation.

CASE 6—Following rescue after submersion with abdominal concussion, which occurred about twelve hours previously, a seaman had persistent severe abdominal symptoms which suggested peritonitis. At operation a careful search failed to reveal any evidence of perforation. The large bowel showed areas of milky petechial to macular subserosal hemorrhage with several areas of larger ecchymosis. Postoperatively, despite supportive measures and indwelling duodenal tube suction drainage, he became progressively worse and died.

CASE 7—A similar instance with almost identical findings was followed by a stormy postoperative course, and the patient eventually recovered.

CASE 8—Operation performed on a survivor who had been afloat for about eight hours following submersion and concussion with the usual story revealed a well sealed pinhead size perforation in the transverse colon in addition to the diffuse subserosal hemorrhages previously described. There were also occasional small areas of hemorrhage seen in the small intestine. The postoperative course was stormy and the patient showed definite evidence of toxicity with ileus, which was combated by indwelling continuous suction drainage of the intestine, intravenous infusions of plasma and electrolyte fluids, prostigmine and other measures. When evacuated, he was still in a precarious state.

#### THERAPEUTIC PROGRAM

Further experience demonstrated that, although there were some in which rents in the colon had occurred, most of the cases presenting pictures of persistent abdominal pain with signs of peritoneal irritation of lesser degree were cases of diffuse milky petechial and larger subserosal hemorrhage without perforation. Despite the universal use of intra-abdominal sulfanilamide, suction drainage, plasma, saline and dextrose infusions, prostigmine and morphine and all other means of support, these patients invariably had a disturbing postoperative course and in some instances died. A change in therapy with emphasis on the expectant and supportive features of the program resulted in a more generally successful outcome.

CASE 9—A chief petty officer had been subjected to four or five underwater blasts at a distance of about 200 yards after leaving his ship and had numerous bowel evacuations with persistence of cramps over a period of about nine hours, after which time he was rescued. His course was marked for the next few days by recurrent waves of colic with diffuse peritoneal irritative signs, abdominal distention and occasional

vomiting. Morphine, indwelling continuous intestinal suction drainage and concomitant intravenous infusions for three days resulted in subsidence of acute symptoms, although tenderness and rigidity persisted for about ten days. Fourteen days after the episode he felt well and his appetite improved, although dietary indiscretion still precipitated abdominal discomfort. Constipation of mild degree required liquid petrolatum for regulation of bowel habit. No blood was ever found in the later stools. (Examination in the early stages of his illness was not made, although there were never evidences of gross bleeding.)

CASE 10—An ensign who had had severe underwater blast concussion with the usual train of symptoms had persistent abdominal discomfort and cramps for several days with signs of peritoneal irritation and distention. Treatment with indwelling continuous intestinal suction drainage, infusions and morphine resulted in recovery from immediate symptoms and signs in about four days with subsequent recurrent intestinal irritability and occasional cramps with diarrhea during the next two weeks.

CASE 11—A petty officer who had run the usual course of underwater blast injury with subsequent epigastric distress, rigidity, peritoneal irritation and vomiting was similarly treated with success. Fourteen days after the episode he had recurrence of symptoms with vomiting and high abdominal pain and distention. Indwelling tube drainage was successful in relieving the situation in twenty-four hours. A second recurrence about a week later indicated the presence of adhesions causing partial jejunal obstruction, which was again easily relieved by the passage of a Levin tube with suction drainage for twenty-four hours. This man apparently had had a small perforation in addition to the subserosal hemorrhage in his bowel, and the later course of the healing process with omentum sealed over it caused the development of a kink or torsion which gave rise to intermittent obstruction. He was evacuated and his subsequent course is not known, although he was momentarily well at the time of his departure.

These cases are illustrative of the general pattern of clinical course and therapy followed in the greater number of instances. The conservative program with symptomatic therapy proved to be the most successful. Instances of major perforation, however, were of necessity treated by operation. Decision concerning these was often difficult and the outcome unsatisfactory.

#### COMPLICATIONS

With realization of the pathologic changes under way in the bowel, chiefly the development of smaller and larger areas of subserosal and mucosal hemorrhage, it was inevitable that some later manifestations of these mural injuries should become apparent. Peritoneal reactions to the serosal injuries undoubtedly account for most of the acute abdominal symptoms and signs which were outstanding in the immediate course of these patients' illnesses. Symptoms of colitis are obviously understood also. Unfortunately, apparatus for proctosigmoidoscopy was not available at the time most of these patients were seen and therefore the appearance of the mucosal surface of the lower bowel in life was not observed. It was expected, however, that there should be evidence of intestinal bleeding, and fecal examination for blood revealed positive findings in several instances. One case of gross bleeding, probably due to late ulceration of an area of intramural hemorrhage, is of interest.

CASE 12—A junior officer who had six or seven loose movements within a period of about twenty minutes subsequent to his abdominal concussion was also suffering from a severe laceration of the scalp when he was rescued four hours later. His intestinal symptoms were limited to mild cramps and abdominal tenderness, which persisted for three days. On the tenth day of his hospitalization for treatment of the scalp wound, just prior to discharge to duty, he was awakened in the

morning by colic, which was relieved by a large soft stool. This was followed within half an hour by another liquid movement, after which he fainted. It was found that he had passed a large quantity of bright red blood. He was kept at rest for three days with sedation and no further evidence of bleeding developed. This hemorrhage was probably the result of rupture into the bowel of a large hematoma in the interstitial tissues of the sigmoid following mucosal ulceration.

The variability of the forces operating in underwater explosions have given rise to effects other than direct intestinal concussion. Sudden compression of the abdominal wall against resistance has produced injury simulating traumatic hernia. Examples of inguinal and diaphragmatic locations of these follow.

**CASE 13**—Following the abandonment of his ship, a petty officer was subjected to hydraulic abdominal concussion when the depth charges exploded after the stern of the vessel sank, the bow having previously been blown away from the ship. After several liquid bowel evacuations in the water he swam toward and eventually reached the bow of the vessel, which by virtue of its compartmentation and buoyancy remained afloat after the remainder of the ship had gone down. He climbed aboard by an anchor chain and remained there through the night until rescued some six hours later.

In addition to intestinal irritability and abdominal pain and cramps he had a diffuse swelling, sausage shaped and tender, occupying the right inguinal canal, the right spermatic cord and the tissues about the right testis. This was interpreted as being a traumatic hernia, treatment of which could not be undertaken at the time on account of the man's general condition and the lack of surgical facilities at the moment. Since he seemed to improve within the next few days he was watched and subsequently evacuated to a nearby base where, two weeks after the incident, he was operated on for the persistent lump and infiltration in his inguinal canal and cord. Recurrent bouts of cramps, pain referred to the right groin tenderness and two to three loose stools daily gave clinical confirmation to the impression that this was a traumatic hernia with incarceration of a piece of omentum in the sac. There was also a fading area of ecchymosis involving the surrounding inguinal and femoral skin. Operation with careful dissection of all layers of inguinal area, cord and tunica failed to reveal a patent sac, the entire area being involved in a hemorrhagic plastic inflammatory process with the region in and about the internal ring sealed off tightly in a smooth manner. Inflamed thickened tissues were dissected free and resected. The abdomen was not opened. Bassini repair was made and healing was uneventful. Bowel irritability continued for a week before it subsided. He was evacuated as a convalescent.

**CASE 14**—After the subsidence of the acute symptoms of hydraulic abdominal concussion this man persisted in having recurrent symptoms of high epigastric discomfort, indigestion and occasional vomiting. Physical examination elicited moderate tenderness on deep pressure in the epigastrium and unusually high tympany in the left lower chest. X-ray examination revealed the presence of the colon and distorted stomach in an unusually high supradiaphragmatic position in the left thorax, interpreted as diaphragmatic herniation of abdominal viscera. He was evacuated for further study and treatment.

The sequelae of underwater blast injury have not always been as simple or apparent as these. There have been some instances of delayed complications and involved series of clinical events which have taxed the interpretive and therapeutic ingenuity of medical officers in attendance. The following is illustrative.

**CASE 15**—Following severe hydraulic abdominal concussion this man had a stormy course marked by high abdominal distress with vomiting. Under conservative treatment the condition seemed well controlled until about a month after the episode, when he became worse with symptoms of high obstruction, vomiting, deep epigastric pain and collapse. Clinically he appeared to have diaphragmatic hernia with constriction, over night, under adequate sedation and gastroduodenal tube

drainage, the condition was relieved and x-ray examination failed to reveal presence of abdominal viscera in the thorax, although the splenic flexure and stomach were high in position under the left diaphragmatic leaf. Within the next few days the moderate fever became higher, deep epigastric pain extended to the lower substernal region and giddiness, cerebellar ataxia and semistupor developed. A week later purulent expectoration appeared. X-ray evidence of a small zone of pneumonitis in the lower medial area of the left lower lobe was suggestive of early abscess formation. The subsequent course was marked by further development of signs and symptoms indicative of lung abscess and questionable intracranial process interpreted as brain abscess, although there were no localizing signs.

This case probably represents an instance of injury with perforation into or adjacent to the mediastinum, mediastinal inflammation with eventual involvement of adjacent lung progressed to abscess formation and secondary cerebral pyogenic metastasis. The intracranial process may also have been the result of hemorrhage caused by venous backpressure incidental to the external pressure developed by the explosion similar to that seen in air blast injury to the lung in bombing by aircraft.

It has been a source of wonder to us that there have been so few instances of intrathoracic compression injury seen in association with hydraulic abdominal concussion. Aside from a case of empyema thoracis reported to us by Lieutenant Commander Marvin Overton which he saw in a Japanese prisoner who had been in an incident of underwater blast 2 cases of fatal pulmonary edema marked by bloody froth following similar experiences reported by Lieutenant Commander Edwin Steele and 1 case of intrathoracic injury with bloody pulmonary edema seen by Lieutenant Commander Albert S. Hyman, we know of no examples of direct pulmonary damage resulting from hydraulic concussion. It is undoubted that there have been instances of intrathoracic damage either by direct violence or by aspiration of seawater incidental to the marine disturbance. Many men have been lost at sea following these incidents. Survivors have, we believe, been protected by the natural resistance and resilience of the thoracic cage reinforced and protected by the thick kapok life jacket which has been worn by all those who have been rescued. This is a different mechanism than that producing blast injury in the air and should not be confused with it.

#### COMMENT

The name "hydraulic abdominal concussion" is given to a syndrome of intra-abdominal intestinal injury resulting from underwater explosions with compression of the abdominal parietes against resistance from water which has entered the lumen of the bowel through the weak anal sphincter. "Hydraulic" refers to the forces of water in motion. "Concussion" is used in preference to the word "compression" or any other descriptive word because we feel that the results of this unique accident are similar to those which occur in the brain or other tissues when subjected to sudden force against resistance. This upsets the equilibrium of the part and produces a molecular, cellular or tissue commotion or disturbance demonstrable as injury by interstitial hemorrhage of varying degree up to gross solution of continuity of the tissue itself.

There have been numerous instances of this occurrence, several illustrative cases of which have been briefly described. The usual course of events is one in which a man finds himself in the sea after abandoning ship following a naval engagement, he is within a radius of 100 to 300 yards when one or more depth charges explode under water, forceful water currents are generated, producing external abdominal compression.



sion simultaneous with the entrance of sea water into the bowel through the anus. Within half an hour there are usually three to ten fluid bowel movements accompanied by violent cramps in the attempt of the bowel to rid itself of the irritating bulk of strongly hypertonic salt water. Dehydration and shock are common. Bowel irritability, with more or less repetition of the fluid stools, continues for several days and sometimes for two weeks.

Examination of the abdominal contents at operations performed in cases characterized by severe peritoneal irritation have shown the chief lesion to be milium, discrete and confluent, subserosal and mucosal intestinal hemorrhages with frequent appearance of larger areas of ecchymosis and hematoma which must inevitably involve the mucosa to a greater or less degree. The serosal irritation produces the peritoneal signs. The breakdown and tension about larger areas of intramural hemorrhage and the damage to mucosa have produced evidence of minor and major intestinal bleeding. We believe that the late results of these injuries may vary from nothing at all to the full blown picture of active or healed ulcerative colitis. It is suggested that these possibilities be kept in mind for future reference in cases with a history of hydraulic abdominal concussion.

The relatively rare examples of macroscopic perforation seen provoke some speculation. In those patients whose intestine was seen at operation it was unusual to see involvement of small intestine in other than scant milium subserosal hemorrhages. The lesions were always chiefly in the colon. No cases of small bowel perforation were seen, the ileocecal valve apparently acting as an efficient barrier to pressure from below. Rents in the large bowel were either pinpoint or longitudinal. They were all at a distance from the rectum, and we believe that their occurrence depends on a combination of factors including degree of pressure both within and without the bowel lumen, and the amounts of fecal material and of gas present at the time. We gain the impression that most of these perforations are the result of "blow outs" at a point where a bubble of gas compressed from below meets an obstruction. Only this will explain the occurrence of leaks in the cecal area and transverse colon. The longitudinal nature of the rents is consistent with the anatomic weakness in structure found in the colon in this direction.

Treatment of these injuries requires good judgment and, at times, considerable courage to withhold operation in the face of what may seem to be an urgent abdominal emergency. They are, in fact, all urgent abdominal emergencies, but experience has shown that supportive treatment without operation produces the best results. Manifestations of frank major perforation of course are indications for operation. Despite all our modern technics and even with the invaluable support of chemotherapy, the mortality in such cases is unusually high and apparently unavoidable. Treatment of small perforations and the peritoneal inflammatory reactions secondary to intramural intestinal hemorrhage and concussion has been most successful with morphine, indwelling intestinal suction drainage and intravenous infusions of electrolyte, dextrose and plasma.

This report is published in the hope that others who may have the occasion to see similar cases will be enabled to recognize the lesions and, if their facilities warrant, may be stimulated to make further observations of a more extensive and accurate nature than we have done.

## TREATMENT OF EPIDEMIC KERATO- CONJUNCTIVITIS

PRELIMINARY REPORT OF TEN CASES

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Epidemic keratoconjunctivitis (shipyard conjunctivitis) was reported on the west coast in 1941 by Hogan and Crawford<sup>1</sup>. The disease began to appear on the east coast in 1942<sup>2</sup>. Although a few short notes suggesting therapy have appeared, it has been generally conceded that no treatment either local or general has materially shortened the course of the disease.

Reports received from the Middle West indicate that the disease is now appearing in parts of this important industrial area. Although the present preliminary report on therapy is based on a small number of cases and has not been controlled, the exigencies of a new infection in wartime industry for which no treatment is known warrant publication of therapeutic studies which may be of some assistance to physicians. Controlled groups are being studied and reports will be published later, along with detailed data on potencies of the serums used.

The studies of one of us (M. S.) have shown that blood serum from persons recovered from the disease contains a substance which will neutralize the virus in mice. We have seen that blood serum of recovered patients gradually builds up a titer of protective substance after the conjunctival phase of the disease has disappeared. Attempts were made, therefore, to draw the blood of convalescent patients when this titer of neutralizing substance was highest.

In an epidemic studied in cooperation with the New York State Public Health Department corneal changes developed in 85 per cent of the cases<sup>3</sup>. The fact that not all cases showed corneal changes indicated that there is either a milder form of the disease in which conjunctivitis alone appears or that mistakes were made in the diagnosis of these cases. The former seemed the more likely in the face of an epidemic. When any form of treatment is to be used some form of case selection must be carried out in order to eliminate the mild forms and the instances of mistaken diagnosis.

All cases reported here presented the following manifestations:

1. Pronounced edema of the lids, conjunctiva and a semilunar fold with bulbar chemosis.
2. Preauricular lymph node involvement, usually submental, and anterior cervical as well.
3. Severe ocular discomfort associated with excessive tearing.
4. Conjunctival scrapings containing only mononuclear cells and practically no polymorphonuclear leukocytes.
5. Negative cultures.

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This investigation was carried on in informal collaboration with the Commission on Neurotropic Virus Diseases, Board for the Investigation and Control of Influenza and Other Epidemic Diseases in the Army.

<sup>1</sup> Hogan, M. J. and Crawford, J. W. *Am. J. Ophth.* 25: 1059 (Sept.) 1942.

<sup>2</sup> Sanders, Murray. Epidemic keratoconjunctivitis. *Arch. Ophth.* 28: 581 (Oct.) 1942.

<sup>3</sup> Perkins, J. E., Korns, R., and Westphal, R. Unpublished data.



Typical corneal changes were present in 4 cases and probable corneal changes in 2 additional cases

With these criteria as a guide, it seemed that the most likely diagnosis was epidemic keratoconjunctivitis. In 4 cases a definite history of close contact with a known case of epidemic keratoconjunctivitis was given. Two of these patients had no corneal involvement when first seen.

CASE 1—G T, a physician not acquainted with this disease, was seen on the tenth day after onset of severe bilateral epidemic keratoconjunctivitis. He gave a history of having seen a man in his office about two weeks before who complained of a sensation of a foreign body in the eye. The physician was unable to find the foreign body but stated that the man had chemosis and edema of the upper lid. Subsequent investigation proved that this man had epidemic keratoconjunctivitis. G T had lid edema, chemosis, follicular hyperplasia and involvement of the preauricular lymph node and of the cornea of the left eye. His vision was only 20/200 in this eye. On the tenth day 50 cc of plasma was given intravenously from R B (this patient had a titer of 10,000 neutralizing doses and had many corneal changes). Twenty-four hours after administration of the intravenous plasma G T was much improved but still had

Case 6 is of interest but could not be carefully followed.

CASE 6—J S had severe involvement of the left eye with beginning corneal changes. He was given 40 cc of potent convalescent serum intravenously on the seventh day of the disease. The following day he stated that he was symptomatically improved, but the follow-up from then on could not be carried out. His physician reported subsequent involvement of the other eye with typical corneal changes in the first eye.

Treatment in this case is classed as a failure, but opinion should be reserved until further check-up can be made.

All cases are reviewed in the accompanying table. Seven patients were clinically cured. In 2 cases the normal course of the disease was shortened and corneal changes possibly were aborted. One case is classed as a failure because of inadequate follow-up.

#### COMMENT AND CONCLUSIONS

The present widespread occurrence of epidemic keratoconjunctivitis in important industrial areas and the failure of all types of therapy justify the focusing

#### Results of Convalescent Serum Therapy in Ten Cases

Case	Name	Days After Onset	Contact	Involvement of		Titer of Protective Substance of Convalescent	Titer of Serum	Amount of Serum Given Cc	Result
				Conjunctiva	Cornea				
1	G T	10	Saw patient with disease	4+ both eyes	2+ left eye	10	10 000	40	Few half moon corneal opacities
2	M T	3	Husband	4+ both eyes	0	0	10 000	40	48 hour clinical cure
3	B T	2	Father	3+ right eye	0	Not done	10 000	20	48 hour cure
4	M N	5	Unknown	4+ left eye	0		10 000	40	48 hour cure
5	A S	6	Unknown	4+ both eyes	+ right eye 60+	0	10 000	30	Two small corneal opacities right eye 48 hour conjunctival cure
6	J S	6	Patient	4+ both eyes	+ left eye	0	10 000	40	24 hour much improved 48 hour nearly cured 72 hour recurrence?
7	D S	4	Unknown	4+ both eyes	± left eye 0 right eye	0	1 000	10	Slow recovery 72 hours half moon corneal changes left eye
8	J L	7	Unknown	3+ both eyes	+ left eye 0 right eye	0	10 000	50	24 hour much improvement 48 hour cure
9	H T	5	Unknown	3+ both eyes	± left eye 0 right eye	0	1 000	50	48 hour cure no corneal change
10	M F	4	Unknown	4+ right eye	0	0	10 000	40	48 hour cure

moderate edema and corneal changes. The following day the edema was gone and all that remained were follicles on the conjunctiva and typical corneal changes. Four days later his vision was 20/30 and he stated that he was cured. Examination of the cornea showed small half-moon shaped opacities where previously there had been large round subepithelial opacities. These have remained almost stationary but his vision has improved to 20/20.

CASES 2 and 3—M T and B T, the wife and 10 year old son respectively of physician G T, presumably had primary contact with him. They were seen on the third and second day of the disease respectively. M T had a severe and bilateral form of the disease but no typical corneal involvement. B T had moderately mild and unilateral involvement. M T received 40 cc of convalescent serum and B T 20 cc. Both were clinically cured in forty eight hours.

#### Case 7 is of considerable interest

CASE 7—D S, a woman, also a physician was not known to have had any contact with the disease. We were able to obtain only 15 cc of convalescent serum, the potency of which was only 1,000 neutralizing doses. She had a severe involvement of the left eye but no corneal opacities when first seen. The 15 cc of serum was given on the fourth day of the disease, and there was slight improvement. On the sixth day the second eye became mildly involved. Her improvement was slow, but by the eleventh day the conjunctiva of each eye was quite normal. The left eye showed very thin half-moon shaped subepithelial opacities. These have remained almost stationary

of attention on the use of convalescent serum as a possible means of treatment. In the present group of 10 cases, 9 showed striking clinical improvement a short time after intravenous injections of human convalescent serum were given. However, need for a controlled group of cases cannot be stressed too strongly. It has been pointed out<sup>4</sup> that there is no correlation between the intensity of clinical symptoms and the duration of the disease. It should also be remembered that it is highly desirable that the present study be enlarged, from the point of view both of treated and of control cases, and that standard, accurately titered convalescent serums be employed.<sup>5</sup>

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<sup>4</sup> Sanders, Murray, Culliver, F. D., Torchheimer, L. L. and Alexander, R. C. Epidemic keratoconjunctivitis. J. A. M. A. 121: 250 (Jan. 23) 1942.

<sup>5</sup> Since this report was written 10 additional patients have been treated: 8 with convalescent plasma and 2 with normal plasma. In each instance 50 cc was injected intravenously. The 2 patients who received normal plasma followed the usual course of the disease. The first patient still has corneal opacities after two months and the acute inflammation lasted for five weeks. The second patient also has corneal opacities which are still present and the course of the acute disease lasted three weeks. The 8 patients who received convalescent plasma were treated on the second to the fifth day of the disease. One of these patients developed corneal opacities and the clinical course of the disease was shortened from two days to one week. Oddly enough 1 of the patients whose clinical course was shortened to three days developed a few corneal opacities on the fourteenth day. We are still encouraged with the therapy.

# STANDARD NOMENCLATURE OF DISEASE AND STANDARD NOMENCLATURE OF OPERATIONS

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The first edition of the portion of this nomenclature covering disease, under the editorship of Dr H B Logie appeared in 1932. It was developed as the result of a national conference on nomenclature of disease initiated by invitation of the New York Academy of Medicine, March 22, 1928. A number of subscribers, special funds, insurance companies and medical organizations supported this work. A second edition appeared in 1935.

In 1937 the editing and publishing of the book was undertaken by the American Medical Association. The preparation of a third edition was begun at once. In connection with this revision a fourth national conference on medical nomenclature was held under the auspices of the American Medical Association in Chicago, March 1, 1940 with Dr Haven Emerson of New York serving as chairman. About sixty delegates from interested organizations and institutions attended that conference, the proceedings of which were abstracted in *THE JOURNAL*, May 18 and 25, 1940. The conference agreed that in the interims between national conferences the work of the Standard Nomenclature should be under the direction of the editor and an editorial advisory board. The present editor is Dr Edwin P Jordan and the members of the board are Drs Dana W Atchley, George Baehr, Bowman C Crowell, Neil A Dayton, Halbert L Dunn, James R Miller and Christopher G Parnall.

The primary purpose of this classification of disease is educational. By clearly differentiating between a disease and its symptoms and by canalizing thought along lines of location and etiology this system tends to improve rational understanding of disease. Eponyms and many terms which have been carelessly employed in the past have been largely eliminated.

The Standard Nomenclature of Disease aims to include every disease which is clinically recognizable and to avoid repetition and overlapping. English terms when in good usage have been preferred to Latin or Greek terms. There have been, however, many exceptions. A clear distinction has been drawn between a disease and the manifestations or symptoms which it produces. The method of classification has been designed primarily for clinicians and not for pathologists, roentgenologists or workers in other special fields. Its uniformity and other features make it readily adaptable to serve as a source for information on the distribution and prevalence of disease.

The method of classification followed is based simply on two primary factors—the portion of the body involved (topographic) and the cause of the disorder (etiologic). The topographic features are designated by numerical digits separated from the etiologic factors by a hyphen. The first three digits in the disease code describe the topographic site, the last three following the hyphen, describe the etiologic agent. The digits are uniform throughout the classification according to a key.

The new edition appeared in June 1942. The nomenclature of disease has been simplified in some ways the diagnoses which are likely to occur with relative

frequency in hospital practice have been placed in bold-face type, there is a new introduction giving instructions to medical record librarians in the use of the nomenclature, the index is entirely new and has been designed to facilitate access to the proper diagnostic term, there is a new table of eponymic diseases which serves as a supplementary index, and there is new thumb indexing.

There has long been a demand for a nomenclature of operations to parallel and accompany the Standard Nomenclature of Disease. This new nomenclature of operations (bound with the nomenclature of disease) has been prepared by the Committee on Operative Nomenclature which was authorized by the National Conference on Medical Nomenclature. The Committee consists of Dr H Perry Jenkins, chairman, and Drs T R Ponton and Bronson S Ray, each of whom has had wide experience in the field. Topographic numbers in this classification, i. e. those digits appearing before the hyphen, correspond exactly with those used in the Standard Nomenclature of Disease. The fundamental surgical procedures—the key—are expressed by digits following the hyphen. There are nine fundamental surgical procedures—incision, excision, amputation, introduction, endoscopy, repair, destruction, suture and manipulation. These main operative procedures have been further subdivided. The classification has been developed by employing the digits specifying the anatomic structure operated on and the posthyphen digits specifying the exact operative procedure. This arrangement follows the same topographic principles as those employed in the nomenclature of disease. The different types of operations are found under the specific organs or regions involved. It is believed that this is as complete as necessary for the use of the average general hospital. There is of course a separate index to the nomenclature of operations. A supplementary classification of anesthetic agents and methods accompanies the nomenclature of operations.

The previous editions of the disease nomenclature have been widely employed by leading hospitals throughout this country and Canada as well as abroad. The system of classification is applicable to small as well as to large hospitals. It is believed that the simplifications introduced and added directions make this edition less formidable and that the addition of the Standard Nomenclature of Operations makes this presentation more complete.

535 North Dearborn Street

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**Nervous Indigestion**—Nervous indigestion means precisely what it implies, namely, a digestive disturbance which is mediated through the nervous system. Ordinarily we speak of nervous indigestion as a disturbance which is brought about by those nervous factors which impair the adaptability of the individual to his surroundings. The individual, as a member of society, is subject to forces many of which are beyond his control. Some of these arise in his home life or derive from marital adjustments, economic factors or stress and strain from a thousand different sources, small in themselves but accumulating to produce widespread nervous aberrations. Today the problem of nervous indigestion is perhaps one of the commonest that the medical man is called on to treat. There is no reasonable doubt in any one's mind that the factors and forces today which are abroad throughout the land can bring about severe dislocation in the smooth function of the autonomic nervous system and result in what is perhaps the commonest of all complaints—nervous indigestion—Rehfuess, Martin E. *Indigestion. Its Diagnosis and Management*. Philadelphia: W. P. Saunders Company, 1943.

## THE EMPLOYMENT AND PLACEMENT OF HANDICAPPED PERSONS IN INDUSTRY

HARVEY BARTLE, M.D.  
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Greatly increased attention has been given recently to the employment and placement of handicapped persons in industry. Profit psychology and profit minded factors are no longer justifiable motives for continuing past practices which are fast becoming outmoded, that of accepting the "one hundred per cent" physically and mentally fit to the exclusion of all substandard individuals. This discriminatory attitude has been condemned loudly and frequently by the handicapped themselves and by others interested in the progress of social welfare. The competitive spirit in industry has not permitted great departure even yet from long established principles, and many employers continue to believe that the engagement of handicapped persons immediately creates an imbalance in production. This decreased production, from an economic standpoint, gives an unfair advantage to a competitor. On the other hand labor and welfare groups claim that handicapped persons, if excluded from employment in industry, create a class of unemployed and unemployable persons to whom society must of necessity render assistance. The financial support necessary to discharge this responsibility must eventually be derived from industry, directly or indirectly.

Shall industry engage handicapped persons and thus absorb them as a direct responsibility, or shall assistance be given through other channels the expense of which will be an indirect responsibility on industry? A workable plan for an equitable distribution of responsibility for engaging and integrating the large group of willing but handicapped workers will be a tremendous task to avoid hardship on employee, employer and industry. Whether this can be accomplished by a voluntary effort on the part of all industries by a mutual pact or understanding remains to be seen. This would be preferable to state enforcement through legal enactment. There are many factors in a discussion of this character necessitating further elaboration.

There has been in recent years a change in social thinking, resulting in a new concept of personal social security. There is sure to appear eventually a definite pattern or program to accomplish social security in a practical workable manner. The scheme will not only involve working days, hours and per diem rates of pay but will plan to assist handicapped persons in securing remunerative work rather than continuing them as beneficiaries of relatives, friends or welfare associations. If industry does not cooperate in this suggestion, the alternative "the survival of the fittest" naturally follows.

When industrialists are convinced and have a mind to face the issue squarely, a plan will be forthcoming which will represent the parallel interests of employer and employee. The economic feature under this caption, from a personal aspect, has many implications. It is also a real problem to the production manager in many job placements. There is, however, at this time, on account of the war, an overriding demand to use

to the fullest extent all manpower available. The prodigal labor supply of yesterday is now supplanted by an appalling scarcity. The only criterion at present is Can the person produce? Logically, if the handicapped can produce he should be employed, if employed he becomes a wage earner and a self-respecting member of society.

Industry bluntly and pertinently asks "Will it work?" Safety is an important consideration in placement so as not to jeopardize the person's life or aggravate his impediment. This is not only a humane question but an intensely practical one. An appraisal of the physical and mental status of the interested person should be made by a physician and become a matter of record to guide the supervisor in industry and later for comparative purposes. Will the placement of handicapped persons jeopardize lives and property of other persons? A potentially unsafe person, who may jeopardize life and property, is a menace not to be condoned. The appraisal of the physical and mental status on which an opinion can be predicated is important. In the final analysis the service rendered by the handicapped person must be weighed against the other factors involved.

The eyes present an interesting and widespread problem to the industrial physician and placement supervisor. The abnormalities range from simple refractive errors to muscle imbalance and serious and complicating disturbance of the inner structures of the eye. Blanket approval or disapproval of persons should not be assigned without considered judgment in each case. Specialists in this field have contributed greatly to the benefit of the employee and employer, in retarding eye deficiencies and advancing corrective measures to reduce to a minimum the dislocation of workers. Deficiencies in color perception will obviously interfere with placement in some textile fields, in work handling multi-colored wires in cables, in transportation where it is necessary to observe colored signals and in other fields in which acute color perception is essential. It need not hamper persons in general industrial work.

Eye refractions to correct vision, general health measures to correct or retard disease of the eyes, and finally placement to obviate the demands of close application or other eyestrain completes the threefold approach to handling and disposing of handicapped persons falling within this category. The results obtained by follow-up supervision of workers with eye defects is an inspiration and fully justifies the advisability of the program.

Deficient hearing is an impediment in placement. While artificial hearing devices may improve the hearing they are not fully reliable under all circumstances. The transportation industries have rather high requirements in vision and hearing. There is certainly no reason to deny persons with deficiencies in hearing and vision from all classes of work.

The tuberculous person of the chronic pulmonary type in a quiescent state is safe to mingle with others provided there is assurance that no activation exists. Placement of such persons in well ventilated work rooms with medically controlled assignments requiring minimal physical effort is permissible. For instance, a few decades ago the medical dispensaries referred quiescent tuberculous patients for work on the street cars, which was essentially outside work where a minimum amount of physical effort was required. This placement was in reality a therapeutic measure in rehabilitation.

Many tuberculous persons employed in suitable jobs react favorably and do effective service under proper

industrial medical supervision. Routine periodic x-ray examination, sputum analysis and clinical examination to safeguard patients and contacts properly are of course highly essential.

Diabetes is not necessarily a cause for displacing an employee. The diabetic patient requires dietetic advice and urine and blood sugar evaluation routinely. In hazardous work the diabetic person who uses insulin regularly must be given special attention concerning placement.

A patient with heart disease, with good compensation, may do well in special placements which do not require physical effort sufficient to aggravate the crippled heart.

In the average stable industry there are about 8 per cent of the entire personnel who are cardiac patients. This group of trained artisans need not and should not be discarded. With proper medical supervision they can continue in active service, with shifting of placement and general oversight, for many years without shortening or jeopardizing life. This group does not include the many persons who die suddenly of a heart attack who previously have shown no symptoms referable to the heart.

The patient with kidney disease may be appraised and the person's usefulness continued under proper guidance. Examination of urine and possibly of blood at regular intervals will be necessary.

Syphilis should be discovered, evaluated and properly treated and its transmissibility definitely stated. The determination of the employability of those afflicted should be predicated on knowledge, capable supervision and safety.

Arthritis varies in its ability to incapacitate from mild joint pain to complete crippling. It is obvious that placement will play an important role among the arthritic. It requires reason, sympathy and good common sense to adjust the needs of both the handicapped and industry.

Persons recovering from fractures of all types and victims of severe or mutilating injuries require special consideration. These anatomic changes, while handicapping the victims, may not impair general health. There is a limited sphere of placement open to those who have lost one or more limbs. Nevertheless, if there is a "will to do" industry may profitably place them. It is a particular achievement to secure cooperation in the case of the tragic back injury or post-traumatic neuroses. In back injuries, x-ray reports should be a matter of record not only to guide the afflicted person but to prevent him from being misguided.

A conspicuous group of handicapped individuals are the nervous and mentally sick. In making health appraisals the mental aspect has been grossly neglected. Present day emphasis will throw new light and attention on neuromental states. The placement of these persons requires serious thought in evaluating capabilities and available supervision. Those mildly afflicted are capable of a normal work output under proper supervision and environmental influence. Unfortunately, some industries cannot open their doors to persons who have been mentally ill. The placement of quiescent cases of dementia praecox, manic depressive insanity and dementia paralytica is a debatable subject and is contingent on safety hazards, need for close application to the job, judgment and facilities for observation and supervision over these workers.

In the gradual progress of industrial medicine and surgery through the years there has been developed an art and science in evaluating, treating and placing injured persons. A sympathetic approach, good remedial medical service and considered placement accomplish the best results.

#### CONCLUSION

The full utilization of all manpower is necessary to keep production at a maximum. Adjustment to achieve this objective for the handicapped should include non-hazardous placement, postural therapy, sitting instead of standing, work in which eye strain is not demanded, deliberate work avoiding the highly repetitive operations for the nervous, and a great number of other factors arising in many and varied industries.

15 North Thirty-Second Street

### THE HOSPITAL PHARMACY

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The hospital pharmacy should be a diplomatic door to rational therapeutics in hospital practice. As one of the most frequently consulted therapeutic departments, it is in intimate relation with the hospital administrators, attending physicians and nursing staff. The influence which it can exert over the purchase and dispensing of drugs is often overlooked.

Five principles have been proposed for an adequate pharmacy service in the hospital: the organization of a hospital pharmaceutical service, the appointment of a pharmacy committee, the maintenance of a pharmaceutical reference library, the use of standard preparations and adequate supervision. In determining the policy of operation, the pharmacy committee should recommend only the use of official agents and nonofficial drugs which have been evaluated by competent medical bodies. Informative standards are the United States Pharmacopeia, the National Formulary and New and Nonofficial Remedies, publications of bodies which have been chosen as representative of pharmacy and medicine.

The economy of choosing drugs judiciously has been demonstrated repeatedly. One hospital pharmacy experienced a saving of \$50,000 within one year after the adoption of specific regulations by the hospital formulary committee, this saving being effected essentially by the limiting of the number of drugs with similar therapeutic action, the elimination of unnecessarily complex mixtures and the regulation of proprietary drugs.

Although a pharmaceutical manufacturer is entitled to the rewards due from the discovery of a new and useful drug, the purchasing department must recognize the economic loss of buying proprietary preparations when official equivalents are available. There is almost always an appreciable difference in the costs. For example, a survey of the September 1941 issue of a popular price list of drugs revealed that the total cost of an ounce of each of nineteen substances under a protected name was \$48.67, whereas the total cost of an ounce of each of these substances under an unprotected name was \$15.67. Thus the cost of a proprietary name to the consumer would be \$33. Included in these nineteen agents were sedatives, vasoconstrictors, local anesthetics, anti-infective agents and analgesics.

In 1933 Hatcher and Stamsby proposed eight rules to aid a hospital formulary committee in determining the admission of articles. These rules are still admirably applicable and in part declare simple official (Pharmacopeial) substances may be admitted on request unless they have become superfluous, no article should be admitted, except for controlled research, before its therapeutic value has been established, no article of secret composition should be admitted, no article which is sold under a proprietary name should be admitted under such a name if a substance of identical composition can be obtained under a nonproprietary name, no mixture of two or more active substances should be admitted unless evidence is submitted that the mixture presents therapeutic advantages over the simple substances, no proprietary article will be admitted before it has been accepted by the Council on Pharmacy and Chemistry of the American Medical Association for inclusion in New and Nonofficial Remedies, the oral should be given preference to the parenteral administration of drugs whenever possible.

Active cooperation is needed by all professions if a hospital is to maintain a progressive pharmacy. The physician should not prescribe any product unless he knows the truth about it at first hand or through an unbiased source, until he knows what the remedy contains or what it may reasonably be expected to do. The pharmacist has a store of information which is available for the asking, a closer acquaintance between him and the members of the attending staff will be of mutual benefit. The pharmacist in turn should be ready to offer up-to-the-minute information on problems within his purview and should not hesitate to advance his views in the interest of the hospital and patient.

The hospital pharmacy and the advisory pharmacy committee can be of added value by providing a list of materials which are scarce because of war and a list of substitutes which are satisfactory both clinically and economically. By maintaining a reference library on laws pertaining to the control of drugs, problems related to the prescribing of agents restricted to a physician's prescription can be obviated. As the nub of hospital materia medica, the pharmacy can serve as a fulcrum for many regular therapeutic conferences.

Obviously the hospital pharmacy is more than a place for the dispensing of drugs. In a sense it is a mirror which reflects the practice of that particular hospital and as such it should be the interest of all hospital departments. If this interest is not made evident, the pharmacy cannot be expected to function as it should, it will be no more than a tap to be turned on and off at will when a pill or powder is needed.

535 North Dearborn Street

**Diabetes Mellitus in the Aged**—It is estimated that there are nearly seven hundred thousand diabetics in the United States. Ninth most frequent cause of death, diabetes has a death rate of 23.8 per hundred thousand. Of those suffering this malady the majority exceeds 60 years, but while mortality is greatest in the seventh decade (28.8 for men, 32.8 for women) the onset is most common between 50 and 60 years (24.2, 30.3). The incidence rises steadily from 0.38 per cent below 14 years to 6.56 per cent at 45-54 years, 14.25 per cent the following ten years, and reaches 18.39 per cent after 65 years, with women prevailing slightly in the higher age groups.—Mueller-Deham, Albert, and Rabson, *S. Milton Internal Medicine in Old Age*, Baltimore, Williams & Wilkins Company, 1942.

## Clinical Notes, Suggestions and New Instruments

### OLD STAB WOUNDS OF THE SPINAL CORD WITH SUBSEQUENT WIDESPREAD PIGMENTATION OF THE SPINAL CORD AND BASE OF THE BRAIN

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While stab wounds of the spinal cord are relatively rare lesions, retention of the foreign body in the spinal canal over a period of years is even more rare. The following is such a case.

#### REPORT OF CASE

A stab wound of the spinal canal at the age of 25 was followed by the first signs of paraplegia at the age of 43. A rusty knife blade was removed at the age of 45. Autopsy, four months later revealed diffuse staining of the leptomeninges and surface of the cord with iron.

J. J. D., a Negro aged 45, was first seen on Dec. 14, 1938. He was examined because of paraplegia, which had been increasing for the past two years. At the age of 25 he was stabbed in the mid dorsal region with a knife. No immediate spinal cord symptoms appeared and no physician was consulted.

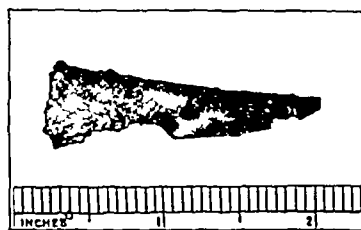


Fig. 1—Rusty knife blade removed at operation. This had lain in spinal canal for twenty-one years.

At the time. Subsequently he joined the army and served with the American Expeditionary Forces in France. He was discharged without disability on March 18, 1919.

Following this he worked as a janitor and did odd jobs. In 1936, eighteen years after the injury, he

first noticed difficulty in walking. During the next two years this weakness in his legs increased and by March 1938 he had become paraplegic and incontinent.

On examination, Dec. 19, 1938, he was found to have advanced spastic paraplegia. He was unable to walk. The left leg seemed weaker than the right. Sensory examination revealed retention of all sensory modalities and no definite level of sensory change could be made out. The abdominal and epigastric reflexes were very sluggish on each side. Cremasteric reflexes were lost. The deep reflexes of the upper extremities were increased with a bilaterally positive Hoffmann sign, greater on the right side. The knee jerks were very lively and about equal. The Achilles tendon jerks could not be obtained because of great spasticity. The Babinski, Rossolimo, Chaddock, Oppenheim, Gordon and Schaffer signs were all bilaterally positive. He also had bilateral ankle clonus. He had lost all control of the bladder and rectum.

Spinal fluid examination revealed a clear, colorless fluid under 80 mm of water pressure. The Queckenstedt test showed no block, the cell count was 9, globulin was normal, the Lange colloidal gold test was 0000000000 and the Wassermann reaction was negative. His blood Wassermann reaction also was negative. Roentgenograms of the spine revealed a fragment of an old knife blade which had penetrated the canal between the spinous process of the ninth and tenth dorsal vertebrae (fig. 2). The blade occupied a diagonal position with the point downward. This is contrary to the situation which obtains in most stab wounds of the cord, in which the knife blade usually points upward.

From the Department of Neurosurgery, Veterans Administration Facility.

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On Jan 3, 1939, a laminectomy was performed and the knife blade removed. It was found on the right side of the spinal canal, its point being buried in the body of the tenth dorsal vertebra. While the blade had entirely transversed the

canal, it had not entered the spinal cord. Many arachnoidal adhesions were present and there was deep pigmentation of both the cord and surrounding tissues. This pigmentation was reddish brown and appeared to be due to iron pigment. The knife blade measured 7.5 cm in length and was very rusty (fig 1).

Following removal of the foreign body, the patient's condition did not improve. He remained paraplegic and incontinent and died four months later as the result of general debility.

At autopsy, April 19, the spinal cord was removed in toto. It was decidedly atrophied below the level of the eighth dorsal vertebra. The entire cord was stained uniformly brown throughout its length. The roots of the cauda equina were not stained but many of the higher spinal roots were brown. There were many arachnoid adhesions throughout the entire length of the cord. The base of the brain was also stained brown. This pigmentation extended as far forward as the chiasmal system (fig 3).

At the site of the injury, small fragments of iron rust were found embedded in the tissues. These were especially prevalent near the point of the knife blade where it had been



Fig 2—Lateral view of the spine showing indriven knife blade. The blade occupies a diagonal direction with the point directed downward. The point is embedded in the body of the tenth dorsal vertebra. Extensive corrosion of the blade is evident.



Fig 4—Section of the spinal cord at the level of the injury. Wide spread impregnation of the outer structures of the cord by particles of iron pigment is seen. Widespread gliosis is present.

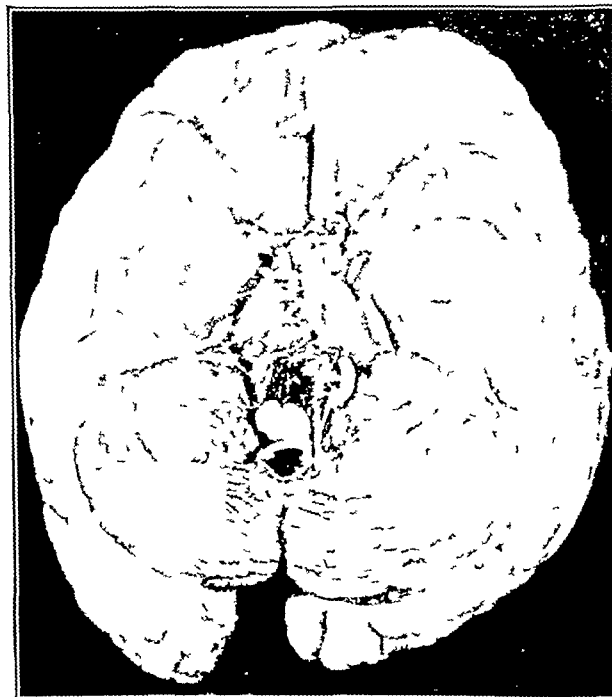


Fig 3—Cross appearance of the base of the brain. Extensive pigmentation of the cerebellum and brain stem is seen. The pigmentation extends to the under and inner surface of the temporal lobes and to a lesser extent to the under surface of the frontal lobe.

embedded in the subdural space. The knife had not entered the cord but from this level downward the cord was definitely atrophied. Microscopic examination of the cord at the level of the injury revealed extensive infiltration of this structure with small particles of iron stained debris (fig 4). These particles were surrounded by areas of gliosis which were undoubtedly caused by the irritative action of the foreign bodies. The major ascending and descending tracts in the cord did not show degeneration but there was rather widespread glial proliferation throughout the section.

#### COMMENT

In 1932 Antonelli<sup>1</sup> reported a case of spastic paraplegia which developed thirty six years after a knife wound of the spinal cord. His case closely parallels mine. His patient was stabbed in the back at the age of 16 and the knife blade was

1. Antonelli, Giovanni. Spastic Paraplegia Developing Thirty Six Years After the Immediate Effects of a Knife Wound of the Dorsal Spinal Cord with Permanent Fixation of Ironment (of Knife Blade) Policlinc (ex med) 30: 467 (Sept.) 1932, printed before Icl clinico Umberto I VII Radiglione Rome June 5, 1932.

removed at the age of 52. Around the blade was found a collection of blackish semifluid and the surrounding tissues were deeply stained with iron. The blade had not entered the spinal cord. His paraplegia, which had been developing two years before his operation, did not improve following removal of the blade. It should be stated that he was given four treatments of neoarsphenamine for supposed syphilis before the development of paraplegia, and the question arises whether he may have had an arsenical myelitis. It seems more probable that this patient also had extensive gliosis of the spinal cord as a secondary reaction to iron pigment.

## Special Article

### NOTES ON PUERPERAL FEVER, 1843-1943

COMMEMORATING THE CENTENARY OF HOLMES'S  
ESSAY "ON THE CONTAGIOUSNESS OF  
PUERPERAL FEVER"

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One hundred years ago a 33 year old American physician Oliver Wendell Holmes convincingly described for the first time in this country the contagiousness of puerperal infection. His evidence, painstakingly pieced together from reports published both in Europe and in the United States and from his own observations in Massachusetts, was presented with an eloquence which even he never surpassed in his extensive writing in later years.

The disease known as puerperal fever is so far contagious as to be frequently carried from patient to patient by physicians and nurses.

It would seem incredible that any should be found too prejudiced or indolent to accept the solemn truth knelled into their ears by the funeral bells from both sides of the ocean—the plain conclusion that the physician and the disease entered, hand in hand, into the chamber of the unsuspecting patient.

This long catalogue of melancholy histories assumes a still darker aspect when we remember how kindly nature deals with the parturient female, when she is not immersed in the virulent atmosphere of an impure lying-in hospital, or poisoned in her chamber by the unsuspected breath of contagion.

The woman about to become a mother, or with her newborn infant on her bosom should be the object of trembling care and sympathy wherever she bears her tender burden or stretches her aching limbs. God forbid that any member of the profession to which she trusts her life, doubly precious at that eventful period, should hazard it negligently, unadvisedly, or selfishly.<sup>1,2</sup>

Fifty years later Holmes wrote to a friend:

I do know that others had cried out with all their might against the terrible evil before I did, and I gave them full credit for it.

But I think I shrieked my warning louder and longer than any of them and I am pleased to remember that I took my ground on the existing evidence before the little army of microbes was marched up to support my position.<sup>2</sup>

The extent of medical knowledge and the methods of treatment in this field prior to Holmes's contribution may be judged somewhat by passages from Mackintosh's book on puerperal fever, published in 1822.

It is really curious to look into the medical world for we shall find one celebrated man attributing all marked changes in the human body to the motion of the blood, another solely to nervous irritation, a third to inflammation of the mucous membrane of the intestines, while others ascribe all diseases to the liver, the spine, or the stomach exclusively, and the practice of each of these individuals is shaped according to his pathological opinions. We need not, therefore, feel surprised when we discover the practice of medicine to be so corrupted and empirical. One will be found to direct his whole attention to the abstraction of blood, another, to placebos and the whole tribe of nervous medicines, or to ptisans, others to purgatives, mercury, applications to the course of the spinal marrow, or tonics. If this be a true picture of the profession at large, we shall not be surprised that genuine accoucheurs (who are neither reckoned to be so wise nor so wary) should have been led to adopt an absurd pathology, and pursue, at all hazards, an uncertain treatment, in some of the diseases they are called upon to attend.<sup>3</sup>

It was generally believed early in the nineteenth century that puerperal fever was caused by atmospheric conditions, the diet or the emotions. The customary treatment included the withdrawal of 24 to 40 ounces of blood at the first bleeding and further bloodletting or application of leeches as seemed desirable.

Many of Holmes's contemporaries in the medical profession remained wholly unconvinced by his reasoning. Some years later Dr. Meigs, professor of midwifery and the diseases of women and children at Jefferson Medical College, Philadelphia, wrote concerning puerperal fever:

The contagious nature of puerperal fever though asserted by so many of the brethren entitled to my respect for their learning and judgment and humanity, I cannot for a moment admit.<sup>4</sup>

In Dewees's textbook which was widely used in this country at that time, the following appeared in 1847:

Had not the belief that puerperal fever was a contagious disease, and had not this belief a great effect upon the minds of females who are pregnant, we should not have touched upon this subject believing as we do that the opinion is altogether without foundation at least in this country.<sup>5</sup>

After the storm of controversy following his original paper, Holmes, in republishing his essay in 1855, ended his introduction with these words, forged at white heat:

There is no quarrel here between men, but there is deadly incompatibility and exterminating warfare between doctrines.

Let the men who mold opinions look to it, if there is any voluntary blindness, any interested oversight any culpable negligence even, in such a matter, and the facts shall reach the public ear, the pestilence carrier of the lying-in chamber must look to God for pardon, for man will never forgive him.<sup>6</sup>

At the time Holmes first published his essay in America, 829 of the 5,139 women delivered in the maternity hospital in Vienna during the period 1841-1843 died, a death rate of 16 per cent. In 1847, Semmelweis, a

3 Mackintosh, John. A Treatise on the Disease Termed Puerperal Fever. London: William Blackwood, 1822. pp. 251-252.

4 Meigs, Charles D. Woman Her Diseases and Remedies. Philadelphia: Blanchard & Lea, 1851. p. 604.

5 Dewees, William P. A Treatise on the Diseases of Females. Philadelphia: Lea & Blanchard, 1847. p. 380.

6 Holmes, Oliver Wendell. Medical Essays. New York: Houghton Mifflin Company, 1891. pp. 103-172 (vol. 9 of 13 volumes The Writings of Oliver Wendell Holmes).

1 Holmes, Oliver Wendell. The Contagiousness of Puerperal Fever read before the Boston Society for Medical Improvement Feb. 13, 1843. New England Quart. J. Med. & Surg. 1. 503-530, 1843.

2 Cullingworth, Charles J. Oliver Wendell Holmes and the Contagiousness of Puerperal Fever. London: Henry J. Glusker, 1906. pp. 24-25.



recent medical graduate working in this hospital, declared that the cause of puerperal fever was conveyed by the examining finger of the doctor or midwife, by instruments, by sponges or, more rarely, by air. He instituted the practice of washing the hands with chlorinated lime water, and the mortality in the clinic within a year fell to 3 per cent and a year later to 1.3 per cent, not because of improved therapeutic measures, for there were none, but because of effective prophylaxis. Not until 1861 did Semmelweis publish his great treatise on the subject.<sup>8</sup>

Le Fort, quoted by J. M. Duncan, reported in 1866 that the maternal mortality in French hospitals was 1 in 29, with some hospitals losing 1 out of every 7 maternity patients. Duncan, after an exhaustive study of the statistics of private practice in hospitals in Europe, concluded in 1871 that

not fewer than 1 in every 120 women delivered at or near the full time died within the four weeks of childbed. In a well managed hospital they die at the rate of 1 in 100, all the country over, the mortality is probably not much less, in the best private practice it appears to be greater.

Between one third and one half of these deaths were attributed to puerperal fever. Although this book was written almost thirty years after Holmes's famous essay, Duncan still believed that the term "preventable," as used in connection with puerperal fever, "is sufficient proof of the thoroughly unpractical or sensational character of the speculations of any writer who uses it as implying that we have the means of preventing its appearance." And he went on to say "It is, in truth, as little preventable as any disease in the nosology, or any crime in the statute book. It is, possibly preventable, but it has certainly never been prevented." Curiously enough, in later chapters of the same book Duncan, in making recommendations concerning the construction of maternity hospitals, urged that women attacked by puerperal fever should be placed in an infirmary which had no direct communication with the maternity hospital and even that the infirmary linen should be washed "in its own wash house." He also advised that maternity hospitals should be arranged in such a manner as to admit not more than 800 to 1,000 women annually.<sup>9</sup>

Not until 1867 did Lister give to the world his essay "On the Antiseptic Principle in the Practice of Surgery,"<sup>10</sup> and in 1879 Pasteur published his observations that the streptococci (chapelets en grains) were the organisms causing puerperal fever,<sup>11</sup> thus scientifically establishing the basis for the prevention of puerperal infection.

The ponderous wheels of progress turned slowly. Hospitals began to be constructed and maintained with proper safeguards for the protection of maternity patients. The principles of aseptic technique became more generally understood and practiced by physicians. The practice of training and using skilled nurses was slowly spreading over the world.

Cullingworth<sup>2</sup> reported in 1905 to the British Medical Association

During the fifty-seven years 1847 to 1903 for which statistics for England and Wales are available, there were registered no fewer than 93,243 mothers as having died of puerperal septicemia, and the enormous sacrifice that these figures represent has been going on steadily all the time and shows no signs of diminution. If there be any change at all, it is in the direction of increase.

and let it be remembered that the returns of the Registrar-General take no account of the vast array of nonfatal cases, with their train of suffering and often of permanent ill health, or of the many fatal cases that for various reasons have been attributed on the death certificate to some other than the true cause. Puerperal fever continues to prevail as though Pasteur and Lister had never lived.

However, the data presented by Arnold Lea in 1910 show the mortality from puerperal infection (excluding infected abortions) in England and Wales averaging 1 such death for every 400 births during the twenty years preceding 1903 and a decrease to 1 such death for every 600 births during the four years 1903 to 1907. Statistics from some sections of the Continent suggested a decrease of 25 to 30 per cent in the maternal mortality from infection during the last twenty years of the nineteenth century.<sup>12</sup> The seeds planted by Holmes and Semmelweis were beginning to bear fruit.

Comparable statistics were not compiled in the United States in the nineteenth century, but we do know that in the state of New York in 1908 one woman died of puerperal infection for every 400 live births.<sup>13</sup> This same mortality rate of 1 death from puerperal infection for every 400 live births was reported by the Bureau of the Census for the United States birth registration area from 1915 through 1935. Approximately 40 per cent of these deaths followed abortions. From 1935 through 1941 the United States mortality rate from puerperal infection decreased 50 per cent,<sup>14</sup> most of the decrease occurring before the sulfonamides were in general use.

By 1941 in England and Wales only 1 out of 2,000<sup>15</sup> and in the United States 1 out of 1,300 mothers died after delivery from puerperal infection (abortion deaths excluded). Only 1,943 deaths from puerperal infection following delivery were reported in the United States in 1941.<sup>16</sup> Most, if not all, of these were, of course preventable. Many physicians now practicing obstetrics in the United States will probably not encounter the tragedy of a maternal death from infection in a lifetime of service. What a far cry from the experience of the Boston physician<sup>2</sup> who wrote Dr. Holmes that he had lost 5 patients from puerperal fever between May 7 and June 17, 1842.

The advances in the science of obstetrics initiated by Holmes and the great men who followed him have in a century practically swept from the civilized world one of the most devastating diseases of mankind.

It is hoped that these fragmentary notes from this period of medical history may serve to remind us again of the courage and wisdom of one of America's greatest men of medicine.

12 Lea, Arnold. Puerperal Infection. London: Oxford University Press, 1910. pp. 21, 23, 25.

13 New York State Health Department. Annual Report 2: 81, 133, 1908.

14 U. S. Bureau of the Census. Death Rates for Puerperal Cause, United States, 1915-1940. Vital Statistics Special Report No. 33, 15, 380, 381 (June 15), 1942.

15 Great Britain. Summary Report by the Ministry of Health April 1, 1941 to March 31, 1942. p. 15. Cmd. 6394. London: H. M. Stationery Office, 1942.

16 U. S. Bureau of the Census. Deaths from Puerperal Cause, United States, 1941. Vital Statistics Special Report No. 5, 17, 36, 34 (Dec. 28), 1942.

7 Thoms, Herbert. Classical Contributions to Obstetrics and Gynecology. Baltimore: Charles C. Thomas, 1932. pp. 184-186.

8 Semmelweis, Ignaz Philipp. The Cause, Concept and Prophylaxis of Childbed Fever (1860), translated by T. P. Murphy. Medical Classics vol. 5. Baltimore: Williams & Wilkins, 1941. pp. 338-775.

9 Duncan, J. M. On the Mortality of Childbed and Maternity. Hospital, New York: William Wood & Co., 1871. pp. 101, 102, 166, 168.

10 Lister, Joseph. On the Antiseptic Principle in the Practice of Surgery. Lancet 2: 353-366 (Sept. 21), 1867.

11 Pasteur, Louis. Septicemic puerperal fever. Bull. de l'Acad. de med. S. 271, 1879.

## Council on Pharmacy and Chemistry

### REPORTS OF THE COUNCIL

THE COUNCIL HAS AUTHORIZED PUBLICATION OF THE FOLLOWING  
STATEMENT  
AUSTIN E SMITH, M D, Secretary

#### STATUS OF THE ORAL USE OF THE SODIUM SALTS OF THE SULFONAMIDES

The oral use of the sodium salts of the sulfonamides has been the subject of discussion and dispute and innumerable inquiries. Economic and therapeutic factors have been concerned in the origin of the inquiries and, while opinion has been divided in some instances, it appears that some degree of skepticism has greeted the general adoption of the procedure. Accordingly, when one manufacturer submitted its brand of sulfathiazole sodium for oral use a review of the existing evidence on this subject was made.

Some of the information supplied by the firm includes studies on monkeys and human individuals which had been carried out in its laboratories and elsewhere. Some of the latter data have been published or are in the process of publication.

Of 8 monkeys which received 1 Gm of sulfathiazole or sulfathiazole sodium, those receiving sulfathiazole experience a mean blood concentration (free sulfonamide) of 275 mg per hundred cubic centimeters at the end of one hour, 11 mg at the end of three hours, 1235 mg in five hours and 11 mg in eight hours, while those monkeys receiving 1 Gm of sulfathiazole sodium obtained a mean blood concentration of 125 mg in one hour, 1812 mg in three hours, 1375 mg in five hours and 8 mg in eight hours. Unfortunately, an estimate for the second hour was not reported to the Council.

Comparative studies were reported on 3 normal men who were given a single dose of 4 Gm of sulfathiazole two and one-half hours after a light breakfast, and five days later 4 Gm of sulfathiazole sodium. At intervals of one, three and seven hours the blood concentration of free sulfonamide after sulfathiazole administration (for the three subjects) was 24, 13, 21, 40, 46, 44, and 38, 45, 23, and after sulfathiazole sodium 73, 46, 47, 58, 69, 73, and 33, 47, 38. The firm stated that the patients "tolerated sulfathiazole without symptoms," but "all had slight abdominal discomfort (characterized by gas) from one and one-half to five hours after medication with sulfathiazole sodium, 1 of the 3 men was slightly nauseated."

In commenting on a report by Carroll, Kappel and Allen,<sup>1</sup> the firm averred "The average greatest blood concentration of the drug occurred between two and three hours after ingestion, one hour earlier than the maximum concentration which occurred after sulfathiazole administration." Reference to another paper, by Wheeler and Plummer,<sup>2</sup> revealed an apparent increase in the blood level following single 4 Gm doses of sodium sulfadiazine over that for sulfadiazine, but the difference was not extreme between 3 and 4 mg for free sulfadiazine at the end of two hours, as compared to between 6 and 7 mg for sulfadiazine sodium and 5 to 6 mg at the end of four hours for sulfadiazine as compared to 7 to 8 mg for sulfadiazine sodium. In all reported instances, as far as could be determined from the firm's brief, only one dose appears to have been given for blood estimations.

Other reports on blood estimations, elimination and therapeutic actions were given. In the case of the latter, however, controls with the free sulfonamide seemed to be in the minority. It is difficult to estimate accurately the possible efficacy of a sodium salt of a compound such as a sulfonamide unless concurrent tests on controls with the free sulfonamide are undertaken and reported, the degree of uncertainty in clinical interpretation and the margin of possible error in compiling evaluations are very real factors influencing this estimation. Tolerance of the sodium salts in oral therapy was reported as favorable or "better," but again the firm failed to submit details of controls.

In reviewing the subject of the oral use of sodium salts of the sulfonamides there are three questions to be answered: 1 Are the sodium salts of the sulfonamides more effective as therapeutic agents than the free sulfonamides? 2 Are the sulfonamides more rapidly and more completely absorbed when given orally in the form of the sodium salts? 3 Are they more readily tolerated?

With regard to the first question there is not enough evidence available at the present time to show that the sodium salts are more effective therapeutic agents in the treatment of infections than the free sulfonamides. Their effect would appear to be equal to that of free sulfonamide therapy, but this is not surprising since the sodium salt is converted into the free sulfonamide in the stomach when acid is present.

With respect to the second question, there seems to be no doubt that the sodium salts of sulfadiazine, and this probably is true of sodium sulfathiazole as well, may be absorbed more rapidly and more completely than the free sulfonamides when it is given by mouth to the fasting subject or when it is given directly into the duodenum by duodenal tube. When it is given after a meal the absorption is delayed and less can be absorbed than when it is taken in the fasting state.

With regard to the third question, the only answer is that there is no evidence which is convincing that the sodium salts are more readily tolerated than the free sulfonamides.

In view of the fact that it is necessary to give the sodium salts directly into the duodenum or to a fasting subject in order to get more rapid absorption than when the free sulfonamides are given, there would seem to be no good reason for accepting the sodium salts for oral administration at the present time.

If it could be shown that the sodium salts were better tolerated and that the therapeutic results were better, then the Council might consider the sodium salts for oral administration.

After due consideration of the evidence presented by the manufacturer submitting sulfathiazole sodium for oral use and of that available from other sources, the Council decided that the work done to date is insufficient to justify recognition of the claimed therapeutic advantage, further, the Council has made quite information with respect to proper dosage of the drug and, if the drug is absorbed much more rapidly, as is claimed, additional evidence with respect to safety seems necessary. The Council recognizes the value of decreasing the time necessary for clinical response following drug administration and will again give consideration to the subject when more conclusive evidence has been presented or made available. Until that time, if it is necessary to bring the blood levels up to the optimal figures immediately, the parenteral use of the sodium salts should be given preference.

#### NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

AUSTIN E SMITH, M D, Secretary

**NIKETHAMIDE** (See Supplement to New and Nonofficial Remedies, 1942, p 17)

The following dosage forms have been accepted  
ABBOTT LABORATORIES, NORTH CHICAGO, ILL

Sterile Ampoules Nikethamide 25% W/V 15 cc and 5 cc

DRUG PRODUCTS CO, INC, LONG ISLAND CITY, N Y

Ampuls Solution of Nikethamide 25% W/V 15 cc

Solution of Nikethamide 25% W/V 30 cc vials Chlorobutanol 0.5 per cent added as a preservative

SMITH-DORSEY CO, LINCOLN, NEB

Ampoules Solution Nikethamide 25% W/V 15 cc and 5 cc

**ASCORBIC ACID-U S P** (See New and Nonofficial Remedies, 1942, p 564)

The following dosage forms have been accepted

MCNEIL LABORATORIES, INC, PHILADELPHIA

Capsules Ascorbic Acid 20 mg and 100 mg

<sup>1</sup> Carroll Grayson Kappel Louis and Allen Hollis J Urol 46 1033 (Nov) 1941  
<sup>2</sup> Wheeler C and Plummer N Ann Int Med 16 269 (Feb) 1942

# HOSPITAL SERVICE IN THE UNITED STATES

TWENTY-SECOND ANNUAL PRESENTATION OF HOSPITAL DATA BY THE COUNCIL ON MEDICAL EDUCATION AND HOSPITALS OF THE AMERICAN MEDICAL ASSOCIATION

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One person every 2.5 seconds is the rate at which patients entered hospitals in the United States during the year 1942. Nearly one tenth (9.5 per cent) of the entire population (1940 census) became a hospital bed patient. Surgical operations were at the rate of one to each 5.6 seconds and the hospital birth rate exceeded three live babies to the minute.

A total of 6,345 registered hospitals is represented in the following report on the Twenty-Second Annual Census of Hospitals by the American Medical Association. This is a decrease of 13 in the number of hospitals on the Register one year ago.

persistently followed up by letters, telegrams and long distance calls.

In the use of population figures in this article it was decided most reliable data would result from using the United States Census Bureau figures of 1940 rather than the Bureau's estimates for 1942.

There is some incompleteness, extent unknown, in figures on recently established federal hospitals due to withholding of information that might be of assistance to our country's enemies.

To the questions as to whether the hospital has a blood bank, a plasma bank and whether these were

## SUMMARY OF HOSPITAL DATA

	Number	Beds	Bassinets	Patients Admitted in 1942
1 Registered hospitals and sanatoriums approved for internships, residencies and fellowships	1,070	544,489	32,349	6,002,666
2 Other registered hospitals, sanatoriums and related institutions	5,275	839,338	39,099	6,542,944
Total registered	6,345	1,383,827	71,448	12,545,610
Of the foregoing the American College of Surgeons approves	2,404	767,384	48,911	8,948,126

Found unsatisfactory on investigation (capacity 15,260)

Unclassified emergency stations, clinics, offices, cottages and so on with facilities for bed care (capacity unknown)

Hospitals and sanatoriums opened Registration pending

\*As of Dec. 31, 1942

Number  
539  
2,698  
62

The capacity of registered hospitals is 1,383,827 beds and 71,448 bassinets. There are 59,446 more beds and 5,285 more bassinets than one year ago. This growth in hospital facilities for the past year was the equivalent of a 163 bed hospital for every day in the year.

For thirty-one years prior to 1941 the average annual growth of hospital facilities was around 25,000 to 30,000 beds.

Grateful acknowledgment is made for the cooperation of officers of hospitals and others who, in spite of war conditions, have furnished the data which make possible the great amount of valuable information that is presented in this issue. Reports were received from over 99 per cent of the hospitals addressed.

The reports by and large were more complete and more accurate than in any previous year. The relatively few incomplete reports and tardy ones were

readily available outside if not in the hospital, 610 have blood banks, 1,741 have plasma banks, 546 have both while 2,457 have such facilities readily available but not in hospital.

The total number of patients admitted during the year was 12,545,610, an increase of 949,422, or 8.2 per cent, over the previous year.

The total of hospital patients operated on during the year was 5,607,879, or 44.7 per cent of all who were admitted for bed care.

The present report covers the calendar year for all the hospitals approved for internships and residencies and many others, but many of the hospitals that are registered but not approved reported for the year ended Sept. 30, 1942. The hope is entertained that the census may before long be placed on the basis of a uniform census period, preferably the calendar year.

The total patient days of hospital service for 1942 was 411,000,220, an increase over 1941 of 14,230,985. The number of patient days is obtained by multiplying the average daily census, 1,126,028, by 365.

There are 1,439 schools of nursing that are accredited by state boards of nurse examiners. Their total student

*Percentage of Beds Occupied*

	1940	1941	1942
<i>According to Ownership or Control</i>			
Federal	70.5	66.3	66.6
State	94.4	93.6	93.4
County	85.0	84.7	77.7
City	80.5	78.2	76.9
City county	65.5	73.7	70.5
Total governmental	89.8	80.2	84.5
Church	70.4	73.1	74.9
Nonprofit associations	70.8	72.7	74.5
Total nonprofit	70.6	73.2	74.7
Individual and partnership	52.0	57.7	56.1
Corporations (profit unrestricted)	62.5	64.5	63.3
Total proprietary	56.8	60.8	60.4
Total nongovernmental	68.5	71.4	72.7
<i>According to Type of Service</i>			
General	70.3	65.2	65.2
Nervous and mental	95.1	94.5	94.4
Tuberculosis	85.6	85.7	85.0
Maternity	62.6	65.3	70.7
Industrial	53.9	56.2	55.5
Eye, ear, nose and throat	54.4	55.5	51.9
Children	68.2	68.1	67.4
Orthopedic	76.5	77.1	75.4
Isolation	42.4	35.0	37.2
Convalescent and rest	77.7	82.7	82.1
Hospital departments of institutions	70.6	76.2	66.4
All other hospitals	79.9	85.6	81.1
Total all hospitals	83.7	82.1	81.4

The total number of all registered hospitals closed during the year was 122. An additional 51 discontinued their hospital services entirely or to the extent that they would no longer be classified as hospitals or related institutions. Eleven registered hospitals were removed from the list because of their admitted failure reasonably to comply with the Essentials of a Registered Hospital.

#### AMERICAN COLLEGE OF SURGEONS AND A. M. A. UNITE ON ANNUAL CENSUS BLANK

For the third time the questionnaires used by the Council represent a combination of the annual census blank of the American Medical Association and the annual questionnaire of the American College of Surgeons. Cooperation of the College and the Council was effected to reduce work of filling out questionnaires in the office of hospitals. It also facilitates the gathering of essential data required by the two cooperating organizations for their use, and for the nation. Most of all, it reduces the confusion which exists when several organizations are working in the same field.

Each organization has its own distinctive separate requirements, inspections and approved lists. Approval of a given institution by one organization does not in any way affect the initiative and the responsibility of the other organization with regard to the approval of that institution. There is cooperation as to the joint questionnaire, correlation of inspection itineraries and mutual courtesy in the use of symbols to designate each other's approvals.

#### *Hospitals Fully Approved by the American College of Surgeons in the United States*

	Hospitals	Beds	Bassinets	Patients Admitted
1942	2,401	767,841	48,911	8,948,176
1941	2,307	756,331	44,350	8,334,516
1940	2,261	655,654	41,694	7,495,255

#### *Average Length of Stay per Patient in General Hospitals, 1935, 1941 and 1942*

	1935	1941	1942
<i>According to Ownership or Control</i>			
Federal	26 days	21 days	22 days
State	21 days	18 days	20 days
County	20 days	15 days	19 days
City	16 days	15 days	15 days
City county	17 days	12 days	12 days
All governmental general	22 days	18 days	19 days
Church related	12 days	10 days	10 days
Other nonprofit associations	11 days	10 days	10 days
All nonprofit general	11 days	10 days	10 days
Individual and partnership	8 days	8 days	7 days
Corporations (profit unrestricted)	9 days	8 days	8 days
All proprietary general	9 days	8 days	8 days
All nongovernmental general	11 days	10 days	10 days
All general hospitals	14 days	12 days	13 days

The officials of the A. M. A. and the College, and their office staffs, worked together to design a questionnaire that would elicit more information with fewer questions and achieve greater uniformity and simplification in the use of terms. All the hospitals that are fully approved as meeting the minimum standards of the American College of Surgeons are designated with a delta (Δ) in the list of registered hospitals published in a later section of this article.

enrolment reported is 98,166, a loss of 9 schools but a gain of 4,189 in enrolment.

Special attention of persons interested in growth of hospital facilities is directed to the year by year summaries in the footings of tables 1 and 2.

As to what classes or groups of hospitals are responsible for increases and decreases during the year, the total governmental hospitals showed an increase in number from 1,864 to 1,924.

#### GOVERNMENTAL HOSPITALS

Under the total governmental hospitals are included those operated by different arms of the federal government, by states, by counties, by cities and by cities and counties combined.

The total bed capacity of the governmental hospitals rose from 965,511 to 1,015,781 and of bassinets from 11,494 to 11,828. The patients admitted to governmental hospitals increased from 3,662,602 to 4,009,675, and the average census rose from 831,892 to 858,638.

The federal hospitals totaled 474 as compared with 428 a year ago, their total bed capacity being 220,938 as compared with 179,202 a year ago. Bassinets increased from 1,006 to 1,206. The number of patients reported as having been admitted rose from 1,268,112 to 1,675,722, and the average census was 147,094 as compared with 118,890 for the previous year. Continuing to examine the footings of table 1, it will be observed that very few changes—no striking increases or decreases—are found in any of the capacity or occupancy columns for hospitals operated by states, counties, cities or those run jointly by cities and counties. The increases and reductions in number of hospitals in each classification, it should be remembered, are net figures after taking into account hospitals that were closed during the year and the new hospitals opened.

## NONGOVERNMENTAL HOSPITALS

In the field of nongovernmental institutions there are 4,421 hospitals—a reduction in number from 4,494 nongovernmental hospitals existing a year ago. Their bed capacity at present, however, is 368,046, a considerable increase over 358,870 reported last year. Their bassinets now number 59,620 as compared with 54,669 a year ago. The total patients admitted were 8,535,935, showing quite a large increase over their former figure, 7,933,586. The average census changed during the year from 255,147 to 267,390.

The nongovernmental hospitals fall readily into two general groups—the nonprofit organizations section B of table 1, composed of those that are church related, and other nonprofit associations, and section C of table 1, composed of hospitals that are owned by individuals or partnerships and those owned by corporations that are unrestricted as to profit. In the nonprofit group are 2,926 with a capacity of 316,291 and 51,416 bassinets to which were admitted 7,463,648 patients and which had an average census of 236,154. The nonprofit group, therefore, showed a strong increase, and the growth was shared in some part by the church related hospitals but to a much greater extent by the other nonprofit associations.

Church hospitals show a net loss from 993 to 977 but a considerable increase in the number of beds and bassinets. Their patients admitted increased from 2,961,594 to 3,211,162 and their average census from 90,195 to 94,521.

The other nonprofit associations increased in number from 1,917 to 1,949 and in capacity from 182,140 beds to 190,150 beds and in bassinets from 26,422 to 29,154. They admitted 4,252,486 as compared with 3,931,141 last year, and their average census was 141,633 as compared with 132,472 last year.

## HOSPITALS ACCORDING TO TYPES OF SERVICE

The hospitals that have been registered nearly all fall easily into twelve classifications as to the type of service rendered. These together with the number of hospitals now in each classification are as follows: general 4,557, nervous and mental 586, tuberculosis 468, maternity 113, industrial 36, eye, ear, nose and throat 42, children's 43, orthopedic 79, isolation 52, convalescent and rest 139, institutional 194, all other types 36. Among all these classes as to types of service there was little change in number or capacity or the amount of service rendered during the past year, except in the general hospitals, and there we find a very great increase.

The number of general hospitals had a net increase of 39. Their capacity increased from 533,498 beds to 594,260, the bassinets from 61,732 to 67,115. The patients admitted reached the enormously large total of 11,634,288 as compared with 10,646,947 in the preceding year.

The trends in all the classifications as to type of service are shown in the footings of the various columns of table 2. The recapitulation by years covers each annual census of hospitals beginning with that of 1927.

## PERCENTAGE OF BEDS OCCUPIED

The percentage of beds occupied is obtained by dividing the number of beds, not including bassinets into the average number of bed patients in the hospital, not including newborn infants and of course, not including outpatients. The percentage of beds occupied is presented in the accompanying table to assist the reader

in understanding the situation in 1942 and also in observing the trend for the past three years 1940, 1941 and 1942. The percentage of occupancy in all hospitals in those three years decreased steadily from 83.7 per cent to 81.4 per cent. Closer examination shows, however, that the nongovernmental hospitals increased in occupancy during the same period from 68.5 per cent to

*Summary of Hospital Service in the United States According to Type of Service and Agencies Concerned from the 1942 Census of Hospitals Registered by the American Medical Association*

U S Totals	6345	1353527	1,126,025	71445	16,0599	12,545,610
Type	Hospitals	Beds	Average Census	Bassinets	Births	Admissions
Federal						
Totals	474	220,938	147,094	1,206	15,157	1,675,722
General	398	169,710	99,533	1,136	15,135	1,632,365
N & M	31	44,513	41,884			18,096
TB	18	4,923	4,309	2	2	9,410
Special	4	592	455	4	15	1,644
Inst	21	1,144	6.3	4	7	14,115
State						
Totals	570	606,437	566,457	1,618	31,573	6,014,811
General	62	24,428	1,061	1,347	31,012	3,311,885
N & M	266	448,014	522,113	135	375	1,351,988
TB	75	24,895	21,451	4	15	2,344
Special	16	2,190	1,670			14,631
Inst	111	6,910	8,233	44	151	91,503
County						
Totals	565	95,997	76,948	3,512	69,891	606,390
General	245	41,716	25,551	5,110	67,415	540,185
N & M	52	28,152	24,727	0	51	13,951
TB	184	21,678	20,545	16	35	23,888
Special	10	1,567	1,077	350	7,407	15,218
Inst	14	2,594	2,118			15,148
City						
Totals	334	79,252	60,982	4,847	115,004	999,687
General	255	49,494	37,191	4,756	116,010	930,92
N & M	6	5,319	4,985	1	1	1,071
TB	30	12,895	11,448	87	1,821	20,561
Special	53	6,639	3,103	23	17	30,759
Inst	10	4,905	4,252		95	9,901
City-County						
Totals	61	10,157	7,177	645	15,895	126,305
General	37	6,418	4,065	619	15,895	119,504
N & M						
TB	16	2,285	1,955			2,416
Special	5	470	327	0		7,416
Inst	3	975	811			1,939
Church						
Totals	977	126,141	94,521	22,262	565,969	3,211,162
General	859	114,249	84,943	20,947	547,177	3,156,975
N & M	17	3,444	3,265			4,279
TB	20	2,880	2,719			4,345
Special	79	5,771	3,948	1,300	15,792	45,676
Inst	2	88	46	15		50
Nonprofit						
Totals	1,949	190,150	141,633	29,154	695,962	4,252,486
General	1,534	151,418	111,938	27,349	667,394	3,931,141
N & M	37	7,210	6,610			12,711
TB	82	7,600	6,015	1		9,585
Special	262	21,977	15,523	1,503	2,655	27,070
Inst	34	1,954	1,187	1		16,458
Individual and Partnership						
Totals	1,089	27,996	1,771	5,147	91,879	176,466
General	882	20,672	10,693	4,793	86,159	159,717
N & M	96	4,704	3,065			11,499
TB	27	1,010	1,291	6	81	2,006
Special	54	2,110	1,317	345	5,679	31,944
Inst						
Corporations						
Totals	406	27,779	17,521	7,057	65,969	49,521
General	258	16,125	10,275	2,965	65,969	47,551
N & M	76	5,006	3,460	16	3	16,054
TB	16	1,117	974			1,552
Special	96	1,471	852	73	997	20,971
Inst						

72.7 per cent, the increase being found in all groups of nongovernmental hospitals, including church related, nonprofit associations and proprietary institutions.

It is in the field of governmental hospitals that the rate of occupancy shows a downward trend from 89.8 per cent in 1940 to 84.5 per cent in 1942. During that period federal hospital occupancy declined from 79.5 per cent to 66.6 per cent. State, county and city hospitals as groups each showed a decline. Persons who are looking for figures to guide them in regard to individual projects should not base their conclusions on figures that arise from group comparisons, such as are made

TABLE 1—HOSPITAL FACILITIES BY STATES AND BY CONTROL A GOVERNMENT HOSPITALS

Marginal No		Federal				State				County				City				City County				Total Governmental				Marginal No		
		Hospitals	Beds	Basinets	Patients	Average	Hospitals	Beds	Basinets	Patients	Average	Hospitals	Beds	Basinets	Patients	Average	Hospitals	Beds	Basinets	Patients	Average	Hospitals	Beds	Basinets	Patients	Average		
1	Alabama	10	4,753	11	33,406	2,778	7	6,850	6	6,300	6,721	8	1,706	78	12,5	35	4,758	72	257	46	7,320	174	18	12,981	185	70,052	10,400	1
2	Arizona	22	3,315	90	23,227	1,802	3	1,140	7	1,147	1,017	7	416	58	7	6,05	110	3	257	46	7,320	174	15	4,900	148	31,517	10,500	2
3	Arkansas	4	4,216	7	27,878	2,820	4	6,660	20	7,117	1,017	7	416	58	7	6,05	110	3	257	46	7,320	174	15	4,900	148	31,517	10,500	3
4	California	10	4,753	11	33,406	2,778	7	6,850	6	6,300	6,721	8	1,706	78	12,5	35	4,758	72	257	46	7,320	174	18	12,981	185	70,052	10,400	4
5	Colorado	4	4,216	7	27,878	2,820	4	6,660	20	7,117	1,017	7	416	58	7	6,05	110	3	257	46	7,320	174	15	4,900	148	31,517	10,500	5
6	Connecticut	4	4,216	7	27,878	2,820	4	6,660	20	7,117	1,017	7	416	58	7	6,05	110	3	257	46	7,320	174	15	4,900	148	31,517	10,500	6
7	Delaware	4	4,216	7	27,878	2,820	4	6,660	20	7,117	1,017	7	416	58	7	6,05	110	3	257	46	7,320	174	15	4,900	148	31,517	10,500	7
8	Dist of Columbia	4	4,216	7	27,878	2,820	4	6,660	20	7,117	1,017	7	416	58	7	6,05	110	3	257	46	7,320	174	15	4,900	148	31,517	10,500	8
9	Florida	14	6,227	57	66,965	2,855	6	6,491	7	4,557	6,151	8	896	77	13,780	72	4	250	25	3,425	113	12	13,451	176	40,974	11,672	9	
10	Georgia	18	10,943	56	92,838	6,365	4	7,703	3	1,246	1,611	8	427	62	8,097	20	9	1,025	397	8,817	1,171	42	13,451	176	40,974	11,672	10	
11	Idaho	12	3,115	4	4,406	3,847	22	4,412	61	59,946	40,671	27	136	47	4,490	7	19	1,025	397	8,817	1,171	42	13,451	176	40,974	11,672	11	
12	Illinois	12	3,115	4	4,406	3,847	22	4,412	61	59,946	40,671	27	136	47	4,490	7	19	1,025	397	8,817	1,171	42	13,451	176	40,974	11,672	12	
13	Indiana	6	3,115	6	14,051	2,655	18	15,017	62	14,099	14,121	11	240	27	3,740	2,017	6	3,300	171	36,610	2,918	66	21,771	517	213,241	59,466	13	
14	Iowa	1	1,758	4	21,828	1,631	11	8,181	60	11,489	11,176	11	70	42	5,983	4	10	1,025	397	8,817	1,171	42	13,451	176	40,974	11,672	14	
15	Kansas	7	2,870	17	21,828	1,631	11	8,181	60	11,489	11,176	11	70	42	5,983	4	10	1,025	397	8,817	1,171	42	13,451	176	40,974	11,672	15	
16	Kentucky	7	2,870	17	21,828	1,631	11	8,181	60	11,489	11,176	11	70	42	5,983	4	10	1,025	397	8,817	1,171	42	13,451	176	40,974	11,672	16	
17	Louisiana	11	6,748	4	50,000	4,318	11	12,171	317	71,789	10,287	3	243	15	3,206	195	5	1,060	54	19,700	2,448	23	19,019	321	153,853	42,068	17	
18	Maine	7	6,748	4	50,000	4,318	11	12,171	317	71,789	10,287	3	243	15	3,206	195	5	1,060	54	19,700	2,448	23	19,019	321	153,853	42,068	18	
19	Maryland	7	6,748	4	50,000	4,318	11	12,171	317	71,789	10,287	3	243	15	3,206	195	5	1,060	54	19,700	2,448	23	19,019	321	153,853	42,068	19	
20	Massachusetts	12	5,001	33	51,967	3,619	13	10,163	69	16,231	9,747	1	106	21	1,600	37	25	1,429	32	3,669	1,012	16	16,311	198	10,280	14,088	20	
21	Michigan	8	3,679	4	18,938	2,900	13	25,213	63	26,741	21,111	28	13,28	84	27,011	1,462	25	6,460	472	86,248	4,279	27	16,311	198	10,280	14,088	21	
22	Minnesota	9	2,044	32	9,996	1,861	17	10,063	46	11,843	1,041	31	1,712	15	3,421	1,481	21	4,771	51	88,944	3,891	94	47,072	563	164,457	37,903	22	
23	Mississippi	9	4,288	7	9,829	2,906	11	5,891	62	17,004	1,100	2	62	11	2,140	1	21	1,460	248	27,272	971	69	22,402	404	69,667	19,969	23	
24	Missouri	7	4,68	6	67,224	4,411	13	12,843	10	10,441	11,891	6	466	71	7,401	291	16	9,112	226	47,618	7,461	43	30,869	313	122,687	24,072	24	
25	Montana	7	4,68	6	67,224	4,411	13	12,843	10	10,441	11,891	6	466	71	7,401	291	16	9,112	226	47,618	7,461	43	30,869	313	122,687	24,072	25	
26	Nebraska	4	4,216	7	27,878	2,820	4	6,660	20	7,117	1,017	7	416	58	7	6,05	110	3	257	46	7,320	174	15	4,900	148	31,517	10,500	26
27	Nevada	4	4,216	7	27,878	2,820	4	6,660	20	7,117	1,017	7	416	58	7	6,05	110	3	257	46	7,320	174	15	4,900	148	31,517	10,500	27
28	New Hampshire	5	1,000	17	33,439	3,280	16	17,166	5	7,795	3,012	2	10	3	3,124	223	2	1,0	11	2,476	2,0	17	7,317	61	14,588	6,934	28	
29	New Jersey	15	1,495	59	13,020	1,078	16	17,166	5	7,795	3,012	2	10	3	3,124	223	2	1,0	11	2,476	2,0	17	7,317	61	14,588	6,934	29	
30	New Mexico	15	1,495	59	13,020	1,078	16	17,166	5	7,795	3,012	2	10	3	3,124	223	2	1,0	11	2,476	2,0	17	7,317	61	14,588	6,934	30	
31	New York	27	12,848	64	88,183	9,646	46	101,7	91	11,06	9,431	16	1,117	59	12,111	1,888	32	21,711	12	2,983	52	32	244,944	1,368	473,174	129,205	31	
32	North Carolina	4	4,216	7	27,878	2,820	4	6,660	20	7,117	1,017	7	416	58	7	6,05	110	3	257	46	7,320	174	15	4,900	148	31,517	10,500	32
33	North Dakota	5	3,925	3	18,543	4,891	23	20,671	4	4,406	1,312	36	3,616	56	14,935	2,98	20	4,095	332	3,023	3,065	12	17,032	182	10,885	14,811	33	
34	Ohio	17	4,971	107	40,745	2,392	24	20,671	4	4,406	1,312	36	3,616	56	14,935	2,98	20	4,095	332	3,023	3,065	12	17,032	182	10,885	14,811	34	
35	Oklahoma	9	1,817	14	10,178	1,442	40	46,241	16	6,967	3,094	13	4,628	12	2,110	31	9	1,067	101	21,912	59	10	1,067	101	21,912	59	35	
36	Oregon	2	5,001	33	51,967	3,619	13	10,163	69	16,231	9,747	1	106	21	1,600	37	25	1,429	32	3,669	1,012	16	16,311	198	10,280	14,088	36	
37	Pennsylvania	37	10,411	58	71,610	6,005	15	17,523	10	29,778	13,246	2	10	3	3,124	223	2	1,0	11	2,476	2,0	17	7,317	61	14,588	6,934	37	
38	Rhode Island	10	8,577	30	7,027	5,27	4	2,845	74	2,111	1,111	1	10	3	3,124	223	2	1,0	11	2,476	2,0	17	7,317	61	14,588	6,934	38	
39	South Carolina	10	8,577	30	7,027	5,27	4	2,845	74	2,111	1,111	1	10	3	3,124	223	2	1,0	11	2,476	2,0	17	7,317	61	14,588	6,934	39	
40	South Dakota	3	5,472	4	26,077	4,002	16	18,941	21	21,335	18,127	21	1,140	14	21,037	707	8	1,013	17	10,191	911	18	13,778	207	73,541	21,037	40	
41	Tennessee	3	5,472	4	26,077	4,002	16	18,941	21	21,335	18,127	21	1,140	14	21,037	707	8	1,013	17	10,191	911	18	13,778	207	73,541	21,037	41	
42	Texas	3	5,472	4	26,077	4,002	16	18,941	21	21,335	18,127	21	1,140	14	21,037	707	8	1,013	17	10,191	911	18	13,778	207	73,541	21,037	42	
43	Utah	5	1,967	7	3,901	2,88	1	1,786	3	7,170	1,701	1	10	3	3,124	223	2	1,0	11	2,476	2,0	17	7,317	61	14,588	6,934	43	
44	Vermont	13	10,411	58	71,610	6,005	15	17,523	10	29,778	13,246	2	10	3	3,124	223	2	1,0	11	2,476	2,0	17	7,317	61	14,588	6,934	44	
45	Virginia	16	7,112	23	67,883	4,10	6	8,845	3	6,663	8,243	11	1,022	10	29,741	1,12	11	1,022	10	29,741	1,12	11	1,022	10	29,741	1,12	45	
46	Washington	2	3,62	4	9,034	2,6	30	10	14	6,970	5,177	1	10	3	3,124	223	2	1,0	11	2,476	2,0	17	7,317	61	14,588	6,934	46	
47	West Virginia	5	1,967	7	3,901	2,88	1	1,786	3	7,170	1,701	1	10	3	3,124	223	2	1,0	11	2,476	2,0	17	7,317	61	14,588	6,934	47	
48	Wisconsin	4	1,967	7	3,901	2,88	1	1,786	3	7,170	1,701	1	10	3	3,124	223	2	1,0	11	2,476	2,0	17	7,317	61	14,588	6,934	48	
49	Wyoming	5	1,967	7	3,901	2,88	1	1,786	3	7,170	1,701	1</																

here, because a separate analysis for each individual project or situation is necessary.

Among the hospitals classified as to type of service it is noted that general hospitals as a group were 70.3 per cent occupied in 1940, 68.2 per cent in 1941 and the

of 1929. More than 97 per cent of the births reported in 1942 were in general hospitals, 85 per cent, or a total of 1,420,079, were in nongovernmental hospitals, and the remaining 15 per cent or 250,520 were in governmental hospitals.

TABLE 1—HOSPITAL FACILITIES BY STATES AND BY CONTROL  
B NONPROFIT ORGANIZATIONS

Marginal No		Church Related (Nonprofit)					Nonprofit Associations					Total Nonprofit					Marginal No
		Hospitals	Beds	Bassinets	Patients Admitted	Average Census	Hospitals	Beds	Bassinets	Patients Admitted	Average Census	Hospitals	Beds	Bassinets	Patients Admitted	Average Census	
1	Alabama	9	892	180	36,390	674	16	1,248	152	28,624	772	25	2,240	338	65,014	1,446	1
2	Arizona	7	828	121	22,451	588	15	624	81	11,871	357	25	1,452	203	34,322	975	2
3	Arkansas	10	1,070	167	31,410	769	18	822	86	16,678	429	28	1,892	253	48,088	1,198	3
4	California	46	9,930	1,228	191,757	4,788	61	7,660	1,098	188,968	5,646	127	13,610	2,376	380,720	10,434	4
5	Colorado	27	2,672	413	63,124	1,895	24	2,212	99	19,666	1,512	51	4,884	511	12,790	3,410	5
6	Connecticut	6	1,169	211	32,924	969	42	6,128	984	144,775	4,793	48	7,297	1,195	177,699	5,702	6
7	Delaware						10	1,228	219	23,375	808	10	1,228	219	23,375	808	7
8	District of Columbia	4	816	172	30,540	685	10	1,746	354	44,750	1,490	14	2,562	526	75,290	2,178	8
9	Florida	8	1,045	204	26,655	639	36	1,891	300	39,595	940	44	2,936	304	60,250	1,639	9
10	Georgia	7	665	98	19,697	521	24	1,768	241	50,168	1,240	31	2,433	339	69,775	1,761	10
11	Idaho	12	884	192	21,542	558	6	197	48	3,149	83	18	1,021	240	24,691	641	11
12	Illinois	62	12,833	2,392	337,506	9,698	98	10,204	1,918	266,981	7,919	184	22,037	4,310	604,487	17,617	12
13	Indiana	26	4,215	818	119,881	3,002	22	1,094	346	43,166	1,153	48	5,909	1,164	161,047	4,155	13
14	Iowa	41	4,093	670	95,408	3,411	25	1,299	297	31,580	893	66	5,382	967	126,988	4,304	14
15	Kansas	37	3,230	556	83,487	2,284	23	871	181	18,311	504	60	4,101	737	101,798	2,784	15
16	Kentucky	12	1,826	319	49,927	1,391	29	1,781	190	38,292	1,034	41	3,697	509	88,219	2,445	16
17	Louisiana	10	1,742	264	51,310	1,396	17	1,293	145	36,965	889	27	3,035	409	87,575	2,225	17
18	Maine	6	446	78	14,279	328	30	1,841	340	42,710	1,442	36	2,287	418	56,989	1,770	18
19	Maryland	9	2,084	254	37,565	1,749	30	4,413	497	75,551	3,344	39	6,497	751	113,416	3,093	19
20	Massachusetts	16	2,756	468	59,314	2,208	112	11,627	2,039	253,156	8,095	128	14,385	2,507	312,470	10,903	20
21	Michigan	47	4,719	1,126	150,767	3,906	95	8,256	1,359	198,552	6,103	126	12,975	2,485	349,349	10,609	21
22	Minnesota	36	3,698	650	112,373	3,020	66	3,714	818	94,377	2,675	102	7,612	1,498	206,750	5,695	22
23	Mississippi	2	240	41	9,658	186	38	1,544	246	42,180	796	40	1,784	287	51,838	1,083	23
24	Missouri	38	6,016	889	140,508	4,747	32	2,948	867	56,914	1,990	70	8,964	1,256	197,772	6,737	24
25	Montana	23	1,855	362	41,772	1,226	6	330	58	6,652	174	31	2,185	470	48,454	1,400	25
26	Nebraska	26	2,438	412	57,138	1,555	9	450	79	13,913	2,48	35	2,915	491	71,051	1,633	26
27	Nevada	1	75	15	2,244	72	12	60	10	732	26	3	135	25	2,976	98	27
28	New Hampshire	5	450	83	10,540	379	24	1,438	316	31,162	880	29	1,918	399	41,702	1,259	28
29	New Jersey	17	3,551	569	79,405	2,690	77	9,731	1,633	204,400	7,355	94	13,282	2,902	283,505	10,045	29
30	New Mexico	16	930	141	17,400	527	10	400	40	5,061	180	26	1,356	187	22,461	607	30
31	New York	78	12,765	1,927	217,730	9,618	222	33,818	4,536	676,427	25,471	300	46,556	6,463	894,166	35,049	31
32	North Carolina	13	1,910	298	30,768	850	63	5,512	776	155,674	3,673	96	6,722	954	156,442	4,533	32
33	North Dakota	24	1,852	376	50,304	1,216	7	332	88	8,530	292	31	2,184	414	58,834	1,435	33
34	Ohio	43	7,467	1,340	212,690	5,926	90	8,908	1,565	248,352	6,694	142	16,355	2,545	461,078	17,670	34
35	Oklahoma	8	970	194	27,024	705	14	767	120	19,555	596	22	1,737	314	46,572	1,101	35
36	Oregon	10	2,298	485	66,147	1,689	11	580	77	11,555	391	30	2,678	562	77,732	2,050	36
37	Pennsylvania	36	5,701	912	110,631	4,064	203	29,776	4,194	502,265	27,753	239	35,477	5,106	702,596	26,797	37
38	Rhode Island	3	430	60	7,937	342	12	1,506	336	34,651	1,291	15	1,936	396	42,588	1,633	38
39	South Carolina	3	263	36	6,908	190	29	2,041	316	54,645	1,941	32	2,704	352	61,553	1,931	39
40	South Dakota	14	1,184	190	27,800	735	12	497	104	13,988	346	26	1,681	294	41,758	1,051	40
41	Tennessee	7	1,295	292	44,658	1,114	27	2,134	270	44,990	1,496	34	3,429	472	95,648	2,610	41
42	Texas	46	4,801	923	147,581	3,095	56	2,553	316	68,321	1,483	102	7,664	1,239	215,902	4,581	42
43	Utah	6	963	241	29,761	790	9	332	95	7,925	165	15	1,295	336	35,656	955	43
44	Vermont	3	230	30	5,110	182	19	1,935	213	24,432	1,509	22	2,165	243	29,432	1,611	44
45	Virginia	3	343	49	10,444	220	43	3,173	490	91,553	2,284	46	3,116	399	101,957	3,054	45
46	Washington	22	2,630	565	73,741	1,958	26	2,203	471	59,227	1,754	45	4,533	1,036	153,268	3,449	46
47	West Virginia	9	1,016	152	26,776	721	16	1,752	180	42,225	1,222	25	2,768	342	65,551	1,943	47
48	Wisconsin	64	7,137	1,283	166,924	5,197	3	2,522	481	6,519	4,614	97	9,659	1,764	232,743	9,911	48
49	Wyoming	2	48	10	1,031	19	4	125	20	3,790	60	6	173	39	4,521	88	49
50	Totals (1942)	977	126,141	22,963	3,211,162	94,571	1,940	190,150	29,154	4,252,456	141,633	2,926	316,291	51,416	7,463,648	276,154	50
51	(1941)	993	123,331	20,145	2,961,594	90,195	1,917	182,140	26,422	3,931,141	132,472	2,910	305,471	46,567	6,892,735	252,667	51
52	(1940)	998	120,809	18,561	2,679,876	85,007	1,903	177,681	24,978	3,574,974	125,757	2,901	298,490	43,059	6,254,550	210,764	52
53	(1939)	1,001	120,740	18,044	2,682,762	81,984	1,899	172,765	23,771	3,503,488	119,342	2,840	293,505	41,415	6,156,250	201,796	53
54	(1938)	981	119,521	17,320	2,531,796	80,576	1,776	169,980	22,223	3,316,310	117,555	2,757	295,501	39,843	5,848,106	195,134	54
55	(1937)	975	115,283	16,851	2,495,114	79,113	1,718	162,474	21,511	3,201,042	115,508	2,793	277,767	38,952	5,596,156	193,691	55
56	(1936)	969	113,268	16,360	2,286,064	74,037	1,742	162,585	21,238	2,972,705	105,510	2,711	275,514	37,958	5,258,772	181,547	56
57	(1935)	970	113,268	16,033	1,950,308	69,098	1,770	155,300	20,119	2,527,297	95,088	2,740	265,565	36,152	4,477,717	167,670	57
58	(1934)	970	113,268	16,007	1,756,222	67,551	1,676	154,449	20,184	2,357,213	93,216	2,616	267,712	36,251	4,163,775	157,067	58
59	(1933)	954	115,840	16,190	1,753,565	67,671											
60	(1932)	1,001	117,555	16,125	1,918,214	70,119											
61	(1931)	1,011	116,985	15,861	2,013,352	73,911											
62	(1930)	1,017	116,546	15,615	1,750,102												
63	(1929)	1,024	113,555	15,037	1,750,770												
64	(1928)	1,056	114,613	13,190													
65	(1927)	1,060	108,582		73,813												

same 68.2 per cent in 1942. The trend has been upward in the occupancy rate of maternity hospitals and downward in children's, orthopedic and isolation hospitals, and not very decisively upward or downward in the other classifications as to types of service.

#### BIRTHS IN HOSPITALS

The total births in hospitals for 1942 was 1,670,599. This represents an increase of 265,659 over the 1,404,940 in 1941. Figures reported for births by hospitals refer to the number of live babies born. The hospital births in 1942 were nearly two and one-half times those

The average number of babies accommodated per bassinets during the year 1942 was 23.3, compared with 21.2 for 1941, 19.6 for 1940 and 12.9 for 1929, showing increasing utilization, from year to year, of the existing supply of bassinets.

#### TOTAL LIVE BIRTHS IN COMPARISON WITH LIVE BIRTHS IN HOSPITALS FOR 1931, 1936 AND 1941

The remarkably rapid gains in the use of hospitals for childbirth has seemed to justify showing the number of all births in comparison with the numbers and percentages of births in hospitals for the years 1931, 1936



and 1941. The total number of births in each state and in all states is supplied by the United States Bureau of the Census, and births in hospitals by the American Medical Association Annual Census. Nineteen hundred and forty-one was the latest year for which the births in the country at large have been made available by the Bureau of the Census, as this article is being prepared.

fact that the Bureau of the Census figures include births in all institutions reported as hospitals, whereas the A M A Annual Census covers only registered hospitals.

The United States Bureau of the Census found that 94.2 per cent of the live babies born in hospitals in 1941 were white and 5.8 per cent were of other races.

TABLE 1—HOSPITAL FACILITIES BY STATES AND BY CONTROL C PROPRIETARY

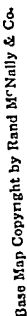
Marginal No	Individual and Partnership				Corporations (Profit Unrestricted)				Total Proprietary				TOTAL NONGOVERNMENTAL				Marginal No					
	Hospitals	Beds	Basinsets	Patients Admitted	Average Census	Hospitals	Beds	Basinsets	Patients Admitted	Average Census	Hospital	Beds	Basinsets	Patients Admitted	Average Census	Hospitals	Beds	Basinsets	Patients Admitted	Average Census		
1	Alabama	33	1,068	148	24,427	524	10	611	92	16,020	360	43	1,679	240	41,047	880	7	3,029	318	106,061	2,235	1
2	Arizona	9	146	30	1,662	78	1	1	1	1,074	1	10	179	1	2,776	9	2	1,111	237	37,078	1,018	2
3	Arkansas	22	572	97	13,815	248	3	110	12	1,011	36	25	682	109	14,040	24	48	2,374	121	10,044	1,482	3
4	California	97	3,427	573	66,701	2,379	36	2,124	225	19,345	1,441	11	5,561	901	116,046	3,970	260	19,161	3,277	496,769	14,534	4
5	Colorado	21	546	77	6,490	333	3	212	12	9,303	100	14	758	79	7,113	48	75	5,642	501	180,167	3,863	5
6	Connecticut	6	127	1	1,466	84	8	283	1	992	389	24	710	1	2,448	47	12	8,007	119	180,147	6,211	6
7	Delaware	1	22	6	65	12	1	1	6	38	8	1	1	0	18	8	11	1,111	22	23,758	816	7
8	Dist. Columbia	1	22	6	65	12	1	212	69	8,308	201	2	254	69	8,773	211	16	2,816	56	18,673	2,791	8
9	Florida	17	487	90	9,983	224	3	200	11	1,510	85	22	687	126	12,798	99	66	3,021	374	77,018	1,948	9
10	Georgia	42	1,092	163	23,799	563	11	455	70	17,619	271	31	1,072	2	41,418	84	84	1,960	570	111,119	2,995	10
11	Idaho	10	239	47	5,447	114	3	76	16	1,951	50	13	315	6	6,518	144	21	1,111	22	31,212	727	11
12	Illinois	37	1,121	140	16,009	721	16	1,211	169	10,884	789	33	2,367	249	21,891	1,110	217	2,391	439	6,620	19,727	12
13	Indiana	18	396	77	11,936	175	9	585	12	11,766	324	27	911	129	23,122	499	77	3,230	129	14,739	4,014	13
14	Iowa	34	586	156	12,117	316	6	181	22	1,014	116	9	767	178	11,631	42	10	1,111	116	142,679	4,760	14
15	Kansas	16	312	68	5,640	184	4	151	12	2,048	83	20	411	50	7,698	101	10	4,411	817	109,996	3,011	15
16	Kentucky	15	263	40	5,210	165	10	401	53	12,702	240	10	512	99	17,012	43	10	4,411	608	109,131	2,850	16
17	Louisiana	22	447	9	9,998	173	10	374	77	15,705	334	22	971	170	25,703	997	10	4,066	579	11,278	2,717	17
18	Maine	12	226	71	3,747	120	6	178	41	4,090	118	18	404	112	8,442	261	11	2,691	360	11,411	2,043	18
19	Maryland	12	420	38	2,661	340	1	1	1	185	22	11	488	18	2,838	36	10	1,000	276	116,244	5,488	19
20	Massachusetts	13	284	44	2,888	161	24	1,301	22	26,762	913	7	1,887	269	29,000	1,010	10	1,000	276	142,120	11,919	20
21	Michigan	24	503	104	9,034	360	8	460	12	5,460	309	12	1,051	112	12,909	728	18	1,000	276	101,048	10,171	21
22	Minnesota	40	640	171	13,467	316	6	701	12	21,490	617	16	1,111	183	34,887	823	148	8,003	161	241,637	6,244	22
23	Mississippi	28	777	116	19,707	394	4	151	19	1,491	101	10	815	115	23,000	417	72	2,712	422	10,008	1,430	23
24	Missouri	22	647	174	23,109	318	7	269	47	7,016	157	21	916	291	10,215	47	99	980	1,147	219,077	7,212	24
25	Montana	9	169	52	3,981	98	3	149	30	3,925	105	12	718	8	7,000	20	41	2,001	62	6,600	1,603	25
26	Nebraska	43	700	204	15,276	316	3	100	15	1,277	98	46	811	219	10,881	414	21	1,770	710	87,694	2,277	26
27	Nevada	2	54	22	2,611	61	1	1	1	1	74	2	54	22	2,611	61	5	219	47	10,047	149	27
28	New Hampshire	1	24	7	1,410	165	8	471	1	970	248	15	718	17	2,749	463	112	14,000	2,119	2,018	10,508	28
29	New Jersey	10	3	18	1,010	19	1	20	1	280	3	15	1	11	1,000	21	29	1,409	108	23,757	731	29
30	New Mexico	48	1,604	490	21,840	985	78	3,777	677	6,710	2,461	86	5,061	1,097	8,111	349	25	1,017	7,000	1,171	3,499	31
31	North Carolina	21	590	68	11,301	282	10	7	60	8,116	274	31	1,127	118	19,117	566	17	7,849	1,102	20,000	5,000	32
32	North Dakota	3	40	2	8,000	20	1	1	1	4,115	11	1	60	27	1,104	1	3	2,244	441	10,002	1,469	33
33	Ohio	14	428	29	5,776	226	9	479	16	2,449	413	2	997	45	7,800	101	10	1,712	2,900	46,000	15,000	34
34	Oklahoma	32	1,330	26	7,043	118	11	494	68	11,800	290	66	1,819	314	41,811	998	55	1,000	625	10,000	2,000	35
35	Oregon	14	475	76	10,000	224	13	404	87	1,887	774	26	1,000	160	26,282	698	7	1,017	77	104,014	2,000	36
36	Pennsylvania	21	1,040	102	7,001	703	9	1	49	4,009	211	10	1,100	147	11,010	968	20	1,000	523	714,000	27,000	37
37	Rhode Island	10	217	44	7,390	111	1	160	30	2,222	21	11	217	44	7,317	111	4	1,000	411	46,000	1,741	38
38	South Carolina	10	224	46	4,107	176	1	20	1	222	21	11	217	44	7,317	111	4	1,000	411	46,000	1,741	39
39	South Dakota	10	224	46	4,107	176	1	20	1	222	21	11	217	44	7,317	111	4	1,000	411	46,000	1,741	40
40	Tennessee	38	975	128	25,034	500	6	206	76	6,000	101	41	1,111	364	10,000	101	78	4,000	600	1,031,212	3,000	41
41	Texas	131	2,623	614	76,400	1,224	40	1,794	242	20,204	1,001	171	4,417	86	129,009	2,000	26	12,071	2,125	315,111	6,850	42
42	Utah	6	112	30	1,944	50	1	1	1	1	8	2	112	30	1,944	50	21	1,407	771	39,000	1,000	43
43	Vermont	1	8	1	100	4	1	20	1	43	8	2	112	30	1,944	50	21	1,407	771	39,000	1,000	44
44	Virginia	21	771	119	17,768	491	16	1,600	167	32,900	869	27	1,811	281	50,111	1,000	61	1,000	771	1,000	3,000	45
45	Washington	23	673	100	14,207	700	6	102	2	4,783	140	29	811	141	18,490	607	77	1,000	1,177	1,177	4,000	46
46	West Virginia	11	697	81	21,364	360	23	1,733	187	49,602	1,122	71	2,100	208	70,008	1,400	9	1,000	1,177	1,177	4,000	47
47	Wisconsin	28	450	133	10,574	200	9	461	35	4,120	330	77	949	168	14,774	601	114	1,000	1,177	1,177	4,000	48
48	Wyoming	10	193	50	4,008	8	1	20	8	602	8	11	213	50	4,000	91	17	36	102	9,491	1,000	49
50	Totals (1942)	1,019	27,996	5,147	576,466	10,711	406	23,700	3,657	19,821	10,721	1,490	51,700	8,201	1,072,087	31,240	4,494	36,040	9,070	533,600	27,000	50
51	(1941)	1,149	28,760	5,034	545,884	16,552	450	24,619	3,048	49,967	11,698	1,681	51,709	8,102	1,010,000	32,400	4,494	36,040	9,070	533,600	27,000	51
52	(1940)	1,174	28,938	4,820	500,040	15,049	449	25,108	3,021	46,614	10,606	1,677	51,006	7,841	960,000	31,071	4,494	36,040	9,070	533,600	27,000	52
53	(1939)	1,190	29,879	4,756	501,860	14,910	446	26,496	2,989	46,769	16,114	1,616	56,175	7,740	908,619	31,109	4,494	36,040	9,070	533,600	27,000	53
54	(1938)	1,188	30,193	4,517	49,513	15,245	493	26,650	2,236	47,136	1,630	1,681	56,743	7,793	960,680	30,880	4,494	36,040	9,070	533,600	27,000	54
55	(1937)	1,183	29,967	4,766	508,300	15,448	570	28,080	3,016	50,017	10,477	1,717	58,042	8,282	1,011,406	31,191	4,494	36,040	9,070	533,600	27,000	55
56	(1936)	1,204	28,496	4,366	437,997	13,612	510	28,511	3,629	197,457	16,462	1,714	57,007	7,985	970,000	30,191	4,494	36,040	9,070	533,600	27,000	56
57	(1935)	1,200	29,913	4,384	413,997	14,212	627	24,040	4,507	112,590	18,607	1,882	61,800	8,741	916,187	30,000	4,494	36,040	9,070	533,600	27,000	57
58	(1934)	1,210	29,499	4,301	376,000	12,046	629	33,072	4,038	408,300	15,950	1,909	67,501	8,429	821,616	30,031	4,494	36,040	9,070	533,600	27,000	58
59	(1933)	1,475	31,385	4,962	418,611	13,741	1,000	37,000	4,000	400,000	15,000	1,0										

TABLE 2—HOSPITAL FACILITIES BY STATES AND BY TYPE OF SERVICE (Continued on next page)

Marginal No	General				Nervous and Mental				Tuberculosis				Maternity				Industrial				Eye Ear Nose and Throat				
	Hospitals	Beds	Basinets	Patients Admitted	Average Census	Hospitals	Beds	Basinets	Patients Admitted	Average Census	Hospitals	Beds	Basinets	Patients Admitted	Average Census	Hospitals	Beds	Basinets	Patients Admitted	Average Census	Hospitals	Beds	Basinets	Patients Admitted	Average Census
1 Alabama	77	7,887	710	161,355	4,150	5	515	10	4,593	8,190	8	505	50	763	17	1	100	6,374	67	8	1	100	6,374	67	8
2 Arizona	44	4,481	307	63,180	2,130	2	127	5	1,005	1,702	1	106	10	135	14	2	275	4,032	110	2	2	275	4,032	110	2
3 Arkansas	23	5,012	402	81,741	3,727	3	1,827	10	9,157	1,307	1	130	13	145	14	2	275	4,032	110	2	2	275	4,032	110	2
4 California	261	48,100	3,118	1,717,071	39,721	35	30,002	16,156	16,156	20,856	311	35	5,041	6	5,848	4,424	2	622	11,423	535	2	622	11,423	535	2
5 Colorado	10	7,115	710	181,371	5,007	9	6,710	10	10,163	1,163	13	1,341	1	1,341	1	2	41	27	207	34	2	41	27	207	34
6 Connecticut	10	1,315	131	23,411	5,007	10	1,315	131	23,411	5,007	10	1,315	131	23,411	5,007	10	1,315	131	23,411	5,007	10	1,315	131	23,411	5,007
7 Delaware	10	1,315	131	23,411	5,007	10	1,315	131	23,411	5,007	10	1,315	131	23,411	5,007	10	1,315	131	23,411	5,007	10	1,315	131	23,411	5,007
8 District of Columbia	16	7,371	580	101,878	5,011	2	7,232	1,887	7,240	255	1	670	1	670	1	20	10	130	8	1	20	10	130	8	
9 Florida	17	11,687	907	178,508	9,011	2	7,232	1,887	7,240	255	1	670	1	670	1	20	10	130	8	1	20	10	130	8	
10 Georgia	107	15,074	916	240,078	8,217	5	9,811	3,130	5,735	1,631	4	591	1	1,130	800	21	3	179	3,373	80	1	25	1,033	11	10
11 Idaho	108	1,881	255	41,517	1,140	5	1,673	1	589	1,631	1	131	1	131	1	10	10	10	10	1	10	10	10	10	10
12 Illinois	213	37,171	4,261	790,510	21,675	32	47,110	11,901	43,705	11,723	32	4,306	14	5,252	3,680	21	2	87	1,256	45	2	275	5,724	183	12
13 Indiana	117	7,008	1,724	255,456	4,778	12	15,161	4,001	11,673	11,723	1	1,728	1	2,129	1,480	17	2	87	1,256	45	2	275	5,724	183	12
14 Iowa	117	7,008	1,724	255,456	4,778	12	15,161	4,001	11,673	11,723	1	1,728	1	2,129	1,480	17	2	87	1,256	45	2	275	5,724	183	12
15 Kansas	92	7,018	929	130,000	4,001	8	7,352	6	5,769	11,631	3	508	7	711	631	11	110	65	136	193	2	17	215	6	14
16 Kentucky	69	7,309	710	168,193	4,418	11	6,401	5,691	9,040	7,774	5	1,128	2	1,632	1,045	1	40	22	145	39	1	38	159	20	16
17 Louisiana	60	1,472	57	79,737	2,408	6	8,660	2,697	7,774	7,774	5	1,128	2	1,632	1,045	1	40	22	145	39	1	38	159	20	16
18 Maine	60	1,472	57	79,737	2,408	6	8,660	2,697	7,774	7,774	5	1,128	2	1,632	1,045	1	40	22	145	39	1	38	159	20	16
19 Maryland	44	10,150	961	171,720	9,066	10	11,011	4,276	10,630	10,630	1	1,513	1	1,513	1,381	1	24	70	2	2	100	4	4,018	55	19
20 Massachusetts	111	20,788	2,962	418,611	18,488	31	32,728	11,065	31,547	31,547	22	4,020	3	5,938	3,164	1	24	70	2	2	100	4	4,018	55	19
21 Michigan	175	21,840	2,962	418,611	18,488	31	32,728	11,065	31,547	31,547	22	4,020	3	5,938	3,164	1	24	70	2	2	100	4	4,018	55	19
22 Minnesota	171	12,120	1,973	285,541	8,684	1	15,097	21	3,046	15,208	15	2,000	1	1,723	1,737	3	62	1,076	28	1	297	6,430	132	20	
23 Mississippi	89	7,187	618	130,919	4,071	1	6,085	1	2,538	5,294	1	425	1	631	304	1	62	1,076	28	1	297	6,430	132	20	
24 Missouri	106	18,670	1,481	306,314	12,210	16	10,176	3	3,841	15,922	5	1,941	1	1,676	1,649	8	435	7,031	217	1	64	390	32	21	
25 Montana	17	1,394	156	62,865	2,018	1	1,940	476	1,045	1,045	1	200	1	196	6	2	1	70	1,852	50	1	64	390	32	21
26 Nebraska	48	4,767	741	99,277	3,091	4	5,801	1,024	5,837	5,837	1	200	1	1,024	1,045	1	70	1,852	50	1	64	390	32	21	
27 Nevada	17	975	119	16,347	602	1	390	52	401	401	2	240	152	188	292	1	70	1,852	50	1	64	390	32	21	
28 New Jersey	48	2,662	417	48,478	1,602	21	25,565	4	6,230	9,611	10	4,294	1	4,078	3,507	3	442	417	9,022	292	1	6	2,050	28	20
29 New Mexico	1	2,116	278	1,031	1,031	2	990	2	990	9,918	5	563	1	856	147	2	101	974	49	1	6	2,050	28	20	
30 New York	311	62,011	8,081	1,272,461	48,708	62	10,725	107	9,902	97,212	56	12,046	20	14,015	10,610	17	1,080	703	23,410	784	6	653	23,328	314	31
31 North Carolina	126	12,364	1,279	297,537	8,684	10	9,460	2	2,817	8,107	20	2,846	1	3,075	2,424	2	1	28	398	12	3	60	3,511	35	32
32 North Dakota	10	2,654	146	67,024	1,676	2	3,012	8	587	2,919	1	139	263	708	25	2	71	40	105	27	1	6	3,511	35	32
33 Ohio	162	2,882	3,099	599,500	17,890	25	30,446	1	4,691	29,578	22	3,400	1	3,503	2,922	3	209	218	5,220	206	1	18	10	1	34
34 Oklahoma	101	8,808	190	119,920	4,670	9	9,362	2,292	9,314	9,314	8	997	2	1,888	821	1	22	26	188	0	1	4	220	1	34
35 Pennsylvania	211	37,979	5,962	708,001	27,712	44	18,357	1	1,747	15,765	17	5,800	691	691	503	9	481	181	3,913	178	3	310	9,150	203	37
36 Rhode Island	60	6,018	770	121,992	3,115	4	4,029	1	1,023	3,766	2	673	463	691	1,105	1	15	11	478	10	1	15	342	3	30
37 South Carolina	76	9,171	688	160,179	5,778	1	5,619	1	1,594	5,612	5	865	2	1,105	771	1	22	22	776	8	5	129	5,910	53	40
38 South Dakota	78	2,693	110	51,768	1,676	2	2,617	1	461	2,360	2	922	1	1,105	771	1	22	22	776	8	5	129	5,910	53	40
39 Tennessee	708	27,070	2,929	593,537	15,975	18	19,312	6,951	18,965	17	2,017	1	6,447	2,173	10	2	22	22	776	8	5	129	5,910	53	40
40 Texas	708	27,070	2,929	593,537	15,975	18	19,312	6,951	18,965	17	2,017	1	6,447	2,173	10	2	22	22	776	8	5	129	5,910	53	40
41 Utah	20	1,701	411	48,725	1,447	2	1,690	1	1,690	1,690	1	96	1	106	66	1	10	10	167	1	3	63	2,510	11	15
42 Vermont	23	1,711	211	37,181	1,074	11	12,195	10	5,061	12,614	8	1,203	317	187	187	3	94	51	201	68	1	10	167	1	15
43 Virginia	35	15,615	1,078	219,629	9,710	11	12,195	10	5,061	12,614	8	1,203	317	187	187	3	94	51	201	68	1	10	167	1	15
44 Washington	35	15,615	1,078	219,629	9,710	11	12,195	10	5,061	12,614	8	1,203	317	187	187	3	94	51	201	68	1	10	167	1	15
45 West Virginia	42	7,131	660	151,893	5,472	8	4,820	1	2,774	8,278	11	1,290	1	1,977	1,127	2	22	22	776	8	5	129	5,910	53	40
46 Wisconsin	111	19,130	2,161	294,618	11,990	51	17,215	5	7,177	10,613	20	2,117	2	2,511	1,938	2	106	45	1,080	68	3	63	2,510	11	15
47 Wyoming	25	1,719	293	37,802	1,611	1	1,613	1	1,613	1,611	1	31	1	47	21	1	10	10	167	1	3	63	2,510	11	15
48 Totals (1912)	4,517	501,240	67,115	11,674,288	40,782	756	610,118	216	211,117	600,773	468	82,772	116	101,526	70,000	113	5,903	3,777	80,775	1,171	76	2,806	2	46,793	1,098
49 (1911)	4,518	513,198	61,712	10,919,917	38,611	506	638,144	210	208,592	601,170	477	82,365	109	101,173	70,000	113	5,919	3,673	81,874	1,171	76	2,806	2	46,793	1,098
50 (1910)	4,432	462,760	68,073	9,219,196	37,160	602	671,941	210	190,760	590,712	479	78,216	111	90,976	67,007	116	5,617	3,789	80,618	1,171	76	2,806	2	46,793	1,098
51 (1909)	4,346	411,017	65,143	9,014,110	37,160	602	671,941	210	190,760	590,712	479	78,216	111	90,976	67,007	116	5,617	3,789	80,618	1,171	76	2,806	2	46,793	1,098
52 (1908)	4,260	421,521	62,624	8,615,970	37,160	602	671,941	210	190,760	590,712	479	78,216	111	90,976	67,007	116	5,617	3,789	80,618	1,171	76	2,806	2	46,793	1,098
53 (1907)	4,116	412,691	61,068	8,719,773	37,160	602	671,941	210	190,760	590,712	479	78,216	111	90,976	67,007										

TABLE 2.—HOSPITAL FACILITIES BY STATES AND BY TYPE OF SERVICE—(Continued)

Marginal No	Children's				Orthopedic				Isolation				Convalescent and Rest				Hospital Departments of Institutions				All Other Hospitals				Totals					
	Hospitals	Beds	Patients Admitted	Average	Hospitals	Beds	Patients Admitted	Average	Hospitals	Beds	Patients Admitted	Average	Hospitals	Beds	Patients Admitted	Average	Hospitals	Beds	Patients Admitted	Average	Hospitals	Beds	Patients Admitted	Average	Hospitals	Beds	Patients Admitted	Average		
1 Alabama	1	50	1,206	29	1	50	175	39	1	90	4	1,197	3	1	10	200	8	4	128	4	384	47	59	1610	763	17611	12	528		
2 Arizona	1	72	880	51	2	143	2,002	91	1	10	81	3	2,21	4	1	200	8	9	168	9	1,819	181	63	6,601	763	17611	12	528		
3 Arkansas	1	283	8,093	148	1	10	81	3	1	10	81	3	2,21	4	1	200	8	9	168	9	1,819	181	63	6,601	763	17611	12	528		
4 California	3	215	5,248	120	1	10	81	3	1	10	81	3	2,21	4	1	200	8	9	168	9	1,819	181	63	6,601	763	17611	12	528		
5 Colorado	1	215	5,248	120	1	10	81	3	1	10	81	3	2,21	4	1	200	8	9	168	9	1,819	181	63	6,601	763	17611	12	528		
6 Connecticut	1	215	5,248	120	1	10	81	3	1	10	81	3	2,21	4	1	200	8	9	168	9	1,819	181	63	6,601	763	17611	12	528		
7 Delaware	1	215	5,248	120	1	10	81	3	1	10	81	3	2,21	4	1	200	8	9	168	9	1,819	181	63	6,601	763	17611	12	528		
8 District of Columbia	1	210	7,916	134	3	184	1,276	109	2	64	144	48	2	206	117	102	3	300	403	4,03	179	28	16,267	722	13,617	14	663			
9 Florida	1	44	1,070	32	2	143	810	159	1	6	401	21	2	64	144	48	3	300	403	4,03	179	28	16,267	722	13,617	14	663			
10 Georgia	1	44	1,070	32	2	143	810	159	1	6	401	21	2	64	144	48	3	300	403	4,03	179	28	16,267	722	13,617	14	663			
11 Idaho	2	288	4,263	164	3	210	726	111	2	44	2,311	100	1	74	2,87	40	5	10,34	10,717	1,000	10	44	716	722	13,617	14	663			
12 Illinois	1	68	1,170	55	2	143	810	159	1	6	401	21	2	64	144	48	3	300	403	4,03	179	28	16,267	722	13,617	14	663			
13 Indiana	1	68	1,170	55	2	143	810	159	1	6	401	21	2	64	144	48	3	300	403	4,03	179	28	16,267	722	13,617	14	663			
14 Iowa	1	68	1,170	55	2	143	810	159	1	6	401	21	2	64	144	48	3	300	403	4,03	179	28	16,267	722	13,617	14	663			
15 Kansas	1	68	1,170	55	2	143	810	159	1	6	401	21	2	64	144	48	3	300	403	4,03	179	28	16,267	722	13,617	14	663			
16 Kentucky	1	68	1,170	55	2	143	810	159	1	6	401	21	2	64	144	48	3	300	403	4,03	179	28	16,267	722	13,617	14	663			
17 Louisiana	1	68	1,170	55	2	143	810	159	1	6	401	21	2	64	144	48	3	300	403	4,03	179	28	16,267	722	13,617	14	663			
18 Maine	1	68	1,170	55	2	143	810	159	1	6	401	21	2	64	144	48	3	300	403	4,03	179	28	16,267	722	13,617	14	663			
19 Maryland	1	68	1,170	55	2	143	810	159	1	6	401	21	2	64	144	48	3	300	403	4,03	179	28	16,267	722	13,617	14	663			
20 Massachusetts	7	700	7,744	503	2	213	681	148	5	213	681	148	2	213	681	148	5	213	681	148	2	213	681	148	5	213	681	148	2	213
21 Michigan	2	269	6,462	187	2	140	478	113	5	213	681	148	2	213	681	148	5	213	681	148	2	213	681	148	5	213	681	148	2	213
22 Minnesota	1	67	2,061	47	2	110	709	241	1	16	122	1	2	102	2	93	4	120	2	200	911	2	144	2,569	120	3	71	374		
23 Mississippi	2	340	6,433	241	2	110	709	241	1	16	122	1	2	102	2	93	4	120	2	200	911	2	144	2,569	120	3	71	374		
24 Missouri	1	60	1,219	33	6	670	3,882	791	5	678	3,420	243	1	80	1,12	110	1	12	42	12	808	1	1	102	123	771	102	123		
25 Montana	1	60	1,219	33	6	670	3,882	791	5	678	3,420	243	1	80	1,12	110	1	12	42	12	808	1	1	102	123	771	102	123		
26 Nebraska	1	60	1,219	33	6	670	3,882	791	5	678	3,420	243	1	80	1,12	110	1	12	42	12	808	1	1	102	123	771	102	123		
27 Nevada	1	60	1,219	33	6	670	3,882	791	5	678	3,420	243	1	80	1,12	110	1	12	42	12	808	1	1	102	123	771	102	123		
28 New Hampshire	1	60	1,219	33	6	670	3,882	791	5	678	3,420	243	1	80	1,12	110	1	12	42	12	808	1	1	102	123	771	102	123		
29 New Jersey	2	222	3,776	171	11	2,022	12,364	1,464	7	1,223	2,100	61	10	2,001	6,000	117	21	5,211	1,12	4,44	4	10	210	1,411	548	1,96	891	8,928	1,410	914
30 New Mexico	3	134	5	1,234	71	2	141	517	140	1	40	2	0	21	311	3	2	1,1	1,1	1,1	1,1	1,1	1,1	1,1	1,1	1,1	1,1	1,1	1,1	
31 New York	3	478	17	12,343	338	3	128	194	76	1	50	63	4	8	777	2	1,619	640	10	12	4	10	406	609	242	58	332	3,341	1,607	73
32 North Carolina	5	453	9,033	311	6	306	810	307	1	40	2	0	21	311	3	2	1,1	1,1	1,1	1,1	1,1	1,1	1,1	1,1	1,1	1,1	1,1	1,1	1,1	
33 North Dakota	1	60	1,219	33	6	670	3,882	791	5	678	3,420	243	1	80	1,12	110	1	12	42	12	808	1	1	102	123	771	102	123		
34 Ohio	1	60	1,219	33	6	670	3,882	791	5	678	3,420	243	1	80	1,12	110	1	12	42	12	808	1	1	102	123	771	102	123		
35 Oklahoma	1	60	1,219	33	6	670	3,882	791	5	678	3,420	243	1	80	1,12	110	1	12	42	12	808	1	1	102	123	771	102	123		
36 Oregon	1	60	1,219	33	6	670	3,882	791	5	678	3,420	243	1	80	1,12	110	1	12	42	12	808	1	1	102	123	771	102	123		
37 Pennsylvania	1	60	1,219	33	6	670	3,882	791	5	678	3,420	243	1	80	1,12	110	1	12	42	12	808	1	1	102	123	771	102	123		
38 Rhode Island	1	60	1,219	33	6	670	3,882	791	5	678	3,420	243	1	80	1,12	110	1	12	42	12	808	1	1	102	123	771	102	123		
39 South Carolina	1	60	1,219	33	6	670	3,882	791	5	678	3,420	243	1	80	1,12	110	1	12	42	12	808	1	1	102	123	771	102	123		
40 South Dakota	1	60	1,219	33	6	670	3,882	791	5	678	3,420	243	1	80	1,12	110	1	12	42	12	808	1	1	102	123	771	102	123		
41 Tennessee	1	60	1,219	33	6	670	3,882	791	5	678	3,420	243	1	80	1,12	110	1	12	42	12	808	1	1	102	123	771	102	123		
42 Texas	1	60	1,219	33	6	670	3,882	791	5	678	3,420	243	1	80	1,12	110	1	12	42	12	808	1	1	102	123	771	102	123		
43 Utah	1	60	1,219	33	6	670	3,882	791	5	678	3,420	243	1	80	1,12	110	1	12	42	12	808	1	1	102	123	771	102	123		
44 Vermont	1	60	1,219	33	6	670	3,882	791	5	678	3,420	243	1	80	1,12	110	1	12	42	12	808	1	1	102	123	771	102	123		
45 Virginia	1	60	1,219	33	6	670	3,882	791	5	678	3,420	243	1	80	1,12	110	1	12	42	12	808	1	1	102	123	771	102	123		
46 Washington	1	60	1,219	33	6	670	3,882	791	5	678	3,420	243	1	80	1,12	110	1	12	42	12	808	1	1	102	123	771	102	123		
47 West Virginia	1	60	1,219	33	6	670	3,882	791	5	678	3,420	243	1	80	1,12	110	1	12	42	12	808	1	1	102	123	771	102	123		
48 Wisconsin	1	60	1,219	33	6	670	3,882	791	5	678	3,420	243	1	80	1,12	110	1	12	42	12	808	1	1	102	123	771	102	123		
49 Wyoming	1	60	1,219	33	6	670	3,882	791	5	678	3,420	243	1	80	1,12	110	1	12	42	12	808	1	1	102	123	771	102	123		
50 Totals (1912)	43	4,314	84,740	2,905	70	7,717	29,278	1,46	2	6,21	33,37	2,067	1	9,079	10,111	5,011	191	1,12	11,171	11,740	1	1,12	11,171	11,740	1	1,12	11,171	11,740	1	1,12
51 (1913)	46	4,781	92,234	3,263	82	7,842	30,370	1,691	2	6,21	33,37	2,067	1	9,079	10,111	5,011	220	1,12	11,171	11,740	1	1,12	11,171	11,740	1	1,12	11,171	11,740	1	1,12
52 (1914)	48	5,140	100,420	3,524	82	7,842	30,370	1,691	2	6,21	33,37	2,067	1	9,079	10,															



### Occurring in Hospitals in 1941

I A M A 3-28 42

Based on total live births for 1941 reported by U S Census Bureau and live births in hospitals in 1942					
	J	A	M	A	3-28 42
Alabama	22 2				
Arizona	40 8				
Arkansas	16 6				
California	68 8				
Illinois	57 7				
Indiana	89 1				
Iowa	72 4				
Kansas	73 8				
District of Columbia	15 0				
Florida	30 8				
Georgia	34 9				
Hawaii	74 3				
Idaho	54 3				
Illinois	57 7				
Indiana	89 1				
Iowa	72 4				
Kansas	73 8				
Kentucky	41 7				
Louisiana	41 7				
Maine	56 7				
Maryland	54 3				
Massachusetts	52 1				
Michigan	53 5				
Minnesota	52 9				
Mississippi	41 7				
Missouri	41 7				
Montana	56 7				
Nebraska	56 7				
Nevada	52 1				
New Hampshire	51 8				
New Jersey	67 1				
New Mexico	17 5				
New York	17 5				
North Carolina	74 4				
North Dakota	52 1				
Ohio	69 6				
Oklahoma	79 0				
Oregon	92 2				
Pennsylvania	28 5				
Rhode Island	82 3				
South Carolina	28 1				
South Dakota	61 1				
Tennessee	62 1				
Texas	37 0				
Utah	71 0				
Vermont	61 4				
Virginia	77 7				
Washington	2 5				
West Virginia	21 1				
Wisconsin	52 1				
Wyoming	0 4				

New Hampshire 790, Rhode Island 777, Washington 749, Oregon 746, Montana 744, Illinois 743, Delaware 724, Utah 711. The states in which births in

*Births in Hospitals According to Ownership or Control and According to Type of Service*

	1929	1940	1941	1942
According to Ownership or Control				
Federal	2 290	9 423	11 811	15 157
State	9 125	28 943	32 113	31 571
County	17 527	61 963	66 689	69 891
City	4 887	98 435	117 962	118 004
City county	8 866	14 449	15 497	15 891
Total governmental	83 541	213 211	279 072	300 500
Church	209 726	304 765	463 111	565 961
Fraternal	1 730			
Nonprofit associations		48 236	561 844	695 202
Industrial	4 327			
Independent	253 136			
Total nonprofit		880 001	1 024 955	1 261 211
Individual and partnership	39 436	67 799	79 734	91 879
Corporations (profit unrestricted)	51 851		61 159	65 963
Total proprietary		121 980	140 913	158 818
Total nongovernmental	518 155	1 001 281	1 165 865	1 420 019
According to Type of Service				
General	566 177	1 167 694	1 742 195	1 607 216
Maternity	5 019	48 176	51 484	60 610
Children	862	19 4	7 916	
Hospital departments of institutions	277	172	328	231
All other hospitals	1 561	516	2 917	2 170
Total births in all hospitals	671 896	1 214 492	1 804 910	1 670 129

*Total Live Births in Comparison with Live Births in Hospitals for 1931, 1936 and 1941*

Number of total births were supplied by the United States Bureau of the Census. Births in hospitals were shown in A. M. A. Annual Census of Hospitals.

	Total Births U. S. Bureau of Census			Births in Hospitals A. M. A. Annual Census			Per Cent of Births in Hospitals		
	1931	1936	1941	1931	1936	1941	1931	1936	1941
Ala.	62 747	69 116	64 238	5 284	6 631	14 243	8.1	11.1	22.2
Ariz.	9 69	9 545	12 011	2 040	2 667	5 675	21.5	27.9	46.8
Ark.	41 042	3 320	40 437	2 267	2 451	6 750	5.5	7.1	16.6
Calif.	81 426	84 502	174 682	39 862	49 141	85 763	49.0	58.2	68.8
Colo.	18 511	15 719	21 400	6 466	7 371	12 281	19.4	40.7	57.7
Conn.	25 555	22 228	28 576	16 670	17 010	22 505	62.7	76.5	89.4
Del.	4 237	3 022	5 121	1 959	2 095	1 711	29.7	34.4	32.4
D. C.	9 355	11 704	18 294	7 180	10 577	17 465	78.9	90.4	91.8
Fla.	21 033	28 097	37 551	4 501	7 629	16 889	16.7	27.2	45.0
Ga.	61 180	61 658	68 744	7 166	10 175	21 047	11.1	16.5	30.8
Idaho	9 075	10 224	11 715	2 249	3 717	6 428	25.1	36.4	54.9
Ill.	118 788	112 167	134 451	64 970	64 602	99 997	54.7	57.6	74.3
Ind.	55 913	54 014	66 036	14 040	17 178	35 938	25.1	31.2	53.1
Iowa	41 943	42 711	46 826	17 020	15 599	25 378	10.1	11.5	15.5
Kan.	37 374	20 995	30 143	8 176	9 548	15 974	24.8	31.8	52.9
Ky.	57 120	55 778	67 430	6 666	6 767	11 770	9.9	12.1	21.7
La.	4 369	43 828	54 672	7 689	11 280	22 781	17.7	25.1	41.7
Me.	16 303	15 302	18 855	3 590	4 490	7 211	22.0	30.0	43.7
Mid.	28 722	26 548	34 267	7 506	11 058	19 452	26.4	41.7	60.7
Mass.	99 221	61 704	70 189	42 162	41 716	57 642	60.9	66.6	81.1
Mich.	90 929	88 427	107 511	32 643	37 385	69 610	35.9	42.1	61.8
Minn.	46 882	47 516	54 402	20 956	22 171	36 569	44.7	48.7	67.1
Miss.	45 211	49 446	54 454	2 822	5 477	8 606	6.2	6.9	15.5
Mo.	60 734	55 916	66 050	17 425	19 634	31 226	28.7	35.1	47.3
Mont.	9 618	10 400	11 437	3 952	5 574	8 505	41.0	53.1	74.4
Neb.	26 699	23 198	27 197	6 053	7 599	11 663	22.8	32.0	62.5
Nev.	1 223	1 419	2 181	476	793	1 517	38.9	55.2	73.6
N. H.	7 704	7 619	8 747	7 610	4 245	6 904	46.5	55.2	79.0
N. J.	64 654	53 823	65 953	30 585	36 199	67 761	47.8	68.2	92.2
N. Mex.	12 922	12 907	14 774	1 087	1 750	4 214	8.8	13.8	28.5
N. Y.	205 617	182 469	211 171	117 710	131 570	180 937	57.2	71.9	83.3
N. C.	74 799	76 182	84 674	6 214	10 296	24 150	8.3	13.5	25.5
N. D.	14 350	15 511	13 461	4 715	4 839	7 794	29.5	35.7	54.2
Ohio	108 150	107 703	126 155	37 155	43 964	87 617	34.4	42.4	69.5
Okl.	43 969	41 815	45 447	6 671	9 308	16 815	15.4	22.3	37.0
Ore.	13 210	13 915	19 198	6 462	7 011	14 283	48.9	50.2	74.6
Pa.	178 714	159 793	174 093	61 172	70 162	112 392	34.2	43.9	64.1
R. I.	11 725	10 186	11 582	4 470	6 355	8 994	38.0	62.7	77.7
S. C.	39 515	39 292	47 162	2 716	4 271	11 071	6.9	10.9	23.5
S. D.	*	12 819	11 647	7 718	3 932	6 012	*	30.5	52.1
Tenn.	52 734	50 571	60 337	7 281	9 853	18 783	13.9	19.5	30.4
Texas	*	111 062	136 291	18 816	20 075	69 564	*	23.4	43.7
Utah	12 018	12 551	13 745	4 312	5 917	7 765	35.9	47.1	71.1
Vt.	6 676	6 449	6 762	2 057	2 510	3 987	30.8	39.1	59.0
Va.	52 771	51 247	55 552	6 608	8 000	19 671	12.5	15.6	35.0
Wash.	22 028	23 376	30 567	10 846	12 880	22 962	49.2	55.1	74.9
W. Va.	39 325	40 583	43 827	3 521	4 639	10 557	9.0	11.4	24.1
Wis.	54 490	52 613	57 120	22 499	23 810	38 916	41.3	45.3	68.2
Wyo.	4 504	4 753	5 181	1 401	1 507	3 737	31.1	31.7	62.5
Totals	2 112 760	2 144 790	2 513 427	708 889	831 500	1 404 940	33.6	38.8	55.9

\* No data for total births

hospitals were less than 30 per cent of the total births in 1941 were Mississippi 15.8 per cent, Arkansas 16.6, Kentucky 21.7, Alabama 22.2, South Carolina 23.5, West Virginia 24.1, New Mexico 28.5, North Carolina 28.5. There were eighteen states with percentages running between 50 and 70 per cent and ten states between 30 and 50 per cent.

*PERCENTAGE OF POPULATION HOSPITALIZED AND PERCENTAGE OF PATIENTS OPERATED ON*

It may be surprising for some to learn that the number of patients admitted to hospitals for bed care, 12,545,610, not excluding duplicate admissions, is

*Percentage of Population Hospitalized and Percentage of Patients Operated on, by States*

	Population (Census of 1940)	Patients Admitted	Percentage of Popula- tion Hospi- talized	Patients Operated On	Percentage of Patients Operated On
Alabama	2 532 961	176 113	6.2	65 570	36.9
Arizona	449 261	65 615	14.3	24 002	36.0
Arkansas	1 913 47	10 468	5.4	57 765	58.8
California	6 907 57	855 590	12.8	369 709	41.5
Colorado	1 123 296	155 95	12.4	58 654	47.2
Connecticut	1 709 212	195 046	11.6	94 147	48.8
Delaware	266 565	21 231	10.2	11 704	4.0
Dist. of Columbia	661 091	1 06 7	19.7	61 440	47.0
Florida	1 816 414	146 255	9.8	68 958	37.0
Georgia	3 123 712	26 213	8.5	98 653	37.0
Idaho	1 187 3	41 197	8.2	1 595	4.1
Illinois	7 857 211	819 671	10.8	407 440	45.0
Indiana	3 424 716	273 563	8.0	121 412	44.5
Iowa	2 538 785	192 078	7.8	90 101	45.3
Kansas	1 501 028	156 018	8.7	61 549	41.6
Kentucky	2 541 677	172 077	6.0	70 381	40.9
Louisiana	2 455 550	261 131	11.4	121 002	45.0
Maine	814 256	81 409	9.6	36 762	44.6
Maryland	1 821 214	158 514	10.2	85 751	46.0
Massachusetts	4 316 171	495 581	11.1	233 710	46.9
Michigan	5 981 101	56 405	10.0	259 217	49.2
Minnesota	2 792 000	708 041	11.0	1 171 212	44.6
Mississippi	2 183 166	176 687	6.3	66 618	41.5
Missouri	7 814 641	36 674	8.9	145 567	4.3
Montana	1 044 678	10 231	11.0	23 522	76.3
Nebraska	1 115 854	102 102	7.8	48 467	47.4
Nevada	110 247	16 972	1.4	5 575	24.6
New Hampshire	491 574	40 851	10.5	27 470	51.0
New Jersey	4 169 171	350 211	9.1	172 365	48.0
New Mexico	1 818 518	40 300	7.6	14 957	37.0
New York	13 419 142	1 419 255	10.6	602 922	46.2
North Carolina	711 071	710 444	8.7	132 609	42.5
North Dakota	611 071	66 211	10.3	24 509	37.4
Ohio	6 907 612	56 491	8.4	2 241	48.5
Oklahoma	2 451 431	156 077	6.7	57 305	36.7
Oregon	1 081 614	126 274	11.6	56 778	43.0
Pennsylvania	9 900 150	825 334	8.3	442 669	53.7
Rhode Island	711 746	56 621	7.8	29 788	25.8
South Carolina	1 599 504	169 702	8.0	69 151	35.4
South Dakota	642 661	56 974	8.9	11 123	3.1
Tennessee	2 018 841	193 666	9.6	50 011	46.0
Texas	4 414 571	59 692	9.9	22 838	38.2
Utah	500 710	49 997	9.1	21 816	41.6
Vermont	252 121	33 358	9.8	14 916	44.4
Virginia	2 767 773	26 067	9.8	118 155	46.1
Washington	1 758 191	244 325	14.1	86 012	38.9
West Virginia	1 901 174	156 014	8.2	76 955	49.3
Wisconsin	3 137 577	309 065	9.0	149 574	41.4
Wyoming	250 742	38 425	15.3	8 357	21.8
Totals	131 679 255	12 545 610	9.5	6 697 579	44.7

equivalent to 9.5 per cent of the entire population according to the census of 1940. The incidence of hospitalization in terms of percentage of population hospitalized in each of the different states affords an especially interesting comparison. In the District of Columbia this amounts to 19.7 per cent of the population, a very high rate the result of conditions that are different from those of any state as a whole.

Among the states having a high percentage of population hospitalized were Nevada 15.4 per cent, Arizona 15.3, Wyoming 15.3, Washington 14.1, California 12.8 and Colorado 12.4. On the other hand, states having a low rate of hospitalization were Arkansas 5.4 per cent, Kentucky 6.0, Alabama 6.2, Mississippi 6.3, Tennessee 6.6 and Oklahoma 6.7.

In answer to the question as to how many patients were operated on during the year, we get a total of

5,607,879, or 44.7 per cent of the patients admitted. This is an increase of 406,229 over the patients operated on in 1941. The state turning in the highest percentage of patients receiving operations is New Hampshire with 54.0 per cent, which is closely followed by Pennsylvania with 53.7 and Rhode Island with 52.8. Thirty states and the District of Columbia had an operating rate between 40 and 50 per cent, fourteen states between 30 and 40, while the lowest record goes to Wyoming, which, as a state, reported 21.8 per cent.

#### HOSPITAL DEATHS AND NECROPSIES COMPARED WITH ADMISSIONS

The total number of deaths reported in all hospitals was 502,334 and the number of necropsies was 116,303, a necropsy rate of 23.2 per cent. In the preceding year the deaths had reached a total of 510,158 with 125,640 necropsies, a rate of 24.6. The present census shows a necropsy rate on the hospital deaths in the District of Columbia of 42.9 per cent. The states which achieved a comparatively high necropsy rate on hospital deaths

#### Hospital Deaths and Necropsies Compared with Admissions

	Deaths Excluding Stillborn	Number of Necropsies	Per centage of Necropsies	Patients Admitted Plus Live Births	Death Rate (Per Cent) of Admissions Plus Live Births
Alabama	5,727	871	15.2	193,440	3.0
Arizona	2,308	447	19.4	75,649	3.1
Arkansas	3,325	397	11.9	114,544	2.9
California	34,939	10,533	30.2	946,096	3.6
Colorado	5,267	1,678	31.9	153,099	3.4
Connecticut	8,101	2,227	28.7	230,870	3.5
Delaware	1,349	290	21.7	31,712	4.2
Dist. of Columbia	5,530	2,340	42.9	151,355	3.7
Florida	7,054	1,284	18.1	203,636	3.4
Georgia	6,851	1,260	18.1	239,437	2.4
Idaho	1,425	92	6.4	50,037	2.4
Illinois	37,367	8,491	22.7	971,634	3.8
Indiana	11,643	1,914	16.4	320,932	3.0
Iowa	7,971	1,277	16.0	238,387	3.3
Kansas	5,670	1,162	20.5	175,666	3.2
Kentucky	6,344	917	14.5	188,722	3.0
Louisiana	7,814	2,306	29.5	293,136	2.7
Maine	2,888	267	12.6	90,851	3.2
Maryland	7,997	2,480	31.0	210,660	3.8
Massachusetts	20,604	5,190	24.9	363,891	3.7
Michigan	19,649	5,115	26.0	613,270	3.2
Minnesota	11,061	4,045	33.8	330,869	3.4
Mississippi	3,865	240	6.3	146,779	2.6
Missouri	13,589	4,278	31.5	374,854	3.6
Montana	2,406	366	14.4	74,718	3.2
Nebraska	3,614	867	22.7	116,441	3.2
Nevada	515	81	15.7	18,749	2.7
New Hampshire	2,368	425	18.0	58,459	4.0
New Jersey	18,571	4,049	21.5	418,455	4.2
New Mexico	1,481	182	12.3	40,013	3.3
New York	71,967	18,634	25.9	1,639,850	4.4
North Carolina	6,677	1,111	12.8	340,452	2.5
North Dakota	1,065	507	29.8	74,289	2.6
Ohio	26,479	5,067	22.5	675,095	3.9
Oklahoma	5,062	629	12.4	174,797	2.9
Oregon	4,727	1,425	30.2	143,326	3.3
Pennsylvania	40,365	10,183	25.2	959,097	4.2
Rhode Island	3,095	756	24.4	66,387	4.6
South Carolina	5,357	617	11.5	182,829	2.9
South Dakota	1,818	249	14.2	63,660	2.9
Tennessee	9,530	1,901	19.6	215,631	4.4
Texas	10,124	2,437	23.1	666,863	2.4
Utah	1,693	357	21.0	67,186	2.7
Vermont	1,340	245	18.3	27,789	3.3
Virginia	8,600	1,567	18.4	285,775	3.0
Washington	8,139	1,807	24.4	212,597	3.0
West Virginia	5,161	577	15.9	168,975	3.1
Wisconsin	12,442	2,186	17.6	359,062	3.5
Wyoming	566	120	11.4	41,001	2.1
Totals (1942)	502,334	116,303	23.2	14,216,209	3.5
(1941)	510,158	125,640	24.6	13,091,125	3.9

during 1942 were Minnesota 33.8 per cent, Colorado 31.9, Missouri 31.5, Maryland 31.0, while California and Oregon tied at 30.2. An accompanying table gives statistics on hospital deaths and necropsies for all states.

The total number of patients admitted plus the number of live babies born in all states during the 1942 period was 14,216,209. The live births are added in this calculation because the number of deaths, 502,334,

included deaths of newborn infants. The over-all death rate for patients admitted to hospitals (plus live births) therefore was 3.5 per cent. This compares with the rate of 3.9 per cent for the preceding year. There

#### Administrative and Nursing Personnel and Schools of Nursing

Hospitals	Administrator or Superintendent				State Accredited Schools of Nursing	Student Nurses	Graduate Nurses Employed at Nursing	Practical Nurses	Attendants	Orderlies
	M	D	R	Other						
Alabama	99	44	44	11	27	1,095	1,145	1,600	1,300	291
Arizona	64	26	6	22	4	26	710	37	451	24
Arkansas	65	25	19	19	11	4,000	700	227	89	181
California	3,019	1,511	115	10	36	33,500	10,435	1,336	5,907	1,804
Colorado	97	34	3	35	18	1,521	1,574	330	1,258	64
Connecticut	5	35	21	29	21	1,266	2,457	227	1,645	374
Delaware	17	7	7	3	7	407	265	55	165	50
Dist. of Columbia	25	16	7	5	10	948	1,470	314	1,142	553
Florida	103	32	44	37	15	903	1,512	27	1,090	144
Georgia	123	58	40	30	17	1,500	1,705	99	2,021	1,700
Idaho	44	15	19	10	9	411	502	87	1,304	49
Illinois	317	85	32	200	106	7,390	7,776	1,058	6,300	77
Indiana	141	49	53	39	25	2,416	2,170	354	1,692	11
Iowa	145	33	75	37	32	2,292	1,614	390	1,075	11
Kansas	114	32	65	17	38	1,702	1,168	265	64	16
Kentucky	94	37	6	21	18	1,041	1,185	421	1,400	670
Louisiana	82	49	2	10	17	1,457	1,570	517	2,300	1,011
Maine	70	24	40	6	20	1,052	693	56	376	59
Maryland	79	35	25	17	30	1,069	1,832	60	1,157	85
Massachusetts	241	89	100	52	72	6,437	5,500	526	4,886	91
Michigan	252	87	102	6	39	5,399	5,127	939	4,116	721
Minnesota	217	74	96	47	35	3,323	3,064	866	1,942	293
Mississippi	98	65	24	9	37	797	738	166	954	19
Missouri	142	54	44	24	34	2,764	2,871	2,850	2,850	91
Montana	50	15	26	15	13	757	576	9	299	4
Nebraska	95	37	42	22	14	966	807	306	574	77
Nevada	10	7	0	7	0	0	160	35	52	4
New Hampshire	42	8	27	7	14	718	509	46	660	29
New Jersey	165	59	79	73	50	3,811	3,749	579	2,157	672
New Mexico	51	23	14	14	2	16	367	69	413	70
New York	545	199	179	170	12	9,254	10,956	3,070	17,527	1,911
North Carolina	167	49	69	49	49	1,106	2,416	404	1,717	1,700
North Dakota	47	9	23	15	16	912	396	45	1,115	15
Ohio	242	75	75	92	70	5,575	5,832	958	5,911	685
Oklahoma	127	49	47	31	15	892	964	327	1,012	667
Oregon	78	24	34	20	14	567	1,250	168	500	92
Pennsylvania	3,521	113	92	147	128	9,654	8,111	1,019	5,065	1,164
Rhode Island	27	11	6	6	9	665	699	56	570	70
South Carolina	67	33	17	17	15	1,092	1,261	111	1,649	449
South Dakota	54	16	23	15	17	619	440	63	214	9
Tennessee	105	54	22	39	29	1,641	1,206	395	1,110	411
Texas	366	140	135	91	42	3,100	3,910	950	3,111	1,011
Utah	26	17	10	9	6	566	479	118	307	6
Vermont	31	10	18	0	11	457	354	54	207	4
Virginia	119	52	29	28	20	1,700	1,007	210	1,100	511
Washington	31	41	50	24	22	1,701	2,361	297	1,106	18
West Virginia	76	40	21	15	21	1,411	850	27	407	774
Wisconsin	222	47	51	94	29	2,212	3,109	512	2,707	274
Wyoming	20	12	0	7	2	68	296	27	197	0
Totals (1942)	6,345	2,280	2,167	1,598	1,439	98,166	120,114	22,161	94,100	2,857
(1941)	6,358	2,133	2,167	1,598	1,448	95,977	117,542	17,332	95,002	2,857

were fourteen states in which the hospital death rate was less than 3 per cent, and there were seven states in which it was over 4 per cent.

In view of the educational importance of necropsies this subject is discussed at greater length in that part of the article relating to internships, residencies and fellowships. In that section comparisons are made between the rates in all hospitals and the higher rates of necropsy performance in the hospitals that are approved specifically for educational purposes.

#### ADMINISTRATIVE PERSONNEL

The questionnaire used in the Annual Census asks for the name of superintendent or administrative head and the title of that person. The returns concerning all of the 6,345 registered hospitals give a total of 2,280 administrators or superintendents who hold the M.D. degree, 2,167 registered nurses and 1,898 other persons. The M.D. degree of each of the physicians was checked in the biographic files of the American Medical Association. The R.N. degrees were recorded as reported on the questionnaire. A physician owning a

hospital was not counted as the administrator or superintendent if the name of any other individual in charge was given. The number of physicians serving in this capacity has increased by 147 during the past year.

#### NURSING PERSONNEL

In order to ascertain the status of nursing personnel as of the date when the questionnaire was answered, the following questions were asked: "Number of graduate nurses employed on nursing service."

#### Technical Personnel in All Hospitals—1942

	Nurse Anesthetists		Laboratory Technicians		X-Ray Technicians		Dietitians		Physical Therapists		Pharmacists		Medical Record Librarians		Other Librarians		Medical Stenographers		Occupational Therapists		Dental Hygienists		Social Service Workers	
	Full Time	Part Time	Full Time	Part Time	Full Time	Part Time	Full Time	Part Time	Full Time	Part Time	Full Time	Part Time	Full Time	Part Time	Full Time	Part Time	Full Time	Part Time	Full Time	Part Time	Full Time	Part Time	Full Time	Part Time
Alabama	40	19	120	28	84	27	10	18	11		27	3	11	17	5	3	107	13	4	14	3	14	10	
Arizona	10	9	56	15	33	16	25	4	12	6	17	3	18	12	4	3	32	13	5	4	13	6	3	3
Arkansas	35	21	107	30	64	20	40	7	24	1	22	0	31	13	9	8	57	16	12	1	8	7	15	39
California	143	50	742	120	455	137	300	30	241	59	247	61	221	55	57	38	484	67	68	19	120	40	216	94
Colorado	32	11	119	27	92	19	85	7	35	11	34	7	36	22	10	0	89	17	23	7	14	9	28	20
Connecticut	08	8	167	16	116	18	109	4	38	14	44	7	59	13	13	10	126	11	78	15	14	12	57	9
Delaware	11	3	29	5	14	4	17		7		0	2	6	2			27	8			2	1	10	16
Dist. Columbia	15	3	87	5	41	7	18	1	40	3	31	2	30	5	17	2	106	4	27	2	8	2	57	98
Florida	08	25	210	44	115	31	80	7	41	10	59	6	59	20	10	0	113	17	8	5	20	4	41	48
Georgia	75	21	263	44	154	36	120	11	45	17	76	12	67	20	7	5	174	29	19		25	0	55	13
Idaho	19	9	25	8	19	11	15	3	4	3	4	1	11	7	1	2	14	6	3	1	1	5	1	14
Illinois	308	70	682	88	451	60	359	32	171	28	177	23	213	61	41	39	378	48	110	20	40	28	174	53
Indiana	18	7	213	28	126	33	94	6	44	10	49	4	70	14	21	11	93	19	39	4	49	14	23	140
Iowa	44	21	137	32	114	31	76	12	30	27	34	11	62	20	9	9	65	11	22	5	8	7	21	4
Kansas	16	12	137	49	86	26	50	8	28	18	35	6	43	27	10	8	62	21	8	4	12	6	14	8
Kentucky	18	9	147	25	76	23	70	8	18	8	25	3	34	16	12	7	101	11	22	1	13	22	26	7
Louisiana	85	9	106	34	100	23	89	9	40	8	56	0	43	17	32	7	119	11	7		21	10	55	42
Maine	37	12	71	13	46	13	46	2	21	2	15	3	25	5	5	3	41	5	8	1	5	5	8	2
Maryland	44	5	210	8	89	11	110	6	45	30	57	7	35	8	16	0	160	18	49	11	25	16	116	4
Massachusetts	60	20	472	60	281	51	320	14	106	30	131	18	109	29	32	29	384	40	142	24	45	15	377	70
Michigan	169	47	433	59	258	51	220	11	102	19	97	24	123	44	26	21	281	0	76	9	31	22	128	27
Minnesota	129	67	210	65	140	65	130	21	38	24	42	18	61	32	20	17	105	28	39	6	15	17	61	3
Mississippi	59	15	118	33	70	31	59	28	19	6	23	6	36	20	3	4	94	16	17	1	15	3	13	11
Missouri	59	18	380	38	195	39	134	9	73	13	85	16	99	22	25	6	181	22	30	7	31	15	122	17
Montana	32	16	40	16	30	14	24	3	12	4	7	4	21	7	4	5	20	4	1	6	1	3	3	2
Nebraska	44	30	74	21	57	25	44	9	15	3	22	3	27	14	5	7	31	18	11	2	10	8	6	59
Nevada	2	6	19	6	11	7	8	2	1	1	7	1	5	4			5	4			3	1	5	
New Hampshire	8	2	49	10	30	13	30	3	4	11	11	2	25	5	1	3	21	0	5	2	3	3	6	
New Jersey	67	8	357	45	183	35	228	8	117	34	68	21	106	32	25	20	205	20	96	11	27	34	144	72
New Mexico	9	5	33	14	20	15	26	5	8	2	9	2	13	8	2	2	23	17	6	1	5	9	4	2
New York	247	43	1451	168	698	127	971	38	437	106	361	47	418	75	107	65	913	84	350	37	127	44	820	496
North Carolina	77	24	248	41	153	39	103	16	47	19	41	5	85	19	11	29	29	27	19	5	22	14	44	94
North Dakota	23	16	36	28	28	18	22	3	9	4	2	1	17	11	2	5	19	8	6	1	1	3	4	1
Ohio	105	17	511	92	241	59	289	25	108	21	100	26	134	40	44	26	22	46	57	10	20	59	105	44
Oklahoma	23	13	131	36	106	31	65	3	21	8	27	5	83	17	11	3	68	26	6	3	19	17	21	1
Oregon	53	17	92	28	58	20	45	7	21	22	21	8	29	12	4	4	47	17	11		9	6	9	3
Pennsylvania	303	56	735	87	361	67	461	16	161	62	172	55	248	49	37	29	393	85	126	20	61	37	267	966
Rhode Island	5	3	63	9	33	5	35	2	14	8	21	5	24	16	3	2	60	3	14		10	3	26	22
South Carolina	29	16	160	40	83	32	85	5	24	6	32	10	36	16	8	5	55	11	11	1	18	4	27	12
South Dakota	31	19	34	13	26	15	10	9	14	3	7	4	16	9	4	2	25	0	3		1	3	3	1
Tennessee	51	16	130	32	78	26	85	16	28	8	45	3	79	17	17	2	129	16	22	1	14	9	28	11
Texas	174	60	608	130	365	96	247	39	121	25	140	17	101	60	51	9	381	61	34	3	60	23	60	119
Utah	19	4	46	5	21	8	27	2	10	3	8	2	14	3	5	3	35	4	7	2	7	3	9	53
Vermont	5	3	27	8	16	13	15	2	10	4	6		13	7	2	1	17	0	10		3	1	1	1
Virginia	03	22	246	31	136	24	148	18	62	16	56	7	74	26	17	17	171	34	28	5	24	11	84	18
Washington	104	25	155	34	92	36	105	11	46	12	53	14	55	24	11	5	91	13	17	3	165	8	48	15
West Virginia	50	12	122	17	78	13	56	5	27	3	8	6	46	0	10	3	87	8	3	3	4	6	4	1
Wisconsin	129	53	229	57	140	52	114	59	65	26	51	21	75	32	6	20	107	56	44	10	14	12	56	3
Wyoming	8	2	24	3	22	5	17	1	12	1	6		5	1			29	2	7		4		2	
Total (1942)	3,254	972	10,981	1,835	6,303	1,604	6,077	557	2,643	712	2,698	555	3,426	1,035	780	574	6,855	1,048	1,727	253	1,031	572	3,618	2,033
(1941)	9,609	1,616	55,324	1,539	5,564	1,539	5,478	459	2,505	602	2,382	497	3,055	897	678	461	6,016	990	1,582	350	919	593	2,950	1,225
Increase	1352	159	769	69	599	65	599	98	138	170	316	76	391	142	102	60	859	88	155	67	112	21	68	808
Per cent of Increase	14.1	9.5	13.9	4.3	9.5	21.3	5.5	28.2	5.5	28.2	13.3	7.2	12.9	15.8	15.0	12.9	14.3	5.9	8.2	10.1	12.2	3.5	23.5	66.0

\* Decrease

**'Practical' nurses** The answer gave a total of 120,114 graduate nurses, 22,161 practical nurses, 94,133 attendants and 25,857 orderlies. The question is limited to those employed on nursing service and does not include student nurses or nurses employed as anesthetists, technicians, instructors, superintendents or other non-nursing duties. With the rarest exceptions those reported as graduate nurses have the R.N. degree from their state board of nurse examiners. The increase in graduate nurses employed at nursing during the year is 7,272 and the increase in practical nurses is 4,829. The number of attendants decreased by 869 and the number of orderlies increased by 1,020.

#### SCHOOLS OF NURSING

The number of schools of nursing that have the approval of their respective state boards of nurse examiners is 1,439 as compared with 1,448 one year ago. The state board of nurse examiners, which usually has its office in the capitol building of the state, is the authority for the number of state accredited schools of nursing. The hospital which maintains the accredited school of nursing is the authority for the number of students enrolled as of date when questionnaire was

filled out. The total number of students enrolled in the accredited schools of nursing was 98,166 as compared with 93,977 one year ago. For more than a decade the number of accredited schools of nursing has been sharply reduced, while the number of students enrolled has constantly increased.

#### TECHNICAL PERSONNEL IN HOSPITALS

To keep pace with developments in the art and science of medicine it has become possible—and necessary—for physicians working in hospitals to use trained persons to assist them in many technical procedures connected with the care of patients. These are in addition to nurses. Some of the technical personnel,



figures on which are presented in an accompanying table, see and handle the patient. Others may not come in contact with the patient. All are essential for administering to the patient's comfort and care and saving the doctor's time.

Some statistics on technical personnel were presented in *THE JOURNAL*, March 27, 1937 and March 28, 1942. Statistics are now available showing the status of technical personnel in hospitals for the year 1942, which reveal a large and varied use of trained assistants and the augmented use of them under war conditions. The number of each of the twelve types of assistant in each state is shown, including those employed on full time and those on part time. The hospitals reported 3,274 nurse anesthetists on full time and 972 on part time, 10,961 laboratory technicians on full time and 1,835 on part time and 6,303 x-ray technicians on full time and 1,604 on part time. The dietitians number, full time and part time respectively, 6,077 and 557, physical therapists 2,643 and 772, pharmacists 2,698 and 533, medical stenographers 6,875 and 1,048, occupational therapists 1,727 and 283, dental hygienists 1,031 and 572. In social service there are 3,618 workers on a salary and 2,033 are voluntary. In all these groups there is noted a considerable increase over the previous year except in the case of occupational therapists and part time dental hygienists in which slight decreases are noted.

Medical record librarians number 3,426 full time as compared with 3,035 a year ago and 1,035 part time as compared with 897. Other librarians have increased from 678 to 780 full time and 464 to 524 part time.

A special report on the work of the Council on Medical Education and Hospitals with reference to laboratory technicians, physical therapy technicians and occupational therapists, and lists of approved schools for their training, will be found in later pages of this issue. There is also an announcement regarding the work assigned to the Council by the House of Delegates at the 1942 meeting relative to the formation of standards and the preparation of lists of schools for medical record librarians.

#### REGISTRATION AND APPROVAL

It is well to distinguish between registration and approval of hospitals. Registration means the inclusion of a hospital in the list maintained by the Council on Medical Education and Hospitals and published in the Hospital Number of *THE JOURNAL* and in the American Medical Directory. The Essentials of a Registered Hospital are used as a guide in considering hospitals for registration and are employed in such a way as to raise the standards of hospitals and to point the way to better service.

Approval means specific endorsement of hospitals for educational purposes, the fitness for which is determined by observation, inspection and comparison with definite requirements for the training of interns and residents.

Registration is a basic recognition extended to the hospitals and related institutions concerning which the Council has no evidence of irregular or unsafe practices. Approval is designation of certain registered institutions by the Council for internships, residencies and fellowships.

The term approved as used by the College of Surgeons may be applied to those registered hospitals that meet the minimum standards of the College.

The registered hospitals are printed in a list on later pages of this issue. Approval of the Council for internship is shown by a star (\*), approval of residencies by a plus (+) sign. Approval by the American College of Surgeons is shown by the delta (Δ) and approval by the state board of nurse examiners by the diamond (◇).

#### HOSPITAL FACILITIES NOT IN THE REGISTER

At all times there are some hospitals that are in formative stages or that lack further development and are not ready for registration.

There are other facilities that are omitted from the list of registered hospitals, such as follow methods and practices that are generally recognized as unsatisfactory or dangerous and that therefore need complete change of policy before being recommended to the public. Their number at the present time is 539. Their capacity, according to the latest available information, is 15,260, or less than two thirds of 1 per cent of the facilities furnished by the hospitals recognized in the Register. Each year a number of such institutions close

Summary of Growth of Hospitals 1909 to 1942

Year	Federal Hospitals		State Hospitals		All Other Hospitals		Total	
	Number	Capacity	Number	Capacity	Number	Capacity	Number	Capacity
1909	71	8,427	232	189,049	4,066	223,119	4,369	421,065
1914	93	12,602	294	232,834	4,630	247,046	5,037	532,481
1918	110	18,815	303	262,234	4,910	331,182	5,323	612,281
1923	220	33,663	601	502,208	6,009	399,645	6,330	700,722
1928	294	61,766	360	360,750	5,963	461,410	6,362	892,934
1931	291	69,170	376	411,252	5,746	480,663	6,613	974,115
1932	301	74,151	368	442,601	5,693	497,602	6,662	1,014,354
1933	295	75,635	357	459,646	5,585	491,765	6,437	1,027,046
1934	313	77,865	344	473,000	5,477	497,701	6,344	1,048,101
1935	316	83,303	326	483,994	5,404	500,792	6,746	1,075,139
1936	323	84,234	324	503,306	5,342	509,181	6,789	1,096,121
1937	329	97,951	312	505,913	5,277	517,644	6,128	1,124,548
1938	340	92,248	323	511,219	5,313	527,833	6,166	1,161,300
1939	329	96,345	323	560,000	5,374	580,113	6,246	1,190,076
1940	340	108,928	321	572,079	5,474	584,735	6,291	1,276,245
1941	428	179,202	330	600,370	5,409	544,830	6,335	1,324,881
1942	471	220,935	330	606,437	5,341	556,452	6,345	1,333,827

their doors and a few pass into competent hands or make improvements to qualify for registration.

Another class of facilities not appearing in the Register includes emergency stations, clinics, offices and so on, with some facilities for at least occasional bed care, attached or available. They are recognized as ethical and valuable auxiliary facilities to the hospital system. Most of these unclassified facilities have 3 to 10 beds each, which are used as occasion demands. Some of them are sickrooms attached to small custodial institutions. The bed capacity of these institutions, usually spoken of as unclassified, is too variable to be positively enumerated. Hospitals that are not named in the registered list may apply at any time and be given consideration in accordance with the Essentials of a Registered Hospital.

The Essentials of a Registered Hospital, adopted by the House of Delegates of the American Medical Association, suggest minimum standards for hospital service in the best interests of the patient. The Essentials are distributed in pamphlet form on application and have been a force of appreciable educational value to hospitals.

Opportunity always is open for unregistered hospitals to make application through the Council on Medical Education and Hospitals.

## INTERNSHIPS, RESIDENCIES AND FELLOWSHIPS

(As of March 1, 1943)

## NUMBER OF INTERNSHIPS

In the present discussion of internships, residencies and fellowships the federal hospitals approved by the Council are omitted for reasons of military security. Aside from these institutions there are now 702 hospitals approved for intern training. They can accommodate 7,959 interns but have only 5,567 on duty at the present time, indicating a shortage of 2,392. Since the number of admissions in the approved internship hospitals was 5,121,911 in 1942 and the average daily census 171,636, it is apparent that the general over all ratio of interns to patients is now 1 to 920 annual admissions, or 1 to every 31 patients currently under treatment. It should be noted however, that the hospitals holding internship approval have an additional house staff of 3,207 resident physicians, including 154

TABLE A—Number of Internships 1914-1943

	Number of Hospitals	Available Internships	Medical Graduates (United States)
1914	505	2,067	3,574
1916	519	2,709	4,318
1920	461	2,969	4,017
1921	482	2,962	3,156
1922	492	3,063	2,320
1923	500	3,119	3,120
1924	518	3,269	3,362
1925	528	3,332	3,974
1926	534	4,727	3,962
1927	578	4,132	4,033
1928	611	5,109	4,262
1929	674	5,409	4,446
1930	631	5,331	4,533
1931	674	6,134	4,735
1932	696	6,961	4,966
1933	681	6,204	4,895
1934	616	6,201	5,033
1935	697	6,419	5,101
1936	703	6,739	5,183
1937	712	7,167	5,377
1938	729	7,334	5,194
1939	734	7,833	5,039
1940	732	7,993	5,097
1941	743	8,189	5,270
1942	732	8,181	5,163
1943	702*	7,939	5,567†

\* Does not include federal hospitals approved for intern training.

† Estimated number for the entire calendar year under accelerated program of medical education.

general residents whose service usually corresponds to a second year internship. Considering the entire house staff of 8,773, the ratios become 1 to 583 admissions, or 1 to approximately every 20 patients now under hospital care. The number of outpatient visits in these hospitals was 20,257,848 last year.

Table A, illustrating the increase of internships from 1914 to 1943, shows the number of hospitals and available internships in relation to the annual output of medical graduates in the approved medical schools of the United States. In this connection it is of interest to note that when the first list of approved hospitals was published in 1914 only 70 per cent of the medical graduates were applying for internship appointment. In recent years 99 per cent have taken at least one year of hospital training after graduation, even though an internship is not required for licensure in twenty-six states.

The number of hospitals approved for intern training in each state is shown in table B.

## SHORTAGE OF INTERNS

For several years the number of available internships has exceeded the annual number of medical graduates, but many of the surplus appointments have usually been filled by second year interns and graduates of

TABLE B—Vacancies in Approved Intern Hospitals—January 1943

	No. of Hospitals	Internships Available	Interns Now Serving	No. of Vacancies
Alabama	1	10	1	8
Arizona	2	10	3	7
Arkansas	2	22	12	10
California	59	599	42	117
Colorado	10	64	37	7
Connecticut	13	103	103	61
Delaware	4	28	22	6
District of Columbia	9	108	73	29
Florida	6	59	23	23
Georgia	9	130	98	22
Illinois	39	618	239	219
Indiana	14	169	139	31
Iowa	10	64	33	29
Kansas	6	42	23	14
Kentucky	3	71	41	30
Louisiana	10	221	191	30
Maine	4	36	12	14
Maryland	16	236	167	59
Massachusetts	21	333	207	76
Michigan	1	33	24	11
Minnesota	1	13	14	23
Missouri	23	31	219	91
Montana	2	6	6	6
Nebraska	9	3	34	19
New Hampshire	1	11	7	4
New Jersey	41	271	134	133
New York	39	1,338	1,034	439
North Carolina	8	117	33	43
North Dakota	1	4	4	4
Ohio	21	4	30	10
Oklahoma	1	36	0	20
Oregon	5	60	3	7
Pennsylvania	21	730	532	218
Rhode Island	4	40	27	13
South Carolina	2	4	33	11
Tennessee	10	139	107	23
Texas	13	103	144	2
Utah	1	1	14	17
Vermont	2	8	5	3
Virginia	9	102	83	20
Washington	12	92	6	26
West Virginia	2	33	23	13
Wisconsin	21	131	103	48
Totals	702	7,939	5,567	2,392

\* Does not include federal hospitals approved for intern training.

medical schools outside the United States. Vacancies have been increasing, however, and are now becoming more apparent since the use of second year interns has necessarily been curtailed. In 1939 only 317 vacancies were reported but these increased to 344 in 1940, 615 in 1941 and 1,128 by January 1942. Currently the number of unfilled positions in hospitals approved for intern training is 2,392, as indicated by the report of 7,959 internships available and 5,567 interns employed (table B).

In the face of this shortage it would seem particularly important that all hospitals cooperate in an effort to maintain an equitable distribution of interns by limiting their appointments to actual minimum needs. As a general rule the ratio of house officers to patients should not exceed 1 intern to 600 annual admissions. Economy in the use of interns is important not only from a numerical point of view but also in relation to individual duties and assignments. Thus to conserve the interns' time for essential hospital and educational needs the routine procedures which do not contribute materially to the training course should be shifted to nursing and technical personnel whenever possible. Obviously when an intern group has been diminished it may likewise become necessary for the members of the attending staff to take over many of the functions ordinarily assigned to house officers. Under present conditions it is increasingly important that the educational character of the internship be preserved. The employment of interns, therefore, should not be viewed primarily as a means of supplying personnel in relation to institutional service.

The Council has recently declared that hospitals approved for internships and residencies may accept graduates of Latin American schools as interns or residents, the responsibility for the evaluation of credentials of each applicant to rest with the hospital involved. Similarly, graduates of European medical schools may be appointed if their qualifications are found to be satisfactory. Again the responsibility for evaluating credentials must necessarily rest with individual hospitals, since foreign medical colleges have not been investigated and classified by the American Medical Association as in the case of the United States and Canadian schools. The shortage of interns might also be relieved to some extent by the employment of second year interns and general residents when such applicants are available. In this connection it should be noted that all hospitals approved for interns are likewise accredited for general or mixed residency training.

#### LENGTH OF INTERNSHIPS

There has been considerable discussion regarding the length of internship during the present accelerated program of medical education. However, it has not become necessary to reduce the intern training program below one year even though medical students are now graduating at intervals of nine months. Both the Council on Medical Education and Hospitals and the Association of American Medical Colleges have recommended that a one year internship be maintained. The essential character of the intern service has likewise been recognized by the Army, Navy and Selective Service, which have made provisions whereby medical students may be deferred from active military duty until they have completed a year of hospital training. It is necessary, however under present conditions that students eligible for military service begin their internship immediately on graduation. Those who are not subject to induction because of physical defects or other reasons are not officially restricted in length of internship, yet they should also complete their training as early as possible so as to be available for essential civilian needs.

In January 1942 608 of the approved hospitals were offering internships of twelve months' duration, 17 had services of eighteen months while 71 reported two year assignments. In addition there were 31 hospitals which had two services ranging from twelve to twenty-

four months and 5 other institutions in which the internship varied from twenty-one to thirty-six months. From reports received in January 1943 it is apparent that all of the intern hospitals are now offering a one year internship in accordance with military needs. Twenty-eight of these are also providing services of longer duration for such applicants as may be able to continue beyond the regular one year period. Ten of the longer assignments are eighteen months in length, while 18 are in the two year group.

#### INCREASED PRODUCTION OF INTERNS

It has been estimated that the accelerated program of medical education will produce over 21,000 medical graduates in the first three years of operation. Of this number approximately 9,560 will complete their undergraduate training in 1943. There is some variation in the dates of graduation of the medical schools and a careful study of these may permit some staggering of the dates of beginning of internships. However 4,180 medical graduates will be ready for intern service by the first of April, 681 by July 1, 255 by October 1 and 4,444 in the last three months of the year.

It is obvious that under present conditions there is no one solution to the problem of coordinating a twelve month internship with an incoming class of interns every nine months. Conditions vary in the intern hospitals, and a number of different programs have been adopted or are now under consideration. Some hospitals are experiencing such a shortage of interns that they will have little difficulty in accommodating a new group three months before the previous group has completed its year of service. Other institutions anticipating difficulty in providing quarters and satisfactory training schedules during the three months period of overlapping assignments are arranging for affiliated services in neighboring hospitals which are prepared to offer supplemental training acceptable to the hospital responsible for the internship. Only when an institution is prepared to assume supervision and responsibility for the affiliated three months training will it be in position to certify the completion of the required twelve months internship. Otherwise the hospital should issue certification for only such period of training as was actually under its own supervision. If a divided internship of nine and three months is served in two approved intern hospitals without a direct affiliation, the assignment in each hospital will be recorded separately in the biographic files of the American Medical Association. This is in accordance with the policy of the Council of listing educational services on the basis of institutional approval.

In some institutions the older interns will be assigned to senior positions carrying greater responsibility during the last three months of the internship. This method is especially applicable in hospitals which previously employed residents and assistant residents. A few hospitals are studying the possibility of assigning interns to senior staff physicians who would assume responsibility for their training during the final three months. Such preceptorships should be under the supervision of the hospital, however, and so correlated with the previous training that a well rounded internship will be provided.

The Surgeon General of the Army and the Surgeon General of the Navy have expressed their willingness to cooperate in every way possible and have indicated that as far as arrangements can be made and such a

procedure is desirable the facilities of the military hospitals will be made available for the completion of the last three months of the internship period. Many of the hospitals of the Army, the Navy and the United States Public Health Service are currently approved for intern training. The approved naval hospitals and those of the U. S. Public Health Service are also accepting interns for the full twelve months training program.

#### TYPES OF INTERNSHIPS

The Council on Medical Education and Hospitals approves rotating, mixed and straight internships. The most common is the rotating service which provides supervised experience in internal medicine, surgery, pediatrics, obstetrics and their related subspecialties together with experience in laboratory and radiologic diagnosis. The mixed internship is defined as one which provides supervised experience in two or more but not in all of the clinical divisions named. A straight internship is one which provides training in a single department, although it may include limited opportunity for work in a related subspecialty. Straight internships are now approved in internal medicine, surgery, pediatrics, obstetrics (with or without gynecology) and pathology.

In January 1942, 660 of the approved hospitals offered a full rotating service, 27 had mixed assignments, 18 had straight internships, 17 provided both rotating and straight service, 5 mixed and straight, 2 rotating and mixed, while 3 hospitals furnished all three types. At that time 86.1 per cent of the internship appointments were rotating in type, 3.4 per cent were mixed and 10.4 per cent straight.

Since the internship has long been considered an essential preparation for general practice and a prerequisite for subsequent specialty training, it is logical that most interns should prefer a rotating assignment to gain wide experience in relation to the various aspects of modern medicine. Military needs have also emphasized the importance of a general type of training during the initial hospital year. It is significant therefore, that the number of rotating internships has increased considerably in the last year. From current reports it is apparent that 635 hospitals exclusive of the federal hospitals approved for intern training are now offering a rotating service, 25 have mixed assignments and 16 provide straight internships. In addition there are 14 that have rotating and straight services, 4 rotating and mixed, 6 mixed and straight and 2 that provide all three types. According to these figures rotating internships are available in 93.3 per cent of the 702 hospitals included in this report. Of the individual internships available at present, 6,862, or 86.2 per cent, are rotating in type, 258, or 3.2 per cent, are mixed, while 839, or 10.5 per cent, are classified as straight.

#### NECROPSY PERFORMANCE

In 1942 the hospitals approved for intern training reported a total of 210,533 deaths exclusive of stillbirths and coroners' cases not available for teaching. The corresponding number of necropsies was 74,879 indicating an average necropsy rate of 35.6 per cent. While there has been some reduction in the number of necropsies since last year, it should be noted that these figures do not include the federal hospitals approved for intern training, which ordinarily have a high ratio of necropsy performance. From 1938 to 1941 the average necropsy rates were 37.6, 37.8, 38.9 and 38.97 per cent respec-

tively. Table C gives comparative data for several annual periods since 1926. In this the most striking feature perhaps is the rapid response of the approved hospitals to the requirement of the Council that a minimum rate of at least 15 per cent be maintained after Jan. 1, 1929. There has likewise been a notable increase in the higher percentage groups showing that the hospitals are constantly striving to improve their educational facilities. In the last year, however, the loss of medical personnel incident to military needs has apparently affected the ability of several hospitals to maintain their usual level of necropsy performance. Forty-three fell below the minimum requirement of 15 per cent as compared with 18 in 1941. The fact that 116 hospitals had necropsy rates above 50 per cent is indeed encouraging, for it illustrates clearly that even under conditions imposed by war it is possible to maintain efficiently the essential functions of an educational program. Twenty-one hospitals had the highly commendable rate of 70 per cent or over, as shown in the accompanying list. Their achievement should serve to stimulate other hospitals to greater effort in relation to educational needs. Under present conditions it is especially important that the medical and administrative personnel concerned with the training of house

TABLE C—Necropsy Performance in Approved Intern Hospitals

Percentage	Number of Hospitals					
	1926	1930	1937	1940	1941	1942
70 or over	14	10	27	41	43	21
60-69	21	56	68	100	120	95
50-59	65	164	263	271	290	219
40-49	146	351	348	223	256	294
Below 40	29	71	26	8	18	43
Hospitals reporting	575	661	772	718	727	702*

\* Does not include federal hospitals approved for intern training.

officers exert every effort to insure their adequate preparation for civilian and military service.

The intern and residency hospitals combined had an average necropsy rate of 35.2 per cent on the basis of 249,383 deaths and 87,687 postmortem examinations. The other registered hospitals not approved for internships or residencies reported 252,951 deaths in 1942 and 28,616 necropsies—a ratio of 11.3 per cent. The amount of necropsy material available for teaching purposes in the approved hospitals is shown in table D.

#### RESIDENCIES AND FELLOWSHIPS

Of the 6,345 hospitals registered by the American Medical Association 646 are currently approved for the training of resident physicians, not counting six federal hospitals which also hold residency approval. Included in this group are 310 of the 702 hospitals reported as having approved internship programs. From reports received in January 1943 it is apparent that the 646 residency hospitals are offering 5,596 residencies, assistant residencies and fellowships as shown in table E. At the time of reporting only 4,082 of these positions were filled, however, indicating a shortage of 1,514 in comparison with the number desired.

For further information regarding the present status of residencies in relation to hospital and military needs, reference should be made to the article Medical Education and the Procurement and Assignment Service by

H S Diehl, M D, member, Directing Board, Procurement and Assignment Service, published in THE JOURNAL, Feb 27, 1943, p 635 This article indicates that in general the number of hospital residents should be less than 50 per cent of the number employed before the war and that this figure must be reduced still more in 1943. Residencies and fellowships, therefore, should be limited to such assignments as are essential for the provision of adequate medical care for hospital patients and for the clinical training of medical students. When vacancies exist it has been recommended that essential residencies be filled by the following groups in order: (1) women physicians, (2) men physicians who are physically disqualified for military service, (3) other interns or residents deferred by Selective Service, (4) qualified graduates of foreign medical schools.

The approval of residencies by the Council began in 1927, when 278 hospitals were certified for advanced training. Prior to that time the special hospital assignments were included in the approved intern list, which was first published in 1914. From 1927 to 1942 the opportunities for residency training have practically tripled in number in view of the increase of available positions from 1,776 to 5,293 and the number of approved hospitals from 278 to 632. In recent years there has been considerable acceleration in the growth of residencies because of the development of the certifying boards and the continuing emphasis on specialization. For the duration of the war, however, a curtailment of graduate training must necessarily take place.

*Highest Necropsy Rates\* in Approved Internship Hospitals—1942*

	Control	Per centage
1 Research and Educational Hospitals Chicago	State	97.7
2 Hospital of the University of Pennsylvania Philadelphia	Non Profit Assn	88.6
3 Trinity Hospital Minot N D	Church	86.3
4 University of Nebraska Hospital, Omaha	State	84.6
5 Beverly Hospital Beverly, Mass	Non Profit Assn	82.8
6 Evanston Hospital, Evanston, Ill	Non Profit Assn	81.0
7 University of Chicago Clinics, Chicago	Non Profit Assn	80.8
8 Mary Hitchcock Memorial Hospital Hanover N H	Non Profit Assn	79.5
9 Colorado General Hospital Denver	State	77.8
10 St Mary's Hospital Duluth Minn	Church	76.9
11 Santa Barbara General Hospital Santa Barbara Calif	Non Profit Assn	76.5
12 University of California Hospital San Francisco	State	74.5
13 University Hospitals Minneapolis	State	74.2
14 Iowa Methodist Hospital Des Moines	Church	73.3
15 Presbyterian Hospital Philadelphia	Church	73.2
16 Anchor Hospital, St Paul	City County	71.5
17 Massachusetts Memorial Hospitals Boston	Non Profit Assn	71.3
18 St Luke's Hospital Chicago	Non Profit Assn	71.1
19 Strong Memorial and Rochester Municipal Hospitals, Rochester N Y	City Non Profit Assn	70.6
20 Jewish Hospital Philadelphia	Non Profit Assn	70.6
21 St Luke's Hospital Duluth Minn	Non Profit Assn	70.2

\* Thirteen of the federal hospitals approved for intern training had rates above 70 per cent.

In the evaluation of educational residencies the Council has received valuable assistance from the specialty boards. This cooperation has been helpful not only in connection with new applications but also in the

TABLE D—Necropsy Performance in Approved Hospitals—1942

	Hospitals Employing Interns Only		Hospitals Employing Both Interns and Residents		Hospitals Employing Residents Only		Total All Approved Hospitals	
	Deaths	Necropsies	Deaths	Necropsies	Deaths	Necropsies	Deaths	Necropsies
Alabama	557	129	1,062	415	585	88	2,204	632
Arizona	449	130			104	40	603	175
Arkansas	521	146	237	33	77	22	835	201
California	3,962	1,622	10,236	4,824	1,383	546	15,581	6,992
Colorado	1,117	322	1,279	742	662	207	3,058	1,271
Connecticut	3,239	1,000	1,791	788	767	190	5,797	2,633
Delaware	569	106	198	53	93	30	860	204
Dist of Columbia	308	148	2,690	1,103	470	239	3,468	1,490
Florida	742	193	1,344	389	31	10	2,117	502
Georgia	1,109	219	1,534	581	106	62	2,749	862
Illinois	6,402	1,790	10,779	3,703	2,780	1,016	20,011	6,514
Indiana	1,743	372	2,413	839	775	230	4,931	1,446
Iowa	1,679	526	514	271	209	47	2,402	844
Kansas	632	253	634	300	208	60	1,474	623
Kentucky	1,120	235	1,341	338	125	23	2,586	596
Louisiana	713	191	3,163	1,366	12	7	3,878	1,564
Maine	854	236			18	8	872	244
Maryland			4,988	1,701	446	173	4,704	1,874
Massachusetts	4,363	1,149	4,309	1,645	3,610	1,310	12,287	4,104
Michigan	2,322	678	5,767	2,745	2,429	849	10,518	4,267
Minnesota	1,638	600	2,281	1,549	1,576	748	5,515	2,936
Mississippi					45	17	45	17
Missouri	1,595	501	5,392	2,508	1,232	508	8,219	3,617
Montana	206	71					236	71
Nebraska	806	270	592	283	463	163	1,861	721
New Hampshire	86	23	127	101	307	76	520	200
New Jersey	6,847	1,599	4,447	1,460	1,644	439	12,938	3,498
New York	8,876	2,234	28,464	10,619	9,141	2,879	46,481	15,732
North Carolina	811	183	1,110	477	321	48	2,242	703
North Dakota			131	113	167	40	298	113
Ohio	2,630	581	10,037	3,637	2,000	612	14,667	4,860
Oklahoma	720	126	670	227	22	9	1,426	362
Oregon	152	78	1,065	707	306	71	2,133	996
Pennsylvania	9,032	2,597	11,661	5,574	2,779	752	23,462	8,913
Rhode Island	587	148	482	232	511	163	1,580	513
South Carolina	700	85	501	189			1,206	274
Tennessee	1,044	179	2,022	787	207	43	4,273	1,009
Texas	2,939	669	2,437	763	820	166	6,196	1,793
Utah	1,227	303					1,227	303
Vermont	96	46	106	63			202	109
Virginia	406	181	1,574	503	496	202	2,476	891
Washington	2,306	616	1,629	573	691	370	4,626	1,559
West Virginia	1,012	219	407	148	241	92	1,660	479
Wisconsin	2,618	700	1,930	692	721	203	5,269	1,595
Totals	79,014	21,728	131,519	53,101	38,800	12,003	249,333	87,607

reappraisal of services previously approved. Consideration is now being given to postwar needs, for it is apparent that large numbers of physicians may wish to resume their graduate training or begin new hospital assignments as soon as their military duties have been completed. To help meet this demand the Council is planning to make a survey of all potential and available facilities for graduate training in connection with hospitals, undergraduate and graduate medical schools, clinics, departments of health and other agencies interested in graduate or postgraduate education. No doubt there will be opportunities for the development of additional high grade training programs in institutions that have not yet reached their full educational capacity. The Council is confident that all institutions and agencies concerned will give every assistance in connection with this survey.

to meet the needs of the armed forces. In many instances there will be opportunities for continued specialty training in army and naval hospitals for which credit may be assigned in accordance with the regulations issued by the individual certifying boards. Reference should be made to the Educational Number of THE JOURNAL, Aug 15, 1942, page 1345.

In January 1942 the 1,070 hospitals approved for internships and/or residencies employed 7,219 interns, 3,311 residents, 2,036 assistant residents and 802 fellows. At present 1,038 approved hospitals have 5,567

TABLE E—Classification of Approved Residencies and Fellowships—1943

Specialty	Residencies		Asst Residencies		Fellowships		Total		Number of Hospitals
	Offered	Filled	Offered	Filled	Offered	Filled	Offered	Filled	
Anesthesiology	17	5	20	10	22	15	123	85	18
Cardiology	6	1	1		1		8	1	7
Communicable diseases	50	32	13	5			63	37	18
Dermatology & syphilology	41	30	21	11	20	18	82	69	34
Epilepsy	1	1					1	1	1
Fractures	5	1	3	2			8	3	4
Gynecology	29	26	10	14			44	40	21
Malignant diseases	47	41	2				49	41	17
Medicine	418	297	321	192	200	168	939	657	221
Mixed	139	48	10	5			144	53	61
Neurology	43	34	26	19	21	21	90	74	30
Neurosurgery	27	17	13	7	20	18	60	42	27
Obstetrics	88	72	54	6			142	108	60
Obstetrics—gynecology	165	142	131	94	19	16	316	202	96
Ophthalmology	116	106	47	30	20	17	183	108	44
Ophthalmology									
Otolaryngology	80	59	26	24	6	2	118	80	42
Orthopedic surgery	140	112	33	29	36	28	235	169	80
Otolaryngology	99	77	30	26	16	8	140	111	70
Pathology	204	124	10	44	37	29	311	187	181
Pediatrics	187	127	189	176	13	13	299	266	120
Physical therapy	1	1	1		3	1	5	2	3
Plastic surgery	2	2	1		3	1	6	3	4
Psychiatry	317	221	64	31	16	13	407	265	126
Radiology	166	90	71	50	44	36	281	146	134
Surgery	413	366	430	322	186	172	1,069	800	366
Thoracic surgery	26	23	7	7	8	7	41	37	20
Traumatic surgery	2	2					2	2	2
Tuberculosis	234	169	50	34			287	203	93
Urology	50	30	31	33	20	17	106	105	72
Totals	3,323	2,331	1,762	1,151	711	600	5,396	4,002	*

\* Number of hospitals approved for residencies and fellowships 646

interns on duty, 2,633 residents, 1,210 assistant residents and 609 fellows. These hospitals reported 5,804,279 admissions in 1942, an average daily census of 423,246, and 23,644,700 outpatient visits. Reference should be made to table F, showing the number of available positions as well as the number of house officers now serving. In comparing these figures with table E it is apparent that 370 members of the resident staff are employed in departments that have not yet been approved for residency training. Detailed information concerning individual residencies on the approved list is published annually in the Educational Number of THE JOURNAL.

#### DISEASE NOMENCLATURE

In 1938 the Council on Medical Education and Hospitals included in its questionnaire addressed to hospitals an inquiry asking for the disease nomenclature used by them. Of those which replied at that time, 753 stated that they were using the Standard Classified Nomenclature of Disease and 1,063 stated that they were using either the Bellevue Hospital, Ponton Alphabetical or the Massachusetts General Hospital, and 1,067 reported the use of other classifications or none at all. This question was repeated in slightly different form in the questionnaire sent to hospitals in 1942. Of those which replied, 1,014 stated that they were using

the Standard Nomenclature of Disease. Ninety-one institutions reported using the classification of the American Psychiatric Association, which is identical with the psychiatric section in the Standard Nomenclature of Disease. The Ponton Alphabetical Nomenclature, the Bellevue Hospital or the Massachusetts General Hospital classifications were reported in use by 1,079 hospitals. A total of 616 hospitals employ other nomenclatures, most of which have not been designed for modern use. The remaining institutions did not reply to this question and were evidently unfamiliar with the need and purposes of disease nomenclature.

It would be desirable that hospitals planning to establish a disease classification or reorganize their present

TABLE F—Interns and Residents in Approved Hospitals—1943

	Hospitals Approved	Internships		Residencies		Assistant Residencies		Fellowships	
		Offered	Filled	Offered	Filled	Offered	Filled	Offered	Filled
Alabama	10	53	31	5	24				
Arizona	3	10	3	2	1				
Arkansas	4	22	12	5	5				
California	52	369	222	243	149	115	97	6	5
Colorado	16	14	37	3	2	1	1		
Connecticut	26	111	105	33	42	37	25	4	4
Delaware	5	2	22	5	2				
District of Columbia	13	105	49	55	3	41	31	8	8
Florida	7	50	20	11	8	5	2		
Georgia	12	170	75	7	23	33	21		
Illinois	6	618	391	347	245	99	47	33	18
Indiana	21	160	179	74	31	18	7	5	4
Iowa	13	64	30	24	22	39	22		
Kansas	8	42	28	16	9	1		1	1
Kentucky	10	71	41	21	10	35	14		
Louisiana	12	271	171	150	54	61	29		
Maine	5	26	12	3	1				
Maryland	22	240	167	54	75	143	105	2	1
Massachusetts	10	31	97	169	133	93	80	50	69
Michigan	46	315	274	215	142	169	18	36	31
Minnesota	23	112	154	41	20	4	4	30	37
Mississippi	1		3	1					
Missouri	56	313	199	12	60	74	66	8	8
Montana	2	6	6						
Nebraska	13	53	34	21	10			1	1
New Hampshire	4	11	7	5	1	1			
New Jersey	52	311	146	71	55	15	13		
New York	108	1,500	1,034	927	738	479	293	25	24
North Carolina	11	117	5	33	73	52	38	1	1
North Dakota	2	4		6					
Ohio	53	435	305	178	125	172	118	39	29
Oklahoma	7	50	30	16	9	6	6		
Oregon	7	60	33	22	13	19	14	3	
Pennsylvania	105	740	552	285	185	31	19	47	36
Rhode Island	8	40	27	20	14	1	1		
South Carolina	3	43	32	10	3	7	1	6	3
Tennessee	10	130	107	33	37	27	20	7	4
Texas	38	161	144	73	45	50	22	1	
Utah	5	51	14	1	1				
Vermont	2	8	5	4	2				
Virginia	15	102	52	46	29	35	22	7	5
Washington	17	92	68	16	10	4	2		
West Virginia	11	39	22	22	16	5	5		
Wisconsin	29	171	103	179	99	7	2		
Totals	1,038	7,959	5,567	3,747	2,633	1,850	1,210	721	609

system should consider the adoption of a nomenclature that is suitable for universal use. The Standard Nomenclature of Disease has been officially endorsed by the American Medical Association, the American College of Surgeons, the American Hospital Association and several other medical and surgical societies.

## HOSPITALS REGISTERED BY THE AMERICAN MEDICAL ASSOCIATION

The following list contains the names of 6,345 hospitals, sanatoriums and related institutions that are located in the United States and 128 in Alaska, Canal Zone, Hawaii, Puerto Rico and Virgin Islands. The list for each state is presented in two groups: (1) hospitals and sanatoriums, and (2) related institutions. The related institutions include infirmaries, nursing homes and other institutions designed to give certain medical and nursing care in an ethical and acceptable manner, without giving a full hospital service.

Registration of hospitals is governed by the Essentials of a Registered Hospital, adopted by the House of Delegates in 1928 and revised in 1939.

Registration is a basic recognition, extended to all the hospitals and related institutions in the following list, concerning which we have no evidence of irregular or unsafe practices. Approval is designation of certain registered institutions by the Council on Medical Education and Hospitals for internships, residencies and fellowships, or by the American College of Surgeons as unconditionally meeting its minimum standards.

## KEY TO SYMBOLS AND ABBREVIATIONS

\* Approved for training interns by the Council on Medical Education and Hospitals. List with detailed information is sent on request.  
+ Approved for residencies or fellowships. List with detailed information is sent on request.

▲ Approved by American College of Surgeons as meeting unconditionally its minimum standards.  
◊ School of nursing accredited by state board of nurse examiners.  
◊ Affiliated for nurse training on state accredited basis.  
† Figures for average census and admissions are exclusive of newborn infants.

The column headed "Type of Service" tells what diseases are treated in each institution.

Card	Cardiac	ENT	Eye, ear, nose and throat	Is	Isolation	NM	Nervous and mental
Chil	Children	Gen	General	Mat	Maternity	Orth	Orthopedic
Chr	Chronic	Incur	Incurable	MatCh	Maternity and children	SKCa	Skin and cancer
Conv	Convalescent and rest	Indus	Industrial	MeDe	Mentally deficient	TB	Tuberculosis
Drug	Drug and alcoholic	Inst	Institutional	Ment	Mental	Ven	Veneral
Epile	Epileptic						

The column headed "Control" indicates control, or auspices under which the institution is conducted.

GOVERNMENTAL			NONPROFIT ORGANIZATIONS			PROPRIETARY		
Fed	Federal	State	Church	Indiv	Individual	Part	Partnership	
IA	Indian Affairs	City	NPA	Nonprofit Association	Corp	Corporation (unrestricted as to profit)		
Army	United States Army	County						
Navy	United States Navy	City County						
USPHS	United States Public Health Service	City County						
Vet	Veterans Administration Facility	CyCo						

The accompanying list omits additions to hospital facilities that may have been made by certain departments of the Federal Government since the publication of the issue of March 15, 1941.

Corrections were made in the list to the time of going to press. Totals of the list, therefore, may vary from totals in Tables 1 and 2 which were necessarily compiled earlier.

## ALABAMA

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Births	Admissions †
Alabama City 8544—Etowah						
Etowah County Tuberculosis Sanatorium	TB	County	22	70		52
Albertville 3661—Marshall						
Sand Mountain Infirmiry	Cen	Indiv	15	6	2	27
Alexander City 6640—Tallapoosa						
Russell Hospital	Gen	Corp	34	12	6	179
Altoona 993—Etowah						
Klein Hospital	Cen	Indiv	27	17	3	51
Andalusia 686—Covington						
Memorial Hospital	Cen	Part	20	12	5	61
Anniston 2323—Calhoun						
Carner Hospital	Gen	City	60	34	24	426
Susie Parker Stringfellow Memorial Hospital	TB	NPA	15	14		34
Athens 4342—Limestone						
Limestone County Hospital	Cen	Indiv	12	6	2	120
Atmore 3200—Escambia						
Atmore General Hospital	Cen	Indiv	22	9	3	56
Auburn 462—Lee						
John Hodges Drake Hospital	Gen	State	63	9	4	46
Bellamy 43—Sumter						
Bellamy Hospital	Gen	Indiv	16	3	2	24
Bessemer 2230—Jefferson						
Bessemer General Hospital	Gen	Corp	75	32	5	132
Birmingham 2673—Jefferson						
Baptist Hospital	Cen	Church	190	145	26	907
Children's Hospital	Chil	NPA	30	29		126
Hargis Clinic Hospital	Gen	Indiv	25	13	4	34
Hill Crest Sanitarium	NM	Indiv	50	32		583
Hillman Hospital	Gen	County	432	273	46	1462
Jefferson Hospital	Gen	County	335	176	30	1239
Jefferson Tuberculosis Sanatorium	TB	County	140	106		302

## ALABAMA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Births	Admissions †
Miss Quinn's Nursing Home	Conv	Part	10	8		200
Norwood Hospital	Cen	Church	27	125	27	712
St. Vincent's Hospital	Gen	Church	125	98	6	193
South Highlands Infirmiry	Gen	Corp	140	119	25	591
365 Crippled Children's Clinic	Orth	NPA	50	39		135
Cullman 5074—Cullman						
Cullman Hospital	Cen	CyCo	50	17	10	221
Decatur 16604—Morgan						
Benevolent Society Hospital	Gen	NPA	30	21	10	119
Dothan 17194—Houston						
Dr. M. S. Davie's Private Hospital	Gen	Indiv	20	19	4	50
Fraser Ellis Hospital	Gen	Indiv	60	52	6	103
Moody Hospital	Gen	Corp	19	31	8	222
East Tallapoosa 3600—Tallapoosa						
Community Hospital	Gen	NPA	29	14	9	211
Enterprise 4333—Coffee						
Gibson Hospital	Gen	NPA	41	22	4	74
Eufaula 6265—Barbour						
Salter Hospital	Gen	Indiv	52	31	8	118
Fairfield 11703—Jefferson						
Employees Hospital of the Tennessee Coal Iron and Railroad Company	Gen	NPA	297	206	53	1559
Fayette 2668—Fayette						
McNense and Robert on Hospital	Gen	Part	20	9	4	63
Flint (Decatur P. O.) 134—Morgan						
Morgan County Tuberculosis Sanatorium	TB	County	53	50		111
Floral 2099—Covington						
Lakeview Hospital	Gen	Indiv	32	10	2	42

Key to symbols and abbreviations is on this page preceding the tabulation.



## ALABAMA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basins	Number of Births	Admissions †
Florence 15 043—Lauderdale	Gen	City	40	26	6	304	1 899
Eliza Coffee Memorial Hospital	Gen	City	40	26	6	304	1 899
Fort McClellan—Calhoun	Gen	Army	200	160	2	22	5 449
Station Hospital	Gen	Army	200	160	2	22	5 449
Gadsden 36 970—Etowah	Gen	Indiv	80	32	10	142	1 150
Forrest General Hospital	Gen	Indiv	80	32	10	142	1 150
Holy Name of Jesus Hospital	Gen	Church	100	74	18	487	6 111
Greensboro 2 034—Hale	Gen	Indiv	17	3	2	36	186
Greensboro Hospital	Gen	Indiv	17	3	2	36	186
Greenville 5 070—Butler	Gen	Indiv	46	7	7	45	487
Speer Hospital	Gen	Indiv	46	7	7	45	487
Stabler Infirmary	Gen	Part	40	18	9	97	826
Guntersville 4 298—Marshall	Gen	City	25	12	5	50	601
Guntersville City Hospital	Gen	City	25	12	5	50	601
Huntsville 13 000—Madison	Gen	NPA'ssn	70	32	10	146	1 601
Huntsville Hospital	Gen	NPA'ssn	70	32	10	146	1 601
Jackson 2 039—Clarke	Gen	Corp	16	7	3	45	360
South Alabama Infirmary	Gen	Corp	16	7	3	45	360
Jasper 6 847—Walker	Gen	County	70	34	8	133	1 289
Peoples Hospital	Gen	County	70	34	8	133	1 289
Walker County Hospital	Gen	County	70	34	8	133	1 289
Lafayette 2 138—Chambers	Gen	County	80	68			1 7
Batson Memorial Sanatorium	Gen	County	80	68			1 7
Mobile 78 720—Mobile	Mat	Church	20	12	20	609	6 35
Allen Memorial Home	Gen	City	132	122	18	503	4 241
City Hospital	Gen	City	132	122	18	503	4 241
Mobile County Tuberculosis Sanatorium	TB	NPA'ssn	60	30			48
Mobile Infirmary	Gen	NPA'ssn	150	110	20	287	4 561
Providence Hospital	Gen	Church	100	94	30	736	5 047
U S Marine Hospital	Gen	USPHS	191	148			2 103
Montgomery 78 084—Montgomery	Gen	Indiv	30	20	8	234	1 106
Fitts Hill Hospital	Gen	Indiv	30	20	8	234	1 106
Fraternal Hospital	Gen	Indiv	50	20	10	87	1 370
Hubbard Hospital	Gen	Indiv	55	34	12	309	2 099
Kilby Prison Hospital	Inst	State	45	30			1 300
Montgomery Tuberculosis Sanatorium	TB	NPA'ssn	100	91			101
St Margaret's Hospital	Gen	Church	144	101	24	772	4 990
Station Hospital	Gen	Army	50	50	4	25	1 911
Veterans Admin Facility	Gen	Vet	268	168			1 900
Mount Vernon 810—Mobile	Ment	State	1,689	1 680			573
Searcy Hospital	Gen	Indiv	25	12	8	155	700
Opelika 8 487—Lee	Gen	Indiv	36	11	6	113	670
Opelika Infirmary	Gen	Indiv	36	11	6	113	670
Pell City 900—St Clair	Gen	Indiv	20	6	5	78	450
Pell City Infirmary	Gen	Indiv	20	6	5	78	450
Prattville 2 664—Autauga	Gen	Indiv	16	7	3	30	379
Prattville General Hospital	Gen	Indiv	16	7	3	30	379
Repton 365—Conecuh	Gen	Indiv	32	19	3	32	702
Carter Hospital	Gen	Indiv	32	19	3	32	702
Roanoke 4 163—Randolph	Gen	Indiv	30	13	4	57	817
Knight Sanatorium	Gen	Indiv	30	13	4	57	817
Russellville 3 510—Franklin	Gen	Indiv	20	8	2	25	315
Russellville Hospital	Gen	Indiv	20	8	2	25	315
Scottsboro 2 834—Jackson	Gen	Indiv	20	8	2	25	315
Hodges Hospital	Gen	Indiv	20	8	2	25	315
Tri Counties Tuberculosis Sanatorium	TB	Counties	20	16			52
Selma 10 834—Dallas	Gen	Part	35	18	3	18	400
Burwell Infirmary	Gen	Part	35	18	3	18	400
Goldby King Memorial Hospital	Gen	NPA'ssn	65	46	7	37	1,308
Good Samaritan Hospital	Unit of Selma Baptist Hospital	NPA'ssn	50	30	8	263	2 099
Selma Baptist Hospital	Gen	NPA'ssn	50	30	8	263	2 099
Vaughan Memorial Hospital	Gen	Corp	35	24	6	110	1,300
Sheffield 7 933—Colbert	Gen	City	75	35	18	389	2 102
Colbert County Hospital	Gen	City	75	35	18	389	2 102
Sylacauga 6 269—Talladega	Gen	Corp	85	51	22	300	2 843
Drummond Fraser Hospital	Gen	Corp	85	51	22	300	2 843
Sylacauga Infirmary	Gen	Corp	85	51	22	300	2 843
Talladega 9 298—Talladega	Gen	NPA'ssn	75	50	10	737	4 410
Citizens Hospital	Gen	NPA'ssn	75	50	10	737	4 410
Goodnow Hospital	Inst	NPA'ssn	18	1	1		92
Troy 7 005—Pike	Gen	Indiv	35	18	6	78	800
Beard Memorial Hospital	Gen	Indiv	35	18	6	78	800
Edge Hospital	Gen	Indiv	35	18	6	78	800
Tuscaloosa 27 493—Tuscaloosa	Ment	State	4 144	4,182			1 402
Bryce Hospital	Gen	NPA'ssn	81	55	10	579	3 461
Druid City Hospital	Gen	NPA'ssn	55	20	5	60	896
Stillman Institute Hospital	Gen	Church	55	20	5	60	896
Veterans Admin Facility	Gen	Vet	558	330			730
Tuskegee 3 937—Macon	Ment	Vet	1 509	1 426			1 907
Veterans Admin Facility	Ment	Vet	1 509	1 426			1 907
Tuskegee Institute 375—Macon	Gen	NPA'ssn	134	56	14	93	1 114
John Albin Andrew Memorial Hospital	Gen	NPA'ssn	134	56	14	93	1 114
Wetumpka 3 059—Elmore	Gen	Corp	37	13	5	126	638
Wetumpka General Hospital	Gen	Corp	37	13	5	126	638
York 1 783—Sumter	Gen	Indiv	20	8	2	29	910
Hill Hospital	Gen	Indiv	20	8	2	29	910

## Related Institutions

Birmingham 267 553—Jefferson	Inst	State	29	5			552
Alabama Boys Industrial School	Inst	State	29	5			552
Salvation Army Home and Hospital	Mat	Church	10	5	25	83	108
Montevallo 1 490—Shelby	Inst	State	36	6			1 890
Peterson Hall	Inst	State	36	6			1 890
Tuscaloosa 27 493—Tuscaloosa	Inst	State	36	6			1 890
Partlow State School	MeDe	State	553	848			48

## ARIZONA

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Ajo 1 100—Pima							
Phelps Dodge Hospital	Gen	Corp	33	15	5	104	1 074
Bisbee 5 803—Cochise	Gen	NPA'ssn	42	20	8	311	1 963
Copper Queen Hospital	Gen	IA	15	10	3	33	531
Chinle 65—Apache	Gen	IA	15	10	3	33	531
Chinle General Hospital	Gen	IA	15	10	3	33	531
Coolidge 1 200—Pinal	Gen	NPA'ssn	61	31	12	152	1,197
Burton Cairns General Hospital	Gen	Indiv	8	7	3	72	407
Coolidge Hospital	Gen	Indiv	8	7	3	72	407
Douglas 8 62—Cochise	Gen	County	100	72	6	40	733
Cochise County Hospital	Gen	County	100	72	6	40	733
Flagstaff 5,050—Coconino	Gen	NPA'ssn	20	9	6	70	591
Flagstaff Hospital	Gen	Indiv	17	9	4	67	402
Merced Hospital	Gen	Indiv	17	9	4	67	402
Florence 1 553—Pinal	Inst	State	20	20			690
Arizona State Prison Hospital	Gen	County	46	20	9	91	800
Pinal County Hospital	Gen	County	46	20	9	91	800
Fort Defiance 600—Apache	Unit of Navajo Med Center Hosp & Sanat	GenTb IA	273	203	14	112	2 357
Fort Defiance Sanatorium	Unit of Navajo Med Center Hosp & Sanat	GenTb IA	273	203	14	112	2 357
Navajo Medical Center Hospital and Sanatorium	Unit of Navajo Med Center Hosp & Sanat	GenTb IA	273	203	14	112	2 357
Fort Huachuca 1 500—Cochise	Gen	Army	48	31	1	12	862
Station Hospital	Gen	Army	48	31	1	12	862
Ganado 150—Apache	Gen	Church	100	85	15	156	1,594
Sage Memorial Hospital	Gen	Church	100	85	15	156	1,594
Globe 6 111—Gila	Gen	County	50	32	6	133	800
Gila County Hospital	Gen	County	50	32	6	133	800
Holbrook 1 181—Navajo	Gen	Indiv	10	3	3	33	311
Park Navajo Private Hospital	Gen	Indiv	10	3	3	33	311
Jerome 2 200—Yavapai	Gen	NPA'ssn	52	41	4	182	1 493
United Verde Hospital	Gen	NPA'ssn	52	41	4	182	1 493
Keams Canyon 1 000—Navajo	Gen	IA	38	37	3	36	1,131
Hopi General Hospital	Gen	IA	38	37	3	36	1,131
Kingman 2 200—Mohave	Gen	County	30	19	5	85	700
Mohave General Hospital	Gen	County	30	19	5	85	700
McNary 60—Apache	Gen	NPA'ssn	12	3	1	53	216
McNary Hospital	Gen	NPA'ssn	12	3	1	53	216
Mesa 7 221—Maricopa	Gen	NPA'ssn	50	29	9	339	1 729
South Side District Hospital	Gen	NPA'ssn	50	29	9	339	1 729
Miami 4 722—Gila	Gen	NPA'ssn	40	21	5	150	1,593
Miami Inspiration Hospital	Gen	NPA'ssn	40	21	5	150	1,593
Morenci 1 500—Greenlee	Gen	NPA'ssn	32	21	8	240	1 341
Phelps Dodge Hospital	Gen	NPA'ssn	32	21	8	240	1 341
Nogales 5 135—Santa Cruz	Gen	Church	30	15	7	30	300
St Joseph's Hospital	Gen	Church	30	15	7	30	300
Oracle 200—Pinal	Gen	Indiv	8	8			19
La Casa del Lacanto	Gen	Indiv	8	8			19
Parker 200—Yuma	Gen	IA	41	15	4	43	578
Colorado River Indian Agency Hospital	Gen	IA	41	15	4	43	578
Phoenix 6 114—Maricopa	Ment	State	1 015	920			403
Arizona State Hospital	Ment	State	1 015	920			403
Good Samaritan Hospital	Gen	Church	185	137	30	700	5,311
Phoenix Indian Hospital	Gen	IA	65	51	10	93	1 090
Phoenix Indian Hospital	Gen	IA	65	51	10	93	1 090
Phoenix Indian Sanatorium	TB	IA	170	90			227
St Joseph's Hospital	Gen	Church	200	163	44	1 317	9 709
St Luke's Home	TB	Church	40	28			128
Poston —Yuma	Gen	Fed	120				1912
Poston General Hospital	Gen	Fed	120				1912
Prescott 6 018—Yavapai	TB	Indiv	70	8			20
Pam etganf Sanatorium	TB	Indiv	70	8			20
Yavapai County Hospital	Gen	County	70	44	10	98	803
Ray 1 100—Pinal	Gen	NPA'ssn	20	11	6	60	463
Ray Hospital	Gen	NPA'ssn	20	11	6	60	463
Saenaton 315—Pinal	Gen	IA	42	20	7	82	919
Pima Indian Hospital	Gen	IA	42	20	7	82	919
Safford 2 966—Graham	Gen	NPA'ssn	37	11	5	53	521
Morris Squibb Hospital	Gen	NPA'ssn	37	11	5	53	521
San Carlos 100—Gila	Gen	IA	47	26	6	46	860
San Carlos Indian Hospital	Gen	IA	47	26	6	46	860
Sells 800—Pima	Gen	IA	44	30	5	50	542
Indian Onsis Hospital	Gen	IA	44	30	5	50	542
Tempe 2 906—Maricopa	TB	State	99	92			111
State Welfare Sanatorium	TB	State	99	92			111
Tuba City 100—Coconino	Gen	IA	43	33	5	25	1 107
Tuba City Hospital	Gen	IA	43	33	5	25	1 107
Tucson 36 818—Pima	TB	Part	30	25			47
Anson Rest Home	TB	Part	30	25			47
Barfield Sanatorium	TB	Indiv	22	9			22
Comstock Children's Hospital	TB	NPA'ssn	22	9			22
Desert Sanatorium of Southern Arizona	Gen	NPA'ssn	90	29	14	60	600
Pima County General Hospital	GenTb County	IA	140	76	10	23	1 400
St Luke's in the Desert Sanatorium	TB	Church	35	19			35
St Mary's Hospital and Sanatorium	GenTb Church	IA	188	141	25	67	5 306
San Xavier Indian Sanatorium	TB	IA	46	39			36
Southern Pacific Sanatorium	TB	NPA'ssn	82	44			50
Veterans Admin Facility	TbGen Vet	300	300				900
Whipple —Yavapai	GenTb Vet	537	287				1 396
Veterans Admin Facility	GenTb Vet	537	287				1 396
Whiteriver 300—Navajo	Gen	IA	48	32	4	26	770
Fort Apache Agency Hospital	Gen	IA	48	32	4	26	770
Wickenburg 900—Maricopa	Gen	NPA'ssn	21	9	3	60	491
Wickenburg Hospital	Gen	NPA'ssn	21	9	3	60	491
Williams 2 622—Coconino	Gen	Indiv	8	3	3	23	141
Edel Hospital	Gen	Indiv	8	3	3	23	141
Winslow 4 577—Navajo	TB	IA	50	50			90
Winslow Indian Sanatorium	TB	IA	50	50			90
Yuma 5 325—Yuma	Gen	IA	29	12	8	20	846
Fort Yuma Indian Hospital	Gen	IA	29	12	8	20	846
Yuma County General Hosp	Gen	County	60	53	12	309	1 790

## ARIZONA—Continued

Related Institutions	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Kayenta 40—Navajo							
Kayenta Indian Sanatorium	TB	IA	54	35	2	2	103
Phoenix 65 414—Maricopa							
Eva Harris Maternity Home	Mat	Indiv	16		16		
Pueron 36 818—Pima							
Arizona State Elks Association Hospital	TB	NPA's'n	25	17			33
Valentine 110—Mohave							
Truxton Canyon Hospital	Gen	IA	10	6	5	17	152

## ARKANSAS

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Alexander 134—Pulaski							
McRae Memorial Sanatorium	TB	State	200	175			249
Arkadelphia 5 078—Clark							
Downs Hospital	Gen	Indiv	14	4	4	50	202
Bates 116 5 247—Independence							
Craig Hospital	Gen	Indiv	12	6	3	19	430
Dr Gray's Hospital	Gen	Indiv	50	14	6	30	590
Benton 3 502—Saline							
State Hospital	Unit of State Hospital Little Rock						
Blytheville 10 652—Mississippi							
Blytheville City Hospital	Gen	City	30	15	6	75	1 732
Walls Hospital	Gen	Indiv	34	16	6	143	1 084
Camden 8 95—Ouachita							
Camden Hospital	Gen	NPA's'n	46	19	9	274	1 455
Charleston 9 88—Franklin							
Bollinger Hospital	Gen	Indiv	12	4		100	100
Clarksburg 3 118—Johnson							
St. Hildegard's Municipal Hospital	Gen	Church	26	13	5	69	945
Conway, 5 789—Faulkner							
Conway Memorial Hospital	Gen	NPA's'n	30	16	4	134	782
Crossett 4 891—Ashley							
Crossett Hospital	Gen	NPA's'n	46	25	12	160	1 585
D. Queen 3 055—Seyler							
Archer Hospital	Gen	Indiv	22	6	1	20	285
De Queen General Hospital	Gen	Part	24	11	3	80	691
Dermott 3 083—Chicot							
Dermott Municipal Hospital	Gen	Church	30	15	6	56	595
Dumas 2 323—Desha							
Dumas Hospital	Gen	Corp	25	8	4	115	300
El Dorado 15 858—Union							
Henry C. Rosamond Memorial Hospital	Gen	Part	24	7	8	41	231
Warner Brown Hospital	Gen	Church	69	56	10	395	2 940
Fayetteville 3 212—Washington							
Fayetteville City Hospital	Gen	City	55	45	10	298	2 134
Veterans Admin. Facility	Gen	Vet	208	190			1 657
Fort Smith 36 554—Sebastian							
Arkansas Tuberculosis Sanatorium	Unit of Arkansas Tuberculosis Sanatorium State Sanatorium Ark.						
St. Edwards Mercy Hospital	Gen	Church	150	115	20	772	4 514
Sparks Memorial Hospital	Gen	NPA's'n	100	55	15	303	3 008
Haskell 171—Saline							
State Hosp. Benton Division	Unit of State Hospital Little Rock						
Heber Springs 1 636—Cleburne							
Estelle Hospital	Gen	Indiv	22	11	5	88	610
Helena 8 546—Phillips							
Helena Hospital	Gen	NPA's'n	60	30	8	133	1 442
Hope 7 475—Hempstead							
Josephine Hospital	Gen	Indiv	22	5	4	51	317
Julia Chester Hospital	Gen	NPA's'n	35	22	6	115	934
Hot Springs National Park 21 370—Garland							
Army and Navy General Hospital	Gen	Army	412	309	3	10	3 098
Leo N. Levi Memorial Hospital	Gen	NPA's'n	70	56	5	80	840
Ozark Sanatorium	Gen	Corp	60	13	4	47	439
St. Joseph's Infirmary	Gen	Church	144	93	10	245	2 770
U. S. Public Health Service Medical Center Infirmary	Ven	USPHS	90	62	4	18	908
Jonesboro 11 729—Craighead							
St. Bernard's Hospital	Gen	Church	100	70	12	319	2 561
Lake Village 2 045—Chicot							
Lake Village Infirmary	Gen	Part	37	29	5	74	1 040
Little Rock 84 039—Pulaski							
Arkansas Children's Home and Hospital	Chil	NPA's'n	83	51			880
Baptist State Hospital	Gen	Church	360	169	40	734	6 940
Florence Crittenton Home	Mat	NPA's'n	39	14	13	37	40
Granite Mountain Hospital	Gen	Indiv	20	4	2	23	174
Missouri Pacific Hospital	Indus	NPA's'n	125	45			1 718
Pulaski County Hospital	Gen	County	214	175	6	117	784
St. Vincent's Infirmary	Gen	Church	183	176	50	1 003	6 040
State Hospital	Ven	State	4 497	4 633			1 824
Trinity Hospital	Gen	Part	40	1	10	134	1 630
United Friends of American Hospital	Gen	NPA's'n	20	20	2	20	517
University Hospital	Gen	State	210	104	20	502	3 037
Magnolia 4 396—Columbia							
City Hospital	Gen	City	21	10	4	84	532
Monticello 1 600—Drew							
Mack Wilson Hospital	Gen	Indiv	70	14	4	55	749
Morrilton 4 608—Conway							
St. Anthony's Hospital	Gen	Church	30	26	4	106	570
Newport 4 321—Jackson							
Dr. Gray's Hospital	Gen	Indiv	23	11	2	30	480
Pragould 7 070—Greene							
Dickson Memorial Sanatorium	Gen	Corp	20	15	4	80	842

## ARKANSAS—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Pine Bluff 21 290—Jefferson							
Davis Hospital	Gen	City	70	40	12	457	2 107
Prescott 3 177—Nevada							
Corra Donnell Hospital	Gen	Indiv	30	12	6	77	671
Rogers 3 500—Benton							
Rogers Sanatorium	Gen	Indiv	14	6	4	64	349
Russellville 5 027—Pope							
Haney Eye Ear Nose and Throat Hospital	ENT	Indiv	8	2			300
St. Mary's Hospital	Gen	Indiv	60	40	12	183	1 319
Searcy 3 670—White							
Hawkins Clinic Hospital	Gen	Indiv	26	8	7	59	447
Wakenight Hospital	Gen	Indiv	50	27	5	103	2 478
Silvian Springs 2 764—Benton							
John Brown University Hosp	Gen	NPA's'n	20	8	4	56	460
State Sanatorium 300—Logan							
Arkansas Tuberculosis Sanatorium	TB	State	1 102	1 102			1 608
Texarkana 11 821—Miller							
Michael Mengher Memorial Hospital	Gen	Church	53	36	10	402	2 038
St. Louis Southwestern Hospital	Indus	NPA's'n	100	71			2 974
Veterans Administration Facility	Pulaski						
Veterans Admin. Facility	Ven	Vet	1 360	1 224			633
Warren 2 510—Bradley							
Crow Hospital Clinic	Gen	Part	16		5	5	Estab 1943
Hunt Hospital	Gen	Indiv	12	5	5		2 1

## CALIFORNIA

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †	
Agnew 300—Santa Clara								
Agnews State Hospital	Ment	State	3 612	3 000			902	
Ahwahnee 50—Madera								
Ahwahnee Sanatorium	TB	Counties	120	104			111	
Alameda 36 256—Alameda								
Alameda Hospital	Gen	NPA's'n	92	63	20	511	3 475	
Albany 11 493—Alameda								
Albany Hospital	Gen	Indiv	32	25	22	637	1 509	
Alcatraz—San Francisco								
U S Penitentiary Hospital	Inst	USPHS	30	14			245	
Alhambra 38 930—Los Angeles								
Alhambra Hospital	Gen	Corp	40	31	18	500	2 130	
Angel Island 478—Marin								
Station Hospital	Gen	Army	70	41			1 584	
Antioch 5 106—Contra Costa								
Antioch Hospital	Gen	Indiv	23	10	9	316	1 139	
Arcata 1 835—Humboldt								
Trinity Hospital	Gen	Church	23	15	5	130	700	
Arlington 3 440—Riverside								
Riverside County Hospital	See Riverside							
Artesia 3 891—Los Angeles								
Artesia Hospital	Gen	Indiv	20	16	9	260	700	
Atwater 1 230—Merced								
Bloss Memorial Hospital	Unit of Merced General Hospital Merced							
Aubrey 200—Fresno								
Wishah Sanatorium	TB	County	100	89			101	
Auburn 4 013—Placer								
Highlands General Hospital and Sanatorium	Gen	Indiv	26	10	5	100	617	
Placer County Hospital	Inst	Gen	126	90	5	56	660	
Bakersfield 29 202—Kern								
Kern General Hospital	Gen	County	600	603	60	1 300	11 193	
Merced Hospital	Gen	Church	112	77	20	602	4 023	
Banning 3 874—Riverside								
Banning Hospital and Sanatorium	Gen	Tb	Indiv	8	4	1	3	16
South Sierras Sanatorium	TB	Indiv	30	18			14	
Bell 11 264—Los Angeles								
Bell Mission Hospital	Gen	Corp	70	37	13	600	1 480	
Belmont 1 220—San Mateo								
Alexander Sanitarium	N&M	Corp	70	57			303	
California Sanatorium	TB	Corp	100	70			206	
Twin Pines Sanitarium	N&M	Corp	38	4			122	
Berkeley 50 517—Alameda								
Alta Bates Hospital	Gen	Corp	100	60	26	1 160	4 580	
Berkeley Hospital	Gen	NPA's'n	100	46	20	307	2 780	
Ernest V Cowell Memorial Hospital	Gen	State	100	75	1		2 790	
Blythe 2 300—Riverside								
Riverside County Branch Hospital	Gen	County	20	11	10	135	670	
Brawley 11 778—Imperial								
Brawley Community Hospital	Gen	Indiv	22	11	9	260	700	
Burbank 24 337—Los Angeles								
Burbank Hospital	Gen	Indiv	42	23	15	309	1 014	
Cammarillo 300—Ventura								
Cammarillo State Hospital	Ven	State	3 705	3 200			2 124	
Carmel 2 837—Monterey								
Peninsula Community Hosp	Gen	NPA's'n	40	20	12	300	1 067	
Chico 9 275—Butte								
Enloe Hospital	Gen	Indiv	50	27	14	320	1 496	
Coalinga 5 026—Fresno								
Pleasant Valley Hospital	Gen	NPA's'n	15	8	6	89	400	
Colfax 704—Placer								
Bushnell Sanatorium	Unit of Colfax School for the Tuberculous							
Colfax Hospital	Unit of Colfax School for the Tuberculous							
Colfax School for the Tuberculous	TB	Indiv	30	20			33	

## CALIFORNIA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census	Basins	Number of Births	Admissions
Compton 16198—Los Angeles Compton Sanatorium+O	N&M Cen	Corp	120	67		608	
La Campanas Hospital	Cen	Corp	15	51	19	602	1 623
Concord 1117—Contra Costa	Cen	Indiv	40	17	8	268	907
Concord Hospital	Cen	Indiv	40	17	8	268	907
Covina 3019—Los Angeles	Cen	Part	50	32	10	253	1 3 6
Covina Hospital	Cen	Part	50	32	10	253	1 3 6
Crecent City 1363—Del Norte	Cen	NPAsen	24	8	5	54	462
Knapp Hospital	Cen	NPAsen	24	8	5	54	462
Culver City 8976—Los Angeles	Cen	Indiv	12	8	8	241	675
Community Hospital	Cen	Indiv	6	24	22		1 0 6
Culver City Hospital	Cen	Indiv	6	24	22		1 0 6
Delano 4,777—Kern	Cen	Indiv	18	10	7	115	316
Delano Hospital	Cen	Indiv	18	10	7	115	316
Dinuba 1790—Inulare	Cen	Part	17	4	4	368	2 6
Alta District Hospital	Cen	Part	17	4	4	368	2 6
Dos Palos 218—Merced	Cen	Indiv	19	9	3	149	557
Dos Palos Community Hospital	Cen	Indiv	19	9	3	149	557
Downey 15,000—Los Angeles	Cen	NPAsen	31	17	14	225	1 444
Downey Community Hospital	Cen	NPAsen	31	17	14	225	1 444
Duarte 2,000—Los Angeles	IB	NPAsen	210	104			217
Los Angeles Sanatorium+O	IB	NPAsen	210	104			217
Dunsmuir 2,500—Siskiyou	Cen	Part	17	6	6	87	433
Dunsmuir Hospital and Sanatorium	Cen	Part	17	6	6	87	433
El Centro 10,017—Imperial	Cen	County	93	52	4	178	1 176
Imperial County Charity Hospital	Cen	County	93	52	4	178	1 176
Elkridge 16—Sonoma	MeDu	State	1192	313			476
Sonoma State Home	MeDu	State	1192	313			476
El Monte 4740—Los Angeles	GenMat	NPAsen	135	46	15	16	81
Ruth Home	GenMat	NPAsen	135	46	15	16	81
Eureka 17,000—Humboldt	Cen	NPAsen	40	25	8	174	1 101
General Hospital	Cen	NPAsen	40	25	8	174	1 101
Humboldt County Hospital	Cen	County	101	60	6	62	1 125
Humboldt County School for the Tuberculous	TB	County	65	49			83
St. Joseph Hospital	Cen	Church	65	36	13	242	1 850
Fairfield 1312—Solano	In (Cen)	County	100	90	10		961
Solano County Hospital	In (Cen)	County	100	90	10		961
Fort Bragg 3,235—Mendocino	Cen	Corp	27	14	8	86	612
Redwood Coast Hospital+O	Cen	Corp	27	14	8	86	612
French Camp 600—San Joaquin	Cen	County	525	455	25	807	8 814
San Joaquin General Hospital+O	Cen	County	525	455	25	807	8 814
Fresno 60,685—Fresno	Cen	Corp	134	84	32	758	3 940
Burnett Sanatorium	Cen	Corp	134	84	32	758	3 940
General Hospital of Fresno	Cen	County	10	49	1	1 005	7 735
County+O	Cen	County	10	49	1	1 005	7 735
St. Agnes Hospital	Cen	Church	75	51	2	775	2 634
Fullerton 10,442—Orange	Cen	Church	5	25	10	311	1 192
Fullerton Hospital	Cen	Church	5	25	10	311	1 192
Gilroy 3,615—Santa Clara	Cen	NPAsen	25	12	8	172	459
Wheeler Hospital	Cen	NPAsen	25	12	8	172	459
Glendale 82,882—Los Angeles	Cen	Church	275	192	52	1 767	6 729
Glendale Sanatorium and Hos	Cen	Church	275	192	52	1 767	6 729
Physicians and Surgeons Hos	Cen	NPAsen	10	76	18	987	4 450
Hospital+O	Cen	NPAsen	10	76	18	987	4 450
Grass Valley 5,701—Nevada	Cen	NPAsen	19	9	7	196	486
Community Hospital	Cen	NPAsen	19	9	7	196	486
W. O. Jones Memorial Hosp	Gen	Indiv	10	12	4	75	460
Hamilton Field—Marin	Gen	Army	66	25			1 005
Stanford Hospital	Gen	Army	66	25			1 005
Hanford 8,235—Kings	Cen	Corp	28	23	8	270	1 070
Hanford Sanatorium	Cen	Corp	28	23	8	270	1 070
Kings County Hospital	Cen	County	225	145	16	208	1 760
Sacred Heart Hospital	Cen	Church	25	20	8	276	1 320
Hawthorne 8,963—Los Angeles	Cen	Part	0	23	15	463	1 947
Hawthorne Hospital	Cen	Part	0	23	15	463	1 947
Hayward 6,736—Alameda	Cen	Indiv	27	10	14	764	901
Hayward Hospital	Cen	Indiv	27	10	14	764	901
Healdsburg 2,507—Sonoma	Cen	NPAsen	25	8	6	85	808
Healdsburg General Hospital	Cen	NPAsen	25	8	6	85	808
Hermosa Beach 7,197—Los Angeles	Cen	NPAsen	21	8	7	76	484
South Bay Community Hosp	Cen	NPAsen	21	8	7	76	484
Hollister 3,881—San Benito	Cen	NPAsen	22	11	5	171	643
Hazel Hawkins Memorial Hospital	Cen	NPAsen	22	11	5	171	643
San Benito County Hosp	InstCen	County	40	34	3	10	120
Hondo 3,150—Los Angeles	InstMat	County	2 881	2 803			2 499
Rancho Los Amigos	InstMat	County	2 881	2 803			2 499
Hoopa 140—Humboldt	IB		44	15	5	45	784
Hoopa Valley Indian Hospital	IB		44	15	5	45	784
Huntington Park 28,648—Los Angeles	Cen	Corp	42	36	10	605	1 816
Mission Hospital	Cen	Corp	42	36	10	605	1 816
Imola 20—Napa	MeDu	State	1 850	3 767			999
Napa State Hospital	MeDu	State	1 850	3 767			999
Indio 2,296—Riverside	Cen	Indiv	26	16	7	166	757
Cusita Hospital	Cen	Indiv	26	16	7	166	757
Conechella Valley Hospital	Cen	Part	40	17	6	130	2 817
Inglewood 10,114—Los Angeles	Cen	Indiv	19	44	17	359	1 987
Centinela Hospital	Cen	Indiv	19	44	17	359	1 987
Inglewood Woman's Hospital	Mat	Part	200	108			941
St. Frne Sanatorium	N&M	Indiv	200	108			2 2
Keene 164—Kern	IB	County	103	96			68
Stony Brook Retreat	IB	County	103	96			68
King City 1,700—Monterey	Cen	Indiv	24	12	6	75	604
Community Hospital	Cen	Indiv	24	12	6	75	604
Kingsburg 1,504—Fresno	Cen	Indiv	11	9	4	78	465
Kingsburg Sanatorium	Cen	Indiv	11	9	4	78	465
La Crecenta 3,000—Los Angeles	IB	County	160				Reorganized
Hillcrest Sanatorium	IB	County	160				Reorganized
La Jolla—San Diego	Cen	NPAsen	11	37	6	103	1 465
Scripps Memorial Hospital+O	Cen	NPAsen	11	37	6	103	1 465
Scripps Metabolic Clinic	Metab	NPAsen	33	26			1 55

## CALIFORNIA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census	Basinets	Number of Births	Admissions
La Vina 35—Los Angeles	IB	NPAsen	50	49			45
La Vina Sanatorium	IB	NPAsen	50	49			45
Indsay 4,997—Inulare	Cen	City	20	10	5	1 2	712
Indsay Municipal Hospital	Cen	City	20	10	5	1 2	712
Livermore 2,885—Alameda	FB	County	274	2 9			3 5
Arroyo Del Valle Sanatorium+O	FB	County	274	2 9			3 5
Livermore Sanatorium	N&M	Corp	146	104			446
St. Paul's Hospital	Cen	Indiv	2	14	6	121	5 7
Veterans Admin Facility+O	IB	Vet	159	292			1 3
Lodi 11,050—San Joaquin	Cen	Indiv	25	18	10	257	1 055
Buchanan Ho pital	Cen	Indiv	25	18	10	257	1 055
Mason Hospital	Cen	Indiv	25	18	10	257	1 055
Yoma Linda 2,500—San Bernardino	Cen	Church	122	101	12	2 6	3 72
Yoma Linda Sanitarium and Hospital+O	Cen	Church	122	101	12	2 6	3 72
Long Beach 161,211—Los Angeles	Mat	Part	24	20	75	731	716
Bixby Knolls Maternity Hos pital	Mat	Part	24	20	75	731	716
Harriman Jones Clinic Hos pital+O	Cen	Indiv	40	21	8	230	1 093
Long Beach Community Ho pital+O	Cen	NPAsen	160	8	20	756	4 297
St. Mary's Long Beach Ho pital+O	Cen	Church	100	98	15	1 105	4 613
Seaside Memorial Hospital+O	Cen	NPAsen	51	18	40	901	9 775
Los Angeles 1,04,277—Los Angeles	Cen	NPAsen	70	19	6	50	871
Alvarado Hospital	IB	NPAsen	100	97			65
Barlow Sanatorium+O	IB	NPAsen	100	97			65
California Babies and Children's Hospital+O	Chil	NPAsen	70	5			455
California Hospital+O	Cen	Church	201	265	45	1 792	10 33
Clarks of Lebanon Hos pital+O	Cen	NPAsen	200	272	50	1 489	10 470
Children's Hospital+O	Chil	NPAsen	20	143			5 681
East Los Angeles Hospital	Cen	NPAsen	20	2	11	340	9 7
Eye and Ear Hospital	IB	Corp	21	2			1 563
French Hospital	Cen	NPAsen	50	52	20	4 9	1 57
Golden State Hospital	Cen	Indiv	50	24			865
Hospital of the Good Samaritan+O	Cen	Church	400	277	44	1 753	11 411
Yuville Hall Hospital	Inst	County	121	78			5 017
Lincoln Hospital	Cen	NPAsen	50	26	11	496	1 134
Los Angeles County Ho pital (Medical Unit)+O	Cen	County	7,704	2 259	217	7 112	4 215
Los Angeles County Jail Hospital	Inst	County	79	64			2 495
Los Angeles County Psychopathic Hospital	Unit of Los Angeles County Hospital		37	17			173
Los Angeles Sanitarium	Cen	Indiv	37	17			173
Methodist Hospital of Southern California+O	Cen	Church	195	166	48	2 016	8 342
Mount Sinai Hospital	Chr	NPAsen	105	55			3
Orthopaedic Hospital+O	Orth	NPAsen	75	57			1 876
Pauli Hospital	Cen	Indiv	15	6	3	54	551
Presbyterian Hospital	Cen	Indiv	15	6	3	54	551
Olmsted Memorial+O	Cen	NPAsen	258	219	65	1 826	10 161
Queen of Angels Hospital+O	Cen	Church	125	255	65	2 505	11 747
St. Vincent's Hospital+O	Cen	Church	255	218	55	1 199	10 561
Santa Fe Coast Lines Hos pital+O	Indus	NPAsen	197	167			4 796
Veterans Admin Facility	See West Los Angeles						
White Memorial Hospital+O	Cen	Church	40	1 0	50	1 468	8 715
Yuba County 2,214—Merced	Cen	Church	40	1 0	50	1 468	8 715
City Clinic and Emergency Hospital	Cen	Church	12	6	4	12	323
Madera 6,472—Madera	Cen	Indiv	25	17	4	171	803
Deerhorn Hospital	Cen	Indiv	25	17	4	171	803
Madera County Hospital	CenTb	County	141	85	8	175	1 065
Madera Sanitarium	Cen	Indiv	22	10	3	119	820
Manor—Marin	FB	NPAsen	55	47			70
Arequipa Sanatorium	FB	NPAsen	55	47			70
March Field—Riverside	Cen	Army	75	23	5	65	1 080
Station Hospital+O	Cen	Army	75	23	5	65	1 080
Marine Island—Solano	Cen	NPAsen	484	469	5	82	5 016
U. S. Naval Hospital+O	Cen	Navy	484	469	5	82	5 016
Martinez 7,381—Contra Costa	Cen	County	270	161	12	218	2 334
Contra Costa County Hosp	Cen	County	270	161	12	218	2 334
Martinez Community Hosp	Cen	Corp	50	33	7	300	1 457
Marysville 6,646—Yuba	Cen	Indiv	32	24	9	215	1 431
Rideout Memorial Hospital	Cen	Indiv	32	24	9	215	1 431
Yuba County Hospital	InstGen	County	90	66	6	117	797
McCloud 2,000—Siskiyou	Cen	NPAsen	25	9	6	72	555
McCloud Hospital	Cen	NPAsen	25	9	6	72	555
Merced 10,135—Merced	Cen	County	250	240	19	544	3 576
Merced General Hospital	Cen	County	250	240	19	544	3 576
Mercy Hospital	Cen	Indiv	50	33	12	323	1 816
Modesto 16,779—Stanislaus	Cen	Indiv	35	30	5	250	1 637
McPheters Hospital	Cen	Indiv	35	30	5	250	1 637
Robertson Hospital	Cen	Indiv	35	30	5	250	1 637
St. Mary's Hospital	Cen	Church	22	18	10	234	1 313
Stanislaus County Hospital	Gen	County	250	200	94	450	3 191
Monrovia 12,607—Los Angeles	IB	Indiv	20	20	12		72
Korumbega Sanatorium	IB	Indiv	20	20	12		72
Pottenger Sanatorium and Clinic+O	TB	Corp	90	88			161
Monterey 10,084—Monterey	Gen	NPAsen	26	15	6	58	422
Monterey Hospital	Cen	NPAsen	26	15	6	58	422
Station Hospital	Cen	Army	700	250	2	11	4 009
Monterey Park 8,531—Los Angeles	Gen	Corp	37	30	12	651	1 755
Garfield Hospital	Gen	Corp	37	30	12	651	1 755
Mount Shasta 1,618—Siskiyou	Cen	Corp	16	7	6	36	200
Mount Shasta Community Hospital	Cen	Corp	16	7	6	36	200
Murphy's 600—Calaveras	TB	Counties	159	136			193
Bret Harte Sanatorium+O	TB	Counties	159	136			193

## CALIFORNIA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Businets	Number of Births	Admits †
Napa 740—Napa Victory Hospital	Cen	Corp	68	27	10	412	1 402
National City 1034—San Diego Flrya Hospital	Cen	Part	10	6	3	69	319
Paradise Valley Sanitarium and Hospital†	Cen	Church	143	10	27	738	3 461
Nevada City 244—Nevada Miners Hospital	Cen	NPA's n	20	14	4	71	330
Nevada City Sanitarium	Cen	Indiv	10	5	8	96	191
Nevada County Hospital	InstCen	County	100	72	4	13	632
Newhall 1800—Los Angeles Wildwood Sanatorium	Unit of Olive View Sanatorium Olive View						
Newman 1214—Stanislaus West Side Hospital	Cen	Indiv	15	6	3	104	500
Norwalk 3000—Los Angeles Norwalk State Hospital	Ment	State	2 485	2 181			518
Oakland 302 163—Alameda Children's Hospital of the East Bay†	Chil	NPA's n	58	45		2 751	
East Oakland Hospital†	Cen	Corp	80	60	26	1 224	4 013
Highland Alameda County Hospital†	Cen	County	480	302	26	660	8 420
Peralta Hospital†	Cen	NPA's n	160	123	40	1 249	6 661
Permanente Foundation Hospital	Indus	NPA's n	60			Estab 1942	
Providence Hospital	Gen	Church	193	181	30	1 541	8 200
Samuel Merritt Hospital†	Cen	NPA's n	178	151	30	1 382	6 603
Oceanside 4 631—San Diego Oceanside Hospital	Cen	Corp	42	25	8	2 40	1 040
Olive View —Los Angeles Olive View Sanatorium†	TB	County	1 073	1 060			724
Orange 7 001—Orange Orange County General Hospital†	Cen	County	358	281	20	228	3 166
St Joseph Hospital†	Cen	Church	110	80	26	719	3 305
Ornard 8 519—Ventura St John's Hospital†	Cen	Church	34	19	9	292	817
Pacific Grove 6 249—Monterey Pine Grove Sanitarium and Hospital	Cen	Indiv	13	1	4	50	100
Palo Alto 16 774—Santa Clara Palo Alto Hospital	Cen	NPA's n	160	100	20	749	5 067
Veterans Admin Facility†	Ment	Vet	1 203	1 906			2 6
Pasadena 81 564—Los Angeles Collins P and Howard Huntington Memorial Hospital†	Gen	NPA's n	212	178	30	1 006	7 701
Las Encinas Sanitarium	Nerv C	IntMed Corp	90	90			295
Lutheran Good Samaritan Hospital	Gen	Church	55			No data supplied	
St Luke Hospital†	Gen	Church	90	84	20	706	3 382
Southern California Sanitarium for Nervous and General Diseases	See Las Encinas Sanitarium						
Woman's Hospital	Mat	NPA's n	14	11	14	374	3 0
Patton 4 100—San Bernardino Patton State Hospital	Ment	State	3 911	3 633			1 630
Placerville 3 064—Eldorado El Dorado County Hospital	InstGen	County	60	40	4	14	115
Placerville Sanatorium	Cen	Part	30	10	5	97	594
Pomona 23 539—Los Angeles Pomona Valley Community Hospital	Cen	NPA's n	82	31	21	372	1 680
Porterville 6 270—Tulare New Porterville Hospital	Cen	Part	18	10	8	288	861
Portola 2 000—Plumas Western Pacific Railroad Hosp	Cen	NPA's n	21	10	4	70	506
Quincy 1 800—Plumas Plumas County Hospital	Cen	County	42	27	6	23	372
Randsburg 500—Kern Rand District Hospital	Cen	Indiv	8	8	2	30	461
Red Bluff 3 824—Tehama St Elizabeth's Mercy Hosp	Cen	Church	40	30	8	126	600
Tehama County Hospital	Cen	County	54	4	58		
Redding 8 109—Shasta Shasta County Hospital	InstGen	County	100			No data supplied	
Redlands 14 324—San Bernardino Redlands Community Hosp	Cen	NPA's n	06	00	17	238	1 516
Redwood City 12 483—San Mateo Canyon Sanatorium	TB	County	00	50			78
Hassler Health Home	TB	CyCo	275	200			224
Reedley 3 170—Fresno Reedley Hospital	Cen	NPA's n	19	9	6	161	830
Repress 280—Sacramento Folsom Prison Hospital	Inst	State	52	60			522
Richmond 23 642—Contra Costa Richmond Hospital	Cen	Part	60	72	16	640	3 100
Riverside 34 096—Riverside Riverside Community Hosp	Cen	NPA's n	99	62	20	000	3 275
Riverside County Hospital†	Inst	IA	211	200		304	3 400
Sherman Institute Hospital	Inst	IA	08	12			407
Roanoke 5 400—Los Angeles Alhambra Sanatorium	N C M	Indiv	22	15			89
Ross 1 751—Marin Ross General Hospital	CenTb	Corp	90	60	10	176	1 077
Sacramento 105 000—Sacramento Mercy Hospital	Cen	Church	177	170	30	874	7 300
Sacramento County Ho p†	CenTb	County	475	300	20	340	7 200
Sutter General Hospital	Cen	NPA's n	200	190			6 600
Sutter Maternity Ho pital	Mat	NPA's n	72	02	80	1 006	2 000
Salinas 11 506—Monterey El Sausal Sanitarium	Unit of Monterey County Hospital						
Monterey County Hospital†	CenTb	County	200	100	10	200	2 400
Park Lane Hospital	Cen	Indiv	39	35	12	300	
Salinas Valley Hospital	Cen	Indiv	23	20	9	227	1 400

## CALIFORNIA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Businets	Number of Births	Admits †
San Andrea 1 082—Calaveras San Andreas Hospital	Cen	Indiv	12	3	2	11	0
San Bernardino 43 646—San Bernardino St Bernardine's Hospital†	Cen	Church	120	50	24	70	2 004
San Bernardino County Charity Hospital†	CenTb	County	224	2 4	17	4 6	4 245
San Diego 203 341—San Diego Mercy Hospital†	Cen	Church	000	200	100	0 470	11 044
San Diego County General Hospital†	CenTb	County	600	460	14	4 4	7 000
U S Naval Hospital†	Cen	Navy	1 184	000			9 011
Laurel Home	Unit of San Diego County General Hosp						
San Fernando 9 004—Los Angeles San Fernando Hospital	Cen	Indiv	20	21	8	200	000
Valle Lindo Sanatorium	FB	Indiv	00			Reorganize	1
Veterans Admin Facility†	FB	Vet	004	340			714
San Francisco 634 000—San Francisco Children's Hospital†	Cen	NPA's n	200	150	50	1 400	10 000
Chinese Hospital	Cen	NPA's n	0	0	0	123	10 000
Dante Hospital	Cen	Corp	174	100	10	400	4 000
Franklin Hospital†	Cen	NPA's n	220	000	20	600	10 000
French Hospital†	Cen	NPA's n	100	100	10	400	4 000
Greens Eye Hospital†	F N P	Part	0	14			1 000
Hahnemann Hospital	Cen	NPA's n	0	40		10	1 000
Laguna Honda Home	InstCen	CyCo	900	000			1 000
Langley Porter Clinic	Ment	State	100			Estab 1940	
Letterman General Hosp †	Cen	Army	1 100	700	10	14	9 000
Mary's Help Hospital†	Cen	Church	100	100	10	400	4 000
Mount Zion Hospital†	Cen	NPA's n	10	121	20	175	4 000
Park Sanitarium	N C M	Corp	00	20			900
St Elizabeth's Infant Hosp	Mat	Church	60	2	10	10	200
St Francis Hospital†	Cen	NPA's n	200	224	60	1 190	10 000
St Joseph's Hospital†	Cen	Church	244	177	40	1 464	7 014
St Luke's Hospital†	Cen	Church	200	170	20	382	6 000
St Mary's Hospital†	Gen	Church	330	200	00	1 280	10 000
San Francisco Hospital†	CenTb	CyCo	1 346	900	00	608	16 000
San Francisco Polyclinic	Cen	NPA's n	12	0			10 000
San Francisco Psychopathic Hospital	Unit of San Francisco Hospital						
Shriners Hospital for Crippled Children†	Orth	NPA's n	60	00			21
Southern Pacific General Hospital†	Indus	NPA's n	400	00			10 000
Stanford University Hospital†	Cen	NPA's n	000	290	01	921	9 000
U S Marine Hospital†	Cen	USPHS	480	400			2 111
University of California Hospital†	Cen	State	200	210	00	7	7 400
Veterans Admin Facility†	Cen	Vet	340	100			900
Sanger 4 017—Fresno Sanger Sanitarium	Cen	Indiv	16	10	4	140	000
Sanitarium 000—Napa St Helena Sanitarium and Hospital	Cen	Church	100	90	7	10	2 000
San Jacinto 13 000—Riverside Soboba Indian Hospital	Cen	IA	00	10	0	00	000
San Jose 68 457—Santa Clara Alum Rock Sanatorium	TB	Corp	00	00			200
O'Connor Sanitarium†	Cen	Church	11	00	00	900	0 000
San Jose Hospital†	Cen	NPA's n	140	100	40	1 040	4 600
Santa Clara County Hospital†	CenTb	County	00	000	02	004	9 000
Santa Clara County Sanatorium†	Unit of Santa Clara County Hospital						
Sunnyholme Preventorium	Unit of Santa Clara County Hospital						
San Leandro 14 601—Alameda Fairmont Hospital of Alameda County†	CenTb	County	000	700			700
San Luis Obispo 8 881—San Luis Obispo Mountain View Hospital	Cen	Indiv	0	1	8	173	900
San Luis Obispo County Tuberculosis Sanatorium	Unit of San Luis Obispo General Hospital						
San Luis Obispo General Hospital	CenTb	County	0	41	8	100	1 148
San Luis Sanitarium	Cen	Indiv	0	1	00	100	800
San Mateo 19 403—San Mateo Community Hospital of San Mateo County†	Cen	County	21	00	10	10	1 000
Mills Memorial Hospital	Cen	Church	14	104	00	900	4 000
San Pedro —Los Angeles San Pedro Hospital†	Cen	Corp	11	00	00	000	0 000
Station Hospital†	Cen	Army	86	0			1 000
San Quentin 000—Marin Charles L Neumiller Memorial Hospital	Inst	State	140	10			1 100
San Rafael 8 000—Marin Marin County Ho pital and Farm	InstTb	County	100	100			117
San Rafael Cottage Ho pital	Cen	Indiv	40	00	16	00	1 000
Santa Barbara 14 000—Santa Barbara St Francis Hospital†	Cen	Church	00	61	20	272	2 000
Santa Barbara Cottage Ho pital†	Cen	NPA's n	160	100	20	200	3 600
Santa Barbara General Ho pital†	CenTb	County	009	179	12	192	2 100
Santa Cruz 16 000—Santa Cruz Santa Cruz County Ho pital	Cen	County	142	141	00	00	1 200
Santa Cruz Hospital	Cen	Corp	20	12			1 900
Sisters Hospital	Cen	Church	2	10	7	78	480
Santa Maria 8 000—Santa Barbara Our Lady of Perpetual Help Hospital	Gen	Church	50	00	14	007	3 100
Santa Monica 50 000—Los Angeles Santa Monica Hospital	Cen	Church	190	146	00	1 807	7 000

## CALIFORNIA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basins	Number of Births	Admissions †
Santa Rosa 1260—Sonoma	Gen Part	County	20	16	5	190	1050
Eliza Tanner Hospital	Gen	County	424	330	14	200	2790
Sonoma County Hospital†	Gen	County	30	13	5	60	475
Scotia 2200—Humboldt	Gen	NPA ssn	30	16	5	100	1203
Scotia Hospital	Gen	County	20	16	5	100	1203
Selma Sanitarium	Gen	County	20	16	5	100	1203
Shasta Dam 700—Shasta	Indus	NPA ssn	20	16	5	100	1203
Shasta Dam Hospital†	Indus	NPA ssn	20	16	5	100	1203
Sonora 2200—Tuolumne	Gen	County	20	16	5	100	1203
Sonora Hospital	Gen	County	20	16	5	100	1203
Tuolumne County Hospital	Inst	County	40	20	10	30	300
South Gate 2000—Los Angeles	Gen	County	46	20	20	917	1762
Suburban Hospital	Gen	County	46	20	20	917	1762
South Pasadena 1436—Los Angeles	N&M	County	75	26	6	63	63
Pasadena Sanitarium	N&M	County	75	26	6	63	63
South San Francisco 6629—San Mateo	Gen	County	34	No data supplied			
South San Francisco Hospital	Gen	County	34	No data supplied			
Spudra 270—Los Angeles	McD	State	1821	1470			317
Pacific Colony	McD	State	1821	1470			317
Springville 600—Tulare	TB	County	146	127			121
Tulare Kings Counties Joint Tuberculosis Hospital	TB	County	146	127			121
Stockton 54714—San Joaquin	Gen	County	77	70	16	330	2717
Dameron Hospital	Gen	County	77	70	16	330	2717
St Joseph's Home and Hospital	Gen	County	77	70	16	330	2717
Stockton State Hospital	Gen	County	77	70	16	330	2717
Susanville 1575—Lassen	Gen	County	40	14	6	65	911
Riverside Hospital	Gen	County	40	14	6	65	911
Talmage 300—Mendocino	Gen	County	304	2774			1181
Mendocino State Hospital†	Gen	County	304	2774			1181
Tehachapi 1261—Kern	Gen	County	10	9	4	50	521
Tehachapi Valley Hospital	Gen	County	10	9	4	50	521
Torrance 9000—Los Angeles	Gen	County	40	31	20	517	1063
Jared Sidney Torrance Memorial Hospital†	Gen	County	40	31	20	517	1063
Trona 775—San Bernardino	Gen	County	20	10	6	84	1006
Trona Hospital	Gen	County	20	10	6	84	1006
Tulare 800—Tulare	Gen	County	12	8	12	443	500
East Tulare Hospital	Gen	County	12	8	12	443	500
Tulare County General Hosp	Gen	County	103	61	10	297	1732
Tulare Hospital	Gen	County	24	14	4	6	877
Turlock 4839—Stanislaus	Gen	County	40	20	9	220	946
Emanuel Hospital	Gen	County	40	20	9	220	946
Jillian Collins Hospital	Gen	County	18	9	6	97	573
Upland 6310—San Bernardino	Gen	County	66	41	18	323	1870
San Antonio Community Hospital	Gen	County	66	41	18	323	1870
Vallejo 20072—Solano	Gen	County	70	60	20	614	1000
Vallejo General Hospital	Gen	County	70	60	20	614	1000
Ventura 13264—Ventura	Unit of Ventura County Hospital	County	60	33	18	223	1061
Bard Memorial Hospital	Gen	County	292	209	8	244	4206
Foster Memorial Hospital†	Gen	County	292	209	8	244	4206
Ventura County Hospital†	Gen	County	292	209	8	244	4206
Veterans Home 1000—Yuba	Inst	State	200	273			1007
Veterans Home Hospital†	Inst	State	200	273			1007
Vineburg 100—Sonoma	Gen	County	14	8	4	10	100
Burdale Hospital	Gen	County	14	8	4	10	100
Visalia 6004—Tulare	Gen	County	40	26	12	431	1454
Visalia Municipal Hospital	Gen	County	40	26	12	431	1454
Watsonville 8937—Santa Cruz	Gen	County	37	29	10	20	1004
Watsonville Hospital	Gen	County	37	29	10	20	1004
Weed 2000—Siskiyou	Gen	County	18	9	0	83	471
Weed Hospital	Gen	County	18	9	0	83	471
Weimar 120—Placer	TB	County	67	499			401
Weimar Joint Sanatorium	TB	County	67	499			401
West Los Angeles —Los Angeles	Gen	County	104	1742			720
Veterans Admin Facility†	Gen	County	104	1742			720
Westwood 5000—Lassen	Gen	County	42	10	10	142	991
Westwood Hospital	Gen	County	42	10	10	142	991
Willits 1625—Mendocino	Gen	County	20	14	0	60	60
Frank R. Howard Memorial Hospital	Gen	County	20	14	0	60	60
Woodland 663—Yolo	Gen	County	60	47	10	212	200
Woodland Clinic Hospital†	Gen	County	60	47	10	212	200
Yosemite National Park 200—Mariposa	Gen	County	14	4	2	10	271
Lewis Memorial Hospital	Gen	County	14	4	2	10	271
Yreka 2480—Siskiyou	Inst	County	160	131	14	109	1060
Siskiyou County General Hospital	Inst	County	160	131	14	109	1060
Yuba City 4900—Sutter	Inst	County	40	21	8	194	1001
Sutter County Hospital	Inst	County	40	21	8	194	1001
Yuba City General Hospital	Gen	County	20	10	10	231	1001

## Related Institutions

Altadena —Los Angeles	Conv	NPA ssn	40	23			70
Pasadena Preventorium	Conv	NPA ssn	40	23			70
Artesia 3891—Los Angeles	N&M	County	0	0			60
Pioneer Sanitarium	N&M	County	0	0			60
Belmont 1229—San Mateo	TB	County	20	16			45
Chas S. Howard Foundation	N&M	County	30	34			47
The Hillwell	N&M	County	30	34			47
Claremont 3007—Los Angeles	Inst	NPA ssn	22	3			24
Claremont College Infirmary	Inst	NPA ssn	22	3			24
Duarte 2000—Los Angeles	N&M	County	05	03			30
Palm Grove Sanatorium	TB	County	124	115			70
Santa Teresa Sanatorium	TB	County	124	115			70
Eureka 17000—Humboldt	Iso	County	16	3			81
Humboldt County Isolation Hospital	Iso	County	16	3			81
Glendale 82082—Los Angeles	N&M	County	20	20			20
Villa Shaw Rest Home	N&M	County	20	20			20

## CALIFORNIA—Continued

Related Institutions	Type of Service	Ownership or Control	Beds	Average Census †	Basins	Number of Births	Admissions †
Irwindale 400—Los Angeles	Conv	NPA ssn	90	90			200
Rural Rest Home and Sanitarium	Conv	NPA ssn	90	90			200
Keene 164—Kern	Conv	NPA ssn	44	16			21
Kern County Preventorium	Conv	NPA ssn	44	16			21
La Crescenta 600—Los Angeles	N&M	County	28	21			130
Kimball Sanitarium	N&M	County	28	21			130
Lancaster 2400—Los Angeles	TB	County	118	100			103
Antelope Valley Sanatorium and Hospital	TB	County	118	100			103
Larkspur 1500—Marin	Conv	County	16	6			82
Larkspur Convalescent and Rest Home	Conv	County	16	6			82
Lincoln 2044—Placer	N&M	County	15	10			12
Joslin & Sanatorium	N&M	County	15	10			12
Long Beach 161271—Los Angeles	Conv	County	38	20			919
California Sanitarium	Conv	County	38	20			919
Los Angeles 1001277—Los Angeles	Conv	County	22	16			187
Chase Diet Sanitarium	Conv	County	22	16			187
Dougherty Sanatorium	TB	County	41	26	6	69	99
Florence Crittenton Home	N&M	County	41	26	6	69	99
Resthaven	N&M	County	41	26	6	69	99
St Anne's Maternity Hosp	N&M	County	10	9	16	223	103
St Barnabas Rest Home for Men	Conv	County	15	12			107
Salvation Army Women's Home and Hospital	Mat	County	6	50	8	100	200
Twentieth Century Sanitarium	N&M	County	41	45			67
Monrovia 12007—Los Angeles	TB	County	0	47			63
Maryknoll Sanatorium	TB	County	0	47			63
Montebello 006—Los Angeles	Conv	NPA ssn	42	20			400
Los Angeles Convalescent Home	Conv	NPA ssn	42	20			400
National City 10344—San Diego	N&M	County	0	40			67
Hillcrest Home	N&M	County	0	40			67
Oakland 30711—Alameda	Mat	County	60	60	30	100	200
Salvation Army Women's Home and Hospital	Mat	County	60	60	30	100	200
Pacifica —Los Angeles	Conv	NPA ssn	60	No data supplied			
Independent Order of Foresters California Tuberculosis Sanitarium	TB	NPA ssn	60	No data supplied			
Rosemead 5000—Los Angeles	N&M	County	60	20			210
Rosemead Lodge	N&M	County	60	20			210
Rose 1701—Marin	McD	County	42	40			7
Cedars Development School	McD	County	42	40			7
San Diego 03341—San Diego	Conv	County	20	16			172
Trasler Hall	Conv	County	20	16			172
San Francisco 634500—San Francisco	Incur	NPA ssn	77	70			101
Carden Nursing Home	Incur	NPA ssn	77	70			101
San Gabriel 11007—Los Angeles	N&M	County	60	60			33
Mission Lodge Sanitarium	N&M	County	60	60			33
San Marino Sanitarium	N&M	County	60	60			33
San Jose 6847—Santa Clara	N&M	County	10	11			31
Beale Sanitarium	N&M	County	10	11			31
San Mateo 10400—San Mateo	TB	NPA ssn	28	0			17
San Mateo Preventorium	TB	NPA ssn	28	0			17
Santa Barbara 4000—Santa Barbara	Chil	NPA ssn	20	0			20
La Loma Feliz	Chil	NPA ssn	20	0			20
Santa Monica 13000—Los Angeles	Conv	NPA ssn	21	16			101
Thomson Convalescent Hospital and Rest Home	Conv	NPA ssn	21	16			101
Stanford University 720—Santa Clara	Chil	NPA ssn	0	73			100
Stanford Convalescent Home	Chil	NPA ssn	0	73			100
Sunland —Los Angeles	TB	County	0	0			110
Sunland Sanatorium	TB	County	0	0			110
Tujunga —Los Angeles	Chil	County	74	26			00
Reslock Health Retreat	Chil	County	74	26			00
Verdugo City 1000—Los Angeles	N&M	County	100	100			91
Rockhaven Sanitarium	N&M	County	100	100			91

## COLORADO

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basins	Number of Births	Admissions †
Alamosa 5610—Alamosa	Gen	County	40	22	11	260	2043
Alamosa Community Hosp	Gen	County	40	22	11	260	2043
Aspen 77—Pitkin	Gen	NPA ssn	10	0	12	9	40
Citizens Hospital	Gen	NPA ssn	10	0	12	9	40
Boulder 12900—Boulder	Conv	NPA ssn	101	40	8	40	1671
Boulder Colorado Sanitarium and Hospital†	Conv	NPA ssn	101	40	8	40	1671
Boulder County Hospital	Conv	NPA ssn	101	40	8	40	1671
Community Hospital†	Conv	NPA ssn	101	40	8	40	1671
Brush 2481—Moran	Conv	NPA ssn	24	14	8	112	600
Eben Fzer Hospital	Conv	NPA ssn	24	14	8	112	600
Burlington 1280—Kit Carson	Conv	NPA ssn	14	9	6	40	300
Hayes General Hospital	Conv	NPA ssn	14	9	6	40	300
Canon City 6000—Fremont	Gen	County	28	20	0	84	700
Colorado Hospital	Gen	County	28	20	0	84	700
Colorado State Penitentiary	Inst	State	45	38	6	78	307
St Thomas More Hospital	Gen	County	42	10	6	78	307
Cheyenne Wells 600—Cheyenne	Conv	NPA ssn	31	5	6	70	907
Cheyenne County Hospital	Conv	NPA ssn	31	5	6	70	907
Climax 600—Lake	Indus	NPA ssn	10	4			200
Climax Molybdenum Company Hospital	Indus	NPA ssn	10	4			200
Colorado Springs 36700—El Paso	Gen	County	184	100	20	520	2093
Beth El General Hospital and Sanatorium†	Gen	County	184	100	20	520	2093

## COLORADO—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinsets	Number of Births	Admissions †
Colorado Springs Psychopathic Hospital	N&M	Indiv	150	134		163	
Glockner Sanatorium and Hospital	Gen	Tb Church	170	133	10	243	2 419
National Methodist Episcopal Sanatorium for Tuberculosis	Unit of Beth El General Hosp						
Observation Hospital	Unit of Beth El General Hosp						
St. Francis Hospital and Sanatorium	Gen	Tb Church	150	106	15	377	2 158
Union Printers Home and Tuberculosis Sanatorium	Gen	Tb NPAssn	255	279		164	
Cripple Creek 2358—Jeller	Gen	NPAssn	25	9	6	70	504
Cripple Creek Hospital							
Del Norte 1922—Rio Grande							
St. Joseph's Hospital and Sanatorium	Gen	Church	45	20	11	145	735
St. Mary's Pavilion	Unit of St. Joseph's Hospital and Sanat						
Delta 3717—Delta							
Western Slope Memorial Hospital	Gen	NPAssn	12	5	3	11	180
Denver 322 412—Denver							
Bethesda Sanatorium	TB	Church	65	23		31	
Beth Israel Hospital	Gen	NPAssn	55	43	10	71	1 498
Childrens Hospital	Chil	NPAssn	215	120		5 238	
Colorado General Hosp	Gen	State	245	200	20	598	4 340
Colorado Psychopathic Hospital	Ment	State	78	83		876	
Denver General Hospital	Gen	Tb CyCo	664	304	36	330	8 336
Ex Patients Tubercular Home	TB	NPAssn	65	43		58	
Fitzsimons General Hosp	Gen	Tb Army	1 185	888	6	77	7 344
Mercy Hospital	Gen	Church	215	180	30	952	8 700
Mount Airy Sanatorium	N&M	Corp	66	35		520	
National Jewish Hospital	TB	NPAssn	257	233		205	
Porter Sanatorium and Hospital	Gen	Church	90	78	18	489	2 228
Presbyterian Hospital	Gen	Church	100	131	25	1 063	5 700
Robert W. Speer Memorial Hospital for Children	Unit of Denver General Hospital						
St. Anthony Hospital	Gen	Church	190	133	30	1 065	5 270
St. Joseph's Hospital	Gen	Church	246	230	64	1 593	8 187
St. Luke's Hospital	Gen	Church	250	184	40	1 124	8 527
Steele Memorial Hospital	Iso	CyCo	80	24		630	
Durango 5 887—LaPlata							
Mercy Hospital	Gen	Church	55	38	9	164	2 167
LaPlata County Hospital	Gen	County	27	12	7	63	530
Edgewater 1 648—Jefferson							
Craig Colony	TB	NPAssn	50	34		34	
Sands House	TB	NPAssn	44	32		24	
Englewood 9 680—Arapahoe							
Federal Correctional Institution	Inst	USPHS	25	3		47	
Swedish National Sanatorium	TB	NPAssn	90	58		76	
Fairplay 739—Park							
Fairplay Hospital	Gen	Indiv	14	No data supplied			
Fort Collins 12 251—Larimer							
Larimer County Hospital	Gen	County	52	47	8	319	1 632
Fort Logan—Arapahoe							
Station Hospital	Gen	Army	74	39		677	
Fort Lyon 1 180—Bent							
Veterans Admin. Facility	Ment	Vet	1 067	938		494	
Fort Morgan 4 884—Morgan							
Fort Morgan Hospital	Gen	Indiv	25	13	6	137	573
Fruita 1 466—Mesa							
Fruita Community Hospital	Gen	Indiv	8	3	2	37	178
Glenwood Springs 2 233—Garfield							
Dr. Porter's Hospital	Gen	Part	20	12	4	54	427
Grand Junction 12 410—Mesa							
St. Mary's Hospital	Gen	Church	65	34	12	249	1 149
Greeley 15 935—Weld							
Greeley Hospital	Gen	County	108	67	26	546	3 951
Gunnison 2 177—Gunnison							
Gunnison Community Hosp	Gen	Part	25	9	6	61	440
Hayden 640—Routt							
Solandt Memorial Hospital	Gen	NPAssn	16	11	3	56	338
Holyoke 1 150—Phillips							
Holyoke Hospital	Gen	Indiv	8	5	2	28	286
Ignacio 555—LaPlata							
Edward T. Taylor Indian Hospital	Gen	IA	36	10	4	13	372
Julesburg 1 619—Sedgwick							
Community Hospital	Gen	Indiv	10	4	4	21	199
La Junta 7 040—Otero							
Atchison 1 064 and Santa Fe Railroad Hospital	Indus	NPAssn	36	19		451	
Mennonite Hospital and Sanatorium	Gen	Church	71	59	14	212	1 235
Leadville 4 774—Lake							
St. Vincent Hospital	Gen	Church	36	16	10	100	350
Longmont 7 406—Boulder							
Longmont Hospital	Gen	Indiv	33	18	7	73	831
St. Vrain Hospital	Gen	Indiv	25	10	5	40	312
Loveland 6 145—Larimer							
Loveland Hospital and Clinic	Gen	Indiv	10	6	4	23	208
Montrose 4 764—Montrose							
St. Luke's Hospital	Gen	Indiv	16	8	7	88	310
Oak Creek 1 769—Routt							
Oak Creek Hospital	Gen	Indiv	15	6	5	59	355
Ourray 951—Ourray							
Bates Hospital and Sanatorium	Gen	Corp	16	5	2	10	233
Pueblo 52 102—Pueblo							
Colorado State Hospital	Ment	State	4 387	4 135		770	
Corvino Hospital	Gen	NPAssn	206	171	22	357	3 932
Parkview Hospital	Gen	NPAssn	66	60	14	331	2 225
St. Mary's Hospital	Gen	Church	175	111	27	538	3 048
Woodcroft Hospital	N&M	Corp	130	65		150	

## COLORADO—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinsets	Number of Births	Admissions †
Rocky Ford 3 494—Otero							
Physicians Hospital	Gen	NPAssn	10	9	4	95	384
Salida 4 969—Chaffee							
Denver and Rio Grande Western Railroad Hospital	Gen	NPAssn	80	50	7	139	1 580
Spivak 350—Jefferson							
Sanatorium of the Jewish Con-							
sumptives Relief Society	TB	NPAssn	300	250		139	
Sterling 7 411—Logan							
Good Samaritan Hospital	Gen	Church	30	17	10	119	917
St. Benedict Hospital	Gen	Church	30	15	6	167	566
Towaoc 60—Montezuma							
Ute Mountain Indian Hosp	Gen	IA	11	9	4	15	338
Trinidad 13 223—Las Animas							
Mount San Rafael Hospital	Gen	Church	75	35	9	167	1 095
Walsenburg 5 505—Huerfano							
Lamme Brothers Hospital	Gen	Part	20	8	3	31	350
Wheat Ridge 3 500—Jefferson							
Evangelical Lutheran Sanatorium	TB	Church	110	88		61	
Woodmen 250—El Paso							
Modern Woodmen of America Sanatorium	TB	NPAssn	155	68		71	
Wray 2 061—Yuma							
Wray Hospital	Gen	Indiv	15	6	6	87	370

## Related Institutions

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinsets	Number of Births	Admissions †
Boulder 12 958—Boulder							
Mesa Vista Sanatorium	TB	Part	55	50		40	
Collbran 301—Mesa							
Plateau Valley Congregation Hospital	Gen	Church	13	7	6	34	294
Colorado Springs 36 783—El Paso							
Cragmor Sanatorium	TB	NPAssn	125	19		69	
Denver, 322 412—Denver							
Florence Crittenton Home (Mary H. Donaldson Woman's Hospital)	Mat	NPAssn	11	7	9	91	205
St. Francis Sanatorium	TB	Church	22	17		47	
Salvation Army Woman's Home and Hospital	Mat	Church	30	27	18	53	92
Englewood 9 680—Arapahoe							
Costello Home	TB	NPAssn	16	8		5	
Temple Sanatorium	N&M	Indiv	37	31		112	
Flagler 506—Kit Carson							
Flagler Hospital	Gen	Indiv	10	5	4	43	181
Golden 3 175—Jefferson							
Hospital—State Industrial School for Boys	Inst	State	25	6		457	
Grand Junction 12 479—Mesa							
State Home and Training School for Mental Defectives	MeDe	State	500	425		36	
Greeley 15 935—Weld							
Island Grove Hospital	Inst	Iso County	65	50		140	
Homelake 225—Rio Grande							
Colorado State Soldiers and Sailors Home	Inst	State	35	16		139	
Ridge 100—Jefferson							
State Home and Training School for Mental Defectives	MeDe	State	325	317		19	

## CONNECTICUT

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinsets	Number of Births	Admissions †
Bridgeport 147 121—Fairfield							
Bridgeport Hospital	Gen	NPAssn	312	311	74	2 270	10 744
Englewood Hospital	Iso	Tb City	150	23		417	
Park City Hospital	Gen	NPAssn	55	25	10	133	1 000
St. Vincent's Hospital	Gen	Church	205	216	57	2 105	9 000
Bristol 30 167—Hartford							
Bristol Hospital	Gen	NPAssn	100	106	25	837	4 850
Canaan 550—Litchfield							
Robert C. Geer Memorial Hospital	Gen	NPAssn	26	21	7	60	656
Cromwell 3 251—Middle ex							
Cromwell Hall	Nerv	Corp	33	17		96	
Danbury 22 330—Fairfield							
Danbury Hospital	Gen	NPAssn	195	107	40	623	3 511
Derby 10 287—New Haven							
Griffin Hospital	Gen	NPAssn	92	71	26	751	3 642
Greens Farms 275—Fairfield							
Hall Brooke Sanatorium	N&M	Corp	75	41		137	
Greenwich 6 000—Fairfield							
Blythwood	N&M	Corp	79	53		97	
Greenwich Hospital	Gen	NPAssn	115	83	20	436	2 600
St. Luke's Convalescent Hospital	Conv	Church	110	84		841	
Hartford 168 267—Hartford							
Avery Convalescent Hospital	Unit of Hartford Hospital						
Cedarcrest Sanatorium	TB	State	250	327		259	
Hartford Hospital	Gen	NPAssn	758	614	107	4 204	24 978
Mount Sinai Hospital	Gen	NPAssn	54	47	6	139	1 627
Municipal Hospital	Gen	Iso City	315	240	34	133	4 151
Neuro Psychiatric Institute of the Hartford Retreat	N&M	NPAssn	270	293		646	
St. Francis Hospital	Gen	Church	492	408	108	2 591	15 591
Kent 1 245—Litchfield							
Kent School Infirmary	Inst	NPAssn	26	5		405	
Lakeville 1 800—Litchfield							
Hotchkiss School Infirmary	Inst	NPAssn	40	16		576	

## CONNECTICUT—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census†	Basinets	Number of Births	Admissions†
Manchester 23 799—Hartford	Gen	NPAcen	100	82	20	423	3 161
Manchester Memorial Hosp	Gen	NPAcen	110	103	23	020	3 007
Meriden 39 494—New Haven	Gen	NPAcen	305	275			392
Meriden Hospital*AO	Gen	NPAcen	110	103	23	020	3 007
Undercliff Meriden State Tuberculosis Sanatorium†	TB	State	305	275			392
Middletown 26 490—Middletown	Gen	NPAcen	315	296	5	711	
Connecticut State Hospital*AO	Gen	NPAcen	156	125	31	754	3 993
Middlesex Hospital*AO	Gen	NPAcen	50	31	15	306	1 217
Millford 16 439—New Haven	Gen	NPAcen	50	31	15	306	1 217
Millford Hospital	Gen	NPAcen	50	31	15	306	1 217
New Britain 68 680—Hartford	Gen	NPAcen	220	178	40	1 580	6 526
New Britain General Hospital*AO	Gen	NPAcen	220	178	40	1 580	6 526
New Haven 160 600—New Haven	Gen	NPAcen	220	178	40	1 580	6 526
Dr J H Evans Private Hospital	Gen	Indiv	7	6			2 8
Grace Hospital*AO	Gen	NPAcen	200	169	61	1 440	6 380
Hospital of St Raphael*AO	Gen	Church	240	227	40	1 714	7 141
New Haven Hospital*AO	Gen	NPAcen	339	437	50	1 761	11 483
Psychiatric Clinic Yale School of Medicine	Unit of New Haven Hospital						
Sarah Wey Tompkins Memorial Pavilion	Unit of New Haven Hospital						
Newington 5 449—Hartford	Orth	NPAcen	200	179			117
Newington Home for Crippled Children	Orth	NPAcen	200	179			117
Veterans Admin Facility	Gen	NPAcen	57	38	12	212	1 022
New London 30 486—New London	Gen	NPAcen	57	38	12	212	1 022
Home Memorial Hospital	Gen	NPAcen	57	38	12	212	1 022
Lawrence and Memorial Asso	Gen	NPAcen	219	147	57	1 011	4 741
Dr Lenn Surgical Hospital	Gen	NPAcen	219	147	57	1 011	4 741
U S Coast Guard Academy Hospital	Gen	NPAcen	219	147	57	1 011	4 741
New Milford 3 000—Litchfield	Gen	NPAcen	30	12	6	97	476
New Milford Hospital	Gen	NPAcen	30	12	6	97	476
Newtown 607—Fairfield	Gen	NPAcen	30	12	6	97	476
Fairfield State Hospital	Gen	NPAcen	30	12	6	97	476
Norwalk 38 840—Fairfield	Gen	NPAcen	151	100	33	1 216	5 77
Norwalk General Hospital*AO	Gen	NPAcen	151	100	33	1 216	5 77
Norwich 23 652—New London	Gen	NPAcen	151	100	33	1 216	5 77
Norwich State Hospital*AO	Gen	NPAcen	151	100	33	1 216	5 77
Norwich State Tuberculosis Sanatorium (Uncas on Thames)*AO	TB	State	438	364			772
William W Backus Hosp *AO	Gen	NPAcen	131	86	29	811	3 214
Portland 2 500—Middletown	Gen	NPAcen	131	86	29	811	3 214
Elmerest Manor	Gen	NPAcen	131	86	29	811	3 214
Putnam 7 775—Windham	Gen	NPAcen	74	61	22	371	2 109
Day Kimball Hospital	Gen	NPAcen	74	61	22	371	2 109
Rockville 7 572—Tolland	Gen	NPAcen	30	26	6	190	602
Rockville City Hospital	Gen	NPAcen	30	26	6	190	602
Sharon 500—Litchfield	Gen	NPAcen	40	16	10	177	743
Sharon Hospital	Gen	NPAcen	40	16	10	177	743
Shelton 10 971—Fairfield	Gen	NPAcen	40	16	10	177	743
Laurel Heights State Tuberculosis Sanatorium*AO	TB	State	352	362			711
Southbury 1 100—New Haven	Gen	NPAcen	11	8			353
Southbury Training School	Gen	NPAcen	11	8			353
Southington 5 688—Hartford	Gen	NPAcen	11	8			353
Bradley Memorial Hospital	Gen	NPAcen	11	8			353
South Norwalk—Fairfield	Gen	NPAcen	11	8			353
Woodcourt (Wadsworth Sanatorium)	Gen	NPAcen	11	8			353
Stafford Springs 3 401—Tolland	Gen	NPAcen	48	33	8	225	1 001
Cyril and Julia O Johnson Memorial Hospital	Gen	NPAcen	48	33	8	225	1 001
Stamford 47 938—Fairfield	Gen	NPAcen	60	34			101
Dr Barnes Sanatorium	Gen	NPAcen	60	34			101
Stamford Hall	Gen	NPAcen	60	34			101
Stamford Hospital*AO	Gen	NPAcen	60	34			101
Tophamsee Grange	Gen	NPAcen	60	34			101
Torrington 26 988—Litchfield	Gen	NPAcen	137	107	27	662	3 522
Charlotte Hungerford Hosp	Gen	NPAcen	137	107	27	662	3 522
Wallingford 11 420—New Haven	Gen	NPAcen	140	137			219
Gaylord Farm Sanatorium*	Gen	NPAcen	140	137			219
Waterbury 99 314—New Haven	Gen	NPAcen	327	243	60	1 734	8 800
St Mary's Hospital*AO	Gen	NPAcen	303	236	60	1 213	7 760
Waterbury Hospital*AO	Gen	NPAcen	303	236	60	1 213	7 760
Waterford 100—New London	Gen	NPAcen	140	137			219
The Seaside	Gen	NPAcen	140	137			219
Westport 8 258—Fairfield	Gen	NPAcen	100	82			200
Westport Sanatorium	Gen	NPAcen	100	82			200
Willimantic 12 101—Windham	Gen	NPAcen	80	60	18	300	2 475
Windham Community Memorial Hospital	Gen	NPAcen	80	60	18	300	2 475
Winsted 7 674—Litchfield	Gen	NPAcen	63	44	17	240	1 136
Litchfield County Hospital	Gen	NPAcen	63	44	17	240	1 136

## Related Institutions

Avon 1 000—Hartford	Inst	NPAcen	12	2			140
Avon Old Farms Infirmary	Inst	NPAcen	12	2			140
Bridgport 147 121—Fairfield	Chr	City	300	276			665
Hillside Home and Hospital	Chr	City	300	276			665
Cheshire 4 302—New Haven	Inst	State	28	3			117
Connecticut Reformatory	Inst	State	28	3			117
East Lyme 3 338—New London	Unit of Connecticut State Farm for Women	Nanticoke					
Ida Thompson Hospital	Unit of Connecticut State Farm for Women	Nanticoke					
Greenwich 6 000—Fairfield	TbIso	City	72	36	2		178
Municipal Hospital	TbIso	City	72	36	2		178
Mansfield Depot 300—Tolland	MeDe	State	1 061	1 145			204
Mansfield State Training School and Hospital	MeDe	State	1 061	1 145			204

## CONNECTICUT—Continued

Related Institutions	Type of Service	Ownership or Control	Beds	Average Census†	Basinets	Number of Births	Admissions†
Meriden 39 494—New Haven	Inst	State	30	6			700
Connecticut School for Boys	Inst	State	30	6			700
New Britain 68 680—Hartford	Gen	Church	60	32			79
New Britain Rest Home	Gen	Church	60	32			79
New Canaan 6 921—Fairfield	Nerv	Corp	20	20			167
Silver Hill Foundation	Nerv	Corp	20	20			167
New Haven 160 600—New Haven	Inst	NPAcen	96	91			14
Jewish Home for the Aged	Inst	NPAcen	96	91			14
Yale Infirmary	Inst	NPAcen	96	91			14
Niantic 1 012—New London	Inst	State	70	69	8	57	1 000
Connecticut State Farm for Women	Inst	State	70	69	8	57	1 000
Rocky Hill 1 600—Hartford	Inst	State	254	100			1 14
State Veterans Hospital	Inst	State	254	100			1 14
Waterbury, 99 314—New Haven	McDe	NPAcen	120	110			100
Connecticut Children's Hospital	McDe	NPAcen	120	110			100
West Hartford 7 16—Hartford	Mat	Church	9	2	6	61	60
St Agnes Home	Mat	Church	9	2	6	61	60
West Haven 6 021—New Haven	Conv	Indiv	22	10			27
West Haven Convalescent Home	Conv	Indiv	22	10			27
West Suffield 700—Hartford	Conv	NPAcen	40	9			34
Travelers Rest Home	Conv	NPAcen	40	9			34
Wethersfield 9 614—Hartford	Inst	State	70	10			210
Connecticut State Prison Hospital	Inst	State	70	10			210
Woodmont 74—New Haven	Conv	Indiv	12	4			17
Woodmont Hall	Conv	Indiv	12	4			17

## DELAWARE

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census†	Basinets	Number of Births	Admissions†
Dover 5 717—Kent	Gen	NPAcen	69	70	10	2 0	1 40
Kent General Hospital	Gen	NPAcen	69	70	10	2 0	1 40
Lancaster 700—New Castle	Gen	NPAcen	1 247	1 192			749
Delaware State Hospital*AO	Gen	NPAcen	1 247	1 192			749
Fort Dupont (Delaware City 1 Station Hospital)	Gen	NPAcen	46	5			357
Lanes 2 916—Sussex	Gen	NPAcen	104	46	12	145	1 120
Beche Hospital*AO	Gen	NPAcen	104	46	12	145	1 120
Marshallton 1 600—New Castle	TB	State	160	17			174
Brandywine Sanatorium	TB	State	160	17			174
Edgewood Sanatorium	TB	State	160	17			174
Middletown 1 200—New Castle	Mat	Indiv	20	8	10	170	170
Maternity Home	Mat	Indiv	20	8	10	170	170
Millford 4 214—Sussex	Gen	NPAcen	100	51	15	304	2 000
Millford Memorial Hospital	Gen	NPAcen	100	51	15	304	2 000
Smymna 1 870—Kent	Inst	Gen	111	69	8	25	732
Delaware State Welfare Home Hospital	Inst	Gen	111	69	8	25	732
Wilmington 11 001—New Castle	Orth	Chil	70	61			73
Alfred I duPont Institute of The Nemours Foundation	Orth	Chil	70	61			73
Delaware Hospital*AO	Gen	NPAcen	70	61			73
Doris Memorial Hospital	Gen	NPAcen	70	61			73
Cross Private Hospital	Gen	NPAcen	70	61			73
Memorial Hospital*AO	Gen	NPAcen	70	61			73
St Francis Hospital*AO	Gen	NPAcen	70	61			73
Wilmington General Hospital*AO	Gen	NPAcen	70	61			73

## Related Institutions

Marshallton 1 600—New Castle	ThChil	NPAcen	20	20			16
Sunnybrook Cottage	ThChil	NPAcen	20	20			16
Stockley 65—Sussex	MeDe	State	50	410			21
Delaware Colony	MeDe	State	50	410			21

## DISTRICT OF COLUMBIA

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census†	Basinets	Number of Births	Admissions†
Washington 796 000	Gen	NPAcen	210	211			7 000
Central Dispensary and Emergency Hospital*AO	Gen	NPAcen	210	211			7 000
Children's Hospital*AO	Gen	NPAcen	210	211			7 000
Columbia Hospital for Women and Lying In Asylum*AO	Gen	NPAcen	120	112	46	3 011	4 600
District of Columbia Reformatory and Workhouse Hospital (Fortron An P O)	Inst	City	120	39			3 127
Doctors Hospital*AO	Gen	Corp	200	201	60	1 400	8 800
Eastern Dispensary and Casualty Hospital	Gen	NPAcen	147	97	12	19	3 000
Episcopal Eye Ear and Throat Hospital*AO	ENT	Church	100	67			6 14
Freedmen's Hospital*AO	Gen	NPAcen	402	280	48	1 971	4 400
Gallinger Municipal Hospital*AO	Gen	NPAcen	1 000	930	54	2 061	10 523
Garfield Memorial Hospital*AO	Gen	NPAcen	340	307	107	2 000	10 197
Georgetown University Hospital*AO	Gen	NPAcen	220	190	51	1 594	6 040
George Washington University Hospital*AO	Gen	NPAcen	92	77	22	767	2 900
National Homeopathic Hospital*AO	Gen	NPAcen	60	45	20	490	1 610



## DISTRICT OF COLUMBIA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Providence Hospital**	Gen	Church	275	248	50	2 299	10 065
St Elizabeths Hospital **	Gen	USPHS	454	422	12	12	2 201
Sibley Memorial Hosp **	Gen	USPHS	7 017	524	12	12	1 253
Tuberculosis Sanatorium**	Gen	Church	253	209	96	2 726	9 858
(Glenn Dale Sanatorium)							
Glenn Dale Md P O	TB	City	636	636			465
U S Soldiers Home Hosp	InstGen	Fed	466	263			1 484
Veterans Admin Facility**	Gen	Vet	327	292			4 003
Walter Reed General Hosp **	Gen	Army	1 400	1 035	21	170	8 467
Washington Sanitarium and Hospital**	Gen	Church	188	164	26	812	4 213
Related Institutions							
Washington 796 000							
District Training School (Laurel Md P O)	MeDe	City	740	640			90
Florence Crittenton Home	Mat	NPA'sn	50	44	40	84	132
Home for the Aged and Infirm	Inst	City	150	130			137
Kendall House Sanitarium	Conv	Indiv	22	12			65
National Training School for Boys Hospital	Inst	Fed	30	10			761
Washington Home for Incurables	Incur	NPA'sn	184	180			72

## FLORIDA

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Arcadia 4 055—DeSoto							
Arcadia General Hospital	Gen	Corp	28		No data supplied		
Bartow 6 158—Polk							
Bartow General Hospital	Gen	City	20	8	5	97	580
Polk County Hospital	Gen	County	60	52	5	16	1 039
Bay Pines—Pinellas							
Veterans Admin Facility	Gen	Vet	444	383			3 349
Bradenton 7 444—Manatee							
Bradenton General Hospital	Gen	Part	18	7	7	57	275
Century 2 000—Escambia							
Turberville Hospital	Gen	NPA'sn	35	15	4	45	678
Chattahoochee 7 110—Gadsden							
Florida State Hospital	Gen	State	5 347	5 003	5	25	2 041
Clearwater 10 136—Pinellas							
Morton F Plant Hospital	Gen	NPA'sn	75	23	10	120	997
Coral Gables 8 204—Dade							
University Hospital	Gen	Corp	35	23	12	174	1 222
Dade City 2 501—Pasco							
Jackson Memorial Hospital	Gen	County	20	4	3	33	248
Daytona Beach 22 584—Volusia							
Hallifax District Hospital	Gen	NPA'sn	145	35	35	109	1 163
De Funiak Springs 2 570—Walton							
Lakeside Clinic	Gen	Indiv	10	7	8	176	310
De Land 7 041—Volusia							
De Land Memorial Hospital	Gen	NPA'sn	22	4	8	64	347
Dunedin 1 758—Pinellas							
Mease Hospital	Gen	NPA'sn	24	9	6	50	406
Eustis 2 930—Lake							
Lake County Medical Center	Gen	NPA's n	63	15	10	81	812
Fort Barrancas 750—Escambia							
Station Hospital	Gen	Army	90	64			1 752
Fort Lauderdale 17 996—Broward							
Broward General Hospital	Gen	CyCo	65	33	14	237	1 910
Fort Myers 10 604—Lee							
Jones Walker Hospital	Unit of Lee Memorial Hospital						
Lee Memorial Hospital	Gen	NPA'sn	75	17	4	146	992
Fort Pierce 8 646—St Lucie							
Fort Pierce Memorial Hosp	Gen	NPA'sn	50	22	6	123	765
Gainesville 13 757—Alachua							
Alachua County Hospital	Gen	County	65	43	20	308	1 992
University of Florida Infirmary	Inst	State	45	5			525
Hollywood 6 239—Broward							
Hollywood Hospital	Gen	Corp	30	12	6	119	613
Jacksonville 173 065—Duval							
Brewster Hospital	Gen	Church	80	46	15	543	2 275
Duval County Hospital**	Gen	County	225	172	15	697	3 910
Hazlehurst Sanatorium	TB	NPA'sn	21		No data supplied		
Hope Haven Hospital	Orth	NPA'sn	74	45			177
Negro Tuberculosis Hospital	TB	CyCo	50	41			141
Dr Randolphs Sanitarium	N&M	Indiv	8	3			14
Riverside Hospital**	Gen	NPA'sn	50	37	10	184	1 662
St Luke's Hospital**	Gen	NPA'sn	185	139	25	174	6 462
St Vincent's Hospital**	Gen	Church	233	185	65	1 471	7 126
Kissimmee 3 725—Oceola							
Oceola Hospital	Gen	Indiv	40	18	5	78	1 018
Lake City 5 836—Columbia							
Lake Shore Hospital	Gen	City	7	18	8	145	564
Veterans Admin Facility	Gen	Vet	406	245			2 141
Lakeland 22 063—Polk							
Morrell Memorial Hospital	Gen	City	84	40	12	300	1 755
Lake Wales 5 024—Polk							
Lake Wales Hospital	Gen	NPA'sn	25	5	7	47	240
Leesburg 465—Lake							
Theresa Holland Hospital	Gen	Indiv	40	12	6	89	800
Manatee 3 570—Manatee							
Manatee County Hospital	GenTb	County	65	41	8	230	756
Riverside Hospital	Gen	Indiv	20	6	3	37	462
Marianna 5 070—Jackson							
Jackson Hospital	Gen	NPA'sn	34		6	Estab	1912

## FLORIDA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Melbourne 2 622—Brevard							
Brevard Hospital	Gen	City	30	6	5	50	276
Miami 172 172—Dade							
Christian Hospital	Gen	NPA'sn	40	8	6	127	372
Dade County Hospital	GenTb	County	181	113	20	457	2 962
James M Jackson Memorial Hospital**	GenTb	City	500	374	55	1 755	13 706
Miami Retreat	N&M	NPA'sn	55	40			462
Miami Riverside Hospital	Gen	Corp	44	20	10	207	611
National Childrens Cardiac Home	Card	NPA'sn	24	24			24
Sun Ray Park Health Resort	Conv	Corp	65	20			255
Victoria Hospital	Gen	Indiv	75	44	26	618	2 011
Miami Beach 23 012—Dade							
St Francis Hospital	Gen	Church	175	82	24	312	3 277
Ocala 8 996—Marion							
Munroe Memorial Hospital	Gen	CyCo	55	55	11	244	1 549
Orlando 36 736—Orange							
Florida Sanitarium and Hospital	Gen	Church	150	67	10	150	1 799
Florida State Tuberculosis Sanatorium	TB	State	400	357			327
Orange General Hospital**	Gen	NPA'sn	163	111	33	465	4 037
Palatka 7 140—Putnam							
Glendale Hospital	Gen	Indiv	20	10	4	100	400
Mary Lawson Sanatorium	Gen	Indiv	50	15	6	65	242
Panama City 11 610—Bay							
Lisenby Hospital	Gen	Indiv	31	12	6	128	704
Panama City Hospital	Gen	NPA'sn	19	7	5	160	564
Pensacola 37 440—Escambia							
Escambia County Tuberculosis Sanatorium	TB	CyCo	50	24			23
Pensacola Hospital**	Gen	Church	167	142	30	1 135	6 243
Pensacola Maternity Home	Mat	NPA'sn	23	7	32	570	625
U S Naval Hospital	Gen	Navy	142	93			1 552
Quincy 3 888—Gadsden							
Gadsden County Hospital	Gen	NPA'sn	25	13	4	91	659
Rockledge 725—Brevard							
Eugene Wuesthoff Memorial Hospital	Gen	NPA'sn	12	5	3	33	210
St Augustine 12 090—St Johns							
East Coast Hospital	Gen	NPA'sn	55	37	5	125	1 441
Flagler Hospital	Gen	NPA'sn	66	26	10	143	1 013
St Petersburg 60 812—Pinellas							
American Legion Hospital for Crippled Children	Orth	NPA'sn	35	19			210
Mercy Hospital	Gen	City	46	15	4	15	777
Mound Park Hospital	Gen	City	192	86	16	350	5 513
St Anthony's Hospital	Gen	Church	100	41	15	142	1 562
St Anthony's Villa	Unit of St Anthony's Hospital						
Sanford 10 217—Seminole							
Fernald Loughton Memorial Hospital	Gen	NPA'sn	22	10	6	85	559
Sarasota 11 141—Sarasota							
Joseph Halton Hospital	Gen	Indiv	20	15	5	12	650
Sarasota Hospital	Gen	City	50	25	10	205	1 170
Sebring 3 155—Highlands							
Weems Hospital	Gen	Indiv	16	9	3	114	859
Stuart 2 438—Martin							
Martin County Hospital	Gen	NPA'sn	30	5	8	44	348
Tallahassee 16 240—Leon							
Johnston's Hospital	Gen	Indiv	33	23	7	267	851
Tampa 108 391—Hillsborough							
Centro Asturiano Hospital	Gen	NPA'sn	75	35	8	219	1 144
Clara Frye Tampa Municipal Negro Hospital	Gen	City	53	23	6	107	2 433
Hillsborough County Home and Hospital	InstGen	County	220	197	6	27	2 367
St Joseph's Hospital	Gen	Church	75	63	20	712	2 072
Tampa Municipal Hospital	Gen	City	295	163	32	1 010	7 370
Umatilla 1 140—Lake							
Harry Anna Crippled Childrens Home	Orth	NPA'sn	75	45			879
Venice 507—Sarasota							
Florida Medical Center	Gen	NPA'sn	52	20			426
Vero Beach 3 050—Indian River							
Indian River Hospital	Gen	NPA'sn	21	6	5	54	310
West Palm Beach 33 035—Palm Beach							
Good Samaritan Hospital	Gen	NPA'sn	117	85	1	313	3 171
Pine Ridge Hospital	Gen	NPA'sn	40		No data supplied		
St Mary's Hospital	Gen	Church	100	35	15	255	1 152
Winter Haven 6 199—Polk							
Winter Haven Hospital	Gen	NPA'sn	25	9	5	88	554
Related Institutions							
Daytona Beach 22 584—Volusia							
Daytona Beach Sanitarium	Gen	Indiv	10	5	2	11	117
Fort Lauderdale 17 996—Broward							
Provident Hospital	Gen	NPA'sn	18	12	6	75	420
Gainesville 13 757—Alachua							
Florida Farm Colony	MeDe	State	573	573			85
Jacksonville 13 065—Duval							
Dr Miller's Sanitarium	Drug	Indiv	20	6			283
Largo 1 031—Pinellas							
Pinellas County Home	InstTb	County	152	93			106
Miami 172 172—Dade							
Edgewater Hospital	Gen	Indiv	34	8	7	23	100
Raiford 472—Union							
Florida State Farm Hospital	Inst	State	85	60			554
St Petersburg 60 812—Pinellas							
Earle Restorium	Conv	Indiv	40	24			160
Florence Crittenton Home	Mat	NPA'sn	25	18	15	28	49
Tallahassee 16 240—Leon							
Florida Agricultural and Mechanical College Hospital	InstGen	State	43	33	2	10	775

## GEORGIA

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basins ‡	Number of Births	Admissions †
Albany 19 055—Dougherty Phoebe Putney Memorial Hospital	Gen	NPAssn	50	33	15	347	1 845
Alto, 217—Habersham State Tuberculosis Sanatorium	TB	State	637	600			867
Americus 9 281—Sumter Americus and Sumter County Hospital	Gen	NPAssn	35	20	5	120	770
Athens 20 630—Clarke Athens General Hospital	Gen	County	60	38	10	128	1 537
St Mary's Hospital	Gen	Church	68	47	12	245	1 790
Atlanta 302 288—Fulton Albert Steiner Clinic for Cancer and Allied Diseases	Cancer	City	30	27		2 830	
Battle Hill Sanatorium	TB	City	256	234		203	
Blackman Sanatorium	Gen	Indiv	25	10		748	
Contagious Disease Hospital	Unit of Grady Hospital						
Crawford W Long Memorial Hospital	Gen	NPAssn	224	205	45	1 848	8 662
Georgia Baptist Hospital	Gen	Church	164	161	30	766	6 093
Grady Hospital	Gen	City	626	398	95	3 710	15 557
Grady Hospital, Emory University Division	Unit of Grady Hospital						
Henrietta Eggleston Hospital for Children	Child	NPAssn	44	32		1 076	
Jesse Parker Williams Hospital	Gen	NPAssn	30	21		810	
Joseph B Whitehead Memorial Hospital	Inst	State	30	6		519	
Piedmont Hospital	Gen	NPAssn	132	117	15	713	4 276
Ponce de Leon Eye, Ear and Throat Infirmary	ENT	Indiv	25	11		1 033	
St Joseph Infirmary	Gen	Church	185	110	23	650	4 841
U S Penitentiary Hospital	Inst	USPHS	148	74		2 712	
Veterans Admin Facility	Gen	Vet	315	293		3 135	
William A Harris Memorial Hospital	Gen	Corp	28	23	2	37	683
Augusta 65 919—Richmond University Hospital	Gen	City	300	304	45	1 555	10 892
Veterans Admin Facility	Ment	Vet	1 061	1 028		531	
Bainbridge 6 352—Decatur Bainbridge Hospital	Gen	Indiv	22	9	6	94	312
Riverside Hospital	Gen	Part	25	11	6	142	826
Barwick, 409—Brooks Sanchez Private Sanatorium	Gen	Indiv	15	4	2	35	450
Brunswick 15 035—Glynn Brunswick City Hospital	Gen	City	55	40	10	2 4	1 449
Butler 1 093—Taylor Montgomery Hospital	Gen	Indiv	20	6	4	50	319
Calro 4 633—Grady Calro Hospital	Gen	Indiv	25	12	4	81	557
Calhoun 2 655—Gordon Johnston Hall Hospital	Gen	Indiv	19	8	3	241	644
Canton 2 631—Cherokee Cokers Hospital	Gen	Corp	35	18	3	91	869
Cedartown 9 025—Polk Cedartown Hospital	Gen	Indiv	12	4	4	30	129
Hall Chaudron Hospital	Gen	Indiv	8	5	2	56	2 2
Whitely Hospital	Gen	Indiv	10	2	3	38	117
Columbus 53 280—Muscookee Columbus City Hospital	Gen	City	250	129	30	991	5 870
Cuthbert 3 447—Randolph Patterson Hospital	Gen	Indiv	42	23	8	71	856
Dalton 10 448—Whitfield Hamilton Memorial Hospital	Gen	NPAssn	50	25	0	434	1 870
Decatur 16 661—De Kalb Scottish Rite Hospital for Crippled Children	Orth	NPAssn	64	58		305	
Douglas 5 175—Coffee Douglas Hospital	Gen	City	32	13	3	180	909
Dublin 7 814—Laurens Claxton Sanatorium	Gen	Indiv	55	20	5	80	1 012
Coleman Hospital	Gen	Indiv	40	25	4	159	1 366
Thompson Sanatorium	Gen	Indiv	14	7	3	42	421
Eastman 3 311—Dodge Clinic Hospital	Gen	Indiv	12	6	4	55	465
Coleman Sanatorium	Gen	Indiv	39	12	4	25	603
Elberton 6 188—Elbert Elbert County Hospital	Gen	CyCo	10	5	4	63	417
Thompson Johnson Hospital	Gen	Corp	16	6	2	60	518
Emory University 250—De Kalb Emory University Hospital	Gen	NPAssn	241	108	45	7 514	
Fort Benning —Chattahoochee Station Hospital	Gen	Army	364	496	15	191	12 855
Fort McPherson (Atlanta P O) —Fulton Station Hospital	Gen	Army	247	140	4	31	3 901
Fort Oglethorpe 800—Catoosa Station Hospital	Gen	Army	271	104	5	25	2 100
Fort Screven —Chatham Station Hospital	Gen	Army	50	36	1	12	912
Gallesville 10 243—Hall Downey Hospital	Gen	Corp	52	31	6	296	1 696
Hall County Memorial Hosp	Gen	County	35	16	4	73	742
Griffin 13 222—Spalding R F Strickland and Son Memorial Hospital	Gen	Indiv	45	28	5	145	1 315
Hawkinsville 3 000—Pulaski R J Taylor Memorial Hosp	Gen	NPAssn	43	6	5	50	301
Homerville 1 522—Clinech Huey Hospital	Gen	Indiv	14	5	2	24	740
Hocton, 364—Jackson Allen Clinic and Hospital	Gen	Part	15	9	3	65	410
Jasper 576—Pickens Roper Hospital	Gen	Indiv	9	5	3	69	325
Jesup, 2 903—Wayne Colvin Ritch Hospital	Gen	Part	27	13	5	205	958

## GEORGIA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basins ‡	Number of Births	Admissions †
La Grange 21,983—Troup City County Hospital	Gen	CyCo	60	39	6	269	1 783
Macon 57 895—Bibb Clinch Hospital	Gen	Corp	26	20	4	126	1 450
Macon Hospital	Gen	CyCo	220	162	33	1 145	7 277
Middle Georgia Hospital	Gen	Corp	50	39	14	250	2 102
Oglethorpe Private Infirmary	Gen	Corp	86	25	4	140	1 862
St Luke Hospital	Gen	NPAssn	30	12	5	23	308
Marietta 8 667—Cobb Marietta Hospital	Gen	Corp	29	14	8	158	934
Metter 1 825—Candler Kennedy Memorial Hospital	Gen	Part	20	11	3	22	423
Milledgeville, 6 778—Baldwin Allen's Invalid Home	N & M	Indiv	140	93			514
Baldwin Memorial Hospital	Gen	Indiv	70	23	15	137	833
Milledgeville State Hospital	Ment	State	8 113	7,501		1 635	
Scott Hospital	Gen	Indiv	25	20	6	40	410
Millen, 2 820—Jenkins Millen Hospital	Gen	Indiv	22	8	4	60	515
Mulkey Hospital	Gen	Part	20	9	6	57	465
Monroe 4 168—Walton Walton County Hospital	Gen	CyCo	17	5	4	67	337
Montezuma 2 546—Macon Macon County Clinic	Gen	Part	22	8	4	40	500
Riverside Sanatorium	Gen	Indiv	16	8	6	75	455
Moultrie 10 147—Colquitt Vereen Memorial Hospital	Gen	NPAssn	50	21	8	155	1,601
Nashville 2 449—Berrien Askeew Memorial Hospital	Gen	Indiv	12	3	3	66	95
Ocella, 2 124—Irwine Ocella Hospital	Gen	Part	24	12	5	142	790
Quitman 4 450—Brooks Brooks County Hospital	Gen	CyCo	32	15	4	112	836
Rockville 805—Tattnall Telks Hospital	Gen	Indiv	13	9	2	63	495
Rome, 26 965—Lloyd Lloyd County Hospital	Gen	County	50	20	20	Estab	1948
Harbin Hospital	Gen	Corp	60	35	12	255	2,583
McCall Hospital	Gen	Corp	73	48	12	674	4 711
Royston 1 549—Franklin Brown Hospital	Gen	Indiv	15	10	2	35	465
Sandersville 3 560—Washington Rawlins Sanatorium	Gen	NPAssn	68	30	7	96	1 136
Savannah, 95 996—Chatham Central of Georgia Railway Hospital	Indus	NPAssn	65	50			2 905
Charley Hospital	Gen	NPAssn	65	60	14	390	2 846
Georgia Infirmary	Gen	NPAssn	65	41	13	279	3 713
Oglethorpe Sanatorium	Gen	Indiv	50	33	12	184	1 900
St Joseph's Hospital	Gen	Church	100	84	15	503	3 132
Telfair Hospital	Gen	NPAssn	65	60	20	636	2 165
U S Marine Hospital	Gen	USPHS	150	157		1 461	
Warren A Candler Hospital	Gen	Church	100	74	14	435	2 559
Smyrna, 1 440—Cobb Brawner's Sanatorium	N & M	Indiv	40	33			496
Statesboro, 5 078—Bulloch Bulloch County Hospital	Gen	County	50	23	7	117	847
Van Buren's Sanatorium	Gen	Indiv	20	15	5	50	225
Thomasville 12 685—Thomas John D Archbold Memorial Hospital	Gen	NPAssn	110	65	12	216	3 356
Tifton 5 228—Tift Tift County Hospital	Gen	County	32	13	7	113	558
Toccoa 5 491—Stephens Stephens County Hospital	Gen	County	30	13	0	251	1 222
Trion 3 800—Chattooga Riegel Community Hospital	Gen	NPAssn	56				Reorganized
Valdosta 15 095—Lowndes Frank Bird Hospital	Gen	Indiv	22	7	3	44	474
Little Cirila Owens Saunders Hospital	Gen	NPAssn	60	23	8	255	432
Valdalia 4 169—Toombs City Hospital	Gen	Indiv	14			No data supplied	
Warm Springs 608—Meriwether Georgia Warm Springs Foundation	Orth	NPAssn	175	101			472
Washington 3 337—Wilkes Washington General Hospital	Gen	City	40	22	8	221	1 233
Waycross 16 763—Ware Atlantic Coast Line Hospital	Indus	NPAssn	75	30			1 165
Ware County Hospital	Gen	County	72	46	8	375	2 701
West Point 3 591—Troup Valley Hospital	Gen	NPAssn	25	13	5	144	1 012

## Related Institutions

Atlanta 302 988—Fulton Dwell's Infirmary	Gen	Indiv	15	9	2	17	380
Florence Crittenton Home	Mat	NPAssn	30	21	10	60	60
Georgia Sanatorium	Gen	Indiv	5	2	2	11	79
Our Lady of Perpetual Help	Cancer	Church	78	35			143
Free Cancer Home	Gen	City	36	21			461
Social Disease Hospital	Gen	City	36	21			
Columbus 53 250—Muscookee Muscookee County Tuberculosis Hospital	TB	County	48	35			60
Cordele 7 923—Crisp Gillespie Hospital	Gen	Church	70	10	4	15	160
Gracewood 500—Richmond Georgia Training School for Mental Defectives	MeDe	State	400	460			87
Lyons 1 900—Toombs Aiken Hospital	Gen	Indiv	9	4	3	35	61
Summerville 1 358—Chattooga Summerville Trion Hospital	Gen	Corp	20	9	3	123	778

## IDAHO

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admits †
American Falls 1430—Power	Gen	County	20	10	8	116	362
Schlitz Memorial Hospital	Gen	County	20	10	8	116	362
Blackfoot 3681—Bingham	Gen	County	20	10	8	116	362
State Hospital South	Ment	State	600	639			436
Boise 20130—Ada	Gen	County	20	10	8	116	362
St. Alphonsus Hospital	Gen	Church	140	80	20	466	3 350
St. Luke's Hospital	Gen	Church	110	95	20	570	5 135
Veterans Admin. Facility	Gen	Vet	174	133			1 070
Bonniers Ferry 1845—Boundary	Gen	Corp	28	10	8	96	396
Bonniers Ferry Hospital	Gen	Corp	28	10	8	96	396
Burley 5329—Cassia	Gen	Corp	18	10	4	137	547
Cottage Hospital	Gen	Corp	18	10	4	137	547
Caldwell 7272—Canyon	Gen	Part	22	9	8	88	400
Caldwell Sanitarium	Gen	Part	22	9	8	88	400
Coeur d'Alene 10 040—Kootenai	Gen	NPAsn	20	4	2	3	43
Coeur d'Alene Hospital	Gen	NPAsn	20	4	2	3	43
Cottonwood 673—Idaho	Gen	Church	30	21	5	70	533
Our Lady of Consolation Hospital	Gen	Church	30	21	5	70	533
Fort Hall 200—Bingham	Gen	IA	16	11	4	40	416
Fort Hall Indian Agency Hospital	Gen	IA	16	11	4	40	416
Gooding 2 568—Gooding	Gen	NPAsn	18	10	6	145	603
Gooding County Hospital	Gen	NPAsn	18	10	6	145	603
Grangerville 1 929—Idaho	Gen	City	20	7	6	41	293
General Hospital	Gen	City	20	7	6	41	293
Hailey 1 443—Blaine	Gen	Indiv	20	11	0	33	520
Hailey Clinical Hospital	Gen	Indiv	20	11	0	33	520
Idaho Falls 16 024—Bonnerville	Gen	Church	105	70	35	686	3 237
Idaho Falls Latter Day Saints Hospital	Gen	Church	105	70	35	686	3 237
Sacred Heart Hospital	Gen	Church	30	27	8	160	750
Kellogg 4 235—Shoshone	Gen	Part	30	25	7	168	1 421
Wardner Hospital	Gen	Part	30	25	7	168	1 421
Lapwai 426—Nez Perce	TB	IA	132	132			175
Fort Lapwai Sanatorium	TB	IA	132	132			175
Lewiston 10 542—Nez Perce	Gen	Church	120	80	18	420	2 200
St. Joseph's Hospital	Gen	Church	30	10	4	49	338
White Hospital	Gen	Corp	30	10	4	49	338
Malad City 2 731—Oneida	Gen	NPAsn	20	9	8	148	483
Oneida Hospital	Gen	NPAsn	20	9	8	148	483
Moscow 6 014—Latah	Gen	NPAsn	27	29	12	219	1 024
Gritman Memorial Hospital	Gen	NPAsn	27	29	12	219	1 024
University of Idaho Infirmary	Inst	State	30	10			657
Nampa 12 149—Canyon	Gen	Church	70	40	16	300	1 034
Mersey Hospital	Gen	Church	70	40	16	300	1 034
Nazarene Missionary Sanitarium and Institute (Samaritan Hospital Division)	Gen	Church	50	24	7	93	89
Orofino 1 602—Clearwater	Gen	Part	33	19	4	56	590
Orofino Hospital	Gen	Part	33	19	4	56	590
State Hospital North	Ment	State	430	4 0			121
Pocatello 15 133—Bannock	Gen	CyCo	70	20	16	415	2 144
Pocatello General Hospital	Gen	CyCo	70	20	16	415	2 144
St. Anthony Mercy Hosp	Gen	Church	100	34	25	409	1 741
Potlatch 1 160—Latah	Gen	Part	20	7	3	65	300
Potlatch Hospital	Gen	Part	20	7	3	65	300
Preston 4 236—Franklin	Gen	NPAsn	17	11	12	174	376
General Memorial Hospital	Gen	NPAsn	17	11	12	174	376
Rexburg 3 437—Madison	Gen	Indiv	14	8	6	70	490
Harlo B. Rigby Hospital	Gen	Indiv	14	8	6	70	490
Rupert 3 167—Minidoka	Gen	Indiv	15	5	8	40	283
Rupert General Hospital	Gen	Indiv	15	5	8	40	283
St. Maries 2 234—Benewah	Gen	Part	25	13	3	33	366
St. Maries Hospital	Gen	Part	25	13	3	33	366
Sandpoint 4 306—Bonner	Gen	NPAsn	30	20	6	140	600
Community Hospital	Gen	NPAsn	30	20	6	140	600
Soda Springs 1 687—Caribou	Gen	County	36	20	7	24	800
Caribou County Hospital	Gen	County	36	20	7	24	800
Twin Falls 11 851—Twin Falls	Gen	County	60	60	25	670	2 005
Twin Falls County General Hospital	Gen	County	60	60	25	670	2 005
Wallace 3 539—Shoshone	Gen	Church	30	30	12	234	1 279
Providence Hospital	Gen	Church	30	30	12	234	1 279
Wallace Hospital	Gen	Church	30	30	12	234	1 279
Wendell 1 001—Gooding	Gen	Church	27	10	9	163	816
St. Valentine's Hospital	Gen	Church	27	10	9	163	816

## ILLINOIS

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admits †
Aledo 2 533—Mercer	Gen	Indiv	14	6	4	81	550
Siltos Hospital	Gen	Indiv	14	6	4	81	550
Alton 31 200—Madison	Gen	Church	81	84	15	73	4 003
Alton Memorial Hospital	Gen	Church	81	84	15	73	4 003
Alton State Hospital	Ment	State	1 522	1 706			606
St. Anthony's Infirmary and Sanitarium	Gen	Church	60	62			732
St. Joseph's Hospital	Gen	Church	120	121	25	707	4 706
Ambly 1 906—Lee	Gen	NPAsn	13	9	4	80	229
Ambly Public Hospital	Gen	NPAsn	13	9	4	80	229

## ILLINOIS—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Anna 4 092—Union							
Anna State Hospital	Ment	State	2 314	2 176			717
Hale Willard Memorial Hosp	Gen	City	16	13	4	124	440
Arlington Heights 5 665—Cook							
Magnus Institute and Farm	N&M	Indiv	20	10			90
Aurora 47 170—Kane							
Copley Hospital	Gen	NPA'ssn	130	111	22	572	3 739
Kane County Springbrook Sanitarium	TB	County	85	73			72
Merseyville Sanitarium	N&M	Church	150	160			334
St Charles Hospital	Gen	Church	110	110	23	571	2 830
St Joseph Mercy Hospital	Gen	Church	118	117	36	629	3 200
Avon 803—Fulton							
Saunders Hospital	Gen	NPA'ssn	14	6	8	63	185
Butavia 5 101—Kane							
Bellevue Place Sanitarium	N&M	Corp	40	28			12
Fox River Sanitarium	TB	NPA'ssn	70	46			70
Belleville 23 400—St Clair							
St Elizabeth's Hospital	Gen	Church	100	83	24	1 030	3 457
Belvidere 8 094—Boone							
Highland Hospital	Gen	NPA'ssn	32	22	10	147	505
St Joseph's Hospital	Gen	Church	32	20	9	100	821
Benton 7 372—Franklin							
Moore Hospital	Gen	Indiv	20	12	2	47	400
Berwyn 48 451—Cook							
MacNeal Memorial Hospital	Gen	NPA'ssn	130	92	60	1 156	4 907
Bloomington 32 585—McLean							
Mennonite Hospital	Gen	Church	68	61	15	474	2 742
St Joseph's Hospital	Gen	Church	203	175	27	476	4 003
Blue Island 16 635—Cook							
St Francis Hospital	Gen	Church	30	60	10	753	3 924
Breezy 2 206—Clinton							
St Joseph Hospital	Gen	Church	40	19	10	214	7 9
Bushnell 2 900—McDonough							
Elmhurst Sanatorium	TB	County	26	34			23
Cairo 14 401—Alexander							
Alexander County Tuberculosis Sanitarium	TB	County	80	59			76
St Mary's Infirmary	Gen	Church	100	60	12	208	2 255
Canton 11 577—Fulton							
Graham Hospital	Gen	NPA'ssn	94	45	20	480	2 482
Carbondale 8 550—Jackson							
Holden Hospital	Gen	Church	68	36	12	108	1 900
Carlinville 4 060—Macoupin							
Macoupin Hospital	Gen	Indiv	20	19	6	146	823
Centralia 16 313—Marion							
St Mary's Hospital	Gen	Church	75	50	10	602	2 000
Champaign 23 302—Champaign							
Burnham City Hospital	Gen	City	136	56	24	627	4 110
Charleston 8 197—Coles							
M A Montgomery Memorial Sanitarium	Gen	NPA'ssn	24	9	6	58	46
Chicago 3 396 608—Cook							
Albert Merritt Billings Hosp	Unit of University of Chicago Clinics	Gen	Church	2 2	213		5 100
Alexian Brothers Hospital	Gen	Church	20	175	56	10	418
American Hospital	Gen	NPA'ssn	175	56	10	418	4 560
Augustana Hospital	Gen	Church	270	209	30	805	6 092
Belmont Community Hosp	Gen	NPA'ssn	100	70	20	706	3 390
Bethany Home Hospital	Gen	Church	23	13			350
Bethany Sanitarium and Hos pital	Gen	Church	53	39	23	513	2 100
Bob's Roberts Memorial Hos pital for Children	Unit of University of Chicago Clinics	Gen	Indiv	40	9	6	70
Burrows Hospital	Gen	Indiv	40	9	6	70	471
Chicago Eye Ear Nose and Throat Hospital	ENT	Corp	75	10			561
Chicago Fresh Air Hospital	TB	NPA'ssn	40	23			130
Chicago Lying In Hospital of the Univ of Chicago	Unit of University of Chicago Clinics	Gen	NPA'ssn	55	67	20	57
Chicago Memorial Hospital	Gen	NPA'ssn	55	67	20	57	3 713
Chicago State Hospital	Ment	State	4 799	4 030			1 303
Children's Memorial Hospital	Chil	NPA'ssn	252	150			4 090
City of Chicago Municipal Tuberculosis Sanitarium	TB	City	1 210	1 183			1 811
Columbus Hospital	Gen	Church	102	107	18	400	3 490
Cook County Children's Hosp	Unit of Cook County Hospital	Gen	County	2 963	2 747	225	5 394
Cook County Hospital	Gen	County	2 963	2 747	225	5 394	67 323
Cook County Psychopathic Hospital	Unit of Cook County Hospital	Gen	NPA'ssn	120	93	50	914
Edgewater Hospital	Gen	NPA'ssn	120	93	50	914	4 000
Englewood Hospital	Gen	NPA'ssn	157	118	30	963	5 261
Evangelical Hospital	Gen	Church	120	107	70	2 451	8 905
Fairview Sanitarium	N&M	Corp	45	30			174
Frank Cuneo Hospital	Mat	Church	100	59	16	141	2 342
Franklin Boulevard Hosp	Gen	Corp	53	42	16	120	6 113
Garfield Park Community Hospital	Gen	NPA'ssn	150	106	32	1 120	6 113
Grant Hospital	Gen	NPA'ssn	242	155	50	1 250	7 658
Henrotin Hospital	Gen	NPA'ssn	100	77	29	400	3 179
Holy Cross Hospital	Gen	Church	130	119	33	1 340	4 967
Home for Destitute Crippled Children	Unit of University of Chicago Clinics	Gen	Church	220	180	40	1 644
Hospital of St Anthony de Padua	Gen	Church	220	180	40	1 644	7 041
Illinois Central Hospital	Gen	NPA'ssn	200	181	40	947	5 049
Illinois Eye and Ear Infirmary	ENT	State	200	122			5 013
Illinois Masonic Hospital	Gen	NPA'ssn	159	130	20	860	4 951
Illinois Neuropsychiatric Institute	Ment	State	152	23			705
Illinois Surgical Institute for Children	Unit of Research and Educational Hospital	Gen	Corp	170	80	40	650
Jackson Park Hospital	Gen	NPA'ssn	40	10	6	125	777
Kenner Hospital	Gen	NPA'ssn	40	10	6	125	777

Key to symbols and abbreviations is on page 1027

## ILLINOIS—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Number of Births	Admissions †
La Rabida Jackson Park Sanitarium	CardChil	NPAasn	100	57		89
Lewis Memorial Maternity Hospital†	Mat	Church	106	52 100	1 781	2 237
Loretto Hospital†	Gen	Church	123	97 84	907	4 230
Lutheran Deaconess Home and Hospital†	Gen	Church	176	140 42	1 262	6 316
Martha Washington Hospital	Gen	NPAasn	75	35 15	324	1 032
Mercy Hospital Loyola University Clinics†	Gen	Church	319	220 40	904	7 672
Michael Reese Hospital†	Gen	NPAasn	619	520 80	2 317	18 987
Midcordia Hospital and Home for Infants†	Mat	Church	58	7 10	283	288
Mother Cabrini Memorial Hospital†	Gen	Church	120	112 21	706	4 283
Mount Sinai Hospital†	Gen	NPAasn	217	180 48	1 410	7 393
Municipal Contagious Disease Hospital†	Isd	City	428	90		2 260
North Chicago Hospital	Gen	NPAasn	60	30 14	250	1 800
Norwegian American Hospital†	Gen	NPAasn	181	141 30	1 400	7 611
Orthopaedic Institute Parkway Sanitarium	N&M	Corp	39			412
Pasayant Memorial Hospital†	Gen	NPAasn	220	183 35	696	6 424
Pine Sanitarium	N&M	NPAasn	40	29		240
Presbyterian Hospital†	Gen	Church	405	325 39	1 240	12 707
Provident Hospital†	Gen	NPAasn	147	116 20	730	4 111
Ravenwood Hospital†	Gen	NPAasn	164	136 41	1 352	5 918
Research and Educational Hospital†	Gen	State	302	290 34	731	5 609
Roseland Community Hospital†	Gen	NPAasn	101	79 28	828	3 970
St Anne's Hospital†	Gen	Church	240	231 100	2 445	9 450
St Anthony de Padua Hosp	See Hospital of St Anthony de Padua					
St Bernard's Hospital†	Gen	Church	200	165 42	1 246	7 401
St Elizabeth Hospital†	Gen	Church	241	234 66	2 288	10 771
St George Hospital†	Gen	Church	109	60		2 201
St Joseph Hospital†	Gen	Church	225	172 40	1 323	5 820
St Luke's Hospital†	Gen	NPAasn	481	390 55	1 101	13 629
St Mary of Nazareth Hospital†	Gen	Church	234	220 60	2 370	9 859
St Vincent's Infant and Maternity Hospital†	MatCh	Church	290	196 20	383	991
Sarah Morris Hospital for Children	Unit of Michael Reese Hospital					
Shriners Hospital for Crippled Children†	Orth	NPAasn	60	33		163
South Chicago Community Hospital†	Gen	NPAasn	130	75 40	570	3 406
South Shore Hospital†	Gen	Corp	120	71 25	810	3 782
Southtown Hospital	Gen	NPAasn	50	44 14	229	1 070
Swedish Covenant Hospital†	Gen	Church	184	143 60	1 712	6 001
U S Marine Hospital†	Gen	USPHS	301	199		2 884
University Hospital†	Gen	NPAasn	100	79 21	379	4 210
University of Chicago Clinics†	Gen	NPAasn	576	437 134	3 446	12 209
Walther Memorial Hosp †	Gen	Church	170	170 34	820	4 820
Wesley Memorial Hosp †	Gen	Church	537	328 30	1 090	9 961
Women and Children's Hospital†	Gen	NPAasn	90	84 30	840	2 091
Woodlawn Hospital†	Gen	NPAasn	120	98 20	512	4 301
Chicago Heights 22401—Cook	Gen	Church	100	75 20	622	3 948
St James Hospital†	Gen	Church	100	75 20	622	3 948
Clinton 6331—De Witt	Gen	City	30	22 4	162	919
Dr John Warner Hospital	Gen	City	30	22 4	162	919
Danville 30919—Vermilion	Gen	NPAasn	145	99 20	420	3 117
Lake View Hospital†	Gen	Church	180	140 34	700	4 654
St Elizabeth Hospital†	Gen	Church	180	140 34	700	4 654
Vermilion County Tuberculosis Dispensary and Hospital†	TB	County	50	48		59
Veterans Admin Facility†	Ment	Vet	1 503	1 748		770
Decatur 59305—Macon	Gen	NPAasn	147	123 30	731	3 091
Decatur and Macon County Hospital†	Gen	NPAasn	147	123 30	731	3 091
Macon County Tuberculosis Sanatorium†	TB	County	60	64		79
St Mary's Hospital	Gen	Church	180	178 20	860	5 094
Wabash Employees Hospital†	Indus	NPAasn	70	43		1 161
De Kalb 9146—De Kalb	Gen	Church	100	75 20	622	3 948
De Kalb County Tuberculosis Sanatorium	TB	County	33	21		22
De Kalb Public Hospital†	Gen	Church	40	28 9	283	1 010
St Mary's Hospital†	Gen	Church	45	30 9	147	1 161
Des Plaines 9518—Cook	Gen	Church	100	75 20	622	3 948
Forest Sanitarium	N&M	Indiv	24	13		69
Dixon 10671—Lee	Gen	NPAasn	100	61 20	437	2 069
Dixon Public Hospital†	Gen	NPAasn	100	61 20	437	2 069
Downey —Lake	Gen	NPAasn	100	61 20	437	2 069
Veterans Admin Facility†	Ment	Vet	1 470	1 471		434
Dunning —Cook	Gen	NPAasn	48	28 9	233	997
Chicago State Hospital	See Chicago					
Du Quoin 7515—Perry	Gen	NPAasn	48	28 9	233	997
Marshall Browning Hospital	Gen	NPAasn	48	28 9	233	997
Dwight 2499—Livingston	Gen	NPAasn	48	28 9	233	997
Veterans Admin Facility†	Gen	Vet	190	158		1 137
East Moline 12309—Rock Island	Gen	NPAasn	190	158		1 137
East Moline State Hospital	Gen	NPAasn	190	158		1 137
East St Louis 70609—St Clair	Gen	NPAasn	127	94 27	872	3 861
Christian Welfare Hospital†	Gen	NPAasn	98	86		178
Pleasant View Sanatorium†	TB	County	260	124 36	840	4 703
St Mary's Hospital†	Gen	Church	260	124 36	840	4 703
Edwardsville 8005—Madison	Gen	NPAasn	99	82		61
Madison County Sanatorium†	TB	County	99	82		61
Effingham 6180—Effingham	Gen	Church	91	80 10	341	2 106
St Anthony's Hospital	Gen	Church	91	80 10	341	2 106

## ILLINOIS—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Number of Births	Admissions †
Eldorado, 4891—Saline	Gen	Indiv	22	0 6	66	447
Ferrell Hospital	Gen	Indiv	22	0 6	66	447
Elgin, 38333—Kane	Gen	Indiv	22	0 6	66	447
Flain State Hospital†	Ment	State	4 000	5 022		2 000
Resthaven Sanitarium	N&M	Indiv	80	75		199
St Joseph Hospital†	Gen	Church	104	73 20	431	2 700
Sherman Hospital†	Gen	NPAasn	120	112 30	625	4 640
Elmhurst 1545—Du Page	Gen	NPAasn	110	87 25	630	3 593
Elmhurst Community Hosp	Gen	NPAasn	110	87 25	630	3 593
Evanston 6209—Cook	Gen	NPAasn	27	12 5	21	325
Evanston Community Hosp	Gen	NPAasn	212	181 40	1 233	7 913
Evanston Hospital†	Gen	NPAasn	212	181 40	1 233	7 913
St Francis Hospital†	Gen	Church	262	186 60	1 621	9 671
Evergreen Park 3313—Cook	Gen	Church	262	186 60	1 621	9 671
Little Company of Mary Hospital†	Gen	Church	200	180 81	2 400	8 189
Fairbury 2700—Livingston	Gen	NPAasn	13	9 5	170	593
Fairbury Hospital	Gen	NPAasn	13	9 5	170	593
Fort Sheridan —Lake	Gen	Army	169	149 6	27	3 200
Station Hospital†	Gen	Army	169	149 6	27	3 200
Forest 22506—Stephenson	Gen	NPAasn	80	60 21	417	2 150
Deaconess Hospital†	Gen	NPAasn	80	60 21	417	2 150
St Francis Hospital†	Gen	Church	105	65 18	340	2 599
Galesburg, 28876—Knox	Gen	NPAasn	100	72 20	459	2 400
Galesburg, Cottage Hospital†	Gen	NPAasn	100	72 20	459	2 400
Geneseo 3244—Henry	Gen	City	24	14 10	213	778
Geneseo 3244—Henry	Gen	City	24	14 10	213	778
Geneya 4101—Kane	Gen	NPAasn	60	44 20	234	1 422
Community Hospital†	Gen	NPAasn	60	44 20	234	1 422
Granite City 22074—Madison	Gen	Church	104	89 20	763	3 374
St Elizabeth Hospital†	Gen	Church	104	89 20	763	3 374
Grant Lakes —Lake	Gen	Navy	280	140		3 892
U S Naval Hospital†	Gen	Navy	280	140		3 892
Harrisburg, 11403—Saline	Gen	Corp	30	7 5	25	233
Harrisburg Hospital	Gen	Corp	30	7 5	25	233
Lightner Hospital	Gen	Indiv	30	14 5	87	1 066
Harvard, 3121—Mellon	Gen	Part	21	12 8	128	300
Harvard Community Hosp	Gen	Part	21	12 8	128	300
Harvey 17878—Cook	Gen	NPAasn	60	62 20	783	3 203
Ingalls Memorial Hospital†	Gen	NPAasn	60	62 20	783	3 203
Herrin 902—Williamson	Gen	Indiv	80	52 15	237	1 600
Herrin Hospital	Gen	Indiv	80	52 15	237	1 600
Highland 600—Madison	Gen	Church	76	49 12	260	1 557
St Joseph's Hospital	Gen	Church	76	49 12	260	1 557
Highland Park 14470—Lake	Gen	NPAasn	30	32 17	293	1 714
Highland Park Hospital†	Gen	NPAasn	30	32 17	293	1 714
Hillshoro 4014—Montgomery	Gen	NPAasn	40	26 10	181	749
Hillshoro Hospital	Gen	NPAasn	40	26 10	181	749
Hines —Cook	Gen	NPAasn	40	26 10	181	749
Veterans Admin Facility†	Gen	NPAasn	40	26 10	181	749
Hin dale 7736—Du Page	Gen	NPAasn	100	55 14	300	1 712
Hinsdale Sanitarium and Hospital†	Gen	Church	100	55 14	300	1 712
Jacksonville 10844—Morgan	Gen	Church	100	55 14	300	1 712
Jacksonville State Hospital	Gen	Church	100	55 14	300	1 712
Morgan County Tuberculosis Sanatorium	TB	County	40	26		41
Norbury Sanatorium†	N&M	Corp	120	86		152
Our Saviour's Hospital†	Gen	Church	92	45 12	149	1 740
Pasayant Memorial Hosp †	Gen	Church	73	53 12	264	1 673
Joliet 42700—Will	Gen	Church	100	75 20	622	3 948
Illinois State Penitentiary Hospital	Inst	State	133	40		1 774
St Joseph's Hospital†	Gen	Church	290	229 50	1 440	7 112
Silver Cross Hospital†	Gen	NPAasn	108	92 00	743	3 811
Will County Tuberculosis Sanatorium	TB	County	60	60		67
Kankakee 22241—Kankakee	Gen	Church	100	75 20	622	3 948
Kankakee State Hospital	Gen	Church	100	75 20	622	3 948
St Mary Hospital†	Gen	Church	100	75 20	622	3 948
Kendallworth 2900—Cook	Gen	Church	100	75 20	622	3 948
Kendallworth Sanitarium	N&M	Indiv	60	29		100
Kewanee 16901—Henry	Gen	NPAasn	60	34 12	200	1 022
Kewanee Public Hospital†	Gen	NPAasn	60	34 12	200	1 022
St Francis Hospital†	Gen	Church	90	57 18	202	1 740
Lake Forest 6480—Lake	Gen	NPAasn	42	16 10	100	788
Lake Forest Hospital†	Gen	NPAasn	42	16 10	100	788
La Salle 12812—La Salle	Gen	Church	90	62 15	330	1 921
St Mary's Hospital†	Gen	Church	90	62 15	330	1 921
Libertyville 3030—Lake	Gen	NPAasn	20	18 9	137	779
Condell Memorial Hospital	Gen	NPAasn	20	18 9	137	779
Lincoln 12700—Jogan	Gen	Church	55	40 13	201	1 650
Angelic Deaconess Hospital†	Gen	Church	60	30 7	115	1 061
St Clara's Hospital	Gen	Church	60	30 7	115	1 061
Itasca, 7048—Montgomery	Gen	Church	148	154 24	845	3 919
St Francis Hospital	Gen	Church	148	154 24	845	3 919
Mackinaw 845—Tazewell	TB	County	43	35		59
Oak Knoll Sanatorium	TB	County	43	35		59
Vacoma 8764—McDonough	Gen	NPAasn	45	28 6	143	967
Phelps Hospital	Gen	NPAasn	90	63 15	238	2 403
St Francis Hospital†	Gen	Church	90	63 15	238	2 403
Manteno 1637—Kankakee	Gen	NPAasn	45	28 6	143	967
Manteno State Hospital†	Gen	NPAasn	45	28 6	143	967
Marion 9201—Williamson	Gen	NPAasn	45	28 6	143	967
Veterans Admin Facility	Gen	Vet	160			156
Mattoon 15827—Coles	Gen	Church	60	45 10	228	1 294
Memorial Methodist Hospital	Gen	Church	60	45 10	228	1 294
Melroe & Park 10933—Cook	Gen	NPAasn	65	41 25	535	1 977
Westlake Hospital†	Gen	NPAasn	65	41 25	535	1 977
Mendota 4215—La Salle	Gen	Part	20	8 8	148	600
Harris Hospital	Gen	Part	20	8 8	148	600
Metropolis 6287—Massac	Gen	Indiv	16	9 4	103	499
Fisher Hospital	Gen	Indiv	16	9 4	103	499

Key to symbols and abbreviations is on page 1027

## ILLINOIS—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Business †	Number of Births	Admissions †
Moline 34 603—Rock Island Lutheran Hospital <sup>o</sup>	Gen	Church	125	81	24	641	2 211
Moline Public Hospital <sup>o</sup>	Gen	City	103	139	32	1 152	5 184
Monmouth 9 936—Warren	Gen	City	65	48	15	280	1 141
Monmouth Hospital <sup>o</sup>	Gen	City	65	48	15	280	1 141
Monticello 2 523—Platt	Gen	City	65	48	15	280	1 141
John and Mary E Kirby Hospital	Gen	NPA <sup>ssn</sup>	25	13	9	121	601
Morris 6 145—Grundy	Gen	NPA <sup>ssn</sup>	40	24	16	245	943
Morris Hospital	Gen	NPA <sup>ssn</sup>	40	24	16	245	943
Moweaqua 1 366—Shelby	Gen	Indiv	26	19	8	93	186
Moweaqua Hospital	Gen	Indiv	26	19	8	93	186
Murphysboro 8 976—Jackson	Gen	Church	35	22	8	163	1 063
St Andrew's Hospital <sup>o</sup>	Gen	Church	35	22	8	163	1 063
Naperville 5 272—Du Page	TB	NPA <sup>ssn</sup>	101	88			207
Edward Sanatorium <sup>o</sup>	TB	NPA <sup>ssn</sup>	101	88			207
Normal 6 953—McLean	Gen	Church	91	70	15	267	2 733
Brokaw Hospital <sup>o</sup>	TB	County	57	45			22
Fairview Sanatorium	TB	County	57	45			22
North Riverside (Riverside P O)—Cook	TB	City	250	220			257
Municipal Tuberculosis Sanatorium—North Riverside Division	TB	City	250	220			257
Oak Forest 825—Cook	Chr	County	1 075	1 042			3 590
Cook County Infirmary	TB	County	5 5	364			376
Cook County Tuberculosis Hospital	TB	County	5 5	364			376
Oak Park 66 015—Cook	Gen	Church	140	104	46	1 043	4 657
Oak Park Hospital <sup>o</sup>	Gen	NPA <sup>ssn</sup>	312	240	103	2 521	10 572
West Suburban Hospital <sup>o</sup>	Gen	NPA <sup>ssn</sup>	312	240	103	2 521	10 572
Olney 7 831—Richland	Gen	Corp	75	63	11	224	1 952
Olney Sanatorium <sup>o</sup>	Gen	Corp	75	63	11	224	1 952
Oregon 2 826—Ogle	Gen	Indiv	25	7	5	45	346
Warmolts Clinic	Gen	Indiv	25	7	5	45	346
Ottawa 16 000—La Salle	TB	County	76	70			62
Highland	TB	County	76	70			62
Ottawa Tuberculosis Sanatorium	TB	County	76	70			62
Ryburn Memorial Hospital <sup>o</sup>	Gen	Corp	133	130			147
Pana 5 906—Christian	Gen	Church	87	31	6	130	1 351
Huber Memorial Hospital <sup>o</sup>	Gen	Church	87	31	6	130	1 351
Paris 9 281—Edgar	Gen	NPA <sup>ssn</sup>	70	50	8	225	1 710
Paris Hospital <sup>o</sup>	Gen	NPA <sup>ssn</sup>	70	50	8	225	1 710
Paxton 3 106—Ford	Gen	NPA <sup>ssn</sup>	18	8	4	97	350
Paxton Community Hospital	Gen	NPA <sup>ssn</sup>	18	8	4	97	350
Pekin 19 407—Tazewell	Gen	NPA <sup>ssn</sup>	70	71	18	506	2 592
Pekin Public Hospital	Gen	NPA <sup>ssn</sup>	70	71	18	506	2 592
Peoria 105 087—Peoria	N&M	Indiv	10	7			63
Costeff Sanatorium	Gen	NPA <sup>ssn</sup>	110	81	18	408	2 679
John C Proctor Hospital <sup>o</sup>	Gen	NPA <sup>ssn</sup>	110	81	18	408	2 679
Methodist Hospital of Central Illinois <sup>o</sup>	Gen	Church	200	145	40	1 270	6 240
Michell Farm	N&M	Indiv	25	18			63
Michell Sanatorium	N&M	Indiv	25	20			92
Peoria Municipal Tuberculosis Sanatorium <sup>o</sup>	TB	City	103	84			162
Peoria State Hospital <sup>o</sup>	Gen	State	2 700	2 481			835
St Francis Hospital <sup>o</sup>	Gen	Church	420	310	90	1 098	13 436
Peru 8 986—La Salle	Gen	NPA <sup>ssn</sup>	50	33	10	123	890
Peoples Hospital	Gen	NPA <sup>ssn</sup>	50	33	10	123	890
Pittsfield 2 884—Pike	Gen	NPA <sup>ssn</sup>	39				1912
Illini Community Hospital	Gen	NPA <sup>ssn</sup>	39				1912
Pontiac 9 585—Livingston	TB	County	60	46			62
Livingston County Sanatorium	TB	County	60	46			62
St James Hospital	Gen	Church	40	30	12	246	2 000
Princeton 5 224—Bureau	Gen	City	58	33	14	241	1 317
Julia Rackley Perry Memorial Hospital	Gen	City	58	33	14	241	1 317
Quincy 40 469—Adams	Gen	NPA <sup>ssn</sup>	110	84	20	457	2 720
Blessing Hospital <sup>o</sup>	Gen	NPA <sup>ssn</sup>	110	84	20	457	2 720
Hillcrest	TB	County	50	37			36
St Mary Hospital <sup>o</sup>	Gen	Church	190	125	25	665	4 471
Rantoul 2 367—Champaign	Gen	Army	150	114	4	10	4 071
Station Hospital <sup>o</sup>	Gen	Army	150	114	4	10	4 071
Red Bud 1 302—Randolph	Gen	Church	11	7	8	63	220
St Clement's Hospital	Gen	Church	11	7	8	63	220
Robinson 4 311—Crawford	Gen	Part	20	12	5	94	553
Brooks Hospital	Gen	Part	18	3	5	22	97
Robinson Hospital	Gen	Part	18	3	5	22	97
Rockford 84 627—Winnebago	N&M	Indiv	30	11			102
Elmhurst (Wilgus Sanatorium)	N&M	Indiv	30	11			102
Rockford Memorial Hosp <sup>o</sup>	Gen	NPA <sup>ssn</sup>	84	70	18	417	2 775
Rockford Municipal Tuberculosis Sanatorium <sup>o</sup>	TB	City	124	101	50	1 70	1 62
St Anthony's Hospital <sup>o</sup>	Gen	Church	200	153	50	1 70	1 62
Swedish American Hospital <sup>o</sup>	Gen	NPA <sup>ssn</sup>	70	84	15	540	3 487
Winnebago County Hospital	Gen	County	76	45	6	11	617
Rock Island 42 775—Rock Island	Gen	County	76	51			67
Rock Island County Tuberculosis Sanatorium	TB	County	76	51			67
St Anthony's Hospital <sup>o</sup>	Gen	Church	150	92	20	59	3 691
Roselare 1 774—Hardin	Gen	Indiv	17	6	4	72	3 6
Roselare Hospital	Gen	Indiv	17	6	4	72	3 6
Rushville 2 450—Schuyler	Gen	Indiv	5	7	5	27	250
Culbertson Hospital	Gen	Indiv	5	7	5	27	250
St Charles 5 570—Kane	Gen	NPA <sup>ssn</sup>	50	17	8	162	702
Deinor Hospital <sup>o</sup>	Gen	NPA <sup>ssn</sup>	50	17	8	162	702
Salem 7 510—Varian	Gen	NPA <sup>ssn</sup>	50				1912
Salem Memorial Hospital	Gen	NPA <sup>ssn</sup>	50				1912
Savanna 4 702—Carroll	Gen	City	16	10	6	161	395
Savanna City Hospital	Gen	City	16	10	6	161	395
Shelbyville 4 002—Shelby	Gen	NPA <sup>ssn</sup>	21	18	6	110	510
Shelby County Memorial Hospital	Gen	NPA <sup>ssn</sup>	21	18	6	110	510
Sparta 3 661—Randolph	Gen	Indiv	10	5	2	29	151
Sparta Community Hospital	Gen	Indiv	10	5	2	29	151

## ILLINOIS—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Business †	Number of Births	Admissions †
Springfield 70 503—Sangamon Memorial Hospital <sup>o</sup>	Gen	NPA <sup>ssn</sup>	100	101	10	510	3 663
Palmer Sanatorium <sup>o</sup>	TB	Corp	83	77			118
St John's Crippled Children's Home	Unit of St John's Sanatorium	Gen	630	458	70	1 336	13 617
St John's Hospital <sup>o</sup>	Gen	Church	300	240			404
St John's Sanatorium and Orthopedic Hospital	TbOr	Church	300	240			404
Spring Valley 5 010—Bureau St Margaret's Hospital	Gen	Church	78	70	12	252	2 465
Stateville—Will Illinois State Penitentiary Hospital	See Joliet						
Sterling 11 363—Whiteside Home Hospital	Gen	NPA <sup>ssn</sup>	25	11	6	12	342
Public Hospital <sup>o</sup>	Gen	City	57	41	14	428	1 561
Streator 14 930—La Salle St Mary's Hospital	Gen	Church	114	93	14	557	3 741
Sycamore 4 702—De Kalb Sycamore Municipal Hosp <sup>o</sup>	Gen	City	27	17	15	155	753
Taylorville 8 313—Christian St Vincent Hospital	Gen	Church	85	62	20	314	2 787
Tuecola 2 838—Douglas Douglas County Jarman Hosp <sup>o</sup>	Gen	County	37	25	9	166	915
Urbana 14 064—Champaign Carle Memorial Hospital <sup>o</sup>	Gen	Corp	55	38	12	172	1 811
Champaign County Hospital	Gen	County	55	45	10	106	965
Mersey Hospital <sup>o</sup>	Gen	Church	103	65	10	417	3 191
The Outlook	TB	County	40	39			41
Vandalia 5 288—Fayette Mark Greer Hospital	Gen	Indlv	30	23	8	119	580
Watseka 3 744—Iroquois Iroquois Hospital	Gen	NPA <sup>ssn</sup>	41	26	15	206	1 100
Waukegan 34 241—Lake Lake County General Hosp	Gen	County	70	50	8	780	
Lake County Tuberculosis Sanatorium <sup>o</sup>	TB	County	100	80			214
St Therese's Hospital <sup>o</sup>	Gen	Church	200	123	38	939	6 500
Victory Memorial Hospital <sup>o</sup>	Gen	NPA <sup>ssn</sup>	110	81	25	614	3 866
White Hall 3 025—Greene White Hall Hospital	Gen	NPA <sup>ssn</sup>	10	6	5	53	250
Winfield 637—Du Page Winfield Sanatorium	TB	NPA <sup>ssn</sup>	92	75			167
Zace Sanatorium	TB	NPA <sup>ssn</sup>	60	35			63
Woodstock 6 123—McHenry Woodstock Public Hospital	Gen	NPA <sup>ssn</sup>	46	25	18	253	1 252
Zeigler 3 006—Franklin Zeigler Hospital	Indus	NPA <sup>ssn</sup>	12	2			89
Related Institutions							
Belleville 28 400—St Clair St Clair County Hospital and Home	Inst	Gen	100	80	2	19	374
Chicago 3 396 803—Cook Beverly Hills Rest Home	Conv	Indlv	12	7			33
Chicago Home for Convalescent Women and Children	Conv	NPA <sup>ssn</sup>	41	25			109
Chicago Home for Incurables	Incur	NPA <sup>ssn</sup>	270	264			77
House of Correction Hospital	Inst	City	70	23			1 370
Jones Nursing Home	Conv	Indiv	25	23			110
Long's Convalescent Home	N&M	Indiv	24	18			80
Parkway Lodge Convalescent Home for Men and Women	Conv	City	166	160			617
Reynolds Rest Home	Conv	Indiv	12	5			60
Rosary Hill Convalescent Home	Conv	Church	36	36			111
Salvation Army Booth Memorial Hospital	Mat	Church	21	14	12	211	263
Sheridan Mansion	Conv	Indiv	16	14			96
Washington and Jane Smith Home	Inst	Gen	22	17			305
Danvers 700—McLean Willow Park Hospital	Alcoh	Corp	12	4			42
Decatur 59 305—Macon City Public Hospital	Iso	City	20	4			91
Des Plaines 6 518—Cook Northwestern Hospital	Gen	NPA <sup>ssn</sup>	14	8	6	80	319
Dixon 10 671—Lee Dixon State Hospital	MeDe	State	4 761	4 300	10	5	513
Evans 6 359—Cook Broadhurst Nursing Home	Conv	Part	24	19			60
The Cradle	Chil	NPA <sup>ssn</sup>	70	71			163
Virginia Hall Nursing Home	Conv	Part	20	20			50
Geneva 4 101—Kane State Training School for Girls	Inst	State	22	17	15		315
Godfrey 300—Madison Beverly Farm	MeDe	Corp	85	80			15
Lincoln 12 752—Logan Lincoln State School and Colony	MeDe	State	4 801	4 300			380
Mattoon 35 822—Coles Independent Order Odd Fellows Old Folks Home Hospital	Inst	NPA <sup>ssn</sup>	55	33			101
Menard 22—Randolph Illinois Security Hospital	Ment	State	442	430			51
Minonk 1 897—Woodford Woodford County Tuberculosis Sanatorium	TB	County	12	7			8
Moochert 675—Kane Philadelphia Memorial Hos pital	Inst	Chil	NPA <sup>ssn</sup>	63	33		1 390

## ILLINOIS—Continued

Related Institutions	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Normal 6953—McLean Soldiers and Sailors Children's School Hospital	Inst	State	120	35			
Peoria 10,057—Peoria Florence Crittenton Home	Mat	NPAasn	70	25	4	67	80
Pontiac 9585—Livingston Illinois State Penitentiary Hospital	Inst	State	120	74			1 110
Quincy, 40469—Adams Quincy Memorial Sanitarium	Conv	NPAasn	20	8			97
Rockford 84627—Winnebago Children's Convalescent Home and Cottage	Orth	NPAasn	30	70			17
St. Charles 5870—Kane Illinois State Training School for Boys	Inst	State	26	13			1 029
Urbana 14064—Champaign McKinley Memorial Hospital	Gen	State	150	26			2 476
Wedron 202—La Salle St. Joseph's Health Resort	Conv	Church	72	60			1 201
West Chicago 3355—Du Page Country Home for Convalescent Crippled Children	Orth	NPAasn	100	58			80
Wheaton 7850—Du Page Mary F. Pogue School	MeDe	Indiv	55	50			14
Winnetka 12470—Cook North Shore Health Resort	Conv	Corp	75	42			816

## INDIANA

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Anderson 41572—Madison Hoppes Lying In Hospital	Mat	Corp	14	5	9	176	75
St. John's Hickey Memorial Hospital	Gen	Church	145	125	32	963	3 683
Angola 3141—Steuben Cameron Hospitals	Gen	NPAasn	20	14	5	102	50
Argos 1150—Marshall Kelly Hospital	Gen	NPAasn	10	6	4	29	223
Auburn, 5415—De Kalb Dr. Bonnell M. Souder Hospital	Gen	Indiv	20	5	7	97	339
Batesville 3060—Ripley Margaret Mary Hospital	Gen	Church	50	27	14	231	988
Bedford 12514—Lawrence Dunn Memorial Hospital	Gen	County	50	38	8	339	1,586
Beech Grove 3907—Marion St. Francis' Hospital	Gen	Church	123	85	50	1 954	3 561
Bloomington 20870—Monroe Bloomington Hospital	Gen	NPAasn	35	29	15	260	1 341
Bluffton 5417—Wells Clinic Hospital	Gen	Corp	43	74	8	103	1 028
Wells County Hospital	Gen	County	24	14	6	174	523
Clinton 7,092—Vermillion Vermillion County Hospital	Gen	County	37	29	12	176	1 181
Columbus 11738—Bartholomew Bartholomew County Hosp	Gen	County	33	33	15	392	1 073
Connersville 12898—Fayette Fayette Memorial Hospital	Gen	NPAasn	40	35	15	250	1 086
Crawfordsville 11089—Montgomery Culver Hospital	Gen	County	85	50	18	355	2 119
Crown Point 4413—Lake James O. Parramore Hosp	† TB	County	250	272			506
Decatur 5861—Adams Adams County Memorial Hospital	Gen	County	40	25	18	311	1 237
Dyer 976—Lake Mount Mercy Sanitarium	Conv	Church	85			† estab 1942	
East Chicago 54637—Lake St. Catherine's Hospital	Gen	Church	284	211	60	1,460	9 013
Elkhart 33434—Elkhart Elkhart General Hospital	Gen	NPAasn	85	52	22	879	2 797
Elwood, 10918—Madison Mercy Hospital	Gen	Church	45	21	15	383	1,171
Evansville 97,062—Vanderburgh Boehne Tuberculosis Hosp	† TB	County	150	122			297
Evansville State Hospital	† TB	State	1,200	1 187			801
Protestant Deaconess Hosp	† TB	Church	177	160	23	962	5 769
St. Mary's Hospital	† TB	Church	150	97	20	632	4,078
U. S. Marine Hospital	† TB	USPHS	100	61			741
Welborn Walker Hospital	† TB	Corp	118	85	19	858	5,566
Fort Benjamin Harrison, —Marion Station Hospital	Gen	Army	154	78	4	27	2,178
Fort Wayne, 118410—Allen Irene Byron Sanatorium	† TB	Counties	254	210			256
Lutheran Hospital	† TB	Church	175	147	80	1 044	4 813
Methodist Hospital	† TB	Church	87	50	25	845	1 902
St. Joseph Hospital	† TB	Church	290	213	60	1,216	6 471
Frankfort 13,706—Clinton Clinton County Hospital	Gen	County	43	27	10	321	1,105
Garrett 4255—De Kalb Sacred Heart Hospital	Gen	Church	42	31	12	169	824
Gary 111719—Lake Lincoln Hospital	Gen	NPAasn	40	18	6	32	350
Methodist Hospital	† TB	Church	116	129	24	1,253	5 943
St. John Hospital	† TB	Indiv	17	8	4	48	1 261
St. Mary's Mercy Hosp	† TB	Church	200	172	65	1 068	7,427
Greencastle, 4872—Putnam Putnam County Hospital	Gen	County	46	24	8	206	1 639

## INDIANA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Greensburg, 6,065—Decatur Decatur County Memorial Hospital	Gen	County	23	20	10	168	782
Hammond, 70,184—Lake Mount Mercy Sanitarium	N.A.M.	Church	32	20			223
St. Margaret Hospital	† TB	Church	231	178	50	2,104	8 035
Hartford City, 6,946—Blackford Blackford County Hospital	Gen	County	30	14	6	220	576
Huntingburg, 3,816—Dubois Stork Hospital	Gen	Indiv	11	7	6	73	339
Huntington, 13,903—Huntington Huntington County Hospital	Gen	County	29	23	12	316	840
Indianapolis, 886,972—Marion Central State Hospital	† TB	State	2 214	2 060			552
Emhardt Memorial Hospital	† TB	NPAasn	36	26	10	150	841
Flower Mission Memorial Hospital	† TB	Unit of Indianapolis City Hospital					
Indianapolis City Hosp	† TB	City	683	536	41	707	9 021
Indiana University Medical Center	† TB	Gen	681	485	62	1 065	9 706
James Whitcomb Riley Hospital for Children	† TB	Unit of Indiana University Medical Center					
Kokomo Home	† TB	Unit of Indiana University Medical Center					
Methodist Hospital	† TB	Church	590	400	90	3 133	19,831
'Normans' Sterne Memorial Hospital	† TB	N.A.M. Corp	22	21			291
Robert W. Long Hospital	† TB	Unit of Indiana University Medical Center					
Rotary Convalescent Home	† TB	Unit of Indiana University Medical Center					
St. Vincent's Hospital	† TB	Church	235	225	55	1 543	5,450
Sunnyside Sanatorium	† TB	County	252	249			188
Veterans Admin. Facility	† TB	Gen	316	241			2 636
William H. Coleman Hospital for Women	† TB	Unit of Indiana University Medical Center					
Jeffersonville 11493—Clark Clark County Memorial Hospital	Gen	County	40	26	7	306	1 177
Kendrickville 5431—Noble Lakeside Hospital	Gen	City	32	21	12	221	716
Kokomo 23795—Howard St. Joseph Memorial Hospital	Gen	Church	100	68	25	636	2,693
La Fayette 28795—Lippencott La Fayette Home Hosp	† TB	NPAasn	129	89	25	671	3 325
St. Elizabeth Hospital	† TB	Church	215	163	40	925	5 719
William Ross Sanatorium	† TB	County	40	22			62
La Porte 16180—La Porte Fairview Hospital	Gen	NPAasn	30	22	8	157	799
Holy Family Hospital	† TB	Church	106	90	16	719	4,041
Lebanon 6,229—Boone Witham Memorial Hospital	Gen	County	51	50	12	421	1 443
Linton 6263—Greene Freeman Greene County Hospital	Gen	County	50	17	10	314	854
Logansport, 20177—Cass Cass County Hospital	Gen	County	70	40	12	333	1,820
Logansport State Hosp	† TB	State	2 795	2,225			436
St. Joseph Hospital	† TB	Church	50	40	10	226	1,223
Madison 6,923—Jefferson Kings Daughters Hospital	Gen	NPAasn	50	25	10	148	1 132
Marion 26,767—Grant Marion General Hospital	Gen	NPAasn	90	50	20	615	2 729
Veterans Admin. Facility	† TB	See Veterans Administration Hospital Ind.					
Martinsville, 6,009—Morgan Morgan County Memorial Hospital	Gen	County	15	10	5	190	734
Michigan City, 26476—La Porte Clinic Hospital	Gen	Corp	50	27	12	85	1 632
Indiana Hospital for Insane	† TB	State	315	306			80
Michigan State Prison Hospital	† TB	Inst	125	100			85
Michigan City Sanitarium	† TB	Conv	50	10			351
St. Anthony's Hospital	† TB	Church	105	58	26	564	2 374
Mishawaka, 29235—St. Joseph St. Joseph Hospital	Gen	Church	109	68	30	543	3 133
Mooreville 1979—Morgan Comer's Sanitarium	Proct	Indiv	15	10			300
Muncie 49,720—Delaware Ball Memorial Hospital	Gen	NPAasn	229	163	30	1,417	6 766
New Albany 2,414—Floyd St. Edward Hospital	Gen	Church	116	61	24	460	2 433
Silvercrest Southern Indiana Tuberculosis Hospital	† TB	State	152	128			183
New Castle, 16030—Henry Clinch Hospital	Gen	Part	18	14	4	157	955
Henry County Hospital	† TB	Gen	60	60	14	461	2 601
North Madison 316—Jefferson Madison State Hospital	† TB	State	1 580	1 562			275
Peru 12432—Miami Dulce Miami County Memorial Hospital	Gen	County	50	41	12	256	1 074
Wabash Railroad Employees Hospital	† TB	Indus	50	24			549
Plymouth, 6718—Marshall Parkview Hospital	Gen	County	31	22	12	347	1 194
Portland, 6392—Jay Jay County Hospital	Gen	County	35	31	10	265	1 439
Princeton, 7,786—Gibson Gibson General Hospital	Gen	NPAasn	32	24	8	191	953
Rensselaer 3,214—Jasper Jasper County Hospital	Gen	County	40	34	10	252	1 019
Richmond, 85147—Wayne Reid Memorial Hospital	Gen	NPAasn	150	102	26	748	5 156
Richmond State Hospital	† TB	State	1 714	1 656			353
Smith Esteb Memorial Hosp	† TB	County	70	32			51
Rochester 8835—Fulton Woodlawn Hospital	Gen	Indiv	31	17	5	194	714

## INDIANA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Rockville 2 208—Farle	TB	State	230	103		230	
Indiana State Sanatorium							
Rome City 404—Noble	Gen	Church	175	61		1 772	
Knapp Springs Sanatorium	Gen	City	12	7	7	1 5	545
Rushville 5 000—Rush	Gen	County	25	10	12	209	1 043
City Hospital	Gen	City	50	25	13	237	1 276
Seymour 8 620—Jackson	Gen	County	174	143	40	1 359	7 929
Schneck Memorial Hospital	TB	County	185	183		233	
Shelbyville 10 791—Shelby	Gen	Church	150	103	42	1 243	4 494
W & Major Hospital	Gen	NPAsen	175	143	40	1 359	7 929
South Bend 101 268—St Joseph	Gen	NPAsen	185	183		233	
Epworth Hospital*+o	Gen	Church	150	103	42	1 243	4 494
Healthwin Hospital*+o	Gen	County	50	23	11	223	1 148
St Joseph Hospital*+o	Gen	County	14	7	2	17	296
Sullivan 2 077—Sullivan	Gen	Indiv	14	8	3	20	1 069
Mary Sherman Memorial Hos pital*+o	Gen	Church	176	100	26	642	3 388
Tell City 5 230—Perry	Gen	NPAsen	192	145	26	671	4 389
Parkview Hospital	Gen	Part	10	4	2	83	280
Terre Haute 62 693—Vigo	Gen	Indiv	13	9	3	122	505
Hoover s Sanatorium	Gen	County	57	43	16	441	1 602
St Anthony s Hospital*+o	Gen	County	92	73	15	326	2 544
Union Hospital*+o	Gen	County	63	53		42	
Tipton 5 101—Tipton	Gen	County	55	35	17	369	1 322
Emergency Hospital	Gen	Indiv	35	25	0	277	1 050
Union City 3 330—Randolph	Gen	Indiv	23	13	10	115	632
Union City Hospital	Gen	County	90	61	12	443	2 333
Valparaiso 8 736—Porter	Gen	County	22	12	5	77	635
Porter Memorial Hospital	Gen	County	35	30	10	233	1 033
Veterans Administration Hospital 507—Grant	Gen	County	20	9	4	59	203
Veterans Admin Facility*+o	Gen	County	15	3	4	142	836
Vincennes 18 228—Knox	Gen	County	50	30		70	
Good Samaritan Hospital*+o	Gen	County	1 200	1 200		76	
Hillcrest Tuberculosis Hosp	TB	County	6	4		997	
Wabash 9 653—Wabash	Gen	County	1 003	1 013		113	
Wabash County Hospital	Gen	County	25	12		63	
Warsaw 6 378—Kosciusko	Gen	County	21	12	11	221	604
McDonald Hospital	Gen	County	74	22		546	
Murphy Hospital	Gen	County	75	53		75	
Washington 9 312—Davies	Gen	County	10	5		1 809	
Davies County Hospital	Gen	County	20	12	20	41	43
Williamsport 1 222—Warren	Gen	County	63	3		1 134	
Maris Hospital	Gen	County	120	61		411	
Winchester 5 303—Randolph	Gen	County	14	8		2 6	
Randolph County Hospital	Gen	County	162	97		2 011	
Wolfske 250—Noble	Gen	County	113	42		1 110	
Lucky Hospital	Gen	County	1 035	1 000		93	

## Related Institutions

Anderson 41 572—Madison	Gen	Corp	15	3	4	142	836
Citizens Nursing Center	TB	County	50	30		70	
Elia B Lecher Hospital	Gen	County	1 200	1 200		76	
Butler 256—Jennings	McDe	State	6	4		997	
Muscatine State School	Proct	NPAsen	6	4		997	
Evansville 97 062—Vanderburgh	Gen	County	180	131	40	1 072	4 995
French Hospital	Gen	County	111	72		122	
Fort Wayne 135 410—Allen	Gen	County	81	69	26	746	4 076
Fort Wayne State School	McDe	State	1 003	1 013		113	
Grace Convalescent Hospital	Gen	County	25	12		63	
Medical Center Hospital	Gen	County	21	12	11	221	604
Greencastle 4 572—Putnam	Gen	County	74	22		546	
Indiana State Farm Hospital	Inst	State	74	22		546	
Greensburg 8 090—Decatur	Gen	County	75	53		75	
Odd Fellows Home Hospital	Inst	NPAsen	75	53		75	
Hammond 10 184—Lake	ENT	Indiv	10	5		1 809	
Kuhn Clinic Hospital	ENT	Indiv	10	5		1 809	
Indianapolis 389 972—Marion	Mat	NPAsen	20	12	20	41	43
Suemma Coleman Home	Mat	NPAsen	20	12	20	41	43
Knightstown 2 323—Henry	Inst	State	63	3		1 134	
Indiana Soldiers and Soldiers Children s Home	Inst	State	63	3		1 134	
La Fayette 28 798—Tippecanoe	Inst	State	120	61		411	
Indiana State Soldiers Home Hospital	Inst	State	120	61		411	
Lagrange 1 814—Lagrange	Inst	County	14	8		2 6	
Lagrange County Hospital	Inst	County	14	8		2 6	
Martinsville 5 000—Morgan	Conv	Corp	162	97		2 011	
Home Lawn Mineral Springs	Conv	Corp	113	42		1 110	
Martinsville Sanitarium	Conv	Corp	113	42		1 110	
New Castle 16 620—Henry	Epil	State	1 035	1 000		93	
Indiana Village for Epileptics	Epil	State	1 035	1 000		93	
Pendleton 1 681—Madison	Inst	State	50	8		1 050	
Indiana State Reformatory Hospital	Inst	State	50	8		1 050	
Plainfield 1 811—Hendricks	Inst	State	20	2		440	
Indiana Boys School Hosp	Inst	State	20	2		440	
Wilkinson 330—Hancock	ENT	Indiv	7	1		335	
Dr Charles Titus Hospital	ENT	Indiv	7	1		335	

## IOWA

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Akron 1 314—Plymouth	Gen	Indiv	14	4	3	70	2 21
Akron Hospital	Gen	Indiv	25			No data supplied	
Alpha 5 157—Monroe	Gen	Indiv	50	16	6	133	537
Miner s Hospital	Gen	Indiv	50	16	6	133	537
Alcona 4 034—Kosciusko	Gen	Indiv	50	16	6	133	537
Kosciusko Ho pital	Gen	NPAsen	13	4	5	32	147
Alta 1 203—Burda Vista	Gen	NPAsen	13	4	5	32	147
Alta Community Hospital	Gen	NPAsen	13	4	5	32	147

## IOWA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Ames 12 555—Story							
Iowa State College Hospital	Inst	State	75	11			1 135
Anamosa 4 060—Jones							
Mersey Hospital	Gen	Church	30	15	10	171	590
Atlantic 5 902—Cass							
Atlantic Hospital	Gen	Corp	50	25	6	150	1,000
Battle Creek 827—Ida							
Battle Creek Hospital	Gen	Part	17			No data supplied	
Belmond 2 169—Wright							
Belmond Hospital	Gen	Part	11	6	4	5	552
Buffalo Center 911—Winnebago							
Dolmage Hospital	Gen	Part	13	6	7	81	251
Burlington 25 532—Des Moines							
Burlington Protestant Hos pital	Gen	NPA'ssn	105	82	20	333	2 794
Mersey Hospital	Gen	Church	100	57	25	332	1,075
St Francis Hospital	Gen	Church	50	45	15	144	1 034
Carroll 5 380—Carroll							
St Anthony Hospital	Gen	Church	120	73	25	555	2 741
Cedar Falls 9 340—Black Hawk							
Sartori Memorial Hospital	Gen	City	37	24	11	220	917
Cedar Rapids 62 120—Linn							
Mersey Hospital	Gen	Church	147	103	33	767	3 601
St Luke's Methodist Hos pital	Gen	Church	140	112	25	914	5 707
Centerville 8 413—Appanoose							
St Joseph's Mercy Hospital	Gen	Church	50	35	6	244	1 713
Chariton 5 704—Lucas							
Yocom Hospital	Gen	Indiv	90	13	6	74	464
Charles City 8 681—Floyd							
Cedar Valley Hospital	Gen	City	60	32	12	260	1 400
Cherokee 7 460—Cherokee							
Cherokee State Hospital	Ment	State	1 700	1 602			497
Sioux Valley Hospital	Gen	NPA'ssn	53	27	12	203	1 214
Clarinda 4 905—Page							
Clarinda Municipal Hospital	Gen	City	40	20	10	143	3 115
Clarinda State Hospital	Ment	State	1 793	1 644			479
Clarion 2 971—Wright							
Clarion General Hospital and Clinic	Gen	Part	17	7	6	133	2 51
Clinton 26 270—Clinton							
Jane Lamb Memorial Hosp	Gen	NPA'ssn	90	60	15	339	2 101
St Joseph Mercy Hospital	Gen	Church	85	53	15	372	1 724
Colfax 2 253—Jasper							
Colfax Sanitarium	Gen	Corp	18	8	1	12	224
Council Bluffs 41 439—Pottawattamie							
Jennie Edmundson Memorial Hospital	Gen	NPA'ssn	135	86	22	530	3 010
Mersey Hospital	Gen	Church	130	81	14	375	7 10
St Bernard's Hospital	N&M	Church	180	153		260	360
Cresco 3 030—Howard							
St Joseph Mercy Hospital	Gen	Church	25	11	7	103	471
Creston 8 033—Union							
Greater Community Hospital	Gen	County	60	30	10	202	1 665
Davenport 66 039—Scott							
Mersey Hospital	Gen	Church	180	131	40	1 072	4 995
Plac Knoll Sanatorium	TB	County	111	72			122
St Elizabeth's and St John's Hospitals							
St Luke's Hospital	Units of Mercy Hospital						
St Luke's Hospital	Gen	Church	81	69	26	746	4 076
Decorah 5 303—Winnebago							
Decorah Hospital	Gen	NPA'ssn	20	20	8	214	961
Denison 4 361—Crawford							
Denison Hospital	Gen	Indiv	15	7	4	83	45
Des Moines 159 819—Polk							
Broadlawn Polk County Public Hospital	Gen	County	102	87	16	241	3 260
Broadlawn Polk County Public Hospital							
Broadlawn Polk County Public Hospital	Iso	County	49	11		332	
Broadlawn Polk County Public Hospital	TB	County	87	54		90	
Iowa Lutheran Hospital	Gen	Church	135	103	20	698	4 020
Iowa Methodist Hospital	Gen	Church	230	174	40	1 250	8 531
Mersey Hospital	Gen	Church	163	123	24	890	4 000
The Retreat	N&M	Corp	43	38		141	
Veterans Admin Facility	Gen	Vet	337	317		3 091	
Dubuque 43 892—Dubuque							
Finley Hospital	Gen	NPA'ssn	100	66	19	473	2 431
St Joseph Mercy Hospital	Gen	Church	130	93	23	601	3 396
St Joseph Sanitarium	N&M	Church	200	211		550	
Sunny Crest Sanatorium	TB	County	70	65		72	
Eldora 3 553—Hardin							
Eldora Memorial Hospital	Gen	City	24	10	8	122	595
Emmetsburg 3 374—Palo Alto							
Emmetsburg Hospital	Gen	NPA'ssn	23	12	10	169	710
Estherville 5 631—Emmet							
Coleman Hospital	Gen	NPA'ssn	25	17	7	141	805
Forest City 2 545—Winnebago							
Irish Hospital	Gen	Indiv	14	9	7	167	354
Fort Des Moines —Polk Station Hospital	Gen	Army	73	59	4	35	1 161
Fort Dodge 2 904—Webster							
Lutheran Hospital	Gen	Church	100	65	24	599	3 147
St Joseph Mercy Hospital	Gen	Church	125	75	18	343	2 000
Fort Madison 14 003—Lee							
Atchison Topeka and Santa Fe Railway Employees Hos pital							
Sacred Heart Hospital	Indus	NPA'ssn	40	13			492
Grinnell 5 210—Poweshiek	Gen	Church	50	50	10	404	2 612
Grinnell Community Hosp	Gen	NPA'ssn	54	21	6	132	852
St Francis Hospital	Gen	Church	50	15	10	83	43
Hamburg 2 187—Fremont							
Hamburg Hospital	Gen	Indiv	24	15	8	121	740
Hampton 4 006—Franklin							
Lutheran Hospital	Gen	Church	46	24	10	170	1 029



## IOWA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Bartley, 1 503—O'Brien Hand Hospital	Gen	Indiv	12	5	5	75	370
Hull 1 072—Sioux	Gen	Corp	15	8	3	31	402
Hull Hospital	Gen	Corp	15	8	3	31	402
Ida Grove 2 238—Ida	Gen	Part	12	5	4	33	221
Ida Grove General Hospital	Gen	Part	12	5	4	33	221
Independence 4 342—Buchanan	Gen	State	1 816	1 600			
Independence State Hospital	Gen	State	1 816	1 600			
Peoples Hospital	Gen	NPAsn	30	17	12	176	691
Iowa City, 17 182—Johnson	Gen	State	1 816	1 600			
Children's Hospital	Gen	State	1 816	1 600			
Iowa State Psychopathic Hospital	Gen	State	1 816	1 600			
Mersey Hospital	Gen	Church	100	78	22	500	2 230
University Hospitals**+▲	Gen	State	900	631	04	1 566	20 990
Iowa Falls 4 420—Hardin	Gen	City	35	23	10	215	1 204
Ellsworth Municipal Hospital	Gen	City	35	23	10	215	1 204
Keokuk 15 076—Lee	Gen	NPAsn	60	44	10	184	2 065
Graham Protestant Hospital	Gen	NPAsn	60	44	10	184	2 065
St. Joseph's Hospital	Gen	Church	110	73	10	340	2 488
Knoxville 6 935—Marion	Gen	NPAsn	60	44	10	184	2 065
Veterans Admin Facility	Ment	Vet	1 268	1 967			343
Lake City 2 216—Calhoun	Gen	Indiv	15	7	5	93	204
McCrory Hospital	Gen	Part	15	7	5	93	382
McKay Memorial Hospital	Gen	Part	15	7	5	93	382
Le Mars, 5 333—Plymouth	Gen	Church	40	27	10	267	1 192
Sacred Heart Hospital	Gen	Church	40	27	10	267	1 192
Leon 2 307—Decatur	Gen	County	30	10	5	128	532
Decatur County Hospital	Gen	County	30	10	5	128	532
Maquoketa 4 076—Jackson	Gen	Indiv	20	15	0	70	383
City Memorial Hospital	Gen	Indiv	20	15	0	70	383
Marshalltown 10 240—Marshall	Gen	Church	150	106	20	419	3 034
Evangelical Deaconess Home and Hospital	Gen	Church	66	51	15	303	1,104
St. Thomas Mercy Hospital	Gen	Church	66	51	15	303	1,104
Mason City 27 050—Cerro Gordo	Gen	Corp	50	38	12	201	1 87
Park Hospital	Gen	Corp	50	38	12	201	1 87
St. Joseph's Mercy Hosp	Gen	Church	175	63	20	409	2 834
McGregor 1 809—Clayton	Gen	Indiv	10	4	3	23	141
McGregor Hospital	Gen	Indiv	10	4	3	23	141
Monticello 2 546—Jones	Gen	NPAsn	45	22	10	172	1 002
John McDonald Hospital	Gen	NPAsn	45	22	10	172	1 002
Mount Pleasant 4 010—Henry	Gen	County	26	24	8	170	879
Henry County Soldiers and Sailors Memorial Hospital	Gen	State	1 622	1 530			517
Mount Pleasant State Hosp	Gen	State	1 622	1 530			517
Muscatine 18 286—Muscatine	Gen	NPAsn	42	29	12	224	1 266
Bellevue Hospital	Gen	NPAsn	42	29	12	224	1 266
Benjamin Hershey Memorial Hospital	Gen	NPAsn	50	29	14	246	1 210
Nevada 3 432—Story	Gen	Church	40	11	5	66	309
Iowa Sanitarium and Hosp	Gen	Church	40	11	5	66	309
New Hampton 2 933—Chickasaw	Gen	Church	61	25	12	224	1 214
St. Joseph's Hospital	Gen	Church	61	25	12	224	1 214
Newton 10 462—Jasper	Gen	City	43	31	7	198	941
Mary Frances Skiff Memorial Hospital	Gen	City	43	31	7	198	941
Oakdale —Johnson	Gen	State	424	392			310
State Sanatorium	Gen	State	424	392			310
Oelwein 7 801—Fayette	Gen	Church	30	20	10	200	1 021
Mersey Hospital	Gen	Church	30	20	10	200	1 021
Onawa 3 438—Monona	Gen	Indiv	20	8	0	66	401
Onawa Hospital	Gen	Indiv	20	8	0	66	401
Oseola 3 281—Clarke	Gen	Indiv	20	7	3	18	231
Bates Hospital	Gen	Indiv	20	7	3	18	231
Harken Hospital	Gen	Indiv	20	7	3	18	231
Oseola Hospital	Gen	Indiv	20	7	3	18	231
Oskaloosa 11 041—Mahaska	Gen	Part	30	20	7	169	900
Mersey Hospital	Gen	Part	30	20	7	169	900
Ottumwa 31 570—Wapello	Gen	NPAsn	62	40	16	274	1 710
Ottumwa Hospital	Gen	NPAsn	62	40	16	274	1 710
St. Joseph Hospital	Gen	Church	109	65	12	400	2,673
Sunnyhope Sanatorium	Gen	Church	109	65	12	400	2,673
Perry 5 977—Dallas	Gen	NPAsn	20	9	0	92	479
Kings Daughters Hospital	Gen	NPAsn	20	9	0	92	479
Pleasantville, 890—Marion	Gen	Indiv	10	4	2	12	182
Community Hospital	Gen	Indiv	10	4	2	12	182
Rock Rapids 2 550—Lyon	Gen	Indiv	20	7	5	70	347
W. Vander Wilt Hospital	Gen	Indiv	20	7	5	70	347
Sheldon 3 763—O'Brien	Gen	Church	20	12	5	60	310
Sheldon Good Samaritan Hospital	Gen	Church	20	12	5	60	310
Shenandoah 6 846—Page	Gen	NPAsn	35	22	8	204	1 007
Hand Memorial Hospital	Gen	NPAsn	35	22	8	204	1 007
Sibley 2 306—Oseola	Gen	Part	10	9	0	67	421
Oseola Hospital	Gen	Part	10	9	0	67	421
Sigourney 2 300—Keokuk	Gen	Indiv	11	3	3	16	123
Sigourney Hospital	Gen	Indiv	11	3	3	16	123
Sioux City 82 384—Woodbury	Gen	Church	100	60	10	320	2 300
Lutheran Hospital	Gen	Church	100	60	10	320	2 300
Methodist Hospital	Gen	Church	100	60	10	320	2 300
St. Joseph Mercy Hospital	Gen	Church	200	131	20	794	5 937
St. Vincent's Hospital	Gen	Church	116	97	14	304	3 602
Spencer 6 599—Clay	Gen	City	26	15	10	230	1 000
Spencer Municipal Hospital	Gen	City	26	15	10	230	1 000
Spirit Lake 2 161—Dickinson	Gen	Part	10	9	5	74	503
Spirit Lake Hospital	Gen	Part	10	9	5	74	503
Storm Lake 5 274—Buena Vista	Gen	Indiv	11	10	8	102	384
Porath Hospital	Gen	Indiv	11	10	8	102	384
Vinton 4 163—Benton	Gen	City	25	17	7	135	587
Virginia Gay Hospital	Gen	City	25	17	7	135	587
Washington 5 227—Washington	Gen	County	50	23	19	200	1 031
Washington County Hospital	Gen	County	50	23	19	200	1 031

## IOWA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Waterloo 51 743—Black Hawk	Gen	NPAsn	70	71	15	703	2 730
Allen Memorial Hospital	Gen	NPAsn	70	71	15	703	2 730
Presbyterian Hospital	Gen	NPAsn	103	78	20	181	1 342
St. Francis Hospital	Gen	Church	103	78	20	181	1 342
Waverly, 4 156—Bremer	Gen	Church	50	26	10	240	940
St. Joseph Mercy Hospital	Gen	Church	50	26	10	240	940
West Union 2 009—Fayette	Gen	City	15	6	4	63	320
West Union Community Hosp	Gen	City	15	6	4	63	320
Williamsburg 1 308—Iowa	Gen	Indiv	8	4	4	40	191
Miller Hospital	Gen	Indiv	8	4	4	40	191
Related Institutions							
Anamosa 4 060—Jones	Inst	State	21	5			1 720
Men's Reformatory Hospital	Inst	State	21	5			1 720
Des Moines 1 09 810—Polk	Mat	NPAsn	30	10	15	8	9
Benedict Home	Mat	NPAsn	30	10	15	8	9
Junior League Convalescent Home for Children	Conv	NPAsn	20	16			90
Salvation Army Booth Memorial Hospital	Mat	Church	50	6	15	66	70
Lidona 3 003—Hardin	Inst	State	29	11			1 732
Iowa Training School for Boys Hospital	Inst	State	29	11			1 732
Fort Madison 14 060—Lee	Inst	State	30	20			330
Iowa State Penitentiary Hosp	Inst	State	30	20			330
Glenwood 4 501—Mills	McDe	State	1 000	1 820			191
Glenwood State School	McDe	State	1 000	1 820			191
Harlan 3 727—Shelby	Gen	Indiv	14	8	5	107	360
Harlan Hospital	Gen	Indiv	14	8	5	107	360
Marshalltown 19 240—Marshall	Inst	State	140	100			440
Iowa Soldiers' Home Hosp	Inst	State	140	100			440
Orange City 1 000—Sioux	Gen	Indiv	6	4	1	23	163
Doornink Hospital	Gen	Indiv	6	4	1	23	163
Postville 1 194—Allamakee	Gen	City	14	6	4	44	225
Postville Community Hosp	Gen	City	14	6	4	44	225
Red Oak 5 703—Montgomery	McDe	Indiv	50	40			11
Powell School for Backward and Nervous Children	McDe	Indiv	50	40			11
Sioux City 82 364—Woodbury	Mat	NPAsn	37	37	20	107	107
Florence Crittenton Home	Mat	NPAsn	37	37	20	107	107
Toledo 2 073—Tama	Inst	State	20	1			422
State Juvenile Home Hosp	Inst	State	20	1			422
Waukon 2 752—Allamakee	Gen	Part	8	2			2 90
Rominer and Keffeler Emergency Hospital	Gen	Part	8	2			2 90
Woodward 800—Dallas	McDe	State	1 500	1 000			167
Hospital for Epileptics and School for Feeble-minded	McDe	State	1 500	1 000			167

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Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Ablene 5 671—Dickinson	Gen	NP Ascn	30	17	6	173	891
Dickinson County Memorial Hospital	Gen	Indiv	52	30	7	150	1 104
Anthony 2 673—Harper	Gen	NP Ascn	40	12	8	210	846
Galloway Hospital	Gen	NP Ascn	40	12	8	210	846
Arkansas City 12 702—Cowley	Gen	NP Ascn	40	26	9	321	908
Mersey Hospital	Gen	NP Ascn	40	26	9	321	908
Stricklen Hospital	Gen	NP Ascn	40	26	9	321	908
Atchison 1 644—Atchison	Gen	NP Ascn	40	26	9	321	908
Atchison Hospital	Gen	NP Ascn	40	26	9	321	908
Atell 544—Marshall	Gen	Indiv	12	7	5	55	390
Atell Hospital	Gen	Indiv	12	7	5	55	390
Belleville 2 000—Republic	Gen	Indiv	20	9	6	39	306
Patterson Memorial Hospital	Gen	Indiv	20	9	6	39	306
Beloit 3 760—Mitchell	Gen	NP Ascn	44	20	11	228	1 112
Community Hospital	Gen	NP Ascn	44	20	11	228	1 112
Caldwell 1 967—Burner	Gen	NP Ascn	20	7	5	20	407
Caldwell General Hospital	Gen	NP Ascn	20	7	5	20	407
Chanute 10 142—Neosho	Gen	Corp	56	20	6	104	1 032
Johnson Hospital	Gen	Corp	56	20	6	104	1 032
Coffeyville 17 300—Montgomery	Gen	Indiv	10	3	2	8	122
Coffeyville General Hospital	Gen	NP Ascn	16	6	5	123	903
Medical Center Hospital	Gen	NP Ascn	20	16	0	116	600
Southeast Kansas Hospital	Gen	NP Ascn	20	16	0	116	600
Colby 2 458—Thomas	Gen	Church	23	14	6	102	167
St. Thomas Hospital	Gen	Church	23	14	6	102	167
Columbus 3 402—Cherokee	Gen	City	21	14	2	6	301
Maude Norton Memorial City Hospital	Gen	City	21	14	2	6	301
Concordia 6 200—Cloud	Gen	Church	75	71	10	244	2 029
St. Joseph's Hospital	Gen	Church	75	71	10	244	2 029
Dodge City 8 457—Ford	Gen	Church	80	43	10	260	1 721
St. Anthony Hospital	Gen	Church	80	43	10	260	1 721
El Dorado 10 045—Butler	Gen	NP Ascn	60	43	14	330	1 731
Susan B. Allen Memorial Hos	Gen	NP Ascn	60	43	14	330	1 731
Wickard 902—Morton	Gen	Indiv	18	No data supplied			
Tucker Hospital	Gen	Indiv	18	No data supplied			
Ellsworth 2 227—Ellsworth	Gen	NP Ascn	40	20	9	138	914
Ellsworth Hospital	Gen	NP Ascn	40	20	9	138	914
Emporia 10 188—Lyon	Gen	County	66	52	20	263	1 809
Newman Memorial County Hospital	Gen	County	66	52	20	263	1 809
St. Mary's Hospital	Gen	Church	70	59	10	120	906
Fort Leavenworth 4 982—Leavenworth	Gen	Army	155	81	5	24	1 637
Station Hospital	Gen	Army	155	81	5	24	1 637
Station Hospital U S Discl	Gen	Army	180				
plinary Barracks	Gen	Army	180				

## KANSAS—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Businesses	Number of Births	Admissions †
Fort Riley —Geary Station Hospital <sup>1</sup>	Gen	Army	181	106	8	103	2 429
Fort Scott 10 537—Bourbon	Gen	Church	110	87	10	314	2 447
Mercy Hospital <sup>1</sup>	Gen	Church	43	30	7	120	1 445
Garden City 6 283—Finney	Gen	Church	15	4	3	20	135
St Catherine's Hospital <sup>1</sup>	Gen	Indiv	20	10	4	74	402
Gardner 510—Johnson	Gen	City	15	4	3	20	135
Reece Hospital	Gen	City	20	10	4	74	402
Girard 2 554—Crawford	Gen	City	20	10	4	74	402
Girard General Hospital	Gen	City	20	10	4	74	402
Goessel 300—Marion	Gen	Church	15	7	6	89	351
Mennonite Bethesda Hospital	Gen	Church	15	7	6	89	351
Goodland 3 306—Sherman	Gen	Church	19	12	5	149	892
Boothroy Memorial Hospital	Gen	Church	19	12	5	149	892
Grant Bend 9 044—Barton	Gen	Church	120	80	22	637	3 201
St Rose Hospital <sup>1</sup>	Gen	Church	120	80	22	637	3 201
Halstead 1 307—Harvey	Gen	Church	170	104	8	56	3 369
Halstead Hospital <sup>1</sup>	Gen	Church	170	104	8	56	3 369
Harper 1 093—Harper	Gen	Indiv	10	6	4	67	216
Johns Hospital	Gen	Indiv	10	6	4	67	216
Hays 6 388—Ellis	Gen	Church	45	13	5	47	470
Hadley Memorial Hospital	Gen	Church	100	70	22	440	3 043
St Anthony's Hospital <sup>1</sup>	Gen	Church	100	70	22	440	3 043
Hillsboro 1 586—Marion	Gen	Church	20	14	7	102	487
Salem Hospital	Gen	Church	20	14	7	102	487
Holingsworth 3 119—Barton	Gen	NPAsen	15	7	4	76	502
Holingsworth Hospital	Gen	NPAsen	15	7	4	76	502
Horton 2 572—Brown	Gen	Part	25	23	10	207	839
Horton Hospital	Gen	Part	25	23	10	207	839
Hutchinson 30 013—Reno	Gen	Church	107	67	19	537	2 840
Grace Hospital <sup>1</sup>	Gen	Church	50	31	17	370	1 338
St Elizabeth Mercy Hosp <sup>1</sup>	Gen	Church	50	31	17	370	1 338
Independence 11 065—Montgomery	Gen	Church	60	40	10	202	1 370
Mercy Hospital <sup>1</sup>	Gen	Church	60	40	10	202	1 370
Iola 7 244—Allen	Gen	Church	30	10	6	97	962
St John's Hospital	Gen	Church	30	10	6	97	962
Junction City 8 507—Geary	Gen	City	40	30	10	271	1 099
Junction City Municipal Hospital	Gen	City	40	30	10	271	1 099
Kansas City 121 458—Wyandotte	Unit of University of Kansas Hospitals						
Bell Memorial Hospital	Gen	Church	100	130	30	760	4 793
Bethany Hospital <sup>1</sup>	Gen	Church	20	13	3	40	317
Douglass Hospital	Gen	Church	20	13	3	40	317
Grandview Sanitarium	N&M	Indiv	37	21			219
Providence Hospital <sup>1</sup>	Gen	Church	90	86	20	623	2 773
St Margaret's Hospital <sup>1</sup>	Gen	Church	224	130	26	300	3 923
University of Kansas Hospitals <sup>1</sup>	GenTbState		320	262	25	621	6 599
Larned 3 533—Pawnee	Ment	State	1 451	1 446			270
Larned State Hospital	Ment	State	1 451	1 446			270
Lawrence 14 380—Douglas	In-t	IA	40	5			221
Haskell Institute Hospital	Gen	City	65	28	16	329	2 049
Lawrence Memorial Hospital <sup>1</sup>	In-t	State	62	15			995
Watkins Memorial Hospital <sup>1</sup>	Gen	NPAsen	55	40	10	200	1 548
Leavenworth 19 220—Leavenworth	Gen	Church	65	50	10	145	972
Cushing Memorial Hospital <sup>1</sup>	Inst	USPHS	160	116			1 619
St John's Hospital <sup>1</sup>	Gen	Church	65	50	10	145	972
U S Penitentiary Hospital <sup>1</sup>	Inst	USPHS	160	116			1 619
Liberal 4 410—Seward	Gen	Church	47	13	5	71	469
Epworth Hospital	Gen	Church	47	13	5	71	469
Little River 603—Rice	Gen	City	18	7	2	30	229
Hoffman Memorial Hospital	Gen	City	18	7	2	30	229
Lyons 4 497—Rice	Gen	NPAsen	20	13	6	140	465
Lyons Hospital	Gen	NPAsen	20	13	6	140	465
Manhattan 11 609—Riley	Gen	Church	60	30	15	249	1 179
St Mary Hospital <sup>1</sup>	Gen	Church	60	30	15	249	1 179
Marysville 4 000—Marshall	Gen	Indiv	10	4	4	30	150
Marysville Hospital	Gen	Indiv	10	4	4	30	150
Randell Hospital	Gen	Indiv	16	9	6	66	376
McPherson 7 194—McPherson	Gen	County	60	35	10	237	1 236
McPherson County Hospital	Gen	County	60	35	10	237	1 236
Mulvane 940—Sumner	Indus	NPAsen	50	23			303
Atchison Topeka and Santa Fe Railway Hospital <sup>1</sup>	Indus	NPAsen	50	23			303
Neodesha 3 376—Wilson	Gen	County	30	19	6		781
Wilson County Hospital	Gen	County	30	19	6		781
Newton 11 018—Harvey	Gen	Church	55	36	12	150	1 441
Axtell Christan Hospital <sup>1</sup>	Gen	Church	63	48	12	236	1 543
Bethel Deaconess Hospital <sup>1</sup>	Gen	Church	63	48	12	236	1 543
Norton 2 772—Norton	Unit of State Sanatorium for Tuberculosis						
Northern Memorial Hospital	Gen	City	30	16	6	116	512
Norton Hospital	Gen	City	30	16	6	116	512
State Sanatorium for Tuberculosis <sup>1</sup>	TB	State	432	410			207
Norwich 411—Kingman	Gen	Indiv	7	4			200
Wallace Hospital	Gen	Indiv	7	4			200
Oberlin 1 816—Decatur	Gen	Part	10	6	5	84	300
Benton Memorial Hospital	Gen	Part	10	6	5	84	300
Oswatimie 4 140—Miami	Ment	State	1 715	1 601			308
Oswatimie State Hospital	Ment	State	1 715	1 601			308
Ottawa 10 193—Franklin	Gen	County	40	14	12	149	730
Ransom Memorial Hospital	Gen	County	40	14	12	149	730
Parsons 14 204—Labette	Gen	Church	45	30	10	314	1 115
Mercy Hospital <sup>1</sup>	Gen	Church	45	30	10	314	1 115
Missouri Kansas Texas Railroad Employees Hospital	Indus	NPAsen	50	2			460
State Hospital for Epileptics	Epil	State	535	520			62
Pittsburg 17 571—Crawford	Gen	Church	80	50	12	310	2 306
Mount Carmel Hospital <sup>1</sup>	Gen	Church	80	50	12	310	2 306
Pratt 6 591—Pratt	Gen	Corp	20	14	4	74	600
Minnehaha Hospital <sup>1</sup>	Gen	Corp	20	14	4	74	600
Sabetha 2 241—Nemaha	Gen	Church	100	42	12	92	1 466
St Anthony Murdock Memorial Hospital <sup>1</sup>	Gen	Church	100	42	12	92	1 466

## KANSAS—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Businesses	Number of Births	Admissions †
Salina 21 073—Saline	Gen	Church	50	44	15	300	1 730
Asbury Protestant Hosp <sup>1</sup>	Gen	Church	85	50	15	200	1 030
St John's Hospital <sup>1</sup>	Gen	Church	85	50	15	200	1 030
Scott City 1 848—Scott	Gen	NPAsen	11	6	4	83	431
Scott City Hospital	Gen	NPAsen	11	6	4	83	431
Spearsville 603—Ford	Gen	NPAsen	10	7	3	37	341
Perkins Hospital	Gen	NPAsen	10	7	3	37	341
Stafford 2 011—Stafford	Gen	Indiv	25	15	6	97	505
Feldhut Memorial Hospital	Gen	Indiv	25	15	6	97	505
Sterling 2 210—Rice	Gen	NPAsen	20	11	5	44	645
Sterling Hospital	Gen	NPAsen	20	11	5	44	645
Syracuse 1 226—Hamilton	Gen	County	31	6	6	100	560
Donohue Memorial Hospital	Gen	County	31	6	6	100	560
Topeka 6 733—Shawnee	Indus	NPAsen	140	88			2 102
Atchison Topeka and Santa Fe Railway Hospital <sup>1</sup>	Indus	NPAsen	140	88			2 102
Christ's Hospital <sup>1</sup>	Gen	Church	90	62	20	206	1 034
Hillcrest Sanitarium	TB	CyCo	70	33			94
Jane C Stormont Hosp <sup>1</sup>	Gen	NPAsen	80	53	20	430	2 021
Menninger Sanitarium <sup>1</sup>	N&M	Corp	60	40			107
St Francis Hospital <sup>1</sup>	Gen	Church	96	79	22	429	2 000
Security Benefit Assn Hosp	Gen	NPAsen	106	73			1 000
Topeka State Hospital	Ment	State	1 008	1 076			310
Wadsworth 2 300—Leavenworth	GenTbVet		742	516			3 380
Veterans Admin Facility <sup>1</sup>	GenTbVet		742	516			3 380
Wamego 1 767—Pottawatomie	Gen	City	20	12	7	118	351
Genn Hospital	Gen	City	20	12	7	118	351
Wellington 7 246—Sumner	Gen	NPAsen	20	8	8	103	434
St Luke's Hospital	Gen	NPAsen	20	8	8	103	434
Wichita 114 906—Sedgwick	Gen	Corp	10	4	2	16	279
Coffman Hospital	Gen	Church	350	306	72	1 750	12 550
St Francis Hospital <sup>1</sup>	Gen	Church	350	306	72	1 750	12 550
Sedgwick County Hospital	Gen	County	55	48	4	120	1 637
Sedgwick County Tuberculosis Sanitarium	TB	County	60	33			36
Veterans Admin Facility <sup>1</sup>	Gen	Vet	246	169			1 001
Wesley Hospital <sup>1</sup>	Gen	Church	230	197	22	1 593	8 020
Wichita Hospital <sup>1</sup>	Gen	Church	125	103	20	751	3 777
Winfield 9 006—Cowley	Gen	Church	50	37	6	113	1 090
St Mary's Hospital <sup>1</sup>	Gen	Church	50	37	6	113	1 090
William Newton Memorial Hospital <sup>1</sup>	Gen	City	47	41	10	218	1 461

## Related Institutions

Ashland 1 186—Clark	Gen	NPAsen	10	0	4	97	518
Ashland Hospital	Gen	NPAsen	10	0	4	97	518
Fort Dodge 550—Ford	Inst	State	32	13			308
Kansas State Soldiers Home Hospital	Inst	State	32	13			308
Lansing 812—Leavenworth	Inst	State	50	26			817
Kansas State Penitentiary Hospital	Inst	State	50	26			817
Manhattan 11 609—Riley	Inst	State	60	18			1 231
Kansas State College Hosp	Inst	State	60	18			1 231
Topeka 6 733—Shawnee	Mat	NPAsen	20	8	16	22	23
Florence Crittenton Home	Mat	NPAsen	20	8	16	22	23
Wichita 114 906—Sedgwick	Mat	Church	50	30			112
Salvation Army Home and Hospital	Mat	Church	50	30			112
Suburban Rest Sanitarium	N&M	Indiv	40	20			80
Winfield 9 506—Cowley	McDe	State	1 300	1 041			73
State Training School	McDe	State	1 300	1 041			73

## KENTUCKY

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Businesses	Number of Births	Admissions †
Anchorage 609—Jefferson	N&M	Indiv	55	37			133
Hord's Sanitarium							
Ashland 29 537—Boyd	Gen	NPA'sen	50	60	15	501	2 273
Kings Daughters Hospital							
Berea 2 176—Madison	GenIso	NPA'sen	125	27	6	60	1 000
Berea College Hospital <sup>1</sup>							
Beverly 306—Bell							
Red Bird Francigael Hosp	Gen	Church	10	3	4	44	100
Bowling Green 14 580—Warren	Gen	City	43	30	8	221	1 702
City Hospital							
Corbin 7 593—Whitley	Gen	Indiv	32	13	4	46	51
Smith Hospital							
Covington 62 018—Kenton							
Covington Kenton County							
Tuberculosis Sanatorium	TB	County	17	10			11
St Elizabeth Hospital <sup>1</sup>	Gen	Church	277	203	53	1 419	5 720
Wm Booth Memorial Hosp <sup>1</sup>	Gen	Church	101	70	22	603	2 669
Cynthiana 4 810—Harrison	Gen	NPA'sen	30	18	8	132	431
Harrison Memorial Hospital							
Danville 6 734—Boyle							
Ephraim McDowell Memorial							
Hospital	Gen	NPA'sen	70	43	12	139	1 011
Dayton 4 379—Campbell							
Speers Memorial Hospital <sup>1</sup>	Gen	County	100	60	15	363	3 093
Fort Knox—Hardin							
Station Hospital <sup>1</sup>	Gen	Army	200	140	5	42	3 270
Fort Thomas 11 034—Campbell							
Station Hospital	Gen	Army	142	86	3	14	1 204
Frankfort 11 407—Franklin							
Kings Daughters Hospital	Gen	NPA'sen	70	39	17	226	2 026
Fulton 3 260—Fulton							
Fulton Hospital	Gen	Part	12	5	4	72	343
Georgetown 4 420—Scott							
John Graves Ford Memorial							
Hospital	Gen	CyCo	26	12	6	78	599

## KENTUCKY—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Cabertville 323—Marshall Kentucky Dam Hospital	Gen	Fed	17	5	9	10	348
Glasgow 5810—Barren T I Sam on Community Hospital	Gen	NPA'sn	65	49	6	128	2,828
Crayton 1176—Carter J Q Stovall Memorial Hosp	Gen	Corp	20	9	4	51	400
Greenville 2347—Muhlenberg Muhlenberg Community Ho p	Gen	NPA'sn	34	18	5	60	1,147
Harlan 5122—Harlan Harlan Ho pital	Gen	Corp	70	38	10	52	1,900
Harrodsburg 4673—Mercer A D Price Memorial Ho p	Gen	NPA'sn	20	9	4	61	462
Hartford 1380—Ohio Crowder Clinic	Gen	Indiv	9	2	1	21	170
Hazard 7397—Perry Hazard Hospital	Gen	Corp	80	47	8	96	2,777
Hurst Snyder Hospital	Gen	Corp	20	16	5	38	817
Henderson 13160—Henderson Henderson Hospital	Gen	Corp	30	19	6	100	1,300
Hopkinsville 11724—Christian Jennie Stuart Memorial Hos pital	Gen	NPA'sn	34	20	4	40	1,075
Western State Hospital	Ment	State	1,000	2,002			580
Hyden, 500—Lecelle Frontier Nursing Service Hos pital	Gen	NPA'sn	18	14	9	131	500
Jenkins, 9428—Letcher Jenkins Hospital	Gen	NPA'sn	60	27	0	39	1,010
Lakeland 50—Jefferson Central State Ho pital	Ment	State	2,474	2,437			602
Lebanon 3760—Marion J A Baute Memorial Ho pital	Gen	Indiv	20	11	6	76	570
Lexington 49304—Fayette Eastern State Hospital	Ment	State	2,112	2,044			534
Good Samaritan Hospital	Gen	Church	265	201	28	373	7,001
High Oaks Sanatorium	N&M	Indiv	30	13			171
Iubus Marks Sanatorium	TB	County	116	114			198
St Jo eph Hospital	Gen	Church	221	140	22	594	2,238
Shriners Ho pital for Crippled Children	Orth	NPA'sn	20	20			100
U S Public Health Service Hospital	Drug	LSPHS	1,000	934			516
Veterans Admin Facility	Ment	Vet	60	53			381
London 2263—Laurel Pennington General Hospital	Gen	Indiv	25	12	3	3	300
Louis 2023—Lawrence Riverview Hospital	Gen	Indiv	10	5	2	63	316
Louisville 31967—Jefferson Children's Free Hospital	Chil	NPA'sn	68	30	14	303	1,170
Jewish Hospital	Gen	NPA'sn	56	67	14	303	2,057
Kentucky Baptist Hosp	Gen	Church	130	130	20	910	900
Kosair Crippled Children Hos pital	Orth	NPA'sn	120	97			1,310
Louisville General Hosp	Gen	City	227	347	60	1,567	10,712
Louisville Neuropathic Sana torium	N&M	Corp	24	21			704
Methodist Deaconess Ho p	Gen	Church	67	68	8	400	2,306
Norton Memorial Infirmary	Gen	NPA'sn	140	120	20	823	4,730
Red Cross Hospital	Gen	NPA'sn	55	10	6	31	417
St Anthony's Hospital	Gen	Church	170	112	20	964	4,476
St Joseph Infirmary	Gen	Church	329	230	40	1,000	5,712
SS Mary and Elizabeth Hos pital	Gen	Church	140	116	60	1,513	4,617
State Tuberculosis Sana torium (Hazelwood)	TB	State	120	121			231
Stokes Sanatorium	N&M	Indiv	40	18			196
U S Marine Hospital	Gen	LSPHS	161	50			1,007
Lynch 10000—Harlan Lynch Hospital	Gen	NPA'sn	50	34	5	141	1,580
Madisonville 8209—Hopkins Hopkins County Hospital	Gen	NPA'sn	60	15	0	51	1,783
Mayfield 5619—Graves Fuller Gilliam Hospital	Gen	Corp	20	15	4	105	871
Mayfield Hospital	Gen	NPA'sn	40	19	6	91	600
Mayfield 6070—Ma on Haywood Hospital	Gen	NPA'sn	56	29	8	131	1,680
Middlesboro 1177—Bell Middlesboro Hospital	Gen	Corp	60	30	0	106	1,080
Morganfield 3079—Union Union County Hospital	Gen	NPA'sn	35	16	0	107	1,081
Murray 7773—Calloway Keys Houston Clinic Hospital	Gen	Part	20	12	8	60	601
Wm Mason Memorial Hosp	Gen	NPA'sn	60	23	5	66	894
Outwood 50—Christian Veterans Admin Facility	TB	Vet	375	329			723
Owensboro 30245—Davies Owensboro Davies County Hospital	Gen	CyCo	100	65	17	417	2,190
Paducah 33763—McCracken Ewart Purell I olation Hos pital	Unit of Indus	Riverside Ho pital	90	40			1,096
Illinois Central Hospital	Gen	NPA'sn	103	46	16	463	2,643
Paintsville 2324—Johnson Paintsville Clinic	Gen	Indiv	20	5	4	22	300
Paintsville Hospital	Gen	Corp	65	30	8	96	1,400
Paris 6697—Bourbon W W Ma sie Memorial Hos pital	Gen	City	50	22	5	117	824
Pewee Valley 620—Oldham Pewee Valley Sanitarium and Hospital	Gen	NPA'sn	33	23	2	27	204
Pikeville 4180—Pike Methodist Hospital	Gen	Church	90	52	10	159	3,141
Pineville 3882—Bell Pineville Community Hospital	Gen	Corp	60	44	8	74	1,003

## KENTUCKY—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Richmond 7330—Madison Gibson Hospital	Gen	Indiv	20	12	3	20	300
Irvine McDowell Memorial Trachoma Hospital	Trach	State	38	24			150
Pattie A Clay Infirmary	Gen	NPA'sn	50	31	5	84	1,210
Russellville 3903—Togon Russellville Hospital	Gen	Indiv	10	No data supplied			
Stanford 1940—Lincoln Stanford Hospital	Gen	Part	9	7	2	18	204
Versailles 2548—Woodford Woodford Memorial Hospital	Gen	CyCo	72	12	6	95	592
Waverly Hills 200—Jefferson Waverly Hills Sanatorium	TB	CyCo	500	460			490
Winchester 8594—Clark Clark County Hospital	Gen	NPA'sn	40	19	6	40	821
Guerrant Clinic and Hospital	Gen	NPA'sn	20	7	4	12	206
Related Institutions							
Fleming 1193—Letcher Fleming Hospital	Gen	Indiv	20	5		13	500
Frankfort 11432—Franklin State Institution for the Feeble-minded	MeDe	State	700	740			34
La Grange, 1234—Oldham State Reformatory Hospital	Inst	State	150	72			1,807
Louisville 31067—Jefferson Kings Daughters Home for Incurables	Incur	NPA'sn	100	91			26
Susan Speed Davis Home and Hospital	MatCh	Church	40	39	22	102	140
Princeton 1301—Caldwell Princeton Hospital	Gen	City	16	9	3	55	394

## LOUISIANA

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Abbeville 6672—Vermillion Abbeville Clinic	Gen	Indiv	12	5	3	14	40
Alexandria 27000—Rapides Baptist Hospital	Gen	Church	66	63	37	451	3,230
Culpepper White Clinic	Gen	Part	12	4	0	83	277
Veterans Admin Facility	Gen	TB Vet	621	476			3,466
Barksdale Field —Bos ler Station Hospital	Gen	Army	160	127	8	0	2,500
Bastrop 6666—Morehouse Baton Rouge General Hospital	Gen	Church	26	7	0	81	316
Baton Rouge 34710—Fast Baton Rouge Baton Rouge General Ho p	Gen	NPA'sn	57	49	18	462	2,700
Our Lady of the Lake Sanatorium	Gen	Church	160	121	44	1,010	2,300
Bogalusa 14604—Washington Elizabeth Sullivan Memorial Hospital	Gen	NPA'sn	64	66	16	244	3,334
Breaux Bridge 1000—Saint Martin St Paul Hospital	Gen	Indiv	10	2	1	11	90
Carville 200—Iberville U S Marine Hospital	Lepro	LSPHS	454	366			61
Converse 314—Sabine Allen Sanatorium	Gen	Corp	12	5	3	26	306
Covington 4173—St Tammany Fenwick Sanatorium	N&M	Indiv	64	16			220
Crowley 9523—Acadia Acadia Hospital	Gen	Part	12	6	3	82	400
Crowley Sanatorium (Legion Memorial Hospital)	Gen	NPA'sn	20	10	3	84	614
Delhi 1192—Richland Delhi Clinic and Sanitarium	Gen	Part	10	3	5	78	221
De Ridder 3700—Boutte Frazier Clinic and Hospital	Gen	Indiv	20	12	7	300	770
Donaldsonville 3881—Ascension Donaldsonville General Hosp	Gen	Indiv	9	2	4	40	106
Ferriday 2601—Concordia Ferriday Ho pital	Gen	Part	28	No data supplied			
Greenwell Springs 130—East Baton Rouge Greenwell Springs Tuberculosis Hospital	TB	State	243	91			133
Havensville 2418—Chalborne Havensville Hospital	Gen	Corp	20	10	5	62	500
Hodge 1440—Jackson Hodge Clinic	Gen	Indiv	10	5	3	112	468
Houma 9002—Terrebonne Flender Memorial Hospital	Gen	Part	23	10	8	219	70
Independence 1408—Tangipahoa Florida Parishes Charity Hos pital	Gen	State	60	37	11	500	2,104
Jackson 5384—East Feliciana East Louisiana State Hos pital	Ment	State	4,785	4,300			806
Parker Hospital	Unit of East Louisiana State Hos pital						
Lafayette 10210—Lafayette Des Ormeaux Clinic	Gen	Indiv	10	7	2	29	672
Lafayette Charity Hospital	Gen	State	227	168	19	1,023	6,911
Lafayette Sanitarium	Gen	Corp	25	10	7	180	463
St Ann Infirmary	Gen	Indiv	12	6	10	101	430
Lake Charles 21207—Calcasieu St Patrick's Hospital	Gen	Church	75	68	12	630	3,106
Lecompte 1331—Rapides Lecompte Sanitarium	Gen	Indiv	18	7	2	104	280
Mansfield 4060—De Soto Mansfield Sanitarium	Gen	Corp	32	9	2	30	499
Mary 1474—Sabine Fraser Sanitarium	Gen	Indiv	15	9	4	244	517

Key to symbols and abbreviations is on page 1027

## LOUISIANA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Minden 6077—Webster	Gen	Corp	45	25	6	190	1 202
Minden Sanitarium	Gen	Corp	45	25	6	190	1 202
Monroe 28 309—Ouachita	Gen	Corp	45	25	6	190	1 202
E A Conway Memorial Hos	Gen	State	150	140	15	392	5 117
pital	Gen	State	150	140	15	392	5 117
G B Cooley Sanatorium	Gen	State	46	39			153
Monroe Charity Hospital	See E	4 Conway Memorial Hospital					
Riverside Sanitarium	Gen	Indiv	25	10	4	84	670
St Francis Sanitarium	Gen	Church	125	78	20	502	4 023
Vaughan Wright Dendel Clinic	Gen	Part	25	25	11	125	1 013
New Iberia 13 747—Iberia	Gen	Indiv	40	8	7	221	1 022
Dauterive Hospital	Gen	Indiv	10	3	3	58	370
Iberia General Hospital	Gen	Indiv	10	3	3	58	370
New Orleans 494 537—Orleans	Gen	State	2 207	1 778	174	5 434	33 746
Charity Hospital of Louisiana	Gen	State	2 207	1 778	174	5 434	33 746
City Hospital for Mental Diseases	Ment	City	100	54			503
Delgado Memorial Hospital	Unit of Charity Hospital						
De Paul Sanitarium	NAM	Church	350	300			465
Eye Ear Nose and Throat Hospital	ENT	NPA	85	39			4 333
Flint Goodridge Hospital of	Gen	NPA	88	67	12	543	2 610
Dillard University	Gen	NPA	63	24	12	234	1 497
French Hospital	Gen	NPA	263	230	75	1 402	9 484
Hotel Dieu Sisters Hosp	Indus	NPA	60	23			1 005
Illinois Central Hospital	Unit of Charity Hospital						
John Dibert Memorial Tuberculosis Hospital	Gen	Church	125	80	32	1 093	4 339
Mercy Hospital Soniat	Gen	Church	125	80	32	1 093	4 339
Memorial	Gen	Church	125	80	32	1 093	4 339
New Orleans Hospital and Dispensary for Women and Children	Gen	NPA	60	25	22	678	2 620
Richard Milliken Memorial Hospital	Unit of Charity Hospital						
Southern Baptist Hosp	Gen	Church	370	300	54	1 649	16 064
Touro Infirmary	Gen	NPA	400	234	40	1 412	13 465
U S Marine Hospital	Gen	USPHS	672	434			5 412
Oculous 8 950—St Landry	Gen	Corp	24	9	5	212	670
St Rita's Infirmary	Gen	Part	40			No data supplied	
Pineville 4 297—Rapides	Ment	State	2 400	2 304			553
Central Louisiana State Hospital	Ment	State	2 400	2 304			553
Fugate Memorial Hospital	Gen	State	314	183	30	883	7 046
Huey P Long Charity Hosp	Gen	State	314	183	30	883	7 046
Plaquemine 5 049—Iberville	Gen	NPA	55	10	9	156	921
Plaquemine Sanitarium	Gen	NPA	55	10	9	156	921
Port Sulphur 550—Plaquemine	Gen	NPA	10	5	4	41	295
Port Sulphur Hospital	Gen	NPA	10	5	4	41	295
Ruston 7 107—Lincoln	Gen	NPA	48	14	5	96	955
Ruston Lincoln Sanitarium	Gen	NPA	48	14	5	96	955
Shreveport 98 107—Caddo	TB	Indiv	18	11			65
Gilmer Chest Hospital	TB	Corp	30	30			70
Gowan Sanatorium	Gen	Corp	100	84	16	340	3 124
Highland Sanitarium	Gen	Corp	100	84	16	340	3 124
North Louisiana Sanitarium	Gen	Corp	100	84	16	340	3 124
Pine Sanatorium	TB	NPA	104	78			118
T E Schumpert Memorial Sanitarium	Gen	Church	150	78	34	683	3 735
Shreveport Charity Hosp	Gen	State	725	433	62	1 795	12 221
Shriners Hospital for Crippled Children	Orth	NPA	60	60			105
Tri State Hospital	Gen	Corp	121	87	19	333	4 634
Tallulah 5 712—Madison	Gen	Indiv	14	5	2	24	137
Madison Sanitarium	Gen	Indiv	14	5	2	24	137
Thibodaux 5 501—La Fourche	Gen	NPA	40	5	4	78	750
St Joseph Hospital	Gen	NPA	40	5	4	78	750
Related Institutions							
Alexandria 27 006—Rapides	MeDe	State	270	500			65
State Colony and Training School	MeDe	State	270	500			65
Angola 18—West Feliciana	Inst	State	125	33			1 104
Angola General Hospital	Inst	State	125	33			1 104
New Orleans 494 537—Orleans	Conv	NPA	23	21			257
New Orleans Convalescent Home	Conv	NPA	23	21			257

## MAINE

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Augusta 19 300—Kennebec	Gen	NPA	65	56	23	372	2 125
Augusta General Hospital	Gen	NPA	65	56	23	372	2 125
Augusta State Hospital	Ment	State	1 500	1 491			230
Bangor 29 522—Penobscot	TB	NPA	30	15			25
Bangor Sanatorium	Ment	State	1 100	1 100			315
Bangor State Hospital	Gen	NPA	213	199	20	464	5 487
Eastern Maine General Hospital	Gen	Indiv	20	15	5	7	255
Paine Private Hospital	Gen	Indiv	22	15	11	134	564
Stinson Private Hospital	Gen	NPA	53	31	10	102	1 250
Bar Harbor 43—Hancock	Gen	NPA	50	53	12	261	1 297
Mount Desert Island Hosp	Gen	NPA	15	5	8	6	91
Bath 19 225—Sagadahoc	Gen	NPA	15	5	8	6	91
Bath Memorial Hospital	Gen	NPA	15	5	8	6	91
Belfast 5 540—Waldo	Gen	NPA	25	23	5	61	554
Bradbury Memorial Hospital	Gen	NPA	25	23	5	61	554
Waldo County General Hospital	Gen	NPA	25	23	5	61	554

## MAINE—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Biddeford 19 790—York	Gen	Corp	45	45	10	212	1 115
Trull Hospital	Gen	Corp	45	45	10	212	1 115
Webber Hospital	Gen	NPA	25	10	8	27	205
Blue Hill 1 343—Hancock	Gen	NPA	25	10	8	27	205
Blue Hill Memorial Hospital	Gen	NPA	25	10	8	27	205
Boothbay Harbor 2 121—Lincoln	Gen	Corp	25	9	5	49	355
St Andrews Hospital	Gen	Corp	25	9	5	49	355
Brewer 6 510—Penobscot	Gen	Indiv	13	7	10	153	271
Russell Hospital	Gen	Indiv	13	7	10	153	271
Brunswick 8 655—Cumberland	Gen	Indiv	40	5	15	109	813
Brunswick Hospital	Gen	Indiv	40	5	15	109	813
Camden 3 554—Knox	Gen	NPA	15	1	6	62	271
Camden Community Hospital	Gen	NPA	15	1	6	62	271
Cape Cottage 1 025—Cumberland	Gen	Army	54	42			842
Station Hospital	Gen	Army	54	42			842
Caribou 8 218—Aroostook	Gen	City	40	20	10	113	720
Cary Memorial Hospital	Gen	City	40	20	10	113	720
Castine 662—Hancock	Gen	NPA	12	9	6	70	405
Castine Community Hospital	Gen	NPA	12	9	6	70	405
Damariscotta 54—Lincoln	Gen	NPA	25	12	5	86	511
Miles Memorial Hospital	Gen	NPA	25	12	5	86	511
Dexter 3 714—Penobscot	Gen	NPA	15	4	5	56	190
Plummer Memorial Hospital	Gen	NPA	15	4	5	56	190
Dover Foxcroft 4 015—Piscataquis	Gen	City	90	15	5	63	654
Mayo Memorial Hospital	Gen	City	90	15	5	63	654
Eastport 3 316—Washington	Gen	Indiv	14	4	8	44	175
Eastport Memorial Hospital	Gen	Indiv	14	4	8	44	175
Ellsworth 3 011—Hancock	Gen	Indiv	16	5	5	35	305
Ellsworth Private Hospital	Gen	Indiv	16	5	5	35	305
Fairfield 5 294—Somerset	TB	State	205	105			155
Central Maine Sanatorium	TB	State	205	105			155
Farmington 3 743—Franklin	Gen	NPA	45	22	10	110	925
Franklin County Memorial Hospital	Gen	NPA	45	22	10	110	925
Fort Fairfield 5 607—Aroostook	Gen	Corp	15	11	0	55	55
Fort Fairfield Clinic	Gen	Corp	15	11	0	55	55
Gardiner 8 044—Kennebec	Gen	NPA	50	30	12	25	155
Gardiner General Hospital	Gen	NPA	50	30	12	25	155
Greenfield Junction 600—Piscataquis	Gen	NPA	14	5	5	69	654
Charles A Dean Memorial Hospital	Gen	NPA	14	5	5	69	654
Greenwood Mountain 250—Oxford	TB	State	150	150			172
Western Maine Sanatorium	TB	State	150	150			172
Houlton 7 711—Aroostook	Gen	NPA	40	25	12	125	850
Aroostook General Hospital	Gen	NPA	40	25	12	125	850
Madison Memorial Hospital	Gen	Church	30	30	12	107	1 655
Island Falls 1 370—Aroostook	Gen	NPA	15	5	5	45	255
Emma V Milliken Memorial Hospital	Gen	NPA	15	5	5	45	255
Lewiston 3 598—Androscoggin	Gen	NPA	26	150	5	75	3 652
Central Maine General Hospital	Gen	NPA	26	150	5	75	3 652
St Mary's General Hosp	Gen	Church	150	120	25	445	5 580
Mars Hill 1 556—Aroostook	Gen	Indiv	7	3	3	14	155
Mars Hill Hospital	Gen	Indiv	7	3	3	14	155
Milo 2 060—Piscataquis	Gen	Indiv	12	7	8	45	55
McNaughton Hospital	Gen	Indiv	12	7	8	45	55
Old Town 7 65—Penobscot	Gen	Corp	12	10	6	81	455
Home Private Hospital	Gen	Corp	12	10	6	81	455
Portland 73 643—Cumberland	Chil	NPA	100	79			555
Children's Hospital	Chil	NPA	100	79			555
Farrington Hospital	Gen	City	161	149	14	101	1 555
Dr Leighton's Private Hosp	GynOb	Indiv	14	10	12	111	455
Maine Eye and Ear Infirmary	Gen	NPA	125	124	31	655	4 655
Maine General Hospital	Gen	NPA	270	215	50	1 155	7 075
Queen's Hospital	Gen	Church	65	51	16	250	1 555
State Street Hospital	Gen	Corp	65	51	16	250	1 555
U S Marine Hospital	Gen	USHS	62	62			611
Presque Isle 7 335—Aroostook	TB	State	125	110			155
Northern Maine Sanatorium	TB	State	125	110			155
Presque Isle General Hospital	Gen	NPA	50	31	10	162	1 015
Rockland 8 659—Knox	Gen	NPA	65	34	5	155	855
Knox County General Hosp	Gen	NPA	65	34	5	155	855
Rumford 10 220—Oxford	Gen	NPA	63	49	12	256	2 115
Rumford Community Hosp	Gen	NPA	63	49	12	256	2 115
Sanford 14 856—York	Gen	NPA	42	35	8	151	1 399
Henrietta D Goodall Hosp	Gen	NPA	42	35	8	151	1 399
Skowhegan 7 150—Somerset	Gen	NPA	30	16	5	75	615
Redington Memorial Hospital	Gen	NPA	30	16	5	75	615
Totus 2 550—Kennebec	Gen	Indiv	205	202			1 555
Veterans Admin Facility	Gen	Indiv	205	202			1 555
Waterville 16 658—Kennebec	Gen	Church	120	96	20	520	6 455
Sisters Hospital	Gen	NPA	34	26	6	92	1 091
Thayer Hospital	Gen	NPA	34	26	6	92	1 091
Westbrook 11 05—Cumberland	Gen	NPA	22			No data supplied	
Westbrook Hospital	Gen	NPA	22			No data supplied	
Related Institutions							
Auburn 19 517—Androscoggin	Gen	Indiv	10	4	4	51	105
Auburn Private Hospital	Gen	Indiv	10	4	4	51	105
Bangor 29 522—Penobscot	NAM	Indiv	15	12			135
Gay Private Hospital	NAM	Indiv	15	12			135
Bar Mills 400—York	Gen	Corp	15	6	2	10	155
Buxton Hollis Hospital	Gen	Corp	15	6	2	10	155
Eagle Lake 1 501—Aroostook	Gen	Church	45	21			611
Northern Maine General Hospital	Gen	Church	45	21			611
Pownal 5—Cumberland	MeDe	State	1 120	1 074			555
Pownal State School	MeDe	State	1 120	1 074			555
Union 1 100—Knox	NAM	Corp	30	15			17
Jones Sanitarium	NAM	Corp	30	15			17
Van Buren 5 250—Aroostook	Gen	Church	15	10	5	39	315
Hotel Dieu Hospital	Gen	Church	15	10	5	39	315
York Village 1 500—York	Gen	NPA	21	7	7	57	235
York Hospital	Gen	NPA	21	7	7	57	235

Key to symbols and abbreviations is on page 1027

## MARYLAND

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Aberdeen Proving Ground—Harford Station Hospital	Gen	Army	12	3			192
Annapolis 1300—Anne Arundel	Gen	NPAsn	85	43	19	510	2,741
Annapolis Emergency Hospital	Gen	Navy	102	79			1,876
Baltimore 300—Baltimore City	Gen	City	1270	920	80	1,571	6,186
Baltimore City Psychopathic Hospital	Unit of Baltimore City Hospitals						
Baltimore City Tuberculosis Hospital	Unit of Baltimore City Hospitals						
Baltimore Eye, Ear and Throat Charity Hospital	FNT	NPAsn	60	46		7,223	230
Beck Diagnostic Clinic	Gen	Indiv	12	9			3,121
Bon Secours Hospital**	Gen	Church	158	142	32	1,044	3,663
Children's Hospital School	Orth	NPAsn	130	93			666
Church Home and Infirmary**	Gen	Church	163	131	28	678	4,070
Franklin Square Hosp**	Gen	NPAsn	217	127	51	1,430	4,776
Gundry Sanitarium	N&M	Indiv	40	30			25
Hospital for Women**	Gen	NPAsn	124	99	38	1,083	3,363
James Lawrence Kernan Hospital and Industrial School for Crippled Children	Orth	NPAsn	103	65			217
Johns Hopkins Hospital**	Gen	NPAsn	909	605	70	1,876	10,864
Johnston Memorial Children's Hospital	Unit of Johns Hopkins Hospital						
Maryland General Hospital**	Gen	Church	238	206	20	755	5,509
Mercy Hospital**	Gen	Church	243	201	50	1,300	7,569
Mount Hope Retreat	N&M	Church	600	560			108
Philips Psychiatric Clinic	Unit of Johns Hopkins Hospital						
Presbyterian Eye, Ear and Throat Charity Hospital	ENT	Church	40	9			1,033
Provident Hospital and Free Dispensary**	Gen	NPAsn	140	120	22	570	2,470
St Agnes Hospital**	Gen	Church	270	130	28	1,067	4,934
St Joseph's Hospital**	Gen	Church	240	207	46	1,344	6,910
Stinal Hospital**	Gen	NPAsn	200	210	40	1,100	5,619
South Baltimore General Hospital**	Gen	NPAsn	143	109	27	778	3,750
Sydenham Hospital**	Gen	City	110	110	46		1,103
Union Memorial Hosp**	Gen	NPAsn	346	240	36	830	7,847
U. S. Marine Hospital	Gen	USPHS	331	422			5,597
University Hospital**	Gen	State	430	357	50	1,673	11,318
West Baltimore General Hospital**	Gen	NPAsn	128	101	23	789	3,540
Brentwood 2433—Prince Georges	N&M	Corp	30	No data supplied			
Brentwood Sanatorium							
Brunswick 3800—Frederick	Gen	Indiv	30	12	5	81	563
Schnauffer Hospital	Gen	NPAsn	70	36	15	216	1,123
Cambridge 10102—Dorchester	Gen	State	500	445			1,571
Cambridge Maryland Hosp**	Gen	NPAsn	70	36	15	216	1,123
Eastern Shore State Hospital	Gen	State	500	445			1,571
Eastonsville 704—Baltimore	N&M	Indiv	50	30			151
Harlem Lodge	Gen	State	2,100	2,003			619
Spring Grove State Hospital	Gen	State	2,100	2,003			619
Chesterdown 2700—Kent	Gen	NPAsn	31	16	8	98	576
Kent and Upper Queen Anne's General Hospital	Gen	NPAsn	31	16	8	98	576
Crisfield 3908—Somerset	Gen	County	26	14	5	76	487
Edward W. McCready Memorial Hospital	Gen	County	26	14	5	76	487
Crownsville 30—Anne Arundel	Gen	State	1,513	1,006			498
Crownville State Hospital	Gen	State	1,513	1,006			498
Hospital for Colored Feeble-minded Children	Unit of Crownsville State Hospital						
Cumberland 39483—Allegany	Gen	Church	119	80	44	626	2,575
Allegany Hospital of the Sisters of Charity	Gen	CyCo	166	129	30	630	4,340
Easton 4528—Talbot	Gen	NPAsn	100	70	19	200	2,000
Emergency Hospital	Gen	NPAsn	100	70	19	200	2,000
Edgewood Arsenal—Harford	Gen	Army	56	23			753
Elkton 3018—Cecil	Gen	NPAsn	52	30	8	312	1,470
Union Hosp of Cecil County	Gen	NPAsn	52	30	8	312	1,470
Fort George G. Meade—Anne Arundel	Gen	Army	113	68	5	27	1,382
Frederick 15462—Frederick	Gen	County	50	30	10	234	630
Emergency Hospital	Gen	NPAsn	120	70	13	349	2,263
Frederick City Hospital	Gen	NPAsn	120	70	13	349	2,263
Frostburg 7609—Allegany	Gen	State	40	28	10	103	1,060
Miners Ho pital	Gen	State	40	28	10	103	1,060
Glenn Dale 210—Prince Georges	See Washington D C						
Glenn Dale Sanatorium	See Washington D C						
Hagerstown 32491—Washington	Gen	NPAsn	142	130	24	713	4,956
Washington County Hosp**	Gen	NPAsn	142	130	24	713	4,956
Havre de Grace 4907—Harford	Gen	NPAsn	41	40	8	262	1,064
Harford Memorial Hospital	Gen	NPAsn	41	40	8	262	1,064
Henryton 30—Carroll	TB	State	500	411			534
Maryland Tuberculosis Sanatorium	TB	State	500	411			534
Ijamsville 200—Frederick	N&M	Indiv	29	28			33
Riggs Cottage Sanitarium	N&M	Indiv	29	28			33
La Plata 400—Charles	Gen	County	20	13	6	120	434
Physicians Memorial Hosp	Gen	County	20	13	6	120	434
Laurel 2823—Prince Georges	See Washington D C						
District Training School	See Washington D C						
Laurel Sanitarium	N&M	Indiv	70	70			300
Warren Hospital	Gen	Part	9	4	8	101	220
Leonardtown 668—St Marys	Gen	NPAsn	20	11	6	117	516
St Mary's Hospital	Gen	NPAsn	20	11	6	117	516
Mount Wilson 220—Baltimore	Gen	NPAsn	20	11	6	117	516
Mount Wil on Branch Maryland Tuberculosis Sanitarium	TB	State	210	191			287

## MARYLAND—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Olney 100—Montgomery	Gen	NPAsn	40	33	14	210	1,402
Montgomery County General Hospital	Gen	NPAsn	40	33	14	210	1,402
Perry Point 80—Cecil	Gen	NPAsn	40	33	14	210	1,402
Veterans Admin Facility	Gen	NPAsn	40	33	14	210	1,402
Prince Frederick 300—Calvert	Gen	NPAsn	40	33	14	210	1,402
Calvert County Hospital	Gen	NPAsn	40	33	14	210	1,402
Riverton 2000—Baltimore	TB	NPAsn	60	56			63
Mount Pleasant	TB	NPAsn	60	56			63
Relay 2016—Baltimore	N&M	Part	30	22			139
Relay Sanitarium	N&M	Part	30	22			139
Rockville 2047—Montgomery	N&M	Indiv	60	47			103
Chestnut Lodge Sanitarium	N&M	Indiv	60	47			103
Salisbury, 13713—Wicomico	TB	State	70	61			107
Maryland Tuberculosis Sanatorium Eastern Shore	TB	State	70	61			107
Branch Peninsula General Hospital	Gen	NPAsn	117	117	30	541	3,970
Silver Spring 28000—Montgomery	N&M	Part	45	35			318
Cedarcroft Sanatorium	N&M	Part	45	35			318
State Sanatorium 200—Frederick	TB	State	510	473			517
Maryland Tuberculosis Sanatorium	TB	State	510	473			517
Sykesville 806—Carroll	Gen	NPAsn	40	33	14	210	1,402
Springfield State Hospital	Gen	NPAsn	40	33	14	210	1,402
Takoma Park 800—Montgomery	Gen	NPAsn	40	33	14	210	1,402
Walter Reed General Hospital	See Washington D C						
Washington Sanitarium and Hospital	See Washington, D C						
Towson 2074—Baltimore	Nerv	Indiv	27	18			82
Alburt Manor	Nerv	Indiv	27	18			82
Hospital for Consumptives (Ludowood Sanatorium)	TB	NPAsn	100	100			100
Sheppard and Fnoch Pratt Hospital	N&M	NPAsn	200	200			318
Western Port 3005—Allegany	Gen	Part	17	8	5	63	507
Reeves Clinic	Gen	Part	17	8	5	63	507

## Related Institutions

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Baltimore 800—Baltimore City	Gen	NPAsn	40	33	14	210	1,402
Baltimore City Jail Hospital	Gen	NPAsn	40	33	14	210	1,402
Happy Hills Convalescent Home for Children	Conv	NPAsn	80	64			241
Home for Incurables	Incur	NPAsn	100	100			33
Maryland Penitentiary Hospital	Incur	NPAsn	100	100			33
Jessups 400—Anne Arundel	Gen	NPAsn	40	33	14	210	1,402
Maryland House of Correction	Gen	NPAsn	40	33	14	210	1,402
Owens Mills 130—Baltimore	Gen	NPAsn	40	33	14	210	1,402
Roewood State Training School	Gen	NPAsn	40	33	14	210	1,402
Rockville 2047—Montgomery	Gen	NPAsn	40	33	14	210	1,402
Christ Child Farm for Convalescent Children	Conv	NPAsn	20	25			60
Sparrows Point—Baltimore	Indus	NPAsn	24	2			0
Sparrows Point Hospital	Indus	NPAsn	24	2			0

## MASSACHUSETTS

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Acushnet (New Bedford P O)—Bristol	Gen	NPAsn	40	40	17	4,2	1,517
Acushnet Hospital	Gen	NPAsn	40	40	17	4,2	1,517
Adams 12008—Berkshire	Gen	City	40	26	10	225	1,010
W. B. Plunkett Memorial Hospital	Gen	City	40	26	10	225	1,010
Amesbury 10002—Essex	Gen	City	30	19	6	157	1,341
Amesbury Hospital	Gen	City	30	19	6	157	1,341
Arlington 40013—Middlesex	N&M	Corp	60	41			318
Ring Sanatorium and Hosp	Gen	NPAsn	80	60	20	224	2,001
Symmes Arlington Hospital	Gen	NPAsn	80	60	20	224	2,001
Attleboro 22071—Bristol	TB	County	60	54			87
Bristol County Tuberculosis Hospital	TB	County	60	54			87
Sturdy Memorial Hospital	Gen	NPAsn	100	61	06	600	0,144
Ayer 3572—Middlesex	Gen	NPAsn	23	13	7	105	451
Community Memorial Hospital	Gen	NPAsn	23	13	7	105	451
Baldwinsville 2200—Worcester	Chil	NPAsn	130	101			13
Hospital Cottages for Children	Chil	NPAsn	130	101			13
Bedford 3807—Middlesex	Gen	NPAsn	15	11			41
Veterans Admin Facility	Gen	NPAsn	15	11			41
Belmont 26607—Middlesex	N&M	NPAsn	200	198			212
McLean Hospital	N&M	NPAsn	200	198			212
Beverly 20037—Essex	Gen	NPAsn	100	110	41	617	3,407
Boston 770816—Suffolk	Nerv	NPAsn	15	11			41
Adams House (Adams Nervine)	Gen	Corp	25	21	6	100	849
Audubon Hospital	Gen	NPAsn	25	21	6	100	849
Beth Israel Hospital**	Gen	NPAsn	232	1310	117	2,901	39,400
Boston City Hospital**	Gen	City	232	1310	117	2,901	39,400
Boston Floating Hospital**	Chil	NPAsn	60	31			860
Boston Lying In Hospital**	Nat	NPAsn	136	112	180	2,900	3,700
Boston Psychopathic Hospital	Gen	NPAsn	110	90			1,000
Boston State Hospital**	Gen	State	2,540	2,448			1,100
Carney Hospital**	Gen	Church	234	177	24	503	5,619
Channing Home	TB	NPAsn	27	20			34
Children's Hospital**	Chil	NPAsn	283	179			5,000
Doctors Hospital	Gen	Corp	27	15	10	106	679

## MASSACHUSETTS—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Evangeline Booth Maternity Hospital and Home	Mat	Church	70	52	60	551	1 013
Faulkner Hospital	Gen	NPAssn	137	109	33	604	4 004
Glenside Hospital	N&M	Corp	125	100			235
Harley Private Hospital	Gen	Corp	59	32	21	344	1 714
House of the Good Samaritan	Card	NPAssn	83	66			109
Huntington Clinic	Maintained by Massachusetts Gen Hosp						
Infants Hospital	Unit of Children's Hospital						
Jewish Memorial Hospital	GenChr	NPAssn	79	75			172
Joseph H. Pratt Diagnostic Hospital	IntMed	NPAssn	43	29			1 505
Long Island Hospital	GenChr	City	578	525	5	25	1 399
Massachusetts Eye and Ear Infirmary	ENT	NPAssn	227	132			6 430
Massachusetts General Hospital	Gen	NPAssn	502	401			7 823
Massachusetts General Hospital Baker Memorial	Gen	NPAssn	300	255	42	653	6 002
Massachusetts General Hospital Phillips House	Gen	NPAssn	102	88	15	204	2 392
Massachusetts Memorial Hospital	Gen	NPAssn	414	285	41	1 061	7 500
Massachusetts Women's Hospital	Gen	NPAssn	62	47	22	280	1 539
New England Baptist Hospital	Gen	NPAssn	235	194	25	71	6 402
New England Deaconess Hospital	Gen	Church	315	237			7 512
New England Hospital for Women and Children	Gen	NPAssn	185	117	75	1 591	3 801
Palmer Memorial Hospital	Unit of New England Deaconess Hospital						
Peter Bent Brigham Hospital	Gen	NPAssn	250	173			4 704
Robert Breck Brigham Hospital	Gen	NPAssn	110	83			1 145
Robert Dawson Evans Memorial	Unit of Massachusetts Memorial Hospitals						
St. Elizabeth's Hospital	Gen	Church	252				No data supplied
St. Margaret's Hospital	Gen	Church	75	44	34	85	2 316
St. Mary's Lying in Hospital	MatCh	Church	48	24	28	123	179
Sanatorium Division of Boston City Hospital	TB	City	616	519			604
U. S. Marine Hospital	Gen	USPHS	336	164			2 076
Bridgewater 8 902—Plymouth	See State Farm						
Bridgewater State Hospital							
Brookline 62 343—Plymouth							
Brookline Hospital	Gen	NPAssn	126	101	29	528	2 872
Goddard Hospital	Gen	Corp	63	58	20	656	2 277
Moore Hospital	Gen	Indiv	25	19	8	142	652
Brookline 49 780—Norfolk							
Allerton Hospital	Gen	Corp	50	47	20	411	2 181
Bellevue Hospital	Gen	NPAssn	30	15	6	75	833
Board of Health Hospital	TB	City	55	21			48
Bournewood Hospital	N&M	Indiv	14	8			1
Brooks Hospital	Gen	NPAssn	63	45			1 699
Corey Hill Hospital	Gen	Corp	60	50			1 515
Free Hospital for Women	Gyn	NPAssn	101	77			2 729
Parkway Hospital	Unit of Free Hospital for Women						
Cambridge 110 518—Middlesex							
Cambridge City Hospital	Gen	City	300	205	100	1 573	6 632
Cambridge Hospital	Gen	NPAssn	218	173	51	1 328	5 670
Cambridge Sanatorium	TB	City	100	83			92
Charlesgate Hospital	Gen	Corp	85	46	10	31	2 090
Chester Hospital	Gen	Corp	40	25	20	306	972
Canton 6 381—Norfolk							
Massachusetts Hosp. School	Orth	State	300	257			319
Chelsea 41 253—Suffolk							
Captain John Adams Hospital at Soldiers Home	Inst	State	237	232			2 516
Chelsea Memorial Hospital	Gen	Corp	60	67	25	615	2 426
U. S. Naval Hospital	Gen	Navy	452	305	9	62	3 503
Clinton 12 440—Worcester							
Clinton Hospital	Gen	NPAssn	63	35	20	296	1 661
Concord 7 912—Middlesex							
Emerson Hospital	Gen	NPAssn	37	25	18	310	1 100
Valleyhead	Nerv	Indiv	20	8			194
Danvers 14 170—Essex							
Hunt Memorial Hospital	Gen	City	20	10	6	77	344
Everett 46 784—Middlesex							
Whidden Memorial Hosp.	Gen	NPAssn	95	77	20	678	3 564
Fall River 115 428—Bristol							
Fall River General Hospital	GenTb	City	274	270			2 403
St. Anne's Hospital	Gen	Church	130	96	26	403	3 107
Truesdale Hospital	Gen	NPAssn	145	112	27	753	3 904
Union Hospital	Gen	NPAssn	151	109	35	818	3 725
Fitchburg 41 824—Worcester							
Burbank Hospital	GenTb	Corp	205	164	42	754	4 652
Lucy Helen Memorial Hosp.	Unit of Burbank Hospital						
Forest Hills (Boston P. O.)—Suffolk							
Forest Hills General Hospital	Gen	NPAssn	150				No data supplied
Fort Devens—Middlesex							
Station Hospital	Gen	Army	99	71			1 554
Foxboro 6 302—Norfolk							
Foxboro State Hospital	Ment	State	1 918	1 346			254
Framingham 23 214—Middlesex							
Framingham Union Hosp.	Gen	NPAssn	103	77	20	605	3 122
Gardner 20 206—Worcester							
Gardner State Hospital	Ment	State	1 475	1 418			1
Henry Heywood Memorial Hospital	Gen	NPAssn	75	70	23	446	2 529
Georgetown 1 503—Essex							
Baldpate	N&M	Corp	47	25			202
Gloucester 21 016—Essex							
Addison Gilbert Hospital	Gen	NPAssn	55	56	19	321	2 311
Great Barrington 1 574—Berkshire							
Fairview Hospital	Gen	NPAssn	53	40	13	184	1 054

## MASSACHUSETTS—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Greenfield 15 672—Franklin							
Franklin County Public Hospital	Gen	NPAssn	57	69	21	475	3 103
Groton 2 550—Middlesex							
Groton Hospital	Gen	Corp	14				No data supplied
Hanson 2 570—Plymouth							
Plymouth County Hospital	TB	County	140	50			79
Hathorne 146—Essex							
Danvers State Hospital	Ment	State	2 371	2 292			794
Haverhill 46 752—Essex							
Benson Hospital	Gen	Indiv	25	12	8	23	375
Haverhill Municipal Hospitals (Hale)	Gen	City	170	91	78	553	4 457
Haydenville 1 606—Hampshire							
Hampshire County Sanatorium	TB	County	50	47			45
Holden 3 924—Worcester							
Holden District Hospital	Gen	NPAssn	32	25	6	122	1 031
Holyoke 53 750—Hampden							
Holyoke Hospital	Gen	NPAssn	131	106	24	573	2 918
Providence Hospital	Gen	Church	163	136	32	1 000	4 125
Hyannis 1 800—Barnstable							
Cape Cod Hospital	Gen	NPAssn	65	49	15	363	1 810
Ipswich 6 348—Essex							
Benjamin Stickney Cable Memorial Hospital	Gen	NPAssn	23	14	7	130	496
Lawrence 84 323—Essex							
Bessie Burke Memorial Hosp	Gen	City	115	85	15	132	1 078
Clover Hill Hospital	Gen	Corp	60	45	20	618	1 862
Lawrence General Hospital	Gen	NPAssn	176	149	42	773	4 774
Leominster 22 226—Worcester							
Leominster Hospital	Gen	NPAssn	61	48	12	343	1 951
Lowell 101 880—Middlesex							
Lowell General Hospital	Gen	NPAssn	135	97	30	650	3 197
St. John's Hospital	Gen	Church	150	151	30	763	4 433
St. Joseph's Hospital	Gen	Church	116	88	18	572	3 399
Shaw Hospital	Gen	Indiv	20	8	8	93	233
Ludlow 8 181—Hampden							
Ludlow Hospital	Gen	NPAssn	50	22	14	351	948
Lynn 98 123—Essex							
Lynn Hospital	Gen	NPAssn	154	109	48	1 552	6 473
Union Hospital	Gen	NPAssn	56	39	25	611	1 850
Malden 58 010—Middlesex							
Malden Hospital	Gen	NPAssn	231	125	40	1 060	4 984
Marblehead 10 856—Essex							
Mary A. Alley Emergency Hospital	Gen	City	15	10	8	72	389
Marlboro 15 154—Middlesex							
Marlborough Hospital	Gen	NPAssn	63	50	22	415	1 849
Medfield 4 384—Norfolk							
Medfield State Hospital	Ment	State	1 859	1 539			101
Medford 63 083—Middlesex							
Lawrence Memorial Hospital	Gen	NPAssn	75	63	34	900	2 519
Melrose 25 333—Middlesex							
Melrose Hospital	Gen	NPAssn	100	78	25	616	3 114
New England Sanitarium and Hospital	Gen	Church	135	95	17	223	2 953
Methuen 21 850—Essex							
Mary E. McGowan Memorial Hospital	Gen	Corp	28	22	9	784	810
Middleboro 9 032—Plymouth							
Lakerville State Sanatorium	TB	State	302	247			218
St. Luke's Hospital	Gen	NPAssn	31	15	15	153	60
Middleton 2 248—Essex							
Essex County Tuberculosis Hospital	TB	County	360	316			470
Milford 15 388—Worcester							
Milford Hospital	Gen	Corp	61	49	15	492	2 349
Milton 18 708—Norfolk							
Milton Hospital and Convalescent Home	Gen	NPAssn	25	13	6	91	577
Montague City 635—Franklin							
Farren Memorial Hospital	Gen	Church	74	52	12	250	1 574
Natick 12 851—Middlesex							
Leonard Morse Hospital	Gen	City	61	40	14	315	1 448
Norham 12 445—Norfolk							
Glover Memorial Hospital	Gen	City	22	17	10	109	553
New Bedford 110 341—Bristol							
St. Luke's Hospital	Gen	NPAssn	294	225	45	1 436	7 587
Sassaquin Sanatorium	TB	NPAssn	124	107			96
Union Hospital	Gen	Corp	32	27			910
Newburyport 13 916—Essex							
Anna Jaques Hospital	Gen	NPAssn	52	36	10	202	1 110
Worcester Memorial Hospital	Gen	NPAssn	24	13	5	84	418
Newton 69 573—Middlesex							
New England Peabody Home for Crippled Children	TbOr	NPAssn	100	76			12
Newton Hospital	Gen	NPAssn	234	193	52	956	5 440
Norfolk 2 294—Norfolk							
State Prison Colony Hosp.	Inst	State	73	35			439
North Adams 22 213—Berkshire							
North Adams Hospital	Gen	NPAssn	93	62	19	367	2 295
Northampton 24 794—Hampshire							
Cooley Dickinson Hospital	Gen	NPAssn	139	91	22	506	3 074
Northampton State Hospital	Ment	State	2 230	2 143			059
Veterans Admin. Facility	Ment	Vet	760	769			113
North Grafton 1 150—Worcester							
Crafton State Hospital	Ment	State	1 750	1 639			254
North Wilmington 472—Middlesex							
North Reading State Sanatorium	TbChil	State	297	171			121
Norwood 15 383—Norfolk							
Norwood Hospital	Gen	NPAssn	85	93	20	683	3 917
Oak Bluff 1 584—Dukes							
Martha's Vineyard Hospital	Gen	NPAssn	29	11	10	65	444

Key to symbols and abbreviations is on page 1027

## MASSACHUSETTS—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Ipswich 9149—Hampden	Epil	State	1,661	1,518			157
Monson State Hospital*†	Gen	NPAsen	32	17	8	111	1,082
Wing Memorial Hospital*†	Gen	City	65	27	16	103	1,001
Peabody 21711—Essex	Gen	NPAsen	42	42	10	162	1,050
Josiah B. Thomas Hospital	Gen	NPAsen	210	133	33	554	4,053
Pittsfield 4964—Berkshire	Gen	Church	146	128	44	781	3,536
Hillcrest Hospital	Gen	NPAsen	75	37	10	254	1,224
House of Mercy Hospital*†	Gen	NPAsen	210	133	33	554	4,053
St. Luke's Hospital*†	Gen	Church	146	128	44	781	3,536
Plymouth 13100—Plymouth	Gen	NPAsen	75	37	10	254	1,224
Jordan Hospital*†	Gen	NPAsen	75	37	10	254	1,224
Pocasset 365—Barnstable	Gen	NPAsen	75	37	10	254	1,224
Barnstable County Sanatorium	Gen	Tb County	70	57			337
Quincy 75810—Norfolk	Gen	City	274	253	60	1,530	9,120
Quincy City Hospital*†	Gen	City	274	253	60	1,530	9,120
Rutland 2181—Worcester	Gen	City	274	253	60	1,530	9,120
Jewish Tuberculosis Sanatorium	TB	NPAsen	30	20			20
Rutland State Sanatorium*†	TB	State	370	282			274
Rutland Heights 800—Worcester	Gen	Tb Vet	465	407			1,641
Veterans Admin. Facility*†	Gen	Tb Vet	465	407			1,641
Salem 41213—Essex	Chil	NPAsen	50	33			571
North Shore Babies Hosp.	Chil	NPAsen	50	33			571
Salem Hospital*†	Chil	NPAsen	236	168	49	902	5,073
Sharon 3737—Norfolk	Chil	NPAsen	44	33			53
Sharon Sanatorium	Chil	NPAsen	44	33			53
Somerville 107177—Middlesex	Gen	NPAsen	116	103	30	816	3,408
Somerville Hospital*†	Gen	NPAsen	116	103	30	816	3,408
South Braintree—Norfolk	TB	County	168	168			128
Norfolk County Hospital*†	TB	County	168	168			128
Southbridge 16825—Worcester	Gen	NPAsen	52	31	15	291	1,078
Harrington Memorial Hosp.	Gen	NPAsen	52	31	15	291	1,078
South Dartmouth 1815—Bristol	Gen	NPAsen	52	31	15	291	1,078
Sole Marine Orthopedic Hospital for Children	Orth	NPAsen	40	36			31
Springfield 149554—Hampden	Tb Iso	City	98	64			630
Health Department Hospital*†	Tb Iso	City	98	64			630
Mercy Hospital*†	Gen	Church	315	267	50	1,973	8,337
Shriners Hospital for Crippled Children*†	Orth	NPAsen	60	55			301
Springfield Hospital*†	Gen	NPAsen	281	238	4	9	6,076
Wesson Maternity Hospital*†	Mat	NPAsen	62	57	66	1,729	1,553
Wesson Memorial Hospital*†	Gen	NPAsen	116	74			2,920
State Farm 200—Plymouth	Gen	NPAsen	116	74			2,920
Bridgewater State Hospital	Ment	State	968	86			63
Stockbridge 1815—Berkshire	Gen	NPAsen	30	20			177
Auten Riggs Foundation	Gen	NPAsen	30	20			177
Taunton 3737—Bristol	Gen	NPAsen	60	56	40	470	3,032
Morton Hospital*†	Gen	NPAsen	60	56	40	470	3,032
Taunton State Hospital*†	Gen	NPAsen	60	56	40	470	3,032
Fewsbury, 6261—Middlesex	Ment	State	1,870	1,853			556
Tewksbury State Hospital and Infirmary*†	Gen	Tb State	340	225	40	51	2,196
Vineyard Haven 1,000—Dukes	Gen	USPHS	24	15			117
U. S. Marine Hospital	Gen	USPHS	24	15			117
Walpole 7443—Norfolk	Gen	NPAsen	147	81			1,112
Pondville Hospital*†	Cancer	State	147	81			1,112
Waltham 40020—Middlesex	Gen	NPAsen	1,696	1,597			91
Metropolitan State Hospital*†	Gen	NPAsen	1,696	1,597			91
Middlesex County Sanatorium*†	TB	County	350	315			330
Waltham Contagious Hosp.	Gen	NPAsen	162	118	53	612	2,172
Waltham Hospital*†	Gen	NPAsen	162	118	53	612	2,172
Ware 7557—Hampshire	Gen	NPAsen	40	36	18	396	1,543
Mary Lane Hospital*†	Gen	NPAsen	40	36	18	396	1,543
Wareham 6364—Plymouth	Gen	NPAsen	40	36	18	396	1,543
Tobey Hospital	Gen	NPAsen	40	36	18	396	1,543
Webster 13185—Worcester	Gen	NPAsen	30	30	8	312	696
Webster District Hospital	Gen	NPAsen	30	30	8	312	696
Wellesley 15127—Norfolk	Gen	NPAsen	30	30	8	312	696
Channing Sanitarium	N&M	Corp	35	21			31
Wiswall Sanitarium	N&M	Indiv	30	24			16
Westboro 6463—Worcester	Gen	NPAsen	85	55	16	343	2,416
Westboro State Hospital*†	Gen	NPAsen	85	55	16	343	2,416
Westfield 18793—Hampden	Gen	NPAsen	85	55	16	343	2,416
Noble Hospital	Gen	NPAsen	85	55	16	343	2,416
Westfield State Sanatorium*†	Tb Cancer	State	233	197			876
Westwood 3876—Norfolk	Gen	NPAsen	71	63	38		2,570
Westwood Lodge	N&M	Corp	21	14			36
Weymouth 23868—Norfolk	Gen	NPAsen	71	63	38		2,570
Weymouth Hospital*†	Gen	NPAsen	71	63	38		2,570
Whitinsville 7000—Worcester	Gen	NPAsen	25	15	8	310	647
Whitinsville Hospital	Gen	NPAsen	25	15	8	310	647
Winchendon 6375—Worcester	Gen	Corp	26	16	8	97	727
Millers River Hospital	Gen	Corp	26	16	8	97	727
Winchester 15081—Middlesex	Gen	NPAsen	69	62	20	425	1,914
Winchester Hospital	Gen	NPAsen	69	62	20	425	1,914
Winthrop 16765—Suffolk	Gen	Army	118	68	6	59	432
Station Hospital*†	Gen	NPAsen	44	42	20	547	1,620
Winthrop Community Hosp.	Gen	NPAsen	44	42	20	547	1,620
Woburn 19751—Middlesex	Gen	NPAsen	42	32	19	201	1,202
Charles Choate Memorial Hospital*†	Gen	NPAsen	42	32	19	201	1,202
Worcester 193694—Worcester	Tb Iso	City	250	144			987
Belmont Hospital*†	Gen	NPAsen	50	45	18	327	1,739
Fairlawn Hospital*†	Gen	NPAsen	50	45	18	327	1,739
Harvard Private Hospital	Gen	Corp	25	12	5	61	471
Memorial Hospital*†	Gen	NPAsen	185	155	30	849	7,747
St. Vincent Hospital*†	Gen	Church	280	216	33	723	5,934
Worcester City Hospital*†	Gen	City	480	370	70	1,822	11,941
Worcester County Sanatorium*†	TB	County	130	103			95
Worcester Hahnemann Hospital*†	Gen	NPAsen	113	111	37	653	3,158
Worcester State Hospital*†	Gen	NPAsen	2,650	2,511			897

## MASSACHUSETTS—Continued

Related Institutions	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Andover, 11,122—Essex	Inst	NPAsen	50	20			0.0
Ipswich Infirmary	Inst	NPAsen	50	20			0.0
Leicester, 3,507—Hampshire	McDe	State	1,315	1,291			53
Belchertown State School	McDe	State	1,315	1,291			53
Boston 770,816—Suffolk	Gen	Part	10	12	4	43	403
Bay State Hospital	Gen	Part	10	12	4	43	403
Boston Home for Incurables	ChrOr	NPAsen	56	55			9
Deer Island Hospital Suffolk	Inst	CyCo	40	25			360
County House of Correction	Inst	CyCo	40	25			360
Florence Crittenton Home and Hospital	Mat	NPAsen	21	9	47	102	118
New England Home for Little Wanderers	Inst	NPAsen	44	15	6		479
Prendergast Preventorium	TB	NPAsen	120	115			221
Riverbank Cottage	Gen	Indiv	20	4	4	2	106
Falsham Cuni Home	Mat	NPAsen	34	5	18	62	86
Dr. Taylor's Private Hospital	Drug	Indiv	16	5			1.5
Washingtonian Hospital	Alcoh	NPAsen	25	21			917
Cambridge 110,570—Middlesex	Alcoh	NPAsen	25	21			917
Holy Ghost Hospital for Incurables	Incur	Church	216	209			149
Egypt, 600—Plymouth	Orth	NPAsen	50				No data supplied
Children's Sunlight Hospital	Orth	NPAsen	50				No data supplied
Framingham, 23,214—Middlesex	N&M	Corp	22	19			51
Woodside Cottage	N&M	Corp	22	19			51
Greensfield, 16,672—Franklin	Tb Iso	City	20	4			126
Greensfield Isolation Hospital	Tb Iso	City	20	4			126
Haverhill 40,752—Essex	Chr	City	72	2			10
Haverhill City Infirmary	Chr	City	72	2			10
Haverhill Municipal Hospital (Contagious)	Iso	City	40	2			51
Holbrook 3,750—Norfolk	Conv	Indiv	16	6			101
Flmhurst Hospital and Sanatorium	Conv	Indiv	16	6			101
Ipswich 101,359—Middlesex	Tb Iso	City	60	49			151
Ipswich Isolation Hospital	Tb Iso	City	60	49			151
Lynn 25,123—Essex	Iso	City	75	6			135
Lynn Health Department Hospital	Iso	City	75	6			135
Marblehead 10,556—Essex	Conv	NPAsen	91	91			101
Children's Island Sanitarium	Conv	NPAsen	91	91			101
Pittsfield 49,614—Berkshire	TB	NPAsen	14	6			91
Pittsfield Anti-Tuberculosis Hospital	TB	NPAsen	14	6			91
Quincy 75,810—Norfolk	Conv	Corp	30	27			34
Wellington Hospital Home	Conv	Corp	30	27			34
Salem, 41,213—Essex	Health	Department	60	4			87
Health Department Hospital for Communicable Diseases	Iso	City	60	4			87
Somerville 102,177—Middlesex	Iso	City	70	10			250
Somerville Contagious Disease Hospital	Iso	City	70	10			250
Springfield 149,554—Hampden	Conv	Indiv	25	15			42
Bucall Nursing Home	Conv	Indiv	25	15			42
City of Springfield Infirmary	Inst	City	115	91			355
Waltham 40,070—Middlesex	Med	State	1,955	1,925			61
Walter F. Fernald State School	Med	State	1,955	1,925			61
Wellesley, 1,127—Norfolk	Orth	NPAsen	75	51			276
Convalescent Home of the Children's Hospital	Orth	NPAsen	75	51			276
Simpson Infirmary of Wellesley College	Inst	NPAsen	27	14			845
West Concord 3,300—Middlesex	Inst	State	50	5			254
Massachusetts Reformatory Hospital	Inst	State	50	5			254
Whitman 7,759—Plymouth	Gen	Indiv	15	10	6	13	36
Whitman Hospital	Gen	Indiv	15	10	6	13	36
Williamstown 4,994—Berkshire	Inst	NPAsen	21	4			352
Williams College Infirmary	Inst	NPAsen	21	4			352
Wrentham 4,674—Norfolk	McDe	State	2,075	1,960			131
Wrentham State School	McDe	State	2,075	1,960			131

## MICHIGAN

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Adrian 14,930—Lenawee							
Emma L. Dixby Hospital	Gen	City	62	43	17	578	1,532
Lenawee County Tuberculosis Sanatorium	TB	County	78	26			25
Ablon 8,345—Calhoun							
James W. Shickel Memorial Hospital	Gen	City	40	26	8	235	1,032
Allegan 4,576—Allegan							
Allegan Health Center	Gen	NPA sen	35	23	12	211	1,112
Alma 7,202—Gratiot							
Carney Wilcox Miller Hosp	Gen	NPA sen	33	11	6	108	560
R. B. Smith Memorial Hosp	Gen	NPA sen	20	17	8	209	571
Almont 924—Lapeer							
Bishop Hospital	Gen	Indiv	14	9	5	93	316
Alpena 12,608—Alpena							
Alpena General Hospital	Gen	City	72	43	15	310	1,411
Ann Arbor 29,815—Washtenaw							
Mercywood Neuropsychiatric Hospital	N&M	Church	40	28			229
St. Joseph's Mercy Hosp.*†	N&M	Church	250	172	56	630	5,937
State Psychopathic Hospital	Unit of	University Hospital	1,200	848	85	531	18,441
University Hospital.*†	Gen	State	1,200	848	85	531	18,441
Bad Axe 2,624—Huron							
Hubbard Memorial Hospital	Gen	NPA sen	30	23	6	150	694
Battle Creek 43,453—Calhoun							
American Legion Hospital†	TB	NPA sen	266	180			266



## MICHIGAN—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Battle Creek Sanitarium	Gen	NPAsn	300	107			2 393
Calhoun County Public Hospital	TB	County	75	58			93
Community Hospital* <sup>1</sup>	Gen	NPAsn	100	89	24	9.2	4 201
Lela Y. Post Montgomery Hospital* <sup>1</sup>	Gen	Church	158	104	17	6.0	4 923
Bay City 47956—Bay	Gen	City	73	53	13	546	2 222
Bay City General Hospital* <sup>1</sup>	Gen	NPAsn	44	20	4	82	1 245
Bay City Samaritan Hospital	Gen	Church	122	101	25	745	3 960
Mercy Hospital* <sup>1</sup>	Gen	NPAsn	110	60	24	550	3 026
Benton Harbor 16 063—Berrien	Gen	NPAsn	60	31	5	37	723
Berrien Center 241—Berrien	Gen	County	31	17	10	163	747
Berrien County Hospital	Gen	City	12	9	4	66	339
Big Rapids 4 981—Mecosta	Gen	Church	54	39	16	3.1	2 268
Brighton 1 353—Livingston	Gen	Church	20	9			2.0
Mellus Hospital	Gen	NPAsn	16	9	5	161	562
Cadillac 9 800—Wexford	Gen	Church	1465	1351			135
Mercy Hospital* <sup>1</sup>	Indus	NPAsn	20	9			2.0
Calumet 1 469—Houghton	Gen	City	16	9	5	161	562
Calumet and Hecla Hospital	Gen	City	16	9	5	161	562
Caro 3 676—Tuscola	Gen	City	16	9	5	161	562
Caro Community Hospital	Gen	City	16	9	5	161	562
Caro State Hospital for Epileptics	Epil	State	1 465	1 351			135
Cass City 1 362—Tuscola	Gen	Indiv	15	8	4	166	60
Pleasant Home Hospital	Gen	Indiv	15	8	4	166	60
Charlevoix 2 999—Charlevoix	Gen	NPAsn	27	14	7	121	463
Charlevoix Hospital	Gen	NPAsn	27	14	7	121	463
Charlotte 5 544—Eaton	Gen	County	23	13	6	250	706
Hayes Green Beach County Memorial Hospital	Gen	County	23	13	6	250	706
Clare 1 844—Clare	Gen	Part	25	7	6	32	292
Clare Hospital and Clinic	Gen	Part	25	7	6	32	292
Coldwater 7 343—Branch	Gen	County	56	26	14	376	1 476
Community Health Center	Gen	County	56	26	14	376	1 476
Crystal Falls 2 641—Iron	Gen	City	17	10	5	72	300
Crystal Falls Municipal Hospital	Gen	City	17	10	5	72	300
Cutlerville (Grand Rapids P O)	Gen	Unit of Christian Psychopathic Hospital					
Pine Rest Sanitarium	Gen	Unit of Christian Psychopathic Hospital					
Dearborn 63 554—Wayne	Gen	NPAsn	60	8	25	150	34
Dearborn Clinic and Diagnostic Hospital	Gen	Indiv	17	14			69
Dearborn General Hospital	Gen	NPAsn	25	18	6	206	1 051
Dearborn Industrial and General Hospital	Gen	NPAsn	362	343			705
St Joseph's Retreat	N&M	Church	360	335			2 750
Veterans Admin Facility*	Gen	Vet	360	335			2 750
Detroit 1 623 452—Wayne	Gen	NPAsn	60	46	5	115	2 065
Alexander Blain Hospital* <sup>1</sup>	TB	NPAsn	83	72			118
Bethesda Hospital	Gen	NPAsn	74	50	15	316	2 249
Charles Godwin Jennings Hospital* <sup>1</sup>	TB	NPAsn	52	46			82
Chenik Hospital* <sup>1</sup>	Chil	NPAsn	239	176			6 371
Children's Hospital* <sup>1</sup>	Gen	City	645	594	4	12 18	019
City of Detroit Receiving Hospital* <sup>1</sup>	Gen	City	50	37			1 616
City of Detroit Receiving Hospital (Redford Branch)* <sup>1</sup>	Gen	NPAsn	45	30	15	364	1 905
Cottage Hospital* <sup>1</sup>	Gen	NPAsn	75	63	22	707	3 419
Delray General Hospital* <sup>1</sup>	TB	NPAsn	206	153			634
Detroit Tuberculosis Sanatorium*	Gen	NPAsn	87	71	45	1 452	4 123
East Side General Hospital* <sup>1</sup>	Gen	NPAsn	136	62	17	197	1 914
Edyth K. Thomas Memorial Hospital	Gen	NPAsn	175	147	45	1 670	5 653
Evangelical Deaconess Hospital* <sup>1</sup>	TB	NPAsn	68	62			159
Fairview Sanatorium	Gen	NPAsn	163	163	92	2 452	9 021
Florence Crittenton Hosp * <sup>1</sup>	TB	NPAsn	29	23			71
Good Samaritan Hospital	Gen	NPAsn	478	472	77	2 6 6	16 617
Grace Hospital* <sup>1</sup>	Gen	NPAsn	152	60			1942
Grace Hospital Northwestern Branch*	Gen	NPAsn	600	463	85	2 167	20 929
Harper Hospital* <sup>1</sup>	Gen	NPAsn	564	456	26	1 750	14 761
Henry Ford Hospital* <sup>1</sup>	Gen	NPAsn	1 196	970	65	1 66	0 951
Herman Kiefer Hosp * <sup>1</sup>	Conv	NPAsn	25	10			200
Hobbs Convalescent Hospital and Rest Home	Gen	NPAsn	12	5	4	46	411
Kretschmar Diagnostic Clinic and Hospital	Gen	NPAsn	65	67	21	506	2 142
Lincoln Hospital*	Gen	NPAsn	35	35	12	456	1 420
Marr General Hospital	Gen	NPAsn	10	7	3	23	37
Martin Place Hospital	Gen	NPAsn	31	24			3.1
McGregor Health Foundation	Gen	Indiv	46	29	6	59	225
Mercy General Hospital	Cancer	NPAsn	36	30			170
Mercy Hall Cancer Hospital	Indus	NPAsn	42	19			796
Michigan Mutual Hospital*	Gen	Church	450	448	100	4 121	20 055
Miriam Memorial Hospital	Gen	NPAsn	52	36	12	229	1 297
St Carmel Mercy Hosp * <sup>1</sup>	Gen	Church	324	320	100	3 277	12 191
Parkside Hospital* <sup>1</sup>	Gen	Indiv	45	7	5	26	200
St Aubin General Hospital	Gen	Church	225	152	63	2 004	9 742
St Joseph's Mercy Hosp * <sup>1</sup>	Gen	Church	315	278	72	1 900	9 420
St Mary's Hospital* <sup>1</sup>	Gen	NPAsn	100	87	35	945	4 667
Saratoga General Hospital	Gen	Indiv	55	63			1 901
Shurly Hospital*	Gen	Army	60	44			513
Trinity Hospital	Gen	NPAsn	110	67	22	415	1 507
U. S. Marine Hospital* <sup>1</sup>	Gen	USPHS	201	160			2 351
Warren Diagnostic Hospital	Gen	Indiv	15	14	3	40	45
Wayne Diagnostic Hospital	Gen	NPAsn	50	35	10	123	

Key to symbols and abbreviations is on page 1027

## MICHIGAN—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
William Booth Memorial Hospital	Mat	Church	35	27	43	956	1 112
Women's Hospital* <sup>1</sup>	Gen	NPAsn	242	196	109	3 327	5 335
Dowagiac 5 007—Cass	Gen	Church	25	13	8	159	564
Lee Memorial Hospital	Gen	NPAsn	14	10	5	95	3.2
Durant 3 127—Shiawassee	Gen	NPAsn	22	15			556
Durant Hospital	Gen	NPAsn	14	10	5	95	3.2
East Grand Rapids (Reeds Lake P O)	Proct	Corp	22	15			556
Burleson Hospital	Gen	NPAsn	14	8	5	20	19
Eaton Rapids 3 000—Eaton	Gen	NPAsn	14	8	5	20	19
Stimson Hospital	Gen	Indiv	90	8	5	64	316
Edmore 825—Montcalm	Gen	Indiv	90	8	5	64	316
Edmore Hospital	Gen	Indiv	90	8	5	64	316
Eloise 1 700—Wayne	Gen	County	3 765	3 901			4 745
Eloise Hosp and Infirmary* <sup>1</sup>	Gen	County	6 432	3 304			8 557
William J. Seymour Hosp * <sup>1</sup>	Gen	Acute General Unit of Eloise Hospital and Infirmary					
Escanaba 14 530—Delta	Gen	Church	75	60	20	332	2 264
St Francis Hospital	Gen	Church	75	60	20	332	2 264
Flint 151 543—Genesee	Gen	City	373	272	53	1 602	7 500
Hurley Hospital* <sup>1</sup>	Gen	Church	240	206	60	1 074	7 011
St Joseph Hospital*	Gen	NPAsn	40	31	25	2	1 217
Women's Hospital*	Gen	NPAsn	40	31	25	2	1 217
Fort Custer—Calhoun	Gen	NPAsn	40	31	25	2	1 217
Veterans Admin Facility*	Ment	Vet	1 555	1 740			440
Fremont 2 570—Newaygo	Gen	City	27	14	10	165	601
Gerber Memorial Hospital	Gen	City	27	14	10	165	601
Gaylor 2 055—Ontonagon	Gen	City	27	14	10	165	601
Northern Michigan Tuberculosis Sanatorium*	TB	State	130	127	2	1	103
Gladwin 1 600—Gladwin	Gen	Part	10	6	4	111	361
Gladwin Hospital	Gen	Part	10	6	4	111	361
Goodrich 4 100—Genesee	Gen	NPAsn	33	19	8	145	1 157
Goodrich General Hospital*	Gen	NPAsn	33	19	8	145	1 157
Grand Haven 8 789—Ottawa	Gen	City	47	26	14	265	1 054
Grand Haven Municipal Hospital	Gen	City	47	26	14	265	1 054
Grand Rapids 164 232—Kent	Gen	NPAsn	140	151	30	596	4 553
Blodgett Memorial Hosp * <sup>1</sup>	Gen	NPAsn	224	175	45	1 445	6 005
Butterworth Hospital* <sup>1</sup>	Gen	NPAsn	224	175	45	1 445	6 005
Christian Psychopathic Hospital	N&M	NPAsn	325	318			335
City General Hospital	Gen	City	35	16			715
Ferguson Droste Ferguson Sanitarium	Proct	Corp	36	25			1 312
St Mary's Hospital* <sup>1</sup>	Gen	Church	225	201	56	1 634	7 440
Sunshine Sanatorium	IB	County	145	116			130
Grayling 2 124—Crawford	Gen	Church	45	17	5	53	815
Mercy Hospital*	Gen	Church	45	17	5	53	815
Greenville 5 391—Montcalm	Gen	NPAsn	30	15	6	161	650
United Memorial Hospital	Gen	NPAsn	30	15	6	161	650
Hamtramck 49 833—Wayne	Gen	Church	94	56	36	1 066	4 377
St Francis Hospital*	Gen	Church	94	56	36	1 066	4 377
Hancock 5 554—Houghton	Gen	Church	94	56	36	1 066	4 377
St Joseph's Hospital*	Gen	Church	94	56	36	1 066	4 377
Hart 1 922—Oceana	Gen	NPAsn	20	16	6	114	641
Oceana Hospital	Gen	NPAsn	20	16	6	114	641
Hartford 1 694—Van Buren	Gen	County	30	20	3	14	
Van Buren County Hospital	Gen	County	30	20	3	14	
Hastings 5 175—Barry	Gen	NPAsn	35	26	8	210	1 205
Pennock Hospital	Gen	NPAsn	35	26	8	210	1 205
Hazel Park—Oakland	Gen	Indiv	12	7	8	103	473
Helene Meinke Hospital	Gen	Indiv	12	7	8	103	473
Highland Park 50 810—Wayne	Gen	City	180	177	45	1 612	7 003
Highland Park General Hospital* <sup>1</sup>	Gen	City	180	177	45	1 612	7 003
Hillsdale 6 381—Hillsdale	Gen	City	65	32	17	261	1 612
Hillsdale Community Health Center*	Gen	City	65	32	17	261	1 612
Holland 14 616—Ottawa	Gen	City	51	36	12	392	1 544
Holland City Hospital	Gen	City	51	36	12	392	1 544
Houghton 3 693—Houghton	IB	County	66	61			67
Copper Country Sanatorium	IB	County	66	61			67
Howell 3 743—Livingston	Gen	City	25	15	8	251	723
McPherson Memorial Hosp	IB	State	470	427			337
Michigan State Sanatorium* <sup>1</sup>	IB	State	470	427			337
Ionia 6 392—Ionia	Ment	State	1 075	1 004			130
Ionia State Hospital	Ment	State	1 075	1 004			130
Iron Mountain 11 000—Dickinson	Gen	NPAsn	28	20	8	232	1 017
Iron Mountain General Hospital	Gen	NPAsn	28	20	8	232	1 017
Ironwood 13 350—Gogebic	Gen	NPAsn	120	90	13	242	2 091
Grand View Hospital*	Gen	NPAsn	13				No data supplied
Newport Hospital	Gen	NPAsn	13				No data supplied
Ishpeming 9 431—Marquette	Gen	NPAsn	53	41	12	319	1 493
Ishpeming Hospital*	Gen	NPAsn	53	41	12	319	1 493
Jackson 49 606—Jackson	Gen	City	145	134	30	599	5 472
W. A. Foote Memorial Hospital*	Gen	City	145	134	30	599	5 472
Jackson County Sanatorium	TB	County	68	71			69
Mercy Hospital* <sup>1</sup>	Gen	Church	125	55	25	966	4 037
Kalamazoo 51 097—Kalamazoo	Gen	Church	235	150	27	1 025	5 597
Borgess Hospital*	Gen	Church	140	101	30	904	4 715
Bronson Methodist Hosp * <sup>1</sup>	Gen	Church	140	101	30	904	4 715
Fairmount Hospital*	TB	County	93	67			122
Kalamazoo State Hospital*	Ment	State	3 378	3 106			1 114
Lakeview 824—Montcalm	Gen	Part	20	8	4	103	531
Kelsey Hospital	Gen	Part	20	8	4	103	531
Lansing 78 753—Ingham	Gen	NPAsn	135				No data supplied
Edward W. Sparrow Hospital*	Gen	NPAsn	135				No data supplied
Ingham Sanatorium* <sup>1</sup>	TB	County	135	123			216
St Lawrence Hospital* <sup>1</sup>	Gen	Church	163	141	30	1 407	7 957

## MICHIGAN—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basins	Number of Births	Admissions †
Lapeer 5363—Lapeer	Gen	Part	18	7	4	37	493
Lapeer City Hospital	Gen	City	18	7	4	37	493
Lapeer State Home and Training School	McDe	State	4 043	3 071			460
Laurium 9329—Houghton	Gen	NPAasn	29	18	10	182	601
Calumet Public Hospital	Gen	NPAasn	46	23	6	157	1 016
Ludington 8701—Mason	Gen	NPAasn	46	23	6	157	1 016
Laudina Stearns Hospital	Gen	NPAasn	46	23	6	157	1 016
Manistee 8694—Manistee	Gen	Church	40	24	10	122	601
Mercy Hospital and Sanatorium	Gen	Church	40	24	10	122	601
Manistiquet 5399—Schoolcraft	Gen	Church	40	24	10	122	601
Shaw General Hospital	Gen	Church	40	24	10	122	601
Marquette 15 928—Marquette	Gen	Church	40	24	10	122	601
Morgan Heights Sanatorium	Gen	Church	40	24	10	122	601
St. Luke's Hospital	Gen	Church	40	24	10	122	601
St. Mary's Hospital	Gen	Church	40	24	10	122	601
Marshall 6233—Calhoun	Gen	NPAasn	18	14	7	59	264
Oklaunaw Hospital	Gen	NPAasn	18	14	7	59	264
Marion 2 867—Ingham	Gen	Indiv	14	7	5	59	264
Corsant Hospital	Gen	Indiv	14	7	5	59	264
Menominee 10 230—Menominee	Gen	Church	55	51	13	327	1 741
St. Joseph's Hospital	Gen	Church	55	51	13	327	1 741
Milan 2 340—Washtenaw	Gen	Church	55	51	13	327	1 741
Federal Correctional Institution	Inst	USPHS	21	12			370
Monroe 18 476—Monroe	Gen	Church	60	50	17	501	2 820
Mercy Hospital	Gen	Church	60	50	17	501	2 820
Monroe Hospital	Gen	NPAasn	64	59	10	506	3 109
Morenci 1 845—Lenawee	Gen	NPAasn	14	6	0	61	450
Blanchard Hospital	Gen	NPAasn	14	6	0	61	450
Mount Clemens 14 389—Macomb	Gen	Church	127	113	34	760	4 452
St. Joseph Sanatorium and Hospital	Gen	Church	127	113	34	760	4 452
Mount Pleasant 8 413—Isabella	Gen	Indiv	16	7	2	180	
Brondstetter Memorial Hosp	Gen	Indiv	16	7	2	180	
Mount Pleasant Community Hospital	Gen	NPAasn	20	20	4	188	822
Munising 4 400—Alger	Gen	NPAasn	22	10	4	85	521
Munising Hospital	Gen	NPAasn	22	10	4	85	521
Muskegon 47 037—Muskegon	Gen	NPAasn	108	66	17	640	3 008
Hackley Hospital	Gen	NPAasn	108	66	17	640	3 008
Mercy Hospital	Gen	Church	130	93	30	1 400	4 759
Muskegon County Sanatorium	TB	County	80	60			63
Newberry 2 732—Luce	Gen	Part	18	8	7	30	240
Newberry Clinic Hospital	Gen	Part	18	8	7	30	240
Newberry State Hospital	Gen	State	1 592	1 597			516
Niles 11 328—Berrien	Gen	NPAasn	30	35	0	603	1 712
Pawing Hospital	Gen	NPAasn	30	35	0	603	1 712
Northville 3 032—Wayne	Gen	NPAasn	30	35	0	603	1 712
East Lawn Sanatorium	TB	Corp	95	81			122
Sessions Hospital	Gen	NPAasn	20	10	8	375	1 800
Wm H. Maybury Sanatorium (Detroit Municipal Tuberculosis Sanatorium)†	TB	City	843	805			600
Norway 3 728—Dickinson	Gen	NPAasn	14	8	7	140	460
Penn Iron Mining Company Hospital	Gen	NPAasn	14	8	7	140	460
Omer 295—Arenac	Gen	Indiv	12	5	6	30	177
Omer Hospital	Gen	Indiv	12	5	6	30	177
Ontonagon 2 290—Ontonagon	Gen	NPAasn	17	14	3	77	441
Ontonagon Hospital	Gen	NPAasn	17	14	3	77	441
Oshkosh 235—Kalamazoo	TB	Corp	120	91			87
Pine Crest Sanatorium	Gen	NPAasn	60	64	16	699	2 093
Owosso 14 424—Shiawassee	Gen	NPAasn	60	64	16	699	2 093
Memorial Hospital	Gen	NPAasn	60	64	16	699	2 093
Paw Paw 1 910—Van Buren	Gen	City	22	12	6	80	608
Lake View Municipal Hosp	Gen	City	22	12	6	80	608
Petoskey 0 018—Emmet	Gen	NPAasn	63	63	5	181	2 281
Little Traverse Hospital	Gen	NPAasn	63	63	5	181	2 281
Lockwood General Hospital	Gen	City	49	34	8	212	1 324
Plainwell 2 424—Allegan	Gen	City	25	16	11	206	616
Wm. Crispe Hospital	Gen	City	25	16	11	206	616
Plymouth 5 360—Wayne	Gen	Part	10	3	3	70	281
Plymouth Hospital	Gen	Part	10	3	3	70	281
Pontiac 66 626—Oakland	Gen	County	85	27			635
Oakland County Contagious Hospital	Gen	County	85	27			635
Oakland County Tuberculosis Sanatorium†	TB	County	243	223			928
Pontiac General Hospital†	Gen	City	200	169	40	1 234	6 068
Pontiac State Hospital†	Gen	State	2 395	2 079			652
St. Joseph Mercy Hospital†	Gen	Church	226	208	133	1 010	7 703
Port Huron 32 759—St. Clair	Gen	NPAasn	120	83	24	604	3 081
Port Huron Hospital	Gen	NPAasn	120	83	24	604	3 081
Powers 208—Menominee	TB	Counties	140	124			121
Pinecrest Sanatorium	TB	Counties	140	124			121
Reed City 1 845—Oscoda	Gen	City	34	23	0	148	1 004
Reed City Hospital	Gen	City	34	23	0	148	1 004
River Rouge 17 008—Wayne	Gen	NPAasn	30	17	5	74	313
Sidney A. Sumbly Memorial Hospital	Gen	NPAasn	30	17	5	74	313
Rochester 3 750—Oakland	Gen	NPAasn	60	40			355
Haven Sanatorium	Gen	NPAasn	60	40			355
Romeo 2 627—Macomb	TB	Indiv	40	38			123
Wehenkel Sanatorium	TB	Indiv	40	38			123
Royal Oak 25 087—Oakland	Gen	City	19	16	4	64	822
Royal Oak Hospital	Gen	City	19	16	4	64	822
Saginaw 82 794—Saginaw	Gen	County	28	25	5	20	232
County Convalescent Home	Gen	County	28	25	5	20	232
Saginaw County Hospital†	Gen	County	170	130			318
Saginaw General Hospital†	Gen	NPAasn	133	100	33	1 221	4 896
St. Luke's Hospital†	Gen	Church	68	43	17	697	2 344
St. Mary's Hospital†	Gen	Church	168	128	30	1 041	5 318

## MICHIGAN—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basins	Number of Births	Admissions †
St. Clair 3 471—St. Clair	Gen	City	17	10	10	214	622
St. Clair Community Hosp	Gen	City	17	10	10	214	622
St. Johns, 4 422—Clinton	Gen	NPAasn	60	44	10	264	1 843
Clinton Memorial Hospital	Gen	NPAasn	60	44	10	264	1 843
St. Joseph 8 963—Berrien	Gen	NPAasn	41	26	12	270	1 542
St. Joseph Michigan Hosp	Gen	NPAasn	41	26	12	270	1 542
Sault Ste. Marie, 15 847—Chippewa	Gen	County	75	82	17	403	3 160
Chippewa County War Memorial Hospital	Gen	County	75	82	17	403	3 160
Station Hospital	Gen	Army	45	38			510
Selfridge Field—Macomb	Gen	Army	45	38			510
Station Hospital	Gen	Army	45	38			510
Shelby, 1 767—Oscoda	Gen	City	10	5	4	64	240
Shelby Hospital	Gen	City	10	5	4	64	240
South Haven 4 740—Van Buren	Gen	City	30	22	11	140	603
South Haven Hospital	Gen	City	30	22	11	140	603
Stambaugh 2 081—Iron	Gen	NPAasn	29	13	12	242	806
General Hospital Company of Iron River District	Gen	NPAasn	29	13	12	242	806
Sturgis 7 214—St. Joseph	Gen	City	40	27	10	330	1 171
Sturgis Memorial Hospital	Gen	City	40	27	10	330	1 171
Tecumseh 2 021—Tuscola	Gen	City	37	21	12	238	837
Tecumseh Hospital	Gen	City	37	21	12	238	837
Three Rivers 6 710—St. Joseph	Gen	City	30	26	6	142	1,200
Three Rivers Hospital	Gen	City	30	26	6	142	1,200
Traverse City, 14 400—Grand Traverse	Gen	NPAasn	20	13	4	44	450
Central Michigan Children's Clinic	Chil	NPAasn	20	13	4	44	450
Grand Traverse County Hosp	Chil	NPAasn	20	13	4	44	450
James Decker Memorial Hos	Gen	State	100	72	17	374	2 410
Traverse City State Hosp†	Gen	State	2,743	2 339			630
Trimountain 700—Houghton	Gen	NPAasn	20	7	5	40	241
Copper Range Hospital	Gen	NPAasn	20	7	5	40	241
Wakefield 3 591—Gogebie	Gen	NPAasn	14	11	5	59	308
Wakefield Hospital	Gen	NPAasn	14	11	5	59	308
Wayne 4 223—Wayne	Gen	NPAasn	15	9	7	120	512
Parker Vincent Hospital	Gen	NPAasn	15	9	7	120	512
Wayne Clinic	Gen	NPAasn	15	9	7	120	512
Wayne General Hospital	Gen	NPAasn	15	9	7	120	512
West Branch 1 902—Ogemaw	Gen	City	10	10	4	60	570
Tolmie Memorial Hospital	Gen	City	10	10	4	60	570
Wyandotte 30 618—Wayne	Gen	City	166	121	42	1 762	6 009
Wyandotte General Hospital	Gen	City	166	121	42	1 762	6 009
Ypsilanti 12 121—Washtenaw	Gen	City	40	30	20	403	1 506
Beyer Memorial Hospital	Gen	City	40	30	20	403	1 506
Hull Memorial City Hospital	Gen	City	40	30	20	403	1 506
Leland Sanatorium†	TB	NPAasn	120	71			63
Ypsilanti State Hospital†	Gen	State	3 340	3 298			863
Zeeland 3 007—Ottawa	Gen	NPAasn	13	8	4	105	304
Thomas G. Hulzink Memorial Hospital	Gen	NPAasn	13	8	4	105	304

## Related Institutions

Related Institutions	Type of Service	Ownership or Control	Beds	Average Census †	Basins	Number of Births	Admissions †
Alma 7 202—Gratiot	Inst	NPAasn	45	25			104
Michigan Maconic Home and Hospital	Inst	NPAasn	45	25			104
Coldwater 7 743—Branch	Gen	State	600	604			357
Coldwater State Home and Training School	McDe	State	600	604			357
Detroit 1 633 402—Wayne	LNT	NPAasn	5	1			300
Barnett Clinic and Hospital	Gen	Indiv	28				1912
Central Hospital	Gen	Indiv	28				1912
DeNike Sanatorium	Alcoh	Corp	90	85			212
Doctor's Hospital	Conv	Indiv	35	30			178
General Hospital and Clinic	TB	Indiv	44	40			127
Van Dyke Maternity Center and Hospital	Gen	Indiv	9	5	5	143	403
Just Grand Rapids (Reed's Lake P. O.)	Gen	NPAasn	20	22			50
O'Keefe Sanatorium	NAM	Corp	20	22			50
Farmington 1 710—Oakland	Conv	NPAasn	200	106			357
Children's Hospital Convalescent Home	Conv	NPAasn	200	106			357
Ferndale, 21 524—Oakland	Gen	Corp	14	10	8	200	833
Ardenmore Hospital	Gen	Corp	14	10	8	200	833
Flint 1 1643—Genesee	Gen	Inst	100	80	17	101	633
Genesee County Hospital and Infirmary	Gen	Inst	100	80	17	101	633
Grand Rapids 164 292—Kent	Gen	County	32	10			407
Kent County Receiving Hosp	Gen	County	32	10			407
Mary Free Bed Guild Convalescent Home	Orth	NPAasn	100	90	10		803
Municipal Isolation Hospital	Iso	City	22	4			55
Salvation Army Evangeline Booth Home and Hospital	Mnt	Church	40	20	20	116	138
Ionla 6 392—Ionla	Inst	State	24	10			471
Michigan Reformatory	Inst	State	24	10			471
Jackson 40 606—Jackson	Mnt	NPAasn	25	16	20	87	53
Florence Crittenton Home and Hospital	Mnt	NPAasn	25	16	20	87	53
Jackson County Isolation Hospital	Iso	County	30	6			145
Southern Michigan Prison Hospital	Inst	State	200	113			2 587
Lansing 78 753—Ingham	Inst	State	50	10			658
Boys Vocational School	Inst	State	50	10			658
Lansing City Hospital	Iso	City	45	10	6		370
Marquette 15 028—Marquette	Inst	State	24	4			93
Marquette Branch Prison	Inst	State	24	4			93
Mount Clemens 14 389—Macomb	Orth	NPAasn	60	48			120
George H. Cummings Memorial Hospital School	Orth	NPAasn	60	48			120

## MICHIGAN—Continued

Related Institutions	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Mount Pleasant 8413—Isabella Mount Pleasant State Home and Training School	MeDe	State	345	320			46
Northville 3032—Wayne Wayne County Training School	MeDe	County	83	63			130
Otter Lake 515—Lapeer American Legion Children's Billet	TB	NPAsen	12	100			268
Pontiac 6626—Oakland Oakland County Infirmary	Inst	County	22	No data supplied			
Port Huron 32759—St Clair Port Huron Emergency Hos- pital	Iso	City	18	3	6	1	90
Stockbridge 852—Ingham Rowe Memorial Hospital	Gen	Indiv	10	5	5	72	245
Vicksburg 1774—Kalamazoo Franklin Memorial Hospital	Gen	City	10	7	3	66	34

## MINNESOTA

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Ada 1038—Norman Ada Hospital	Gen	City	2		10	Estab	1942
Adrian 1066—Nobles Adrian Hospital	Gen	NPAsen	16	8	6	119	362
Ah gwa ching 15—Cass Minnesota State Sanatorium	TB	State	480	333			423
Albert Lea 12200—Freeborn Naeve Hospital	Gen	NPAsen	72	50	18	583	2410
Alexandria 5031—Douglas Douglas County Hospital	Gen	NPAsen	30	11	6	80	490
St Luke's Hospital	Gen	Indiv	20	12	6	112	573
Anoka 6426—Anoka Anoka Hospital	Gen	NPAsen	15	7	8	100	371
Anoka State Hospital	Ment	State	1490	1433			90
Appleton 1877—Swift Kaufman Hospital	Gen	Indiv	20	9	5	53	450
Austin 18307—Mower St Olaf Hospital	Gen	NPAsen	10	45	2	517	2014
Battle Lake 623—Otter Tail Otter Tail County Sana- torium	TB	County	48	46			47
Bemidji 9427—Beltrami Lutheran Hospital	Gen	NPAsen	60	45	15	299	2040
Benson 2729—Swift Swift County Hospital	Gen	NPAsen	22	14	5	146	632
Bertha 578—Todd Thiel Hospital	Gen	NPAsen	18	13	8	149	602
Bigfork 382—Itasca Northern Itasca Hospital	Gen	City	10	6	3	77	860
Biwabik 1304—St Louis Biwabik Hospital	Gen	Indiv	11	4	6	70	223
Blue Earth 3702—Faribault Blue Earth Hospital	Gen	Indiv	10	5	4	60	230
Braham 578—Isanti Braham Hospital	Gen	Indiv	12	7	6	57	367
Brainerd 12071—Crow Wing St Joseph's Hospital	Gen	Church	75	42	15	397	2531
Breckenridge 2745—Wilk- in St Francis Hospital	Gen	Church	62	41	12	306	2000
Buffalo 1095—Wright Cattlin Hospital	Gen	Part	12	3	4	33	139
Buhl 1000—St Louis Range Hospital	Gen	County	44	39			450
Cambridge 1092—Isanti Minnesota Colony for Epileptics	MeDe	State	1105	1057			10
Canby 2094—Yellow Medicine John Swenson Memorial Hos- pital	Gen	City	29	8	6	76	385
Cannon Falls 1544—Goodhue Mineral Springs Sanatorium	TB	Counties	100	99			89
Cass Lake 1904—Cass Cass Lake General Hospital	Gen	NPAsen	20	6	4	40	203
Cass Lake Indian Hospital	Gen	IA	32	21	4	82	790
Chatfield 1040—Fillmore Chatfield Hospital	Gen	Part	15	6	3	54	214
Chisholm 7487—St Louis Mesaba Clinic Hospital	Gen	Part	14	11	4	110	455
Clarkfield 963—Yellow Medicine Clarkfield Community Hosp	Gen	NPAsen	10	7	4	77	355
Cloquet 7304—Carlton Fond du Lac Indian Hosp	Gen	IA	22	14	4	59	518
Raiter Hospital	Gen	NPAsen	42	16	7	147	940
Cokato 1170—Wright Cokato Hospital	Gen	Indiv	13	5	4	59	288
Crookston 7161—Polk Bethesda Hospital	Gen	Church	54	37	12	171	1395
St Vincent's Hospital	Gen	Church	60	48	15	193	1220
Sunnyrest Sanatorium	TB	Counties	72	66			63
Crosby 2934—Crow Wing Miner's Hospital	Gen	Indiv	20	4	6	92	221
Dawson 1646—Lac qui Parle Dawson Hospital	Gen	NPAsen	3	15	5	60	480
Deerwood 500—Crow Wing Deerwood Sanatorium	TB	Counties	27	21			18
Detroit Lakes 5013—Becker St Mary's Hospital	Gen	Church	50	23	1	277	1703

## MINNESOTA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Duluth 101065—St Louis Miller Memorial Hospital	Gen	City	68	68			1865
St Luke's Hospital	Gen	NPAsen	237	217	33	1092	7533
St Mary's Hospital	Gen	Church	260	232	30	1153	5688
Webber Hospital	Gen	Indiv	40	27	10	170	1008
Ely 5970—St Louis Shipman Hospital	Gen	Part	15	6	5	69	303
Eveleth 6887—St Louis More Hospital and Clinic	Gen	Corp	39	15	8	133	604
Fairmont 6988—Martin Fairmont Community Hosp	Gen	NPAsen	36	9	12	123	444
Hunt Hospital	Gen	Part	12	7	6	65	300
Faribault 14527—Rice Minnesota School for Feeble- minded	MeDe	State	2035	2510	17	18	319
St Lucas Evangelical Deaconess Hospital	Gen	Church	60	39	18	363	1592
Farmington 1580—Dakota Emond Hospital	Gen	NPAsen	11	3	6	48	144
Sanford Hospital	Gen	NPAsen	30	18	6	71	440
Fergus Falls 10848—Otter Tail Fergus Falls State Hospital	Ment	State	2000	1915			515
George B Wright Memorial Hospital	Gen	NPAsen	48	34	12	216	1403
St Luke's Hospital	Gen	NPAsen	60	31	15	220	1106
Fort Snelling—Hennepin Station Hospital	Gen	Army	177	119	8	29	1719
Fosston 1271—Polk Fosston Hospital	Gen	Part	12	11	6	140	890
Glencoe 2387—McLeod Glencoe Municipal Hospital	Gen	City	38			14	Estab 1912
Glenwood 2564—Pope Glenwood Community Hosp	Gen	City	36	16	10	140	535
Graceville 1070—Big Stone West Central Minnesota Hos- pital	Gen	NPAsen	30	23	10	162	1093
Grand Rapids 4815—Itasca Itasca County Hospital	Gen	County	55	48	15	483	1827
Granite Falls 2388—Yellow Medicine Granite Falls Hospital	Gen	NPAsen	18	8	5	84	331
Riverside Sanatorium	TB	Counties	48	40			30
Hallock 1303—Kittson Kittson War Veterans Me- morial Hospital	Gen	NPAsen	31	20	9	152	806
Hastings 5602—Dakota Hastings State Hospital	Ment	State	1124	1098			92
Hendricks 740—Lincoln Hendricks Community Hosp	Gen	NPAsen	2	19	6	98	1187
Heron Lake 532—Jackson Southwestern Minnesota Hos- pital	Gen	Indiv	12	7	3	62	224
Hibbing 16385—St Louis Hibbing General Hospital	Gen	Church	132			20	Estab 1912
Hutchinson 3887—McLeod Hutchinson Community Hos- pital	Gen	NPAsen	2	22	10	211	825
Jackson 2840—Jackson Holloran Hospital	Gen	Indiv	15	11	5	85	450
Lake City 3204—Wabasha Lake City Hospital	Gen	City	30	20	8	101	670
Lake Park 604—Becker Sand Beach Sanatorium	TB	Counties	42	30			49
Litchfield 3920—Meeker Litchfield Hospital	Gen	NPAsen	43	31	9	197	1143
Little Falls 6047—Morrison St Gabriel's Hospital	Gen	Church	84	81	15	332	1740
Littlefork 600—Koochiching Littlefork Hospital	Gen	NPAsen	22	15	8	125	700
Long Prairie 2311—Todd Long Prairie Hospital	Gen	NPAsen	20	8	6	79	400
Luverne 3114—Rock Luverne Hospital	Gen	NPAsen	16	8	6	152	532
Madison 2312—Lac qui Parle Ebenezer Lutheran Hospital	Gen	Church	20	16	7	148	597
Mahnomen 1429—Mahnomen Mahnomen Hospital	Gen	Indiv	15	6	4	59	342
Mankato 1561—Blue Earth Immanuel Hospital	Gen	Church	60	44	15	330	1463
St Joseph's Hospital	Gen	Church	90	47	18	360	2218
Marshall 4590—Lyon Anna Maria Memorial Hosp	Gen	Indiv	13	9	6	134	365
Marshall Hospital	Gen	NPAsen	30	11	5	41	280
Melrose 2015—Stearns Melrose Hospital	Gen	Indiv	18	7	5	92	617
Milaca 1627—Mille Lacs Memorial Hospital	Gen	Indiv	15	12	6	158	730
Minneapolis 492370—Hennepin Abbott Hospital	Gen	Church	150	119	22	557	5529
Asbury Hospital	Gen	Church	140	111	22	673	5640
Ellet Hospital	Gen	NPAsen	102	104	18	228	4538
Elliot Memorial Hospital	Unit of University Hospitals						
Fairview Hospital	Gen	Church	157	124	25	885	5250
Franklin Hospital	ChrConv	NPAsen	63	60			430
George Chase Christian Memo- rial Cancer Institute	Unit of University Hospitals						
Harriet Walker Hospital	Mat	NPAsen	57	52	30	169	197
Jannet Children's Hospital	Unit of Abbott Hospital						
Lutheran Deaconess Home and Hospital	Gen	Church	120	114	30	892	4636
Maternity Hospital	Mat	NPAsen	36	20	40	1001	1262
Minneapolis General Hospi- tal	Gen	City	616	421	55	582	10074
Minnesota General Hospital	See University Hospitals						
Northwestern Hospital	Gen	NPAsen	230	191	50	1661	7302
Ripley Memorial Hospital	Unit of Maternity Ho pital						

Key to symbols and abbreviations is on page 1027



## MISSOURI—Continued

Related Institutions	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Marshall 8 533—Saline							
Missouri State School—Epilepsy and Feeble-minded	MeDe	State	1 700	1 629			85
Marthasville 321—Warren Evangelical Emmaus Home for Epileptics and Feeble-minded	MeDe	Church	100	100			7
Mountain Grove 2 431—Wright Ryan Hospital	Gen	Indiv	10	3	3	30	90
Rolla 5 141—Phelps Missouri School of Mines Hospital	Inst	State	17	2			189
St Charles 10 803—St Charles Evangelical Emmaus Home for Epileptics and Feeble-minded	MeDe	Church	150	144			17
St James 1 512—Phelps State Federal Soldiers Home Hospital	Inst	State	42	25			133
St Louis 816 048—St Louis City Booth Memorial Hospital City Infirmary	Mat	Church	75	49	32	244	310
Hospital of Masonic Home	Inst	City	1 000	840			290
Mother of Good Council Home and Hospital	Inst	NPAasn	123	69			403
St Louis Training School Valley Park 2 091—St Louis Ridge Farm	Cancer	Church	70	70			57
West Plains 4 026—Howell Cottage Hospital	MeDe	City	525	466			54
Unit of St Louis Children's Hospital							
	Gen	Indiv	7	3	5	63	81

## MONTANA

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Anaconda 11 004—Deer Lodge St Ann's Hospital	Gen	Church	80	65	18	361	1 585
Billings 23 261—Yellowstone Billings Deaconess Hosp	Gen	Church	78	62	20	567	2 774
St Vincent Hospital	Gen	Church	165	115	22	617	3 804
Bozeman 8 655—Gallatin Bozeman Deaconess Hospital	Gen	Church	55	50	13	322	1 559
Browning 1 525—Glacier Blackfeet Hospital	Gen	IA	45	33	12	165	1 001
Butte 57 081—Silver Bow Murray Hospital	Gen	Corp	100	80	20	389	3 043
St James Hospital	Gen	Church	130	90	26	723	3 150
Silver Bow County Hospital	Gen	Inst	150	105	8	32	359
Choteau 1 181—Teton Choteau Hospital	Gen	Indiv	17	11	3	24	170
Conrad 1 471—Pondera St Mary's Hospital	Gen	Church	58	27	10	139	1 045
Crow Agency 300—Big Horn Crow Agency Hospital	Gen	IA	56	23	4	70	1 113
Deer Lodge 3 278—Powell Montana State Tuberculosis Sanitarium	TH	State	260	255			212
St Joseph Hospital	Gen	Church	40	30	9	112	463
Dillon 3 014—Beaverhead Barrett Hospital	Gen	NPAasn	22	9	6	71	502
Eureka 312—Lincoln Clark's Hospital	Gen	Indiv	9	5	5	30	144
Forsyth 1 696—Rosebud Rosebud Community Hospital	Gen	Church	30	14	5	67	368
Fort Benton 1 227—Chouteau St Clare Hospital	Gen	Church	40	30	6	57	940
Fort Harrison 300—Lewis and Clark Veterans Admin Facility	Gen	Vet	240	120			1 455
Fort Peck 1 500—Valley Fort Peck Hospital	Gen	Army	28	15			823
Glasgow 3 799—Valley Frances Mahon Deaconess Hospital	Gen	Church	60	24	12	193	1 061
Glendive 4 524—Dawson Dawson County Hospital	Gen	County	30	14	5	38	173
Northern Pacific Hospital	Gen	NPAasn	61	38	10	153	1 590
Great Falls 29 928—Cascade Columbus Hospital	Gen	Church	225	147	50	546	4 036
Montana Deaconess Hosp	Gen	Church	146	113	32	565	3 644
Hamilton 2 332—Ravalli Marcus Daly Memorial Hosp	Gen	NPAasn	32	22	8	80	917
Hardin 1 886—Big Horn Hardin General Hospital	Gen	Corp	25	9	5	56	477
Harlem 1 166—Blaine Fort Belknap Indian Hospital and Sanitarium	Gen	IA	47	34	5	91	906
Havre 6 427—Hill Kennedy Deaconess Hospital	Gen	Church	58	29	14	132	1 370
Sacred Heart Hospital	Gen	Church	100	66	14	238	2 121
Helena 15 056—Lewis and Clark St John Hospital	Gen	Church	85	58	15	232	1 000
St Peter's Hospital	Gen	NPAasn	63	26	10	139	950
Shadai Crippled Children's Hospital	Orth	NPAasn	40	16	12		147
Jordan 500—Garfield Lutheran Good Samaritan Hospital	Gen	Church	29	12	4	45	232
Kalispell 2 215—Flathead Kalispell General Hospital	Gen	Church	43	31	14	29	1 351
Lame Deer 350—Rosebud Tongue River Agency Hosp	Gen	IA	47	25	6	46	555
Lewistown 5 854—Fergus St Joseph's Hospital	Gen	Church	120	73	17	237	2 749

## MONTANA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Libby 1 837—Lincoln Libby General Hospital	Gen	Indiv	15	12	4	70	300
Livingston 6 642—Park Park Hospital	Gen	Indiv	22	12	6	58	452
Miles City 7 313—Custer Miles City Hospital (Holy Rosary Hospital)	Gen	Church	110	67	15	211	2 396
Missoula 18 449—Missoula Northern Pacific Hospital	Indus	NPAasn	76	50			1 552
St Patrick Hospital	Gen	Church	115	92	24	557	3 832
Thornton Hospital	Gen	Part	35	21	12	229	1 331
Plentywood 1 574—Sheridan Sheridan Memorial Hospital	Gen	NPAasn	16	13	5	81	551
Poplar 1 442—Roosevelt Fort Peck Indian Agency Hospital	Gen	IA	33	19	6	87	440
Roundup 2 644—Missoula Musselshell Valley Hospital	Gen	Indiv	20	8	8	78	556
St Ignace 708—Lake Holy Family Hospital	Gen	Church	43	23	7	106	956
Sidney 2 978—Kleland Sidney Deaconess Hospital	Gen	Church	29	21	12	168	1 243
Townsend 1 309—Broadwater Broadwater Hospital	Gen	Corp	24	16	5	64	405
Warm Springs 1 900—Deer Lodge Montana State Hospital	Ment	State	1 950	1 945			476
Wolf Point 1 769—Roosevelt Lutheran Trinity Hospital	Gen	NPAasn	17	11	5	49	302

## Related Institutions

Billings 23 261—Yellowstone Yellowstone County Hospital	Gen	County	50	30	6	96	378
Great Falls 29 928—Cascade Detention Hospital	Iso	County	25	7			114
Helena 15 056—Lewis and Clark Florence Crittenton Home	Mat	NPAasn	19	3	6	62	60
Lewis and Clark County Hospital	Gen	Inst	75	60	2	9	174
Lewistown 5 574—Fergus Fergus County Hospital	Gen	County	17	11	4	31	325
Polson 2 156—Lake Hotel Dieu Hospital	Gen	Church	25	9	7	47	413
Scobey 1 311—Daniels Scobey Clinic Hospital	Gen	Indiv	15	10	4	46	157
Shelby 2 33—Toole New Shelby Hospital	Gen	Indiv	20	6	5	70	290
Terry 1 012—Prairie Lutheran Good Samaritan Hospital	Gen	Church	15	5	6	37	219

## NEBRASKA

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Albion 1 538—Brown Albion Hospital	Gen	Part	22	10	5	154	855
Alliance 6 253—Fox Butte St Joseph's Hospital	Gen	Church	165	77	15	291	2 060
Auburn 3 630—Aumaha Auburn Hospital	Gen	Indiv	18	8	5	70	424
Toshiba General Hospital	Gen	Indiv	15	8	5	73	502
Aurora 2 419—Hamilton Aurora Hospital	Gen	Indiv	16	6	6	30	213
Basett 931—Rock Basett Hospital	Gen	Part	12	5	6	33	271
Beatrice 10 883—Gage Lutheran Hospital	Gen	Church	45	29	8	256	925
Mennonite Deaconess Home and Hospital	Gen	Church	30	23	10	162	771
Beemer 555—Cuming Beemer Hospital	Gen	Indiv	10	1	2	17	81
Benkelman 1 445—Dundy Morehouse Hospital	Gen	Indiv	8	6	4	50	378
Blair 3 253—Washington Blair Hospital	Gen	Indiv	13	4	3	60	183
Broken Bow 2 065—Custer Broken Bow Hospital	Gen	Indiv	35	10	4		
Cambridge 1 054—Furnas Republican Valley Hospital	Gen	Indiv	25	6	3	20	140
Chadron 4 262—Dawes Chadron Municipal Hospital	Gen	City	25	14	7	104	699
Columbus 7 632—Platte Lutheran Good Samaritan Hospital	Gen	Church	30	16	5	111	472
St Mary's Hospital	Gen	Church	125	67	10	158	940
Dalton 355—Cheyenne Pioneer Memorial Hospital	Gen	Indiv	10	2	3	46	236
David City 2 272—Butler David City Hospital	Gen	NPAasn	12	4	4	50	238
Fairbury 6 304—Jefferson Fairbury Hospital	Gen	Indiv	15	10	4	87	437
Falls City 6 146—Richardson Our Lady of Perpetual Help Hospital	Gen	Church	85	15	5	77	584
Farnam 346—Dawson Reeves Memorial Hospital	Gen	Indiv	10	4	3	38	252
Fort Crook 55—Searcy Station Hospital	Gen	Army	50	32			603
Fremont 11 862—Dodge Dodge County Hospital	Gen	County	55	29	14	344	1 271
Friend 1 169—Saline Warren Memorial Hospital	Gen	City	15	5	4	75	170

## NEBRASKA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Genoa 1231—Nance Emergency Hospital Genoa Hospital	Gen Gen	Part Indiv	6 10	3 11	3 3	26 63	146 212
Grand Island 19120—Hall Grand Island Lutheran Hosp St. Francis Hospital	Gen Gen	Church Church	35 140	22 78	12 10	205 260	1 048 2 138
Hastings 15145—Adams Mary Lanning Memorial Hos- pital	Gen	NPA's n	00	60	15	378	1 942
Hoboken 1909—Thayer Blue Valley Hospital	Gen	Indiv	20	8	5	40	320
Holdrege 3760—Pheips Holdrege Hospital	Gen	Part	10	10	5	56	482
Humboldt 1236—Richardson Humboldt Hospital	Gen	Indiv	11	8	4	51	310
Imperial 1195—Chase Imperial Community Hospital	Gen	NPA's n	10	10	6	142	577
Ingleside 1690—Adams Hastings State Hospital	Gen	State	1 700	1 770			359
Kearney 9 013—Buffalo Good Samaritan Hospital Hospital for the Tuberculous	Gen TB	Church State	60 290	41 15	12	201	1 129 101
Kimball 1725—Kimball Holt Hospital Kimball Hospital	Gen Gen	Indiv Part	10 10	5 5	5 4	7 45	256 213
Lexington 368—Dawson Lexington Community Hosp	Gen	Corp	20	9	0	150	410
Lincoln 81084—Lancaster Bryan Memorial Hospital	Gen	Church	100	72	20	310	2 976
Green Gables Dr. Lenj F Bailey Sanatorium	Gen	Corp	120	82	4	9	403
Lincoln General Hospital	Gen	NPA's n	153	146	20	507	4 000
Lincoln State Hospital	Gen	State	1 410	1 407			770
Nebraska Orthopedic Hosp	Gen	State	110	81			634
St. Elizabeth Hospital	Gen	Church	170	115	10	618	5 212
Veterans Admin. Facility	Gen	Vet	251	226			2 263
Loup City 1470—Sherman Loup City Hospital	Gen	Indiv	11	8	6	81	992
Lynch 487—Boyd Sacred Heart Hospital	Gen	Church	18	9	4	56	337
McCook 6212—Red Willow St. Catherine of Siena Hos- pital	Gen	Church	75	21	12	205	1 100
Minnehon 1845—Kearney Secker Hospital	Gen	Indiv	16	5	10	77	205
Nebraska City 23—Otoe St. Mary's Hospital	Gen	Church	57	35	13	29	1 090
Norfolk 10430—Madison Lutheran Hospital	Gen	Church	60	20	15	214	1 417
Norfolk State Hospital	Gen	State	1 120	1 141			1 500
Our Lady of Lourdes Hosp Verger Sanatorium	Gen	Church Indiv	2 20	2 16	10	172 75	870 263
North Platte 12424—Lincoln St. Mary Hospital	Gen	Church	67	4	10	243	1 597
Oakland 1750—Burt Oakland Community Hos p	Gen	Indiv	12	6	4	71	210
Odell 401—Gage Odell General Hospital	Gen	Indiv	11	7	5	60	520
Omaha 223 844—Douglas Bishop Clarkson Memorial Hospital	Gen	Church	135	113	12	25	4 061
Crelighton Memorial St Joseph's Hospital	Gen	Church	405	30	50	1 063	10 721
Doctor's Hospital	Gen	NPA's n	90	64	12	2 8	4 446
Douglas County Hospital	Gen	Tu County	400	311	8	116	2 781
Douglas County Psychiatric Hospital	Gen	Unit of Douglas County Hospital					
Immanuel Deaconess Insti- tute	Gen	Church	122	104	35	7 0	3 765
Lutheran Hospital	Gen	Church	110	74	17	769	2 479
Nebraska Methodist Hospital and Deaconess Home	Gen	Church	155	112	20	716	5 037
St. Catherine's Hospital	Gen	Church	173	111	50	709	4 694
University of Nebraska Hos- pital	Gen	State	210	184	20	421	2 907
Ord 2240—Valley Ord Hospital	Gen	Indiv	15	9	4	42	2 7
Oxford 1141—Furness Oxford General Hospital	Gen	Corp	15	7	5	89	371
Pawnee City 1617—Pawnee Pawnee Hospital and Mater- nity Annex	Gen	Indiv	26	10	5	113	611
Pender 117—Thurston Logan Valley Hospital	Gen	Indiv	12	7	5	47	286
Rushville 112—Sheridan Rushville Hospital	Gen	Indiv	10	3	5	60	310
Scottsbluff 12 057—Scotts Bluff Fairness Hospital	Gen	Indiv	30	24	10	245	1 418
West Nebraska Methodist Hospital	Gen	Church	50	35	12	314	1 709
Seward 2 820—Seward Seward Hospital	Gen	Indiv	10	5	0	80	236
Sidney 3 388—Cheyenne Roche Hospital	Gen	Indiv	18	9	4	57	501
Taylor Hospital	Gen	Part	20	14	5	140	638
Stratton 670—Hitchcock Stewart Hospital	Gen	Indiv	11	4	3	43	217
Stromsburg 1 127—Polk Stromsburg Hospital	Gen	Indiv	9	5	3	47	271
Stuart 769—Holt Wilson Hospital	Gen	Indiv	20	9	3	45	312
Superior 2 600—Nuckolls Brookstone Memorial Hospital	Gen	NPA's n	20	8	4	43	238
Valentine 2 188—Cherry General Hospital	Gen	Indiv	15	8	5	56	414

## NEBRASKA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Wahoo 2 618—Saunders Wahoo Community Hospital	Gen	Indiv	20	12	10	130	67
Wakefield 961—Dixon Coe Hospital	Gen	Indiv	8	3	5	47	159
Winnebago 800—Thurston Winnebago Indian Hospital	Gen	IA	61	35	9	82	1 014
York 538—York Lutheran Hospital	Gen	Church	50	19	10	151	705
Related Institutions							
Beatrice 10 883—Gage Nebraska Institution for Feeble-minded	Gen	State	1 631	1 514			129
Lincoln 81 084—Lancaster Nebraska State Centenary Hospital	Inst	State	25	11			719
Millard 709—Seward Nebraska Industrial Home	Inst	State	17	4	12	65	6
Omaha 223 844—Douglas City Emergency Hospital	Gen	City	40	5			129
Salvation Army Booth Me- morial Hospital	Gen	Church	77	26	15	80	105
Orchard 435—Antelope Orchard Hospital	Gen	Indiv	10	2	3	22	159
Plainville 1411—Pierce Plainville General Hospital	Gen	NPA's n	8	1	1	62	204
Sutherland 562—Lincoln Sutherland Hospital	Gen	NPA's n	8	2	5	49	167
Tennessch 2 101—Johnson Tennesch Hospital	Gen	Indiv	12	4	3	43	195
Tilden 914—Madison Tilden Hospital	Gen	Indiv	10	6	3	26	215
Walthill 1 201—Thurston Dr. E. C. C. Memorial Hosp	Gen	Indiv	12	7	4	5	4
Westpoint 2 100—Cummins St. Joseph Home Hospital	Gen	Church	16	11	6	80	520

## NEVADA

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Calliente 1 800—Lincoln Lincoln County Hospital	Gen	County	16	10	4	89	2 1
East Ely 700—White Pine Steeple Valley Hospital	Gen	NPA's n	40	15	7	105	251
Eiko 4 094—Eiko Eiko General Hospital	Gen	County	50	24	10	118	822
Ely 4 140—White Pine White Pine General Hos pital	Gen	County	50	21	10	103	102
Fallon 1 911—Churchill Hendley Hospital	Gen	Part	21	14	6	26	611
Las Vegas 842—Clark Las Vegas Hospital	Gen	Part	60	37	16	25	2 054
Reno 21 17—Washoe Nevada State Hos pital for Mental Diseases	Gen	State	250	401			62
St. Mary's Hospital	Gen	Church	75	72	15	345	2 914
Veterans Admin. Facility	Gen	Vet	26	20			127
Washoe County General Hosp	Gen	County	125	176	21	382	3 439
Schurz 300—Mineral Walker River Indian Hospital	Gen	IA	30	25	2	51	885
Stewart 500—Ormsby Carson Agency Hospital	Gen	IA	34	25	5	32	448
Tonopah 1 600—Nye Tonopah Mines Hospital	Gen	NPA's n	20	11	3	42	355
Winnemucca 245—Humboldt Humboldt County General Hospital	Gen	County	75	50	14	110	1 051
Related Institutions							
Hawthorne 800—Mineral Mineral County Hospital	Gen	County	34	14	10		709
Owyehee 100—Ely Western Shoshone Hospital	Gen	IA	23	13	4	24	409
Stewart 500—Ormsby Carson Indian School Hosp	Inst	IA	34	11			513

## NEW HAMPSHIRE

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Berlin 10 084—Coos St. Louis Hospital	Gen	Church	90	63	15	272	1 865
Claremont 12 144—Sullivan Claremont General Hospital	Gen	NPA's n	59	33	11	313	1 945
Concord 27 171—Merrimack Margaret Pillsbury General Hospital	Gen	NPA's n	100	57	18	200	1 941
New Hampshire Memorial Hospital	Gen	NPA's n	78	58	16	361	1 318
New Hampshire State Hos- pital	Gen	State	2 356	2 503			665
Dover 14 090—Strafford Wentworth Hospital	Gen	City	63	46	15	293	1 551
Fast Derry —Rockingham Alexander Eastman Hospital	Gen	NPA's n	23	10	6	77	356

## NEW HAMPSHIRE—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Epping, 1 618—Rockingham	Gen	County	48	26	10	103	726
Mitchell Memorial Hospital	Gen	NP Assn	73	40	22	330	1 454
Exeter 5 398—Rockingham	Gen	NP Assn	50	25	16	206	825
Franklin 6 749—Merrimack	Gen	NP Assn	140	114	.	.	63
Franklin Hospital	TB	State	123	90	14	194	1 061
Glencliff 200—Grafton	Gen	County	123	90	14	194	1 061
New Hampshire State Sanatorium	Gen	County	123	90	14	194	1 061
Grasmere, 200—Hillsboro	Gen	County	123	90	14	194	1 061
Hillsborough County General Hospital	Gen	County	123	90	14	194	1 061
Hanover 3 425—Grafton	Gen	NP Assn	178	162	18	381	5 332
Vary Hitchcock Memorial Hospital	Gen	NP Assn	85	55	15	384	2 373
Keene, 13 832—Cheshire	Gen	NP Assn	89	67	25	417	2 270
Elliot Community Hospital	Gen	NP Assn	20	12	4	75	404
Laconia, 13 484—Belknap	Gen	NP Assn	17	8	11	117	263
Laconia Hospital	Gen	NP Assn	50	25	12	128	591
Lancaster 3 095—Coos	Gen	NP Assn	122	70	32	607	2 567
Lancaster Hospital	Gen	NP Assn	93	73	15	340	2 276
Lebanon 7 090—Grafton	Gen	Church	124	96	19	338	2 350
Alice Peck Day Memorial Hospital	Gen	Church	84	77	16	328	1 882
Littleton 4 571—Grafton	Gen	NP Assn	69	65	18	403	2 164
Littleton Hospital	Gen	NP Assn	25	12	7	29	487
Manchester 77 685—Hillsboro	Gen	NP Assn	25	13	9	108	310
Balch Hospital	Gen	NP Assn	37	26	10	141	932
Elliot Hospital	Gen	NP Assn	100	74	.	89	.
Notre Dame de Lourdes Hospital	Gen	NP Assn	30	21	10	139	781
Our Lady of Perpetual Help Maternity Hospital	Gen	NP Assn	33	24	7	124	803
Sacred Heart Hospital	Gen	NP Assn	112	70	24	436	3 074
Nashua 32 927—Hillsboro	Gen	NP Assn	152	43	.	578	.
Nashua Memorial Hospital	Gen	NP Assn	60	38	20	391	2 039
St Joseph's Hospital	Gen	NP Assn	50	33	5	88	402
New London 1 039—Merrimack	Gen	NP Assn	50	12	10	41	216
New London Hospital	Gen	NP Assn	36	25	6	89	810
Newport 5 304—Sullivan	Gen	NP Assn	28	16	8	115	763
Carrie F Wright Hospital	Gen	NP Assn	32	27	4	5	126
North Conway 900—Carroll	Gen	NP Assn	30	21	10	139	781
Memorial Hospital	Gen	NP Assn	33	24	7	124	803
Pembroke (Suncook P O) 50—Merrimack	Gen	NP Assn	112	70	24	436	3 074
Pembroke Sanatorium	Gen	NP Assn	152	43	.	578	.
Peterborough 2 470—Hillsboro	Gen	NP Assn	60	38	20	391	2 039
Peterborough Hospital	Gen	NP Assn	50	33	5	88	402
Plymouth 2 533—Grafton	Gen	NP Assn	50	12	10	41	216
Severa Speare Memorial Hosp	Gen	NP Assn	36	25	6	89	810
Portsmouth 14 821—Rockingham	Gen	NP Assn	28	16	8	115	763
Portsmouth Hospital	Gen	NP Assn	32	27	4	5	126
U S Naval Hospital	Gen	NP Assn	30	21	10	139	781
Rochester 12 012—Strafford	Gen	NP Assn	33	24	7	124	803
Friskie Memorial Hospital	Gen	NP Assn	112	70	24	436	3 074
West Stewartstown 350—Coos	Gen	NP Assn	152	43	.	578	.
Coos County Hospital	Gen	NP Assn	60	38	20	391	2 039
Whitefield 1 834—Coos	Gen	NP Assn	50	33	5	88	402
Morrison Hospital	Gen	NP Assn	50	12	10	41	216
Wolfeboro 2 636—Carroll	Gen	NP Assn	36	25	6	89	810
Huggins Hospital	Gen	NP Assn	28	16	8	115	763
Woodsville 1 900—Grafton	Gen	NP Assn	32	27	4	5	126
Cottage Hospital	Gen	NP Assn	30	21	10	139	781
Grafton County Hospital	Inst	Gen	County	62	No data supplied	.	.

## Related Institutions

Epping 1 618—Rockingham	Inst	County	62	No data supplied	.	.
Rockingham County Farm Hospital	Inst	County	62	No data supplied	.	.
Exeter 5 398—Rockingham	Inst	NP Assn	53	8	.	776
Lamont Infirmary	Inst	NP Assn	53	8	.	776
Laconia 13 484—Belknap	Inst	NP Assn	53	8	.	776
Laconia State School	Inst	NP Assn	53	8	.	776
Manchester 77 685—Hillsboro	Inst	NP Assn	53	8	.	776
Manchester Isolation Hospital	Inst	NP Assn	53	8	.	776

## NEW JERSEY

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Allentown 766—Monmouth	Gen	Indiv	30	18	6	105	783
Dr Farmer's Private Hosp	Gen	Indiv	30	18	6	105	783
Allenwood 100—Monmouth	Gen	Indiv	30	18	6	105	783
Allenwood Sanatorium and Monmouth County Hospital for Tuberculosis	TB	County	100	96	.	119	.
Atlantic City 64 094—Atlantic	Gen	NP Assn	260	189	40	1 121	5 601
Atlantic City Hospital	Gen	NP Assn	260	189	40	1 121	5 601
Children's Seashore House at Atlantic City for Invalid Children	Orth	NP Assn	375	167	4	3	2 119
Municipal Hospital	Gen	NP Assn	220	135	30	1 040	4 592
Bayonne 79 198—Hudson	Gen	NP Assn	16	6	6	6	230
Bayonne Hospital and Dispensary	Gen	NP Assn	16	6	6	6	230
Swiney Sanatorium	Gen	NP Assn	16	6	6	6	230
Beach Haven 74—Ocean	Gen	NP Assn	16	6	6	6	230
Seashore Branch of Babies' Hospital	Gen	NP Assn	16	6	6	6	230
Belmont 61—Somerset	Gen	NP Assn	16	6	6	6	230
Belle Mead Sanatorium and Farm	Gen	NP Assn	16	6	6	6	230

## NEW JERSEY—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Belleville 28 167—Essex	Gen	County	510	149	.	3 095	.
Essex County Hospital for Contagious Diseases	Gen	County	510	149	.	3 095	.
Bernardsville 3 460—Somerset	Gen	NP Assn	30	No data supplied	.	.	.
Shannon Lodge Sanatorium	Gen	NP Assn	30	No data supplied	.	.	.
Bound Brook 7 616—Somerset	Gen	NP Assn	30	No data supplied	.	.	.
Bound Brook Hospital	Gen	NP Assn	30	No data supplied	.	.	.
Bridgeton 15 992—Cumberland	Gen	NP Assn	93	68	22	460	2 068
Bridgeton Hospital	Gen	NP Assn	93	68	22	460	2 068
Ivy Hall Sanatorium	Gen	NP Assn	25	25	.	33	.
Browns Mills 500—Burlington	Gen	NP Assn	78	74	.	82	.
Deborah Sanatorium	Gen	NP Assn	78	74	.	82	.
Camden 117 536—Camden	Gen	NP Assn	23	20	12	400	1 200
Bellevue Hospital	Gen	NP Assn	341	257	56	1 002	7 459
Cooper Hospital	Gen	NP Assn	341	257	56	1 002	7 459
Marion Childs Hospital for Children	Gen	NP Assn	341	257	56	1 002	7 459
Municipal Hospital for Contagious Diseases	Gen	NP Assn	341	257	56	1 002	7 459
West Jersey Homeopathic Hospital	Gen	NP Assn	257	173	63	1 514	5 775
Cedar Grove 2 000—Essex	Gen	NP Assn	257	173	63	1 514	5 775
Essex County Hospital	Gen	NP Assn	257	173	63	1 514	5 775
Dover 10 491—Morris	Gen	NP Assn	114	68	21	594	2 638
Dover General Hospital	Gen	NP Assn	114	68	21	594	2 638
Dumont 7 556—Bergen	Gen	NP Assn	14	6	5	32	209
Dumont Private Hospital	Gen	NP Assn	14	6	5	32	209
East Orange 68 945—Essex	Gen	NP Assn	190	86	30	778	3 794
East Orange General Hosp	Gen	NP Assn	190	86	30	778	3 794
Elizabeth 109 912—Union	Gen	NP Assn	168	135	.	2 563	.
Alexian Brothers Hospital	Gen	NP Assn	168	135	.	2 563	.
Elizabeth General Hospital and Dispensary	Gen	NP Assn	208	162	44	1 252	6 523
St Elizabeth Hospital	Gen	NP Assn	222	159	44	1 493	4 757
Englewood 18 966—Bergen	Gen	NP Assn	196	155	42	1 153	4 893
Englewood Hospital	Gen	NP Assn	196	155	42	1 153	4 893
Fort Dix—Burlington	Gen	NP Assn	196	155	42	1 153	4 893
Station Hospital	Gen	NP Assn	196	155	42	1 153	4 893
Fort Hancock—Monmouth	Gen	NP Assn	196	155	42	1 153	4 893
Station Hospital	Gen	NP Assn	196	155	42	1 153	4 893
Fort Monmouth—Monmouth	Gen	NP Assn	196	155	42	1 153	4 893
Station Hospital	Gen	NP Assn	196	155	42	1 153	4 893
Franklin 4 009—Essex	Gen	NP Assn	27	17	7	144	692
Franklin Hospital	Gen	NP Assn	27	17	7	144	692
Glen Gardner 536—Hunterdon	Gen	NP Assn	27	17	7	144	692
New Jersey Sanatorium for Tuberculous Diseases	TB	State	494	60	.	512	.
Grenloch 800—Camden	Gen	NP Assn	250	149	.	1 194	.
Camden County General Hospital	Gen	NP Assn	250	149	.	1 194	.
Camden County Hospital for Mental Diseases	Gen	NP Assn	250	149	.	1 194	.
Camden County Tuberculosis Hospital	Gen	NP Assn	250	149	.	1 194	.
Greystone Park—Morris	Gen	NP Assn	250	149	.	1 194	.
New Jersey State Hosp	Gen	NP Assn	250	149	.	1 194	.
Hackensack 26 279—Bergen	Gen	NP Assn	250	149	.	1 194	.
Hackensack Hospital	Gen	NP Assn	250	149	.	1 194	.
Hasbrouck Heights 6 716—Bergen	Gen	NP Assn	250	149	.	1 194	.
Hasbrouck Heights Hospital	Gen	NP Assn	250	149	.	1 194	.
Hoboken 50 110—Hudson	Gen	NP Assn	31	26	.	613	.
St Mary's Hospital	Gen	NP Assn	31	26	.	613	.
Irvington 55 328—Essex	Gen	NP Assn	31	26	.	613	.
Irvington General Hospital	Gen	NP Assn	31	26	.	613	.
Jersey City 301 173—Hudson	Gen	NP Assn	79	67	17	424	2 932
Christ Hospital	Gen	NP Assn	79	67	17	424	2 932
Fairmount Hospital	Gen	NP Assn	79	67	17	424	2 932
Greenville Hospital	Gen	NP Assn	79	67	17	424	2 932
Hudson County Tuberculosis Hospital	Gen	NP Assn	79	67	17	424	2 932
Jersey City Hospital	Gen	NP Assn	79	67	17	424	2 932
Jersey City Hospital for Communicable Diseases	Gen	NP Assn	79	67	17	424	2 932
Margaret Hague Maternity Hospital	Gen	NP Assn	79	67	17	424	2 932
Psychopathic Hospital	Gen	NP Assn	79	67	17	424	2 932
St Francis Hospital	Gen	NP Assn	79	67	17	424	2 932
Hearny (Arlington P O) 39 467—Hudson	Gen	NP Assn	155	100	21	1 957	5 710
West Hudson Hospital	Gen	NP Assn	155	100	21	1 957	5 710
Lakewood 8 000—Ocean	Gen	NP Assn	62	47	10	224	1 345
Paul Kimball Hospital	Gen	NP Assn	62	47	10	224	1 345
Long Branch 17 408—Monmouth	Gen	NP Assn	64	35	10	196	860
Dr E C Hazard Hospital	Gen	NP Assn	64	35	10	196	860
Monmouth Memorial Hospital	Gen	NP Assn	64	35	10	196	860
Lyons—Somerset	Gen	NP Assn	212	165	42	1 012	6 020
Veterans Admin Facility	Gen	NP Assn	212	165	42	1 012	6 020
Marlboro 500—Monmouth	Gen	NP Assn	212	165	42	1 012	6 020
New Jersey State Hospital	Gen	NP Assn	212	165	42	1 012	6 020
Metuchen 6 557—Middlesex	Gen	NP Assn	277	2 097	.	877	.
Roosevelt Hospital	Gen	NP Assn	277	2 097	.	877	.
Midland Park 4 535—Bergen	Gen	NP Assn	221	213	.	254	.
Christian Sanatorium	Gen	NP Assn	221	213	.	254	.
Millville 14 606—Cumberland	Gen	NP Assn	185	184	.	173	.
Millville Hospital	Gen	NP Assn	185	184	.	173	.
Montclair 39 897—Essex	Gen	NP Assn	37	35	5	252	1 195
Montclair Community Hosp	Gen	NP Assn	37	35	5	252	1 195
Mountainside Hospital	Gen	NP Assn	56	53	20	468	1 518
St Vincent's Hospital	Gen	NP Assn	312	193	60	1 077	6 080
Morris Plains 2 018—Morris	Gen	NP Assn	56	38	12	277	1 483
Children's Heart Unit of Victoria Foundation	Gen	NP Assn	20	21	.	20	.
Morristown 15 200—Morris	Gen	NP Assn	20	21	.	20	.
All Souls Hospital	Gen	NP Assn	20	21	.	20	.
Aurora Institute	Gen	NP Assn	20	21	.	20	.

Key to symbols and abbreviations is on page 1027



## NEW JERSEY—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Morristown Memorial Hospital	Gen	NPAssn	140	97	18	407	3,382
Shongum Mountain Sanatorium	IB	County	70	69			67
Mount Holly, 6573—Burlington	Gen	NPAssn	127	91	18	607	2,201
Naptune 2,392—Monmouth	Gen	NPAssn	150	124	30	991	4,230
Fitch Memorial Hospital	Gen	NPAssn	150	124	30	991	4,230
Newark 420-760—Fsscx	Gen	NPAssn	30	20	13	385	1,018
American Legion Memorial Hospital	Gen	NPAssn	60	73			1,210
Babbs Hospital Colt Memorial	Chil	NPAssn	73	59	32	904	2,800
Columbus Hospital	Gen	NPAssn	26	17	4	22	400
Community Hospital	Gen	NPAssn	110	70			318
Hospital and Home for Crippled Children	Orth	NPAssn	217	160	30	1,130	6,018
Hospital of St. Barnabas and for Women and Children	Gen	Church	791	718	72	2,417	12,100
Newark Beth Israel Hospital	Gen	NPAssn	700	519	40	1,177	13,133
Newark City Hospital	Gen	NPAssn	00	28			2,050
Newark 130 and Far Infirmity	FN I	NPAssn	130	78	30	569	2,800
Newark Memorial Hospital	Gen	NPAssn	271	270	60	1,207	7,808
Presbyterian Hospital	Gen	NPAssn	160	84	20	533	1,017
St. James Hospital	Gen	Church	400	278	70	1,495	7,172
St. Michael's Hospital	Gen	Church	110	65	18	509	2,138
New Brunswick 71-180—Middlesex	Gen	NPAssn	180	100	42	1,170	6,074
St. Peter's General Hospital	Gen	Church	144	104			00
New Lisbon 213—Burlington	TB	County	42	31	0	266	1,239
Fairview Sanatorium	Gen	NPAssn	410	300			180
Newton 6533—Sussex	Gen	NPAssn	86	69			109
Newton Memorial Hospital	Gen	NPAssn	71	98			593
Northfield 2848—Atlantic	Gen	NPAssn	201	210	70	1,712	7,936
Atlantic County Hospital for Mental Diseases	Ment	County	110	111	40	763	1,742
Atlantic County Hospital for Tuberculous Diseases (Line Rest Sanatorium)	TB	County	76	57	20	490	1,931
Orange 3,717—Sussex	Gen	NPAssn	223	170	72	1,682	5,631
New Jersey Orthopaedic Hospital and Dispensary	Orth	NPAssn	167	160	50	1,120	5,631
Orange Memorial Hospital	Gen	NPAssn	70	57	20	490	1,931
St. Mary's Hospital	Gen	Church	167	160	50	1,120	5,631
Passaic 61-94—Passaic	Gen	NPAssn	223	170	72	1,682	5,631
Beth Israel Hospital	Gen	NPAssn	167	160	50	1,120	5,631
Passaic General Hospital	Gen	NPAssn	223	170	72	1,682	5,631
St. Mary's Hospital	Gen	Church	167	160	50	1,120	5,631
Paterson 139-60—Passaic	Gen	NPAssn	116	100	29	912	3,450
Nathan and Miriam Barnert Memorial Hospital	Gen	NPAssn	284	231	41	1,718	7,936
Paterson General Hospital	Gen	NPAssn	390	290	78	1,918	7,936
St. Joseph's Hospital	Gen	Church	210	230			200
Valley View Sanatorium	TB	County	210	230			200
Perth Amboy, 41,242—Middlesex	Gen	NPAssn	163	112	31	1,070	4,072
Perth Amboy General Hospital	Gen	NPAssn	80	37	12	101	910
Pinevald (Banyville P. O.),—Ocean	Gen	NPAssn	201	200	11	1,770	8,507
Royal Pines Hospital	Gen	NPAssn	48	20	10	120	600
Pinefield 3,469—Union	Gen	NPAssn	120	170			478
Muhlenberg Hospital	Gen	NPAssn	54	16			977
Point Pleasant 2,000—Ocean	Gen	NPAssn	70	44	11	206	1,230
Point Pleasant Hospital	Gen	NPAssn	18	4			230
Prekness (Mountain View P. O.)—Passaic	Gen	NPAssn	80	73	20	600	2,012
Hope Dell Hospital	Gen	NPAssn	30	23	15	200	1,200
Princeton 770—Mercer	Gen	NPAssn	600	292			500
Isabella McCosh Infirmary of Princeton University	Inst	NPAssn	41	10	15	301	1,154
Princeton Hospital	Gen	NPAssn	40	No data supplied			
Rahway, 17,493—Union	Gen	NPAssn	428	301			303
New Jersey Reformatory Hospital	Inst	State	178	71			407
Rahway Hospital	Gen	NPAssn	237	227			331
Red Bank 10,974—Monmouth	Gen	NPAssn	1,007	1,811			390
Riverview Hospital	Gen	NPAssn	1,550	1,510			107
Ridgewood 11,918—Bergen	Gen	NPAssn	65	25	9	138	1,000
Bergen Pines Bergen County Hospital	TB	County	80	60	20	712	3,184
Riverside 4,000—Burlington	Gen	NPAssn	42	No data supplied			
Zurbrugg Memorial Hospital	Gen	NPAssn	42	No data supplied			
Salem 8,618—Salem	Gen	NPAssn	42	No data supplied			
Salem County Memorial Hospital	Gen	NPAssn	42	No data supplied			
Scott Plains 3,000—Union	TB	County	428	301			303
Bonnie Burn Sanatorium	TB	County	428	301			303
Secaucus 9,751—Hudson	Gen	NPAssn	178	71			407
Hudson County Contagious Disease Hospital	Iso	County	237	227			331
Hudson County Hospital	Gen	NPAssn	1,007	1,811			390
Hudson County Hospital for Mental Diseases	Ment	County	1,550	1,510			107
Skilman 23—Somerset	Gen	NPAssn	65	25	9	138	1,000
New Jersey State Village for Epileptics	Epil	State	1,550	1,510			107
Somers Point 1,092—Atlantic	Gen	NPAssn	65	25	9	138	1,000
Shore Memorial Hospital	Gen	NPAssn	65	25	9	138	1,000
Somerville 8,720—Somerset	Gen	NPAssn	65	25	9	138	1,000
Somerset Hospital	Gen	NPAssn	65	25	9	138	1,000
South Amboy 7,802—Middlesex	Gen	NPAssn	42	No data supplied			
South Amboy Memorial Hospital	Gen	NPAssn	42	No data supplied			

## NEW JERSEY—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Summit 16,100—Union	Gen	NPAssn	42	29			139
Tulr Oaks Sanatorium	Nerv	Corp	148	119	30	730	3,610
Overlook Hospital	Gen	NPAssn	20	10	5	300	337
Sussex, 1,478—Sussex	Gen	NPAssn	182	148	43	1,580	4,843
Alexander Linn Hospital	Gen	NPAssn	20	10	5	300	337
Tenneck 20,270—Trenton	Gen	Church	182	148	43	1,580	4,843
Holy Name Hospital	Gen	Church	182	148	43	1,580	4,843
Trenton 124,697—Mercer	Gen	Church	182	148	43	1,580	4,843
T. W. Donnelly Memorial Hospital	Thlso	City	200	200			504
Clenwood Sanatorium	N&M	Indiv	24	18			47
Mercer Hospital	Gen	NPAssn	231	169	41	1,212	5,331
New Jersey State Hospital	Ment	State	3,000	2,901			900
New Jersey State Prison Hospital	Inst	State	42	20			500
Orthopaedic Hospital and Dispensary	Orth	NPAssn	47	27			180
St. Francis Hospital	Gen	NPAssn	290	221	47	1,107	7,101
Trenton General Hospital	Gen	NPAssn	60	30	10	100	823
William McKinley Memorial Hospital	Gen	NPAssn	121	109	33	723	3,010
Union City 56,173—Hudson	Gen	NPAssn	20	15	10	71	510
Union City General Hospital	Gen	NPAssn	20	15	10	71	510
Vernon, 8,007—Sussex	TB	County	410	407			480
Jesse Mountain Sanatorium	TB	County	410	407			480
Vineland 7,014—Cumberland	Gen	NPAssn	87	54	18	300	1,708
Newcomb Hospital	Gen	NPAssn	87	54	18	300	1,708
Weehawken (Union City P. O.), Hudson	Gen	NPAssn	106	104	20	461	3,040
North Hudson Hospital	Gen	NPAssn	106	104	20	461	3,040
Westfield, 14,454—Union	Orth	NPAssn	70	50			100
Children's Country Home	Orth	NPAssn	70	50			100
Woodbury 8,300—Cape May	Gen	NPAssn	50	43	20	409	1,771
Underwood Hospital	Gen	NPAssn	50	43	20	409	1,771
Related Institutions							
Bridgeton 1,902—Cumberland	Ment	County	700	201			60
Cumberland County Hospital for Insane	Ment	County	700	201			60
Brown's Mills 500—Burlington	IB	Corp	40	37			21
Brown's Mills Nursing Cottage	IB	Indiv	40	37			21
Manor Nursing Cottage	IB	Indiv	40	37			21
Sycamore Hall Sanatorium	IB	Inst	31	21			20
Caldwell 4,932—Fsscx	CardConv	NPAssn	40	31			300
Theresa Cottage Home for Convalescents	CardConv	NPAssn	40	31			300
Larmingdale 600—Monmouth	TB	NPAssn	206	141			570
Tuberculosis Preventorium for Children	TB	NPAssn	206	141			570
Jamesburg 2,125—Middlesex	Inst	State	21	11			763
New Jersey State Home for Boys	Inst	State	21	11			763
Jersey City 201,173—Hudson	Ment	County	700	201			60
Salvation Army Door of Hope Home and Hospital	Ment	County	700	201			60
Longport 63—Atlantic	Orth	NPAssn	100	60			71
St. Barnabas Home for Afflicted Children	Orth	NPAssn	100	60			71
Maplewood 23,100—Fsscx	Inst	City	100	93			200
Newark City Almshouse	Inst	City	100	93			200
Monte Park 400—Middlesex	Inst	State	54	66			700
New Jersey Home for Disabled Soldiers	Inst	State	54	66			700
Newark 4,932—Fsscx	Inst	NPAssn	20	27	30	61	600
Florence Crittenton Home	Inst	NPAssn	20	27	30	61	600
Newark Convalescent Hospital	Inst	NPAssn	20	27	30	61	600
New Brunswick 23,100—Middlesex	Inst	NPAssn	20	27	30	61	600
Mary Kingsland Mary Wilks Infirmary	Inst	State	22	1			120
Rutgers Infirmary	Inst	NPAssn	12	4			60
Newfoundland, 56—Morris	TB	Corp	60	10			30
Idylse Sanatorium	TB	Corp	60	10			30
New Lisbon 213—Burlington	Gen	NPAssn	116	100	29	912	3,450
Burlington County Hospital	Gen	NPAssn	116	100	29	912	3,450
for the Insane	Ment	County	205	200			40
New Jersey State Colony	MeDe	State	800	761			130
Paterson 139-60—Passaic	ChrIso	City	110	44			270
Paterson City Hospital	ChrIso	City	110	44			270
Roseland 1,606—Fsscx	N&M	Corp	22	21			74
Mountain View Rest	N&M	Corp	22	21			74
Sea Isle City 703—Cape May	Inst	State	60	19			120
Sea Isle Hospital and Training School	Inst	State	60	19			120
Totowa (Little Falls P. O.) 510—Passaic	MeDe	NPAssn	668	645			74
North Jersey Training School	MeDe	NPAssn	1,627	1,500			74
Trenton 124,697—Mercer	Inst	State	70	47	3	20	310
State Home for Girls	Inst	State	70	47	3	20	310
Upper Montclair—Fsscx	Conv	Part	10	7			26
Montclair Sanatorium	Conv	Part	10	7			26
Vineland 7,014—Cumberland	MeDe	Indiv	20	18			2
Maplehurst School	MeDe	Indiv	20	18			2
New Jersey Memorial Home for Disabled Soldiers Sailors Marines and Their Wives and Widows	Inst	State	60	19			120
Training School at Vineland	MeDe	NPAssn	668	645			74
Vineland State School	MeDe	NPAssn	1,627	1,500			74
Westfield 18,408—Union	Conv	Indiv	30	28			23
Brookside Nursing Home	Conv	Indiv	30	28			23
Woodbury 2,111—Cape May	MeDe	State	730	688			19
State Colony for Feeble minded Males	MeDe	State	730	688			19

## NEW MEXICO

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Inpatients	Number of Births	Admissions †
Albuquerque 35449—Bernalillo							
Albuquerque Indian Sanatorium	TB	IA	100	86			68
Atchison Topeka and Santa Fe Hospital	Indus	NPAasn	67	20			424
Children's Home and Hosp	Orth	NPAasn	40	6			400
Methodist Sanatorium	TB	Church	65	51			63
Nazareth Sanatorium	Conv	Church	25	20			63
St Joseph Sanatorium and Hospital	GenTb	Church	170	98	30	628	4 119
Southwestern Presbyterian Sanatorium	GenTb	Church	147	104	12	466	2 434
U S Indian School Hosp	Gen	IA	60	40	8	112	1 607
Veterans Admin Facility	GenTb	Vet	259	184			1 289
Artesia 4 071—Eddy							
Artesia Municipal Hospital	Gen	Church	20	6	6	80	447
Black Rock (Zuni P O)—McKinley							
Zuni Indian Hospital	Gen	IA	43	13	8	12	281
Carlsbad 7 110—Eddy							
Carlsbad Memorial Hospital	Gen	NPAasn	25	10	4	33	147
St Francis Xavier Hospital	Gen	Church	42	27	13	242	1 859
Clayton, 3 188—Union							
St Joseph Hospital	Gen	Church	25	8	5	65	472
Clovis 10 065—Curry							
Atchison Topeka and Santa Fe Hospital	Indus	NPAasn	34	23			510
Clovis Memorial Hospital	Gen	City	50	41	8	454	1 689
Crownpoint 90—McKinley							
Eastern Navajo Hospital	Gen	IA	65	37	10	111	1 332
Dawson 2 000—Colfax							
Phelps Dodge Corporation Hospital	Gen	NPAasn	30	5	4	38	259
Deming 3 608—Luna							
Deming Ladies Hospital	Gen	NPAasn	25	5	5	56	380
Dulce 150—Rio Arriba							
Jicarilla Hospital and Sanatorium	GenTb	IA	74	35	4	30	308
Jicarilla Indian Sanatorium	Unit of Jicarilla	Hospital and Sanatorium					
Embudo—Rio Arriba							
Embudo Presbyterian Hosp	Gen	Church	25	13	13	130	708
Farlington 2 161—San Juan							
San Juan Episcopal Indian Mission Hospital	Gen	Church	16	9	1	29	321
San Juan Hospital	Gen	NPAasn	22	6	5	41	308
Fort Bayard 750—Grant							
Veterans Admin Facility	GenTb	Vet	305	257			861
Fort Stanton 490—Lincoln							
U S Marine Hospital	TB	USPHS	237	177			253
Fort Wingate 100—McKinley							
Charles H Burke Hospital	Gen	IA	35	23	6	54	1 109
Gallup 7 041—McKinley							
St Mary's Hospital	Gen	Church	90	40	12	182	1 619
Hobbs 10 619—Lea							
Hobbs General Hospital	Gen	Indiv	25	17	5	204	976
Hot Springs 2 940—Sierra							
Carrie Tingley Hospital for Crippled Children	Orth	State	125	50			234
Las Vegas 5 941—San Miguel							
Las Vegas Hospital (Carpenter Memorial)	Gen	NPAasn	35	18	4	87	832
New Mexico State Hospital	Ment	State	910	860			230
St Anthony's Hospital	Gen	Church	68	35	10	141	1 153
Mescalero 200—Otero							
Mescalero Apache Indian Hospital	Gen	IA	32	13	4	31	422
Raton 7 697—Colfax							
New Mexico Miners Hosp	Gen	State	83	13	10	75	679
Rehoboth 150—McKinley							
Rehoboth Mission Hospital	Gen	Church	29	16	10	78	539
Roswell 13 482—Chaves							
St Mary's Hospital	Gen	Church	75	22	12	280	1 902
Santa Fe 20 325—Santa Fe							
St Vincent Sanatorium and Hospital	GenTb	Church	89	47	12	163	1 370
Santa Fe Indian Hospital	Gen	IA	76	28	6	31	708
Santa Rita 2 000—Grant							
Santa Rita Hospital	Gen	NPAasn	47	25	10	203	915
Shiprock 125—San Juan							
Northern Navajo Hospital	Gen	IA	43	48	4	56	1 478
Silver City 5 044—Grant							
Silver City General Hospital	Gen	NPAasn	40	20	12	217	1 238
Socorro 3 712—Socorro							
State Tuberculosis Sanatorium	TB	State	86	83			165
Taos 965—Taos							
Holy Cross Hospital	Gen	Church	30	8	5	46	406
Tucumcari 6 194—Quay							
Tucumcari General Hospital	Gen	City	21	2	4	90	639
Valmora 125—Mora							
Valmora Sanatorium	TB	NPAasn	75	45	1		152
Related Institutions							
Lordsburg 3 101—Hidalgo							
Lordsburg Hospital	Gen	Corp	20	5	3	30	250
Los Lunas 686—Valencia							
New Mexico Home and Training School for Mental Defectives	MeDe	State	80	78			6
Springer 1 314—Colfax							
Springer Hospital	Gen	Indiv	8	2	3	25	90
Taos 965—Taos							
Thomas P Martin Hospital	Gen	IA	17	7	3	8	283
Tohatchi 100—McKinley							
Tohatchi General Hospital	Gen	IA	14	12	3	49	565

## NEW YORK

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Inpatients	Number of Births	Admissions †
Albany 130 577—Albany							
Albany Hospital	GenTb	NPAasn	551	518	56	1 244	12 065
Anthony N Brady Maternity Home	Mat	Church	65	58	75	1 719	1 557
Child's Hospital	Chil	Church	60	44			497
Memorial Hospital	Gen	NPAasn	130	111	16	456	3 485
St Peter's Hospital	Gen	Church	159	130			4 000
Albion 4 600—Orleans							
Arnold Gregory Memorial Hospital	Gen	NPAasn	24	19	11	168	705
Amityville 5 065—Suffolk							
Long Island Home	N&M	Corp	207	169			2 4
Louden Knickerbocker Hall	N&M	Corp	175	145			223
Amsterdam 33 323—Montgomery							
Amsterdam City Hospital	Gen	NPAasn	88	65	18	303	2 136
Montgomery Sanatorium	TB	County	60	41			46
St Mary's Hospital	Gen	Church	103	88	22	455	2 595
Auburn 35 753—Cayuga							
Auburn City Hospital	Gen	NPAasn	200	152	40	873	5 550
Home for Convalescent and Crippled Children	Unit of Auburn City Hospital						
Mersey Hospital	Gen	Church	80	53	14	249	1 629
Ballston Spa 4 413—Saratoga							
Benedict Memorial Hospital	Gen	NPAasn	17	13	6	137	519
Batavia 17 267—Genee							
Batavia Hospital	Gen	NPAasn	66	49	14	452	1 581
St Jerome Hospital	Gen	Church	73	64	18	461	2 258
Veterans Admin Facility	Gen	Vet	307	222			1 846
Bath 4 696—Steuben							
Bath Memorial Hospital	Gen	City	60	50	8	319	1 539
Veterans Admin Facility	Gen	Vet	428	317			2 140
Bay Shore 10 000—Suffolk							
Dr Kings Hospital	Gen	Indiv	30	10	5	73	409
Southside Hospital	Gen	NPAasn	96	76	24	868	3 145
Beacon 12 572—Dutchess							
Craig House	N&M	Corp	77	38			40
Highland Hospital	Gen	NPAasn	45	30	14	228	1 231
Mattawan State Hospital	Ment	State	1 564	1 569			121
Bedford Hills 2 000—Westchester							
Montefiore Hospital Country Sanatorium	TB	NPAasn	230	229			360
Bellerose 1 317—Nassau							
Hillside Hospital	N&M	NPAasn	85	72			261
Binghamton 78 309—Broome							
Binghamton City Hosp	Gen	City	519	319	40	1 140	9 690
Binghamton State Hosp	Ment	State	2 974	2 761			514
Our Lady of Lourdes Memorial Hospital	Gen	Church	88	56	22	439	1 579
Brentwood 495—Suffolk							
Pilgrim State Hospital	Ment	State	9 529	9 116			1 606
Ross Sanitarium	Gen	Indiv	40	18	3	7	106
Brewster 1 863—Putnam							
Mountainbrook Farm Sanitarium	N&M	Indiv	20			No data supplied	
Brockport 3 590—Monroe							
Brockport Central Hospital	Gen	NPAasn	17	14	7	116	455
Bronxville 6 888—Westchester							
Lawrence Hospital	Gen	NPAasn	104	65	20	382	2 147
Brooklyn 2 695 255—Kings							
Adelphi Hospital	Gen	NPAasn	150	109	50	811	4 762
Bay Ridge Hospital	Gen	Corp	81	70	30	871	2 723
Bensonhurst Maternity Hosp	Mat	Corp	24	19	24	668	717
Bethany Deaconess Hospital	Gen	Church	85	60	25	649	1 793
Beth El Hospital	Gen	NPAasn	242	185	100	2 467	6 721
Beth Moses Hospital	Gen	NPAasn	168	144	30	990	6 430
Brooklyn Cancer Institute	Cancer	City	87	75			824
Brooklyn Doctors Hospital	Gen	Indiv	120	69	55	1 007	2 540
Brooklyn Eye and Ear Hospital	ENT	NPAasn	143	72			7 279
Brooklyn Hospital	Gen	NPAasn	366	242	44	1 254	7 50
Brooklyn State Hospital	Ment	State	3 450	3 407			3 148
Brooklyn Thoracic Hospital	TB	NPAasn	16	124			140
Brooklyn Womens Hospital	Mat	NPAasn	43	41	50	1 351	1 669
Buchwick Hospital	Gen	NPAasn	105	76	22	632	2 520
Caledonian Hospital	Gen	NPAasn	100	88	30	738	3 391
Carson C Peck Memorial Hospital	Gen	NPAasn	102	77	37	1 101	2 654
Concy Island Hospital	Gen	City	270	216	30	721	4 390
Crown Heights Hospital	Gen	Corp	144	118	28	712	3 305
Cumberland Hospital	Gen	City	361	251	39	996	7 069
Evangelical Deaconess Hosp	Gen	Church	105	79	20	745	1 677
Fort Hamilton Station Hosp	Gen	Army	60	26			658
Greenpoint Hospital	Gen	City	264	245	36	1 100	6 352
Harbor Hospital	Gen	NPAasn	77	46	24	176	1 062
Hospital of the Holy Family	Gen	Church	124	100			2 410
House of St Giles the Cripple	Orth	Church	44	35			189
Israel Zion Hospital	Gen	NPAasn	380	330	142	5 055	11 355
Jewish Hospital	Gen	NPAasn	547	476	114	4 020	13 892
Jewish Sanitarium and Hospital for Chronic Diseases	Chr	NPAasn	525	459			134
Kings County Hospital	Gen	City	2 280	2 252	120	3 296	54 773
Kings County Avenue Hospital	Gen	City	510	319			4 315
Kingsway Hospital	Gen	Indiv	21	12	5	210	404
Long Island College Hospital	Gen	NPAasn	407	341	47	1 031	5 544
Lutheran Hospital	Gen	Church	88	55	25	646	3 078
Madison Park Hospital	Gen	Corp	163	92	37	1 212	3 332
Methodist Hospital	Gen	Church	435	318	86	2 022	7 991
Midwood Hospital	Gen	Corp	55	42	21	551	1 761
Norwegian Lutheran Deaconess Home and Hosp	Gen	Church	162	169	38	875	4 793
Prospect Heights Hospital	Gen	NPAasn	134	103	41	844	3 808
Riverdale Hospital	Gen	Corp	40	13	18	471	702
St Catherine's Hospital	Gen	Church	255	239	68	1 570	6 359
St Charles Hospital Orthopedic Clinic	Orth	Church	55	50			230

Key to symbols and abbreviations is on page 1027



## NEW YORK—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basins	Number of Births	Admissions †
Johnson City, 18 039—Broome Charles S Wilson Memorial Hospital**AO	Gen	NPAsen	318	202	32	924	6 074
Katonah 1 800—Westchester Four Winds	N&M	Indiv	37	27			29
Hillbourne Farms	Nerv	NPAsen	10	3			5
Pinewood Sanitarium	N&M	Indiv	72	45			170
Kings Park 2 500—Suffolk Kings Park State Hosp**AO	Ment	State	6 630	3 125			1 142
Kingston 28 509—Ulster Benedictine Hospital (Our Lady of Victory Sanitarium)AO	Gen	Church	90	57	20	331	3 371
Kingston Hospital**AO	Gen	NPAsen	118	73	15	425	2 539
Ulster County Tuberculosis Hospital	TB	County	56	53			80
Jackawanna, 24 005—Erie Moses Taylor Hospital**	Indus	NPAsen	23	12			328
Our Lady of Victory Hosp**	Gen	Church	148	135	32	1 165	3 991
Lake Kushqua 200—Franklin Stony Wood Sanatorium	TB	NPAsen	145	130			100
Lake Placid 3 136—Essex Lake Placid General Hospital	Gen	City	20	11	6	53	300
Liberty, 3 788—Sullivan Maimonides Hospital	Gen	NPAsen	40	20	8	110	613
Workmen's Circle Sanatorium	TB	NPAsen	50	45			60
Little Falls 10 163—Herkimer Little Falls Hospital	Gen	NPAsen	76	50	13	350	2 122
Livingston 406—Columbia Potts Memorial Institute	TB	NPAsen	54	44			20
Lockport 24 379—Niagara Lockport City Hospital	Gen	City	142	125	30	744	3 694
Niagara Sanatorium	TB	County	225	151			120
Long Beach 9 036—Nassau Long Beach Hospital	Gen	NPAsen	57	33	6	77	1 093
Long Island City—Queens Astoria Sanatorium	Gen	Indiv	30	29	22	705	1 301
Boulevard Hospital	Gen	Corp	78	65	30	1 040	3 023
River Crest Sanatorium	N&M	Corp	132	90			305
St John's Long Island City Hospital**AO	Gen	Church	202	170	40	1 010	5 506
Lowville 3 578—Lewis Lewis County General Hosp	Gen	StateCo	43	30	18	248	1 295
Lyons 8 863—Wayne Edward J Barber Hospital	Gen	Indiv	24	17	4	73	481
Lyons Hospital	Gen	Corp	26	16	6	131	549
Malone 8 743—Franklin Alice Hyde Memorial Hospital	Gen	NPAsen	70	57	12	268	1 933
Marcy, 600—Oneida Marcy State Hospital**AO	Ment	State	2 776	2 574			600
Margaretville 812—Delaware Margaretville Hospital	Gen	NPAsen	14	10	5	51	432
Medina 5 871—Orleans Medina Memorial Hospital	Gen	NPAsen	38	30	10	271	1 282
Middle Grove 100—Saratoga Saratoga County Tuberculosis Hospital	TB	County	100	61			79
Middletown 21 908—Orange Elizabeth A Horton Memorial Hospital	Gen	NPAsen	90	71	15	284	1 751
Middletown Sanitarium and Hospital	Gen	Indiv	50			No data supplied	
Middletown State Homeopathic Hospital**AO	Ment	State	3 338	3 258			650
Mineola 10 004—Nassau Nassau Hospital	Gen	NPAsen	227	196	30	1 143	6 194
Mineville 600—Essex Mineville Hospital	Gen	NPAsen	14	11	1	2	287
Mitchell Hospital—Nassau Station Hospital	Gen	Army	50	30	6	22	1 330
Monticello 3 737—Sullivan Hamilton Avenue Hospital	Gen	Indiv	20	13	4	90	855
Monticello Hospital	Gen	NPAsen	36	16	8	90	604
Montour Falls 1 340—Schuyler Shepard Relief Hospital	Gen	NPAsen	34	20	12	102	750
Vault Klee 5 041—Westchester Northern Westchester Hosp**	Gen	NPAsen	100	73	18	384	2 533
Vault McGregor 300—Saratoga Metropolitan Life Insurance Company Sanatorium	TB	NPAsen	300	101			200
Mount Morris 8 530—Livingston Mount Morris Tuberculosis Hospital**AO	TB	State	200	200			193
Mount Vernon 67 362—Westchester Mount Vernon Hospital**AO	Gen	NPAsen	223	129	41	1 006	4 872
Newark 9 646—Wayne Newark Hospital	Gen	Part	28	19	4	111	004
Newburgh 31 883—Orange Estelle and Walter C Odell Memorial Sanatorium for Tuberculosis	TB	County	50	41			43
St Luke's Hospital**AO	Gen	NPAsen	204	116	19	508	3 711
New Rochelle 58 405—Westchester New Rochelle Hospital**AO	Gen	NPAsen	264	203	40	960	6 016
New York City 4 002 009—New York Babies Hospital**AO	Chil	NPAsen	162	127			3 279
Beekman Hospital**	Gen	NPAsen	90	63			1 701
Bellerose Hospital**AO	Gen	City	2 037	2 311	102	1 691	64 478
Beth David Hospital**	Gen	NPAsen	160	106	27	638	3 676
Beth Israel Hospital**AO	Gen	NPAsen	322	269	74	2 007	8 363
Bronx Eye and Ear Infirmary	F&T	NPAsen	54	19			2 607
Bronx Hospital**AO	Gen	NPAsen	529	246	80	3 150	8 897
Bronx Maternity and Woman's Hospital	GynOb	NPAsen	33	10	34	591	605
Charles B Towns Hospital	Drug	Corp	50	16			630

## NEW YORK—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basins	Number of Births	Admissions †
Columbus Hospital**	Gen	Church	200	180	40	673	4 725
Columbus Hospital Extension	Sec	Mother Cabrini Memorial Hospital					
Community Hospital	Gen	NPAsen	19	20	12	100	1 215
Crotona Park Sanitarium	Gen	Corp	2	16	10	388	711
Doctors Hospital	Gen	NPAsen	200	121	00	600	5 582
Downtown Hospital	Gen	NPAsen	117	41	8		1 541
Flower and Fifth Avenue Hospitals**AO	Gen	NPAsen	340	281	71	1 310	9 213
Fordham Hospital**AO	Gen	City	000	434	34	900	12 433
Franklin Maternity San- itarium	Mat	Indiv	10	4	10	140	150
French Hospital**	Gen	NPAsen	270	194	62	1 600	6 074
Goldwater Memorial Hosp**	Gen	City	1 083	1 091			2 456
Gotham Hospital	Gen	Corp	64	51	21	010	2 208
Gouverneur Hospital**	Gen	City	200	100	20	200	3 002
Harlem Eye and Ear Hosp**	F&T	NPAsen	00	8			1 676
Harlem Hospital**AO	Gen	City	604	673	109	2 010	16 000
Home and Hospital of the Daughters of Jacob	Gen	NPAsen	500	260			145
Hospital for Joint Dis- eases**	GenOrth	NPAsen	300	00			6 113
Hosp for Special Surgery**	Orth	NPAsen	200	170			3 001
Hospital of the Rockefeller Institute for Medical Research	Gen	NPAsen	60	34	10	10	300
International Medical Center	Gen	NPAsen	04	10	17	10	225
Jewish Maternity Hospital	Gen	Unit of Beth Israel Hospital					
Jewish Memorial Hospital**	Gen	NPAsen	177	18	40	1 844	4 994
Kniekerbocker Hospital**	Gen	NPAsen	178	114	22	331	3 000
Lebanon Hospital**AO	Gen	NPAsen	139	100	10	269	2 607
Left Central Maternity Hos- pital	Mat	Indiv	30	20	30	1 166	1 231
Lenox Hill Hospital**AO	Gen	NPAsen	534	430	08	1 710	12 412
Le Roy Sanitarium	Gen	Corp	50	10	14	218	1 107
Lincoln Hospital**AO	Gen	City	430	384	70	1 010	12 110
Lutheran Hospital	Gen	NPAsen	110	60	26	600	2 000
Lying in Hospital**	Unit of New York Hospital						
Manhattan Eye Ear and Throat Hospital**	F&T	NPAsen	212	132			13 138
Manhattan General Hospital	Gen	Corp	315	130	60	500	0 290
Manhattan Maternity and Dispensary	Unit of New York Hospital						
Manhattan State Hospital	Ment	State	3 147	2 901			1 500
Memorial Hospital for the Treatment of Cancer and Allied Diseases**	Cancer	NPAsen	213	187			0 029
Metropolitan Hospital**AO	Gen	City	1 003	1 001	08	900	10 000
Midtown Hospital	Gen	NPAsen	61	40			1 235
Misericordia Hospital**AO	Gen	Church	201	136	62	1 100	4 001
Montefiore Hospital for Chronic Diseases**	GenTb	NPAsen	713	60	40	106	1 020
Morrisania City Hosp**AO	Gen	City	466	442	40	1 060	12 000
Mother Cabrini Memorial Hospital	Gen	Church	175	112	30	600	0 424
Mount Eden Hospital	Gen	Indiv	40	31	30	467	1 774
Mount Sinai Hospital**AO	Gen	NPAsen	806	622			16 700
Murray Hill Hospital	Gen	Corp	86	41			1 600
Neurological Institute of New York**AO	Neur	NPAsen	200	133			3 484
New York City Cancer Insti- tute Hospital**	Cancer	City	102	14			539
New York City Hospital**	Gen	City	800	600	30	600	0 000
New York Eye and Ear Infirmary**	F&T	NPAsen	100	106			6 000
New York Foundling Hos- pital**	MatChil	Church	133	61	06	1 710	1 402
New York Hospital**AO	Gen	NPAsen	971	738	142	3 100	17 003
New York Infirmary for Women and Children**	Gen	NPAsen	122	78	88	968	2 005
New York Nursery and Child's Hospital	Unit of New York Hospital						
New York Orthopaedic Dis- pensary and Hospital**	Orth	NPAsen	302	212			1 150
New York Polyclinic Medical School and Hospital**	Gen	NPAsen	374		37	1 110	6 000
New York Post Graduate Med- ical School and Hosp**AO	Gen	NPAsen	411	200			0 000
New York Skin and Cancer Hospital	Unit of New York Post Graduate Medical School and Hospital						
New York State Psychiatric Institute and Hospital**AO	Ment	State	102	144			300
Park East Hospital	Gen	Corp	121	61	24	428	2 013
Parkway Hospital	Gen	NPAsen	70	28	15	320	1 200
Park West Hospital	Gen	Corp	84	60	13	262	2 103
Payne Whitney Psychiatric Clinic**	Unit of New York Hospital						
Presbyterian Hospital and Sloan Hospital for Women**AO	Gen	NPAsen	893	60	144	2 763	17 705
Psychiatric Pavilion	Unit of Bellevue Hospital						
Reconstruction Hospital	Unit of New York Post Graduate Medical School and Hospital						
Rikers Island Hospital	GenInst	City	208	108			2 290
Riverside Hospital**	TbIso	City	200	00			600
Roosevelt Hospital**AO	Gen	NPAsen	900	200			7 160
St Ann's Maternity Hospital	Unit of New York Foundling Hospital						
St Clare's Hospital**	Gen	Church	370	247	70	1 100	7 000
St Elizabeth's Hospital	Gen	Church	105	90	27	619	2 000
St Francis Hospital**	Gen	Church	304	240	47	1 200	6 000
St John's Hospital	Unit of New York Foundling Hospital						
St Joseph's Hospital for Consumptives**	TB	Church	300	200			000
St Luke's Hospital**AO	Gen	NPAsen	507	348			8 115
St Vincent's Hospital**AO	Gen	Church	47	400	100	1 111	10 074

Key to symbols and abbreviations is on page 1027

## NEW YORK—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Seton Hosp (Male Division)†	TB	Church	266	266		340	
Seton Hospital (Nazareth Hospital for Women and Children)†	TB	Church	305	203		269	
Sloane Hospital for Women†	See Presbyterian Hospital						
Sydenham Hospital†	Gen	NPA'sn	181	137	24	911	4 263
Union Hospital	Gen	NPA'sn	50	42	20	382	1 470
U S Hospital Ship Relief†	Gen	Navy	367	173		2 737	
U S Marine Hospital†	Gen	USPHS	404	327		19 403	
University Heights Sanitarium	Gen	Corp	60	30	17	423	1 547
Veterans Admin Facility†	Gen	Tb Vet	1 649	1 360		7 914	
Westchester Square Hospital	Gen	Corp	160	82	02	1 243	3 704
West Hill Sanitarium	N&M	Indiv	70	53			349
West Side Hospital	Gen	Corp	136		13 Reorganized		
Wickerham Hospital	Gen	Corp	70	01	9	333	2 343
Willard Parker Hospital†	Tb Iso	City	433	224		4 163	
William Booth Memorial Hospital†	Gen	Church	48	26	24	323	861
Woman's Hospital†	Gyn Ob	NPA'sn	224	153	100	2 139	4 248
Nagara Falls 70-029—Nagara Mount St Mary's Hosp†	Gen	Church	178	137	42	1 160	5 026
Nagara Falls Memorial Hospital†	Gen	NPA'sn	166	163	24	997	6 806
Northport 3 007—Suffolk Veterans Admin Facility†	Ment	Vet	2 220	2,190			361
North Tonawanda 20 234—Nagara De Craf Memorial Hospital	Gen	City	51	45	18	807	2 800
Norwich 8 049—Chenango Chenango Memorial Hospital†	Gen	NPA'sn	77	51	15	249	1 773
Nyack 5 206—Rockland Nyack Hospital†	Gen	Corp	91	70	18	431	2 745
Ogdensburg 16 346—St Lawrence A Barton Hepburn Hosp†	Gen	Church	160	120	20	477	4 5 6
St Lawrence State Hosp†	Gen	State	2 253	2 020			306
Olean 21 506—Cattaraugus Mountain Clinic	Gen	Indiv	32	17	5	66	602
Olean General Hospital†	Gen	NPA'sn	80	53	24	444	2 021
Rocky Crest Sanatorium	TB	County	43	37			49
St Francis Hospital†	Gen	Church	100	47	18	340	1 604
Oneida 10 291—Madison Main Street Hospital	Gen	Indiv	16	0	5	82	330
Oneida City Hospital†	Gen	City	62	53	17	283	2 491
Oneonta 11 731—Otsego Aurelia Osborn Fox Memorial Hospital†	Gen	NPA'sn	77	51	12	2 38	1 403
Homer Folks Tuberculosis Hospital†	TB	State	2 0	232			290
Parshall Private Hospital	Gen	Indiv	32	0	6	83	321
Orangeburg 700—Rockland Rockland State Hospital†	Ment	State	7 065	7 511		1 472	
Ossining 15 996—Westchester Ossining Hospital†	Gen	NPA'sn	67	58	12	2 0	1 553
Sing Sing Prison Hospital†	Inst	State	84	32			161
Stony Lodge	N&M	Indiv	20	20			76
Oswego 22 062—Oswego Oswego Hospital	Gen	NPA'sn	89	58	11	406	2 289
Station Hospital	Gen	Army	34	23			40
Otisville 889—Orange Municipal Sanatorium†	TB	City	490	309			588
Owego 5 068—Tioga Glenmary Sanitarium	N&M	Corp	50	8			4
Peekskill 17 311—Westchester Peekskill Hospital	Gen	NPA'sn	73	47	10	794	1 612
Penn Yan 5 308— Yates Soldiers and Sailors Memorial Hospital†	Gen	NPA'sn	50	29	10	187	1 060
Perrysburg, 375—Cattaraugus J N Adam Memorial Hosp†	TB	City	402	429			389
Philmont 1 679—Columbia Columbia Sanatorium	TB	County	72	46			43
Plattsburgh 16 301—Clinton Champlain Valley Hospital†	Gen	NPA'sn	104	70	15	345	2 916
Physicians Hospital†	Gen	NPA'sn	96	69	18	762	2 792
Station Hospital	Gen	Army	70	51	3	32	1 363
Pomona 50—Rockland Summit Park Sanatorium†	TB	County	91	82			76
Port Chester 23 073—Westchester Brooklea Farm	N&M	Indiv	15	10			20
Mary Harkness Home for Convalescent Care	Conv	NPA'sn	50	30			513
St Luke's Convalescent Hosp	See Greenwich Conn						
United Hospital†	Gen	NPA'sn	148	148	36	974	5 089
Port Jefferson 3 500—Suffolk John T Mather Memorial Hospital†	Gen	NPA'sn	70	36	24	401	1 886
St Charles Hospital for Crippled Children	Orth	Church	210	180			8
Wharton Memorial Institute	Unit of St Charles Hospital for Crippled Children						
Port Jervis 9 749—Orange St Francis Hospital†	Gen	Church	55	31	10	96	882
Potdam 4 821—St Lawrence Potdam Hospital†	Gen	NPA'sn	63	60	22	404	2 534
Poughkeepsie 40 478—Dutchess Hudson River State Hosp†	Ment	State	4 880	4 613			1 129
St Francis Hospital†	Gen	Church	80	70	25	296	2 140
Samuel and Nettie Bowne Hospital	Tb Card	NPA'sn	50	41			130
Samuel W Bowne Memorial Hospital	TB	Cy Co	131	118			92
Vassar Brothers Hospital†	Gen	NPA'sn	207	160	43	896	5 207
Queens Village—Queens Creedmoor State Hospital†	Ment	State	4 860	4 686			1 160

## NEW YORK—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Ray Brook 550—Essex New York State Hospital†	TB	State	384	369			474
Rhinebeck 1 631—Dutchess Northern Dutchess Health Service Center†	Gen	NPA'sn	34	24	0	120	718
Richland 300—Oswego Oswego County Sanatorium	TB	County	100	86			80
Rochester, 324 070—Monroe Gene ce Hospital†	Gen	NPA'sn	223	216	34	1 117	5 040
Highland Hospital†	Gen	NPA'sn	200	164	60	1,022	0 69
Iola Monroe County Tubercu losis Sanatorium†	TB	County	370	200			302
Monroe County Hospital	Gen	County	500	480	20	72	2 003
Park Avenue Hospital†	Gen	NPA'sn	80	73	20	531	0 3 6
Rochester General Hosp†	Gen	NPA'sn	231	201	63	1 601	9 111
Rochester Municipal Hosp†	Gen	City	321	200	35	497	5 00
Rochester State Hospital†	Ment	State	3 334	3 123			692
St Mary's Hospital†	Gen	Church	220	199	32	1 366	9 800
Strong Memorial Hosp†	Gen	NPA'sn	323	250	35	730	8 917
Rockaway Beach—Queens Nonspent Beach Hospital for Children	Tb Orth Cy Co		120	101			143
Rockaway Beach Hospital and Dispensary†	Gen	NPA'sn	110	74	15	374	2 800
Rockville Centre 18 613—Nassau Mryce Hospital†	Gen	Church	70	54	23	749	2 413
South Nassau Communities Hospital†	Gen	NPA'sn	109	94	40	1 234	2 609
Rome 4 214—Oneida Oneida County Hospital	Gen	County	200	183	8	100	2 219
Rome Hospital and Murphy Memorial Hospital†	Gen	City	116	102	26	84	4 044
Rome State School	Me De	State	3 573	3 046	24	11	241
Roslyn 072—Nassau St Francis Sanatorium for Cardiac Children	Card	Church	100	111			170
Sackett Harbor 1 062—Jefferson Station Hospital	Gen	Army	50	14			43
Salamanca 9 011—Cattaraugus City Hospital	Gen	City	46	41	10	276	1,020
Sall bury Centr 331—Herkimer Pine Crest Sanatorium	TB	County	90	76			50
Saranac Lake 7 138—Franklin General Hospital†	Gen	NPA'sn	50	20	6	91	916
Northwoods Sanatorium	TB	NPA'sn	20	20			24
Reception Hospital	TB	Corp	20	20			12
Will Rogers Memorial Hosp†	TB	NPA'sn	80	71			34
Saratoga Springs 13 700—Saratoga Saratoga Hospital†	Gen	NPA'sn	90	54	17	273	2 000
Schenectady 67 513—Schenectady Eastern New York Orthopedic Hospital School † Sunny View	Orth	Orth NPA'sn	40	71			42
Schenectady County Tubercu losis Hospital (Glenridge Sanatorium)†	TB	County	170	110			139
Seneca Falls 642—Seneca Seneca Falls Hospital	Gen	City	31	21	11	160	610
Sherburne 1 192—Chenango Chenango County Tuberculosis Hospital	TB	County	30	20			19
Sodus 1 513—Wayne T F Myers Hospital	Gen	Part	30	14	7	79	061
Sonyea 000—Livingston Craig Colony	Epil	State	2 312	2 300			221
Southampton 3 818—Suffolk Southampton Hospital†	Gen	NPA'sn	103	38	10	283	1 430
Stamford 1 688—Delaware Bathale Hospital	Gen	NPA'sn	18	5	6	50	003
Stapleton (Staten Island P O) † U S Marine Hospital†	Gen	USPHS	869	571	6	31	8 329
Staten Island 174 441—Richmond Richmond Borough Hospital	Gen	City	70	60			24
Richmond Memorial Hosp†	Gen	NPA'sn	100	85	19	000	1 997
St Vincent's Hospital†	Gen	Church	220	181	20	000	4 000
Seaside Hospital of St John's Guild	Unit of Hospital for Special Surgery New York City						
Sea View Hospital†	TB	City	1 000	1 000	12	000	0 271
Staten Island Hospital†	Gen	Corp	146	173	03	1 442	5 500
Suffern 2 768—Rockland Good Samaritan Hospital	Gen	Church	200	00	20	514	2 763
Summit 50—Franklin Veterans Admin Facility†	TB	Vet	518	429			707
Syracuse 20 067—Onondaga City Hospital†	Gen	City	84	18			680
Crou e Irving Hospital†	Gen	NPA'sn	21	177	27	1 400	6 490
General Hospital†	Gen	NPA'sn	80	83	20	914	2 693
Ho pital of the Good Shepherd†	Gen	NPA'sn	210	160			4 803
Onondaga General Hospital	Gen	NPA'sn	70	38	6	58	800
Onondaga Sanatorium†	TB	County	200	241			994
Peoples Hospital	Gen	NPA'sn	28	13	8	87	463
St Joseph Hospital†	Gen	Church	205	160	30	1 016	5 719
St Mary's Maternity Hospital and Infants Asylum	Mat	Church	97	21	29	508	547
Syracuse Memorial Hosp†	Gen	NPA'sn	200	210	40	1 025	6 660
Syracuse Psychopathic Hospital†	Ment	State	60	52			600
Twin Flms	N&M	Indiv	10	9			113
Tarrytown 6 974—Westchester Tarrytown Hospital†	Gen	NPA'sn	57	88	13	334	1 001
Thiells 700—Rockland Ietchworth Village	Me De	State	3 690	3 944	6	13	561
Ticonderoga 3 400—Essex Moses Ludington Hospital†	Gen	Corp	47	31	6	10	944

## NEW YORK—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Troy 70 804—Rensselaer	Gen	NPAssn	125	111	25	698	3 207
Leonard Hospital	Gen	NPAssn	60	39			302
Marshall Sanitarium	N&M	NPAssn	60	39			
Price Memorial Hospital	Unit of Samaritan Hospital						
St Joseph's Maternity Hosp	Mat	Church	33	9	32	274	311
Samaritan Hospital*+AO	Gen	NPAssn	179	134	21	744	4 032
Troy Hospital*+AO	Gen	Church	272	190	24	504	4 546
Trudeau, 600—Essex							
Trudeau Sanatorium*+AO	TB	NPAssn	200	196			225
Tupper Lake 5 451—Franklin							
Mercy General Hospital	Gen	Church	28	17	7	85	603
Tuxedo Park 2 500—Orange							
Tuxedo Memorial Hospital	Gen	NPAssn	83	16	7	72	524
Utica 100 518—Oneida							
Children's Hospital Home	OrthTb	NPAssn	40	27			121
Faxton Hospital	Gen	NPAssn	106	91	24	636	2 490
Masonic Soldiers and Sailors Memorial Hospital	Gen	NPAssn	200	95			302
Onondaga County Tuberculosis Sanatorium (Broadacres)	TB	County	182	164			142
St Elizabeth Hospital	Gen	Church	140	137	30	680	5 099
St Luke's Home and Hosp	Gen	Church	123	85	28	547	3 208
Utica General Hospital	Gen	City	150	63	14	124	2 917
Utica Memorial Hospital	Gen	NPAssn	76	56	24	451	3 159
Utica State Hospital*+AO	Ment	State	1 787	1 765			525
Valhalla 2 220—Westchester							
Grasslands Hospital*+AO	Gen	County	810	612	15	169	4 633
Warsaw 8 554—Wyoming							
Wyoming County Community Hospital	Gen	StateCo	122	103	20	457	2 525
Warwick 2 534—Orange							
St Anthony's Hospital	Gen	Church	50	15	12	83	540
Watertown 4 010—Seneca							
Watertown Memorial Hospital	Gen	NPAssn	25	10	5	151	592
Watertown 33 335—Jefferson							
House of the Good Samaritan	Gen	NPAssn	120	106	15	386	3 098
Jefferson County Sanatorium	TB	County	78	55			83
Mercy Hospital	Gen	Church	119	90	28	667	2 798
Waverly 5 450—Tioga							
Tioga County General Hosp	Gen	NPAssn	65	58	12	240	1 477
Wayland 1 795—Steuben							
Wayland Hospital	Gen	Part	17	16	8	84	421
Wellsville 5 942—Allegany							
Memorial Hospital of Wm F and Gertrude F Jones	Gen	City	45	45	10	821	1 636
West Haverstraw 2 533—Rockland							
New York State Reconstruction Home	OrChil	State	810	151			293
West Point—Orange							
Station Hospital	Gen	Army	158	79	8	80	3 470
White Plains 40 327—Westchester							
Burke Convalescent Home	Conv	NPAssn	250	209			4 026
New York Hospital—Westchester Division*+AO	N&M	NPAssn	550	279			861
New York Orthopaedic Dispensary and Hospital Country Branch	Unit of New York Orthopaedic Dispensary and Hospital New York City						
St Agnes Hospital	Gen	Church	138	91	39	568	2 892
White Plains Hospital	Gen	NPAssn	178	121	24	552	4 297
Willard 600—Seneca							
Willard State Hospital	Ment	State	8 079	2 821			663
Wingdale 500—Dutchess							
Harlem Valley State Hospital	Ment	State	4 627	4 006			492
Woodhaven—Queens							
St Anthony's Hospital	TB	Church	390	376			952
Wynantskill 200—Rensselaer							
Pawling Sanatorium	TB	County	118	91			111
Yaphank 350—Suffolk							
Suffolk Home and Infirmary	GenCh	County	268	201			264
Yonkers 142 589—Westchester							
Gray Oaks Hospital	TB	City	45	48			40
House of Rest at Sprain Ridge	TB	NPAssn	100	80			114
St John's Riverside Hosp	Gen	NPAssn	189	131	32	639	4 310
St Joseph's Hospital	Gen	Church	177	92	20	478	2 554
Yonkers General Hospital	Gen	NPAssn	142	114	33	837	3 873
Yonkers Professional Hosp	Gen	Corp	100	50	25	890	2 113

## Related Institutions

Albany 130 577—Albany							
Albany's Hospital for Incurables	Incur	NPAssn	100	99			60
St Margaret's House and Hospital	Inst	Church	40	45			60
Albion 4 660—Orleans							
Albion State Training School	MeDe	State	484	302			83
Orleans Welfare Hospital	Gen	County	45	25	5	14	95
Alden 8 4—Erie							
Erie County Penitentiary Hospital	Inst	County	27	7			130
Amityville 5 638—Suffolk							
Branswick Home	N&M	Chr Corp	215	231			290
Bainbridge 1 450—Chenango							
Bainbridge Hospital	Gen	Indiv	15	9	8	80	450
Bedford Hills 2 000—Westchester							
Westfield State Farm	Inst	State	52	25			706
Binghamton 78 309—Broome							
Binghamton Training School for Nervous Backward and Mental Defectives	MeDe	Indiv	55	52			7

## NEW YORK—Continued

Related Institutions	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Brooklyn 2 698 265—Kings							
Brooklyn Hebrew Home and Hospital for Aged	Inst	NPAssn	704	626			203
Buffalo 575 901—Erie							
Buffalo 575 901—Erie	Mat	NPAssn	8	3	24	102	102
Castile 902—Wyoming							
Green Sanitarium (Castile Sanitarium)	Conv	Indiv	45	14			39
Delhi, 1 841—Delaware							
Delaware Infirmary	Inst	County	13	6			300
Eastview, 1 000—Westchester							
Solomon and Betty Loeb Memorial Home for Convalescents	Conv	NPAssn	100	104			1 430
Elmira 45 106—Chemung							
Elmira Reformatory Hospital	Inst	State	100	22			970
Far Rockaway—Queens							
Wave Crest Convalescent Home	OrChil	NPAssn	130	60			171
Hawthorne 2 000—Westchester							
Rosary Hill Home	Cancer	Church	110	93			197
Industry 350—Monroe							
Hospital of State Agriculture and Industrial School	Inst	State	50	21			793
Iroquois 40—Erie							
Thomas Indian School Hosp	Inst	State	36	13			363
Ithaca 19 730—Tomplins							
Bailey Jones Hospital	Gen	Indiv	14	6			276
Reconstruction Hospital	Orth	NPAssn	100	67			102
Johnson City 18 689—Broome							
Mrs Springer's Private Hospital	Mat	Indiv	10	8	14	83	104
Keene Valley 511—Essex							
Keene Valley Neighborhood House and Hospital	Gen	NPAssn	11	4	2	16	91
Lake Ronkonkoma 1 000—Suffolk							
Gary de Vabre Academy	MeDe	Part	18	7			7
Millbrook 1 340—Dutchess							
Cardinal Hayes Convalescent Home for Children	Conv	Church	60	40			361
Napanoch 750—Ulster							
Institution for Male Defective Delinquents	MeDe	State	28	12			134
Newark 9 646—Wayne							
Newark State School	MeDe	State	2 460	2 315	9	14	214
New York City 4 682 263—New York							
Beth Abraham Home for Incurables	Incur	NPAssn	816	286			120
Bryant Sanitarium	Mat	Indiv	10	3	10	82	57
Hebrew Convalescent Home	Conv	NPAssn	87	81			708
Home for Aged and Infirm Hebrews	Inst	NPAssn	52	11			417
Home for Dependents	Inst	City	1 847	1 857			1 037
Home for Incurables	Cancer	Church	348	733			252
House of Calvary	Cancer	Church	146	133			500
St Andrew's Convalescent Hospital	Conv	Church	24	16			230
St Mary's Hospital for Children	Conv	Church	60	56			515
St Rose's Free Home for Incurable Cancer	Cancer	Church	90	90			230
Niagara Falls 78 029—Niagara							
Niagara Falls Municipal Hospital	Iso	City	38	12			93
Niskayuna 500—Schenectady							
Bellevue Maternity Home	Mat	Indiv	83	26	56	850	895
Onondaga 325—Onondaga							
Onondaga County Hospital	Inst	County	230	229			413
Oxford 1 718—Chenango							
New York State Woman's Relief Corps Home	Inst	State	61	67			179
Pawling 1 446—Dutchess							
White Oak Farm	N&M	Corp	15	10			1
Pelham Manor 5 802—Westchester							
Pelham Home for Children	Card	NPAssn	80	28			50
Pleasantville 4 454—Westchester							
Pleasantville Cottage School	Inst	NPAssn	27	4			263
Poughkeepsie 40 478—Dutchess							
Baldwin House (Vassar College Infirmary)	Inst	NPAssn	25	11			929
Poughkeepsie City Home Infirmary	Inst	City	48	41			46
Queens Village—Queens							
Queens Village Sanatorium	Gen	Indiv	10	2	8	87	151
Rhinebeck 1 697—Dutchess							
Holiday Farm Home for Convalescent Children	Conv	NPAssn	25	21			181
Rochester 324 97—Monroe							
Convalescent Hospital for Children	Conv	NPAssn	60	46			103
Field Sanitarium	Conv	Indiv	27	24			115
Knorr Sanitarium	N&M	Indiv	35	10			45
Rockaway Park—Queens							
Convalescent Home for Hebrew Children	OrthConv	NPAssn	104	94			307
Rye 9 805—Westchester							
Haleyon Rest Sanitarium	N&M	Indiv	48	47			132
Saranac Lake 7 183—Franklin							
Franklin Manor	TB	Indiv	15	12			25
Owens Private Sanatorium	TB	Indiv	50	18			85
Schenectady 87 649—Schenectady							
Schenectady County Home and Hospital	Inst	County	65	55			299
Schenectady Isolation Hosp	Iso	City	85	14			358

## NEW YORK—Continued

Related Institutions	Type of Service	Ownership or Control	Beds	Average Census †	Patients	Number of Births	Admissions †
Ben Chiff 4416—Nassau Country Home for Convalescent Babies	Conv	NPA n	70	48		299	
Staten Island 174 441—Richmond New York City Farm Colony	Inst	City	1 965	1 114		452	
Sailors Saug Harbor Hosp	Gen	NPA n	192	112		317	
State School—Orange Hospital of New York State	Inst	State	25	16		659	
Training School for Boys							
Syracuse 265 967—Onondaga Syracuse State School	MeDe	State	1 166	1 002		85	
Tupper Lake 5 451—Franklin American Legion Mountain Camp	Conv	NPA n	69	40		161	
Valhalla 2 200—Westchester Blythedale Ho pital and Home for Crippled Children	Orth	NPA n	62	56		83	
Wallkill 800—Ulster Wallkill State Prison Hosp	Inst	State	18	5		253	
Wales 250—Dutchess Wassaic State School	MeDe	State	4 312	4 444	12	10	450
Williamsville 3 614—Erie Josephine Goodyear Convalescent Home	Conv/Chil	NPA n	60	41		173	
Woodbourne 500—Sullivan Woodbourne Institution for Defective Delinquents	MeDe	State	759	6 4		211	
Yonkers 142 583—Westchester Yonkers City Hospital for Communicable Diseases	Is	City	57	19		169	

## NORTH CAROLINA

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Patients	Number of Births	Admissions †
Albermarle 4 000—Stanly Stanly General Ho pital	Gen	NPA n	24	22	8	145	120
Yadkin Ho pital	Gen	NPA n	41	25	10	311	154
Albemore 6 951—Randolph Barnes Griffin Clinic	Gen	Part	23	17	6	225	1204
Randolph Hospital	Gen	NPA n	40	29	0	179	1591
Asheville 51 310—Buncombe Appalachian Hall	NAM	Corp	175	61		307	
Asheville Mission Hospital	Gen	NPA n	114	85	16	227	144
Ashton Park Hospital	Gen	NPA n	50	27	11	216	1617
Highland Hospital	NAM	NPA n	85	52		142	
Norburn Hospital	Gen	NPA n	40	31	2	110	
St Joseph's Hospital	Gen	Church	20	57	21	54	2 174
Wesnoe	Nerv/Conv	Corp	23	7		15	
Zephyr Hill Sanatorium	TB	Indiv	30	20		32	
Indian 2 003—Stanly Badin Hospital	Gen	Part	25	7	4	46	276
Banner Elk 344—Avery Grace Hospital	Gen	Church	57	41	12	197	1006
Beaufort 3 275—Currier Potter Emergency Hospital	Gen	NPA n	12	6	4	57	289
Biltmore 15—Buncombe Biltmore Ho pital	Gen	NPA n	55	39	10	192	1596
Black Mountain 1 012—Buncombe Bealmon Park Sanatorium	Nerv/Drug	Corp	20	6		40	
Fellowship Sanatorium of the Royal League	TB	NPA n	20	10		15	
Western North Carolina Sanatorium	TB	State	305	200		316	
Breard 3 061—Transylvania Transylvania Community Hospital	Gen	NPA n	25	7	6	80	523
Burlington 12 198—Alamance Alamance County Sanatorium	TB	County	30			Estab 1942	
Alamance General Hospital	Gen	NPA n	42	23	5	362	1 697
Charlotte 100 633—Mecklenburg Charlotte Eye Ear and Throat Ho pital	FAT	Part	20	17		1 759	
Charlotte Memorial Hosp	Gen	NPA n	297	172	28	412	6 709
Good Samaritan Hospital	Gen	Church	54	67	16	112	2 567
Mercy Hospital	Gen	Church	148	160	21	971	4 541
Presbyterian Hospital	Gen	Church	172	146	30	829	5 832
Cherokee 500—Swain Eastern Cherokee Indian Hospital	Gen	IA	28	14	7	83	619
Columbia 1 000—Tyrrell Columbia Hospital	Gen	Indiv	15	6	4	52	409
Concord 15 572—Cabarrus Cabarrus County Hospital	Gen	County	146	99	30	858	5 935
Crossnore 256—Avery Garrett Memorial Hospital	Gen	NPA n	20	7	11	69	491
Durham 60 185—Durham Duke Hospital	Gen	NPA n	54	34	50	917	12 023
Lincoln Hospital	Gen	NPA n	99	51	9	276	1 767
McPherson Hospital	FAT	Indiv	20	12		1 134	
Watts Hospital	Gen	NPA n	200	147	25	770	5 821
Elizabeth City 11 564—Pasquotank Albemarle Hospital	Gen	CyCo	45	33	6	89	1 127
Fikla 2 734—Surry Hugh Chatham Memorial Hospital	Gen	Church	60	30	12	212	1 587
Erwin 3 500—Harnett Good Hope Hospital	Gen	NPA n	34	10	8	140	709
Farmont 1 993—Robeson Weinstein Clinic Hospital	Gen	Part	30	6	5	117	218

## NORTH CAROLINA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Patients	Number of Births	Admissions †
Fayetteville, 17 425—Cumberland Cumberland County Tubercular Ho ls Sanatorium	TB	County	31	27		73	
Hicksmith Hospital	Gen	NPA n	129	6	12	291	4 229
R I Pittman Hospital	Gen	NPA n	85	39	12	154	1 166
Veterans Admin Facility	Gen	Vet	110	29		1 833	
Fletcher, 500—Henderson Mountain Sanatorium and Hospital	Gen	Church	60	49	10	105	1 077
Fort Bragg—Cumberland Station Hospital	Gen	Army	5 0	174	9	95	7 01
Franklin, 3 243—Macon Angel Clinic	Gen	Indiv	30	20	4	65	540
Angel Hospital	Gen	Indiv	50	21	6	65	863
Castonia 21 315—Gaston City Hospital	Gen	Corp	75	29	12	136	1 413
Carroll General Hospital	Gen	NPA n	43	16	12	289	1 259
Gaston County Negro Hosp	Gen	County	22	9	3	19	819
Gastonia Eye Ear Nose and Throat Ho pital	FAT	Indiv	10			Estab 1919	
North Carolina Orthopedic Hospital	Orth	State	169	160		409	
Goldboro 17 274—Wayne Goldboro Hospital	Gen	NPA n	106	61	9	150	2 533
State Hospital	Gen	State	2 650	2 454		654	
Greensboro 29 310—Gulford Piedmont Memorial Ho pital	Gen	NPA n	61	41	17	303	4 341
L Richard on Memorial Ho pital	Gen	NPA n	60	31	8	131	1 207
St Leo's Hospital	Gen	Church	55	57	9	233	2 27
Sternberger Hospital for Women and Children	Gen	NPA n	42	29	10	373	1 247
Wesley Long Hospital	Gen	Corp	60	60	14	353	3 007
Greenville 12 674—Pitt Pitt General Hospital	Gen	NPA n	60	31	5	127	1 819
Hamlet 5 111—Richmond Hamlet Hospital	Gen	NPA n	50	45	4	110	1 57
Henderson 7 617—Vance Jubilee Hospital	Gen	Church	59	27	6	49	577
Maria Parham Hospital	Gen	NPA n	32	17		215	1 394
Hendersonville 1 751—Henderson Patton Memorial Hospital	Gen	NPA n	50	15	10	114	1 155
Hickory 1 457—Catawba Hickory Memorial Hospital	Gen	NPA n	25	12	6	145	859
Richard Baker Hospital	Gen	Indiv	65	29	18	345	1 577
High Point 33 450—Gulford Burrus Memorial Hospital	Gen	NPA n	70	52	15	378	2 194
Gulford General Hospital	Gen	NPA n	23	23	0	267	1 495
Huntersville 763—Mecklenburg Mecklenburg Sanatorium	TB	County	170	149		133	
Jamestown 800—Gulford Guilford County Sanatorium	TB	County	140	133		124	
Jefferson 594—Ashe Ashe County Memorial Hosp	Gen	NPA n	23	9	6	78	416
Kinston 15 788—Lenoir Memorial General Hospital	Gen	NPA n	69	41	6	251	2 716
Parrott Memorial Hospital	Gen	NPA n	40	21	0	237	1 625
Jaurburg 5 655—Scotland Jaurburg Hospital	Gen	NPA n	29	15	4	114	771
Jealville 1 886—Rockingham Leaksville General Hosp	Gen	NPA n	45	27	5	123	1 76
Lenoir, 7 698—Caldwell Blackwelder Hospital	Gen	NPA n	5	13	8	919	909
Caldwell Hospital	Gen	NPA n	25	12	8	86	619
Lexington 10 550—Davidson Davidson Hospital	Gen	County	23	17	6	109	1 078
Lincolnton 4 521—Lincoln Gordon Crowell Memorial Hospital	Gen	Corp	50	2	8	151	1 844
Reyes Gamble Hospital	Gen	NPA n	25	22	6	157	1 313
Lumberton 5 800—Robeson Baker Sanatorium	Gen	NPA n	73	52	6	317	2 831
Thompson Memorial Hosp	Gen	NPA n	75	54	10	823	2 743
Marion 2 590—McDowell Marion General Hospital	Gen	NPA n	40	32	6	234	2 099
Monroe 4 478—Union Marion Fitzgerald Hospital	Gen	NPA n	60	31	8	143	1 234
Mooreville 6 689—Iredell Lawrence Ho pital	Gen	NPA n	65	47	12	578	2 973
Morehead City 7 600—Currier Morehead City Hospital	Gen	City	28	16	7	140	731
Morganton 7 670—Burke Brondons Sanatorium	NAM	Part	75	32		140	
Grange Hospital	Gen	Church	62	60	18	417	3 101
State Hospital	Gen	State	2 523	2 575		695	
Mount Airy 6 950—Surry Martin Memorial Hospital	Gen	NPA n	46	46	6	113	1 354
Murphy 1 577—Cherokee Pettie Hospital	Gen	Corp	23	15	8	110	595
Nashville 1 171—Nash R R Gay Nash County Tubercular Sanatorium	TB	County	34	81		33	
New Bern 11 815—Craven Good Shepherd Hospital	Gen	Church	31	17	4	43	554
Newton, 5 407—Catawba Catawba General Hospital	Gen	NPA n	37	27	10	255	1 305
North Wilkesboro 4 478—Wilkes Wilkes Hospital	Gen	NPA n	55	37	12	193	1 683
Oteen 1 200—Buncombe Veterans Admin Facility	TB	Vet	850	772		1 163	
Oxford 5 991—Cranville Cranville Hospital	Gen	NPA n	25	15	8	59	871
Susie Clayton Chatham Memorial Hospital	Gen	NPA n	16	8	1	37	456
Pineluff, 330—Moore Pineluff Sanatorium	NAM	Indiv	33	23		139	



## NORTH CAROLINA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Pinehurst, 1500—Moore	Gen	NP Assn	65	49	12	216	2 960
Moore County Hospital	AO						
Raleigh 46 897—Wake	Gen	NP Assn	130	67		1 060	
Central Prison Hospital	Inst	State	40	33	9	172	1 031
Mary Elizabeth Hospital	Gen	Corp	208	170	24	823	5 816
Rev Hospital	Gen	NP Assn					
Royster Medical Center	Unif	of State Hospital					
St Agnes Hospital	Gen	Church	100	67	8	323	1 923
State Hospital	Ment	State	2 490	2 452			760
Wake County Sanatorium	TB	CyCo	50	48			52
Reidsville 10 387—Rockingham	Gen	NP Assn	50	30	8	229	1 640
Annie Penn Memorial Hosp	Gen	NP Assn	57	97	13	440	3 877
Roanoke Rapids 8 545—Halifax	Gen	NP Assn					
Roanoke Rapids Hospital	Gen	NP Assn	50	27			790
Rocky Mount 20 568—Dash	Indus	NP Assn	110	79	10	249	2 782
Atlantic Coast Line Hosp	Gen	NP Assn	74	41	6	153	1 023
Park View Hospital	Gen	Part	12	6	5	171	571
Rocky Mount Sanitarium	Gen	Part	6	2	3	70	214
Height Stone Bunn Clinic	Gen	Part	6	2	3	70	214
Hospital	Gen	Part	6	2	3	70	214
Roseboro 839—Sampson	Gen	Part	6	2	3	70	214
Brewer Starling Clinic	Gen	Part	6	2	3	70	214
Roxboro 4 599—Person	Gen	NP Assn	28	13	6	126	846
Community Hospital	Gen	NP Assn	28	13	6	126	846
Rutherfordton 2 326—Rutherford	Gen	NP Assn	58	33	4	89	1 828
Rutherford Hospital	Gen	NP Assn	58	33	4	89	1 828
Salisbury 19 037—Rowan	Gen	NP Assn	107	71	10	399	3 004
Rowan Memorial Hospital	Gen	NP Assn	107	71	10	399	3 004
Sanatorium 200—Hole	TB	State	600	617			771
North Carolina Sanatorium	TB	State	600	617			771
for the Treatment of Tuberculosis	TB	State	600	617			771
Sanford 4 900—Lee	Gen	County	50	32	4	220	1 541
Lee County Hospital	Gen	County	50	32	4	220	1 541
Shelby 14 037—Cleveland	Gen	CyCo	100	62	16	553	3 263
Shelby Hospital	Gen	CyCo	100	62	16	553	3 263
Siler City 2 197—Chatham	Gen	NP Assn	22	12	6	60	800
Chatham Hospital	Gen	NP Assn	22	12	6	60	800
Smithfield 8 678—Johnston	Gen	NP Assn	35	18	10	65	648
Johnston County Hospital	Gen	NP Assn	35	18	10	65	648
Southport 1 760—Brunswick	Gen	CyCo	50	20	4	54	779
J Arthur Doshier Memorial Hospital	Gen	CyCo	50	20	4	54	779
Statesville 11 440—Iredell	Gen	NP Assn	100	98	15	182	3 984
Davis Hospital	Gen	NP Assn	100	98	15	182	3 984
H F Long Hospital	Gen	NP Assn	60	47	6	177	2 762
Silva 1 469—Jackson	Gen	NP Assn	25	15	5	60	460
C J Harris Community Hospital	Gen	NP Assn	25	15	5	60	460
Tabor City 1 552—Columbus	Gen	Indiv	15	3	6	110	491
Williams Clinic Hospital	Gen	Indiv	15	3	6	110	491
Tarboro 7 145—Edgecombe	Gen	Indiv	8	4	5	23	142
Basin Memorial Hospital	Gen	NP Assn	50	26	12	97	1 017
Edgecombe General Hospital	Gen	NP Assn	50	26	12	97	1 017
Thomasville 11 041—Davidson	Gen	NP Assn	50	29	14	240	1 181
City Memorial Hospital	Gen	NP Assn	50	29	14	240	1 181
Tryon 2 043—Polk	Gen	NP Assn	29	14	5	92	600
St Luke's Hospital	Gen	NP Assn	29	14	5	92	600
Valdese 2 615—Burke	Gen	NP Assn	30	19	6	90	864
Valdese General Hospital	Gen	NP Assn	30	19	6	90	864
Wadesboro 3 557—Anson	Gen	NP Assn	50				No data supplied
Anson Sanatorium	Gen	NP Assn	50				No data supplied
Washington 8 569—Beaufort	Gen	NP Assn	60	42	6	299	2 281
Taylor Hospital	Gen	NP Assn	60	42	6	299	2 281
Waynesville 2 940—Haywood	Gen	County	75	50	10	403	2 299
Haywood County Hospital	Gen	County	75	50	10	403	2 299
Whiteville 3 011—Columbus	Gen	NP Assn	50	32	12	263	2 061
Columbus County Hospital	Gen	NP Assn	50	32	12	263	2 061
Williamston 3 900—Marlin	Gen	Indiv	20	11	6	74	860
Brown Community Hospital	Gen	Indiv	20	11	6	74	860
Wilmington 33 407—New Hanover	Gen	Corp	32	14	3	82	761
Bulluck Hospital	Gen	CyCo	47	47	13	382	1 863
Community Hospital	Gen	CyCo	47	47	13	382	1 863
James Walker Memorial Hospital	Gen	NP Assn	200	174	40	1 013	7 800
Wilmington Red Cross Sanatorium	TB	NP Assn	41	41			31
Wilson 19 234—Wilson	Gen	NP Assn	43	30	7	215	1 218
Carolina General Hospital	Gen	NP Assn	43	30	7	215	1 218
Eastern North Carolina Sanatorium	TB	State	150				Establish 1912
Mercy Hospital	Gen	CyCo	41	19	2	33	516
Woodard Herring Hospital	Gen	NP Assn	73	34	6	178	1 856
Winston Salem 7 945—Forsyth	Gen	City	397	232	43	1 093	8 959
City Hospital	Gen	City	397	232	43	1 093	8 959
City Memorial Hospital	White	Division of City Hospital					
Forsyth County Hospital	Gen	County	103	113	6	80	430
Forsyth County Sanatorium	TB	County	168	138			301
Kate Blitting Reynolds Memorial Hospital	Colored	Division of City Hospital					
North Carolina Baptist Hospital	Gen	Church	270	179	50	801	6 229
Wrightsville Sound 200—New Hanover	Chil	NP Assn	35	19	5		930
Babies Hospital	Chil	NP Assn	35	19	5		930
Related Institutions							
Asheville 51 310—Duncombe	Orth	NP Assn	24	20			138
Asheville Orthopedic Home	Orth	NP Assn	24	20			138
Pisgah Sanitarium and Hosp	Gen	Church	20	12	3	12	347
Sunset Heights	TB	Corp	1	14			49
Violet Hill Sanatorium	TB	Indiv	3	35			45
Charlotte 100 899—Mecklenburg	Mat	NP Assn	26	27	20	33	63
Florence Crittenton Home	Mat	NP Assn	26	27	20	33	63

## NORTH CAROLINA—Continued

Related Institutions	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Clemmons 200—Forsyth	Gen	Indiv	10	4	2	51	125
Castevens Clinic	Gen	Indiv	10	4	2	51	125
Davidson 1 530—Mecklenburg	Inst	NP Assn	20	3			300
Davidson College Infirmary	Inst	NP Assn	20	3			300
Goldboro 17 244—Wayne	Conv	Indiv	12	5			313
Whispering Cedars Rest Home	Conv	Indiv	12	5			313
Halifax 374—Halifax	TB	County	25	20			40
Halifax County Tuberculosis Sanitarium	TB	County	25	20			40
Henderson 7 647—Vance	TB	County	14	14			8
Scott Parker Sanatorium	TB	County	14	14			8
Kinston 15 388—Lenoir	McDe	State	836	816			34
Caswell Training School	McDe	State	836	816			34
North Wilkesboro 4 478—Wilkes	TB	County	14	8			15
Wilkes County Tuberculosis Hut	TB	County	14	8			15
Raleigh 46 897—Wake	Gen	Indiv	10	4	2	18	115
McCauley Private Hospital	Gen	Indiv	10	4	2	18	115
Tarboro 7 145—Edgecombe	TB	County	31	25			53
Edgecombe County Tuberculosis Sanatorium	TB	County	31	25			53
Related Institutions							
Belcourt 200—Rolette	Gen	LA	42	25	10	100	1 000
Turtle Mountain Hospital	Gen	LA	42	25	10	100	1 000
Bismarck 10 490—Burleigh	Gen	Church	125	107	12	274	3 345
Bismarck Evangelical Hosp	Gen	Church	125	107	12	274	3 345
St Alexius Hospital	Gen	Church	131	100	10	45	3 741
Bottineau 1739—Bottineau	Gen	Church	75	72	12	204	1 909
St Andrew's Hospital	Gen	Church	75	72	12	204	1 909
Carrington 1 800—Foster	Gen	Church	20	5	10	66	576
Carrington Hospital	Gen	Church	20	5	10	66	576
Devils Lake 6 004—Ramsey	Gen	NP Assn	45	34	6	92	1 620
General Hospital	Gen	NP Assn	45	34	6	92	1 620
Mercy Hospital	Gen	Church	100	48	26	208	1 907
Dickinson 5 839—Stark	Gen	Church	86	40	14	229	1 865
St Joseph's Hospital	Gen	Church	86	40	14	229	1 865
Drayton 6 8—Pembina	Gen	Indiv	13	11	5	50	420
Drayton Hospital	Gen	Indiv	13	11	5	50	420
Elbowoods 170—McLean	Gen	LA	25	10	6	52	412
Fort Berthold Indian Hospital	Gen	LA	25	10	6	52	412
Fargo 32 680—Cass	Gen	Church	195	130	35	760	6 600
St John's Hospital	Gen	Church	110	78	17	420	3 004
St Luke's Hospital	Gen	Church	110	78	17	420	3 004
Veterans Admin Facility	Gen	Yel	181	139			1 196
Fort Totten 100—Benson	Gen	LA	31	17	4	44	600
Fort Totten Indian Hospital	Gen	LA	31	17	4	44	600
Fort Yates 1 000—Sioux	Gen	LA	47	20	5	76	781
Standing Rock Indian Hosp	Gen	LA	47	20	5	76	781
Grafton 4 000—Walsh	Gen	Church	60	45	10	304	2 105
Grafton Deaconess Hospital	Gen	Church	60	45	10	304	2 105
Grand Forks 20 228—Grand Forks	Gen	NP Assn	80	76	20	291	3 160
Grand Forks Deaconess Hospital	Gen	NP Assn	80	76	20	291	3 160
St Michael's Hospital	Gen	Church	60	60	10	363	2 388
Harvey 1 501—Wells	Gen	Church	44	22	12	203	1 312
St Alois Hospital	Gen	Church	44	22	12	203	1 312
Jamestown 8 790—Stutsman	Gen	NP Assn	59	32	10	132	1 231
Jamestown Hospital	Gen	NP Assn	59	32	10	132	1 231
North Dakota State Hospital for Insane	Ment	State	2 007	1 974			400
Trinity Hospital	Gen	Church	77	49	12	100	1 729
Kenmare 1 525—Ward	Gen	Church	33	18	5	100	806
Kenmare Deaconess Hospital	Gen	Church	33	18	5	100	806
Langdon 1 546—Cavaller	Gen	Church	35	25	12	220	1 130
Mercy Hospital	Gen	Church	35	25	12	220	1 130
Mandan 6 685—Morton	Gen	Church	42	16	8	100	1 004
Mandan Deaconess Hospital	Gen	Church	42	16	8	100	1 004
Mayville 1 301—Traill	Gen	NP Assn	16	15	6	94	47
Union Hospital	Gen	NP Assn	16	15	6	94	47
McVie 546—Nelson	Gen	Corp	15	11	4	71	210
Community Hospital	Gen	Corp	15	11	4	71	210
Minot 16 077—Ward	Gen	Church	120	70	10	292	2 010
St Joseph's Hospital	Gen	Church	120	70	10	292	2 010
Trinity Hospital	Gen	Church	120	70	10	292	2 010
New Rockford 2 017—Fddy	Gen	Church	40	18	6	113	623
City Hospital	Gen	Church	40	18	6	113	623
Northwood 1 100—Grand Forks	Gen	NP Assn	20	14	6	76	438
Northwood Deaconess Hosp	Gen	NP Assn	20	14	6	76	438
Oakes 1 660—Dickey	Gen	Church	16	7	6	96	308
Mercy Hospital	Gen	Church	16	7	6	96	308
Rolette 460—Rolette	Gen	NP Assn	24	10	4	38	500
Community Hospital	Gen	NP Assn	24	10	4	38	500
Rolla 1 005—Roktke	Gen	City	20	10	6	83	501
Rolla Community Hospital	Gen	City	20	10	6	83	501
Rugby 2 215—Pierce	Gen	Church	75	58	15	298	3 410
Good Samaritan Hospital	Gen	Church	75	58	15	298	3 410
San Haven —Rolette	TB	State	379	308			600
North Dakota State Tuberculosis Sanatorium	TB	State	379	308			600
Valley City 5 917—Barnes	Gen	Church	100	53	15	227	1 432
Mercy Hospital	Gen	Church	100	53	15	227	1 432
Wahpeton 2 477—Richland	Gen	Church	23	12	4	45	160
St Mary Hospital	Gen	Church	23	12	4	45	160
Williston 700—Williams	Gen	Church	40	25	10	100	1 004
Good Samaritan Hospital	Gen	Church	40	25	10	100	1 004
Mercy Hospital	Gen	Church	100	50	11	240	2 160

Key to symbols and abbreviations is on page 1027

## NORTH DAKOTA Continued

Related Institutions	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Bismarck 1406—Burlingame North Dakota State Penitentiary Hospital	Inst	State	35	15			312
Elgin 553—Grant Elgin Hospital	Gen	Indiv	17	7	0	92	421
Fargo 32 530—Cass Camp Maternity Hospital	Mat	Indiv	15	no data supplied			
Cass County Hospital	Gen	County	30	10	4	56	411
City Detention Hospital	Ins	City	40	21			70
Florence Crutten Home	Mat	NPA'sen	50	25	23	57	78
Grafton 4 070—Walsh Grafton State School	McDe	State	1,025	945			101

## OHIO

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Akron 244 791—Summit Akron Clinic Hospital	Gen	Part	12	6			515
Children's Hospital+AO	Chil	NPA'sen	110	90			1,100
City Hospital+AO	Gen	NPA'sen	327	307	48	2,511	11,269
East Akron Community Hosp	Gen	NPA'sen	100	17	5	89	829
Edwin Shaw Sanatorium	TB	County	204	164			213
Peoples Hospital+AO	Gen	NPA'sen	165	153	30	1,940	8,712
St Thomas Hospital+AO	Gen	Church	148	127	27	1,418	5,710
Alliance 22 400—Stark Alliance City Hospital	Gen	City	85	53	15	630	2,146
Amherst 2 890—Lorain Pleasant View Sanatorium	TB	County	90	80			64
Ashland 12 453—Ashland Samaritan Hospital	Gen	NPA'sen	48	24	12	422	1,206
Ashtabula 21 400—Ashtabula Ashtabula General Hospital	Gen	NPA'sen	72	59	13	318	1,857
Athens 7 090—Athens Athens State Hospital	Ment	State	1 850	1 700			223
Sheltering Arms Hospital	Gen	Part	44	22	9	169	979
Barberton 21 078—Summit Citizens Hospital	Gen	NPA'sen	57	59	18	670	1,003
Barnesville 5 002—Belmont Barnesville Hospital	Gen	NPA'sen	18	8	6	73	772
Bedford 7 390—Cuyahoga Bedford Municipal Hospital	Gen	City	34	34	15	263	1,319
Bellaire 13 790—Belmont City Hospital	Gen	NPA'sen	40	33	5	410	1,207
Bellevue 6 127—Huron Bellevue Hospital	Gen	NPA'sen	37	19	10	177	679
Berea 6 020—Cuyahoga Community Hospital	Gen	NPA'sen	37	29	10	203	1,181
Brecksville 1 900—Cuyahoga Veterans Admin Facility	Gen	Vet	269	228			2,774
Bryan 5 404—Williams Cameron Hospital	Gen	NPA'sen	16	10	5	172	597
Bucyrus 9 727—Crawford Bucyrus City Hospital	Gen	City	48	30	13	374	1,511
Cambridge 15 014—Guernsey St Francis Hospital	Gen	NPA'sen	23	10	7	110	814
Swan Hospital	Gen	NPA'sen	20	8	4	60	294
Canton 108 401—Stark Aultman Hospital+AO	Gen	NPA'sen	181	134	30	1,432	5,744
Little Flower Hospital	Unit of Mercy Hospital						
Mercy Hospital+AO	Gen	Church	210	193	40	2,012	7,960
Molly Stark Sanatorium	TB	County	166	148			181
Celina 4 841—Mercer Gibbons Hospital	Gen	NPA'sen	25	19	5	248	1,014
Otis Hospital	Gen	NPA'sen	20	11	4	75	659
Chagrin Falls 2 500—Cuyahoga Windsor Hospital	N&M	Corp	90	67			511
Chillicothe 20 120—Ross Chillicothe Hospital	Gen	NPA'sen	50	26	10	200	1,107
Federal Reformatory Hosp	Inst	USPHS	73	23			1,506
Mount Logan Sanatorium	TB	Counties	68	62			461
Veterans Admin Facility	Ment	Vet	1 222	1 538			67
Cincinnati 450 610—Hamilton Bethesda Hospital+AO	Gen	Church	211	189	52	1,748	7,023
Children's Hospital+AO	Chil	Church	208	143	5	5,569	
Christ Hospital+AO	Gen	Church	329	289	57	1,829	9,811
Christian R Holmes Hosp	Gen	City	52	44			1,351
Cincinnati General Hosp+AO	Gen	City	900	641	60	2,442	10,321
Cincinnati Sanitarium	N&M	Corp	75	71			293
Deaconess Hospital+AO	Gen	Church	175	139	30	694	5,042
Good Samaritan Hosp+AO	Gen	Church	555	426	100	2,589	14,899
Hamilton County Home and Chronic Disease Hospital	Chr	County	260	241			589
Hamilton County Tuberculosis Hospital+AO	TB	County	583	522			619
Jewish Hospital+AO	Gen	NPA'sen	260	229	40	1,346	7,739
Longview State Hospital+AO	Ment	State	2 819	2 795			481
Ohio Hospital for Women and Children	Unit of Bethesda Hospital						
Our Lady of Mercy Hospital	Gen	Church	60		12	1 724	1912
St Mary's Hospital+AO	Gen	Church	200	138	30	689	5,114
Circleville 7 952—Pickaway Berger Hospital	Gen	City	25	10	6	154	720
Cleveland 878 330—Cuyahoga Babies and Childrens Hosp	Unit of University Hospitals						
Booth Memorial Home and Hospital	Mat	Church	17	18	17	661	673
City Hospital+AO	Gen	TB City	1 688	1 150	59	859	12,090
City Psychopathic Hospital	Unit of City Hospital						
Cleveland Clinic Foundation Hospital+AO	Gen	NPA'sen	200	220			7,780

## OHIO—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Cleveland State Hospital+AO	Ment	State	2 800	2 761			774
East with Street Hospital	Gen	Corp	60	10	12	2	120
Evangelical Deaconess Hosp	Gen	Church	172	123	32	1,482	4,006
Fairview Park Hospital+AO	Gen	Church	150	127	51	1,738	5,899
Glennville Hospital+AO	Gen	NPA'sen	100	93	0	979	4,873
Grace Hospital	Gen	NPA'sen	61	47	12	293	2,333
Huron Road Hospital	See Fast Cleveland						
John H Lowman Memorial Pavilion	Unit of City Hospital						
Lakeside Hospital	Unit of University Hospitals						
Leonard O Hanna House	Unit of University Hospitals						
Lutheran Hospital+AO	Gen	Church	109	97	23	1,020	4,121
Maternity Hospital	Unit of University Hospitals						
Mount Sinai Hospital+AO	Gen	NPA'sen	220	202	40	1,417	8,731
Polyclinic Hospital	Gen	NPA'sen	100	91	15	699	4,613
St Alexis Hospital+AO	Gen	Church	270	152			7,613
St Ann's Maternity Hosp	Mat	Church	67	60	79	2,220	2,423
St John's Hospital+AO	Gen	Church	218	195	57	1,733	7,141
St Luke's Hospital+AO	Gen	Church	323	286	60	1,910	10,316
St Vincent Charity Hospital+AO	Gen	Church	275	221			7,747
U S Marine Hospital	Gen	USPHS	306	206			3,093
University Hospitals+AO	Gen	NPA'sen	777	474	109	3,266	17,693
Woman's Hospital+AO	Gen	NPA'sen	93	80	70	600	4,154
Columbus, 300 057—Franklin Children's Hospital+AO	Chil	NPA'sen	120	77	12	2,100	
Columbus Rest Home	Conv	Indiv	40	29			110
Columbus State Hospital+AO	Ment	State	2 517	2 515			479
Franklin County Tuberculosis Hospital+AO	TB	County	299	223			2,770
Grant Hospital+AO	Gen	NPA'sen	273	216	40	1,540	6,175
McMillen Sanitarium	N&M	Corp	40	20			204
Mercy Hospital	Gen	NPA'sen	65	30	12	147	1,013
Mount Carmel Hospital+AO	Gen	Church	200	201	00	1,501	7,416
St Ann's Maternity Hosp	Mat	Church	20	21	20	963	979
St Anthony Hospital	Gen	Church	202	183			1,693
St Francis Hospital+AO	Gen	State	160	111			3,112
Starling, Ioving University Hospitals+AO	Gen	State	200	182	20	779	5,730
Station Hospital	Gen	Army	179	119	3	20	16
White Cross Hospital+AO	Gen	Church	204	211	40	1,500	8,525
Conneaut 9 705—Ashtabula Brown Memorial Hospital	Gen	NPA'sen	23	23	10	278	1,170
Coshocton 11 000—Coshocton Coshocton City Hospital	Gen	City	63	56	10	869	1,635
Crestline 4 337—Crawford Crestline Emergency Hospital	Gen	NPA'sen	15	7	5	95	431
Cuyahoga Falls 20 510—Summit Oak Hills Villa Sanitarium	N&M	NPA'sen	75	47			810
Dayton 210 715—Montgomery Dayton State Hospital	Ment	State	1 900	1 733			401
Good Samaritan Hospital+AO	Gen	Church	200	222	60	2,508	7,999
Miami Valley Hospital+AO	Gen	NPA'sen	394	270	50	2,021	11,770
St Ann's Maternity Hosp	Unit of St Elizabeth Hospital						
St Elizabeth Hospital+AO	Gen	Church	320	200	40	2,130	8,500
Stillwater Sanatorium	TB	Counties	170	99			106
Delland 9 744—Delland Delland Hospital	Gen	NPA'sen	35	22	10	300	1,430
Dennison 4 413—Tuscarawas Twin City Hospital	Gen	NPA'sen	32	18	9	200	753
Dover, 9 691—Tuscarawas Union Hospital	Gen	NPA'sen	75	57	10	493	1,760
East Cleveland 39 400—Cuyahoga Huron Road Hospital+AO	Gen	NPA'sen	202	231	60	2,225	9,670
East Liverpool 23 500—Columbiana East Liverpool City Hospital	Gen	City	80	73	17	666	2,092
Florida 20 120—Lorain Flynn Memorial Hospital and Gates Hospital for Crippled Children+AO	Gen	NPA'sen	120	92	36	873	3,070
Fairfield 2 549—Greene Station Hospital	Gen	Army	40	11			657
Findlay 20 225—Hancock Findlay Hospital	Gen	NPA'sen	64	47	14	622	2,918
Fremont 14 710—Sandusky Community Hospital	Gen	NPA'sen	14	8	4	33	376
Memorial Hospital	Gen	NPA'sen	56	53	17	519	2,430
Gallion 8 600—Crawford Gallion City Hospital	Gen	City	33	18	8	203	90
Gallipolis 7 630—Gallia Holzer Hospital	Gen	Part	62	41	7	112	1,880
Ohio Hospital for Epileptics	Phil	State	2 170	2 062			180
Green Springs 930—Sandusky and Seneca Oak Ridge Sanatorium	Indiv		70	58			183
Greenville, 7 745—Darke Wayne Hospital	Gen	NPA'sen	47	24	12	890	1,153
Hamilton 60 592—Butler Fort Hamilton Hospital	Gen	NPA'sen	80	73	24	588	2,907
Mercy Hospital+AO	Gen	Church	200	124	30	916	4,704
Hillsboro 4 713—Highland Hillsboro Hospital	Gen	NPA'sen	19	10	4	97	511
Ironton 15 851—Lawrence Charles S Gray Deaconess Hospital	Gen	NPA'sen	50	20	5	190	500
Lawrence County General Hospital	Gen	County	65	36	12	406	2,013
Kenton 7 593—Hardin McKittick Hospital	Gen	NPA'sen	25	19	5	60	671
San Antonio Hospital	Gen	Church	35	20	6	148	862
Lacarne 200—Ottawa Station Hospital	Gen	Army	28	2			94
Lakewood 69 160—Cuyahoga Lakewood Hospital	Gen	City	187	100	23	893	4,300
Lebanon 3 890—Warren Blair Brothers Hospital	Gen	Part	8	7	8	60	334

## OHIO—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basins ‡	Number of Births	Admissions †
Lima 44 711—Allen District Tuberculosis Hosp	TB	County	136	119			100
Lima Memorial Hospital*AO	Gen	NPA'ssn	136	125	21	850	4 409
Lima State Hospital	Ment	State	1 190	1 143			141
St Rita's Hospital*AO	Gen	Church	140	114	20	700	3 842
Lodi 1 304—Medina							
Lodi Hospital	Gen	NPA'ssn	30	22	10	391	2 210
Logan 6 177—Hocking							
Cherrington Hospital	Gen	NPA'ssn	35	13	6	98	447
Lorain 44 125—Lorain							
St Joseph's Hospital	Gen	Church	122	75	22	900	3 870
Macedonia 734—Summit							
Hawthornden State Hospital	Ment	State	1 070	993			320
Mansfield 37 154—Richland							
Mansfield General Hosp*AO	Gen	NPA'ssn	152	138	30	1 058	4 383
Richland County Tuberculosis Sanatorium	TB	County	30	20			31
Marietta 14 543—Washington							
Marietta Memorial Hospital	Gen	NPA'ssn	58	30	10	314	1 510
Marion 30 817—Marion							
Marion City Hospital	Gen	City	50	53	12	601	2 469
Sawyer Sanatorium	N&M	Indiv	50	24			77
Martins Ferry 14 729—Belmont							
Martins Ferry Hospital*AO	Gen	NPA'ssn	100	80	20	597	3 308
Massillon 26 644—Stark							
Massillon City Hospital*AO	Gen	NPA'ssn	107	85	24	826	3 822
Massillon State Hospital*AO	Ment	State	3 420	3 409			763
McConnellsville 1 895—Morgan							
Rocky Glen Sanatorium	TB	Corp	150	130			133
Middletown 31 220—Butler							
Middletown Hospital*AO	Gen	NPA'ssn	159	107	40	998	4 171
Millersburg 2 239—Holmes							
Holmes County Joel E Pomerene Memorial Hosp	Gen	County	27	14	8	166	832
Mount Vernon 10 122—Knox							
Avalon Sanatorium	TB	NPA'ssn	100	65			72
Mercy Hospital	Gen	Church	60	30	10	424	1 868
Mount Vernon Hospital Sanatorium	Gen	NPA'ssn	52	33	10	152	1 347
Ohio State Sanatorium	TB	State	225	157			204
Munroe Falls 511—Summit							
Summit County Hospital	Inst	County	150	128			252
Napoleon 4 825—Henry							
S M Heller Memorial Hosp	Gen	City	14	11	4	110	625
National Military Home—Montgomery							
Veterans Admin Facility	Gen	Vet	1 000	902			6 016
Newark 31 467—Licking							
Licking County Tuberculosis Sanatorium	TB	County	57	31			58
Newark Hospital*AO	Gen	NPA'ssn	106	75	24	628	3 572
New London 1 606—Huron							
New London Hospital	Gen	NPA'ssn	9	5	3	67	234
New Philadelphia 12 328—Tuscarawas							
Tuscarawas Valley Sanatorium	TB	County	30	26			30
Norwalk 8 211—Huron							
Norwalk Memorial Hospital	Gen	NPA'ssn	28	21	7	311	947
Oberlin 4 805—Lorain							
Allen Hospital Oberlin College	Gen	NPA'ssn	37	24	5	167	1 400
Oxford 2 706—Butler							
Miami University Student Hospital	Inst	State	50	11			970
Painesville 12 230—Lake							
Lake County Memorial Hosp	Gen	County	71	62	14	621	2 543
Perrysburg 3 457—Wood							
Community Hospital	Gen	Indiv	13	3	3	83	261
Rheinfrank Hospital	Gen	Indiv	12	6			239
Piqua 16 049—Miami							
Memorial Hospital	Gen	NPA'ssn	78	67	12	600	2 494
Port Clinton 4 500—Ottawa							
H B Magruder Memorial Hospital	Gen	NPA'ssn	42	25	10	203	1 283
Portsmouth 40 466—Scioto							
Mercy Hospital	Gen	Church	61	59	14	367	2 619
Portsmouth General Hosp	Gen	City	50	62	10	404	2 286
Ravenna 8 538—Portage							
Robinson Memorial Portage County Hospital	Gen	County	50	43	11	642	2 052
St Clairsville 2 797—Belmont							
Belmont Sanatorium	TB	County	56	47			45
Salem 12 301—Columbiana							
Central Clinic and Hospital	Gen	NPA'ssn	32	26	6	180	904
Salem City Hospital	Gen	NPA'ssn	60	44	10	420	1 583
Sandusky 24 674—Erie							
Good Samaritan Hospital	Gen	NPA'ssn	60	33	9	255	1 576
Providence Hospital	Gen	Church	135	71	15	366	1 694
Shelby 6 643—Richland							
Shelby Memorial Hospital	Gen	NPA'ssn	33	20	10	200	1 029
Sidney 9 790—Shelby							
Wilson Memorial Hospital	Gen	NPA'ssn	38	28	12	522	1 300
South Euclid 6 146—Cuyahoga							
Rainbow Hospital for Crippled and Convalescent Children	Unit of University Hospitals	Cleveland					
Springfield 70 602—Clark							
Clark County Tuberculosis Sanatorium	TB	County	120	106			112
Springfield City Hospital*AO	Gen	City	208	100	51	1 560	6 355
Stuebenville 37 631—Jefferson							
Chil Memorial Hospital	Gen	Church	60	39	20	86	1 453
Ohio Valley Hospital*AO	Gen	NPA'ssn	161	144	31	1 213	5 822
Tiffin 16 102—Seneca							
Mercy Hospital	Gen	Church	40	20	12	316	1 825
Toledo 252 349—Lucas							
Fast Side Hospital	Gen	NPA'ssn	41	17	4	51	760
Flower Hospital*AO	Gen	Church	134	129	31	772	4 904

## OHIO—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basins ‡	Number of Births	Admissions †
Lucas County General Hospital*AO	Gen	County	292	164	33	309	3 215
Mercy Hospital*AO	Gen	Church	230	192	55	1 485	8 240
Robinson Hospital*AO	Gen	Church	88	66	13	272	2 310
St Vincent's Hospital*AO	Gen	Church	386	267	45	1 172	9 710
Toledo Hospital*AO	Gen	NPA'ssn	270	195	50	1 341	7 238
Toledo State Hospital*AO	Ment	State	2 896	2 789			693
William W Roche Memorial Tuberculosis Hospital	TB	County	106	100			212
Women's and Children's Hospital*AO	Gen	NPA'ssn	130	97	30	530	4 047
Troy 9 697—Miami							
Stouder Memorial Hospital	Gen	NPA'ssn	44	40	8	440	1 983
Urbana 8 330—Champaign							
Champaign County Hospital	Gen	County	30	26	8	200	76
Van Wert 9 227—Van Wert							
Van Wert County Hospital	Gen	NPA'ssn	44	20	6	247	1 109
Wadsworth 6 490—Medina							
Wadsworth Municipal Hosp	Gen	City	37	20	16	392	1 060
Warren 42 837—Trumbull							
St Joseph's Riverside Hosp	Gen	Church	50	60	10	674	2 797
Trumbull County Tuberculosis Sanatorium	TB	County	40	47			90
Warren City Hospital*AO	Gen	NPA'ssn	130	111	38	1 190	5 120
Warrensville (Cleveland P O) 1 170—Cuyahoga							
Sunny Acres Cleveland Tuberculosis Sanatorium*AO	TB	City	430	432			401
Wauseon 3 016—Fulton							
De Ette Harrison Detweiler Memorial Hospital	Gen	NPA'ssn	53	42	7	273	1 642
Willard 4 261—Huron							
Willard Municipal Hospital	Gen	City	30	12	6	138	770
Wilmington 5 971—Clinton							
Dr Kelley Hale Surgical Hospital	Gen	Indiv	17	6	7	30	328
Wooster 11 643—Wayne							
Beeson Hospital	Gen	NPA'ssn	22	14	6	222	741
Kinney Memorial Emergency Hospital	Gen	NPA'ssn	20	11	4	46	431
Wooster Hospital	Gen	NPA'ssn	20	10	6	176	557
Worthington 1 569—Franklin							
Harding Sanatorium*AO	N&M	Corp	59	47			398
Xenia 10 633—Greene							
McClellan Hospital	Gen	Corp	20	15	4	137	60
Youngstown 167 720—Mahoning							
Mahoning Tuberculosis Sanatorium	TB	County	180	178			190
St Elizabeth's Hospital*AO	Gen	Church	296	234	70	2 127	10 184
Youngstown Hospital*AO	Gen	NPA'ssn	540	420	82	2 600	15 655
Zanesville 37 600—Muskingum							
Bethesda Hospital	Gen	NPA'ssn	103	90	20	600	3 376
Good Samaritan Hospital	Gen	Church	120	80	20	618	2 979
Related Institutions							
Akron 244 791—Summit							
Goodyear Hospital and Dispensary	Indus	NPA'ssn	18	8			100
Apple Creek 510—Wayne							
Institution for Feeble-minded	MeDe	State	684	601			126
Bellefontaine 9 808—Logan							
Harbert Hospital	ENT	Indiv	4	1			220
Bluffton 2 077—Allen							
Bluffton Community Hosp	Gen	NPA'ssn	22	18	7	191	497
Cincinnati 450 610—Hamilton							
Catherine Booth Home and Hospital	Mat	Church	49	20	45	272	361
Children's Convalescent Home of the Cincinnati Orphan Asylum	Inst	NPA'ssn	100	79			192
Children's Home	Inst	NPA'ssn	30	6			490
Home for Incurables	Incur	NPA'ssn	65	68			10
Jewish Convalescent and Foster Homes	Conv	NPA'ssn	20	12			170
Madeline Marie Nursing Home	Conv	Part	42				106
Maple Knoll Hospital and Home for the Friendless	Mat	Chil NPA'ssn	50	30	20	302	547
St Francis Hospital	Chr	Cancer Church	290	200			861
St Joseph Maternity Hospital and Infant Asylum	Mat	Church	10	4	10	112	112
Cleveland 878 336—Cuyahoga							
Children's Fresh Air Camp and Hospital	Conv	NPA'ssn	69	50			180
Florence Crittenton Home	Mat	NPA'ssn	10	11	13	24	31
Inglewood Home	N&M	NPA'ssn	100	84			450
Columbus 306 007—Franklin							
Florence Crittenton Home	Mat	NPA'ssn	36	32	24	73	89
Franklin County Home	Inst	County	123	117			119
Institution for Feeble-minded	MeDe	State	2 180	2 112			167
Ohio Penitentiary Hospital	Inst	State	185	84			3 334
Dayton 210 718—Montgomery							
Barney Convalescent Home for Crippled Children	Orth	NPA'ssn	20	18			78
Wilson Schools	MeDe	Part	40	20			18
Delaware 8 944—Delaware							
Girls Industrial School Hosp	Inst	State	32	20			730
Fuclid 17 000—Cuyahoga							
Rose Mary The Johanna Grace Home for Crippled Children	Orth	Church	24	24			14
Granville 1 507—Jackson							
Denison University Hospital	Inst	NPA'ssn	24	3			389
Lancaster 21 940—Fairfield							
Boys Industrial School Hospital	Inst	State	100	13			504

## OHIO—Continued

Related Institutions	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Marysville 4 037—Union Harmon Hospital (Ohio Reformatory for Women)	Inst	State	34	6	4	6	224
Orient 175—Pickaway Institution for Feeble-minded	MeDe	State	2 806	2 827			260
Reynoldsburg, 632—Franklin Nightingale Cottage	TbChil	NPAAssn	40	34			50
State Soldiers Home 900—Erie Ohio Soldiers and Sailors Home Hospital	Inst	State	180	49			637
Tiffin 16 102—Seneca Kentucky Memorial Hospital	Inst	NPAAssn	50	6			374
Toledo 282 349—Lucas Lucas County Hospital Annex	Chr	County	112	110			83
Toledo Society for Crippled Children Convalescent Home	Orth	NPAAssn	74	34			102
Warren 42 837—Trumbull Elm Manor	Alcoh	Indiv	8	2			43
Warrensville (Cleveland P O) 1 170—Cuyahoga Warrensville Chronic Hosp	Inst	City	170	139			341
Wickliffe 3 155—Lake Ridge-Cliffe Sanitarium	N & M	Corp	60	30			63
Wickliffe Sanitarium	N & M	Corp	15	5			56
Wooster 11 543—Wayne Hygeia Hall	Inst	NPAAssn	20	4			316
Xenia 10 633—Greene Ohio Soldiers and Sailors Orphans Home Hospital	Inst	State	74	16			845
Yellow Springs 1,640—Greene Antioch College Infirmary	Inst	NPAAssn	10	6			674
Youngstown 167 720—Mahoning Youngstown Municipal Hosp	Iso	City	50	4			63

## OKLAHOMA

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Ada 15 143—Pontotoc Breco Memorial Hospital	Gen	NPAAssn	20	9	2	73	583
Valley View Hospital	Gen	NPAAssn	50	22	10	249	1 244
Altus 8 593—Jackson Altus Hospital	Gen	Indiv	17	7	4	27	617
Alva 5 055—Woods Alva General Hospital	Gen	City	33	16	10	204	1 103
Anadarko 5 570—Caddo Anadarko Hospital	Gen	Part	22	5	4	70	367
Ardmore 16 800—Carter Hardy Sanitarium	Gen	Indiv	47	20	11	227	1 713
Bartlesville 16 267—Washington Washington County Memorial Hospital	Gen	County	50	31	13	433	1 616
Beaver 1 166—Beaver Beaver Hospital	Gen	Part	20	10	5	104	400
Blackwell 8 537—Kay Blackwell General Hospital	Gen	NPAAssn	37	23	8	212	1 073
Bristow 6 050—Creek Cowart Sister Hospital	Gen	Part	15	6	5	60	370
Carnegie 1 740—Caddo Carnegie Hospital and Clinic	Gen	Corp	15	7	5	131	796
Cherokee 2 553—Alfalfa Masonic Hospital	Gen	NPAAssn	50	15	7	103	972
Chickasha, 14 111—Grady Chickasha Hospital	Gen	Part	51	27	4	113	1 246
Cottage Hospital	Gen	Indiv	10	9	3	30	356
General Hospital	Gen	NPAAssn	17	8	8	210	
Claremore 4 134—Rogers Claremore Indian Hospital	Gen	IA	80	64	18	190	1 361
Clinton 6 736—Custer Clinton Indian Hospital	Gen	IA	32	17	6	20	506
Western Oklahoma Charity Hospital	Gen	State	100	79	6	200	2 700
Western Oklahoma Tubercu-losis Sanatorium	TB	State	290	266			381
Concho 290—Canadian Cheyenne and Arapaho Hosp	Gen	IA	46	27	8	70	676
Cordell 2 775—Washita Florence Hospital	Gen	Indiv	30	4	7	44	236
Cushing 7 703—Payne Masonic Hospital	Gen	NPAAssn	30	18	6	120	860
Duncan 9 207—Stephens Lindley Hospital	Gen	Indiv	15	8	4	98	641
Patterson Hosp and Clinic	Gen	Indiv	30	8	5	104	591
Weeden Hospital	Gen	Indiv	60	21	8	101	734
Durant 10 027—Bryan Durant Hospital	Gen	Corp	25	15	5	130	827
Evergreen Sanitarium	Gen	Indiv	21	4	6	44	225
Hayne Hospital and Clinic	Gen	Part	11	8	2	92	415
Elk City, 5 021—Beckham Tisdal Hospital	Gen	Indiv	35	7	3	80	448
El Reno 10 078—Canadian Catco Hospital	Gen	Indiv	19	6	3	62	318
El Reno Sanitarium	Gen	Indiv	33	16	6	210	991
Federal Reformatory Hosp	Inst	USPHS	66	26			629
Enid 28 081—Garfield Enid General Hospital	Gen	NPAAssn	90	63	10	136	2 013
St. Mary's Enid Springs Hos-pital	Gen	Church	75	33	12	396	1 772
University Hospital Founda-tion	Gen	NPAAssn	75	35	10	285	1 700

## OKLAHOMA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Erick 1 591—Beckham Stagner Clinic and Hospital	Gen	Indiv	12	6	5	50	200
Fort Sill, —Comanche Station Hospital	Gen	Army	507	271	10	139	9 233
Frederick 5,109—Tillman Frederick Clinic Hospital	Gen	Part	20	7	3	120	403
Spurgeon Arrington and Allen Hospital and Clinic	Gen	Corp	15	5	4	196	700
Grandfield 1,116—Tillman Grandfield Hospital	Gen	Indiv	12	3	3	50	80
Guthrie 10 018—Logan Cimarron Valley Wesley Hospital	Gen	NPAAssn	35	17	5	154	890
Henrietta 6,900—Okmulgee Henrietta Hospital	Gen	Indiv	25	20	6	115	900
John Taylor Hospital	Gen	Indiv	20	9	2	37	800
Hobart 5 177—Kiowa General Hospital	Gen	Indiv	22	9	5	202	1 179
Holdenville 6 637—Hughes Pryor Johnston Kernek Clinic and Hospital	Gen	Part	12	10	6	210	517
Hollis 2 732—Harmon Hollis Hospital	Gen	Indiv	15	4	3	83	576
Hominy, 3 267—Osage Hominy Hospital	Gen	Indiv	23	2	4	63	311
Hugo 5 009—Choctaw Johnson Hospital	Gen	Indiv	9	1	5	71	237
Lawton 18 005—Comanche Angus Hospital	Gen	Part	16	8	8	286	623
Nowa Indian Hospital	Gen	Part	160	103	16	190	2 494
Southwestern Clinic Hospital	Gen	Part	41	20	14	322	1 283
Maud 2 036—Seminole Maud Hospital	Gen	Indiv	12	3	2	34	106
McAlester 12 401—Pittsburg Albert Pike Hospital	Gen	NPAAssn	48	18	7	67	1 009
Central Oklahoma State Hos-pital Annex	MeDe	State	200	248			44
St. Mary's Hospital	Gen	Church	65	16	12	94	673
Miami 8 315—Ottawa Miami Baptist Hospital	Gen	Church	40	19	8	145	900
Muskogee 32 332—Muskogee Oklahoma Baptist Ho p	Gen	Church	120	71	20	330	2 540
Veterans Admin Facility	Gen	Vet	423	271			9,000
Norman 11 423—Cleveland Central Oklahoma State Hospital	Gen	State	2 621	2 800			1 044
Fillson Infirmary	Inst	State	40	17			1 220
Okeene 1 070—Blaine Okeene Clinic Hospital	Gen	Indiv	9	5	5	67	300
Okemah 7 811—Okfuskee Clinic Hospital	Gen	Indiv	10	4	4	110	391
Oklaoma City 204 424—Oklaoma Bone and Joint Hospital—McBride Clinic	Orth	Corp	41	20			660
Capitol Hill General Hospital	Gen	Corp	50	23	6	207	1 161
Coyne Campbell Sanitarium	N & M	Corp	60	40			673
Great Western Hospital	Gen	Corp	30	19	3	20	229
Moorman's Farm Sanatorium	TB	Indiv	22	14			94
Oklaoma City General Hos-pital	Gen	Corp	100	79	12	348	3 874
Polyclinic Hospital	Gen	Indiv	95	62	16	317	1 000
St. Anthony Hospital	Gen	Church	350	323	50	1 939	10 181
University Hospitals	Gen	State	411	377	18	500	5 977
Wesley Hospital	Gen	Part	137	108	30	818	5 506
Willie Neuro Psychiatric Hospital	N & M	Indiv	25				Feb 1943
Okmulgee 16 001—Okmulgee Ming Vernon Hospital	Gen	Part	12	8	2	76	300
Okmulgee City Hospital	Gen	City	35	21	7	104	901
Pauls Valley 5 104—Garvin Lindsey Johnson Shirley Hospital	Gen	Part	23	10	7	219	643
Pawhuska 5 443—Osage Osage County Infirmary	Gen	County	40	13	8	119	602
Pawhuska Municipal Hospital	Gen	City	40	10	4	87	
Pawnee 2,742—Pawnee Pawnee Poncea Hospital	Gen	IA	50	22	6	92	607
Picher 5 818—Ottawa American Hospital	Gen	Indiv	40	4	3	18	200
Picher Hospital	Gen	Part	17	8	2	97	411
Ponca City 16 704—Kay Ponca City Hospital	Gen	Church	58	49	12	543	2 800
Poteau 4 020—Le Flore Woodson Hospital	Gen	Indiv	15	5	2	50	408
Prague 1 422—Lincoln Rollins Hospital	Gen	Indiv	10	5	3	90	290
Sayre 3 037—Beckham Sayre Hospital	Gen	Indiv	20	7	6	98	774
Seminole 11 547—Seminole Harber Hospital	Gen	Corp	27	19	7	312	1 061
Shattuck 1 270—Ellis Shattuck Hospital	Gen	Indiv	48	23	6	273	1 004
Shawnee 22 053—Pottawatomie A O H Hospital	Gen	Part	20	14	5	142	730
Shawnee Indian Sanatorium	Gen	IA	150	113			154
Shawnee Municipal Hospital	Gen	City	54	22	6	301	1 712
Stillwater 10 097—Payne Agricultural and Mechanical College Infirmary	Inst	State	50	11			1,000
Stillwater Municipal Hospital	Gen	City	40	20			1 160
Sulphur 7 070—Murray Soldiers Tubercular Sanatorium	TB	State	136	116			941
Sulphur Hospital and Clinic	Gen	NPAAssn	20	0	4	82	420
Supply 414—Woodward Western Oklahoma Hospital	Gen	State	1 600	1 005			510

Key to symbols and abbreviations is on page 1027

## OKLAHOMA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Taft 772—Muskogee State Hospital for Negro Insane	Ment	State	750	133		291	
Tablequah 3 027—Cherokee Wm W Hastings Indian Hospital	Gen	IA	72	46	13	225	1 426
Tallhina 1 067—Le More Eastern Oklahoma State Tuberculosis Sanatorium	TB	State	310	294			515
Tallhina Sanatorium and Hospital	GenTbIA		240	167	20	182	1 561
Tonkawa 3 197—Kay Tonkawa Hospital	Gen	Indiv	20	4	4	40	132
Tulsa 142 157—Tulsa Flower Hospital	Gen	NPA's'n	30	18	12	335	953
Hillcrest Memorial Hosp *AO	Gen	NPA's'n	358	117	31	1 033	7 376
Mercy Hospital for Crippled Children	Orth	Indiv	50	23			1 011
Oakwood Sanitarium	N&M	Corp	42	15			125
St John's Hospital*AO	Gen	Church	250	185	50	1 421	7 800
Vinita 5 685—Craig Eastern Oklahoma Hospital	Ment	State	2 650	2 677			473
Vinita Hospital	Gen	Corp	14	9	4	154	693
Waurika 2 458—Jefferson Waurika Hospital	Gen	Corp	25	11	4	39	385
Wewoka 10 315—Seminole Knight Hospital	Gen	Corp	20	8	4	74	212
Wewoka Hospital	Gen	Part	25	8	6	37	242
Woodward 5 406—Woodward Memorial Hospital	Gen	Corp	25	15	4	243	1 102

## Related Institutions

Chelsea 1 642—Rogers Jennings Hospital	Gen	Indiv	4	2	1	30	220
Enid 28 081—Garfield Northern Oklahoma Hospital	MeDe	State	1 321	1 206			90
Fort Reno (El Reno P O) 150—Canadian Station Hospital	Gen	Army	14	1			85
McAlester 12 401—Pittsburg Oklahoma State Prison Hosp	Inst	State	40	25			870
Oklahoma City 204 424—Oklahoma Campbell Tuberculosis Sanatorium	TB	Part	29	18			103
Home of Redeeming Love Tablequah 3 027—Cherokee Sequoyah Orphan Training School Hospital	Mat	Church	22	9	25	147	188
Tulsa 142 157—Tulsa Junior League Home for Convalescent Crippled Children	Inst	IA	19	6			320
Watonga 2 828—Blaine Watonga Hospital	Orth	NPA's'n	35	28			52
Wynne Wood 2 318—Garvin Wynnewood Hospital Clinic	Gen	Indiv	12	8	3	53	441
	Gen	Part	10	4	3	78	250

## OREGON

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Albany 5 654—Linn Albany General Hospital	Gen	NPA's'n	61	28	8	231	1 068
Ashland 4 744—Jackson Community Hospital	Gen	NPA's'n	28	14	9	110	540
Astoria 10 389—Clatsop Columbia Hospital	Gen	Church	91	59	12	255	2 323
St Mary's Hospital*AO	Gen	Church	85	40	12	191	2 984
Baker 9 342—Baker St Elizabeth Hospital	Gen	Church	70	33	12	247	2 000
Bend 10 021—Deschutes St Charles Hospital	Gen	Church	45	31	10	364	1 470
Burns 2 566—Harney Valley View Hospital	Gen	Indiv	18	11	4	51	548
Corvallis 8 392—Benton Ball Clinic	Gen	Indiv	18	13	8	60	365
Corvallis General Hospital	Gen	NPA's'n	38	19	6	187	883
Student Health Service Oregon State College	Inst	State	30	10			552
Dallas 3 579—Polk Dallas Hospital	Gen	Corp	32	18	6	78	616
Enterprise 1 709—Wallowa Enterprise Hospital	Gen	Corp	15	6	4	84	322
Eugene 20 858—Lane Eugene Hospital and Clinic	Gen	Part	55	40	3	14	1 761
Sacred Heart General Hospital*AO	Gen	Church	152	87	35	1 110	3 760
Grants Pass 6 028—Josephine Josephine General Hospital	Gen	County	56	48	12	207	2 048
Hood River 3 290—Hood River Hood River Hospital	Gen	NPA's'n	38	24	5	120	1 615
Klamath Agency 150—Klamath Klamath Indian Hospital	Gen	IA	27	11	5	51	411
Klamath Falls 16 497—Klamath Hillside Hospital	Gen	Corp	50	35	12	320	2 244
Klamath Valley Hospital	Gen	Corp	85	35	14	360	1 710
La Grande 7 747—Union St Joseph Hospital	Gen	Church	47	23	10	156	1 239
Lakeview 2 466—Lake Lakeview Hospital	Gen	Corp	20	11	4	97	534

## OREGON—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Lebanon 2 729—Linn Lebanon General Hospital	Gen	Part	30	15	6	372	1 337
Marshfield 5 259—Coos McAuley Hospital	Gen	Church	50	31	10	181	1 570
McMinnville 3 706—Yamhill General Hospital	Gen	Corp	33	13	6	69	536
McMinnville Hospital	Gen	Corp	38	42	13	282	1 987
Medford 11 281—Jackson Community Hospital	Gen	NPA's'n	52	36	10	344	2 103
Sacred Heart Hospital*AO	Gen	Church	75	52	10	210	1 895
Milwaukie 1 871—Clackamas Portland Open Air Sanatorium	TB	NPA's'n	40	29			154
Myrtle Point 1 296—Coos Mast Hospital	Gen	Indiv	40	16	6	44	613
Newberg 2 960—Yamhill Willamette Hospital	Gen	Corp	20	10	4	130	648
North Bend 4 262—Coos Keizer Brothers Hospital	Gen	Part	60	36	7	211	1,002
Ontario 3 551—Malheur Holy Rosary Hospital	Gen	Church	45	22	12	153	1 191
Oregon City 6 124—Clackamas Hutchison General Hospital	Gen	Part	31	15	7	145	596
Oregon City Hospital	Gen	Corp	53	44	10	295	1 638
Pendleton 8 847—Umatilla Eastern Oregon State Hosp	Ment	State	1 350	1 235			227
St Anthony's Hospital*AO	Gen	Church	100	70	26	358	2 237
Portland 305 394—Multnomah Coffey Memorial Hospital	Gen	Corp	115	15			3 373
Doernbecher Memorial Hospital for Children	Unit of University of Oregon Medical School Hospitals and Clinics						
Emanuel Hospital*AO	Gen	Church	330	290	95	2 942	10 660
Good Samaritan Hosp *AO	Gen	Church	387	270	78	1 440	10 892
Hahnemann Hospital	Gen	NPA's'n	65	39	10	212	1 257
Juvenile Hospital for Girls	VenMat	NPA's'n	100	75	6	28	110
Morningside Hospital	Ment Fed		325	307			61
Multnomah Hospital	Unit of University of Oregon Medical School Hospitals and Clinics						
Portland Convalescent Hosp	Med	Indiv	25	10			139
Portland Medical Hospital	Gen	Corp	57	24			518
Portland Sanitarium and Hospital*AO	Gen	Church	156	139	56	1 816	5 902
Providence Hospital	Gen	Church	185	74			3 695
St Vincent's Hospital*AO	Gen	Church	374	336	60	1 457	10 637
Salvation Army White Shield Home	Mat	Church	34	27	7	79	91
Shriners Hospital for Crippled Children*AO	Orth	NPA's'n	60	55			319
Theo B Wilcox Memorial Hospital	Unit of Good Samaritan Hospital						
University of Oregon Medical School Hospitals and Clinics*AO	GenTbCoState		430	400	35	391	6 639
University State Tuberculosis Hospital	Unit of University of Oregon Medical School Hospitals and Clinics						
Veterans Admin Facility	Gen	Vet	407	341			2 555
Prineville 2 358—Crook Prineville General Hospital	Gen	Indiv	25	5	6	126	611
Roseburg 4 924—Douglas Mercy Hospital	Gen	Church	40	20	7	253	981
Veterans Admin Facility	Ment	Vet	566	506			317
St Helens 4 304—Columbia St Helens General Hospital	Gen	Corp	19	8	6	69	735
Salem 30 908—Marion Oregon State Hospital	Ment	State	2 800	2 691			999
Oregon State Tuberculosis Hospital	TB	State	420	287			280
Salem Deaconess Hospital	Gen	Church	100	66	18	449	2 771
Salem General Hospital	Gen	NPA's'n	78	59	18	491	2 767
Silverton 2 925—Marion Silverton General Hospital	Gen	NPA's'n	20	12	9	175	520
The Dalles 6 266—Wasco Eastern Oregon State Tuberculosis Hospital	TB	State	180	154			135
Mid Columbia Hospital	Gen	Indiv	22	11	6	41	639
The Dalles Hospital	Gen	Corp	67	46	8	255	1 643
Tillamook 751—Tillamook Charlton Hospital	Gen	Indiv	48	22	8	105	1 169
Toledo 2 288—Lincoln Lincoln Hospital	Gen	Part	25	16	5	122	560
Troutdale 211—Multnomah Multnomah County Tuberculosis Pavilion	TB	County	40	33			62
Warm Springs 150—Jefferson Warm Springs Hospital	Gen	IA	23	10	6	15	255

## Related Institutions

Chemawa 700—Marion Chemawa Indian Hospital	Gen	IA	49	11	3	10	617
Coquille 3 327—Coos Coquille Hospital	Gen	Indiv	28	13	8	132	733
Portland 305 394—Multnomah City Isolation Hospital	Isol	City	65	10			278
Salvation Army Wemme Home	Mat	Church	22	14	15	37	43
Salem 30 908—Marion Oregon Fairview Home	McDe	State	1 103	1 026			136
Oregon State Penitentiary Hospital	Inst	State	42	20			300
Oregon State School for the Deaf	Inst	State	12	7			376
Waldport 650—Lincoln Waldport Community Hosp	Gen	Indiv	10	1	4	23	34

Key to symbols and abbreviations is on page 1027

## PENNSYLVANIA

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Abington 3200—Montgomery Abington Memorial Hospital**	Gen	NPAssn	290	207	60	1 189	7 114
Allentown 96 904—Lehigh Allentown Hospital**	Gen	NPAssn	342	270	33	1 04	8 293
Allentown State Hospital	Ment	State	1 896	1 812			491
Baer Hospital	Gen	Indlv	15	7	5	53	182
Sacred Heart Hospital**	Gen	Church	294	198	41	1 170	5 096
Allenwood 400—Union Devitt's Camp	TB	NPAssn	104	88			216
Altoona 50 214—Blair Altoona Hospital**	Gen	NPAssn	160	110	25	80	3 634
Mercy Hospital**	Gen	NPAssn	147	105	33	897	3 867
Amble 3 953—Montgomery Dufur Hospital	N & M	Indlv	65	43			87
Ashland 7 045—Schuylkill Ashland State Hospital	Gen	State	173	137	20	48	4 025
Beaver Falls 17 038—Beaver Providence Hospital	Gen	NPAssn	59	54	20	476	2 015
Bedford 3 268—Bedford Tlummis Hospital	Gen	Indlv	17	8	4	40	257
Bellefonte 5 304—Centre Centre County Hospital	Gen	NPAssn	55	47	15	270	1 592
Bellevue 10 488—Allegheny Suburban General Hospital	Gen	NPAssn	100	78	25	501	3 157
Berwick 13 181—Columbia Berwick Hospital	Gen	NPAssn	63	30	12	762	1 200
Bethlehem 58 490—Northampton St. Luke's Hospital**	Gen	NPAssn	22	190	37	1 154	6 519
Bloomsburg 9 709—Columbia Bloomsburg Hospital	Gen	NPAssn	117	68	18	428	2 085
Blossburg 1 945—Tioga Blossburg State Hospital	Gen	State	90	82	9	296	2 041
Braddock 18 326—Allegheny Braddock General Hospital	Gen	NPAssn	173	125	12	1 742	5 591
Bradford 17 691—McKean Bradford Hospital	Gen	NPAssn	115	55	24	510	3 014
Brookville 4 397—Jefferson Brookville Hospital	Gen	NPAssn	35	29	7	175	1 125
Brownsville 8 015—Fayette Brownsville General Hospital	Gen	NPAssn	90	65	10	334	1 977
Bryn Mawr 10 206—Montgomery Bryn Mawr Hospital**	Gen	NPAssn	265	183	48	951	6 514
Butler 24 477—Butler Butler County Memorial Hospital	Gen	NPAssn	148	125	30	704	4 046
Canonsburg 12 699—Washington Canonsburg General Hospital	Gen	NPAssn	72	58	18	618	2 882
Carbondale 19 371—Lackawanna Carbondale General Hospital	Gen	NPAssn	69	44	14	25	1 588
St. Joseph's Hospital	Gen	Church	88	55	10	199	1 600
Carlisle 13 984—Cumberland Carlisle Hospital	Gen	NPAssn	73	73	22	409	3 102
Station Hospital	Gen	Army	60	53	2	26	795
Chambersburg 14 852—Franklin Chambersburg Hospital	Gen	NPAssn	92	62	18	477	2 706
Charleroi 10 784—Washington Charleroi Memorial Hospital	Gen	NPAssn	176	103	27	832	3 736
Chester 59 285—Delaware Chester Hospital	Gen	NPAssn	215	165	35	1 900	6 549
J. Lewis Crozer Homeopathic Hospital	Gen	Incur NPAssn	81	58	21	620	2 550
Clarks Summit 2 691—Lackawanna Hillside Home and Hospital for Mental Diseases	Ment	County	950	916			276
Clearfield 9 372—Clearfield Clearfield Hospital	Gen	NPAssn	108	73	18	794	2 686
Coaldale 6 163—Schuylkill Coaldale State Hospital	Gen	State	120	112	18	376	2 647
Coatesville 14 006—Chester Clement Atkinson Memorial Hospital	Gen	Indlv	17	8	9	32	128
Coatesville Hospital	Gen	NPAssn	91	60	24	431	2 122
Veterans Admin. Facility	Ment	Vet	1 525	1 507			215
Columbia 11 547—Lancaster Columbia Hospital	Gen	NPAssn	45	29	10	237	820
Confluence, 1 035—Somerset Price Hospital	Gen	Indlv	13	3	4	30	151
Connellsville 13 608—Fayette Connellsville State Hospital	Gen	State	97	68	15	440	2 518
Corry 6 935—Erie Corry Hospital	Gen	NPAssn	40	27	8	309	1 544
Coudersport 3 197—Potter Coudersport General Hospital	Gen	NPAssn	25	19	5	153	803
Cresson 2 500—Cambria Pennsylvania State Tuberculosis Sanatorium No. 2	TB	State	840	750			848
Danville 7 122—Montour Danville State Hospital	Ment	State	2 498	2 333			70
Geo. F. Gelsinger Memorial Hospital	Gen	NPAssn	154	13	20	547	5 527
Darby 10 334—Delaware Fitzgerald Mercy Hospital	Gen	Church	191	153	60	1 923	5 577
Diamond 188—Allegheny Diamond Hospital	N & M	NPAssn	1 000	1 130			58
Doylestown 4 076—Bucks Dr. Buckman's Sanitarium	N & M	Indlv	25	15			20
Drevel Hill—Delaware Delaware County Hospital	Gen	NPAssn	74	55	16	426	2 746
Du Bois 12 080—Clearfield Du Bois Hospital	Gen	Church	51	31	11	290	1 380
Maple Avenue Hospital	Gen	NPAssn	73	35	7	186	1 504

## PENNSYLVANIA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Fagleville 500—Montgomery Eagleville Sanatorium for Consumptives	TB	NPAssn	185	171			19
Fauston, 33 589—Northampton Betts Hospital	Gen	NPAssn	39	76	14	401	1 329
Easton Hospital	Gen	NPAssn	199	100	21	676	5 148
Easton Sanitarium	N & M	Indlv	30	15			50
East Stroudsburg, 6 401—Monroe General Hospital of Monroe County	Gen	NPAssn	67	42	12	210	1 477
Elizabethtown 4 315—Lancaster Philadelphia Freemasons Memorial Hospital	Gen	NPAssn	165	145			60
State Hospital for Crippled Children	Orth	State	225	103			177
Elmwood City 12 329—Lawrence Elmwood City Hospital	Gen	NPAssn	55	37	18	374	1 327
Elwyn 200—Delaware Elwyn Training School	MeDe	NPAssn	1 090	1 026			16
Eric 118 000—Eric Erie County Tuberculosis Hospital	TB	County	65	62			123
Hamot Hospital	Gen	NPAssn	251	156	31	1 104	6 334
St. Vincent's Hospital	Gen	NPAssn	202	270	72	2 653	10 475
Zem Zem Hospital for Crippled Children	Orth	NPAssn	48	20			49
Feveritt, 2 425—Bedford Everett Hospital	Gen	NPAssn	25	14	5	83	611
Franklin 9 918—Franklin Franklin Hospital	Gen	NPAssn	51	41	10	176	1 679
Gittysburg 5 016—Adams Annie M. Warner Hospital	Gen	NPAssn	56	31	13	272	1 920
Gladwyne 1 236—Montgomery Gladwyne Colony	N & M	Indlv	55	50			171
Greensburg, 36 747—Westmoreland Westmoreland Hospital	Gen	NPAssn	175	144	70	1 137	5 094
Greenville 8 113—Mercer Greenville Hospital	Gen	NPAssn	62	27	14	293	1 425
Grove City 6 206—Mercer Grove City Hospital	Gen	NPAssn	26	15	6	133	550
Hamburg 1 717—Berk Pennsylvania State Sanatorium for Tuberculosis	TB	State	526	527			517
Hannover, 13 016—York Hannover General Hospital	Gen	NPAssn	80	52	18	551	1 555
Harrisburg, 81 591—Dauphin Harrisburg Hospital	Gen	NPAssn	229	218	25	1 450	6 540
Harrisburg Polyclinic Hospital	Gen	NPAssn	160	124	25	931	4 310
Harrisburg State Hospital	Ment	State	2 357	2 306			837
Keystone Hospital	Gen	Indlv	27	18	6	115	636
Hazleton 38 009— Luzerne Corrigan Hospital	Ment	Corp	15	10	16		401
Hazleton State Hospital	Gen	State	180	156	32	563	5 408
Hollidaysburg 5 010—Blair Hollidaysburg State Hospital	Ment	State	375	351			99
Homestead 19 011—Allegheny Homestead Hospital	Gen	NPAssn	145	97	29	642	3 670
Honesdale 5 687—Wayne Wayne County Memorial Hospital	Gen	NPAssn	32	22	8	155	840
Huntingdon 7 170—Huntingdon J. C. Blair Memorial Hospital	Gen	NPAssn	70	63	14	251	2 046
Indiana 10 050—Indiana Indiana Hospital	Gen	NPAssn	150	118	20	405	4 72
Jersey Shore 5 432—Lycoming Community Hospital	Gen	NPAssn	52	19	10	149	64
Johnstown 66 665—Cambria Conemaugh Valley Memorial Hospital	Gen	NPAssn	131	234	33	1 101	6 751
Lee Homeopathic Hospital	Gen	NPAssn	65	61	23	337	1 748
Mendenhall Maternity Hosp.	Gyn/Mat	Part	21	15	20	226	257
Mercy Hospital	Gen	Church	107	83	23	672	2 158
Kane 6 133—McKean Community Hospital	Gen	NPAssn	59	28	12	116	1 940
Kane Summit Hospital	Gen	NPAssn	23	17	6	107	635
Kingston, 29 679—Luzerne Nesbitt Memorial Hospital	Gen	NPAssn	110	80	20	842	3 748
Kittanning 7 550—Armstrong Armstrong County Hospital	Gen	NPAssn	81	71	22	397	2 118
Lancaster 61 345—Lancaster Lancaster General Hospital	Gen	NPAssn	236	191	45	1 273	5 791
Rossman Sanatorium	TB	CyCo	55	50			66
St. Joseph's Hospital	Gen	Church	222	168	43	745	4 917
Lansdale 9 316—Montgomery Elm Terrace Hospital	Gen	NPAssn	31	18	9	165	675
Latrobe 11 111—Westmoreland Latrobe Hospital	Gen	NPAssn	78	66	20	689	2 889
Laurelton 327—Union Laurelton State Village	MeDe	State	979	923			174
Lebanon 27 706—Lebanon Good Samaritan Hospital	Gen	NPAssn	100	69	20	601	2 425
Lebanon Sanatorium	Gen	Corp	40	No data supplied			
Leetsdale 2 332—Allegheny D. T. Watson Home for Crippled Children	Orth	NPAssn	100	93			215
Lewisburg 3 571—Union Evangelical Hospital	Gen	Church	32	23	18	250	767
U. S. Penitentiary Hospital	Inst	USPHS	84	49			1 575
Lewistown 17 017—Mifflin Lewistown Hospital	Gen	NPAssn	92	79	21	459	2 404

Key to symbols and abbreviations is on page 1027

## PENNSYLVANIA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Inpatients	Number of Births	Admissions †
Lock Haven 10 810—Clinton	Gen	NPAasn	63	45	17	394	1 831
Lock Haven Hospital	Gen	Indiv	21	9	4	50	384
Teah Private Hospital							
Mayview 420—Allegheny	Ment	State	3 216	3 156			519
Mayview State Hospital							
Pittsburgh City Home and Hospitals	Gen	Inst City	668	551	9	4	708
McKeesport 55 305—Allegheny	Gen	NPAasn	263	213	60	1 843	6 313
McKeesport Hospital							
McKees Rocks 17 021—Allegheny	Gen	NPAasn	62	45	21	480	2 423
Ohio Valley General Hosp	Gen	NPAasn					
Meadville 18 919—Crawford	Gen	NPAasn	110	76	21	458	3 133
Meadville City Hospital	Gen	NPAasn	111	94	28	500	3 022
Spencer Hospital							
Media 5 351—Delaware	Gen	Indiv	20	10	4	50	185
Media Hospital							
Mercer 2 272—Mercer	Gen	Corp	54	28	4	100	1 314
Mercer Cottage Hospital	Gen	Part	42	37			125
Mercer Sanitarium							
Meyersdale 3 250—Somerset	Gen	NPAasn	14	7	5	97	390
Hazel McGilvery Hospital	Gen	Indiv	12	1	3	12	121
Meyersdale Wenzel Hospital							
Monaca 7 061—Beaver	TB	County	62	60			73
Beaver County Sanatorium							
Monessen 20 257—Westmoreland	ENT	Part	15	7			604
Gemmill Hospital							
Monongahela 8 825—Washington	Gen	NPAasn	68	53	16	377	2 279
Memorial Hospital							
Mount Pleasant 5 624—Westmoreland	Gen	NPAasn	71	57	27	479	2 497
Henry Clay Frick Memorial Hospital							
Muncy 2 606—Lycoming	Gen	NPAasn	20	11	6	80	300
Muncy Valley Hospital							
Nanticoke 24 387—Luzerne	Gen	State	120	92	10	351	2 844
Nanticoke State Hospital							
New Brighton 9 630—Beaver	Gen	NPAasn	70	54	18	414	2 335
Beaver Valley General Hospital							
New Castle 47 638—Lawrence	Gen	NPAasn	147	106	33	857	4 973
Jameson Memorial Hosp	Gen	Church	110	90	22	587	3 146
New Castle Hospital							
New Kensington 21 005—Westmoreland	Gen	NPAasn	134	94	38	800	3 232
Citizens General Hospital							
New Wilmington 1 018—Lawrence	Conv	Part	35	23			188
Overlook Sanitarium							
Norristown 38 181—Montgomery	Gen	NPAasn	130	148	30	858	4 451
Montgomery Hospital	Gen	State	4 305	4 272			915
Norristown State Hospital							
Riverview Hospital	Gen	NPAasn	30	16	10	297	676
Sacred Heart Hospital	Gen	Church	68	47	22	437	1 564
Oakbourne (West Chester P O)	100—Chester						
Pennsylvania Epileptic Hospital and Colony Farm	Epil	NPAasn	140	127			31
Oil City 20 379—Venango	TB	NPAasn	14	10			20
Grand View Institution	Gen	NPAasn	120	74	20	457	2 638
Oil City Hospital							
Palmerton 7 470—Carbon	Gen	NPAasn	65	60	11	206	1 908
Palmerton Hospital							
Peckville 8 106—Lackawanna	Gen	NPAasn	62	49	8	294	1 737
Mid Valley Hospital							
Pennhurst (Spring City P O)	100—Chester						
Pennhurst State School	MeDe	State	2 400	2 240			183
Philadelphia 1 831 334—Philadelphia							
American Hospital for Diseases of the Stomach	Gen	NPAasn	39	19	3	81	873
American Oncologic Hosp	SkCa	NPAasn	51	25			548
Anderson Hospital	Gen	NPAasn	82	41	23	344	2 824
Babies Hospital	Chil	NPAasn	15	9			311
Broad Street Hospital	Gen	NPAasn	80	62	30	573	1 896
Chestnut Hill Hospital	Gen	NPAasn	104	58	26	573	2 702
Children's Heart Hospital	Card	NPAasn	60	60			110
Children's Hospital	Chil	NPAasn	142	93			2 100
Children's Hospital of the Mary J Drexel Home	Chil	Church	50	20			890
Columbus Hospital	Gen	Church	52	29	18	34	1 093
Community Hospital	Gen	NPAasn	40	10	12	16	154
Eastern State Penitentiary	Inst	State	89	7			379
Hospital	N&M	Corp	46	26			187
Fairmount Farm	Gen	NPAasn	144	113	48	1 205	4 000
Frankford Hospital							
Frederick Douglass Memorial Hospital	Gen	NPAasn	88	44	10	150	730
Friends Hospital	N&M	NPAasn	170	133			151
Garretson Hospital	Unit of Temple University Hospital						
Germanatown Dispensary and Hospital	Gen	NPAasn	345	266	65	1 723	6 812
Graduate Hospital of the University of Pennsylvania	Gen	NPAasn	461	220		14	6 460
Hahnemann Hospital	Gen	NPAasn	586	483	89	2 237	13 330
Home for Consumptives	TB	Church	101	83			135
Hospital of the Protestant Episcopal Church	Gen	Church	432	318	43	1 703	7 523
Hospital of the University of Pennsylvania	Gen	NPAasn	679	415	62	1 108	12 170
Hospital of the Woman's Medical College of Pennsylvania	Gen	NPAasn	164	110	33	807	3 532
Institute of the Pennsylvania Hospital	N&M	NPAasn	70	43			311
Jeanes Hospital	Cancer	NPAasn	73	41			619
Jefferson Medical College Hospital							
Jewish Hospital	Gen	NPAasn	674	551	50	1 760	15 034
Joseph Price Memorial Ho	Gen	NPAasn	400	391	70	1 617	8 502
	Gen	NPAasn	55	30	5	65	34

Key to symbols and abbreviations is on page 1027

## PENNSYLVANIA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Inpatients	Number of Births	Admissions †
Kensington Hospital for Women	GynMat	NPAasn	66	46	35	900	1 699
Lankenau Hospital	Gen	NPAasn	259	186	34	700	5 018
Lying In Hospital	Unit of Pennsylvania Hospital						
Memorial Hospital	Gen	NPAasn	90	72	19	564	2 635
Mercy Hospital	Gen	NPAasn	105	82	20	305	1 801
Methodist Hospital	Gen	Church	199	125	47	891	3 923
Mercer Hospital	Gen	Church	192	178	28	1 321	5 535
Mount Sinai Hospital	Gen	NPAasn	262	211	55	1 380	6 375
National Stomach Hospital	Gen	NPAasn	44	11	8	61	380
Nazareth Hospital	Gen	Church	122	53	23	799	3 126
Northeastern Hospital	Gen	NPAasn	87	61	15	649	2 921
Northern Liberties Hospital	Gen	NPAasn	57	39	11	202	1 494
Northwestern General Hosp	Unit of Temple University Hospital						
Pennsylvania Hospital	Gen	NPAasn	404	318	130	2 204	8 790
Pennsylvania Hospital Department for Mental and Nervous Diseases	N&M	NPAasn	225	174			225
Philadelphia General Hospital	Gen	City	2 676	1 839	60	1 800	26 595
Philadelphia Hospital for Contagious Diseases	Iso	City	1 000	302			4 933
Philadelphia Psychiatric Hospital	Ment	NPAasn	60	45			433
Philadelphia State Hospital	Ment	State	6 160	5 000			1 234
Presbyterian Hospital	Gen	Church	409	267	42	841	6 093
Preston Retreat	Mat	NPAasn	50	14	30	308	455
Rush Hospital for Consumption and Allied Diseases	TB	NPAasn	166	94			214
St Agnes Hospital	Gen	Church	346	143	78	1 036	4 418
St Christopher's Hospital for Children	Chil	NPAasn	82	51			1 877
St Joseph's Hospital	Gen	Church	225	150	44	1 062	4 093
St Luke's and Children's Medical Center	Gen	NPAasn	218	137	82	930	4 766
St Mary's Hospital	Gen	Church	206	106	44	1 071	4 641
St Vincent's Hospital for Women and Children	Gen	Church	137	57	24	562	1 039
Shriners Hospital for Crippled Children	Orth	NPAasn	120	90			318
Skin and Cancer Hospital	SkCa	NPAasn	31	19			189
Stetson Hospital	Gen	NPAasn	75	49	12	202	1 809
Temple University Hospital	Gen	NPAasn	438	343	45	1 304	9 937
U S Naval Hospital	Gen	Navy	951	743			8 023
Urologic Clinic	Urol	Part	35	6			232
Willis Hospital	Eye	NPAasn	200	141			3 624
Women's Hospital	Gen	NPAasn	125	83	41	976	2 837
Women's Homeopathic Hospital	Gen	NPAasn	160	109	40	795	2 810
Philipsburg 3 963—Centre							
Benson Sanatorium	Gen	Indiv	15	8	6	63	405
Philipsburg State Hospital	Gen	State	132	112	18	399	3 433
Phoenixville 12 282—Chester							
Phoenixville Hospital	Gen	NPAasn	67	40	12	278	1 270
Pittsburgh 671 609—Allegheny							
Allegheny General Hosp	Gen	NPAasn	554	402	54	1 636	10 601
Belvedere General Hospital	Gen	NPAasn	40	15	10	89	637
Children's Hospital	Chil	NPAasn	104	133			3 855
City Tuberculosis Hospital	TB	City	455	402			508
Elizabeth Steel Magee Hospital	Gen	NPAasn	309	207	111	3 363	7 421
Eye Ear Nose and Throat Hospital	ENT	NPAasn	90	55			4 922
Fairview Sanatorium	N&M	Corp	12	12			22
Haddon Hospital	Gen	Corp	20	10	15	385	803
Mercy Hospital	Gen	Church	632	533	48	1 531	14 128
Montefiore Hospital	Gen	NPAasn	220	198	32	1 036	7 492
Municipal Hospital for Contagious Diseases	Iso	City	224	46			812
Passavant Hospital	Gen	Church	100	63	20	206	2 207
Pittsburgh Hospital	Gen	NPAasn	186	170	24	1 001	4 580
Presbyterian Hospital	Gen	NPAasn	210	127			4 309
Rosella Foundling and Maternity Hospital	MatCh	NPAasn	110	98	18	295	518
St Francis Hospital	Gen	NPAasn	640	600	60	1 902	12 516
St John's General Hospital	Gen	NPAasn	189	150	50	1 588	5 493
St Joseph's Hospital and Dispensary	Gen	Church	110	90	20	663	3 322
St Margaret Memorial Hospital	Gen	Church	129	77	21	458	2 830
Shadyside Hospital	Gen	NPAasn	262	214	40	1 210	6 770
South Side Hospital	Gen	NPAasn	207	141	18	677	5 227
Tuberculosis League Hosp	TB	NPAasn	150	147			210
U S Marine Hospital	Gen	USPHS	73	65			1 224
Veterans Admin Facility	Gen	Tb Vet	767	639			4 346
Western Pennsylvania Hospital	Gen	NPAasn	600	381	61	1 167	10 729
Western State Penitentiary Hospital	Inst	State	45	31			664
Western State Psychiatric Hospital	Ment	State	272				Estab 1942
Woman's Hospital	Gen	NPAasn	142	44			1 231
Pittston 17 628—Luzerne							
Pittston Hospital	Gen	NPAasn	123	90	18	612	4 420
Polk 3 600—Venango							
Polk State School	MeDe	State	3 320	3 017			369
Pottstown 20 191—Montgomery							
Hill School Infirmary	Inst	NPAasn	40	7			520
Homeopathic Hospital	Gen	NPAasn	52	41	16	311	1 531
Pottstown Hospital	Gen	NPAasn	63	50	12	330	2 155
Pottsville 24 530—Schuylkill							
Lemos B Warner Hospital	Gen	Indiv	75	42	12	171	1 405
A C Milliken Hospital	Gen	NPAasn	72	64	20	472	2 132
Pottsville Hospital	Gen	NPAasn	160	102	12	474	2 801



## PENNSYLVANIA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Primos, 300—Delaware							
Burn Brae Hospital	N&M	Indiv	45	40			79
Punxsutawney 9452—Jefferson							
Adrian Hospital	Gen	NPA's'n	76	69	10	357	2,213
Quakertown 5150—Bucks							
Quakertown Hospital	Gen	NPA's'n	53	33	12	267	1,135
Ransom 150—Lackawanna							
Ransom Mental Hospital	Ment	County	397	390			73
Reading, 110 568—Berks							
Berks County Tuberculosis Sanatorium	TB	County	138	134			129
Homeopathic Hospital	Gen	NPA's'n	113	70	21	470	2,637
Reading Hospital	Gen	NPA's'n	239	185	57	1,360	6,752
St Joseph Hospital	Gen	Church	160	130	30	901	4,375
Renovo 3784—Clinton							
Renovo Hospital	Gen	NPA's'n	24	12	6	125	563
Retreat 2000—Luzerne							
Retreat Mental Hospital	Ment	State	1,175	1,164			200
Ridgway, 6233—Elk							
Elk County General Hospital	Gen	NPA's'n	69	41	10	201	1,410
Ridley Park 3887—Delaware							
Taylor Hospital	Gen	NPA's'n	70	61	18	500	2,913
Roaring Spring 2724—Blair							
Nason Hospital	Gen	NPA's'n	58	34	10	223	1,599
Rochester, 7441—Beaver							
Rochester General Hospital	Gen	NPA's'n	89	59	10	672	2,868
St Marys 7633—Elk							
Andrew Kaul Memorial Hosp	Gen	Church	57	40	18	295	1,550
Sayre 7569—Bradford							
Robert Packer Hospital	Gen	NPA's'n	304	202	21	779	7,342
Scranton, 140 404—Lackawanna							
Hahnemann Hospital	Gen	NPA's'n	109	82	16	807	2,623
Lackawanna County Tuberculosis Hospital	TB	County	150	139			226
Mercy Hospital	Gen	Church	84	72	20	450	2,504
Moses Taylor Hospital	Gen	NPA's'n	120	93			2,050
St Joseph's Children's and Maternity Hospital	MatCh	Church	180	173	24	61	232
St Mary's Mater Misericordiae Hospital	Gen	Church	70	52	12	251	1,300
Scranton State Hospital	Gen	State	390	306	20	470	4,614
West Side Hospital	Gen	NPA's'n	60	50	10	200	1,437
Sellersville 2115—Bucks							
Grand View Hospital	Gen	NPA's'n	74	46	20	447	1,433
Sewickley, 5614—Allegheny							
Sewickley Valley Hospital	Gen	NPA's'n	151	105	31	1,090	3,901
Shamokin 18810—Northumberland							
Shamokin State Hospital	Gen	State	107	85	22	540	2,479
Sharon 20622—Mercer							
Christian H. Buhl Hospital	Gen	NPA's'n	143	124	33	1,217	5,316
Shenandoah 19790—Schuylkill							
Locust Mountain State Hospital	Gen	State	77	73	18	404	2,752
Somerset 5430—Somerset							
Somerset Community Hosp	Gen	NPA's'n	70	40	10	170	1,548
South Mountain 200—Franklin							
Pennsylvania State Sanatorium No 1 (Mont Alto)	TB	State	1,700	1,100			1,133
Spangler 3201—Cambria							
Miners Hospital of Northern Cambria	Gen	NPA's'n	82	60	17	416	2,001
State College 6226—Centre							
Pennsylvania State College Health Service Hospital	Inst	State	30	7			537
Sunbury 15462—Northumberland							
Mary M. Packer Hospital	Gen	NPA's'n	74	69	14	370	2,065
Susquehanna 2740—Susquehanna							
Simon H. Barnes Memorial Hospital	Gen	NPA's'n	16	10	5	47	304
Tarentum, 9846—Allegheny							
Allegheny Valley Hospital	Gen	NPA's'n	90	102	17	683	4,180
Taylor 9002—Lackawanna							
Taylor Hospital	Gen	NPA's'n	46	48	13	276	1,820
Titusville 8,126—Crawford							
Titusville Hospital	Gen	NPA's'n	40	28	14	300	1,308
Torrance, 560—Westmoreland							
Torrance State Hospital	Ment	State	2,400	2,164			769
Uniontown 21819—Fayette							
Uniontown Hospital	Gen	NPA's'n	210	193	15	762	6,347
Warren, 14891—Warren							
Warren General Hospital	Gen	NPA's'n	90	70	20	452	2,573
Warren State Hospital	Ment	State	2,700	2,602			098
Washington 26166—Washington							
Hillsview Sanitarium	Gen	Corp	48	28			363
Washington Hospital	Gen	NPA's'n	180	106	23	844	3,677
Waymart 1009—Wayne							
Farview State Hospital	Ment	State	1,074	1,034			86
Waynesboro, 10231—Franklin							
Waynesboro Hospital	Gen	NPA's'n	57	44	15	391	1,365
Waynesburg 4891—Greene							
Greene County Memorial Hospital	Gen	NPA's'n	78	48	8	273	1,674
Wernersville 1160—Berks							
Wernersville State Hospital	Ment	State	1,600	1,727			665
West Chester, 13289—Chester							
Chester County Hospital	Gen	NPA's'n	148	98	28	671	3,744
Homeopathic Hospital of Chester County	Gen	NPA's'n	64	44	14	236	1,563
Marshall Square Sanitarium	N&M	Part	80	55			213
White Haven 1528—Luzerne							
White Haven Sanatorium	TB	NPA's'n	240	163			274

## PENNSYLVANIA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Wilkes Barre 80,236—Luzerne							
Mercy Hospital	Gen	Church	100	137	25	634	4,586
Wilkes Barre General Hospital	Gen	NPA's'n	360	250	43	1,020	7,894
Wyoming Valley Homeopathic Hospital	Gen	NPA's'n	84	60	20	410	2,204
Wilkinsburg, 29,853—Allegheny							
Columbia Hospital	Gen	Church	170	148	40	1,019	4,610
Williamsport 44,305—Lycoming							
Rothfuss Clinic and Hospital	Gen	Indiv	30	No data supplied			
Williamsport Hospital	Gen	NPA's'n	201	179	41	1,033	5,494
Windber 9,057—Somerset							
Windber Hospital	Gen	NPA's'n	107	89	10	372	2,781
Woodville 4,000—Allegheny							
Allegheny County Institution District Hospital	GenInst	County	828	517			281
Woodville State Hospital	Ment	State	2,600	2,477			441
York 56712—York							
West Side Sanitarium	Gen	Indiv	50	26	8	83	862
York Hospital	Gen	NPA's'n	196	196	52	1,391	5,590
Related Institutions							
Bellefonte, 5304—Centre							
Western State Penitentiary Hospital	Inst	State	22	8			369
Bellevue 10488—Allegheny							
Salvation Army Women's Home and Hospital	Mat	Church	10	7	10	48	119
Broomall 1,200—Delaware							
Convalescent Hospital	Conv	NPA's'n	29	26			223
Bryn Mawr, 10206—Montgomery							
Bryn Mawr College Infirmary	Inst	NPA's'n	20	6			401
Cambridge Springs 1,807—Crawford							
San Rosario Sanitarium	Conv	Church	32	14			303
Camp Hill 3,630—Cumberland							
Pennsylvania Industrial School	Inst	State	40	30			600
Chambersburg, 14802—Franklin							
Chambersburg Maternity Home	Mat	Part	9	4	9	160	117
Chester 19250—Delaware							
Mercy Hospital	Gen	NPA's'n	30	30	12	196	776
Darby 10,531—Delaware							
St Francis Country Home	Incur	Church	60	30			230
Ebensburg, 3719—Cambria							
Cambria County Hospital	Inst	County	110	102			470
Embsville 500—Chester							
Embsville State Hospital	Ment	State	300	208			90
Erie 11600—Erie							
Lakeview Hospital	Inst	City	50	6			60
Harrisburg 900—Allegheny							
Harrisburg Convalescent Home	Conv	NPA's'n	46	46	30		304
Harrisburg 83,893—Dauphin							
Dauphin County Hospital	Inst	County	160	100			197
Johnstown 66,668—Cambria							
Municipal Hospital	Inst	City	62	5	5		70
Lancaster 61,340—Lancaster							
Lancaster County Institution District	ChrInst	County	300	63			707
Langhorne, 1,231—Bucks							
Marydell School	McDe	Part	70	36			60
Malvern 1,680—Chester							
Point Comfort Rest Home	Conv	Indiv	44	43			114
Mercer 2,972—Mercer							
Mercer County Home and Hospital	Chr	County	200	212			89
Middletown 7,046—Dauphin							
Odd Fellows Home	Inst	NPA's'n	37	37			45
Morristown 900—Washington							
Pennsylvania Training School Hospital	Inst	State	40	11			733
North East 3,704—Erie							
St Barnabas House by the Lake	Incur	Church	34	33			01
Oakbourne (West Chester P. O.)	100—Chester						
James O. Smith Memorial Home	Conv	Church	22	19			230
Olyphant, 9,252—Lackawanna							
Blakely Home and Hospital	Ment	County	104	142			38
Philadelphia, 1,931 334—Philadelphia							
Belle Vista Sanatorium	N&M	Indiv	75	70			100
Belmont Hospital Salvation Army Hospital	Mat	Church	10	5	10	130	140
Florence Crittenton Home	Mat	NPA's'n	14	11	14	40	193
Kenwood Sanitarium	N&M	Corp	40	26			
Philadelphia County Prison Hospital (Holmesburg)	Inst	County	32	6			470
Philadelphia County Prison Hospital (Red Street)	Inst	CoCo	35	8			000
Philadelphia Home for Incurables	Incur	NPA's'n	240	234			07
Pine Hall Convalescent Home	Conv	Indiv	22	19			00
Sharon Hall	Conv	Corp	50	48			
Pittsburgh 671,659—Allegheny							
Hasley Nursing Home	Conv	Indiv	20	15			30
Industrial Home for Crippled Children	Orth	NPA's'n	80	73			40
Retreat 2,000—Luzerne							
Luzerne County Home and Infirmary	Inst	County	500	272			56

## PENNSYLVANIA—Continued

Related Institutions	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Rochester 7441—Beaver Passavant Memorial Homes for the Care of Epileptics	Epil	Church	170	129			10
Seranton 140 404—Lackawanna Municipal Contagious Disease Hospital	Iso	City	45	1			52
Selinsgrove 2 877—Snyder Selinsgrove State Colony for Epileptics	Epil	State	980	607			384
Somerset 5 430—Somerset Somerset State Hospital	Ment	State	546	490			63
Towanda 4 154—Bradford Mills Hospital	Gen	Indiv	27	11	8	127	232
Wawa 300—Delaware Sanatorium School	Orth	Indiv	23	23			23
Williamstown 2 709—Dauphin Williams Valley Hospital	Gen	NPA's'n	24	1	2		60
Willow Grove 12 000—Montgomery Willow Crest for Convalescents	Conv	NPA's'n	82	65			1 153

## RHODE ISLAND

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Central Falls 25 248—Providence Notre Dame Hospital	Gen	NPA's'n	50	51	21	463	1 597
East Greenwich 3 842—Kent Crawford Allen Memorial Hospital	Unit of Rhode Island Hospital Providence						
East Providence 32 165—Providence Emma Pendleton Bradley Home	NervChil	NPA's'n	50	41			76
Hillsgrove 1 000—Kent St Joseph's Hospital	TB	Church	60	38			44
Howard 5 000—Providence State Hospital for Mental Diseases+▲	Ment	State	3 038	2 800			699
State Infirmary+▲	Gen	State	988	844	20	50	1 181
Newport 30 532—Newport Newport Hospital+▲	Gen	Corp	160	112	30	637	3 642
Station Hospital	Gen	Army	70	30			1 044
U S Naval Hospital+▲	Gen	Navy	345	196			2 143
Pawtucket 75 797—Providence Memorial Hospital+▲	Gen	NPA's'n	166	141	30	906	4 383
Providence 253 504—Providence Butler Hospital+▲	N&M	NPA's'n	174	106			167
Charles V Chapin Hospital+▲	TbIso	N&M City	260	157			2 123
Homeopathic Hospital+▲	Gen	NPA's'n	164	136	34	1 092	5 262
Jane Brown Memorial Hosp	Unit of Rhode Island Hospital						
Miriam Hospital+▲	Gen	NPA's'n	63	43	14	457	1 777
Providence Lying In Hosp+▲	Mat	NPA's'n	175	132	170	4 268	4 744
Rhode Island Hospital+▲	Gen	NPA's'n	463	383		10 000	
St Joseph's Hospital+▲	Gen	Church	300	236	60	1 567	7 883
Wakefield 4 000—Washington South County Hospital+▲	Gen	NPA's'n	46	31	11	257	1 218
Wallum Lake 100—Providence State Sanatorium+▲	TB	State	618	543			424
Westerly 11 199—Washington Westerly Hospital+▲	Gen	NPA's'n	61	48	12	303	1 500
Woonsocket 49 303—Providence Woonsocket Hospital+▲	Gen	NPA's'n	145	87	39	801	3 703
Related Institutions							
Hovels 135—Kent Lakeside Home and Mary Murray Preventorium	TB	NPA's'n	49	42			140
La Fayette 600—Washington Exeter School	MeDe	State	767	759			81
Providence 253 504—Providence St Elizabeth Home for Incurables	Incur	Church	70	63			10

## SOUTH CAROLINA

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Abbeville 4 630—Abbeville Abbeville County Memorial Hospital	Gen	NPA's'n	40	17	5	98	619
Alken 6 168—Alken Alken County Hospital+▲	Gen	County	60	60	12	20	3 901
Anderson 19 424—Anderson Anderson County Hosp+▲	Gen	NPA's'n	113	72	9	507	3 670
St Mary's Hospital	Gen	NPA's'n	54	25	6	30	700
Bennettsville 4 89—Marlboro Marlboro County General Hospital+▲	Gen	NPA's'n	32	26	8	108	1 330
Camden 5 747—Kershaw Camden Hospital+▲	Gen	NPA's'n	55	36	10	207	1 604
Charleston 71 270—Charleston Baker Memorial Sanatorium+▲	Gen	NPA's'n	50	46	10	517	2 502
Roper Hospital+▲	Gen	NPA's'n	320	272	30	1 074	9 203

## SOUTH CAROLINA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
St Francis Xavier Infirmary+▲	Gen	Church	100	56	24	540	1 094
U S Naval Hospital+▲	Gen	Navy	89	61	4	32	854
Chester 6 392—Chester Pryor Hospital	Gen	NPA's'n	50	25	8	170	1 501
Clinton 5 704—Laurens Hays Hospital	Gen	NPA's'n	20	8	4	47	437
Columbia 62 396—Richland Columbia Hospital+▲	Gen	County	270	235	30	1 125	7 905
Good Samaritan Waverly Hospital+▲	Gen	NPA's'n	53	24	60	81	797
Orthopedic Hospital	Orth	Indiv	19	11			242
Providence Hospital+▲	Gen	Church	96	67	14	439	2 418
Ridgewood Tuberculosis Camp	TB	NPA's'n	70	32			30
South Carolina Baptist Hospital+▲	Gen	Church	95	89	6	334	3 250
South Carolina State Hosp	Gen	State	4 730	4 687			1 278
Veterans Admin Facility+▲	Gen	Vet	614	390			3 692
Waverly Sanitarium	N&M	Corp	25	24			222
Conway 5 066—Horry Conway Hospital+▲	Gen	NPA's'n	65	35	16	411	3 043
Florence 16 634—Florence Florence Darlington Tuberculosis Sanatorium	TB	Counties	100	50			100
McLeod Infirmary+▲	Gen	NPA's'n	180				No data supplied
Saunders Memorial Hospital	Gen	NPA's'n	72				No data supplied
Gaffney 7 636—Cherokee Cherokee County Hospital	Gen	County	54	37	6	143	1 300
Greenville 34 734—Greenville Greenville County Tuberculosis Sanatorium	TB	County	81	78			75
Greenville General Hosp+▲	Gen	City	284	198	31	1 007	7 007
Dr Jervey's Private Hospital	ENT	Part	10	3			342
St Francis Hospital+▲	Gen	Church	110	80	30	644	3 279
Shriners Hospital for Crippled Children+▲	Orth	NPA's'n	60	59			230
Working Benevolent Hospital	Gen	NPA's'n	24	16	3	50	851
Greenwood 13 020—Greenwood Brewer Hospital	Gen	NPA's'n	28	18	6		360
Greenwood Hospital+▲	Gen	NPA's'n	73	48	8	372	2 012
Hartselle 5 399—Darlington Byerly Hospital	Gen	NPA's'n	54	32	4	294	2 371
Powe Hospital	Gen	Indiv	20	14	2	62	516
Kingstree 3 182—Williamsburg Kelley Memorial Hospital	Gen	NPA's'n	60	24	12	91	845
Lake City 2 522—Florence Whitehead Infirmary	Gen	Indiv	12	7	5	53	452
Lancaster 4 430—Lancaster Marion Sims Memorial Hosp	Gen	NPA's'n	52	26	11	203	1 663
Laurens 6 894—Laurens Laurens County Hospital	Gen	County	33	18	8	111	80
Moncks Corner 1 160—Berkeley Berkeley County Hospital	Gen	NPA's'n	58	23	8	139	799
Moultrieville 615—Charleston Station Hospital+▲	Gen	Army	102	45	4	30	2 532
Mullins 4 392—Marion Martin's Private Hospital	Gen	Indiv	30	19	9	88	1 494
Mullins Hospital+▲	Gen	NPA's'n	58	37	7	200	2 200
Navy Yard 1 025—Charleston Pinehaven Sanatorium	TB	County	61	61			120
Newberry 7 510—Newberry Newberry County Hospital	Gen	NPA's'n	26	16	6	214	1 002
Orangeburg 10 521—Orangeburg Tri County Hospital+▲	Gen	City	132	104	12	343	3 000
Urological Institute	Unit of Tri County Hospital						
Parris Island 250—Beaufort U S Naval Hospital+▲	Gen	Navy	102	80	6	38	2 023
Ridgeland 1 021—Jasper Evelyn Ritter Hospital	Gen	Indiv	30	13	7	79	733
Rock Hill 15 009—York Dunlap Hospital	Gen	Indiv	12	1			254
St Philip's Mercy Hospital	Gen	Church	60	45	6	332	2 237
York County Hospital+▲	Gen	County	78	33	14	272	1 607
Seneca 2 155—Oconee Oconee County Hospital	Gen	NPA's'n	45	30	5	100	1 039
Spartanburg 32 249—Spartanburg Mary Black Memorial Hospital+▲	Gen	NPA's'n	50	42	5	161	2 623
Spartanburg General Hosp+▲	Gen	Tb County	340	153	20	797	6 147
State Park 100—Richland Palmetto Sanatorium	Unit of South Carolina Sanatorium						
South Carolina Sanatorium+▲	TB	State	500	510			61
Summerville 8 023—Dorchester Dorchester County Hospital	Gen	County	40	21	11	130	970
Sumter 15 874—Sumter Tuomey Hospital+▲	Gen	NPA's'n	114	56	16	300	2 723
Travellers Rest 1 200—Greenville Coleman Hospital	Gen	Part	15	8	5	33	490
Union 8 478—Union Wallace Thomson Hospital	Gen	City	25	16	3	125	737
Walterboro 3 373—Colleton Charles Es Dorn Hospital	Gen	Indiv	42	29	14	165	2 461
Woodruff 3 508—Spartanburg Workman Memorial Hospital	Gen	Indiv	12	10	2	30	623
Related Institutions							
Clinton 5 704—Laurens State Training School	MeDe	State	830	821			94
Newberry 7 510—Newberry People's Hospital	Gen	NPA's'n	15	5	3	4	292

Key to symbols and abbreviations is on page 1027

## SOUTH DAKOTA

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Inpatients	Number of Births	Admissions †
Aberdeen 1701a—Brown St. Luke's Hospital	Gen	Church	185	96	25	511	0 271
Belle Fourche 2496—Butte John Burns Memorial Hosp	Gen	NPA'ssn	2a	5	10	77	546
Bowdle 757—Edmunds Community Hospital	Gen	Indiv	10	6	4	38	200
Brookings 5346—Brookings Brookings Municipal Hospital	Gen	City	32	22	8	173	1,227
Burke 602—Gregory Burke Hospital	Gen	NPA'ssn	15	8	8	80	420
Cheyenne Agency 121—Dewey Cheyenne River Indian Hosp	Gen	IA	40	23	8	67	569
Deadwood 4100—Lawrence St. Joseph's Hospital	Gen	Church	50	28	12	22a	1,170
Dell Rapids 1706—Minnehaha Dell Rapids Hospital	Gen	Part	30	8	6	57	28a
Eureka 1457—McPherson Eureka Community Hospital	Gen	NPA'ssn	24	20	6	172	72a
Faulkton 747—Faulk Faulk County Hospital	Gen	County	19	3	3	59	496
Flandreau 2212—Moody Flandreau Municipal Hospital	Gen	City	18	7	5	58	261
Fort Meade —Meade Station Hospital	Gen	Army	170	52	2	18	842
Fort Thompson 80—Buffalo Crow Creek Hospital	Gen	IA	20	18	5	48	440
Gregory 1246—Gregory Mother of Grace Hospital	Gen	Church	18	8	6	56	347
Hot Springs 4 083—Fall River Lutheran Sanatorium and Hospital	Gen	Church	50	38	4	58	814
Our Lady of Lourdes Hospital and Sanitarium	Gen	Church	6a	32	6	62	1 010
Veterans Admin Facility	Gen	Vet	281	174			900
Huron 10 843—Beadle Sprague Hospital	Gen	NPA'ssn	50	42	9	215	1,547
Lead 7520—Lawrence Homestake Hospital	Gen	NPA'ssn	2a	16	5	3	531
Lemmon 1781—Perkins Lemmon Hospital	Gen	Indiv	12	6	5	22	1,6
Madison 5 018—Lake Madison Community Hosp	Gen	NPA'ssn	50	3a	8	131	1 023
Milbank 2 745—Grant St. Bernard's Providence Hospital	Gen	Church	27	13	8	1a5	593
Miller, 1460—Hand Miller Hospital and Clinic	Gen	Part	19	10	5	100	400
Mitchell 10 633—Davison Methodist State Hospital	Gen	Church	100	72	15	269	2 374
St. Joseph's Hospital	Gen	Church	118	70	13	237	2,160
Mobridge 3 008—Walworth Love Hospital	Gen	Indiv	20	10	6	9a	569
Mobridge Hospital	Gen	NPA'ssn	30	16	6	83	812
New Underwood 214—Pennington New Underwood Community Hospital	Gen	NPA'ssn	13	8	6	60	332
Parkston 1 30a—Hutchinson St. Benedict Hospital	Gen	Church	13	10	5	91	42a
Pierre 4 322—Hughes St. Mary's Hospital	Gen	Church	102	77	18	263	2 770
Pine Ridge 618—Shannon Pine Ridge Hospital	Gen	IA	51	44	13	143	1 439
Rapid City 13 844—Pennington Black Hills General Hosp	Gen	NPA'ssn	41	37	10	176	1 200
St. John's McNamara Hospital	Gen	Church	110	60	20	289	2 28a
Sioux Sanatorium	TB	IA	130	119			320
Redfield 2 428—Spink Baldwin Community Hospital	Gen	City	13	8	4	78	333
Rosebud 2a8—Todd Rosebud Agency Indian Hosp	Gen	IA	55	48	7	89	1 473
Sanator 10—Custer Moodle Memorial Tuberculosis Sanatorium	Unit of South Dakota State Sanatorium for Tuberculosis	TB	State	192	132		116
South Dakota State Sanatorium for Tuberculosis	TB	State	192	132			116
Sioux Falls 40 832—Minnehaha McKennan Hospital	Gen	Church	116	90	26	601	3 310
Sioux Valley Hospital	Gen	NPA'ssn	143	97	20	5a3	4 594
Sisseton 2 513—Roberts Sisseton Indian Hospital	Gen	IA	32	15	8	39	514
Volga 632—Brookings Volga Hospital	Gen	NPA'ssn	16	9	4	84	361
Watertown 10 617—Codington Barton Hospital	Gen	NPA'ssn	65	53	12	2a6	1 883
Luther Hospital	Gen	Church	70	40	12	206	1 532
Webster 2,173—Day Peabody Hospital	Gen	Indiv	50	39	9	189	1,74a
Winner 2 426—Tripp Winner General Hospital	Gen	Part	16	7	6	82	338
Yankton 6 798—Yankton Sacred Heart Hospital	Gen	Church	170	101	20	292	2 786
Yankton State Hospital	Ment	State	1 867	1 600			306

## Related Institutions

Flandreau 2 212—Moody Flandreau Indian School Hospital	Gen	IA	28	7			34a
Garretson 666—Minnehaha DeVall Hospital	Gen	Indiv	10	1	2	7	48
Hot Springs 4 083—Fall River State Soldiers Home Hosp	Inst	State	36	19			161

## SOUTH DAKOTA Continued

Related Institutions	Type of Service	Ownership or Control	Beds	Average Census †	Inpatients	Number of Births	Admissions †
Redfield 2 428—Spink State School and Home for Feeble-minded	MeDe	State	750	660			99
Sioux Falls 40 832—Minnehaha Moe Memorial Hospital and Home	Cont	Indiv	45	40			1a1
Wagner 1 319—Charles Mix Duggan Hospital	Gen	Indiv	12	9	3	8a	30a
Yankton Indian Hospital	Gen	IA	2a	17	5	37	582

## TENNESSEE

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Inpatients	Number of Births	Admissions †
Athens 6 930—McMinn Epperson Clinic Hospital	Gen	Indiv	20	11	8	171	76a
Force Clinic	Gen	Part	20	11	6	232	7a9
Bristol 14 001—Sullivan Hooks English Infirmary	INT	Part	10	5			592
Brownsville 4 012—Haywood Haywood County Memorial Hospital	Gen	NPA'ssn	32	13	4	6a	72a
Chattanooga 128 16—Hamilton Barones Franger Hosp	Gen	Cy Co	430	270	70	2 123	8,99a
Farl Campbell Clinic	Gen	Indiv	1a	10	7	86	767
Newell and Newell Sanitarium	Gen	Part	6a	3a	3	34	2 500
Physicians and Surgeons Hospital	Gen	Indiv	19	16	8	142	73a
Pine Breeze Sanatorium	TB	NPA'ssn	20a	2a1			671
T. C. Thompson on Children's Hospital	Chil	Cy Co	84	48			1,298
Woman's Clinic	Mat	Indiv	15	10	11	229	4a3
Clarksville 11 831—Montgomery Clarksville Home Infirmary	Gen	Indiv	2a	5		10	2a0
Clarksville Hospital	Gen	NPA'ssn	42	23	9	10a	96a
Cleveland 11,3a1—Bradley Physicians and Surgeons Hospital	Gen	Indiv	2a	9	4	62	57a
Speck Hospital	Gen	NPA'ssn	30	6	5	53	45a
Columbia 10 570—Maury Kings Daughters Hospital	Gen	NPA'ssn	50	20	8	110	1 673
Dayton 1 570—Rhea Broyles Private Hospital	Gen	Indiv	12	5	4	46	246
Thomson Hospital	Gen	Indiv	10	6	2	16	396
Dyersburg 10 031—Dyer Baird Brewer General Hosp	Gen	Corp	3a	17	8	100	8a7
Elizabethton 8 516—Carter St. Elizabeth General Hosp	Gen	Corp	70	14	5	202	96a
Erwin 3 3a0—Unicoi Erwin Community Hospital	Gen	NPA'ssn	1a	4	3	44	346
Ft. Wain 3 362—McMinn Etowah Hospital	Gen	Indiv	8	3	3	80	340
Franklin 4 120—Williamson Dan German Hospital	Gen	Part	16	13	5	164	745
Greenville 6 784—Greene Greeneyville Sanatorium and Hospital	Gen	Corp	60	21	7	6a	8a3
Laughlin Clinic	Gen	Indiv	18	9	5	5a	523
Leahline Reaves Sanatorium	TB	State	24	10			53
Takoma Hospital and Sanitarium	Gen	NPA'ssn	52	40	6	1a0	1 56a
Humboldt 5 160—Gibson Ourser Clinic	Gen	Indiv	10	5	2	43	343
Jackson 2 332—Madison Fitts White Clinic	Gen	Part	70	18	6	1a	818
Memorial Hospital	Gen	NPA'ssn	30	14	6	161	1 005
Webb Williamson Hospital	Gen	Corp	24	19	6	177	1 102
Jefferson City 2 576—Jefferson Douglas Dam Medical Unit	Indus	Fed	12	5			180
Jefferson Hospital	Gen	Indiv	30	13	3	96	896
Johnson City, 2a 332—Washington Appalachian Hospital	Gen	NPA'ssn	64	52	15	518	2 646
Budd Clinic and Hospital	Gen	Indiv	12	5	2	17	293
Campbell's Eye Ear Nose and Throat Hospital	INT	Indiv	10	3			1 09a
Jones Eye Ear Nose and Throat Hospital	INT	Part	2a	16			1 380
Kingsport, 14 404—Sullivan Holston Valley Community Hospital	Gen	NPA'ssn	92	54	17	6a9	3 248
Knoxville 111 580—Knox Beverly Hills Sanatorium	TB	Cy Co	145	104			118
Dr. H. E. Christenberry Eye Ear Nose and Throat Infirmary	INT	Indiv	12	3			1 163
Eastern State Hospital	Ment	State	1 631	1 685			435
Fort Sanders Hospital	Gen	NPA'ssn	200	192	40	1 182	8 010
Knoxville General Hosp	Gen	City	285	198	40	1 106	8 864
St. Mary's Memorial Hosp	Gen	Church	100	81	2a	380	3 494
Lawrenceburg 3 807—Lawrence Lawrenceburg Sanitarium and Hospital	Gen	Church	20	11	4	78	567
Lebanon 5 950—Wilson Martha Gaston Hospital	Gen	Part	20	6	4	34	4a3
McFarland Hospital	Gen	Indiv	41	30	6	197	1,62a
Lenoir City 4 373—Loudon Fort Loudoun Dam Hospital	Indus	Fed	10	3			196

Key to symbols and abbreviations is on page 1027

## TENNESSEE—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Lewisburg 3 682—Marshall	Gen	Indiv	10		4	Estab 1942	
Wheat Memorial Hospital	Gen	Indiv	10		4	Estab 1942	
Loudon 3 017—Loudon	Gen	County	30	20	12	85	551
Charles H. Bacon Hospital	Gen	County	30	20	12	85	551
Madison College 510—Davidson	Gen	NPAsen	113	84	9	228	2 080
Madison Rural Sanitarium and Hospital	Gen	NPAsen	113	84	9	228	2 080
Marionville 5 609—Blount	Gen	Indiv	40	20	6	149	1 000
Fort Craig Hospital	Gen	Indiv	40	20	6	149	1 000
Memphis 292 942—Shelby	Gen	Church	480	449	20	1 250	15 434
Baptist Memorial Hosp	Gen	Church	480	449	20	1 250	15 434
Collins Chapel Connectional Hospital	Gen	Church	60	40	10	20	1 161
Crippled Children's Hospital	Gen	Church	60	40	10	20	1 161
School	Gen	Church	60	40	10	20	1 161
Gartly Ramsay Hospital	Orth	NPAsen	40	24			98
Hospital for Crippled Adults	Orth	NPAsen	40	24			98
John Gaston Hospital	Orth	NPAsen	40	24			98
Memphis Eye Ear Nose and Throat Hospital	ENT	NPAsen	69	26			1 809
Methodist Hospital	Gen	Church	250	215	50	1 876	9 031
Psychiatric Hospital	Gen	Unit of Western State Hospital					
St. Joseph Hospital	Gen	Church	237	194	60	1 466	8 670
Turner Gotten Sanatorium	N&M	Part	19				184
U. S. Marine Hospital	Gen	USPHS	130	104			1 905
Veterans Admin Facility	Gen	Vet	430	318			3 989
Wallace Sanitarium	N&M	Indiv	75	16			352
Willis C. Campbell Clinic	Orth	Part	60	51			1 120
Morristown 8 060—Hamblen	Gen	NPAsen	25	5	5	86	337
Hamblen Hospital	Gen	NPAsen	25	5	5	86	337
Nabers Clinic	Gen	Indiv	20	15	4	77	763
Mountain Home 250—Washington	Gen	Vet	553	420			2 664
Veterans Admin Facility	Gen	Vet	553	420			2 664
Murreesboro 9 495—Rutherford	Gen	NPAsen	42	22	8	2 8	1 352
Rutherford Hospital	Gen	NPAsen	42	22	8	2 8	1 352
Veterans Admin Facility	Gen	Vet	75	520			423
Nashville 167 402—Davidson	Gen	NPAsen	333	102	58	843	6 189
Central State Hospital	Gen	NPAsen	333	102	58	843	6 189
City View Sanitarium	N&M	Indiv	50	20			261
Davidson County Hospital	Gen	County	797	761	4	28	1 017
Davidson County Tuberculosis Hospital	Gen	County	300	240			352
Geo. W. Hubbard Hospital of Meharry Medical College	Gen	NPAsen	165	101	21	248	2 370
Hospital for the Criminal Insane	Gen	NPAsen	165	101	21	248	2 370
Nashville General Hosp	Gen	NPAsen	269	192	36	1 047	6 810
Protestant Hospital	Gen	NPAsen	269	192	36	1 047	6 810
St. Thomas Hospital	Gen	Church	178	152	33	1 259	6 699
Vanderbilt University Hospital	Gen	NPAsen	333	102	58	843	6 189
Newport 3 575—Cocke	Gen	NPAsen	333	102	58	843	6 189
Dr. F. E. Northcutt Private Clinic and Infirmary	Gen	Indiv	12		2	Reopening	
Oakville 16—Shelby	Gen	NPAsen	333	102	58	843	6 189
Oakville Memorial Sanatorium	Gen	NPAsen	333	102	58	843	6 189
Paris 6 000—Henry	Gen	NPAsen	333	102	58	843	6 189
McSwain Clinic	Gen	Indiv	24	8	4	47	452
Nobles Memorial Hospital	Gen	Part	25	13	7	64	567
Pleasant Hill 178—Cumberland	Gen	NPAsen	333	102	58	843	6 189
Uplands Cumberland Mountain Hospital and Sanatorium	Gen	NPAsen	333	102	58	843	6 189
Pressmen's Home 200—Hawkins	Gen	NPAsen	333	102	58	843	6 189
International Printing Pressmen and Assistants Union Sanatorium	Gen	NPAsen	333	102	58	843	6 189
Pulaski 5 314—Giles	Gen	NPAsen	333	102	58	843	6 189
Pulaski Hospital	Gen	NPAsen	333	102	58	843	6 189
Raleigh 450—Shelby	Gen	NPAsen	333	102	58	843	6 189
Cherfield Farm Prevention	Gen	NPAsen	333	102	58	843	6 189
Rockwood 3 981—Roane	Gen	NPAsen	333	102	58	843	6 189
Chamberlain Memorial Hospital	Gen	NPAsen	333	102	58	843	6 189
Rogersville 2 015—Hawkins	Gen	NPAsen	333	102	58	843	6 189
Jones Hospital	Gen	NPAsen	333	102	58	843	6 189
Seyler 1 161—Sevier	Gen	NPAsen	333	102	58	843	6 189
Broady Hospital	Gen	NPAsen	333	102	58	843	6 189
Swanee 1 600—Franklin	Gen	NPAsen	333	102	58	843	6 189
Emerald Hodgson Memorial Hospital	Gen	NPAsen	333	102	58	843	6 189
Springfield 6 668—Robertson	Gen	NPAsen	333	102	58	843	6 189
Robertson County Hospital	Gen	NPAsen	333	102	58	843	6 189
Sweetwater 2 093—Monroe	Gen	NPAsen	333	102	58	843	6 189
Sweetwater Hospital	Gen	NPAsen	333	102	58	843	6 189
Union City 7 000—Obion	Gen	NPAsen	333	102	58	843	6 189
Union City Clinic	Gen	NPAsen	333	102	58	843	6 189
Western State Hospital—Hardman	Gen	NPAsen	333	102	58	843	6 189
Western State Hospital	Gen	NPAsen	333	102	58	843	6 189
Woodbury 66—Cannon	Gen	NPAsen	333	102	58	843	6 189
Good Samaritan Hospital	Gen	NPAsen	333	102	58	843	6 189
Related Institutions							
Chattanooga 12 165—Hamilton	Gen	NPAsen	333	102	58	843	6 189
William J. Bork Memorial Hospital	Gen	NPAsen	333	102	58	843	6 189
Donelson 1 000—Davidson	Gen	NPAsen	333	102	58	843	6 189
Tennessee Home and Training School for Feeble-minded Persons	Gen	NPAsen	333	102	58	843	6 189

## TENNESSEE—Continued

Related Institutions	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Fayetteville 4 654—Lincoln	Gen	County	32	20	3	85	994
Lincoln County Hospital	Gen	County	32	20	3	85	994
Knoxville 111 580—Knox	Gen	County	32	20	3	85	994
Tennessee School for Deaf	Inst	State	20	1			380
University of Tennessee Hospital	Inst	State	13	4			265
Memphis 292 942—Shelby	Gen	NPAsen	113	84	9	228	2 080
Dr. Henry G. Hill Clinic	Orth	Indiv	12	8			350
Shelby County Hospital	Inst	County	707	556			344
Nashville 167 402—Davidson	Gen	NPAsen	333	102	58	843	6 189
Junior League Home for Crippled Children	Orth	NPAsen	42	42			115
Tennessee State Penitentiary Hospital	Inst	State	24	20			410
Shelbyville 6 337—Bedford	Gen	NPAsen	40	34	8	149	1 622
Bedford County Hospital	Gen	NPAsen	40	34	8	149	1 622
TEXAS							
Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Abilene 26 612—Taylor	Gen	NPAsen	333	102	58	843	6 189
Abilene State Hospital	Gen	NPAsen	333	102	58	843	6 189
Hendrick Memorial Hosp	Gen	NPAsen	333	102	58	843	6 189
St. Ann Hospital	Gen	NPAsen	333	102	58	843	6 189
Allee 7 792—Jim Wells	Gen	NPAsen	333	102	58	843	6 189
Physicians and Surgeons Hospital	Gen	NPAsen	333	102	58	843	6 189
Alpine 3 866—Brewster	Gen	NPAsen	333	102	58	843	6 189
Alpine Clinic Hospital	Gen	NPAsen	333	102	58	843	6 189
Amarillo 51 686—Potter	Gen	NPAsen	333	102	58	843	6 189
Northwest Texas Hospital	Gen	NPAsen	333	102	58	843	6 189
Potter County Tuberculosis Cottage	Gen	NPAsen	333	102	58	843	6 189
St. Anthony's Hospital	Gen	NPAsen	333	102	58	843	6 189
Veterans Admin Facility	Gen	NPAsen	333	102	58	843	6 189
Atlanta 2 453—Cass	Gen	NPAsen	333	102	58	843	6 189
Ellington Memorial Hospital	Gen	NPAsen	333	102	58	843	6 189
Austin 87 950—Travis	Gen	NPAsen	333	102	58	843	6 189
Austin State Hospital	Gen	NPAsen	333	102	58	843	6 189
Austin Travis County Sanatorium	Gen	NPAsen	333	102	58	843	6 189
Brackenridge Hospital	Gen	NPAsen	333	102	58	843	6 189
Holy Cross Hospital	Gen	NPAsen	333	102	58	843	6 189
St. David's Hospital	Gen	NPAsen	333	102	58	843	6 189
Seton Hospital	Gen	NPAsen	333	102	58	843	6 189
Baird 1 810—Callahan	Gen	NPAsen	333	102	58	843	6 189
Callahan County Hospital	Gen	NPAsen	333	102	58	843	6 189
Bastrop 1 970—Bastrop	Gen	NPAsen	333	102	58	843	6 189
F. A. Orgain Memorial Hosp	Gen	NPAsen	333	102	58	843	6 189
Bay City 6 594—Matagorda	Gen	NPAsen	333	102	58	843	6 189
Matagorda General Hospital	Gen	NPAsen	333	102	58	843	6 189
Beaumont 59 061—Jefferson	Gen	NPAsen	333	102	58	843	6 189
Hotel Dieu Hospital	Gen	NPAsen	333	102	58	843	6 189
Jefferson County Tuberculosis Hospital	Gen	NPAsen	333	102	58	843	6 189
Jefferson County Tuberculosis Hospital No. 2	Gen	NPAsen	333	102	58	843	6 189
St. Therese Hospital	Gen	NPAsen	333	102	58	843	6 189
Beeville 6 759—Bee	Gen	NPAsen	333	102	58	843	6 189
Beeville Hospital	Gen	NPAsen	333	102	58	843	6 189
Bellefleur 1 347—Austin	Gen	NPAsen	333	102	58	843	6 189
Bellefleur Hospital	Gen	NPAsen	333	102	58	843	6 189
Big Spring 12 604—Howard	Gen	NPAsen	333	102	58	843	6 189
Big Spring Hospital	Gen	NPAsen	333	102	58	843	6 189
Big Spring State Hospital	Gen	NPAsen	333	102	58	843	6 189
Cowper Clinic and Hospital	Gen	NPAsen	333	102	58	843	6 189
Malone and Hogan Clinic	Gen	NPAsen	333	102	58	843	6 189
Blanco 457—Blanco	Gen	NPAsen	333	102	58	843	6 189
Hospital in the Hills	Gen	NPAsen	333	102	58	843	6 189
Bonham 6 349—Fannin	Gen	NPAsen	333	102	58	843	6 189
S. B. Allen Memorial Hosp	Gen	NPAsen	333	102	58	843	6 189
Borger 10 018—Hutchinson	Gen	NPAsen	333	102	58	843	6 189
North Plains Hospital	Gen	NPAsen	333	102	58	843	6 189
Bowie 3 450—Montague	Gen	NPAsen	333	102	58	843	6 189
Bowie Clinic Hospital	Gen	NPAsen	333	102	58	843	6 189
Brackettville 2 673—Kinney	Gen	NPAsen	333	102	58	843	6 189
Station Hospital	Gen	NPAsen	333	102	58	843	6 189
Brady 7 002—McCulloch	Gen	NPAsen	333	102	58	843	6 189
Brady Hospital	Gen	NPAsen	333	102	58	843	6 189
Brenham 6 450—Washington	Gen	NPAsen	333	102	58	843	6 189
Sarah B. Milroy Memorial Hospital	Gen	NPAsen	333	102	58	843	6 189
St. Francis Hospital	Gen	NPAsen	333	102	58	843	6 189
Brownfield 4 009—Terry	Gen	NPAsen	333	102	58	843	6 189
Treadaway Daniel Hospital	Gen	NPAsen	333	102	58	843	6 189
Brownsville 22 073—Cameron	Gen	NPAsen	333	102	58	843	6 189
Mercy Hospital	Gen	NPAsen	333	102	58	843	6 189
Station Hospital	Gen	NPAsen	333	102	58	843	6 189
Brownwood 17 700—Brown	Gen	NPAsen	333	102	58	843	6 189
Brownwood Memorial Hosp	Gen	NPAsen	333	102	58	843	6 189
Medical Arts Hospital	Gen	NPAsen	333	102	58	843	6 189
Bryan 11 512—Brazos	Gen	NPAsen	333	102	58	843	6 189
Bryan College Medical Center	Gen	NPAsen	333	102	58	843	6 189
St. Joseph Hospital	Gen	NPAsen	333	102	58	843	6 189
Burnet 1 150—Burnet	Gen	NPAsen	333	102	58	843	6 189
Shepherd Allen Hospital	Gen	NPAsen	333	102	58	843	6 189

## TEXAS—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basins	Number of Births	Admissions †
Burton 350—Washington	Gen	Indiv	9	2	4	30	133
Cameron 5040—Milam	Gen	Indiv	25	12	4	122	603
Newton Memorial Hospital	Gen	NPA'ssn	25	5	Estab	1942	
Canadian 2151—Hemphill	Gen	Indiv	10	3	3	63	204
Center 3010—Shelby	Gen	Indiv	18	5	3	105	495
Center Sanitarium	Gen	Part	12	5	1	20	220
Warren Hospital	Gen	Part	20	5	0	100	384
Childress 6464—Childress	Gen	Part	22	6	4	02	720
Jeter Townsend Hospital	Gen	Indiv	37	5	6	84	304
Cisco 4868—Eastland	Gen	Indiv	14	4	5	88	300
Grabam Sanitarium	Gen	County	50	13	4	130	080
Clarksville 4095—Red River	Gen	County	150	45			5 610
Red River County Hospital	Gen	County	14	8	8	89	002
Cleburne 10008—Johnson	Gen	Indiv	9	2	3	34	203
Cleburne Sanitarium	Gen	Indiv	10	5	4	63	210
Clifton 1732—Bosque	Gen	Part	10	5	4	78	288
Goodall and Witcher Clinic Hospital	Gen	Part	10	5	4	78	288
Coleman 6004—Coleman	Gen	CyCo	50	13	4	130	080
Overall Memorial Hospital	Gen	CyCo	50	13	4	130	080
College Station 2184—Brazos	Inst	State	150	45			5 610
Agricultural and Mechanical College Hospital	Inst	State	150	45			5 610
Colorado City 213—Mitchell	Gen	Indiv	14	8	8	89	002
C L Root Memorial Hosp	Gen	Indiv	14	8	8	89	002
Columbus 2422—Colorado	Gen	City	9	2	3	34	203
John F Bell Memorial Hosp	Gen	City	9	2	3	34	203
Commerce 4099—Hunt	Gen	Indiv	10	5	4	63	210
Allen Clinic Hospital	Gen	Indiv	10	5	4	63	210
Leberman Hospital	Gen	Indiv	10	5	4	63	210
Conroe 4074—Montgomery	Gen	Part	18	5	4	22	206
Mary Swain Sanitarium	Gen	County	35	17	8	109	1 002
Montgomery County Hosp	Gen	County	35	17	8	109	1 002
Corpus Christie 57301—Nueces	Gen	Indiv	10	5	4	63	210
Fred Roberts Memorial Hospital	Gen	NPA'ssn	09	39	10	225	2 886
Medical Professional Hospital	Gen	Corp	32	17	4	69	1 010
Spohn Hospital	Gen	Church	85	64	35	878	4 260
Corsicana 15242—Navarro	Gen	NPA'ssn	20	5	2	22	265
Corsicana Hospital	Gen	NPA'ssn	20	12	6	125	847
Navarro Clinic Hospital	Gen	County	55	17	12	201	989
Physicians and Surgeons Hospital	Gen	County	55	17	12	201	989
Crockett 4596—Houston	Gen	Indiv	50	10	5	22	369
Butler Hospital	Gen	Indiv	50	10	5	22	369
Jim Smith Memorial Hospital and Crockett Clinic	Gen	Part	20	9	4	60	500
Stokes Dean Hospital and Clinic	Gen	Part	14	3	1	Estab	1942
Crowell 1817—Foard	Gen	County	16	3	3	47	235
Foard County Hospital	Gen	County	16	3	3	47	235
Crystal City 6029—Zavala	Gen	Indiv	11	3	3	30	191
Crystal Hospital	Gen	Indiv	11	3	3	30	191
Cuero 5474—De Witt	Gen	Church	35	10	6	31	004
Burns Hospital	Gen	Church	35	10	6	31	004
Lutheran Hospital	Gen	Part	20	10	3	23	419
Dalhart 4082—Dallam	Gen	Church	40	10	12	142	550
Loretto Hospital	Gen	Church	40	10	12	142	550
Dallas 294734—Dallas	Gen	Church	415	316	75	2 127	14 001
Baylor University Hosp**+▲	Gen	Church	415	316	75	2 127	14 001
Beverly Hills Sanitarium	N&M	Corp	30	27			211
Bradford Memorial Hospital for Babies**	Chil	NPA'ssn	60	20	5		747
Carman Sanatorium	TB	Corp	25	20			63
Childrens Hospital**	Chil	NPA'ssn	55	32			815
Dallas Medical and Surgical Clinic Hospital	Gen	Part	27	18			1 575
Gaston Hospital	Gen	NPA'ssn	55	47			1 977
Medical Arts Hospital**	Gen	Corp	80	76			4 224
Methodist Hospital**	Gen	Church	173	103	33	978	5 345
Nightingale Lying In Hosp	Unit of Baylor University Hospital						
Parkland Hospital**	Gen	CyCo	391	256	36	1 510	8 368
Pinkston Clinic	Gen	Indiv	15	6	3	95	324
St Paul's Hospital**	Gen	Church	200	200	30	1 846	10 828
Texas Scottish Rite Hospital for Crippled Children**	Orth	NPA'ssn	50	51			580
Timberlawn Sanitarium	Ment	Corp	50	32			232
Veterans Admin Facility	Gen	Vet	202	202			2 052
Woodlawn Hospital	TB	CyCo	123	113			219
Decatur 2578—Wise	Gen	Indiv	14	8	5	147	478
Decatur Clinic Hospital	Gen	Indiv	18	12	5	123	922
Rogers Hospital	Gen	Indiv	18	12	5	123	922
Denison 15581—Grayson	Gen	NPA'ssn	21	16	5	227	812
Denison City Hospital	Gen	Part	16	14	5	195	710
Long Sneed Clinic Hospital	Gen	Part	16	14	5	195	710
Missouri Kansas Texas Railroad Employees Hosp	Indus	NPA'ssn	60	24			724
Denton 11192—Denton	Gen	Indiv	30	24	6	182	849
Denton Hospital and Clinic	Gen	Part	11	No data supplied			
Medical and Surgical Clinic	Gen	Part	11	No data supplied			
Dublin 2546—Erath	Gen	Indiv	14	3	3	108	325
Guy Hospital	Gen	Indiv	14	3	3	108	325
Fast Bernard 600—Wharton	Gen	Indiv	10	5	3	78	301
Albert Schuhmann Hospital	Gen	Indiv	10	5	3	78	301
Eden 1603—Concho	Gen	Indiv	14	5	5	59	324
Eden Clinic Hospital	Gen	Indiv	14	5	5	59	324
Edinburg 8718—Hidalgo	Gen	CyCo	48	19	8	102	802
Grandview Hospital	Gen	CyCo	48	19	8	102	802
El Campo 3900—Wharton	Gen	County	65	20	12	205	997
Nightingale Hospital	Gen	County	65	20	12	205	997

## TEXAS—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basins	Number of Births	Admissions †
Electra 5588—Wichita	Gen	Indiv	25	6	7	104	444
Electra Hospital	Gen	Indiv	25	6	7	104	444
Elgin 2008—Bastrop	Gen	Corp	21	8	3	47	692
Elmington Hospital	Gen	Corp	21	8	3	47	692
El Paso 96810—El Paso	Gen	CyCo	192	112	20	521	3 339
El Paso City County Hosp**	Gen	CyCo	192	112	20	521	3 339
El Paso Masonic Hospital	Gen	NPA'ssn	48	30	13	221	1 142
Hotel Dieu, Sisters Hosp**	Gen	Church	125	85	41	714	3 096
Long Sanatorium	IB	Indiv	50	20			50
Newark Conference Maternity Hospital	Mat	Church	20	6	14	303	311
Providence Hospital	Gen	Indiv	40	20			1 365
St Joseph's Sanatorium	IB	Church	75	25			404
Southwestern General Hospital	Gen	Corp	125	70	20	460	3 322
William Beaumont General Hospital**	Gen	Army	700	469	7	68	5 949
Floresville 1708—Wilson	Gen	Indiv	12	4	5	68	289
Blake Hospital	Gen	Indiv	10	3	2	12	161
Oxford Hospital	Gen	Indiv	10	3	2	12	161
Lloydada 2726—Lloyd	Gen	Indiv	8	3	3	20	124
Lloydada Hospital and Clinic	Gen	Indiv	8	3	3	20	124
Fort Crockett—Galveston	Gen	Army	46	26			924
Station Hospital	Gen	Army	46	26			924
Fort Worth 177002—Tarrant	Gen	Church	50	62	15	700	3 230
All Saints Episcopal Hosp**	Gen	CyCo	109	109	20	560	5 558
City and County Hosp**	Gen	CyCo	109	109	20	560	5 558
W I Cook Memorial Hosp**	Gen	NPA'ssn	35	30	8	97	1 182
Ftbel Ransom Memorial Hospital	Gen	Part	25	18	4	30	2 735
Fort Worth Children's Hospital	Chil	NPA'ssn	30	18	3		464
Harris Memorial Methodist Hospital**	Gen	Church	250	147	48	1 546	6 552
Pennsylvania Avenue Hosp	Gen	Indiv	12	12	12	Estab	1942
St Joseph's Hospital**	Gen	Church	201	135	31	1 111	6 609
U S Public Health Service Hospital**	Drug	USPHS	1 000	500			941
Fredericksburg 3044—Gillespie	Gen	Corp	13	5	4	100	394
Fredericksburg Hospital and Clinic	Gen	Corp	13	5	4	100	394
Keloid Memorial Hospital and Clinic	Gen	Indiv	12	5	4	50	200
Freeport 2579—Brazoria	Gen	NPA'ssn	15	14	7	253	1 112
Freeport Hospital	Gen	NPA'ssn	15	14	7	253	1 112
Free 2346—Dyval	Gen	Part	12	7	5	64	300
Thomas Spanns Hospital	Gen	Part	12	7	5	64	300
Calnesville 901—Cooke	Gen	NPA'ssn	45	0	10	94	713
Calnesville Sanitarium	Gen	NPA'ssn	45	0	10	94	713
Medical and Surgical Hospital	Gen	Indiv	15	8	6	2	455
Calveston 60802—Calveston	Gen	Indiv	15	8	6	2	455
Galveston State Psychopathic Hospital**	Ment	State	100	53			491
Hospital for Crippled and Deformed Children	Unit of John Sealy Hospital						
John Sealy Hospital**	Gen	State	454	405	20	620	5 524
Negro Hospital	Gen	State	454	405	20	620	5 524
St Mary's Infirmary**	Gen	Church	200	132	25	608	4 338
U S Marine Hospital	Gen	USPHS	210	160			2 514
Georgetown 3082—Williamson	Gen	Indiv	20	5	4	49	001
Gilmer 3138—Lipschur	Gen	Part	12	5	3	100	350
Oak Lawn Sanitarium	Gen	Part	19	9	6	206	606
Ragland Clinic Hospital	Gen	Part	19	9	6	206	606
Gladeview 4434—Clegg	Gen	Indiv	10	3	4	70	222
Gladeview Hospital	Gen	Indiv	10	3	4	70	222
Hancock Clinic Hospital	Gen	Indiv	10	7	3	53	
Gonzales 4722—Gonzales	Gen	Corp	25	6	3	49	272
Holmes Hospital	Gen	Corp	25	6	3	49	272
Coose Creek 6029—Harris	Gen	Corp	37	25	10	347	1 789
Coose Creek Hospital	Gen	Corp	37	25	10	347	1 789
Lillie and Duke Hospital	Gen	Part	20	10	6	148	441
Gorman 1107—Eastland	Gen	Part	40	25	8	420	1 500
Blackwell Sanitarium	Gen	Part	40	25	8	420	1 500
Graham 5175—Young	Gen	NPA'ssn	18	9	5	164	951
Graham Hospital	Gen	NPA'ssn	18	9	5	164	951
Greenville 1300—Hunt	Surg	Indiv	16	4	2	5	572
Dr F P Becton's Hospital	Gen	Part	10	4	4	102	391
Goode and Phillips Hospital	Gen	Indiv	20	8	4	52	619
Dr Joe Becton's Hospital	Gen	Indiv	20	8	4	52	619
Groesbeck 2222—Limestone	Gen	Indiv	8	4	3	46	217
Dr Cox's Hospital	Gen	Indiv	8	4	3	46	217
Haflettsville 1681—Lavaca	Gen	Indiv	12	6	2	42	200
Renger Hospital	Gen	Indiv	12	6	2	42	200
Hartlingen 13306—Cameron	Gen	Church	65	25	10	149	1 105
Valley Baptist Hospital	Gen	Church	65	25	10	149	1 105
Haskell 3031—Haskell	Gen	County	25	10	5	83	660
Haskell County Hospital	Gen	County	25	10	5	83	660
Henderson 6437—Rock	Gen	NPA'ssn	40	18	7	135	716
Henderson Memorial Hospital	Gen	NPA'ssn	40	18	7	135	716
Hereford 2084—Deaf Smith	Gen	County	22	6	6	148	347
Deaf Smith County Hospital	Gen	County	22	6	6	148	347
Hillsboro 7799—Hill	Gen	Indiv	23	6	5	63	407
Boyd Sanitarium	Gen	Indiv	23	6	5	63	407
Houston 384514—Harris	Unit of Houston Tuberculosis Hospital						100
Autry Memorial Hospital	N&M	Corp	40	25	7	444	1 783
School	Gen	Corp	40	25	7	444	1 783
Dr Greenwood's Sanitarium	Gen	NPA'ssn	248	143	40	743	5 005
Heights Clinic Hospital	Gen	NPA'ssn	248	143	40	743	5 005
Hermann Hospital**	Gen	NPA'ssn	248	143	40	743	5 005
Houston Eye Ear and Throat Hospital	ENT	NPA'ssn	26	10	24		1 154
Houston Negro Hospital	Gen	NPA'ssn	50	24	6	178	1 127
Houston Tuberculosis Hosp	TB	CyCo	172	161			3 709

## TEXAS—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Inpatients	Number of Births	Admissions †
Jefferson Davis Hospital**	Gen	CyCo	478	310	54	1 817	11 591
Memorial Hospital	Gen	Church	270	178	30	1 239	8 175
Methodist Hospital	Gen	Church	122	95	22	646	3 749
Montrose Clinic	N&M	Indiv	40	27			350
Park View Hospital	Gen	Corp	36	14	8	173	865
St Joseph's Infirmary	Gen	Church	355	305	80	43 5	15 395
Southern Pacific Hospital	Indus	NPA'sn	120	75			2 017
Turner Urological Institute	Lrol	Indiv	16	11			432
Wright Clinic and Hospital	Gen	Indiv	27	14	5	93	6 3
Jack-boro 236—Jack	Gen	Part	12	7	5	102	351
Jack-boro Hospital	Gen	Part	12	7	5	102	351
Jacksonville 7213—Cherokee	Gen	NPA'sn	77	40	9	174	2 481
Nan Travis Memorial Hosp	Gen	NPA'sn	77	40	9	174	2 481
Jasper 3497—Jasper	Gen	Part	24	9	6	36	452
Hardy Hancock Hospital	Gen	Indiv	20	12	6	103	696
Richardson Hospital	Gen	Indiv	20	12	6	103	696
Kelly Field—Bevar	Gen	Army	82	43			1 777
Station Hospital	Gen	Army	82	43			1 777
Kenedy 2891—Karnes	Gen	Corp	25				No data supplied
Kenedy Clinic and Hospital	Gen	Corp	25				No data supplied
Kermitt 2584—Winkler	Gen	Part	12	7	4	112	44
Robinson McClure Clinic Hospital	Gen	Part	12	7	4	112	44
Kerrville 5572—Kerr	Gen	NPA'sn	20	6	4	70	411
Kerrville General Hospital	Gen	NPA'sn	20	6	4	70	411
Kerrville State Sanatorium	TB	State	150	175			372
Sunnyside Sanatorium	TB	Indiv	20	14			46
Kilgore 670—Gregg	Gen	NPA'sn	20	11	7	13	630
Kilgore Memorial Hospital	Gen	NPA'sn	20	11	7	13	630
Kingsville 7782—Kleberg	Gen	County	36	19	6	70	723
Kleberg County Hospital	Gen	County	36	19	6	70	723
Knock City 1127—Knock	Gen	County	20	10	4	120	884
Knock County Hospital	Gen	County	20	10	4	120	884
La Grange 2531—Fayette	Gen	Corp	45	14	5	142	702
La Grange Hospital	Gen	Corp	45	14	5	142	702
Lamesa 6035—Dawson	Gen	Indiv	20	5	6	20	542
Lamesa General Hospital	Gen	Indiv	20	5	6	20	542
Price Hospital	Gen	Indiv	10	5	5	104	396
Lampasas 3426—Lampasas	Gen	Part	21	10	6	146	1 001
Rollins Brook Hospital	Gen	Part	21	10	6	146	1 001
Laredo 39274—Webb	Gen	NPA'sn	24	10			56
Laredo Sanatorium	TB	NPA'sn	24	10			56
Mercy Hospital	Gen	Church	75	26	10	266	1 484
Station Hospital	Gen	Army	37	6	1	4	11
La Tuna 200—El Paso	Gen	Army	37	6	1	4	11
Federal Correctional Institution	Inet	LSPHS	26	25			622
Legion 200—Kerr	Gen	LSPHS	26	25			622
Veterans Admin Facility	Gen	LSPHS	26	25			622
Levelland 3691—Hockley	Gen	Part	10	6	5	191	549
Phillips Dupre Hospital	Gen	Part	10	6	5	191	549
Liberty 3057—Liberty	Gen	Church	50	17	12	166	1 330
Mercy Hospital	Gen	Church	50	17	12	166	1 330
Littlefield 3517—Lamb	Gen	Part	20	8	5	161	713
Littlefield Hospital and Clinic	Gen	Part	20	8	5	161	713
Payne Shotwell Hospital and Clinic	Gen	Part	20	10	6	152	1 206
Livingston 1551—Polk	Gen	Indiv	16	7	2	121	617
Livingston Hospital	Gen	Indiv	16	7	2	121	617
Lockhart 5018—Caldwell	Gen	NPA'sn	20	4	3	36	152
Lockhart Sanatorium	Gen	NPA'sn	20	4	3	36	152
Longview 13708—Gregg	Gen	NPA'sn	20	3			739
Hurst Eye Ear Nose and Throat Hospital	Gen	NPA'sn	20	3			739
Markham Hospital	Gen	NPA'sn	20	3			739
Lubbock 31503—Lubbock	Gen	Corp	60	62	10	219	3 500
Lubbock General Hospital	Gen	Corp	60	62	10	219	3 500
St Mary of the Plains Hospital	Gen	Church	30	23	10	312	1 761
West Texas Hospital	Gen	Corp	60	30	12	412	2 352
Lufkin 9567—Angellina	Gen	County	40	7	40		2 348
Angellina County Hospital	Gen	County	40	7	40		2 348
Luling 4437—Caldwell	Gen	Part	12	11	3	72	330
Luling Hospital	Gen	Part	12	11	3	72	330
Marfa 3500—Presidio	Gen	Army	46	17	2	10	464
Station Hospital	Gen	Army	46	17	2	10	464
Marlin 6542—Falls	Gen	Indiv	20	18	3	50	710
Buie Allen Hospital	Gen	Indiv	20	18	3	50	710
Buie Clinic and Marlin Sanatorium Bath House and Hilton Hotel	Unit of Buie Allen Hospital	Gen	20	18	3	50	710
Torbett Clinic and Hospital	Gen	Corp	20	18	3	50	710
Marshall 18410—Harrison	Gen	NPA'sn	40	14	5	220	1 151
Kahn Memorial Hospital	Gen	NPA'sn	40	14	5	220	1 151
Texas and Pacific Railway Employees Hospital	Indus	NPA'sn	100	53			2 149
McAllen 11577—Hidalgo	Gen	City	65	24	12	217	1 172
McAllen Municipal Hospital	Gen	City	65	24	12	217	1 172
McKinney 8500—Collin	Gen	City	60	33	10	300	1 246
McKinney City Hospital	Gen	City	60	33	10	300	1 246
Memphis 3569—Hall	Gen	Indiv	10	6	1	44	344
Memphis Hospital	Gen	Indiv	10	6	1	44	344
Odum Goodall Hospital	Gen	Part	14	7	5	114	847
Meredes 7624—Hidalgo	Gen	NPA'sn	20	7	5	76	442
Meredes General Hospital	Gen	NPA'sn	20	7	5	76	442
Meridian 1016—Bosque	Gen	Indiv	~	3	4	54	244
Holt Hospital and Clinic	Gen	Indiv	~	3	4	54	244
Mexia 6410—Limestone	Gen	NPA'sn	20	8	3	36	324
Brown Memorial Hospital	Gen	NPA'sn	20	8	3	36	324
Midland 9503—Midland	Gen	Indiv	10	5	6	100	300
Western Clinic Hospital	Gen	Indiv	10	5	6	100	300
Mineral Wells 6305—Lalo Pinto	Gen	Church	40	18	10	211	905
Nazareth Hospital	Gen	Church	40	18	10	211	905

## TEXAS—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Inpatients	Number of Births	Admissions †
Nacogdoches 7538—Nacogdoches	Gen	City	42	28	6	176	1 671
City Memorial Hospital	Gen	City	42	28	6	176	1 671
Navasota 6130—Grimes	Gen	Corp	22	9	4	93	824
Brazos Valley Sanitarium	Gen	Corp	22	9	4	93	824
New Braunfels 6978—Comal	Gen	Indiv	10	10	3	60	520
New Braunfels Hospital	Gen	Indiv	10	10	3	60	520
New Gulf—Wharton	Gen	NPA'sn	23	10	2	48	500
Texas Gulf Sulphur Company Hospital	Gen	NPA'sn	23	10	2	48	500
Odeesa 9573—Ector	Gen	Indiv	25	10	10	205	705
Headlee Hospital	Gen	Indiv	25	10	10	205	705
Wood Hospital	Gen	Part	11	7	5	400	360
Olney 3497—Young	Gen	City	22	9	6	119	692
Hamilton Hospital	Gen	City	22	9	6	119	692
Orange 7472—Orange	Gen	NPA'sn	40	20	8	305	1 024
Frances Ann Luther Hosp	Gen	NPA'sn	40	20	8	305	1 024
Paducah 2677—Cottle	Gen	Indiv	20				No data supplied
W Q Richards Memorial Hospital	Gen	Indiv	20				No data supplied
Palestine 12144—Anderson	Gen	NPA'sn	75	30			800
Missouri Pacific Lines Employees Hospital	Indus	NPA'sn	75	30			800
Palestine Sanitarium	Gen	Corp	23	8	5	191	62
Pampa 12890—Gray	Gen	Indiv	40	21	11	303	2 375
Worley Hospital	Gen	Indiv	40	21	11	303	2 375
Paris 18678—Lamar	Gen	Indiv	40	21	11	303	2 375
George Griffiths Memorial Hospital for Children	Unit of Sanitarium of Paris	Gen	40	21	11	303	2 375
Lamar County Hospital	Gen	County	50	24		92	560
St Joseph's Hospital	Gen	Church	75	16	12	125	994
Sanitarium of Paris	Gen	Corp	75	16	12	125	994
Pasadena 3436—Harris	Gen	Part	24	14	13	2 6	1 100
Pasadena Hospital and Clinic	Gen	Part	24	14	13	2 6	1 100
Pearshall 3164—Frio	Gen	Indiv	10	2	2	27	104
Dr J E Beall Hospital	Gen	Indiv	10	2	2	27	104
Goodnight Clinic Hospital	Gen	Indiv	10	3	2	69	270
Pecos 4555—Reeves	Gen	Indiv	20	7	4	71	401
Camp and Camp Hospital	Gen	Indiv	20	7	4	71	401
Phillips 4000—Hutchinson	Gen	NPA'sn	12	4	4	100	403
Pantex Hospital	Gen	NPA'sn	12	4	4	100	403
Pittsburg 2916—Camp	Gen	Corp	20	5	6	82	274
Pittsburg Medical and Surgical Hospital	Gen	Corp	20	5	6	82	274
Plainview 5263—Hale	Gen	Part	62	37	12	1 5	2 300
Plainview Sanitarium and Clinic	Gen	Part	62	37	12	1 5	2 300
Port Arthur 46140—Jefferson	Gen	Church	175	95	2	1 034	5 05
St Mary's Hospital Gates Memorial	Gen	Church	175	95	2	1 034	5 05
Prairie View (Hempstead P O)	Gen	State	52	20	4	20	531
Prairie View State College Hospital	Gen	State	52	20	4	20	531
Quinn 3767—Hardeman	Gen	County	40	19	8	114	1 200
Memorial Hospital	Gen	County	40	19	8	114	1 200
Ranger 4033—Eastland	Gen	CyCo	30	25	5	97	507
City County Hospital	Gen	CyCo	30	25	5	97	507
West Texas Hospital	Gen	Corp	15	13	3	52	440
Refugio 4071—Refugio	Gen	Church	45	12	6	70	630
Refugio County Hospital	Gen	Church	45	12	6	70	630
Rio Grande City 2253—Starr	Gen	Army	30	7	2	12	265
Station Hospital	Gen	Army	30	7	2	12	265
Robstown 6700—Nueces	Gen	Corp	14	10	4	112	1 629
Robstown Hospital	Gen	Corp	14	10	4	112	1 629
Roscoe 1100—Nolan	Gen	Indiv	25	9	7	170	1 067
Young Hospital	Gen	Indiv	25	9	7	170	1 067
Rosenberg 3457—Fort Bend	Gen	Corp	41	7	5	141	527
Fort Bend Hospital	Gen	Corp	41	7	5	141	527
Rotan 2021—Fisher	Gen	Indiv	30	10	0	130	700
Callan Hospital	Gen	Indiv	30	10	0	130	700
Rusk 5600—Cherokee	Gen	State	2410	2 463			801
Rusk State Hospital	Gen	State	2410	2 463			801
San Angelo 25502—Tom Green	Gen	Corp	40	30	12	301	2 290
Clinic Hospital	Gen	Corp	40	30	12	301	2 290
St John's Hospital	Gen	Church	25	15	5	121	1 000
Shannon West Texas Memorial Hospital	Gen	NPA'sn	100	67	15	596	4 405
San Antonio 25554—Bexar	Gen	Army	1 200	606	23	502	11 200
Brooke General Hospital	Gen	Army	1 200	606	23	502	11 200
Central Clinic Hospital	Gen	Indiv	10	6	4	45	200
Grace Lutheran Sanatorium for Tuberculosis	TB	Church	52	30			80
Medical and Surgical Memorial Hospital	Gen	NPA'sn	137	94	20	705	5 444
Medical Arts Hospital	Gen	Corp	31	22	0	101	1 707
Dr Moody's Sanitarium	Gen	N&M	50	32			131
Nix Hospital	Gen	Corp	145	111	26	757	4 765
Physicians and Surgeons Hospital	Gen	Corp	60	57	14	443	3 070
Robert B Green Memorial Hospital	Gen	County	200	105	20	1 033	4 593
Suenz Clinic	Gen	Indiv	10	5	6	54	189
San Antonio State Hospital	Gen	State	2 707	2 002			530
Santa Rosa Hospital	Gen	Church	316	231	45	1 635	11 574
Station Hospital (Brooks Field)	Gen	Army	35	11			946
Woodmen of the World War Memorial Hospital	TB	NPA'sn	10	82			136
Sanatorium 1470—Tom Green	TB	NPA'sn	10	82			136
State Tuberculosis Sanatorium	TB	State	1 000	543			1 991
San Marcos 6005—Hays	Gen	NPA'sn	20	3	3	59	330
Soldiers and Sailors Memorial Hospital	Gen	NPA'sn	20	3	3	59	330

Key to symbols and abbreviations is on page 1027

## TEXAS—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census†	Births	Number of Admissions†
Santa Anna 1661—Coleman Sealy Hospital	Gen	Part	20	8 3	75	458
Seagrave 3223—Gaines David on Clinie Hospital	Gen	Part	15	6 4	72	422
Sealy, 2600—Austin Sealy Hospital	Gen	Indiv	8	1 2	65	392
Seguin 7066—Guadalupe Seguin Ho pital	Gen	NPA ssn	21	7 5	96	485
Seymour, 3328—Baylor Baylor County Hospital	Gen	County	15	6 5	100	510
Shamrock 3123—Wheeler St Mary's Hospital	Gen	Church	14	3 Reorganized		
Shamrock General Ho pital	Gen	Indiv	25	11 5	69	515
Sherman 1716—Grayson St Vincent's Hospital	Gen	Church	65	40 10	261	2 111
Shonon 2 Jones Hospital	Gen	NPA ssn	72	46 8	393	2 55
Shiner, 1520—Lavaca Dr. Wagner's Hospital	Gen	Indiv	17	6 11	53	555
Slaton 557—Jubbok Mercy Hospital	Gen	Church	50	12 12	90	550
Snyder 5815—Curry Snyder General Ho pital	Gen	Corp	21	12 5	1 8	483
Spur 216—Dickens Nichols Sanitarium	Gen	Indiv	20	5 4	50	140
Stamford 4810—Jones Stamford Sanitarium	Gen	Part	50	30 10	327	1 992
Stephenville 4768—Lrath Stephenville Hospital	Gen	NPA ssn	37	22 6	214	1 510
Sugar Land 2400—Fort Bend Laura Ildridge Ho pital	Gen	NPA ssn	25	20 4	120	967
Sulphur Springs 6742—Hopkins Cozad Clinie and Hospital	Gen	Indiv	15	7 5	87	807
Taylor 7875—Williamson Stromberg Clinie and Hosp	Gen	Corp	25	15 7	96	518
Wedemeyer Hospital	Gen	Corp	50	15 7	121	800
League 3157—Tricstone Davidson Memorial Hospital	Gen	Indiv	20	5 3	71	365
Temple 15314—Bell Gulf Colorado and Santa Fe Hospital	Indus	NPA ssn	150	39		1 519
Kings Daughters Hospital	Gen	NPA ssn	110	10 14	2 9	2 711
Scott and White Hospital	Gen	Corp	200	125 10	100	4 553
Terrell 10481—Kaufman Alexander Hospital	Gen	Indiv	25	0 4	59	772
Fridell Hospital	Gen	Indiv	11	5 2	30	61
Holton Johnston Clinie Hosp	Gen	Part	12	No data supplied		
Jane Clinie Hospital	Gen	Indiv	10	4 5	25	146
Terrell State Hospital	Gen	State	2 676	2 651		250
Texarkana 17 019—Bowie Federal Correctional Institution	Inst	Fed	31	11		471
Texarkana Hospital	Gen	NPA ssn	60	40 8	312	2 441
Texas City 5742—Galveston Beeler Manse Clinie Hospital	Gen	Part	9	7 7	1912	
Danforth Clinie Hospital	Gen	Indiv	8	5 5	75	527
Tyler 2829—Smith Bryant Clinie and Sanatorium	Gen	Part	15	14 4	103	1 031
Mother Frances Hospital	Gen	Church	62	52 18	558	1 850
Uvalde 6660—Uvalde Merritt Hospital	Gen	Indiv	12	4 5	85	480
Vernon 9277—Wilbarger Christ the King Hospital	Gen	Church	22	7 3	85	4 65
Moore Brothers Hospital	Gen	Indiv	15	7 3	61	518
Vernon Sanitarium	Gen	Indiv	21	11 8	217	872
Victoria 11566—Victoria Defar Memorial Hospital	Gen	Indiv	26	21 8	191	1 461
Victoria Hospital	Gen	Corp	22	11 8	157	917
Waco, 6592—McLennan Hillcrest Memorial Hospital	Gen	Church	75	51 15	496	2 561
Joanna McClelland Memorial Hospital	Gen	City	50	23 20	282	1 756
Providence Hospital	Gen	Church	110	77 17	460	4 014
Veterans Admin Facility	Gen	Vet	1 122	1 57		705
Waxahachie 8655—Ellis Waxahachie Sanitarium	Gen	NPA ssn	32	15 4	100	763
Weatherford 5024—Parker Medical and Surgical Clinie	Gen	Part	10	6 4	158	392
Wellington 3308—Collinsworth St Joseph's Hospital	Gen	Church	20	8 5	170	857
Wharton 4556—Wharton Caney Valley Hospital	Gen	Corp	22	15 5	152	811
Wheeler 818—Wheeler Wheeler Hospital	Gen	Part	10	6 4	165	518
Wichita Falls 45112—Wichita Bethania Hospital	Gen	Church	51	22 10	411	1 707
Wichita Falls Clinie Hosp	Gen	Part	80	56 10	200	3 211
Wichita Falls State Hospital	Gen	State	2 421	2 458		691
Wichita General Hospital	Gen	City	1 0	79 15	633	3 855
Yokum 4733—Lavaca Ruth Memorial Hospital	Gen	Church	25	10 10	48	400
Related Institutions						
Almeda, 390—Harris Kelchley Hospital	N&M	Indiv	10	8		48
Arlington 4210—Tarrant Knights Templar Hospital	Inst	NPA ssn	23	38		142
Austin 87930—Travis Austin State School	McDe	State	1 913	1 820		2 2
Dallas 294734—Dallas Good Samaritan Hospital	Gen	Part	20	19 17	606	766
Fnnis 7057—Ellis Fnnis Municipal Hospital	Gen	City	25	6 5	250	500
Fort Worth 177692—Tarrant Flmwood Sanatorium	TB	City	68	60		59
Harrison Clinie Hospital	Gen	Indiv	26	21 6	138	1 000
Howard Sanitarium	N&M	Indiv	16	8		30

## Related Institutions

Alameda, 300—Harris Kelchley Hospital	N & M	Indiv	10	8		48
Arlington 4210—Tarrant Knights Templar Hospital	Inst	NPA ssn	23	18		142
Austin 87930—Travis Austin State School	McDe	State	1 913	1 830		2 2
Dallas 29174—Dallas Good Samaritan Hospital	Gen	Part	30	19 17	606	766
Fnnie 7057—Ellis Fnnie Municipal Hospital	Gen	City	25	6 5	250	500
Fort Worth 177662—Tarrant Elmwood Sanatorium	TB	City	68	60		58
Harrison Clinie Hospital	Gen	Indiv	26	21 6	198	1 060
Howard Sanitarium	N & M	Indiv	10	8		85

## TEXAS—Continued

Related Institutions	Type of Service	Ownership or Control	Beds	Average Census†	Births	Admissions†
Hallettsville, 1551—Lavaca Dufner Hospital	Gen	Indiv	6	3 1	14	69
Huntsville 5108—Walker Texas State Prison Ho pital	Inst	State	113	105		2 329
Hutchins 400—Dallas City County Convalescent Hospital	Conv Inst	City	150	110		69
McCombs, 2550—Upton Cooper Hospital	Gen	Indiv	8	4 4	69	279
Mount Vernon 1443—Franklin Crutcher Hospital	Gen	NPA ssn	10	2 2	20	78
Potter 2215—Atascosa Shotts Memorial Hospital	Gen	Part	9	1 3	52	177
San Antonio 25551—Bexar Salvation Army Home and Hospital	Mat	Church	25	3 18	89	119
Southton 89—Bexar Bexar County Tuberculosis Hospital	TB	County	75	70		103
Texon 1200—Reagan Texon Hospital	Gen	NPA ssn	10	4 3	12	167
Waco 6582—McLennan Waco State Home Ho pital	Inst	State	50	15		655

## UTAH

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census†	Births	Admissions†
American Fork 3373—Utah American Fork Community Hospital	Gen	City	20	10 15	290	599
Bingham Canyon 2531—Salt Lake Bingham Canyon Hospital	Gen	Indiv	40	21 7	83	729
Brigham, 5611—Box Elder Cooley Memorial Ho pital	Gen	NPA ssn	25	16 15	292	1 105
Cedar City, 4695—Iron Iron County Hospital	Gen	County	40	20 12	250	657
Conkling 919—Summit Summit County Ho pital	Gen	County	15	8		
Fort Douglas 1071—Salt Lake Station Ho pital	Gen	Army	70	51		891
Fort Duchene 101—Utah Utah and Ourny Agency Indian Hospital	Gen	IA	29	16 7	67	339
Heber 2745—Wasatch Heber Hospital	Gen	Part	14	8 5	121	255
Kanab 1555—Kane Kanab Hospital	Gen	Indiv	9	3 5	62	195
Lchi 2733—Utah Lchi Municipal Hospital	Gen	City	15	6 15	105	233
Logan 11568—Cache Cache Valley General Ho p	Gen	NPA ssn	45	16 13	255	1 131
William Budd Memorial Hospital	Gen	NPA ssn	75	38 21	400	1 991
Monah 1031—Grand Grand County Public Hosp	Gen	County	17	8 7	68	503
Ogden 4368—Weber Thomas D. Dee Memorial Ho pital	Gen	Church	201	151 59	2 110	6 665
Utah State Tuberculosis Sanatorium	TB	State	96	66		106
Park City 3759—Summit Park City Miners Ho pital	Gen	NPA ssn	30	10 5	77	3 1
Payson 3791—Utah Payson City Hospital	Gen	NPA ssn	20	20 12	190	797
Price 5214—Carbon Price City Hospital	Gen	City	56	26 12	325	1 657
Provo 18071—Utah Utah State Hospital	Gen	State	1 115	1 059		197
Utah Valley Hospital	Gen	NPA ssn	50	31 11	454	1 573
Richfield 3651—Sevier Sevier Valley Hospital	Gen	Indiv	20	8 5	100	409
St George 3691—Washington D. A. McGregg Hospital	Gen	NPA ssn	27	9 5	125	400
Sallina 1616—Sevier Sallina Hospital	Gen	Indiv	17	7 6	81	257
Salt Lake City 149011—Salt Lake Dr. W. H. Groves latter Day Saints Hospital	Gen	Church	201	205 70	2 677	11 411
Holy Cross Hospital	Gen	Church	200	152 74	2 250	6 250
Primary Children's Hospital	Child	Church	25	16		
St Mark's Hospital	Gen	Church	150	127 14	490	4 285
Salt Lake County General Hospital	Gen	County	237	135 21	350	2 807
Shriners Hospital for Crippled Children	Orth	NPA ssn	90	20		61
Veterans Admin Facility	Gen	Vet	158	115		1 911
Spanish Fork 4167—Utah Hughes Memorial Hospital	Gen	Indiv	12	3 5	62	1 8
Freemont 1113—Box Elder Valley Hospital	Gen	NPA ssn	20	8 10	118	455

## Related Institutions

American Fork 3373—Utah Utah State Training School	McDe	State	575	550		69
Murray 5740—Salt Lake Cottonwood Stake Maternity Hospital	Mat	Church	23	19 21	718	750



## VERMONT

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Barre 10,909—Washington	Gen	NPAsen	64	44	15	305	1,066
Barre City Hospital	Gen	NPAsen	64	44	15	305	1,066
Washington County Sanatorium	TB	State	47	43			49
Bellows Falls 4 26—Windham	Gen	NPAsen	42	20	8	106	901
Rockingham General Hosp	Gen	NPAsen	42	20	8	106	901
Bennington 7 628—Bennington	Gen	NPAsen	102	54	23	269	1,430
Henry W. Putnam Memorial Hospital	Gen	NPAsen	102	54	23	269	1,430
Brattleboro 9 622—Windham	Gen	NPAsen	75	41	10	233	1,097
Brattleboro Memorial Hospital	Gen	NPAsen	75	41	10	233	1,097
Brattleboro Retreat	Ment	NPAsen	800	770			324
Burlington 27 686—Chittenden	Gen	NPAsen	120	105	10	400	3,233
Bishop DeGoesbriand Hospital	Gen	Church	120	105	10	400	3,233
Green Mountain Sanatorium	IntMed	Indiv	8	4			100
Lakeview Sanatorium	N&M	Corp	20	8			43
Mary Fletcher Hospital	Gen	NPAsen	193	143	37	572	4,277
Fort Ethan Allen 106—Chittenden	Gen	Army	131	77	2	10	1,215
Station Hospital	Gen	Army	131	77	2	10	1,215
Hardwick 1 607—Caledonia	Gen	NPAsen	14	8	4	39	218
Hardwick Hospital	Gen	NPAsen	14	8	4	39	218
Middlebury 2 123—Addison	Gen	NPAsen	40	18	10	107	1,191
Porter Memorial Hospital	Gen	NPAsen	40	18	10	107	1,191
Montpelier 5 006—Washington	Gen	NPAsen	70	39	12	100	2,179
Heaton Hospital	Gen	NPAsen	70	39	12	100	2,179
Morrisville 1 967—Lamoille	Gen	NPAsen	33	No data supplied			
Copley Hospital	Gen	NPAsen	33	No data supplied			
Newport 4 902—Orleans	Gen	NPAsen	32	20	6	162	840
Orleans County Memorial Hospital	Gen	NPAsen	32	20	6	162	840
Pittsford 576—Rutland	TB	State	80	70			114
Vermont Sanatorium	TB	State	80	70			114
Proctor 2 184—Rutland	Gen	NPAsen	29	8	7	36	254
Proctor Hospital	Gen	NPAsen	29	8	7	36	254
Randolph 1 980—Orange	Gen	NPAsen	53	30	10	111	678
Gifford Memorial Hospital	Gen	NPAsen	53	30	10	111	678
Rutland 17 082—Rutland	Gen	NPAsen	140	88	20	490	3,214
Rutland Hospital	Gen	NPAsen	140	88	20	490	3,214
St Albans 8 0 7—Franklin	Gen	NPAsen	50	42	8	260	1,708
St Albans Hospital	Gen	NPAsen	50	42	8	260	1,708
St Johnsbury 7 437—Caledonia	Gen	NPAsen	55	33	12	142	1,176
Brightlook Hospital	Gen	NPAsen	55	33	12	142	1,176
St Johnsbury Hospital	Gen	Church	30	20	5	76	443
Springfield 5 182—Windsor	Gen	NPAsen	47	35	15	337	1,010
Springfield Hospital	Gen	NPAsen	47	35	15	337	1,010
Waterbury 3 074—Washington	Gen	NPAsen	47	35	15	337	1,010
Vermont State Hospital for the Insane	Ment	State	1,080	1,005			332
White River Junction 2 271—Windsor	Gen	Vet	188	120			1,817
Veterans Admin Facility	Gen	Vet	188	120			1,817
Windsor 3 402—Windsor	Gen	NPAsen	14	13	6	127	305
Windsor Hospital	Gen	NPAsen	14	13	6	127	305
Winoski 6 036—Chittenden	Gen	Church	70	63	10	226	1,418
Fanny Allen Hospital	Gen	Church	70	63	10	226	1,418

## Related Institutions

Brandon 2 979—Rutland	MeDe	State	400	389			31
Brandon State School	MeDe	State	400	389			31
Pittsford 576—Rutland	TB	NPAsen	77	60			154
Caverly Preventorium	TB	NPAsen	77	60			154
Windsor 3 402—Windsor	Inst	State	12	5			146
Vermont State Prison Hosp	Inst	State	12	5			146

## VIRGINIA

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Abingdon 3 153—Washington	Gen	NPAsen	60	43	5	60	1,304
Johnston Memorial Hosp	Gen	NPAsen	60	43	5	60	1,304
Alexandria 35 523—Arlington	Gen	NPAsen	102	86	28	923	3,820
Alexandria Hospital	Gen	NPAsen	102	86	28	923	3,820
Bedford 3 943—Bedford	Gen	Corp	21	13	5	80	730
John Russell Hospital	Gen	Corp	21	13	5	80	730
Bristol 0 763—Washington	Gen	NPAsen	46	39	10	304	2,440
King's Mountain Memorial Hospital	Gen	NPAsen	46	39	10	304	2,440
Brook Hill 100—Henrico	TB	City	286	200			207
Pine Camp Hospital	TB	City	286	200			207
Burkeville 638—Nottoway	TB	State	270	246			408
Piedmont Sanatorium	TB	State	270	246			408
Catawba Sanatorium 100—Roanoke	TB	State	400	380			570
Catawba Sanatorium	TB	State	400	380			570
Charlotteville 18 400—Albemarle	TB	State	300	300			830
Blue Ridge Sanatorium	TB	State	300	300			830
Norfolk Jefferson Hospital and Sanatorium	Gen	NPAsen	40	40	10	214	1,448
University of Virginia Hospital	Gen	NPAsen	40	40	10	214	1,448
Christiansburg 2 009—Montgomery	Gen	Corp	26	16	8	178	1,167
New Altamont Hospital	Gen	Corp	26	16	8	178	1,167
Clifton Forge 6 461—Alleghany	Gen	NPAsen	133	101	8	148	4,000
Chesapeake and Ohio Hospital	Gen	NPAsen	133	101	8	148	4,000
Clintwood 1 186—Dickenson	Gen	Indiv	20	12	8	103	837
Dickenson County Hospital	Gen	Indiv	20	12	8	103	837
Coeburn 764—Wise	Gen	Part	20	15	3	37	833
Coeburn Hospital	Gen	Part	20	15	3	37	833

## VIRGINIA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Covington 6 300—Alleghany	Gen	Indiv	26	11	6	54	864
Covington General Hospital	Gen	Indiv	26	11	6	54	864
Dante 2 700—Russell	Gen	NPAsen	20	21	2	13	830
Clinchfield Hospital	Gen	NPAsen	20	21	2	13	830
Danville 32 149—Pittsylvania	TB	NPAsen	50	45			48
Hilltop Sanatorium	TB	NPAsen	50	45			48
Memorial Hospital	Gen	NPAsen	170	94	26	167	6,463
Farmville 3 475—Prince Edward	Gen	NPAsen	50	30	16	203	1,749
Southside Community Hosp	Gen	NPAsen	50	30	16	203	1,749
Fort Belvoir —Fairfax	Gen	Army	50	31			1,177
Station Hospital	Gen	Army	50	31			1,177
Fort Monroe 1 260—Elizabeth City	Gen	Army	106	67	4	43	2,100
Station Hospital	Gen	Army	106	67	4	43	2,100
Fort Myer 1 050—Arlington	Gen	Army	139	61			1,030
Station Hospital	Gen	Army	139	61			1,030
Franklin 3 466—Southampton	Gen	Indiv	30	21	6	100	917
Ratford Hospital	Gen	Indiv	30	21	6	100	917
Fredericksburg 10 066—Spotsylvania	Gen	NPAsen	70	66	10	408	2,912
Mary Washington Hospital	Gen	NPAsen	70	66	10	408	2,912
Front Royal 3 831—Warren	Gen	Corp	20	10	4	42	507
Front Royal Hospital	Gen	Corp	20	10	4	42	507
Gordonsville 508—Orange	Gen	Part	10				3 Estab 1942
Gordonsville Community Hospital	Gen	Part	10				3 Estab 1942
Grundy 1 476—Buchanan	Gen	Indiv	50	40	6	60	1,067
Grundy Hospital	Gen	Indiv	50	40	6	60	1,067
Hampton 5 898—Elizabeth City	Gen	NPAsen	91	69	12	303	2,016
Dixie Hospital	Gen	NPAsen	91	69	12	303	2,016
Harrisonburg 8 768—Rockingham	Gen	NPAsen	140	117	11	497	4,620
Rockingham Memorial Hosp	Gen	NPAsen	140	117	11	497	4,620
Hopewell 8 619—Prince George	Gen	NPAsen	22	11	6	154	861
John Randolph Hospital	Gen	NPAsen	22	11	6	154	861
Hot Springs 1 000—Bath	Gen	NPAsen	13		4	21	178
Community House	Gen	NPAsen	13		4	21	178
Keocoughtan 1 900—Elizabeth City	Gen	Vet	304	304			2,782
Veterans Admin Facility	Gen	Vet	304	304			2,782
Langley Field —Elizabeth City	Gen	Army	125	61	5	99	2,900
Station Hospital	Gen	Army	125	61	5	99	2,900
Lebanon 622—Russell	Gen	Part	10	7	4	20	440
Lebanon General Hospital	Gen	Part	10	7	4	20	440
Leesburg 1 698—Loudoun	Gen	County	32	17	7	99	600
Loudoun County Hospital	Gen	County	32	17	7	99	600
Lexington 3 014—Rockridge	Gen	NPAsen	57	29	8	98	1,417
Stonewall Jackson Memorial Hospital	Gen	NPAsen	57	29	8	98	1,417
Lorton 70—Fairfax	Gen	NPAsen	20	9	10	70	862
District of Columbia Reformatory	Gen	NPAsen	20	9	10	70	862
Luray 1 511—Page	Gen	NPAsen	20	9	10	70	862
Page Memorial Hospital	Gen	NPAsen	20	9	10	70	862
Lynchburg 44 541—Campbell	Gen	NPAsen	100	78	12	430	2,611
Guggenheimer Memorial Hospital	Gen	NPAsen	100	78	12	430	2,611
Lynchburg General Hosp	Gen	NPAsen	123	78	12	239	2,611
Marshall Lodge Memorial Hospital	Gen	NPAsen	123	78	12	239	2,611
Virginia Baptist Hospital	Gen	Church	100	78	12	430	2,611
Lynnhaven 200—Princess Anne	TB	State	50	46			60
Tidewater Sanatorium	TB	State	50	46			60
Marion 5 177—Smyth	Gen	NPAsen	30	20	4	84	1,412
Lee Memorial Hospital	Gen	NPAsen	30	20	4	84	1,412
Southwestern State Hospital	Ment	State	1,347	1,200			300
Martinsville 10 080—Henry	Gen	Indiv	20	12	7	43	57
Henry County Memorial Hospital	Gen	Indiv	20	12	7	43	57
Shackelford Hospital	Gen	Indiv	54	29	12	157	1,088
Nassawadox 200—Northampton	Gen	Counties	53	33	7	177	1,006
Northampton Accomac Memorial Hospital	Gen	Counties	53	33	7	177	1,006
Newport News 37 067—Warwick	Gen	Indiv	123	100	26	800	4,375
Elizabeth Buxton Hosp	Gen	NPAsen	130	80	30	661	3,997
Riverside Hospital	Gen	NPAsen	130	80	30	661	3,997
Whittaker Memorial Hospital	Gen	NPAsen	44	27	6	181	1,051
Norfolk 144 332—Norfolk	TB	City	140	101			212
Grandy Sanatorium	TB	City	140	101			212
Henry A. Wise Memorial Hospital	Iso	City	20				115
Hospital of St Vincent de Paul	Gen	Church	220	166	20	891	8,211
Leigh Memorial Hospital	Gen	NPAsen	72	50	22	421	2,231
McLoy Stokes Hospital	ENT	Part	11				507
Norfolk Community Hosp	Gen	NPAsen	64	49	11	304	1,728
Norfolk General Hosp	Gen	NPAsen	208	236	30	1,471	9,054
U S Marine Hospital	Gen	USPHS	360	274			3,869
Norton 4 006—Wise	Gen	Indiv	30	3			1,080
Dr. Botts Eye Ear Nose and Throat Hospital	ENT	Indiv	30	3			1,080
Norton General Hospital	Gen	Indiv	30	3			1,080
Pennington Gap 1 990—Lee	Gen	Corp	32	20	2	46	1,114
Lee General Hospital	Gen	Corp	32	20	2	46	1,114
Petersburg 30 631—Dinwiddie	Ment	State	3,236	3,896			924
Central State Hospital	Ment	State	3,236	3,896			924
Medical Center Hospital	Gen	NPAsen	50	70	7	404	4,001
Petersburg Hospital	Gen	NPAsen	50	70	7	404	4,001
Petersburg State Colony	MeDe	State	300	204			76
Portsmouth 50 745—Norfolk	Gen	NPAsen	125	110	20	732	4,010
Kings Daughters Hospital	Gen	NPAsen	125	110	20	732	4,010
Norfolk Naval Hospital	Gen	Navy	1,069	609	21	426	9,227
Parrish Memorial Hospital	Gen	Corp	50	52	17	503	2,700
Pulaski 8 792—Pulaski	Gen	Corp	60	49	12	325	2,741
Pulaski Hospital	Gen	Corp	60	49	12	325	2,741
Radford 6 990—Montgomery	Gen	NPAsen	30	20	6	227	1,409
Radford Community Hosp	Gen	NPAsen	30	20	6	227	1,409
St Albans Sanatorium	N&M	Indiv	40	42			414

## VIRGINIA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinsets	Number of Births	Admissions †
Richlands 2 203—Tazewell	Gen	Corp	101	64	10	192	2 864
Clinch Valley Clinic Hosp	Gen	Part	75	41	8	113	1 082
Mattie Williams Hospital	Gen						
Richmond 193,042—Henrico	Orth	NPA'sen	120	91			316
Crippled Children's Hosp	Unit of Med Col of Va	Hosp					
Dooley Hospital	Gen	Corp	65	70	20	985	4 040
Grace Hospital	Gen	Corp	122	127	20	660	6 246
Johnston Willis Hospital	Gen	Corp					
Medical College of Virginia	Gen	State	881	478	04	1 347	12 811
Hospital Division	Unit of Med Col of Va	Hosp					
Memorial Hospital	Inst	State	40	31			913
Penitentiary Hospital	Gen	NPA'sen	90	78	20	634	3 042
Retreat for the Sick	Gen	NPA'sen	32	19	6	67	4 400
Richmond Community Hosp	Gen	Corp	60	50		1	1 100
St Elizabeth's Hospital	Gen	Corp	82	70	20	348	2 822
St Luke's Hospital	Unit of Med Col of Va	Hosp					
St Philip Hospital	Gen	NPA'sen	80	33	17	240	1 231
Sheltering Arms Hospital	Gen	Corp	96	76	24	433	2 901
Stuart Circle Hospital	N & M	Corp	50	26			4 48
Tucker Hospital	N & M	Corp	130	93			336
Westbrook Sanatorium	Gen	NPA'sen	44	22	4	120	639
Roanoke 63 287—Roanoke	Gen	NPA'sen	20	4			923
Burrell Memorial Hospital	Gen	NPA'sen	99	90	21	577	2 020
Gill Memorial Eye, Ear and Throat Hospital	Gen	NPA'sen	122	100	12	412	4 312
Jefferson Hospital	Gen	NPA'sen					
Lewis Gale Hospital	Gen	NPA'sen					
Roanoke City Tuberculosis Sanatorium	TB	City	60	40			3 028
Roanoke Hospital	Gen	NPA'sen	97	64	14	39	3 028
Shenandoah Hospital	Gen	Corp	50	27	8	302	1 977
Veterans Admin Facility	Ment	Vet	1 333	1 080			612
Saltville 2 650—Smyth	Gen	NPA'sen	16	4	5	26	362
Matheson Hospital	Gen	NPA'sen	20	16	6	43	573
South Boston 5 202—Hallifax	Gen	Indiv	34	17	8	81	7 1
South Boston Hospital	Gen	Indiv					
Staunton 13 337—Augusta	Unit of Western State Hospital						
DeFayette Sanatorium	Gen	NPA'sen	72	44	10	260	1 580
Kings Daughters Hospital	Ment	State	2 426	2 446			1 061
Western State Hospital							
Stonega 1 600—Wise	Indus	NPA'sen	16	3			1 07
Stonega Hospital	Gen	Indiv	20	10	3	30	3 79
Stuart 720—Patrick	Gen	Corp	50	36	12	138	1 081
Suffolk 11 343—Ansemond	Gen	NPA'sen	20	6			460
Lakeview Hospital	Gen	Corp					
Virginia General Hospital	Gen	NPA'sen					
University—Albermarle	See Charlottesville Virginia						
University of Virginia Hosp							
Waynesboro 7 743—Augusta	Gen	NPA'sen	30	17	10	160	511
Waynesboro Community Hospital	Gen	Indiv	17	8	5	70	41
Williamsburg 3 942—James City	Ment	State	1 709	1 837			327
Bell Hospital	Gen	NPA'sen	101	90	20	503	4 060
Eastern State Hospital	Gen	Indiv	33	17	6	60	636
Winchester, 12 090—Frederick							
Winchester Memorial Hosp							
Woodstock 1 640—Shenandoah							
Cora Miller Memorial Hosp							

## Related Institutions

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinsets	Number of Births	Admissions †
Beaumont—Powhatan	Inst	State	21	5			261
Virginia Industrial School for Boys							
Colon 100—Amherst	MeDe	State	1 610	1 681			180
Lynchburg State Colony	Unit of Lynchburg State Colony						
Medical Center Hospital	MeDe	Indiv	80	60			8
Falls Church 2 576—Fairfax							
Gundry Home and Training School for Feeble-minded							
Lawrenceville 1 703—Brunswick	Inst	Church	18	1			170
Louie Taylor Letcher Memorial Hospital	Gen	Indiv	12	7	2	36	240
Martinsville 10 080—Henry	GenInst	City	500	410	20	76	1 006
St Mary Hospital	Inst	State	120	62			398
Richmond 193 042—Henrico	Inst	NPA'sen	15	2			161
City Home							
State Farm 75—Goochland							
State Farm Hospital							
Sweet Briar 200—Amherst							
Sweet Briar College Infirmary							

## WASHINGTON

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinsets	Number of Births	Admissions †
Aberdeen 18 840—Grays Harbor	Gen	Church	81	71	24	681	2 673
St Joseph's Hospital							
American Lake 800—Pierce	Ment	Vet	676	692			200
Veterans Admin Facility							
Anacortes 5 875—Skagit	Gen	Corp	24	15	5		602
Anacortes Hospital	Gen	Corp	40	23	15	228	1 040
Auburn 4 211—King	Gen	Corp					
Suburban Hospital	Gen	Indiv	20	15	4	56	300
Bellingham 29 314—Whatcom	Gen	Church	109	71	15	448	1 940
St Frances Hospital	Gen	NPA'sen	70	67	12	430	2 317
St Joseph's Hospital	Gen	County	88	61	6	37	606
St Luke's General Hospital							
Whatecom County Hospital							

## WASHINGTON—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinsets	Number of Births	Admissions †
Bremerton, 15 134—Kitsap	Gen	Navy	208	157	8	96	2 538
U S Naval Hospital							
Chenahall, 4 857—Lewis	Gen	Church	35	24	15	20	1 163
St Helen's Hospital							
Chewelah 1 563—Stevens	Gen	Church	22	16	9	143	137
St Joseph's Hospital							
Colfax, 2 803—Whitman	Gen	Church	60	20	10	150	907
St Ignatius Hospital							
Colville 2 418—Stevens	Gen	Church	30	22	8	119	120
Mount Carmel Hospital							
Dayton 3 076—Columbia	Gen	Indiv	20	14	4	83	522
John Brining Memorial Hosp							
Ellensburg, 5 941—Kittitas	Gen	NPA'sen	20	18	8	123	630
Flensburg General Hospital	Gen	County	43	20	7	34	567
Kittitas County Hospital	Gen	Indiv	14	9	6	120	430
Valley General Hospital							
Elma, 1 370—Grays Harbor	Gen	Indiv	16	7	6	83	404
Elma General Hospital	Gen	County	110	67			50
Onkhorst Sanatorium							
Everett 30 224—Snohomish	Gen	NPA'sen	85	73	24	50	2 931
General Hospital	Gen	Church	140	81	21	531	2 880
Providence Hospital							
Forks, 600—Challam	Gen	Indiv	20	8	8	32	512
Olympic Hospital							
Fort Lewis —Jerre	Gen	Army	432	131	8	118	3 200
Station Hospital							
Fort Steilacoom, 2 000—Pierce	Ment	State	3 004	2 800			567
Western State Hospital							
Fort Worden (Port Townsend) P O —Jefferson	Gen	Army	45	12	2	10	171
Station Hospital							
Kirkland 2 084—King	Gen	Indiv	15	9	10	223	465
Kirkland Hospital							
Lakeview 200—Pierce	Gen	County	110	110			1 00
Mountain View Sanatorium							
Leavenworth 1 600—Chelan	Gen	NPA'sen	35	20	6	90	1 410
Cascade Sanitarium							
Longview 12 300—Cowlitz	Gen	NPA'sen	80	49	20	410	1 120
Cowlitz General Hospital	Gen	Corp	60	26	16	209	1 812
Longview Memorial Hospital							
Medical Lake 2 114—Spokane	Ment	State	2 009	1 933			459
Eastern State Hospital							
Monroe 1 000—Snohomish	Gen	County	72	55	5	50	637
Valley View Hospital							
Mount Vernon 4 278—Skagit	Gen	NPA'sen	25	No data supplied			9.9
Mount Vernon General Hosp	Gen	Indiv	40	23	10	108	9.9
Rowley General Hospital							
Naselle 300—Okanogan	Gen	IA	36	20	5	53	567
Colville Indian Hospital							
Newport 1 174—Pend Oreille	Gen	NPA'sen	20	10	8	116	420
Newport Community Hosp							
Olympia 13 201—Thurston	Gen	Church	100	80	15	447	3 801
St Peter's Hospital							
Pa co 3 912—Franklin	Gen	Church	60	30	7	207	9 037
Our Lady of Lourdes Hosp							
Port Angeles 9 409—Challam	Gen	Indiv	30	27	10	144	1 320
Davidson and Hay Hospital	Gen	NPA'sen	10	61	13	211	9 014
Port Angeles General Hosp							
Port Gamble 500—Kitsap	Gen	Indiv	16	7	6	93	416
Port Gamble General Hosp							
Port Townsend 4 081—Jefferson	Gen	Church	53	30	13	161	1 001
St John's Hospital							
Puyallup 7 889—Pierce	Gen	Indiv	22	12			97
Luget Sound Sanatorium	N & M	Part	24	16	8	30	1 100
Puyallup General Hospital							
Renton 4 488—King	Gen	Indiv	38	12	12	309	1 060
Bronson Memorial Hospital							
Richmond Highlands 600—King	Gen	City	300	218			208
Irland Sanatorium and Isolation Hospital							
Seattle 308 302—King	Gen	NPA'sen	30	10	12	100	1 140
Ballard General Hospital							
Children's Orthopedic Hospital	Orth	NPA'sen	117	112			1 493
Cobb Hospital	Surg	Indiv	20	17			2 480
Columbus Hospital	Gen	Church	200	140	49	1 333	6 040
Flirland Sanatorium	See Richmond Highlands Wash						40
Flirland Sanatorium	N & M	Corp	23	20			
King County Hospital Unit No 1 (Harborview)	Gen	County	454	406	51	480	12 630
King County Hospital, Unit No 2 (Georgetown)	Chr	County	267	200			62
King County Tuberculosis Hospital	TB	County	160	150			129
Laurel Beach Sanatorium	TB	Part	90	86			150
Maynard Hospital	Gen	NPA'sen	96	83	44	1 060	9 035
Meadows Sanatorium	N & M	Corp	35	30			201
Medical and Dental Building							
Surgery	Indiv		20	11			9 501
Providence Hospital	Gen	Church	370	333	73	2 190	19 046
Riverton Hospital for Chest Diseases	TB	NPA'sen	90	83			143
Seattle General Hospital	Gen	NPA'sen	110	107	40	1 107	4 673
Station Hospital	Gen	Army	20	2			170
Swedish Hospital	Gen	NPA'sen	300	258	74	1 737	9 068
U S Marine Hospital	Gen	USPHS	400	333		11	3 477
University of Washington Health Service	Inst	State	75	12			1 080
Virginia Mason Hospital	Gen	NPA'sen	160	144	43	1 071	6 018
Sedro Woolley 2 001—Skagit	Gen	NPA'sen	35	25	6	112	504
Memorial Hospital	Gen	State	2 124	2 080			413
Northern State Hospital							
Shelton 3 707—Mason	Gen	NPA'sen	54	41	12	200	1 591
Shelton General Hospital							

## WASHINGTON—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Snohomish 2794—Snohomish Aldercrest Sanatorium	TB	County	50	54			35
Snohomish General Hospital	Gen	Indiv	16	9	5	162	430
Snoqualmie Falls—King Snoqualmie Falls Hospital	Gen	Indiv	20	12	6	90	432
South Bend 1771—Pacific South Bend General Hospital	Gen	Part	12	8	6	67	210
Spokane 122 001—Spokane Deaconess Hospital* <sup>AO</sup>	Gen	Church	200	163	44	1 141	6 011
Edgecliff Sanatorium	TB	County	144	99			121
Sacred Heart Hospital* <sup>AO</sup>	Gen	Church	300	294	68	1 069	9 274
St Luke's Hospital* <sup>AO</sup>	Gen	NPA <sup>asn</sup>	207	138	20	574	4 378
Salvation Army Women's Hospital and Home	Mat	Church	42	20	20	81	109
Shriners Hospital for Crippled Children* <sup>AO</sup>	Orth	NPA <sup>asn</sup>	24	20			116
Station Hospital* <sup>AO</sup>	Gen	Army	66	40			883
Stellacoom 832—Pierce U S Penitentiary Hospital* <sup>AO</sup>	Inst	USPHS	81	66			900
Tacoma 109 405—Pierce Northern Pacific Beneficial Association Hospital* <sup>AO</sup>	Gen	NPA <sup>asn</sup>	111	73	9	79	2 411
Pierce County Hospital* <sup>AO</sup>	Gen	County	210	127	24	218	2 776
St Joseph's Hospital* <sup>AO</sup>	Gen	Church	279	103	60	1 402	6 853
Tacoma General Hosp * <sup>AO</sup>	Gen	NPA <sup>asn</sup>	213	199	57	2 076	7 929
Tacoma Indian Hospital* <sup>AO</sup>	TbGen	IA	106	183			833
Toppenish 3 683—Yakima Yakima Sanatorium	Gen	IA	37	36			50
Vancouver 18 788—Clark Clark County Hospital	Gen	County	49	37	4	47	600
Clark General Hospital	Gen	NPA <sup>asn</sup>	52	36	13	180	1 561
Northern Permanente Foundation	Gen	NPA <sup>asn</sup>	70	12			Estab 1942
St Joseph's Hospital* <sup>AO</sup>	Gen	Church	112	100	30	684	2 624
Station Hospital* <sup>AO</sup>	Gen	Army	132	68	4	37	1 563
Walla Walla 18 109—Walla Walla St Mary's Hospital* <sup>AO</sup>	Gen	Church	80	66	15	339	2 591
Veterans Admin Facility* <sup>AO</sup>	GenTb	Vet	421	306			1 532
Walla Walla General Hosp * <sup>AO</sup>	Gen	Church	50	41	12	247	1 377
Wenatchee 11 620—Chelan Central Washington Deaconess Hospital* <sup>AO</sup>	Gen	Church	50	43	14	317	1 505
St Anthony's Hospital* <sup>AO</sup>	Gen	Church	65	50	18	326	1 536
Yakima 27 221—Yakima St Elizabeth's Hospital* <sup>AO</sup>	Gen	Church	166	149	30	1 009	5 603
Yakima County Hospital	Gen	County	101	70	13	91	1 393

## Related Institutions

Ole Elum 2 230—Kittitas Roslyn Ole Elum Beneficial Company Hospital	Gen	NPA <sup>asn</sup>	25	15		16	670
Ione 681—Pend Oreille Ione Hospital	Gen	Indiv	10	5	4	24	192
Medical Lake 2 114—Spokane Eastern State Custodial School	MeDe	State	1 463	1 302			60
Seattle 368 302—King Florence Crittenton Home	Mat	NPA <sup>asn</sup>	30	82	10	67	72
Freedlander's Sanitarium	Conv	Part	11	9			89
Junior League Convalescent Home	Chil	NPA <sup>asn</sup>	22	13			54
Shadel Sanitarium	Alcoh	Corp	20	10			472
Spokane 122 001—Spokane Rivercrest Hospital	Iso	City	70				127
Tacoma 109 405—Pierce Washington Minor Hospital	Gen	NPA <sup>asn</sup>	21	13			1 622
White Shield Home	Mat	NPA <sup>asn</sup>	22	11	10	48	80
Tulalip 100—Snohomish Tulalip Hospital	Gen	IA	9	9	3	102	282
Walla Walla 18 109—Walla Walla Blue Mountain Sanatorium	TB	County	40	37			49
Washington State Penitentiary Hospital	Inst	State	60	40			618
White Salmon 885—Klickitat West Klickitat Hospital	Gen	Part	17	5	4	100	200
Yakima 27 221—Yakima Dorps Sanatorium	TB	Part	46	34			32

## WEST VIRGINIA

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Beckley 12 852—Raleigh Beckley Hospital* <sup>AO</sup>	Gen	Part	100	120	15	170	5 400
Pinecrest Sanitarium* <sup>AO</sup>	TB	State	664	484			480
Raleigh General Hospital* <sup>AO</sup>	Gen	Corp	90	65	7	112	2 393
Bluefield 20 641—Mercer Bluefield Sanitarium* <sup>AO</sup>	Gen	Corp	110	97	10	207	4 604
Brown's Hospital	Gen	Indiv	45	13	2	7	1 272
Providence Hospital	Gen	Indiv	20	12	4	6	467
St Luke's Hospital* <sup>AO</sup>	Gen	Corp	75	51	10	110	2 214
Buckhannon 4 450—Upshur St Joseph's Hospital* <sup>AO</sup>	Gen	Church	44	21	6	121	807
Charleston 67 014—Kanawha Charleston General Hospital* <sup>AO</sup>	Gen	NPA <sup>asn</sup>	320	204	20	893	10 070
Kanawha Valley Hospital* <sup>AO</sup>	Gen	Corp	160	121	16	379	4 631
McMillan Hospital* <sup>AO</sup>	Gen	Corp	62	62	18	330	8 283

## WEST VIRGINIA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Mountain State Memorial Hospital* <sup>AO</sup>	Gen	NPA <sup>asn</sup>	88	70	10	316	3 554
St Francis Hospital* <sup>AO</sup>	Gen	Church	100	91	18	644	3 602
Salvation Army Hospital	Gen	Church	20	14	8	126	681
Staats Hospital	Gen	Corp	66	40	6	102	1 957
Charles Town 2 926—Jefferson Charles Town General Hosp	Gen	NPA <sup>asn</sup>	20	13	8	92	481
Clarksburg 30 570—Harrison St Mary's Hospital* <sup>AO</sup>	Gen	Church	177	120	15	382	4 290
Union Protestant Hospital* <sup>AO</sup>	Gen	NPA <sup>asn</sup>	52	36	10	327	1 673
Denmar 100—Pocahontas Denmar Sanatorium	TB	State	100	121			145
East Rainele 1 515—Greenbrier East Rainele General Hosp	Gen	Corp	30	15	4	52	610
Elkins 8 133—Randolph Davis Memorial Hospital* <sup>AO</sup>	Gen	NPA <sup>asn</sup>	108	60	11	46	2 511
Elkins City Hospital* <sup>AO</sup>	Gen	Corp	66	30	7	81	1 134
Fairmont 23 100—Marion Fairmont Emergency Hosp * <sup>AO</sup>	Gen	State	60	70	5	48	1 408
Fairmont General Hospital* <sup>AO</sup>	Gen	NPA <sup>asn</sup>	145	97	18	534	4 661
Glen Dale 1 348—Marshall Reynolds Memorial Hosp * <sup>AO</sup>	Gen	Church	80	48	10	269	2 104
Hinton 5 815—Summers Hinton Hospital* <sup>AO</sup>	Gen	Corp	60	40	8	37	1 445
Holden 3 000—Logan Holden Hospital	Gen	Corp	24	13		17	603
Hopemont 470—Preston Conley Hospital	Unit of Hopemont Sanitarium	TB	405	470			409
Hopemont Sanitarium* <sup>AO</sup>	TB	State	405	470			409
Huntington 7 836—Cabell Chesapeake and Ohio Hospital* <sup>AO</sup>	Gen	NPA <sup>asn</sup>	160	102	20	85	2 900
Huntington Memorial Hospital* <sup>AO</sup>	Gen	NPA <sup>asn</sup>	115	84	24	260	4 069
Huntington Orthopedic Hosp	Orth	NPA <sup>asn</sup>	50	39			440
Huntington State Hospital	Ment	State	906	904			503
St Mary's Hospital* <sup>AO</sup>	Gen	Church	228	106	36	1 300	6 728
Veterans Admin Facility* <sup>AO</sup>	Gen	Vet	317	216			2 486
Keyer 6 377—Mineral Potomac Valley Hospital* <sup>AO</sup>	Gen	Corp	50	37	12	192	1 463
Logwood 1 670—Preston Kerecheval Memorial Clinic	Gen	Corp	10	9	5	56	417
Lakin 50—Mason Lakin State Hospital	Ment	State	410	300			104
Logan 5 166—Logan Logan General Hospital* <sup>AO</sup>	Gen	Corp	100	37	10	96	2 383
Mercy Hospital	Gen	Corp	70	44	8	22	1 461
Marlinton 1 644—Pocahontas Pocahontas Memorial Hosp	Gen	County	20	11	5	46	529
Martinsburg 15 063—Berkeley City Hospital* <sup>AO</sup>	Gen	NPA <sup>asn</sup>	54	36	9	130	1 082
Kings Daughters Hospital* <sup>AO</sup>	Gen	NPA <sup>asn</sup>	104	60	8	121	1 571
Matawan 900—Mingo Matawan Clinic Hospital	Gen	Corp	54	15	3	33	920
Milton 1 641—Cabell Morris Memorial Hosp	OrthConv	NPA <sup>asn</sup>	75	60			
Montgomery 3 231—Fayette Laird Memorial Hospital* <sup>AO</sup>	Gen	Corp	127	80	8	153	3 810
Morgantown 16 600—Monongalia City Hospital* <sup>AO</sup>	Gen	Indiv	68	52	15	248	2 726
Monongalia General Hosp* <sup>AO</sup>	Gen	County	100	89	23	309	2 373
Mullens 3 026—Wyoming Wyle Hospital	Gen	Indiv	40	12	2	15	460
New Martinsville 3 491—Wetzel Wetzel County Hospital	Gen	NPA <sup>asn</sup>	30	24	8	114	1 003
Oak Hill 3 213—Fayette Oak Hill Hospital* <sup>AO</sup>	Gen	Part	70	50	7	60	2 306
Parkersburg 30 103—Wood Camden Clark Memorial Hospital* <sup>AO</sup>	Gen	City	165	92	18	471	3 533
St Joseph's Hospital* <sup>AO</sup>	Gen	Church	120	94	22	305	3 039
Parsons 2 007—Tucker Tucker County Hospital	Gen	Corp	20	12	7	61	623
Phillippi 1 935—Barbour Myers Clinic Hospital* <sup>AO</sup>	Gen	Part	60	29	6	86	1 312
Princeton 7 426—Mercer Mercer Memorial Hospital	Gen	Corp	70	35	10	136	1 207
Richwood 5 001—Nicholas McClung Hospital	Gen	Indiv	50	10	6	21	206
Sacred Heart Hospital	Gen	Church	30	14	5	53	854
Ronceverte 2 200—Greenbrier Greenbrier Valley Hospital* <sup>AO</sup>	Gen	Corp	50	22	3	37	1 188
South Charleston 10 377—Kanawha Dunn Hospital	Gen	Indiv	30	17	12	147	931
Spencer 2 497—Roane De Puc Hospital	Gen	Indiv	20	12	0	44	505
Spencer State Hospital	Ment	State	960	934			433
Triadelphia 300—Ohio Ohio County Tuberculosis Sanatorium	TB	County	35	34			21
Welch 6 261—McDowell Grace Hospital* <sup>AO</sup>	Gen	Corp	130	101	8	143	3 600
Stevens Clinic Hospital* <sup>AO</sup>	Gen	Corp	123	94	10	143	4 830
Welch Emergency Hospital* <sup>AO</sup>	Gen	State	115	33	4	49	1 713
Weston 8 205—Lewis General Hospital	Gen	Indiv	44	23	6	89	1 133
Weston City Hospital	Gen	Corp	30	14	7	69	611
Weston State Hospital* <sup>AO</sup>	Ment	State	1 703	1 706			694
Wheeling 61 000—Ohio Ohio Valley General Hospital* <sup>AO</sup>	Gen	NPA <sup>asn</sup>	209	225	29	1 173	8 270
Wheeling Hospital* <sup>AO</sup>	Gen	Church	204	167	32	924	4 557
Williamson 8 800—Mingo Williamson Memorial Hosp * <sup>AO</sup>	Gen	Corp	100	77	10	16	3 900

Key to symbols and abbreviations is on page 1027

## WEST VIRGINIA—Continued

Related Institutions	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Berkley Springs 1140—Morgantown Pines West Virginia Foundation for Crippled Children	Orth	NP Assn	40	20		42	
Charleston 67914—Kanawha Hillcrest Sanatorium	Tb Chil	NP Assn	52	42		54	
Moundsville 14108—Marshall Grand View Sanatorium	TB	County	26	16		20	
West Virginia Penitentiary Hospital	Inst	State	32	22		424	
St Mary's 2201—Pleasants West Virginia Training School	McDe	State	80	70		13	

## WISCONSIN

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Adams 1310—Adams	Gen	Indiv	10	6	2	20	220
Adams Friendship Hospital	Gen	Indiv	10	6	4	64	283
Algoma 2632—Kewaunee Algoma Hospital	Gen	NP Assn	16	11	5	60	418
Amery 1461—Polk Amery Hospital	Gen	Indiv	16	11	5	60	418
Antigo 949—Langlade Langlade County Memorial Hospital	Gen	Church	50	36	10	182	1705
Appleton 28496—Outagamie St Elizabeth Hospital	Gen	Church	100	121	40	1933	4741
Arcadia 1830—Trempealeau St Joseph's Hospital	Gen	Church	20	12	6	94	376
Ashland 11101—Ashland Ashland General Hospital	Gen	NP Assn	67	39	8	170	1705
St Joseph's Hospital	Gen	Church	130	74	15	376	3212
Baldwin 918—St Croix Baldwin Community Hosp	Gen	NP Assn	15	10	6	151	480
Baraboo 6415—Sauk St Mary's Ringling Hospital	Gen	Church	50	43	10	210	1273
Beaver Dam 10336—Dodge Lutheran Deaconess Hospital	Gen	Church	47	30	8	191	1365
St Joseph's Hospital	Gen	Church	60	37	14	202	1122
Beloit 20360—Rock Beloit Municipal Hospital	Gen	City	50	66	20	749	3126
Berlin 4247—Green Lake Berlin Memorial Hospital	Gen	NP Assn	20	16	7	140	511
Black River Falls 2539—Jackson Krohn Clinic and Hospital	Gen	Part	29	22	10	263	613
Boeckel 2008—Grant Brookside Parker Hospital	Gen	Part	22	4	3	40	187
Burlington 4414—Racine Burlington Memorial Hosp	Gen	NP Assn	30	20	10	201	80
Chippewa Falls 10368—Chippewa Northern Wisconsin Colony and Training School	McDe	State	1429	1400	5	9	290
St Joseph's Hospital	Gen	Church	110	80	10	34	2310
Columbus 2760—Columbia St Mary's Hospital	Gen	Church	40	30	12	160	678
Cumberland 1539—Barron Cumberland Hospital	Gen	Part	22	6	4	70	300
Darlington 2002—Lafayette McConnell McGreene Hospital	Gen	Part	11	5	4	71	200
Dodgeville 2269—Jowa Dodgeville General Hospital	Gen	NP Assn	23	17	5	93	701
St Joseph's Hospital	Gen	Church	51	30	15	212	1365
Eau Claire 30745—Eau Claire Luther Hospital	Gen	NP Assn	146	105	30	590	3888
Mt Washington Sanatorium	TB	County	91	90			81
Sacred Heart Hospital	Gen	Church	144	104	26	401	3784
Edgerton 3060—Rock Edgerton Memorial Hospital	Gen	NP Assn	30	18	9	180	651
Elkhorn 2382—Walworth Walworth County Hospital	Gen	County	70	46	20	300	1737
Fond du Lac 27209—Fond du Lac St Agnes Hospital	Gen	Church	244	217	38	1009	7210
Frederic 720—Polk Frederic Hospital	Gen	Indiv	12	9	4	98	506
Grantsburg 874—Burnett Community Hospital	Gen	Corp	30	18	4	53	501
Green Bay 46235—Brown Bellin Memorial Hospital	Gen	Church	88	70	20	523	7043
St Mary's Hospital	Gen	Church	120	76	22	517	4346
St Vincent's Hospital	Gen	Church	220	161	20	878	7021
Hartford 3910—Washington St Joseph's Hospital	Gen	Church	50	31	8	194	700
Hawthorne 75—Douglas Middle River Sanatorium	TB	County	142	120			120
Hayward 1571—Sawyer Hayward Indian Hospital	Gen	IA	50	32	9	90	876
Hillsboro 1146—Vernon Hansberry Hospital	Gen	Indiv	30	13	5	53	443
Iola 716—Waupaca Iola Hospital	Gen	Corp	19	10	5	53	317
Janesville 22992—Rock Mercy Hospital	Gen	Church	120	82	25	595	2062
Pinehurst Sanatorium	TB	County	70	72			87

## WISCONSIN—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Jefferson 3009—Jefferson Forest Lawn Sanatorium	TB	County	60	50			65
Kaukauna 7382—Outagamie Riverview Sanatorium	TB	County	60	40			104
Kenosha 47760—Kenosha Kenosha Hospital	Gen	NP Assn	100	82	30	560	3418
St Catherine's Hospital	Gen	Church	70	53	24	506	1944
Willowbrook Sanatorium	TB	County	71	40			87
Keshena 500—Shawano St Joseph's Indian Hospital	Gen	NP Assn	63	38	9	111	1000
La Crosse 42707—La Crosse Grandview Hospital	Gen	NP Assn	106	38	10	123	1118
La Crosse Hospital	Gen	NP Assn	40	22	12	104	1015
La Crosse Lutheran Hosp	Gen	Church	100	75	0	200	3094
St Ann's Hospital	Unit of St Francis Hospital	Gen	206	196	36	933	5518
St Francis Hospital	Gen	Church	206	196	36	933	5518
Judy Smith 3001—Rusk St Mary's Hospital	Gen	Church	30	30	8	200	1442
Lancaster 2963—Grant Lancaster General Hospital	Gen	Part	12	7	6	27	200
Ionia 1000—Forest Oviitz Hospital	Gen	Indiv	11	6	4	51	204
Madison 67417—Dane Lake View Sanatorium	TB	County	147	110			110
Madison General Hospital	Gen	NP Assn	177	148	26	812	7150
Methodist Hospital	Gen	Church	110	66	17	167	2806
Morningside Sanatorium	TB	NP Assn	50	45			25
St Mary's Hospital	Gen	Church	170	100	50	1200	6600
State of Wisconsin General Hospital	Gen	State	700	559	22	217	17130
Wisconsin Orthopedic Hospital for Children	Unit of State of Wisconsin General Hosp						
Wisconsin Psychiatric Institute	Unit of State of Wisconsin General Hosp						
Manitowoc 21401—Manitowoc Holy Family Hospital	Gen	Church	110	92	32	608	3000
Marinette 11753—Marinette Marinette General Hospital	Gen	County	80	45	22	301	0700
Marshfield 10000—Wood St Joseph's Hospital	Gen	Church	100	121	18	001	4600
Mauston 2671—Tuneau Mauston Hospital	Gen	Corp	40	26	9	116	901
Medford 2361—Taylor Medford Clinic	Gen	Corp	0	20	6	114	023
Mendota 400—Dane Mendota State Hospital	Gen	State	800	507			1860
Veterans Admin Facility	Gen	Vet	200	200			47
Menomonie 6082—Dunn Menomonie City Hospital	Gen	City	50	20	7	171	860
Merrill 6711—Lincoln Holy Cross Hospital	Gen	Church	50	36	11	244	1334
Lincoln County Hospital	Gen	County	20	15	4	8	
Milwaukee 657472—Milwaukee Columbia Hospital	Gen	NP Assn	120	110	30	790	4760
Trinity Deaconess Hospital	Gen	Church	140	107	30	1107	5001
Johnston Emergency Hospital	Emer	City	20	4			
Milwaukee Children's Hospital	Chil	NP Assn	220	99			3770
Milwaukee County Hospital Dispensary Emergency Unit	Unit of Milwaukee County Hospital						
Wauwatosa Wauwatosa Hospital	Gen	Church	281	229	78	1600	8400
Milwaukee Sanatorium	Sec Wauwatosa						
Milwaukee General Hospital	Gen	Church	138	100	45	002	4601
St Michael's Hospital	Gen	NP Assn	160	100	30	1304	7003
Sacred Heart Sanatorium	Gen	Church	200	181			2100
St Anthony Hospital	Gen	Church	72	47	21	811	2001
St Joseph's Hospital	Gen	Church	320	242	80	2000	10900
St Luke's Hospital	Gen	Church	100	90	30	1000	4600
St Mary's Hill	N & M	Church	101	83			500
St Mary's Hospital	Gen	Church	220	150	30	1164	6000
St Michael Hospital	Gen	Church	140	97	30	700	3013
Shorewood Hospital	N & M	Corp	50	47			300
South View Hospital	Gen	City	200	58			1100
Stark Hospital	Unit of Milwaukee Children's Hospital						5000
Veterans Admin Facility	Gen	Vet	1170	900			1000
West Side Hospital	Gen	NP Assn	30	26	10	316	1000
Mondovi 207—Buffalo Mondovi Clinic Hospital	Gen	Indiv	16	10	4	67	373
Monroe 6182—Green St Clare Hospital	Gen	Church	63	43	16	302	1940
Neenah 1061—Winnebago Theda Clark Memorial Hospital	Gen	NP Assn	55	52	17	400	2004
New London 4890—Waupaca Community Hospital	Gen	Church	40	28	13	298	1077
New London Memorial Hosp	Gen	NP Assn	13	6	6	30	154
Oconomowoc 4562—Waukesha Rogers Memorial Sanatorium	N & M	NP Assn	54	46			120
Summit Hospital	Gen	Corp	50	27	6	90	510
Oconto Falls 1888—Oconto Oconto Falls Hospital	Gen	City	20	10	6	87	300
Onalaska 1742—La Crosse Oak Forest Sanatorium	TB	County	60	60			100
Oscoda 642—Polk Tadd Memorial Hospital	Gen	Part	12	7	3	40	303
Oshkosh 39089—Winnebago Mercy Hospital	Gen	Church	100	108	34	730	4723
Park Falls 302—Price Park Falls Hospital	Gen	Indiv	20	11	4	84	531

Key to symbols and abbreviations is on page 1027

## WISCONSIN—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Perauklee 1332—Waukesha Oak Sanatorium	TB	Counties	42	39			400
Platteville 4762—Grant Andrew Hospital	Gen	Indiv	20	6	4	20	183
Wilson Cunningham Hospital	Gen	Part	25	7	6	45	223
Plum City 365—Pierce Plum City Hospital	Gen	Indiv	15	11	5	85	401
Plymouth 4170—Sheboygan Plymouth Hospital	Gen	Church	36	21	9	170	683
Rocky Knoll Sanatorium	TB	County	90	78			44
Portage 7016—Columbia St Saviors General Hospital	Gen	Church	70	40	14	2 5	1 424
Port Washington 4046—Ozaukee St Alphonsus Hospital	Gen	Church	70	40	15	2 1	1 054
Prairie du Chien 4623—Crawford Beaumont Hospital	Gen	Part	21	10	7	104	304
Prairie du Chien Sanitarium Hospital	Gen	NPA's'n	50	27	8	80	1 322
Prescott 557—Pierce St Croixdale Sanitarium	Gen & M	Corp	50	31	5	17	167
Pureair (Bayfield P O)—Bayfield Pureair Sanatorium	TB	Counties	70	60			92
Racine 6719—Racine St Luke's Hospital	Gen	Church	118	81	40	642	2 907
St Mary's Hospital	Gen	Church	220	115	51	533	5 396
Sunny Rest Sanatorium	TB	County	56	80			53
Reedsburg 3608—Sauk Reedsburg Municipal Hospital	Gen	City	30	15	10	176	664
Rhineland 8501—Oneida St Mary's Hospital	Gen	Church	75	47	10	263	1 577
Rice Lake 5719—Barron Lakeside Methodist Hospital	Gen	Church	50	31	16	198	2 007
St Joseph's Hospital	Gen	Church	40	26	8	165	1 190
Richland Center 4394—Richland Richland Hospital	Gen	NPA's'n	60	48	12	193	1 794
Ripon 4566—Fond du Lac Ripon Municipal Hospital	Gen	City	18	14	6	122	754
River Falls 2896—Pierce City Hospital	Gen	City	23	15	8	110	365
St Croix Falls 1007—Polk St Croix Falls Hospital	Gen	NPA's'n	20	11	4	47	445
Shawano 5565—Shawano Shawano Municipal Hospital	Gen	NPA's'n	63	35	16	306	1 018
Sheboygan 4068—Sheboygan St Nicholas Hospital	Gen	Church	205	149	40	756	3 530
Sheboygan Memorial Hosp	Gen	NPA's'n	112	65	20	504	2 244
Shullsburg 1197—Lafayette Dr Ennis Hospital	Gen	Indiv	15	5	4	25	206
South Milwaukee 11134—Milwaukee South Milwaukee Hospital	Gen	Indiv	14	12	6	171	514
Sparta 5820—Monroe St Mary's Hospital	Gen	Church	75	40	13	319	1 574
Stanley 2021—Chippewa Victory Hospital	Gen	NPA's'n	21	14	4	124	859
Staten 110—Waukesha Wisconsin State Sanatorium	TB	State	241	204			131
Stevens Point 15777—Portage River Pines Sanatorium	TB	Church	63	61			133
St Michael's Hospital	Gen	Church	81	65	15	2 1	2 747
Stoughton 4743—Dane Stoughton Community Hosp	Gen	NPA's'n	33	20	9	200	820
Sturgeon Bay 5439—Door Egeland Memorial Hospital	Gen	Indiv	32	24	8	180	1 240
Leasum Hospital	Gen	Indiv	14	12	8	96	625
Superior 3136—Douglas St Francis Hospital	Gen	Church	50	37	10	181	1 570
St Joseph's Hospital	Gen	Church	38	26	14	342	811
St Mary's Hospital	Gen	Church	137	80	25	314	2 337
Tomah 3517—Monroe Tomah Indian Hospital	Gen	IA	42	27	5	61	462
Tomahawk 3365—Lincoln Sacred Heart Hospital	Gen	Church	50	25	6	72	752
Two Rivers 10302—Manitowoc Two Rivers Municipal Hosp	Gen	City	45	34	10	258	2 500
Union Grove 973—Racine Southern Wisconsin Colony and Training School	McDe	State	500	772			73
Veterans Administration—Milwaukee Veterans Admin Facility	See Milwaukee						
Viroqua 3549—Vernon Viroqua Hospital	Gen	Part	22	No data supplied			
Washburn 2365—Bayfield Washburn Hospital	Gen	NPA's'n	15	Reorganized			
Watertown 11301—Jefferson St Mary's Hospital	Gen	Church	75	52	17	442	1 770
Waukesha 19242—Waukesha Milwaukee Children's Hospital	Unit of Milwaukee Children's Hospital						
Waukesha Memorial Hospital	Gen	City	50	63	31	756	2 591
Waukesha Springs Sanitarium	N & M	Corp					
Waupaca 345—Waupaca City Hospital	Gen	Part	12	7	2	31	251
Waupaca Hospital and Clinic	Gen	Part	12	8	4	39	263
Waupun 6795—Fond du Lac Central State Hospital	Ment	State	315	330			46
Wausau 27265—Marathon Mount View Sanatorium	TB	County	90	59			51
St Mary's Hospital	Gen	Church	150	93	23	555	3 712
Wausau Memorial Hospital	Gen	NPA's'n	61	61	25	410	2 368

## WISCONSIN—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Wauwatosa 27769—Milwaukee Blue Mound Preventorium	Unit of Moundale Sanatorium						
Milwaukee County Asylum for Chronic Insane	Ment	County	1 725	1 725			316
Milwaukee County Hosp ***	Gen	County	1 030	474	75	465	12 092
Milwaukee County Hospital for Mental Diseases	Ment	County	1 105	1 033			570
Milwaukee Sanitarium	N & M	Corp	147	140			332
Moundale Sanatorium	TB	County	602	566			554
West Bend 5432—Washington St Joseph's Hospital	Gen	Church	40	24	8	162	861
West De Pere—Brown Hickory Grove Sanatorium	TB	County	110	90			177
Whitehall 1035—Trempealeau Whitehall Community Hosp	Gen	NPA's'n	30	19	6	120	847
Whitewater 225—Manitowoc Maple Crest Sanatorium	TB	County	52	49			68
Wild Rose 559—Wausara Wild Rose Hospital	Gen	Indiv	24	14	4	23	415
Winnebago 150—Winnebago Sunny View Sanatorium	TB	Counties	95	97			85
Winnebago State Hospital	Ment	State	917	840			973
Wisconsin Rapids 11416—Wood Riverview Hospital	Gen	NPA's'n	85	43	24	450	1 817
Wood—Milwaukee Veterans Admin Facility	See Milwaukee						
Related Institutions							
Appleton 28436—Outagamie Outagamie County Asylum	Ment	County	240	254			31
Chippewa Falls 10368—Chippewa Chippewa County Asylum	Ment	County	355	355			64
Dodgeville 2269—Iowa Iowa County Insane Asylum	Ment	County	182	170			171
Eau Claire 30745—Eau Claire Eau Claire County Insane Asylum	Ment	County	252	249			29
Elkhorn 2382—Walworth Walworth County Asylum for the Insane	Ment	County	227	228			43
Fond du Lac 27209—Fond du Lac Fond du Lac County Asylum	Ment	County	325	315			36
Green Bay 46235—Brown Brown County Insane Asylum	Ment	County	255	305			35
Wisconsin State Reformatory Hospital	Inst	State	14	3			145
Hazel Green 582—Grant Hazel Green Hospital	Gen	Indiv	8	4	4	27	142
Itasca—Douglas Douglas County Asylum and Tuberculosis Sanatorium	Ment	Tb County	356	338			57
Parkland Sanatorium	Unit of Douglas County Asylum and Tuberculosis Sanatorium						
Janesville 22002—Rock Rock County Hospital	Ment	County	350	341			91
Jefferson 3059—Jefferson Jefferson County Asylum for Chronic Insane	Ment	County	242	220			49
Juneau 1301—Dodge Dodge County Asylum and Home	Ment	County	212	212			94
Kewaunee 2533—Kewaunee Dana and Whitealek Hospital	Gen	Part	10	4	4	30	50
Lake Tomahawk 105—Oneida Lake Tomahawk State Camp	TB	State	45	35			46
Lancaster 296—Grant Grant County Asylum	Ment	County	250	235			25
Madison 67447—Dane East Washington Avenue Hospital	Gen	City	55	8			165
Manitowoc 24404—Manitowoc Manitowoc County Insane Asylum	Ment	County	270	210			21
Marshfield 10359—Wood Wood County Asylum for Chronic Insane	Ment	County	241	273			24
Menomonie 6552—Dunn Dunn County Asylum	Ment	County	191	191			191
Milwaukee 257472—Milwaukee Layton Home	Incur	Church	37	37			7
Salvation Army Martha Washington Women's Home and Hospital	See Wauwatosa						
Monroe 6182—Green Green County Asylum	Ment	County	225	212			50
New Richmond 235—St Croix St Croix County Asylum	Ment	County	152	117			26
Oconto 5323—Oconto Oconto County and City Hospital	Gen	NPA's'n	45	15	10	85	651
Oshkosh 29059—Winnebago Alexian Brothers Hospital	N & M	Church	54	78			50
Owen 103—Clark Clark County Hospital	Ment	County	366	363			52
Peshigo 1947—Marquette Marquette County Insane Asylum	Ment	County	310	254			55
Racine 67195—Racine Lincoln Memorial Hospital	Tb & Gen	City	50	15			225
Racine County Asylum	Ment	County	220	325			51
Racine County Hospital	Inst	County	52	52			66
Reedsburg 3605—Sauk Sauk County Home and Asylum	Ment	County	266	195			82

Key to symbols and abbreviations is on page 1027

## WISCONSIN—Continued

Related Institutions	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Richland Center 4364—Richland County Asylum for Insane	Ment	County	141	145		20	
Shawano 5365—Shawano County Insane Asylum	Ment	County	190	183		20	
Sheboygan, 40635—Sheboygan County Hospital for Chronic Insane	Ment	County	300	261		120	
Sparta 5820—Monroe County Insane Asylum	Ment	County	170	165		12	
Superior 3010—Douglas County Asylum and Tuberculosis Sanatorium	See Itasca						
Verona 523—Dane County Asylum for Chronic Insane	Ment	County	290	No data supplied			
Viroqua 3019—Vernon County Asylum	Ment	County	101	100		06	
Watertown 11391—Jefferson Bethesda Lutheran Home for Epileptics and Epileptics	McDe	Church	570	360		2	
Waukesha 19242—Waukesha County Asylum for Chronic Insane	Ment	County	230	221		40	
Waupun 6798—Tond du Lac Wisconsin State Prison Hosp	Inst	State	16	10		340	
Wausau 27265—Marathon County Asylum for Chronic Insane	Ment	County	217	210		40	
Marathon County Home and Hospital	GenInst	County	60	52		162	
Wauwatosa 27760—Milwaukee County Home for Dependent Children	Inst	County	80	75		1200	
St. Camillus Hospital	Incur	Church	40	71		200	
Salvation Army Martha Washington Women's Home and Hospital	Mat	Church	70	43	10	141	100
West Bend 5402—Washington County Asylum for Chronic Insane	Ment	County	105	100		20	
West Salem 1204—La Crosse County Asylum for Insane	Ment	County	200	202		2	
Weyauwega 1113—Waupaca County Insane Asylum	Ment	County	200	196		21	
Whitehall 1030—Trempealeau County Asylum	Ment	County	100	110		17	
Winnebago 100—Winnebago County Asylum	Ment	County	260	261		21	
Wiscoda 700—Columbia County Asylum	Ment	County	310	294		52	

## WYOMING

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Basin 1090—Big Horn Basin Hospital	Gen	Indiv	8	4	4	57	110
Wyoming State Sanatorium	IB	State	3	20		47	
Casper 17064—Natrona Memorial Hospital of Natrona County	Gen	County	121	78	24	293	2576
Cheyenne 22474—Laramie Memorial Hospital of Laramie County	Gen	County	13	80	20	60	2503
Veterans Admin Facility	Gen	Vet	101	105		1148	
Cody 2506—Park Cody Hospital	Gen	NPAasn	23	11	6	80	55
Douglas 2200—Converse County Memorial Hospital	Gen	County	19			4 Reorganized	
Evansston 3000—Uinta Wyoming State Hospital	Ment	State	600	603		89	
Fort Warren 20—Laramie Station Hospital	Gen	Army	210	103	6	41	2411
Fort Washakie 100—Fremont Wind River Indian Hospital	Gen	IA	50	22	6	103	570
Gillette 2177—Campbell McHenry Hospital	Gen	Indiv	15	12	4	50	470
Greybull 1823—Big Horn St. Luke's Hospital	Gen	Indiv	10	3	2	46	174
Jackson 1040—Teton St. John's Hospital	Gen	Church	25	7	4	76	611
Kemmerer 2026—Lincoln Lincoln County Miner's Hosp	Gen	NPAasn	20	15	5	89	508
Lander 2594—Fremont Bishop Randall Hospital	Gen	Church	20	12	6	60	418
Laramie 10027—Albany Irwin Memorial Hospital	Gen	NPAasn	60	37	15	282	2470
Lovell 2175—Big Horn Lovell Hospital	Gen	Part	20	9	8	113	482
Lusk 1814—Niobrara Lusk Hospital	Gen	Indiv	25	11	9	39	400
Spencer Hospital	Gen	Indiv	17	10	6	72	613

## WYOMING—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Rock Springs, 0827—Sweetwater Wyoming General Hospital	Gen	State	130	65	30	520	2912
Sheridan 10029—Sheridan Sheridan County Memorial Hospital	Gen	County	60	48	11	215	1500
Veterans Admin Facility	Gen	Vet	504	618		870	
Wheatland, 2110—Platte Wheatland General Hospital	Gen	NPAasn	41	20	7	119	993
Worland 2710—Washakie Worland Hospital	Gen	Corp	20	8	8	134	660
Related Institutions							
Hanna 1127—Carbon Hanna Hospital	Gen	NPAasn	12	6	3	60	260
Lander 2591—Lander Wyoming State Training School	McDe	State	293	333			23
Sheridan 10023—Sheridan Reynolds Home	Gen	Indiv	12	7	8	121	320
Thermopolis 2422—Hot Springs Yellowstone National Park	Gen	Indiv	10	6	5	50	201
Yellowstone Park 200—Yellowstone Mammoth Hospital	Gen	Indiv	35	1	2		50

## ALASKA

Hospitals Sanatoriums and Related Institutions	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Anchorage 490 Alaska Railroad Bldg Hosp	Gen	Fed	70	15	5	30	1740
Providence Hospital	Gen	Church	50	20	10	137	1024
Bethel 006 Bethel Hospital	Gen	IA	70	32	6	32	306
Cordova 013 Cordova General Hospital	Gen	Indiv	30	17	4	23	211
Fairbanks 2100 St. Joseph's Hospital	Gen	Church	55	41	8	139	1200
Fort Yukon 24 Hudson Stuck Memorial Hospital	Gen	Church	40	16	4	20	222
Haines 307 Station Hospital	Gen	Army	10	7	1	3	141
Juneau 5729 St. Ann's Hospital	Gen	Church	60	32	11	100	1013
United States Hospital for Natives	Gen	IA	53		8		
Kanikank 21 Kanikank Native Hospital	Gen	IA	71	15	6	32	109
Ketchikan 1000 Ketchikan General Hospital	Gen	Church	60		10		
Kodiak 561 Contractors Hospital	Gen	Indiv	42	19	5	16	91
Griffin Memorial Hospital	Gen	Ter	15	8	6	40	307
Kotzebue 502 Kotzebue Hospital	Gen	IA	17	11	1	1	101
Mountain Village 100 Mountain Village Hospital	Gen	IA	10			2	
Nome 1009 Maynard Columbus Hospital	Gen	Church	22			3	
Palmer 100 Matanuska Valley Hospital	Gen	Church	20			4	50
Petersburg 1027 Petersburg General Hospital	Gen	City	10	5	4	34	221
St. Paul Island (Unalaska P. O.) 209 St. Paul Island Hospital	Gen	Fed	10			2	
Seldovia 410 Seldovia Hospital	Gen	Ter	7	3	3	5	100
Seward 010 Seward General Hospital	Gen	Church	70	19	4	50	690
Sitka 1057 Pioneers Home Hospital	Inst	Ter	45				
Skagway 674 White Pass Hospital	Gen	NPAasn	10			2	
Tanana 170 Tanana Hospital	Gen	IA	20			6	
Valdez 500 Valdez Community Hospital	Gen	NPAasn	17	11	4	4	96
Wrangell 1162 Bishop Rowe General Hosp	Gen	Church	14			3	
CANAL ZONE							
Hospitals Sanatoriums and Related Institutions	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Ancon 1010 Gorkas Hospital	Gen	Fed	1310	724	48	833	20064
Balboa 3022 Palo Verde Leper Colony	Lepr	Fed	140	119			3
Station Hospital	Gen	Army	35				
Corozal 1370 Corozal Hospital	Ment	Inst	44	333			490
Station Hospital	Gen	Army	47	33			1006
Cristobal 800 Colon Hospital	Gen	Fed	114	100	16	438	5003
Fort Randolph (Coco Solo P. O.) 1801 Station Hospital	Gen	Army	20	17			1060

Key to symbols and abbreviations is on page 1027

## CANAL ZONE—Continued

Hospitals Sanatoriums and Related Institutions	Type of Service	Ownership or Control	Beds	Average Census †	Inpatients	Number of Births	Admissions †
Fort Sherman, 1 329 Station Hospital	Gen	Army	30	53		1 290	
Fort William D Davis, 3 902 Station Hospital	Gen	Army	60	52		2 345	

## HAWAII

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Inpatients	Number of Births	Admissions †
Aiea, 3 553—Honolulu	Gen	NPAsen	37	23	4	32	1 256
Aiea Hospital							
Eleele 312—Kauai	Gen	NPAsen	36	30	6	132	912
McClyde Sugar Company's Hospital							
Ewa, 3 570—Honolulu	Gen	NPAsen	48	21	6	79	791
Ewa Plantation Company Hospital							
Haina, —Hawaii	Gen	NPAsen	40	10	4	33	257
Honokaa Sugar Company Hospital							
Hakalau, 525—Hawaii	Gen	NPAsen	28	29	3	30	400
Hakalau Plantation Hospital							
Hana, 293—Maui	Gen	County	36		4		
Hana County Hospital							
Hanapepe 1 083—Kauai	Gen	Indiv	12	6	2	40	336
Betuel Hospital							
Hilo 23 351—Hawaii	Gen	County	140	77	18	336	2 549
Hilo Memorial Hospital	Gen	Indiv	42	0	0	18	218
Dr Z Matayoshi Hospital	TB	County	176	100			117
Puunene Home							
Honokaa 1 069—Hawaii	Gen	Indiv	6	2	3	22	50
Okada Hospital							
Honolulu 179 339—Honolulu	Lepro Ter		140				
Kahili Hospital							
Kapiolani Maternity and Gynecological Hospital	MatGyn	NPAsen	50	58	50	2 000	2 562
Kaulaolani Children's Hosp	Chil	NPAsen	75	54			3 216
Leahi Hospital	TB	NPAsen	490	419			428
Queen's Hospital	Gen	NPAsen	310	300	40	1 401	11 175
St Francis Hospital	Gen	Church	90	92	16	363	3 400
Shriners Hospital for Crippled Children	Orth	NPAsen	28	23			72
Tripler General Hospital	Gen	Army	407	270	10	105	4 242
Honolulu, —Maui							
Robert W Shingle Jr, Memorial Hospital	Gen	Church	19	9	8	52	399
Kahuku 1 503—Honolulu	Gen	NPAsen	30	14	6	100	635
Kahuku Hospital							
Kalaupapa —Kalaupapa	Lepro Ter		510	339	2	2	37
Kalaupapa Settlement							
Kaneohe 112—Honolulu	Ment	Ter	1 130	953			332
Territorial Hospital							
Kapaa 2 828—Kauai	TB	County	120	97			60
Samuel Mabelona Memorial Hospital							
Kealahou 300—Hawaii	Gen	County	50	29	7	110	409
Kona Hospital							
Kilauea 1 232—Kauai	Gen	NPAsen	20	10	5	28	30
Kilauea Hospital							
Kohala 720—Hawaii	Gen	County	50	14	6	104	505
Kohala County Hospital							
Kofoa 1 644—Kauai	Gen	NPAsen	20	9	3	48	2 8
Koloa Sugar Company Hospital							
Kula (Waiakoa P O) 20—Maui	Gen	County	23	12	3	38	201
Kula General Hospital	TB	County	203	149			8
Kula Sanatorium							
Lahaina 5 217—Maui	Gen	NPAsen	60	34	9	118	1 134
Pioneer Mill Company's Hospital							
Lanai City 3 597—Maui	Gen	NPAsen	22	11	5	53	374
Lanai City Hospital							
Lihue 4 272—Kauai	Gen	NPAsen	94	30	11	259	1 331
G N Wilcox Memorial Hospital							
Maunaloa —Maui	Gen	NPAsen	19	2	5	23	233
Maunaloa Hospital							
Olaa 597—Hawaii	Gen	NPAsen	37	22	6	117	1 018
Olaa Hospital							
Ookala 576—Hawaii	Gen	NPAsen	10			4	
Ookala Hospital							
Panauilo 1 233—Hawaii	Gen	NPAsen	11	4	2	23	131
Hamakua Mill Company Hospital							
Pahala 290—Hawaii	Gen	NPAsen	30	14	6	99	636
Hawaiian Agricultural Company Hospital							
Pala 4 242—Maui	Gen	NPAsen	102		10		
Maui Agricultural Company's Hospital							
Papaaloa 73—Hawaii	Gen	NPAsen	17	8	4	20	261
Laupahoehoe Sugar Company Hospital							
Pearl City 1 071—Honolulu	MeDe	Ter	391	384			42
Walman Home for Feeble minded Persons							
Pearl Harbor 200—Honolulu	Gen	Navy	178	140			3 389
U S Naval Hospital							
Pepeekeo 570—Hawaii	Gen	NPAsen	41	21	4	86	1 150
Pepeekeo Hospital							
Puunene 4 456—Maui	Gen	NPAsen	150	33	29	202	2 112
Puunene Hospital	O	4 240—Honolulu	530	300	13	100	6 271
Schofield Barracks (Honolulu P Station Hospital)	Gen	Army					

## HAWAII—Continued

Hospitals Sanatoriums and Related Institutions	Type of Service	Ownership or Control	Beds	Average Census †	Inpatients	Number of Births	Admissions †
Wahiawa 5 420—Honolulu	Gen	Indiv	9	4	3	61	221
Mack Hospital							
Wahiawa 2 532—Honolulu	Gen	NPAsen	40	12	6	118	561
Wahiawa Agricultural Company Ltd Hospital							
Wailuku 7 319—Maui	Gen	County	121	80	8		1,855
Malulani Hospital							
Waimae 2 091—Kauai	Gen	NPAsen	38	30	6	83	866
Waimae Hospital							
Waipahu 6 906—Honolulu	Gen	NPAsen	53	80	10	288	1 236
Oahu Sugar Company Hosp	Gen	Indiv	7	4	3	96	190
Tamura Hospital							

## PUERTO RICO

Hospitals Sanatoriums and Related Institutions	Type of Service	Ownership or Control	Beds	Average Census †	Inpatients	Number of Births	Admissions †
Arecibo 22 132—Arecibo	Gen	Indiv	124				
Clinica Dr Susoni							
Bayamon 14 006—San Juan	Gen	Gov t	308		35		
Bayamon Charity District Hospital							
Caguas 24 378—Guayama	Gen	Indiv	65		4		
Clinica San Rafael							
Cayey 5 622—Guayama	Gen	Indiv	40	38			650
Clinica Font							
Central Aguirre —Guayama	Gen	NPAsen	38	21	4	20	831
Central Aguirre Hospital							
Fajardo 7 108—Humacao	Gen	NPAsen	30	6		8	810
Coombs Hospital							
Fajardo Charity District Hospital	Gen	Gov t	300		35		
Guayama 16 910—Guayama	TB	Gov t	100	103			236
Tuberculosis Hospital							
Humacao 7 624—Humacao	Gen	Part	47	21	5	36	893
Clinica Oriente							
Ryder Memorial Hospital	Gen	Church	52	35	8	92	1 211
Jayuya 1 808—Ponce							
Catalina Figueras Memorial Hospital	Gen	City	15				
Juana Diaz 3 931—Ponce	Gen	City	40		6		
Municipal Hospital							
Mayaguez 50 371—Mayaguez	Gen	Indiv	100	23	10	16	598
Clinica Betances							
Mayaguez and Western Polyclinic	Gen	Part	100		3		
Tuberculosis Hospital	TB	Gov t	200				
Ponce 60 179—Ponce	Gen	NPAsen	198		10		
Clinica Quirurgica Dr Pila							
Hospital Municipal Valentin Tricoche	Gen	City	150	150	12	278	3 500
Hospital Santo Asilo de Damas	Gen	Church	120	77	20	92	3 241
Insular Blind Asylum	Inst	State	110				
St Luke's Memorial Hosp	Gen	Church	50	40	12		2 033
Tuberculosis Hospital and Center	TB	Gov t	312	309			502
Rio Piedras 19 033—San Juan	Gen	NPAsen	150	120			
Clinica Dr M Julia	Gen	NPAsen	150				
Insular Leprosy Colony	Lepro	Gov t	80				
Insular Tuberculosis Sanatorium	TB	Gov t	546				
Psychiatric Hospital of Puerto Rico	Ment	Gov t	1 200				
Sanatorio de la Sociedad Espanola de Auxilio Mutuo y Beneficencia de Puerto Rico	Gen	NPAsen	120	86	20	156	1 575
Salinas 3 176—Guayama	Gen	City	46		6		
Hospital Municipal							
San Juan 169 205—San Juan	Gen	City	406		60		
Capital City Hospital	Gen	Indiv	160	54	5		501
Clinica Miramar	Gen	Corp	120	69	16	143	1 900
Hospital San Jose	Gen	Corp	80	57	6	44	
Hospital Diaz Garcia							
Ophthalmic Institute of Puerto Rico	Eye	Corp	60	37			1 548
Presbyterian Hospital	Gen	Church	120	106	21	653	3 069
Station Hospital	Gen	Army	150	70	2	8	900
University Hospital of the School of Tropical Medicine	Gen	Gov t	50	45	2		431
Sancture —San Juan	Gen	Indiv	100	51	15	51	672
Hospital Mimya							
Utua 4 400—Arecibo	Gen	Indiv	70	51	3		1 142
Clinica San Miguel							
Yauco 9 050—Mayaguez	Gen	Indiv	22	2	1	2	53
Clinica El Amparo							

## VIRGIN ISLANDS

Hospitals Sanatoriums and Related Institutions	Type of Service	Ownership or Control	Beds	Average Census †	Inpatients	Number of Births	Admissions †
Charlotte Amalie 9 501—St Thomas Island	Gen	CyCo	100	63	12	196	1 257
Municipal Hospital							
Christiansted 4 400—St Croix Island	Gen	City	64		14		
Christiansted Municipal Hosp							
St Croix Hospital for Leprosy	Lepro	City	92				
Frederiksted 2 400—St Croix Island	Gen	City	65	35	13	112	1 000
Frederiksted Municipal Hosp							



## SCHOOLS OF OCCUPATIONAL THERAPY

At the 1933 Session of the House of Delegates of the American Medical Association a resolution was introduced that some plans be effected for the establishment of standards, ratings and inspections of training schools in occupational therapy. This program was referred to the Council on Medical Education and Hospitals, and all of the 13 existing schools were surveyed. The Essentials of an Acceptable School of Occupational Therapy were ratified by the House of Delegates of the American Medical Association at the Atlantic City Session in 1935, such standards to become effective on Jan. 1, 1939. A report of the Council on Medical Education and Hospitals to the House of Delegates in 1936 contained the names of 4 schools which had already met these standards. There are currently 7 schools on the approved list.

Occupational therapy is now accepted and used in the leading hospitals of this country as an established adjunct of medical treatment. The occupational therapist is trained to work under the direction of a physician and should be capable of planning and coordinating programs designed to recreate specific functions and to aid in the restoration of impaired functions. Additional uses of occupational therapy are found in the field of mental therapy and in the complete care of tuberculous patients.

Reports from the approved schools indicate that 146 students were graduated last year. Apparently 157 are expected to graduate during the calendar year of 1943. It is impossible at this time to estimate the needs for occupational therapists within any degree of certainty, but it is generally conceded that the demand will materially increase in the near future. For several years it has been reported that available positions in civilian hospitals exceed the number of graduates each year. With the increased use of occupational therapy

to assist in the restoration of functions in many of the injured personnel of the armed forces, it is thought that there will be a corresponding increase in the use of occupational therapy in civilian hospitals after the war.

Applications for approval of occupational therapy curriculums have recently been received from several additional educational institutions. If these courses are found to be acceptable, it is likely that the number of approved schools will be doubled within the next year. Senior students are already being trained in these schools or will be enrolled next year. This will greatly increase the annual number of occupational therapy graduates in the United States.

Prerequisites for enrollment in the approved schools vary considerably with the length of the training program. Five schools will admit students directly from high school, but the required course extends over a period of four or five years and includes all the prerequisites for admission to approved schools. Otherwise the minimum prerequisite is one year of college work, while the minimum length of training is twenty-seven months. Six of the schools grant a diploma when the student graduates, while 5 can offer a bachelor's degree in occupational therapy if proper courses are followed. Only 2 of the schools admit male students in their regular classes. The annual tuition varies from \$70 to \$400.

Correspondence regarding schools training occupational therapy technicians should be addressed to the office of the Council on Medical Education and Hospitals. Graduates of approved schools desiring registration should communicate with the American Occupational Therapy Association, 175 Fifth Avenue, New York City.

## APPROVED SCHOOLS OF OCCUPATIONAL THERAPY

## Council on Medical Education and Hospitals of the American Medical Association

Name and Location of School	College Affiliation	Duration of Course	Classes Start	Entrance Requirements	Tuition per Year	Certificate Diploma Degree	Graduates in 1942
Boston School of Occupational Therapy, 7 Hancock St. Boston	None	5 yrs	Sept	1 yr coll	\$300	Diploma	25
Kalamazoo State Hospital School of Occupational Therapy, Kalamazoo, Mich.	Western Michigan College of Education	27 mos 6 yrs	1st Oct 1st Oct	1 yr coll High Sch	\$0 \$0	Diploma B.S.	10
St. Louis School of Occupational and Recreational Therapy, 467 Scott Ave. St. Louis	Washington University	27 mos 40 mos	1st Sept 1st Sept	2 yr coll High Sch	\$50 Univ. fees	Diploma Degree	9
Washington Square College, New York University, New York City	New York University	3 yrs 4 yr	1st Sept 1st Sept	1 yr coll High Sch	Univ. fees	Certificate Degree	
Philadelphia School of Occupational Therapy, 419 S. 19th St. Philadelphia	University of Pennsylvania	2 yrs 3 yrs 5 yrs	Feb June 1st June Feb June	Degree 1 yr coll High Sch	\$50 \$250 \$400	Diploma Diploma B.S.	21
Milwaukee Downer College, Dept. of Occupational Therapy, 2019 E. Hartford Ave. Milwaukee	Milwaukee Downer College	3 yrs 5 yrs	Sept Sept	1 yr coll High Sch	\$200 \$230	Diploma B.S.	8 9
University of Toronto, Dept. of Univ. Extension, Toronto, Ont., Canada	University of Toronto	2½ yrs	Sept	1 yr coll	\$175	Diploma	55

## SCHOOLS FOR PHYSICAL THERAPY TECHNICIANS

The House of Delegates of the American Medical Association in 1934 requested that some plan be effected for the establishment of standards, ratings and inspections of schools for the training of physical therapy technicians. The Council on Medical Education and Hospitals assumed responsibility for this program and by 1936 had completed a survey of these schools. Certain minimum standards were formulated. These were presented to the House of Delegates of the American Medical Association and were ratified in May 1936. The first published list of 13 approved schools for physical therapy technicians appeared in THE JOURNAL in August 1936. At present there are 22 approved schools.

Emergency curriculums continue to offer intensive instruction in all the required subjects with only a minimum of experience in applying the various techniques. These courses are six months in length and involve approximately eight hundred hours of instruction in basic subjects and two hundred hours of practice. Following these courses the student is qualified to work under the direction of a recognized physical therapist in the Army. On completion of six months of supervised Army experience the student is eligible for graduation.

Recently the status of physical therapists in the Army has been defined by Congress, and they are given rank and grade similar to the nurses and dietitians. Nevertheless it is still possible to fill government positions

in the field of physical therapy through U S Civil Service appointments. Information on this subject can be obtained from any first or second class post office. In addition, positions are available in the women's corps of the armed forces such as the Waacs and the Waves.

It is understood that the Navy will need many physical therapists during the current year. Civilian hospital needs have not been met during the last few years, and after the war there will undoubtedly be greatly increased demands for physical therapists in both governmental and civilian hospitals.

Statistics for the calendar year of 1942 disclose that 352 students can be trained in the regular courses and 175 can be trained every six months in the emergency courses. A total of 426 students were graduated from the approved schools in 1942. One hundred and ninety-nine of these graduates were enrolled in the emergency courses.

During the last year there has been an increase in the number of schools that charge no tuition. This arrangement has been made possible in certain institutions which consider the time, effort and use of facilities in presenting these courses as part of their war contribution. In the schools which charge tuition the fees range from \$96 to \$435 for the regular course and from \$96 to \$420 for the emergency course. The mean tuition for either course is \$200.

## APPROVED SCHOOLS FOR PHYSICAL THERAPY TECHNICIANS

Council on Medical Education and Hospitals of the American Medical Association

Name and Location of School	Entrance Requirements *	Emergency Course				Regular Course			
		Length in Months	Classes Start	Tuition	Certificate, Degree, Diploma	Length in Months	Classes Start	Tuition	Certificate, Degree, Diploma
Children's Hospital, Los Angeles <sup>1</sup>	a b c	6	Feb-Aug	\$200	Certificate	12	Feb-Aug	\$200	Diploma
College of Medical Evangelists, Los Angeles <sup>1</sup>	a b c					12	Jan-July	\$200	Certificate
University of California Hospital, San Francisco <sup>1</sup>	a b c					12	Feb	\$150	Certificate
Stanford University, Stanford University, Calif <sup>1</sup>	a b d	7	Quart	\$256	Certificate	10	Quart	\$401	Cert. or Degree
Walter Reed General Hospital, Washington, D C	b	6	Quart	None	Certificate				
Northwestern University Medical School, Chicago	a b d					9	July-Oct	\$700	Certificate
State University of Iowa Medical School, Iowa City	b c	6	Mar-Sept	None	Certificate				
Bouvé Boston School of Physical Education, Boston	HS	Given in conjunction with Harvard				2-4 yrs	Sept	\$400 yr	Dipl. or Degree
Harvard Medical School, Boston	a b c	6	June	\$200	Certificate	9	June	\$250	Certificate
Boston University Sargent College of Physical Education, Cambridge, Mass	a b c					24	Jan-Oct	\$435 yr	Cert. & Degree
University of Minnesota, Minneapolis <sup>1</sup>	a b c <sup>2</sup>					12	Summer	\$112 <sup>1</sup>	Certificate
Mayo Clinic, Rochester, Minn <sup>1</sup>	a b c	6	Jan-July	None	Certificate	12	Jan-July	None	Certificate
Barnes Hospital, St. Louis	a b c					9	Oct	\$200	Certificate
St. Louis University School of Nursing, St. Louis <sup>1</sup>	HS					4 yrs	Jan-Sept	\$250 yr	Cert. or Degree
University of Buffalo School of Nursing, Buffalo <sup>1</sup>	a b c	6	Feb-Sept	\$420	Certificate	13 yrs	Feb-Sept	\$750	Cert. or Degree
Hospital for Special Surgery, New York City <sup>1</sup>	a b c	6	Jan-July	500	Diploma	9	Sept	\$700	Diploma
New York University, New York City <sup>1</sup>	a b c					9	Feb-Sept	\$770	Cert. & Degree
Cleveland Clinic Foundation Hospital, Cleveland	a b c					9	Sept	None	Certificate
D T Watson School of Physiotherapy, Leedsdale, Pa <sup>1</sup>	a b c	6	Jan-July	\$200	Diploma	12	July	\$200	Diploma
Graduate Hosp of the Univ of Pennsylvania, Philadelphia <sup>1</sup>	a b c					12	Sept	\$200	Certificate
Richmond Professional Institute, Richmond, Va	a d					9-12	Sept	\$200-220	Certificate
University of Wisconsin Medical School, Madison <sup>1</sup>	a b	6	Feb-Sept	\$96 <sup>1</sup>	Certificate	12	Sept	\$76 <sup>1</sup>	Certificate

\* Courses are so arranged that any of the entrance requirements will qualify students for training: a = Graduation from accredited school of nursing; b = Graduation from accredited school of physical education; c = Two years of college with science courses; d = Three years of college with science courses; HS = High school graduation.  
<sup>1</sup> Male students are admitted.

<sup>2</sup> High school graduates accepted for a four year course leading to a B.S. degree; students admitted quarterly and tuition is \$12<sup>1</sup> per quarter.  
<sup>3</sup> Medical technology graduates with B.S. degree also admitted.  
<sup>4</sup> Non-residents charged additional fee.  
<sup>5</sup> Those with degree from other colleges also accepted.

## SCHOOLS FOR MEDICAL RECORD LIBRARIANS

Recently the American Association of Medical Record Librarians requested that the American Medical Association assume the responsibility of approving schools for medical record librarians. A resolution to this effect was presented to the House of Delegates of the American Medical Association at the 1942 session. This resolution has been acted on and the Council on Medical Education and Hospitals has been delegated the responsibility of establishing standards and of inspecting and publishing lists of approved schools. In an effort to fulfil this request, each of the schools previously approved by the American Asso-

ciation of Medical Record Librarians has been visited and minimum Essentials have been prepared. These standards will be presented to the House of Delegates of the American Medical Association at its next session. After official acceptance of the Essentials, the list of schools meeting the requirements can be published and new applications can be received. Graduate medical record librarians desiring registration should communicate with the Board of Registry of the American Association of Medical Record Librarians, St. Luke's Hospital, Milwaukee, Wis.

## SCHOOLS FOR CLINICAL LABORATORY TECHNICIANS

The original survey of 196 schools for clinical laboratory technicians was published in *THE JOURNAL*, Aug. 29, 1936 together with the first list of 96 approved schools. Essentials had been formulated by the Council on Medical Education and Hospitals of the American Medical Association with the cooperation of the American Society of Clinical Pathologists and ratified by the House of Delegates of the American Medical Association in May 1936.

Last year 53 schools for clinical laboratory technicians were approved by the Council, resulting in a total of 227 approved schools. All of these approved schools are associated with hospitals providing adequate supervision as well as an adequate amount of teaching material to insure the students a wide scope of experience and training. Only 50 of the schools have a maximum enrolment of 10 or more students.

The 1,008 graduates reported for 1942 represent an increase of only 91 students over the previous year, even though a large number of schools were added to the approved list. Actually there was a decrease in the average number of graduates and students per school. The reader is referred to page 1020, where a table compares the number of technicians employed in 1941 with those employed in 1942. This indicates that a definite increase in the demand for technicians has been prevalent, while information from other sources points to a continued demand. Numbers of qualified technicians have been withdrawn from the hospitals and placed in defense industries, while the Waves and the Waacs are enlisting many technicians for the armed forces. With such a small increase in the number of graduates from approved schools in the face of an apparent continued demand for technicians it is thought that every justifiable effort should be made to increase the number of students during the current year.

In view of the fact that the demand for technicians is increasing, the Council has recommended that the ratio of students to instructors be increased to a maximum of two students for each instructor. The continued efficiency of the practical instruction is made possible by reliance on the prerequisite college training which forms a background for the understanding of tests used in the hospital laboratory. By increasing the maximum

number of students actually trained in each laboratory, it is believed that an adequate supply of clinical laboratory technicians will be available for civilian needs. If a sizable number of technicians is withdrawn from civilian positions for the armed services it is thought that additional efforts should be made to increase the number of students in each of the approved schools. Most of the schools located in areas employing large numbers of defense workers find it difficult to maintain their usual number of students. This condition makes it necessary for the other schools to exert more energy in obtaining and training a larger class if the demand for technicians is to be relieved.

Sixty-four per cent of the approved schools require two years of preliminary college training for entrance. Several require three years of college training, while 15 per cent require a degree from an acceptable college. The two schools admitting students directly from high school are affiliated with colleges and require a training period of four or five years, which includes all the prerequisites for admission to an approved school.

The length of the training program in the hospital laboratories is twelve months in 80 per cent of the schools. Other programs range from thirteen to twenty-four months in duration.

One hundred and five of the schools report that affiliations have been made with accredited colleges. In 77 instances these affiliations permit the student to receive college credit for the time devoted to the hospital training of the student technician. This credit ranges from one-half semester to two years, but the majority of the affiliations result in a complete year of college credit.

Although the tuition varies from nothing to \$300, 54 per cent of the schools charge no tuition. The average tuition is \$49, while only 15 per cent of the schools charge a tuition of more than \$150.

Correspondence regarding schools for the training of clinical laboratory technicians should be addressed to the office of the Council on Medical Education and Hospitals. Graduates of approved schools desiring registration should communicate with the Board of Registry of Medical Technologists, Ball Memorial Hospital, Muncie, Ind.

## APPROVED SCHOOLS FOR CLINICAL LABORATORY TECHNICIANS

Council on Medical Education and Hospitals of the American Medical Association

NOTE Under "Tuition" the letter B indicates that a breakage fee is charged the letter U indicates university fees Degrees mentioned in last column are granted by affiliated colleges and universities  
Students lacking the scholastic requirements should contact the registrar of the college or university and not the hospital Those who wish to enroll in a course given by the college or university or who desire to transfer their credits should correspond with the registrar and not the hospital

Name and Location of School	College Affiliation	College Credit Obtained at Hospital	Minimum Pre- requisite College Training	Length of Train- ing in Months	Minimum Enrollment	Classes Be- gin	Tuition	Certificate Dip, rec
<b>ALABAMA</b>								
Hillman Hospital Birmingham *			Degree	18	4	July/Sept	None	Certificate
South Highlands Infirmary Birmingham			2 yrs	17	4	Varies	None	Certificate
St Margaret's Hospital, Montgomery *	Alabama College	17 sem hrs	Degree	12	2	July	None	Certificate
<b>ARIZONA</b>								
St Joseph's Hospital, Phoenix *	Arizona State Teachers College	32 sem hrs	2 yrs	12	4	July	\$125	A B
<b>ARKANSAS</b>								
University Hospital, Little Rock *	Univ. of Arkansas School of Med	63 1/2 quart hrs	23 yrs	12	4	Sept	\$100	Cert or A B
<b>CALIFORNIA</b>								
Children's Hospital Los Angeles			Degree	12	4	Feb/July	None	Diploma
Los Angeles County Hospital, Los Angeles *			Varies	15	15	Varies	B	Certificate
White Memorial Hospital Los Angeles *	College of Medical Evangelists	32 sem hrs	2 yrs	12	8	Aug	\$100	Certificate
Collis P. and Howard Huntington Memorial Hospital, Pasadena			Degree	12	8	July	B	Certificate
Mary's Help Hospital, San Francisco			2 yrs	12	2	Varies	B	Certificate
Vt Zion Hospital, San Francisco *			Degree	12	6	Quart	None	Certificate
Univ. of California Hospital, San Francisco *	University of California	None	3 yrs	12	15	Varies	None	Certificate
<b>COLORADO</b>								
Colorado General Hospital, Denver *	University of Colorado	45 quart hrs	3 yrs	12	16	Summer	\$270	B S
Denver General Hospital, Denver			2 yrs	12	6	Jan/July	None	Certificate
Mercy Hospital Denver *	University of Denver	45 quart hrs	3 yrs	12	1	Quart	B	B S
St Anthony's Hospital Denver *	University of Denver	45 quart hrs	3 yrs	12	2	Quart	B	B S
St Joseph's Hospital, Denver	St Mary College (Xavier Kan.)	None	2 yrs	12	2	June	None	Certificate
<b>CONNECTICUT</b>								
New Britain General Hospital, New Britain			Degree	12	3	July	None	Diploma
Waterbury Hospital, Waterbury *			2 yrs	12	2	Oct	\$75	Certificate
<b>DISTRICT OF COLUMBIA</b>								
Doctors Hospital, Washington *	George Washington University	None	2 yrs	12	4	Varies	None	Certificate
Garfield Memorial Hospital Washington *			2 yrs	12	8	Quart	None	Certificate
George Washington Univ Hosp., Washington	George Washington University	None	2 yrs	12	6	Quart	None	Certificate
Providence Hospital, Washington			2 yrs	12	6	Varies	None	Certificate
Sibley Memorial Hospital, Washington *	American University	12 sem hrs	2 yrs	12	4	Varies	None	Certificate
<b>FLORIDA</b>								
Florida State Hospital Chattahoochee *			1 yrs	12	4	Varies	None	Diploma
James M. Jackson Memorial Hospital Miami *			Degree	12	12	Varies	\$110	Certificate
<b>GEORGIA</b>								
Crawford W. Long Memorial Hospital Atlanta	Emory University	None	2 yrs	12	3	Varies	\$50	Certificate
Georgia Baptist Hospital Atlanta			2 yrs	12	2	Varies	\$100	Certificate
Grady Hospital, Atlanta	Emory University	None	Degree	12	14	Quart	\$70	Certificate
Piedmont Hospital Atlanta	Emory University	None	Degree	12	4	Jan/June	None	Certificate
University Hospital Augusta *	Univ. of Georgia School of Med	None	Degree	12	2	Varies	\$100	Certificate
Emory University Hospital Emory University *	Emory University	None	Degree	12	18	8	\$225 B	Degree
<b>ILLINOIS</b>								
City of Chicago Municipal Tuberculosis Sanatorium Chicago *			2 yrs	12	1	Quart	B	Certificate
Michael Reese Hospital Chicago			2 yrs	12	14	Monthly	\$100	Certificate
Mt. Sinai Hospital Chicago *			2 yrs	12	18	Varies	\$100 B	Diploma
Northwestern University Medical School Chicago	Northwestern Univ. Medical School	6 quart hrs *	2 yrs	12	12	Monthly	\$0	Certificate
Provident Hospital Chicago *			2 yrs	12	2	Oct	\$100	Certificate
St. Bernard's Hospital Chicago *			2 yrs	12	8	Sept	\$200 B	Certificate
Evanston Hospital Evanston			Degree	12	4	Jan/July	\$50	Certificate
Methodist Hospital of Central Illinois Peoria			2 yrs	12	3	Varies	\$50 B	Certificate
St. Francis Hospital Peoria *			2 yrs	12	7	Sept	\$100 B	Diploma
Rockford Memorial Hospital Rockford *			2 yr	12	3	July	None	None
St. Anthony's Hospital Rockford *			2 yrs	18	6	Varies	\$25	Certificate
St. John's Hospital Springfield			2 yrs	12	6	Sept	\$50	Certificate
St. Theresa's Hospital Waukegan			2 yrs	12	4	Sept	\$100 B	Diploma
<b>INDIANA</b>								
Indiana Univ. Medical Center Indianapolis *	Indiana University	*	2 yrs	12	18	May	None	Diploma
Methodist Hospital Indianapolis *	Butler University	30 sem hrs	2 yrs	12	24	Feb/June	None	Certificate
St. Elizabeth's Hospital Lafayette			2 yrs	12	6	Varies	None	Certificate
South Bend Medical Laboratory, South Bend			2 yrs	18	2	Jan/Sept	\$125	None
<b>IOWA</b>								
Mercy Hospital Cedar Rapids			2 yrs	12	2	Feb/July	None	Diploma
St. Joseph Mercy Hospital Sioux City			Degree	12	4	Sept	B	Diploma
<b>KANSAS</b>								
Bethany Hospital, Kansas City			Degree	12	7	Feb/July	None	Certificate
Providence Hospital Kansas City			Degree	12	2	July	None	Certificate
University of Kansas Hospitals Kansas City *	Univ. of Kansas Graduate School	8 sem hrs	Degree	12	18	Jan/July	None	Certificate
St. Francis Hospital, Wichita	University of Wichita	None	2 yrs	12	12	Feb/Sept	\$150	Diploma
Wichita Hospital Wichita *			2 yrs	12	6	Varies	\$100 B	Certificate
<b>KENTUCKY</b>								
Good Samaritan Hospital, Lexington *	University of Kentucky	51 quart hrs	3 yrs coll	22	20	Quart	U	B S
St. Joseph's Hospital, Lexington			2 yrs	12	4	Jan/Sept	\$100 B	Certificate
Kentucky State Dept. of Health Laboratory Louisville *			2 yrs	12	25	Sept	\$200 B	Diploma
Norton Memorial Infirmary Louisville *			2 yrs	12	3	Varies	\$150	Certificate
St. Joseph Infirmary Louisville *	Nazareth College	16 sem hrs	2 yrs	12	4	Sept	\$50	B S
SS Mary and Elizabeth Hospital Louisville *	Nazareth College	18 sem hrs	3 1/2 yrs	12	6	July/Sept	\$120	B S
<b>LOUISIANA</b>								
Charity Hospital New Orleans *			Degree	12	15	Monthly	None	None
Hotel Dieu Sisters Hospital New Orleans *	Loyola University	None	Degree	12	4	June/July	None	None
Mary Hospital-Soulat Memorial New Orleans *	Loyola University	None	Degree	12	2	Varies	None	None
T. E. Schumpert Memorial Sanit. Shreveport *			2 yrs	12	3	Feb/Sept	\$50	Certificate
Shreveport Charity Hospital Shreveport *			2 yrs	12	4	June/Sept	None	Certificate
<b>MAINE</b>								
Central Maine General Hospital Lewiston			Degree	12	12	Quart	\$100	None
Maine General Hospital Portland			2 yrs	12	6	June	B	Certificate

## APPROVED SCHOOLS FOR CLINICAL LABORATORY TECHNICIANS—Continued

Name and Location of School	College Affiliation	College Credit Obtained at Hospital	Minimum Pre-requisite College Training	Length of Training in Months	Maximum Enrollment	Classes Begin	Tuition	Certificate Diploma Degree	
MARYLAND									
Mercy Hospital Baltimore			2 yrs	18	14	Sept	\$200	Certificate	
St Joseph's Hospital Baltimore	Coll. of Notre Dame of Maryland		Degree	12	6	June	B	None	
MASSACHUSETTS									
Faulkner Hospital Boston	Simmons College	22 sem hrs	Degree	12	2	Feb/Sept	\$220	Certificate	
Massachusetts Memorial Hospital, Boston			2 yrs	12	6	Quart	None	Certificate	
New England Hospital for Women and Children Boston			2 yrs	12	2	July/Sept	B	None	
Mercy Hospital Springfield			2 yrs	12	2	Quart	B	Certificate	
Taunton State Hospital Taunton			2 yrs	12	4	July	None	Certificate	
Tewksbury State Hospital and Infirmary Tewksbury			2 yrs	12	2	Varies	None	Certificate	
Worcester City Hospital, Worcester			2 yr	12	6	Varies	None	Diploma	
Worcester State Hospital Worcester			2 yrs	12	4	Jan/July	None	Certificate	
MICHIGAN									
Leila Y. Post Montgomery Hosp. Battle Creek			Degree	12	4	Varies	B	Certificate	
Mercy Hospital Bay City			2 yrs	12	2	Quart	\$100	Certificate	
Chas. Godwin Jennings Hospital Detroit	Wayne University	20 sem hrs	2 yrs	12	2	Varies	U	Dipl. & B. S.	
City of Detroit Receiving Hospital Detroit	Wayne University	20 sem hrs	2 yrs	12	12	July	\$100	Diploma	
Grace Hospital Detroit	Wayne University	20 sem hrs	2 yrs	12	14	Quart	\$100	Certificate	
Henry Ford Hospital Detroit	Wayne University Graduate School	20 sem hrs	Degree	18	10	Varies	None	Cert. & M. S.	
Mt. Carmel Mercy Hospital Detroit			2 yr	12	2	Varies	\$50	Certificate	
Providence Hospital Detroit	Wayne University	20 sem hrs	2 yrs	12	12	Varies	\$100	Diploma	
St. Mary's Hospital Detroit	Wayne University	20 sem hrs	2 yrs	12	4	Varies	U	Dipl. & B. S.	
Woman's Hospital Detroit	Wayne Univ. or Mich. State Coll.	20 sem hrs	2 yrs	12	10	July	\$100	Cert. & B. S.	
Eloise Hospital Eloise	Univ. of Detroit Wayne Univ. or Michigan State College		2 yrs	12	7	Feb/July	None	Diploma	
Hurley Hospital Flint	Michigan State College	20 quart hrs	2 yrs	12	2	July	None	None	
Blodgett Memorial Hospital Grand Rapids	Michigan State College	20 quart hrs	2 yr	12	2	July	None	B. S.	
Borgess Hospital Kalamazoo			2 yrs	12	4	July/Dce	None	Certificate	
Bronson Methodist Hospital Kalamazoo	Western Mich. Coll. of Education	0 sem hrs	2 yrs	12	4	Varies	None	Dipl. or B. S.	
Edward W. Sparrow Hospital Lansing	Michigan State College	20 quart hrs	2 yrs	12	6	Varies	\$100	Dipl. & B. S.	
Michigan Dept. of Health Bureau of Laboratories Lansing	Michigan State College	50 quart hrs	2 yrs	12	20	Feb/July	B	Degree	
St. Lawrence Hospital Lansing	Michigan State College	50 quart hrs	2 yrs	12	8	Varies	\$100	Dipl. & B. S.	
Port Huron Hospital Port Huron			2 yrs	12	2	Varies	None	Certificate	
Wyandotte General Hospital Wyandotte	Wayne University	20 sem hrs	2 yr	12	2	Varies	\$120	Degree	
MINNESOTA									
St. Luke's Hospital Duluth	Hamline University	28 sem hrs	3 yrs	18	10	Jan/July	None	B. S.	
St. Mary's Hospital Duluth	College of St. Scholastica	20 sem hrs	3 yrs	18	17	1st/July	\$30	Dipl. & B. S.	
Minneapolis General Hospital Minneapolis	University of Minnesota	46 quart hrs	3 yrs	12	18	Varies	None	B. S.	
Northwestern Hospital Minneapolis			2 yrs	12	4	July/Sept	B	Certificate	
Swedish Hospital Minneapolis	Custavus Adolphus College	20 sem hrs	2 yrs	12	8	August	\$15	Cert. & A. B.	
University Hospitals Minneapolis	University of Minnesota	46 quart hrs	2 yrs	12	70	Varies	U	B. S.	
Ancker Hospital St. Paul	University of Minnesota	16 quart hrs	1 yr	12	6	Varies	None	B. S.	
Chas. T. Miller Hospital St. Paul	Macalester College	20 sem hrs	2 yrs	12	8	July	\$110	Cert. & A. B.	
MISSISSIPPI									
Vicksburg Sanitarium Vicksburg			2 yrs	24	10	Varies	B	Certificate	
MISSOURI									
Kansas City General Hospital Kansas City			2 yrs	18	12	Jan/July	None	Certificate	
Kansas City General Hosp. No. 2 Kansas City			2 yrs	18	2	Varies	B	None	
Menorah Hospital Kansas City			2 yrs	12	10	Varies	None	None	
Research Hospital Kansas City			2 yrs	12	10	Varies	None	None	
St. Joseph Hospital Kansas City			Degree	12	12	Varies	B	Certificate	
St. Luke's Hospital Kansas City			2 yrs	12	7	Varies	B	None	
St. Mary's Hospital Kansas City			Degree	12	8	Varies	B	Certificate	
Barnes Hospital St. Louis	Washington Univ. School of Med.	None	2 yrs	12	4	Jan/July	\$50	Certificate	
Firmin Desloge Hospital St. Louis	St. Louis University		4 yrs	12	12	Varies	\$125	Degree	
Homer G. Phillips Hospital St. Louis			2 yrs	18		Varies	None	None	
St. Louis City Hospital St. Louis			2 yrs	12	8	Quart	None	None	
Burge Hospital Springfield	Drury College	20 sem hrs	2 yrs	12	4	June	U	Dipl. & B. S.	
MONTANA									
Murray Hospital Butte	Montana State College or Univ. of Montana		2 yrs	12	4	June	None	Degree	
Columbus Hospital Great Falls	College of Great Falls	40 quart hrs	2 yr	12	2	June/Sept	None	Cert. & Degree	
Montana Deaconess Hospital Great Falls	Montana State College or Univ. of Montana	40 quart hrs	2 yrs	12	3	Jan/June	B	None	
NEBRASKA									
Bryan Memorial Hospital, Lincoln			2 yrs	12	4	Varies	\$50	Diploma	
Lincoln General Hospital Lincoln			2 yrs	12	4	Varies	\$50	Diploma	
Bishop Clarkson Memorial Hospital, Omaha			2 yrs	12	3	Varies	\$75	Certificate	
University of Nebraska Hospital Omaha	Univ. of Nebraska College of Med.	None	2 yrs	12	9	June/Aug	\$50	Certificate	
NEW HAMPSHIRE									
Mary Hitchcock Memorial Hospital, Hanover			2 yrs	12	8	Varies	B	Certificate	
NEW JERSEY									
Newark Beth Israel Hospital Newark	Newark University	22 sem hrs	2 yrs	12	24	10	Varies	U	Dipl. & Degree
NEW YORK									
Bender Hygienic Laboratory Albany			2 yrs	12	12	Sept	\$500	Certificate	
Jewish Hospital Brooklyn			Degree	18	6	Varies	None	Certificate	
Prospect Heights Hospital Brooklyn			2 yrs	12	2	Sept	None	None	
Buffalo General Hospital Buffalo			2 yrs	12	13	Varies	\$50	Certificate	
Edward J. Meyer Memorial Hospital Buffalo	University of Buffalo	24 sem hrs	2 yrs	12	18	Monthly	B	Certificate	
St. Joseph's Hospital Elmira			2 yrs	12	6	1st/Sept	\$50	Certificate	
Meadowbrook Hospital Hempstead	Adelphi College	18 sem hrs	2 yrs	18	2	Varies	None	Certificate	
Mary Immaculate Hospital Jamaica			Degree	12	5	Oct	B	None	
St. John's Long Island City Hospital Long Island City			Degree	12	24	3	Jan/July	None	Certificate
Beth Israel Hospital New York City	New York University	16 sem hrs	3 yrs	12	2	June	U	B. S.	
St. Luke's Hospital New York City	New York University	16 sem hrs	2 yrs	12	2	Varies	None	None	
Rochester General Hospital Rochester			Degree	18	12	Varies	\$500	Certificate	
Ellis Hospital Schenectady	Skidmore College	None	2 yrs	12	10	Varies	\$50	Certificate	
Samaritan Hospital Troy	Russell Sage College	20 sem hrs	3 yrs	12	3	Varies	U	Dipl. & B. S.	
Gracelands Hospital Valhalla	New York University	16 sem hrs	3 yrs	12	2	June	U	B. S.	
NORTH CAROLINA									
Charlotte Memorial Hospital Charlotte			2 yrs	12	3	Jan/July	None	None	
Duke Hospital Durham	Duke University	None	2 yrs	18	20	Varies	B	Certificate	
Watts Hospital Durham	Univ. of North Carolina Med. Sch.	None	2 yrs	12	7	Jan/July	B	Diploma	
North Carolina Baptist Hosp. Winston-Salem	Salem College	30 sem hrs	3 yrs	12	10	July	\$60	Certificate	

APPROVED SCHOOLS FOR CLINICAL LABORATORY TECHNICIANS—Continued

Name and Location of School	College Affiliation	College Credit Obtained at Hospital	Minimum Pre- requisite College Training	Length of Train- ing in Months	Maximum Enrollment	Classes Begin	Tuition	Certificate Diploma Degree
<b>NORTH DAKOTA</b>								
Trinity Hospital Minot			2 yrs	12	6	Sept	B	None
<b>OHIO</b>								
City Hospital Akron			2 yrs	12	4	July	None	Certificate
St Thomas Hospital Akron			2 yrs	12	6	July	None	Certificate
Good Samaritan Hospital Cincinnati	Coll of Mt St Joseph on the Ohio	24 sem hrs	2 yrs	12	6	Mar/Sept	\$250	Cert & BS
Mt Sinai Hospital Cleveland	Western Reserve University	18 sem hrs	2 yrs	12	12	Varies	\$200	Certificate
University Hospital Cleveland	Western Reserve University	18 sem hrs	2 yrs	12	12	June	\$100	Cert & Degree
Mt Carmel Hospital Columbus	Ohio University	16 sem hrs	2 yrs	12	10	Feb/Sept	U	Degree
Starling Loving University Hospital Columbus	Ohio State University	None	2 yrs	12	12	Quart	\$1.0	Certificate
Huron Road Hospital East Cleveland			2 yrs	12	6	Jan/July	\$100	Certificate
Mercy Hospital Toledo			2 yrs	12	6	Jan/Sept	\$50	Certificate
St Vincent's Hospital Toledo	Mary Manse College	None	2 yrs	12	6	Jan/Sept	B	Certificate
Toledo Hospital Toledo	University of Toledo	20 sem hrs	2 yrs	12	4	Feb/July	U & B	Certificate
Youngstown Hospital Youngstown	University of Toledo	20 sem hrs	2 yrs	12	8	Jan/Sept	None	Certificate
<b>OKLAHOMA</b>								
St Anthony's Hospital Oklahoma City			Degree	12	6	Varies	None	None
University Hospital Oklahoma City	Univ of Oklahoma School of Med	None	Degree	12	6	Varies	None	None
<b>OREGON</b>								
Emmanuel Hospital Portland			Degree	12	3	Varies	\$150	Certificate
Good Samaritan Hospital Portland			2 yrs	12	3	Quart	None	None
Portland Sanitarium and Hospital Portland			2 yrs	12	2	Jan/June	None	Certificate
St Vincent's Hospital Portland			2 yrs	12	4	Quart	None	None
University of Oregon Medical School Hospitals and Clinics Portland	University of Oregon Med School	None	2 yrs	12	10	Varies	None	None
<b>PENNSYLVANIA</b>								
Abington Memorial Hospital Abington			2 yr	18	7	Varies	None	Certificate
Allentown Hospital Allentown	Moravian College for Women	24 sem hrs	2 yrs	12	6	July	\$50	None
Sacred Heart Hospital Allentown	Moravian College for Women	24 sem hrs	2 yrs	12	6	Varies	\$50	Certificate
St Luke's Hospital Bethlehem	Moravian College for Women	24 sem hrs	2 yrs	12	6	Varies	\$50	None
Bryn Mawr Hospital Bryn Mawr			2 yrs	12	3	Quart	None	Certificate
Geo F Geisinger Memorial Hospital Danville	Bucknell University	12-17 em hrs	2 yrs	12	6	Feb/July	U	BS or M
Fitzgerald Mercy Hospital Darby			Degree	12	4	Varies	B	Certificate
Faston Hospital Easton	Moravian College for Women	24 sem hrs	2 yrs	12	3	July	None	Degree
Harrisburg Hospital Harrisburg			2 yrs	12	10	Quart	None	Certificate
Mercy Hospital Johnstown			2 yrs	12	2	June	B	Certificate
Germantown Dispensary and Hosp Philadelphia			2 yrs	12	4	Oct	\$100	Certificate
Jefferson Medical College Hospital Philadelphia	Jefferson Medical College	None	2 yrs	12	9	Varies	\$100B	Certificate
Lankenau Hospital Philadelphia			2 yrs	12	2	Feb/Sept	\$50	Certificate
Mt Sinai Hospital Philadelphia			2 yrs	12	3	Varies	\$100B	Certificate
St Joseph's Hospital Philadelphia			2 yrs	12	2	Aug/Sept	\$100B	Certificate
Temple University Hospital Philadelphia	Temple University	60 sem hrs	High Sch 4 yrs	26	Sept	U	B S	Certificate
Montefiore Hospital Pittsburgh			2 yrs	12	4	June	B	Certificate
Reading Hospital Reading	Albright College	16-18 sem hrs	2 yrs	12	4	Sept	\$150	B S
St Joseph's Hospital Reading			2 yrs	12	4	Sept	\$150	Certificate
Moses Taylor Hospital Scranton			2 yrs	12	6	July/Sept	None	Certificate
Scranton State Hospital Scranton			2 yrs	12	10	Varies	None	Certificate
Wilkes Barre General Hospital Wilkes Barre			2 yrs	12	4	Summer	None	Certificate
Williamsport Hospital Williamsport			2 yrs	12	3	Varies	U	Certificate
<b>SOUTH CAROLINA</b>								
Medical College of the State of South Carolina Charleston	Med Coll of State of So Carolina	None	2 yrs	18	12	Varies	None	Certificate
<b>TENNESSEE</b>								
Knoxville General Hospital Knoxville			2 yrs	12	4	July/Dec	B	Certificate
John Gaston Hospital Memphis	Univ of Tennessee Coll of Med	None	2 yrs	12	6	Quart	None	Certificate
St Joseph's Hospital Memphis			2 yrs	12	6	Varies	B	Certificate
Geo W Hubbard Hospital Nashville	MeHarry Medical College	2 yrs	2 yrs	24	6	Varies	\$100	Certificate
Nashville General Hospital Nashville			2 yrs	12	6	Jan/July	None	Certificate
<b>TEXAS</b>								
Hotel Dieu Hospital Beaumont			2 yrs	18	Varies	B	Certificate	
Baylor University Hospital Dallas	Baylor University Medical School	None	2 yrs	12	18	Feb/July	\$100	Certificate
Harris Memorial Methodist Hosp Ft Worth	Texas Christian University	30 sem hr	2 yrs	12	6	June	\$50	B S
John Sealy Hospital Galveston	Univ of Texas Medical Branch	None	2 yrs	12	10	Quart	U & B	Certificate
Jefferson Davis Hospital Houston			2 yrs	12	12	Monthly	\$50	Certificate
Robt B Green Memorial Hosp San Antonio			2 yrs	12	6	Varies	\$50	Certificate
<b>UTAH</b>								
Thomas D Dee Memorial Hospital Ogden	University of Utah	40 quart hrs	2 yrs	12	4	June	None	Certificate
Dr W H Groves Latter Day Saints Hospital Salt Lake City	University of Utah	40 quart hr	2 yrs	12	3	June	None	Certificate
Holy Cross Hospital Salt Lake City	University of Utah	40 quart hrs	2 yrs	12	4	June	None	None
St Mark's Hospital Salt Lake City	Univ of Utah or Brigham Young Univ	40 quart hrs	2 yrs	12	4	July/Sept	None	Degree
Salt Lake County General Hospital Salt Lake City	University of Utah	40 quart hrs	2 yr	12	4	June	\$50	Degree
<b>VIRGINIA</b>								
University of Virginia Hosp Charlottesville			2 yrs	12	12	Sept	B	None
Hospital of St Vincent de Paul Norfolk			2 yrs	18	6	Varies	\$150B	Certificate
Medical College of Virginia Hospital Division Richmond	Medical College of Virginia	None	3 yrs	18	14	Varies	\$150	Certificate
Stuart Circle Hospital Richmond	Richmond Professional Institute	30 em hr	Degree	12	3	Varies	B	Certificate
<b>WASHINGTON</b>								
King County Hospital Seattle			2 yrs	12	6	Varies	\$25	None
Providence Hospital Seattle	Seattle College	40 quart hrs	2 yrs	12	4	Varies	None	B S
Doneness Hospital Spokane	University of Idaho	12 em hrs	2 yrs	12	4	Varies	None	Diploma
Sacred Heart Hospital Spokane			2 yrs	12	4	Quart	None	Certificate
St Luke's Hospital Spokane	State College of Washington	16 em hrs	2 yrs	12	6	Feb/Sept	\$10	Cert & BS
St Joseph's Hospital Tacoma	Seattle College	40 quart hr	2 yrs	18	Var/Sept	\$10	Diploma	
Tacoma General Hospital Tacoma			2 yrs	12	6	Varies	None	Certificate
<b>WISCONSIN</b>								
St Francis Hospital LaCrosse			2 yrs	18	3	Varies	\$100B	Certificate
Madison General Hospital Madison			Degree	12	4	Oct	None	Certificate
St Mary's Hospital Madison			2 yrs	18	Quart	\$50	Diploma	
State of Wisconsin General Hospital Madison	University of Wisconsin	31 sem hrs	High Sch 4 yrs	13	Sept	U	B S	
Milwaukee Hospital Milwaukee			2 yrs	12	3	Sept	\$50	Certificate
Mt Sinai Hospital Milwaukee			2 yrs	24	2	Varies	\$250	Certificate
St Joseph's Hospital Milwaukee	Marquette University	2 yr	2 yrs	24	5	June	None	Cert & Degree
Milwaukee County Hospital Milwaukee			2 yrs	24	3	June	None	Certificate

a Male students are admitted  
b Only students from affiliated college admitted  
1 No tuition for certificate course of twelve months  
2 Students in eighteen month course leading to B.S. degree allowed  
thirty six quarter hours entrance requirements—B.S. degree tuition \$100

3 Students enrolling in four year degree course are allowed twenty  
five semester hours for final year spent in hospital the students pay  
regular university fees

# THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, MARCH 27, 1943

## PHYSICIANS MUST VOLUNTEER FROM LARGE CITIES

At a recent meeting in Washington of the Directing Board of the Procurement and Assignment Service for Physicians, Dentists and Veterinarians with the Officer Procurement Service of the United States Army and with representatives of other governmental agencies, evidence was clearly set forth that the procurement of medical officers for the armed forces is lagging. The responsibility rests unquestionably on the failure of young available physicians in the large cities of the country, particularly those of the eastern seaboard, to volunteer. Officers of the medical societies of New York, Massachusetts and Connecticut were present and the situation was placed before them. The rural areas of the United States have contributed doctors not only up to such quotas as were assigned to them but in many instances well beyond these quotas, it is simply impossible to anticipate that they will make a further contribution at this time. In the meantime, New York, Brooklyn, Boston and some of the larger communities in the states of Connecticut, New Jersey, Pennsylvania and California have failed even to approximate their quotas.

The needs of the armed forces for physicians during 1943 are well defined. The number of physicians to be expected from recent graduates, interns and those now holding residencies has been determined. Beyond this number at least six thousand more physicians must come from the civilian population. The Procurement and Assignment Service for Physicians, Dentists and Veterinarians has devised a technic which involves, first a determination of the availability of the physician concerned or his essentiality for any civilian position which he occupies, second, notification of the physician of his availability and a request that he appear before his local procurement board, third, a notification of the Selective Service Board of the fact that the physician concerned is considered available and that he has failed to volunteer. Thus far pressure beyond this

has not been exercised. There remains, however, the mobilization of the pressure of public opinion.

In some instances physicians have declared flatly to representatives of the Procurement and Assignment Service and the Officer Procurement Service that they do not wish to volunteer and that they will not volunteer. When it is known to other physicians in the community that a physician under 38 years of age, declared available by the Procurement and Assignment Service, refuses to volunteer in this time of the nation's need, when many an older physician, frequently with innumerable obligations, has given up his home, his practice and the responsibilities of years to participate in this war, the public has a right to know that the younger physician is not willing to do his part. Certainly the Procurement and Assignment Service should consider the possibility at this advanced stage of the war effort of making public through the state medical journals not only the names of those who are already participating in the war but also the names of those who have been declared available and have not themselves ever indicated a willingness to participate. Let them be called before the bar of public opinion!

## BIRTHS IN HOSPITALS

Data collected by the Council on Medical Education and Hospitals indicate that the number of births occurring in the hospitals on the list of registered hospitals maintained by the Council increased from 708,889 in 1931 to 1,404,940 in 1941 and to 1,670,599 in 1942. Apparently 27.9 per cent of the increase in the number of patients admitted to the hospitals of the country in 1942 over 1941 was due to the admission of an increased number of maternity patients. Although it is recognized that the data collected do not include all births occurring in all hospitals in the United States, they are sufficiently complete to warrant their use in computing the percentage of births occurring in hospitals, using as a base the total births recorded by the Bureau of Census of the U. S. Department of Commerce.

The table on page 1018 provides a striking picture of the increasing use of hospitals for obstetrics. The percentage of births occurring in hospitals for the country as a whole increased from 33.6 in 1931 to 55.9 in 1941. In New Jersey and the District of Columbia more than 90 per cent of the births recorded by the Bureau of Census for 1941 occurred in hospitals, while in five additional states more than 75 per cent of the births occurred in hospitals. In thirty states more than 50 per cent of the births were in hospitals. In only six states were less than 25 per cent of the births in hospitals, whereas in 1931 there were eighteen states in this category.

While there are many factors involved in maternal morbidity and maternal mortality, an inverse relationship seems to prevail between death rates for "diseases



of pregnancy, childbirth and the puerperium" and the percentage of births which occur in hospitals. According to the Bureau of Census reports<sup>1</sup> the death rate (number per hundred thousand of population) for these diseases for 1941 for the country as a whole was 6.0. The rates for the individual states varied from 3.2 to 15.5. In eleven states death rates for these diseases exceeded 8.0, and in none of these states did as many as 50 per cent of the births occur in hospitals. Furthermore, none of the six states with 75 per cent or more of its births occurring in hospitals showed a death rate for the diseases associated with childbirth as high as 5.0. However, the District of Columbia, with 93.8 per cent of births occurring in hospitals, showed a death rate of 6.7.

### MUSCULAR EXERCISE AND FATIGUE IN DISEASE

Since 1900 many investigators have studied patients during and after muscular work. Simonson and Enzer<sup>2</sup> present an analytic review of such investigations of the gaseous exchange and the circulatory and respiratory functions. Distinctions between demonstrable fatigue and complaints of fatigue must be established by precise objective methods. Following analysis of the effect of disease on performance in various types of work, it might be possible to direct patients with chronic diseases toward occupations in which their working capacity would be least reduced. Control of the tax on their working capacity would be good therapy. Investigation during work permits a better understanding of the patient's actual condition than examination during rest. The patient may still be fully compensated while at rest but not for the increased demands during and immediately after muscular work. Thus the investigation of patients by means of exercise tests is especially important for those on the verge of cardiac decompensation. The state of the patient depends more on the interrelation of several functions than on any single function. Investigations during muscular work will help to recognize the weakest point at which decompensation is most likely to occur.

When the problem is viewed from this aspect, disease may be defined as "diminution of working capacity." Hence the measurement of the maximum working capacity should be an ideal method by which to determine the extent of the damage produced in the organism by pathologic processes. Severe lesions of the heart do not necessarily impair maximum performance for muscular work. Apparently it is not the primary

lesion but the breakdown of the compensatory mechanism which leads to signs and symptoms of circulatory insufficiency.

Among the methods used to measure maximum working capacity, a number of investigators were concerned with the rate of maximum oxygen intake. Measurement of the maximum oxygen intake is an indirect method for determining the maximum minute volume of the heart, provided the pulmonary system is intact. The decrease of the maximum oxygen intake was found proportional to the degree of insufficiency for working condition, that is, to the decrease of the circulatory reserve. The decrease was especially pronounced for patients with mitral stenosis, whose maximum oxygen intake reached only the value of 200 to 300 cc per minute. This is only slightly above the resting stage of oxygen consumption. The rate of maximum oxygen intake is a reliable index of cardiac reserve, provided pulmonary complications are not involved. In the latter case the maximum oxygen intake indicates the capacity of the respiratory and circulatory systems. If the maximum oxygen intake exceeds a value of 1,300 cc per minute it may be assumed that there is no circulatory insufficiency. This is an objective method, although it depends on the patient's cooperation to work with maximum effort. Another objective method involves measurement of the maximum oxygen debt, which is the excess oxygen consumed during the recovery period. The maximum oxygen debt is lower in patients with heart disease.

Investigations of this type brought out some interesting facts. Efficiency in any type of work is considerably reduced in patients with hyperthyroidism. The deviations of efficiency here are much greater than in heart disease. In beginning toxic diffuse goiter the coefficient of efficiency may be decreased before the basal metabolic rate is elevated. Thyroidectomy leads to a consistent improvement of the efficiency, while the improvement of the basal metabolic rate was not as consistent. Thus it appears that the coefficient of efficiency more nearly parallels the seriousness of the disease than does the increase of the basal metabolic rate and therefore might be of considerable diagnostic and prognostic value. Another important index in the analysis of pathologic conditions is the speed of oxidative processes. This may be determined during and after exercise by measuring (a) the speed of the increase of oxygen consumption during the period of adaptation (the first five minutes of work), (b) oxygen debt and (c) recovery speed. Oxygen debt is contracted during the period of adaptation, so that the increase of oxygen consumption during the adaptation period is the fundamental process to which the final oxygen debt is related. The oxygen debt is considerably increased in patients with heart disease, and the

<sup>1</sup> *Vital Statistics Special Reports Deaths from Selected Causes, United States 1941* 17, Dec 9, 1942.

<sup>2</sup> Simonson Ernst and Enzer Norbert. *Physiology of Muscular Exercise and Fatigue in Disease* *Medicine* 21: 345 (Dec.) 1942.

increase parallels the degree of symptoms of decompensation. Hence the measurement of the oxygen debt would seem to be an ideal method for evaluating the state of patients with heart disease. Oxygen debt has been found to be increased in chronic bronchitis, emphysema, advanced lung tuberculosis and pronounced silicosis. Oxygen debt reflects the delay of oxidative processes during the adaptation period.

On the basis of the investigative data the reviewers conclude that there is a quantitative rather than a qualitative difference of physiologic processes in exercise in disease. Fatigue and disease are intimately related. This relationship explains why fatigue is the most common complaint in disease.

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### *Current Comment*

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#### THE NATIONAL CONFERENCE ON PLANNING FOR WAR AND POSTWAR MEDICAL SERVICES

More than seven hundred and fifty physicians and leaders in allied medical industries assembled in New York on March 15 to attend a Conference on Planning for War and Postwar Medical Services. The program served to focus the attention of the medical profession and the interested public on the nature of the problems peculiarly medical which will confront all the world, but particularly the medical profession of the United States, in the postwar period. The morning session was devoted to tropical diseases, especially malaria, influenza and the problems of nutrition. The afternoon session concerned medical and surgical supplies, personnel and research. At the dinner addresses were delivered by Mr. Basil O'Connor as president of the National Foundation for Infantile Paralysis and president of the Finlay Institute of the Americas, Mr. Fred Keppel of the Carnegie Foundation, Richard Allen of the Red Cross, who has just returned from a trip to North Africa and the Near East, Mr. Nelson Rockefeller, Coordinator of Inter-American Affairs, and Dr. Morris Fishbein, Editor of *THE JOURNAL*. Those in attendance at this conference were enthusiastic in their comments concerning the program. The papers taken as a whole, emphasized the diversity of the problems and the importance of maintaining health as a first step in restoration and rehabilitation of a devastated world. Emphasis was placed especially on the desirability of establishing a single, well organized planning committee charged with coordination of the many medical advisory and similar bodies now associated with such agencies as the Board of Economic Warfare, the Lend-Lease Administration, the Joint Army and Navy Purchasing Board, the American Red Cross, the National Research Council and the many departments and bureaus of the federal government. The papers and the discussions emanating from this conference will be published in *THE JOURNAL* in the near future.

#### HOSPITAL RESIDENTS AND MEDICAL EDUCATION

Recent advances in medical education have involved the assignment of third and fourth year students in groups to the wards of the teaching hospitals and to the outpatient departments. Under competent supervision students receive their training by actual experience with patients and associated studies rather than merely by the study of textbooks and the demonstration of patients in amphitheater clinics. These developments represent one of the most significant advances in professional education. Such programs have been possible only because there were available in the teaching wards of the hospital and in the outpatient clinics a sufficient number of younger well trained faculty members and an adequate staff of resident physicians to provide adequate supervision of the students and to participate in the thorough study of the patients. Practically all younger faculty members are now serving with the military forces, this places even greater responsibilities on the resident staff. Internships are now limited to one year, which means that the intern is called to serve with the armed forces just when he is sufficiently well trained to function as an efficient house officer. Today the great responsibility of medical education is the provision of as many competent physicians as possible in the shortest possible time. The medical schools have adopted minimum admission requirements and have accelerated their programs. However, an adequate number of assistant residents and residents must be available in the clinical teaching services of the medical schools of the country if even reasonably satisfactory standards of clinical teaching are to be maintained. Practically all medical school graduates are subject to call to active duty by either the Army or the Navy. These branches of the armed services in cooperation with the Office of Procurement and Assignment have given much attention to the problem. No doubt a satisfactory program will be formulated which will make available to the medical schools enough competent residents to provide satisfactory training for the students.

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#### HOLMES AND PUERPERAL FEVER CENTENARY CELEBRATION

On Feb. 19, 1843 Dr. Oliver Wendell Holmes first read his paper on the contagiousness of childbed fever before the Boston Society for Medical Improvement. In celebration of the centennial of this event—the importance of which to maternal health is so well known to the medical profession as scarcely to require remark—an all day conference on Maternal Health and Child Welfare was held in New York on Feb. 19, 1943. It is wholly fitting that this anniversary of Holmes's great contribution, as discussed elsewhere in this issue by Daily (p. 1006), should be signified by widespread recognition on the part of the medical profession.

# MEDICINE AND THE WAR

*In this section of The Journal each week will appear official notices by the Committee on War Participation of the American Medical Association, announcements by the Surgeon Generals of the Army, Navy and Public Health Service, and other governmental agencies dealing with medicine and the war and such other information and announcements as will be useful to the medical profession*

## ARMY

### GENERAL HOSPITALS DESIGNATED FOR SPECIAL SURGICAL TREATMENT

The War Department, Washington, D C, on March 6 issued the following memorandum

1 It has become evident that certain diseases and injuries will require treatment of a surgical nature in which a high degree of specialization is necessary The following general hospitals have therefore been designated for the special surgical treatment indicated

#### (a) Chest surgery

Fitzsimons,	Denver
Hammond,	Modesto, Calif
Kennedy,	Memphis, Tenn
Walter Reed,	Washington, D C

#### (b) Maxillofacial and plastic surgery

Bushnell,	Brigham, Utah
O'Reilly,	Springfield, Mo
Valley Forge	Phoenixville, Pa
Walter Reed	Washington D C

#### (c) Amputation centers

Bushnell	Brigham Utah
Lawson	Atlanta Ga
McCloskey,	Temple Texas
Percy Jones	Battle Creek Mich
Walter Reed,	Washington D C

#### (d) Ophthalmic surgery and treatment of blinded casualties (including maxillofacial and plastic surgery involving the eye)

Letterman	San Francisco
Valley Forge	Phoenixville, Pa

#### (e) Neurosurgery

Ashford	White Sulphur Springs W Va
Brooke	San Antonio Texas
Bushnell	Brigham, Utah
Fitzsimons,	Denver
Hoff	Santa Barbara Calif
Kennedy,	Memphis, Tenn
Lawson,	Atlanta Ga
Lovell	Fort Devens Mass
McCaw	Walla Walla Wash
McCloskey,	Temple Texas
Nichols	Louisville, Ky
O'Reilly	Springfield Mo
Percy Jones,	Battle Creek Mich
Schick	Clinton Iowa
Tilton	Fort Dix N J
Walter Reed	Washington D C

2 Patients received from overseas who require the specialized treatment indicated will be classified by the general hospitals receiving them and reported to the Surgeon General for transfer to designated specialized hospitals

By order of the Secretary of War

J A ULIO,  
Major General, the Adjutant General

### CONTRACT SURGEONS WANTED

The surgeon of the Seventh Service Command writes that contract surgeons, both male and female, are wanted at army operated industrial plants and depots in Colorado, Missouri, Nebraska, Kansas and South Dakota The pay, with dependents, is about \$3,400 a year For further details write the Surgeon, Headquarters Seventh Service Command, Federal Building, Omaha, Neb

### REJECTION OR DISCHARGE FOR PSYCHIATRIC REASONS

The War Department, Washington, D C, on March 5 issued the following memorandum

1 Men rejected by induction stations and those discharged from the Army by CDD for psychiatric reasons have suffered severely from the injudicious manner in which some of these cases have been rejected or discharged In some instances men who have been returned to the community were told that they were 'crazy' or were given some other equally tactless reason As a result they have suffered severely from the shock to themselves and from the attitude of others in the community who learned of the reason for rejection

2 Since this problem exists, all medical officers concerned with the rejection or discharge of men for psychiatric reasons will use painstaking tact in making the individual aware of the fact that he would be unable to adapt himself to the rigors of army life and that he could serve his country better in a defense industry or other gainful occupation Any other suitable reason may be given In this manner the reason for the person's returning to the community can be explained to him, and the frame of mind in which he is returned to civilian life can be dealt with in such a way as to avoid severe hardship and may possibly help to salvage that person for some gainful occupation at a time when all available manpower is essential

3 Letters sent from some army hospitals to relatives of soldiers who are mentally ill have in many instances not been worded in sympathetic language Some letters have been harsh and unsympathetic and have come as a shock to distraught relatives who for the first time may have been made aware of the soldiers' illness Much can be done for public morale and confidence in the medical department if all concerned will take immediate steps to make certain that letters to relatives of mentally ill soldiers are written in a sympathetic and tactful manner Such letters will contain no statement to the effect that the soldier is not entitled to future hospitalization, since this question is one for the Veterans Administration and not for the Army to decide

By order of the Secretary of War

J A ULIO,  
Major General, the Adjutant General

### THE NICHOLS GENERAL HOSPITAL IN LOUISVILLE

The Nichols General Hospital in Louisville, Ky, was transferred to the Medical Department, U S Army, by the Corps of Engineers on Nov 16, 1942, the date of completion of construction, and following a short period for equipping the several departments, wards and clinics and the organization of the staff the hospital was made ready for the reception of patients on Jan 15, 1943 The hospital is of standard mobilization type construction consisting of one story frame buildings with intercommunicating corridors Military patients are currently being drawn from outlying posts, camps and stations with facilities in readiness for the receipt of overseas patients

The chiefs of the professional services are as follows: medical, Major Thomas J White, surgical, Col S C Woldenberg, neuropsychiatric Major Orr Mullinax, roentgenology, Major Anthony C Galluccio, dental, Lieut Col Emil L Aison, and laboratory, Major Louis R Ferraro

### THE KENNEDY GENERAL HOSPITAL AT MEMPHIS

The U S Army Kennedy General Hospital in Memphis, Tenn, was dedicated January 27 and 58 of its 102 two story brick buildings of colonial architecture are already in use, many of the patients under treatment being battle casualties. When completed in May the hospital will have 3,000 beds, making it one of the largest army hospitals. The city of Memphis donated to the government the site of 144 acres, which only last spring were still cotton farms and woodland. More than 38,000,000 man hours of labor will have been performed, about 180 miles of electric wire and cable and 24 miles of sprinkler pipes will have been laid and more than 14,000,000 board feet of lumber will have been used when the hospital is finished. There will be more than 2 miles of covered corridors and 3 miles of roadway.

The War Department named the hospital as a memorial to the late Brig Gen James W Kennedy, a member of the medical corps for thirty-six years. General Kennedy had been cited for gallantry in action during the Spanish American War and awarded both the Distinguished Service Medal and the Navy Cross for his service as port surgeon at Hoboken, N J, during the first world war. Among those at the dedication ceremonies were Major Gen James C Magee, Surgeon General of the Army, Brig Gen Max C Tyler, engineer in charge of the hospital construction, the Honorable Walter Chandler, mayor of Memphis, Dr James B Stanford, president of the Tennessee State Medical Society, Mrs James M Kennedy and her daughter, Mrs Kean.

The commanding officer of the Kennedy General Hospital is Brig Gen Royal Reynolds, brother of the former surgeon general Charles R Reynolds and of Col Frederick P Reynolds, M C, U S Army, retired, former executive secretary of the New York Academy of Medicine. The executive officer is Lieut Col Hugh L Prather, M C. The chiefs of services now on duty are as follows: Col John N White, D C, chief of Dental Service, Lieut Col Francis J McGowan, M C, chief of Surgical Service, formerly visiting surgeon, St Vincents Hospital, New York City, Major Vernon E Powell, M C, chief of medical service, formerly assistant in medicine, Emory University School of Medicine, Atlanta, Major Emmerich von Haam, M C, chief of laboratory service, formerly instructor in pathology, Ohio State University, Columbus, Major Justin E McCarthy, M C, chief of x-ray service, formerly assistant attending radiologist, University of Cincinnati, and Capt Rusk G Anderson, M C, chief of eye, ear, nose and throat service, formerly of the Spartanburg General Hospital, Spartanburg, S C.

### BRIGADIER BRISTOW VISITS CARLISLE BARRACKS

Brigadier Rowley Bristow of the British Army Staff on February 25 addressed the garrison and student officers at the Medical Field Service School, Carlisle Barracks, Pa, on the treatment of gunshot wounds. Brigadier Bristow, who is a consultant in orthopedics in the British Army and a professor at the University of London, stressed the late advances in the treatment of wounds and compound fractures by the closed plaster method. In World War I he worked with Sir Robert Jones at the Orthopedic Center at Shephard Hospital in London after having served as a battalion surgeon in Gallipoli.

### AVIATION PHYSIOLOGISTS

Another class of aviation physiologists graduated at the School of Aviation Medicine in Texas on February 27. The course of instruction treats of the effects of lowered barometric pressure, anoxia and the effect of flight on man, the operation of low pressure chambers, the theory and practical use of oxygen equipment, and the conduct of high altitude indoctrination and classification. Among the graduates were the following medical officers: Capts Broda O Barnes, Denver, George R Crisler, Winter Park, Fla, and First Lieuts Joseph Bernstein, Wilkes-Barre Pa, Michael L Gompertz, New York, Eugene M

Hartnett, Drexel Hill, Pa, Charles W Klanke, Houston, Texas, Max A Lindauer, Philadelphia, Robert W Ollayos, Hamden, Conn, Frederick F Rogers, Dilley, Texas, Robert W Smith, Owensboro, Ky, Frederick S Sperry, Clarina, Iowa, William F Weeks, Highland Park, Mich, George W Wilkinson, Laurel, Iowa, Edward T Wilson, Chicago, and Norman C Zahrt, Iowa City.

### MAJOR RUSK IN CHARGE OF RECREATION AND RECONDITIONING PROGRAM

Major Howard A Rusk, formerly of St Louis, who has been chief of the medical service at the Station Hospital, Jefferson Barracks, Mo, has been transferred to Washington, D C, and assigned to the staff of Brig Gen David D W Grant, the air surgeon, to be in charge of the recreation and reconditioning program for hospital patients for all army air corps hospitals. Major Rusk initiated a novel program for convalescent soldiers while at Jefferson Barracks whereby they were taught during the period of convalescence by means of lectures, moving pictures and other types of visual education and physical exercises. This program includes instruction in chemical warfare, camouflage, radio, model airplane building, a refresher course in mathematics, a basic course in military discipline and a course for illiterate soldiers. The primary purpose of this program is to make use of the time ordinarily lost during convalescence by giving the men instruction in the technical courses needed by the air forces. This program was initiated at Jefferson Barracks under the supervision of Col James R McDowell, commanding officer of the hospital, and Brig Gen David D W Grant, the air surgeon. Before entering the service, Major Rusk had been in private practice in St Louis for many years, where he was associate chief of staff at St Luke's Hospital and instructor of medicine at Washington University School of Medicine.

### VENEREAL CLINIC AT RECEPTION CENTER

The commanding officer of the reception center at New Cumberland, Pa, has announced the opening of a new hospital unit which will function as a clinic and will have as its chief function the rehabilitation of men who previously had been rejected because of venereal disease. The clinic will deal primarily with newly inducted soldiers and will be in constant contact with health and social agencies, which will follow up on the sources of infection of the soldiers. The clinic is completely and modernly equipped, having its own mess hall, laboratory and pharmacy and, although an independent unit, will function with the regular infirmary. The Venereal Facility will be under the supervision of Capt Russell R Rubba. The administration officer will be Second Lieutenant Paul R Whipp of the Medical Administrative Corps.

### SPECIAL TRAINING COURSES

Nineteen officers of the Medical Department of the Army graduated at the Medical Field Service School, Carlisle Barracks, Pa, March 5, from a special training course and left immediately for assignments in the medical battalions in infantry divisions now being activated. Of the nineteen officers, eighteen hold commissions in the medical corps and one in the medical administrative corps. The officers represented eleven states. Another special course began on March 8.

### PURPLE HEART AWARDS

The War Department recently announced the award of the Purple Heart to Capt Alfred T Leminger and Lieut Howard H Angell, both of the medical corps, for wounds received in action at Clark Field, near Manila, Philippine Islands, Dec 8, 1941. Captain Leminger's home is in Wayside, Wis, and Lieutenant Angell's home is in Saginaw, Mich.

## NAVY

## NAVY CONSULTANT BOARD

The Surgeon General of the U S Navy convened in Washington in December a Board of Honorary Consultants, whose counsel was desired on subjects vital to the naval medical service. The board, after a two day session, submitted a report covering brain surgery, anesthesia, chest surgery, psychotherapy, the psychoneuroses and other subjects. Members of the board of consultants were Dr Donald C Balfour, director of the Mayo Foundation, Rochester Minn, Dr George W Crile, director of the Cleveland Clinic Foundation, Cleveland, Dr Walter E Dandy, professor of neurosurgery at Johns Hopkins Medical School, Baltimore. Dr Frank H Lahey of the Lahey Clinic Boston, and head of the Procurement and Assignment Service, Dr Oswald L Lowsley, New York, Dr Willis B Morse, Salem, Ore. Dr William A Sawyer, New York, director of the International Health Division, Rockefeller Foundation, and Dr Meyer Wiener, professor of clinical ophthalmology, Washington University School of Medicine, St Louis. Dr Crile, who did not attend the conference, died on January 7.

## CLASS OF NAVAL MEDICAL OFFICERS

The following medical officers completed the basic course of instruction at the Naval Medical School, Bethesda, Md, February 6. Included are the dates and places at which these officers served their internships. All of these officers at the time of the graduation were lieutenants (jg) except Drs Hope, Kinne and Myer, whose rank was that of lieutenant.

BAILEY ROBERT LISTON JR (MC) U S N New York Hospital New York 1937 38  
BOSTWICK JACK RAYMOND (MC) U S N San Diego County General Hospital 1940 41  
CLOSE JOHN ROBERT (MC) U S N University Hospitals of Cleveland 1941 42  
CONNELLY JOSEPH R (MC) U S N Temple University Hospital Philadelphia 1940 42  
CONSTABLE WILLIAM P JR (MC) U S N Union Memorial Hospital Baltimore 1941 42  
DAVIS HARRIET J WV(S) U S N R, Philadelphia General Hospital Philadelphia 1935 36  
ENSENAT LOUIS ALBERT (MC) U S N Charity Hospital of Louisiana New Orleans 1941 42  
GERAGHTY JOHN FRANCIS (MC) U S N Philadelphia General and U S Naval Hospital Philadelphia 1941 42

GIFFORD JOHN HARRY (MC) U S N Medical Center Jersey City N J and Victoria Hospital Montreal 1939 41  
GLENN MARSHALL MC V(G) U S N R Harper Hospital Detroit 1939 40  
GUERNSEY DEXTER E MC V(G) U S N R Minneapolis General Hospital Minneapolis 1940 42  
HOPE JOHN WESTGATE (MC) U S N Stanford University Hospital San Francisco 1939 40  
KELLY JAMES E (MC) U S N St Vincent Hospital Los Angeles 1940 41  
KENNEY FRANCIS D MC V(G) U S N R St Margarets Hospital Hammond Ind 1941 42  
KING E RICHARD (MC) U S N U S Naval Hospital Pensacola, Fla 1941 42  
KINNE ABRAM SMITH (MC) U S N St Luke's Hospital Chicago 1939 41  
KLOTH EDWARD W (MC) U S N U S Naval Hospital Brooklyn 1941 42  
MADLEM LEO SMITH JR (MC) U S N U S Public Health Service Boston Marine Hospital 1941 42  
MARTIN JOHN EDWARD MC V(G) U S N R Rhode Island Hospital Providence R I 1942 43  
MCCOY CHARLES THOMAS MC V(G) U S N R Wesley Hospital Wichita Kan 1941 42  
MULRY WILLIAM CHARLES (MC) U S N U S Naval Hospital Great Lakes Ill 1941 42  
MYER JOHN COLBY (MC) U S N Homeopathic Hospital of Rhode Island Providence R I 1939 40  
NEIGHBOR JEAN EMERSON (MC) U S N Los Angeles County Hospital Los Angeles 1941 42  
PAINE WILLIAM GOSNELL (MC) U S N Philadelphia General Hospital Philadelphia 1941 42  
PATTERSON STUART ALEXANDER (MC) U S N St Mary's Hospital Duluth Minn 1940 41  
PAYZANT ARTHUR RANDOLPH (MC) U S N Long Island College Hospital Brooklyn and Medical Center Syracuse University 1940 42  
PORTER MILTON REEVES MC V(G) U S N R Presbyterian Hospital Columbia University Medical Center New York 1941 42  
PRUITT CHARLES EUGENE (MC) U S N Church Home and Infirmary Baltimore 1941 42  
REED PAUL (MC) U S N Minneapolis General Hospital Minneapolis 1936 37  
SEAL JOHN R (MC) U S N Strong Memorial Hospital Rochester N Y 1937 38  
STIRRETT LLOYD ARTHUR (MC) U S N U S Naval Hospital San Diego Calif and Los Angeles County Hospital 1941 42  
TAYLOR RAYMOND ALLEN MC V(G) U S N R York Hospital York Pa 1941 42  
TEDFORD ARTHUR CECIL MC V(G) U S N R Methodist Hospital Brooklyn 1941 42  
WEEKES DON JAMES (MC) U S N Henry Ford Hospital Detroit 1941 42  
WENNER PAULINE H WV(S) U S N R Allentown Hospital Allentown Pa 1937 38

PROCUREMENT AND ASSIGNMENT SERVICE FOR PHYSICIANS,  
DENTISTS AND VETERINARIANSUTILIZATION OF PERSONNEL RESULTING  
FROM OVERLAPPING OF INTERNSHIPS

The directing board of the Procurement and Assignment Service has informed its state chairmen that consideration should be given to overlapping internships resulting from the nine months school year and has suggested that state chairmen should serve as a clearing house between hospitals with such overlapping internships and institutions requiring additional personnel.

Nearly all medical schools now have a graduating class each nine months. A full year internship now is required by Army and Navy regulations, by many state boards and, in some instances, by medical schools. In March and April new groups of interns are entering hospitals for their internships with interns from last year still having three or more months left to complete their required service.

It is the consensus of organizations concerned, sitting with representatives of the three surgeon generals and of Selective Service that there would be no objection to utilizing these overlapping internships elsewhere, such as in approved hospitals without adequate personnel, if the hospital in which the first part of the internship was served will certify to a full year's service. This opinion was concurred in by representatives of the Council on Medical Education and Hospitals of the American Medical Association, the Advisory Board for Medical Specialties, the Federation of State Medical Boards, the Ameri-

can Hospital Association, the American College of Surgeons, the Protestant Hospital Association, the Catholic Hospital Association and the Association of American Medical Colleges.

NURSES IN PROCUREMENT  
SERVICE OFFICES

Under a new policy of the War Department, a nurse will be placed in each of the 38 field offices of the procurement service. According to the *Army and Navy Journal* of February 27, these 38 assignments of chief nurses in these offices was to have been completed by March 1. These nurses will interview applicants, evaluate their aptitude for the Army Nurse Corps and fill speaking and radio engagements in support of the drive for additional nurses. Much of the time of these nurses will be spent with local Red Cross officials, who have the primary responsibility of recruiting nurses for the Army. A total of 13,000 nurses was obtained in the calendar year 1942, and by March recruitment is expected to average 2,500 a month. By the end of this fiscal year, June 30, 1943, a total of 31,000 nurses is expected to be in service. There was a party at Aberdeen Proving Ground, Md, February 27, to honor the Army nurse. A special guest at the festivities was Lieut Col Florence A Blanchfield acting superintendent of the Army Nurse Corps. The commanding general and other officers at Aberdeen were present.

# ORGANIZATION SECTION

## OFFICIAL NOTES

### DOCTORS AT WAR

Radio broadcasts of Doctors at War by the American Medical Association in cooperation with the National Broadcasting Company and the medical department of the United States Army and the United States Navy are on the air each Saturday at 5 p. m. Eastern War Time (4 p. m. Central War Time, 3 p. m. Mountain War Time, 2 p. m. Pacific War Time). An exception is the Chicago area, where the broadcasts are heard by transcription at 10-30 p. m. (formerly heard at 8 p. m.) Saturdays over station WMAQ. Unless otherwise indicated, each program is summarized by Dr. W. W. Bruer, Director, Bureau of Health Education.

The titles and speakers for the next four programs are as follows:

April 3 The White Plague 1943 Speaker Dr. Kendall Emerson  
Managing Director National Tuberculosis Association  
April 10 Battle Stations at Home Speaker Col. George Bach  
Chief Medical Officer Office of Civilian Defense

April 17 "Stratosphere Flight" Speaker Brig. Gen. David N. W. Grant  
Air Surgeon United States Army  
April 24 Ship Eves Speaker Lieut. Col. Harold C. Lueth, Liaison  
Officer Procurement and Assignment Service Chicago

### BEFORE THE DOCTOR COMES

The American Medical Association program on radio station WLS (890 kilocycles) entitled Before the Doctor Comes will be on the air every Thursday morning at 9-45 up to and including May 27. This program is intended to be helpful to the mothers of young children. Mrs. June Merrill will interview Dr. W. W. Bruer, Director of the Bureau of Health Education, on common home health problems. The titles for the next four programs are:

April 1 The Child with Parache  
April 8 What to Do About Cuts and Scratches  
April 15 What to Do About Bad Bumps  
April 22 What to Do About Cholera

## MEDICAL LEGISLATION

### MEDICAL BILLS IN CONGRESS

*Changes in Status*—S. 786 has passed the Senate and House, providing rehabilitation for disabled veterans of World War II. A subcommittee of the House Committee on Military Affairs has approved a bill introduced by Representative Sparkman, Alabama, as H. R. 1857 to provide for the commissioning of female physicians in the Medical Departments of the Army and Navy. The subcommittee eliminated from the bill a restriction that such female physicians should be assigned only to duty in hospitals or stations where female nurses are employed. H. R. 1936 has passed the House authorizing an appropriation of \$2,000,000 to expand the facilities for hospitalization of dependents of Naval and Marine personnel and for certain persons outside the continental limits of the United States.

*Bills Introduced*—S. 1 Res. 43, introduced by Senator Davis, Pennsylvania, proposes to authorize the appropriation of such sums as may be necessary to establish a Division for the Physically Handicapped in the United States Employment Service. S. 876, introduced by Senator Hayden, Arizona, would authorize an appropriation for the fiscal year 1943 of \$2,884,000 and not to exceed \$10,000,000 for any fiscal year thereafter for payment to states for expenditure in accordance with state plans for the wartime care and protection of children of employed mothers. H. R. 2158, introduced by Representative Fay, New York, provides that if a person who served in the military forces of the United States during the period beginning Dec. 7, 1941 and ending on the date on which the President proclaims that hostilities have ceased is honorably discharged from such service for disability, the disability shall be held to have been incurred in or aggravated by active service in the line of duty, unless it is proved that such disability existed prior to induction or enlistment or is of a congenital nature. Each such person on being discharged from the service will be furnished by the Veterans Administration such care and treatment as may be necessary to rehabilitate him for employment in a useful or gainful occupation.

### STATE MEDICAL LEGISLATION

#### Arizona

*Bill Introduced*—H. 214 proposes to require every applicant for a marriage license to file a certificate executed by a licensed physician certifying that in the opinion of the physician the applicant is not infected with syphilis or gonorrhea.

*Bill Enacted*—H. 25 has become chapter 26 of the Laws of 1943. It enacts an occupational disease law and contains a list of some thirty-five diseases which shall be deemed to be occupational in nature, among which are asbestosis and silicosis.

#### Arkansas

*Bill Enacted*—H. 432 was approved, March 11. It prohibits the sale of appliances, drugs or medicinal preparations having special utility for the prevention of conception or venereal diseases without a license issued by the state board of pharmacy but excepts physicians and medical practitioners regularly licensed to practice medicine or osteopathy from the provisions of the proposal.

#### Colorado

*Bills Passed*—H. 199 passed the house March 13. To amend the chiropractic law, it proposes to require chiropractors at the time of the annual renewal of their licenses to present proof that they have attended at least three days of a scientific clinic forum or educational study approved by the Colorado state board of chiropractic examiners. H. 200 passed the house March 13. Proposing to authorize the chiropractic board to adopt a schedule of minimum educational requirements for chiropractic schools to be not less than 3,600 sixty-minute hours of classroom instruction with a maximum of thirty hours per week and covering a period of not less than four years of nine months each, the bill was amended in the house by striking therefrom the requirement that the course of instruction cover a period of not less than four years of nine months each.

#### Connecticut

*Bill Introduced*—Substitute for S. 249 proposes to authorize veterans of the first world war or the second world war and persons in the armed forces of any government associated with the United States in either of said wars who are citizens of the state to receive temporary financial assistance from the veterans' home commission.

#### Delaware

*Bill Enacted*—S. 38 was approved, March 4. It authorizes the medical council of Delaware to issue temporary emergency certificates to physicians licensed outside the state and to make such regulations, restrictions and area limitations concerning such temporary licenses as it deems necessary. Furthermore it provides that an internship of nine months shall be required of applicants for a license to practice medicine and surgery in addition to the other qualifications set forth in the medical practice act. The prior law required an internship of one year.

#### Georgia

*Bill Introduced*—H. 613, to amend the uniform narcotic drug act, proposes to exempt therefrom the administering, dispensing and selling of certain attenuated narcotic preparations.

**Bill Passed**—H 552 passed the senate, March 15 It proposes the abolition of the state boards of medical examiners chiropractic examiners and osteopathic examiners and the creation in their stead of a State Commission of Medical Examiners, Georgia Commission of Chiropractic Examiners and State Commission of Osteopathic Examiners of Georgia The powers duties and qualifications would be the same except that members appointed by the governor must be approved by the secretary of state and confirmed by the senate

#### Illinois

**Bill Introduced**—H 264 proposes the creation of a chiropractic board by the Department of Registration and Education and defines chiropractic as the science of palpating and adjusting the articulations of the human spinal column, correcting interference with nerve transmission and expression, to restore health, without the use of drugs or surgery

#### Indiana

**Bills Enacted**—S 4 has become chapter 158 of the Laws of 1943 It provides for the licensing and regulating of nursing homes but exempts therefrom treatment in a private household and in any hospital, home or institution conducted by or for the members of any religious body or denomination or regularly organized patriotic, fraternal or charitable organization The law provides that it shall be unlawful to conduct a nursing home unless the treatment and care of inmates therein is in charge of a registered nurse and defines the term "practical nurse" as a person who has had not less than one year's experience in caring for sick persons under the direction of a duly licensed practicing physician S 135 has become chapter 162 of the Laws of 1943 It prohibits school authorities from employing food handlers who are addicted to drugs or who have tuberculosis or syphilis in an infectious stage and requires all school employees to undergo a physical examination for tuberculosis at least once every three years by a duly licensed doctor of medicine H 66

has become chapter 264 of the Laws of 1943 It provides for the regulation of plants for the cold storage of food and provides that all employees of such locker plants shall undergo a semiannual health examination by a physician Furthermore the law prohibits the employment of any person suffering from a communicable disease including any communicable skin disease or with infected wounds, and any person who is a carrier of a communicable disease

#### Iowa

**Bill Passed**—S 82 passed the house March 12 To amend the income tax law it proposes to authorize taxpayers to deduct expenses for the medical care of the taxpayer, and the term "medical care" is defined as amounts paid for the diagnosis, cure, mitigation treatment or prevention of disease or for the purpose of affecting any structure or function of the body A senate amendment of February 18 proposes to allow also a deduction for treatment or nursing as prescribed by a well recognized church or religious denomination in a hospital or sanatorium conducted by such church or denomination

#### Maine

**Bills Introduced**—S 303 to amend the osteopathic practice act proposes that the requirement of attendance of at least two days at an annual educational program as a condition for the renewal of an osteopathic license be suspended until six months after the cessation of hostilities in the present war S 304 to amend the osteopathic practice act proposes to authorize approved osteopathic schools to give a course of instruction for a total of thirty-six months within a three to four year period when such school has adopted compressed or accelerated courses as a war emergency measure

**Bill Enacted**—S 406 has become chapter 63 of the Laws of 1943 It amends the law providing for the payment of fees to expert witnesses by providing that all expert witnesses for the state in homicide cases shall be paid such amounts as the presiding judge allows and shall be paid by the state

## MEDICAL ECONOMIC ABSTRACTS

### CHANGING TRENDS IN HOSPITALIZATION

The publication by the Bridgeport (Conn.) Hospital of statistics of many features of hospitalization since 1899 were analyzed in a previous article in this section (*THE JOURNAL*, March 30 1940, p 1272) This showed that in forty years the average stay in the hospital had declined from 34 days in 1899 to 11.2 days in 1940 but had remained between 10 and 11.5 days for the last twenty years also that the cost per patient day had increased in forty years from \$1.32 to \$4.91 The continuation of these figures through 1942 now shows some significant changes due to war conditions While the average stay in the hospital has changed little, being 10.1 days for 1942 and the cost per patient day has continued to rise to \$5.96 the days of free service, which in 1931 were 25,426 and 10,248 in 1940 dropped to 162 for 1941 and 4,529 in 1942 While the number of days in the hospital has fallen more than 75 per cent, the average hospital cost per patient has shown a steady upward trend ever since the low point of \$26.72 of 1914 and reached \$59.34 in 1942

### BLUE CROSS HOSPITALIZATION DATA

A report of the Hospital Plan Commission of the American Hospital Association shows that almost one million patients were hospitalized by plans in 1942 when the average rate of admission was 108 patients per thousand participants Average admissions in 1942 were 1 per cent greater than in 1941 Highest incidence for both years was reported in August and lowest in November 1941 and December 1942 Month to month trend of admission rates in 1942 followed the trend of 1941

The three months with the highest percentage of subscribers hospitalized in 1941 and 1942 were June July and August This is a variation from the customary hospital bed occupancy of all hospitals, which show the highest percentage of occupancy from January to February inclusive,<sup>1</sup> which are also the months which customarily show the highest morbidity

### HOSPITAL SERVICE IN NEW YORK

Mr Louis H. Pink, New York State Superintendent of Insurance since 1939 has announced his intention of leaving his present office December 31 to become president of the Associated Hospital Service of New York filling the vacancy created by the death of Dr S. S. Goldwater This action takes place at the same time that the Hospital Service undertakes a large scale expansion of Community Medical Care Inc., which is to furnish a prepayment surgical service to subscribers to the hospital plan

Under the surgical plan, subscribers will continue to select and engage their own physicians Costs for the surgical coverage are 40 cents per month for an individual contract, \$1 per month for a husband and wife contract and \$1.80 per month for a family group (husband, wife and children) contract

Mr Pink has been treasurer of the New York Child Labor Committee chairman of the State Housing Board and member of the New York City Board of Education and of the New York City Housing Authority

On Oct 31, 1942 the New York Associated Hospital Service, although not yet 8 years old had assets of \$9,894,082.99 In addition to a voluntary \$2,000,000 reserve for epidemics and other possible emergencies, it had a surplus of \$5,121,865.19 for protection of its subscribers



## Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

### ALABAMA

**State Medical Meeting**—The Medical Association of the State of Alabama will hold its annual session in the Tutwiler Hotel Birmingham, April 20-22, under the presidency of Dr. Harvey B. Searcy, Tuscaloosa. Among the speakers will be

Dr. James E. Cameron, Alexander City, The Perforating Peptic Ulcer  
Dr. James M. Wislam, Talladega, The Surgical Consideration of Jaundice  
Dr. Chalmers H. Moore, Birmingham, The Diagnosis of Brain Tumor  
Dr. John D. Sherrill, Birmingham, Internal Derangements of the Knee Joint  
Dr. Hugh E. Gray, Anniston, The Treatment of Compound Fractures  
Dr. Martin G. Neely, Fairfield, Infants—and Overfeeding  
Dr. Charles K. Pitt, Decatur, Rheumatic Infections in Childhood  
Dr. Carl A. Grote, Huntsville, Constrictive Pericarditis, Report of Case  
Drs. Jasper D. Bush, Jr., University, and Enoch M. Mason, Birmingham, Coccioidomycosis  
Dr. Harry A. M. Simpson, Florence, Functional Disorders of the Upper Gastrointestinal Tract  
Dr. Philip M. Lewis, Memphis, Tenn., External Diseases of the Eye  
Dr. James E. Paulin, Atlanta, Ga., President Elect of the American Medical Association, The Contribution of American Medicine to the War Effort  
Dr. Walter E. Dandy, Baltimore, The Diagnosis and Treatment of Ruptured Intervertebral Disks  
Dr. James J. Durrett, Washington, D. C., Our Health and the Federal Trade Commission  
Comdr. Bartholomew W. Hogan, medical inspector, U. S. Navy, Washington, D. C., The Navy Medical Corps in Combat Areas  
Dr. Oscar R. R. Troje, Fairfield, The Minority Opinion on Silicosis

A symposium on "The Sulfonamides—Their Usage in Pediatrics" will be presented by Drs. Wallace A. Clyde, Clifford L. Lamar and Hughes Kennedy Jr., all of Birmingham. Dr. Albert C. Furstenberg, dean, University of Michigan Medical School, Ann Arbor, will deliver the Jerome Cochran Lecture Wednesday on "Objectives in Medical Education." A round table discussion on dermatology will be held Wednesday evening by Drs. Charles O. King and Andrew L. Glaze, Birmingham, on "Differential Diagnosis and Treatment of Fungous Infections of the Skin" and "Some Technical Office Procedures in Dermatology and Syphilology" respectively, and one on genitourinary diseases with Drs. Robert M. Cothran, Birmingham, on "Perinephric Abscess", Jesse U. Reaves, Mobile, "Kidney and Ureteral Colic Unassociated with Calculus" and Jarratt P. Robertson, Birmingham, "Ureterovaginal Fistula Following Hysterectomy."

### COLORADO

**The Bonfils Blood Bank**—The Belle Bonfils Memorial Blood Bank was opened officially in Denver, February 27. The *Rocky Mountain Medical Journal* reports the project to be the only one under the Office of Civilian Defense between Omaha and Salt Lake City and to have been made possible by Miss Helen Bonfils, Denver, in memory of her mother. The blood donor center and the processing laboratory are located at the Colorado General Hospital, Denver. Plans for the unit resulted from the cooperation between the Medical Society of the City and County of Denver, the Denver Chapter of the American Red Cross, the Office of Civilian Defense and the Colorado General Hospital. The purpose of this bank is to maintain a reserve of blood plasma for the needs of the population in the event of possible civilian disaster in the Rocky Mountain region. Surplus of plasma accumulated beyond the requirements of the Office of Civilian Defense will be available for use by licensed physicians and hospitals of this region. Any additional reserve beyond these needs will be made available to the armed forces.

### DELAWARE

**Temporary Licenses to Practice**—The board of medical examiners and the Medical Council of Delaware announced that the following applicants, all of Wilmington, have been granted reciprocal licenses to practice medicine and surgery in Delaware, in accordance with recent action by the legislature to grant temporary licenses for emergency measures: Drs. Joseph M. Orloff (Pennsylvania), Douglas Joseph Barry (New York), Margaret Pauline H. Foulger (Pennsylvania), Paul Charles Johnson (New York), Lemuel C. McGee (West Virginia) and William M. Genthner (New York). The action was taken to assist in the placement of physicians in industrial

plants and in certain localities of the state where there is a shortage of physicians. On account of a bill passed by the legislature, the board of medical examiners will conduct examinations April 13-15 for those applying for a license to practice medicine and surgery in the state of Delaware. Delaware is apparently one of the first states to adopt this procedure. Similar legislation is under consideration by a number of states.

### ILLINOIS

**Health of Industrial Workers**—The Kane County Medical Society and the Fox River Valley Manufacturers Association in cooperation with the state medical society, the state manufacturers association and the division of industrial hygiene of the state department of public health sponsored a conference on "Health of Industrial Workers" at Aurora March 10. Dr. John W. Dreyer, Aurora, presided, and Drs. Orlan J. Johnson, Chicago, spoke on "Better Local Industrial Health Organization." Milton H. Kronenberg, Chicago, "Problem of Women in Industry," Paul A. Brehm, Madison, Wis., "Absenteeism in Industry," and Edward C. Holmblad, Aurora, "How the Small Plant Can Conduct a Health Program." A dinner meeting presided over by Dr. Richard K. Collins, Aurora, president of the Kane County Medical Society, with Mr. W. M. Willett, Aurora, vice president of Western United Gas & Electric Company as toastmaster, was addressed by Arnold P. Benson, Bureau president pro tem of the state senate, on "Why I Am Interested in Promoting an Industrial Health Program" and Dr. Chauncey C. Maher, Chicago, "The Health of the Executive."

### Chicago

**Supreme Court Refuses to Reconsider Abortion Case**—The Illinois Supreme Court on March 11 refused to reconsider its decision of last November reversing the conviction of Mrs. Ada Martin, alleged head of a loop abortion syndicate, and Mrs. Josephine Kuder, her receptionist (*THE JOURNAL*, Aug. 22, 1942, p. 1435).

**New Director of Health Education**—Rachel E. Spinney, M. S. P. H., has been appointed director of health education for the Tuberculosis Institute of Chicago and Cook County to succeed Alice H. Miller, C. P. H., who has become health education consultant with the U. S. Public Health Service, at Kingston, Lenoir County, N. C. Miss Spinney has recently been health education secretary of the Hartford Tuberculosis and Public Health Society in Connecticut. She received her master's degree in public health at the University of Michigan, Ann Arbor.

### INDIANA

**Course in Otolaryngology**—The Indiana University School of Medicine, Indianapolis, will conduct its annual anatomic and clinical course in otolaryngology April 12-24, consisting primarily of studies of the anatomy of the head and neck. Morning periods will be devoted to correlated subjects in otolaryngology, discussions and clinics, while the afternoon and evening sessions will be devoted to anatomic dissections and presentations. On Sunday evening April 11, the Indianapolis Academy of Ophthalmology and Otolaryngology will give a dinner at the Indianapolis Athletic Club.

### KANSAS

**New Director of Venereal Disease**—Dr. Regnar M. Sorensen, surgeon, U. S. Public Health Service Reserve, formerly of Des Moines, has been detailed by the service as director of the division of venereal diseases of the state board of health. He succeeded Dr. Robert H. Riedel, Topeka, who has been given a leave to serve as captain in the medical corps of the U. S. Army.

**Lectures on Psychoanalysis**—The Topeka Institute for Psychoanalysis, which operates in three branches at Topeka, Los Angeles and San Francisco recently had as guest lecturers in its Topeka branch Dr. Alan Gregg, New York, director for the medical sciences, Rockefeller Foundation on "Medical Communications." Dr. Frank Fremont-Smith, New York, director of the medical division, Josiah Macy Jr. Foundation, "Trends in Medical Research." Norman R. F. Maier, Ph.D., University of Michigan, Ann Arbor, "Abnormal Fixation as a Form of Compulsion in the Behavior of Rats" and "Direction of Selective Mechanisms in Thinking" and Robert R. Sears, Ph.D., Iowa Child Welfare Research Institute, Iowa University, Iowa City, "Psychological Research." Seminars and lectures are also presented at the Los Angeles and San Francisco branches. Additional information on Topeka training activities may be obtained from Dr. Ernest Lewy, 3617 West Sixth Avenue, Topeka, and on California training activities from Dr. Ernst Simmel, 555 N. Wilcox Avenue, Los Angeles.

## KENTUCKY

**Portrait of Dr Barbour**—An oil painting of Dr Philip F Barbour, Louisville, has been presented to the University of Louisville School of Medicine by senior medical students, honoring the physician's many years' service to the school. Dr Barbour, who is now pediatric consultant to the state department of health, was clinical professor of diseases of children and head of the department of pediatrics at the medical school from 1908 to 1940. He was president of the state medical society in 1932.

## MASSACHUSETTS

**Postgraduate Course of College of Physicians**—The American College of Physicians is sponsoring a course on internal medicine at Boston University School of Medicine and Massachusetts Memorial Hospitals Boston, April 5-10. The course is similar to those conducted in January and February at the University of Minnesota Medical School, Minneapolis, and the Mayo Clinic, Rochester, Minn.

## MICHIGAN

**Training Program for Physicians in Industry**—A program has been formulated in Michigan for the training of physicians for replacements in industry. Consisting of three weeks' study, the work is part of a plan whereby the state committees on procurement and assignment and on industrial health may assist industry in solving the medical procurement problems of industry. The first week's work will cover preventive aspects, the second field work and the third observation of working methods in full time medical departments. No charge is made for instruction but physicians will pay their own living expenses. The training will be given by the bureau of industrial hygiene of the state department of health. A similar program was launched in Indiana recently (*THE JOURNAL*, February 13, p 531).

## MISSISSIPPI

**Personal**—Dr Clyde M Speck, medical superintendent of the Mississippi State Hospital, Whitfield, has been appointed associate professor of psychiatry at the University of Mississippi School of Medicine, University.

**Society News**—Dr Hilliard E Miller, New Orleans, was asked to repeat the annual C. Jeff Miller address of the Southeastern Surgical Congress before the Central Mississippi Medical Society in Jackson recently. Dr Miller had delivered the lecture before the Southeastern Congress in March, but because his brother, the late Dr C. Jeff Miller, was well known to the Mississippi group, the lecture was made a feature of a recent meeting.

**Lectures on Venereal Diseases**—On March 2 Dr Percy S Pelouze, assistant professor of urology at the University of Pennsylvania School of Medicine, Philadelphia, and consultant for the gonorrhea control program for the U. S. Public Health Service, opened a series of lectures on the diagnosis and treatment of gonorrhea at regular and special meetings of medical societies throughout the state. He spoke in Jackson March 2, Vicksburg March 3, Greenwood March 4, Greenville March 5, Tupelo March 9, Clarksdale March 10, Laurel March 11, Oxford March 12, Natchez March 16, McComb March 17, Meridian March 18, Jackson March 20 and Biloxi March 24.

**Special Examinations for License to Practice**—The Mississippi State Board of Health announces that special examinations for license to practice medicine will be held at the Robert E. Lee Hotel, Jackson, April 7-8. The Mississippi law permits examinations to second year students on the first two years of medicine as well as all the examinations for four year men. At this special examination applicants will be accepted who still lack a few weeks of finishing the first two years or finishing the four years in medicine, but results of such examinations will become effective only after successful completion of the courses concerned. The regular examinations will be postponed until some time in September.

## MISSOURI

**Program on Industrial Health**—"What Should Be Done to Improve the Health Program and the Medical Care of the Worker" was the theme of a program in Kansas City March 17, the first symposium in a series on industrial health planned for the greater Kansas City area. Representatives of labor management, public health, industrial nurses, industrial physicians and the compensation board participated in the program. Dr Clarence D Selby, medical director of General Motors Corporation, Detroit, was the guest speaker. Local health agencies cooperated in presenting the project.

## NEW YORK

**Doctors' War Fund**—The recent establishment of a Doctors' War Fund, maintained by the physicians of Huntington Township, has been announced. The purpose of the fund is to provide regular financial assistance of \$100 monthly to families of those men who have gone into service. Trustees of the fund, which is to be given a year's trial, are Drs Neil E Falkenburg, Huntington; Joseph G Patky, Huntington, and Wilbur C Travis, Northport. It is hoped that through the plan an adjustment can be made between the civilian income and that of an army officer, according to the state medical journal.

**Cancer Teaching Day**—A special program will be presented at the Rochester Academy of Medicine, April 15, to constitute a "cancer teaching day," under the auspices of the Medical Society of the County of Monroe, Seventh District Branch of the state medical society, the academy of medicine, the University of Rochester School of Medicine and Dentistry, Tumor Clinic Association of the State of New York, the state medical society and the state division of cancer control. The speakers will include Drs Norman Treves, New York, "Care of the Advanced Cancer Patient" and Fred W Stewart, New York, "What May Be Logically Expected from Preoperative and Postoperative Radiation in Mammary Cancer." At an evening session Drs Cornelius P Rhoads, New York, will discuss "Role of the Endocrines in Neoplastic Disease" and Charles B Huggins, Chicago, "Diagnosis and Treatment of Prostatic Cancer."

**Minimum Medical Standards in Industry**—The Buffalo District Committee for Industrial Health, of which Dr Herbert H Bauckus, Buffalo, is chairman, has drawn up minimum medical standards for use in industry. The recommendations, which have been sent to all plants in the Buffalo area, are designed to meet low cost health improvements in various plants differing in size and accommodations. The recommendations emphasize the need for good sanitary facilities as a prerequisite to prevent the spread of communicable and occupational diseases, the value of preventive vaccinations, the prevention and care of colds and need for selection in foods. A meeting of the study committee for industrial health of the Medical Society of the State of New York was held in Buffalo recently to discuss plans for a more accelerated promotion of industrial health committees similar to the one set up in Buffalo. Cities tentatively considered for proposed committees were Rochester, Syracuse, Utica and Schenectady.

**Child Care Plan Approved**—The state war council has approved a \$15,000,000 program for the care of children of women working in war industry, one third of the cost to be borne by the state. The *New York Times* reported on March 12. The state's share of the cost will become available on April 1 from the \$7,500,000 provided by Governor Dewey in his executive budget for child care equipment reserve pay increases for the state police and other purposes. The other two thirds of the cost will be divided evenly between the localities and parents making use of the centers. Use of child care centers will be available to all children living in the state whose mothers are working either in war industries or in manpower shortage areas. Applications for state aid will be filed by local war councils but may be made on behalf of religious, charitable, fraternal or community groups seeking to establish child care centers. Child care projects to be conducted in the public schools will be investigated, passed on and supervised by the state education department, but all other such centers will come under the jurisdiction of the social welfare department. The War Council in approving the plan prepared by Governor Dewey's staff, adopted several resolutions of general policy, one of which states that child care centers will be established only in areas where a manpower shortage exists or where mothers are working in the production of goods needed by United Nations forces for the war. The sole exception to the general rules laid down for operation of the program was made to preserve twenty-eight settlement house nursery schools in Manhattan. These institutions, which previously have been used by working mothers whether in war industry or not, will lose on April 1 the Works Project Administration grants which have maintained them. The War Council has agreed to help support these child care centers on the same basis as others to be established provided they make full use of existing facilities to care for children of mothers in war industry. The cost of child care under the program is estimated at a maximum of \$275 a year for each child between 2 and 5 years of age and \$100 a year for children over 5 who presumably attend day school several hours a day. The centers would be open sixty-five to seventy hours a week and then only during the day.

## New York City

**Courses in Cardiovascular Diseases and Gastroenterology**—Mount Sinai Hospital announces two twelve weeks' postgraduate courses, one in cardiovascular diseases the other in gastroenterology April 5-June 23. The former course has been designed to deal with the broader diagnostic and therapeutic aspects of the more common clinical patterns of rheumatic, arteriosclerotic, syphilitic and congenital heart diseases while the course in gastroenterology will attempt to cover the fundamentals of diagnosis, clinical medicine and therapy with particular emphasis on medical symptomatology. Additional information may be obtained from the Secretary for Medical Instruction Mount Sinai Hospital, Fifth Avenue and 100th Street.

**Committee Recommends Oleomargarine**—The committee on public relations of the New York Academy of Medicine recommended on February 14 that oleomargarine be made more freely available to the public as a butter substitute and urged that federal and state laws restricting the manufacture and distribution of oleomargarine be suspended for the duration of the war. Specifically, the committee suggested that the federal government make it mandatory for all oleomargarine to be fortified with vitamin A at a uniform level of 9,000 units per pound, according to the New York *Herald Tribune*. Charging that there had been much misinformation about oleomargarine, the committee is reported to have said that "under the standards set up by the Food and Drug Administration oleomargarine is as clean and sanitary a food as butter."

**New Blood Exchange Bank**—A blood and plasma exchange bank has been established under the auspices of the Medical Society of the County of New York with the approval of the Greater New York Hospital Association. The exchange is a nonprofit organization and has a membership of thirty-five hospitals. Its executive personnel serves without compensation. Overhead costs are borne by blood supplying hospitals. The exchange bank is managed by eight administrators and the eight transfusionists of the supplying hospitals. According to the New York *Times*, in a six month preliminary test involving only three institutions, one hundred transfusions were carried out with an estimated saving of approximately \$1,900 to patients and hospitals. The *Times* pointed out that the next step is to extend the plan to counties that border New York, with the ultimate establishment of a national organization. In the case of a needed transfusion members of the patient's family offer their blood, formerly, if the blood did not match, the donors were rejected. Now two whose blood is of no value to the patient can go to the blood and plasma bank, each giving a pint of blood. If only one donor gives blood to the exchange bank \$10 is charged. If the patient prefers not to send donors but to pay for blood the cost is \$20. The hospital that receives the blood makes its own charge for laboratory and operating room services. Thus eight large hospitals with blood banks (called supplying hospitals) are interlaced with hospitals without banks (called requisitioning hospitals).

## OHIO

**Children's Dental Health Day**—The *Bulletin* of the Academy of Medicine of Cleveland reports that a movement is under way to hold a national observance of Children's Dental Health Day, an expansion of the local observance, February 1, sponsored by the Cleveland Dental Society. The dental society approved a resolution recommending that the first of February each year be designated a national dental health day for submission to the Ohio State Dental Society and the American Dental Association.

**In Memory of Dr Crile**—Special memorial services were held recently in Amasa Stone Chapel of Western Reserve University, Cleveland for Dr George W Crile who died on January 7. The speakers included Brig Gen Fred W Rankin Lexington Ky M C U S Army President of the American Medical Association, Dr Irvin Abell, Louisville Ky president of the American College of Surgeons, William S Wickenden, LL.D. president of the Case School of Applied Science and a director of the Cleveland Clinic Foundation, of which Dr Crile was a co-founder and Winfred G Leutner LL.D. president of Western Reserve University.

**Dr Leggo Directs Industrial Hygiene Service**—Ralph Christopher Leggo, surgeon U S Public Health Service Reserve has been placed in charge of the industrial hygiene service of the state department of health. A former secretary of the Western Association of Industrial Physicians and Surgeons and associate editor of *Industrial Medicine* Dr Leggo recently was industrial hygiene physician for the Missouri State

Board of Health at Jefferson City. He once served as consultant in occupational hygiene to the California State Department of Health and as plant physician for the California and Hawaiian Sugar Refining Corporation. In compliance with the recommendations of the newly organized committee on industrial health of the state medical association, local groups are being formed and plans are under way to present refresher courses throughout the state, specialized programs to be announced later.

## PENNSYLVANIA

**State Health Commissioner Reappointed**—Dr Alexander H Stewart, Harrisburg has been reappointed secretary of the state board of health by Gen Edward Martin, Harrisburg, the new governor of Pennsylvania.

## Philadelphia

**Annual Health Institute**—The woman's auxiliary of the Philadelphia County Medical Society will conduct its thirteenth annual health institute in the society's auditorium on April 13. "Our Own Health" will be the theme of the program, which includes the following speakers all of Philadelphia:

Dr Truman G Schnabel Is It Kidney?  
Dr Walter L Cariss What's in a Cold?  
Dr Merle M Miller, Influence of Allergy on Our Health.  
Dr George M Laws, How We Change with the Times  
Dr Herbert T Kelly Our Changing Foods  
Dr George C Griffith Care of the Heart—Normal and Abnormal

Dr William Bates, president of the county medical society will deliver the address of welcome.

## TEXAS

**Physicians Respond to Placement in Industry**—The committee on industrial health of the state medical association announces that ninety-one physicians have been placed in either full or part time positions in various industrial plants throughout the state. Thus far the Texas committee leads in the movement to have the state committees on industrial health serve as a clearing house for the placement of physicians in industry.

## UTAH

**Activities at Utah Medical School**—Recent appointments to the University of Utah School of Medicine, Salt Lake City include those of Dr Emil G Holmstrom instructor in obstetrics and gynecology, University of Minnesota School of Medicine, Minneapolis to assistant professor of obstetrics and gynecology, Dr Robert H Alway, instructor in pediatrics at Minnesota, to a similar position at Utah and Louis P Gebhardt Jr, PhD, formerly assistant professor of bacteriology at Stanford University School of Medicine San Francisco, to associate professor of bacteriology. Dr John A Anderson associate professor of pediatrics at Minnesota, has been appointed professor and head of the department of pediatrics. Under the recent reorganization the two year university medical school has been expanded to a four year classification. The classes will be limited to forty students each in the last two years. A working agreement has been drawn up between the regents of the university and the commissioners of Salt Lake County, giving the university complete control of all clinical material at Salt Lake County General Hospital by empowering the medical school to nominate members of the staff. This hospital of over 250 beds, plus clinical material available at the Dr W H Groves Latter-Day Saints Hospital, the Holy Cross Hospital, the Veterans Administration Facility and St Marks Hospital, all in Salt Lake City will give the medical school ample clinical material for teaching purposes.

## WEST VIRGINIA

**New Division of Cancer Control**—A new division of cancer control will be set up in the state health department under the provisions of a bill (S B 36) passed by the house of delegates of West Virginia and sent to the governor March 12. The senate had previously passed the bill without a dissenting vote. The new division will be under the supervision of the state health commissioner, the head of the division to be appointed by the commissioner in consultation with the public health council. Besides providing for a wide educational program stressing the importance of early diagnosis the bill, which was sponsored by the state medical association, provides for the establishment of cancer diagnostic and treatment clinics in general hospitals of the state meeting minimum requirements prescribed by the division in consultation with the West Virginia State Medical Association. Treatment will be furnished needy patients within the limits of available funds. The budget bill passed March 13 appropriates \$50,000 annually for the treatment and control of cancer.

## GENERAL

**Easter Seals for Crippled Children**—The tenth annual sale of Easter seals for crippled children, sponsored by the National Society for Crippled Children and its affiliated organizations, opened March 26 to continue to April 5.

**Meetings Canceled**—The Pacific Coast Oto-Ophthalmological Society has canceled its 1943 meeting—The executive committee of the American Diabetes Association has canceled the third annual meeting of the association—Announcement is made of the cancellation of the 1943 meeting of the Central Neuropsychiatric Association.

**Activities of Hospital Association**—The board of trustees of the American Hospital Association, at its meeting in Chicago, February 13, voted to hold its annual meeting, the place and time to be announced later. The appointment of a committee was also authorized to study the publication of a hospital magazine and to consider the employment of an editor. Approval was also given to the employment of a new librarian as soon after July 1 as possible. The board of trustees gave their annual banquet to the presidents and secretaries as a testimonial dinner to Asa S. Bacon, superintendent emeritus of Presbyterian Hospital of Chicago, a past president of the American Hospital Association and for thirty-five years its treasurer, and to Dr. Bert W. Caldwell, executive secretary emeritus and editor of *Hospitals*. Silver plaques were presented to Mr. Bacon and to Dr. Caldwell.

**New Medical Director of Industrial Hygiene Foundation**—Dr. Charles F. Kutscher, Pittsburgh, a member of the industrial health and hygiene committee of the Allegheny County Medical Society, has been named medical adviser of Industrial Hygiene Foundation of America. He succeeds Dr. Samuel R. Haythorn, Pittsburgh, president of the county medical society who has been medical adviser of the organization since it was first established in 1935 as the Air Hygiene Foundation of America. Dr. Haythorn has been advanced to medical consultant. Dr. Kutscher graduated at the University of Pittsburgh School of Medicine in 1927. Wesley C. L. Hemenon, formerly of the industrial hygiene division of the Massachusetts Department of Labor, Boston, has become industrial hygiene engineer at the foundation.

**Resolution About a Commission to Study Hospitals**—At a meeting in New York, February 25, a resolution was adopted by the Hospital Bureau of Standards and Supplies urging the appointment by the President of the United States of a commission 'to study the problem of the most efficient use of the country's hospitals in connection with the war; this commission to consist of representatives active in the management of voluntary, public, and governmental hospitals and national health agencies, with authority to secure adequate professional assistance to advise the commission in regard to technical matters arising in connection with the study.' The Bureau of Hospital Standards also adopted a resolution signifying its cooperation with all government agencies working on the problem of the simplification and standardization of hospital goods to the end that wastage of materials and man hours be reduced.

**Association of Industrial Physicians and Surgeons**—The annual convention of the Western Association of Industrial Physicians and Surgeons will be held at the Biltmore Hotel in Los Angeles, April 29-May 1, under the presidency of Dr. Benjamin J. Grees. Los Angeles. Among the speakers will be:

Dr. William A. Sawyer, medical director of the Eastman Kodak Company, Rochester, N. Y. (subject not announced)  
Philip Drinker, Ch. E., professor of industrial hygiene, Harvard School of Public Health, Boston (subject not announced)  
Dr. John H. Foulger, director of the Haskell Laboratory of Industrial Toxicology, Wilmington, Del. (subject not announced)  
Lyman D. Hencock, dental surgeon, U. S. Public Health Service, Bethesda, Md. Dentistry's Place in Industry  
Dr. Clifford Kuh, director of the Bureau of Industrial Health, California State Department of Health, Sacramento. Rehabilitation of the War Wounded into Industry  
Mr. Robert Stormont, Lockheed Aircraft Corporation, Burbank. Rehabilitation of the War Wounded into Industry  
Lieut. Comdr. Robert S. Poos, surgeon, U. S. Navy, Washington, D. C. (subject not announced)

Additional information may be obtained from the secretary, Dr. Rutherford T. Johnstone, director, department of occupational diseases, Golden State Hospital, Los Angeles.

**Report of Georgia Warm Springs Foundation**—During the fiscal year ended September 1942, 571 patients received treatment at the Georgia Warm Springs Foundation, and of these 390 or 68.3 per cent required partial or full financial aid. The average daily number of patients in residence

throughout the year was 101.16 and they received 36,917 hospital days' care. In the previous year 437 patients were treated for a total of 32,590 hospital days' care. A therapeutic pool completed in June 1942, is the newest addition to the facilities at the foundation. The physical therapy postgraduate school initiated its formal course of instruction in July 1941. The course lasts twelve consecutive months and is open only to technicians who have been graduated from schools of physical therapy approved by the Council on Medical Education and Hospitals of the American Medical Association. The foundation reported a gross revenue for the fiscal year of \$263,991.98 and expenditures totaling \$450,803.75, leaving a deficit of \$186,812. The deficit, however, was covered by a grant of \$262,727 from the National Foundation for Infantile Paralysis. The difference of \$75,915 was added to the reserve fund, which now stands at \$1,824,834.

## LATIN AMERICA

**Congress on Endocrinology Postponed**—The third Pan American Congress of Endocrinology, which was to be held in Buenos Aires, July 1-6, has been postponed.

**Congress on Neurology and Legal Medicine**—Plans are under way to hold the first congress of the Latin American Academy of Neurology, Psychiatry and Legal Medicine; the dates to be announced later.

**New Department of Nutrition in Paraguay**—*Semana Medica* recently announced the formation of a department of nutrition in the ministry of public health of the republic of Paraguay. The unit was formed under the direction of Dr. Francisco A. Montaldo, who for two years specialized in the study of nutrition at the Institute of Nutrition at Buenos Aires on a scholarship of the government of Paraguay.

**New Publications**—The *Anales de la Catidia de Clima Ginecologica* recently made its appearance. The first issue is dated July 1942 and serves to commemorate the twentieth anniversary of the department of gynecology of the faculty of medical sciences of the National University of Rosario, Argentina. Dr. Rafael Araya is the editor. The Academy of the History of Medicine at the University of Buenos Aires began the publication of the *Revista Argentina de Historia de la Medicina*. Prof. Juan Ramon Beltran is founder and editor of the new journal, which is to appear every four months. The issues of January and May 1942, which were recently received, contain original articles, notes and reviews of books and articles. Works to be reviewed should be submitted in duplicate to Professor Beltran, Echeverria 1606, Buenos Aires. The first issue of *Pediatría de las Américas* made its appearance with the January 1943 issue. Dr. Alfonso G. Alarcon is the editor. The headquarters of the new journal, which will be published monthly, are Ponciano Arraga 6, Despacho 2, Mexico, D. F.

## FOREIGN

**X-Ray Pioneer Dies**—Harold J. Suggars, the first of four English x-ray pioneers, died March 9 at the age of 65 in Bellericav, Essex. According to the *New York Times*, forty-one years ago Mr. Suggars, a carpenter, volunteered to assist Dr. Ernest H. Harnack. Two other associates, Reginald Blackwell and E. E. Wilson, also died with aggravated burn conditions.

**Physician Honored**—King George VI recently conferred a peerage on Sir Charles McMoran Wilson, president of the Royal College of Physicians of London and personal physician to Winston Churchill, prime minister. Sir Charles has accompanied Mr. Churchill on at least three "far distant allied capitals on missions of great consequence to the united war effort," the *British Medical Journal* reports.

**Sir Farquhar Buzzard to Retire as Regius Professor**—Sir Edward Farquhar Buzzard will retire in April from the regius professorship of medicine at the University of Oxford, Oxford City, a position he has occupied since 1928. Plans are under way to establish a Buzzard scholarship or prize in medicine and to present a portrait to the school in his honor. Sir Farquhar was president of the British Medical Association 1936-1937 and a representative of the General Medical Council 1929-1939.

## Deaths in Other Countries

**Dr. Russell Henry Jocelyn Swan**, London, emeritus surgeon to the Royal Cancer Hospital and house surgeon at Guy's Hospital and St. Peter's Hospital for Stone, widely known for his work on cancer, died March 6, aged 66. Dr. Swan was also surgeon of the Royal Air Force Hospital and the American Red Cross Hospital for Officers.

## Foreign Letters

### LONDON

(From Our Regular Correspondent)

Feb 13, 1943

#### The Starvation of Children in Occupied Countries

The plight of the civil population in enemy occupied Europe causes much concern. There is serious want, and many have died from starvation. Plans have been made for immediate relief when hostilities cease. The condition of the children has given rise to letters in the *Times* from representative persons. Dr. L. G. Parsons, president of the British Pediatric Association and Dr. Reginald Lightwood, secretary of the Child Relief Subcommittee, draw a harrowing picture. An eye witness has described the children in Athens as "without strength to beg." One child said "I have lost my mother—she died of hunger, my brother died last night because we had not eaten anything for four days." The Athens Welfare Service reports that 9 out of 10 children die before they reach the age of 6 months. An arrangement was made to relax the blockade and allow 100 tons of dried Canadian milk to be imported monthly, a bare pittance for a child population of 2,000,000. Under an earlier plan, suggested by Sweden, 15,000 tons of wheat has been sent monthly since August, but cereal without milk and vitamins is deficient and increases rickets. A famine relief committee is supported by the archbishop of Canterbury and the cardinal archbishop of Westminster in a plea to the British government to send enough dried milk and vitamins to maintain the lives of children under 16 and of expectant and nursing mothers in Greece and Belgium. Each country requires about 2,000 tons monthly. The International Red Cross gives guarantees against the food being used by the enemy.

In another letter to the *Times* H. E. Kershner, director of relief, American Friends Service Committee, states that close study of the continent convinces him that in order to shorten the war and make reconstruction less difficult we should save what we can of the children left in the occupied countries. He has seen the weights of the newborn fall to almost half normal and infant mortality climb to thrice normal. He has seen the children of southern France practically stop growing and a large percentage lose weight. Many lost their memory and learned nothing in school. Many are kept in bed to conserve their strength. For lack of clothing, some go to school only on warm days or on alternate days, using one another's clothing.

In a third letter to the *Times* Lord Noel-Buxton, president, and other officials of the "Save the Children Fund" endorse the previous letters. They have just completed an inquiry into the condition of children in the occupied countries and found starvation to be even more widespread and more terrible than the preceding writers state, perhaps in the desire to avoid exaggeration. In no country under enemy domination is food sufficient to maintain the children in health, in many it is insufficient to keep them alive. Even in countries normally self sufficient in basic foodstuffs, such as the Netherlands and Norway, requisition of the country's produce, by means either overt or covert, has debased the standard of living, threatening the young, while in Poland and Yugoslavia one must ask how many children will be left alive after another year of war.

#### Medical Students Confer

The formation of the British Medical Students Association was reported in a previous letter. The inaugural meeting was held last June. A congress of the association has been held at the British Medical Association House, at which nearly all the medical schools in the country were represented. At the opening session Mr. Ernest Brown, minister of health, delivered an address in which he reviewed the position of students

under the National Service Act. The reservation of male students was subject to periodic certification, satisfactory progress in their studies and performance of part time national service.

Subsequent sessions were devoted to a memorandum on education which had been prepared by a subcommittee. Among the points in the debate were the wider use of municipal hospitals for teaching, the benefits of a system of apprenticeship to general practitioners, the abolition of the long vacation and introducing a fourth term. One student complained that while the report mentioned sociology as a premedical subject it did not recommend an examination in this subject. Without that little interest would be taken in it. Another wanted a more prominent place in the curriculum for industrial medicine. There was much debate on the admission of women. One student was strongly against coeducation in the medical schools, but the general feeling favored it. Many men as well as women students urged that women should be admitted to the profession on exactly the same basis as men.

Prof. J. A. Ryle, honorary president of the association, gave the closing address. He declared that the training and practice of the profession had been too individualistic. It had been directed too much to the intimate as opposed to the ultimate aspect of disease—to the tubercle bacillus rather than to the conditions under which tuberculosis thrived. There had been too much separation of general practitioners from one another, of consultants from general practitioners, of hospital from domiciliary service, of public health service from general practice, of research from all the rest. The student was taught little about the subject of health but much about departures from it.

#### Vital Statistics Improve Notwithstanding the War

A total of 168,638 live births in England and Wales during the September quarter was the highest in any quarter since June 1930. In comparison with previous third quarters it was the highest since 1926 and represented a birth rate of 161 per thousand of population, the highest since 1930. In the quarter 86,893 boys and 81,745 girls were born, a proportion of 1,063 to 1,000, compared with an average of 1,052 to 1,000 for the ten preceding third quarters. Stillbirths numbered 5,425, or 31 per cent of the total births, the lowest percentage yet recorded.

For the first time in any quarter since 1936 the total number of deaths fell below 100,000. The figure was 97,276, which represents an annual death rate of 93 per thousand and was lower than that of any third quarter since 1927. It compares with 97 for the third quarter of 1941 and an average of 10 for the same quarters of the previous five years. There were 6,766 deaths of infants under 1 year, a rate of 40 per thousand live births. This was 5 below the average of the ten preceding third quarters and was equal to the low record that was reached in 1939.

There was a decline in the number of marriages. The total for the quarter of 95,713 was 8,620 fewer than in the corresponding quarter of 1941 and 31,937 below the average for the same quarters of the previous five years. The marriage rate of 183 per thousand of population was lower than that of any third quarter since 1936. The explanation of the decline seems to be as follows. The outbreak of war was followed by an increase in the number of marriages, which is now reflected in the rise in the birth rate. This was partly due to the fact that in addition to their ordinary pay soldiers receive allowances for wives and children. The increase in the number of marriages was largely due to earlier ones, thus diminishing those which would take place in the ordinary course in the later years of the war.

### Pneumoconiosis Made an Industrial Disease

In the House of Commons a workmen's compensation bill making pneumoconiosis an industrial disease was read a second time. The disease is due to the inhalation of dust in coal mines and elsewhere. Compensation will be paid for any form, including old cases in men who have left the industry. It is proposed to pay those affected \$4 a week in addition to their national health insurance grant in the case of temporary incapacity and \$1,000 to widows in case of death. The cost will be levied on the output of coal. It is estimated that it would not exceed 2 cents per ton, and that only for a single year.

### JERUSALEM, PALESTINE

(From Our Regular Correspondent)

Jan 15, 1943

### Microbiological Society of Palestine

On Dec 9, 1942 the fifth annual meeting of the Microbiological Society of Palestine was held under the chairmanship of Dr Olitzki in the premises of the Medical School of the Hebrew University.

In his opening address, Olitzki pointed out that in this country too microbiologic studies, originally concerned only with pure research problems, have been transferred to the sphere of practical work by war conditions (preparation of serums and vaccines, army hygiene, diagnostic courses of tropical and subtropical diseases, antimalaria measures).

In the theoretical part of the meeting Ernst Simon of Rehovoth gave a survey on "New Ways in the Investigation of Bacterial Metabolism" wherein he outlined the progress marked by the introduction of the electron microscope, spectography and the ultra centrifuge in the investigation of bacterial metabolism and in virus research.

Subjects referring to war conditions were dealt with by Olenik, who gave an outline of the method used at the bacteriologic department of the Hebrew University for the preparation of antityphus vaccine, and further by Ashbel, who reported on "Immunologic Properties of Spirochaeta Recurrentis of Cases from the Libyan Desert." Dealing with practical issues, Rappaport discussed the possibility of replacing peptone or bouillon in the culture medium by fish extracts.

Subjects especially concerning this country were discussed by Tshernomoretz speaking on the "successful immunization of cattle against Theileria infection," by Saliternik who reported on the identification of the various anophelis species by the pattern in which their eggs are arranged on the water surface, and by B Levy on the preparation of highly active antianthrax vaccine. Volcani reported on the microflora of the bottom layer of the Dead Sea, where he had found various species of living protozoa and bacteria.

Guggenheim gave an account of his experiments carried out with a view to determine the reduced resistance of vitamin A deficient rats to typhus muris infection. Olitzki spoke about the method used in the preparation of highly virulent dysentery toxins (Shiga) from strains grown on synthetic culture mediums.

Diagnostic problems were dealt with by Adler ("On the Culture of Trichomonas hominis Without Bacterial Contamination") Klopstock discussed the value of the amebic complement reaction, while Gurewitz reported on skin tests in bacillary dysentery.

### Pharmacologic Institute for Mount Scopus

With the establishment of a pharmacologic institute under the joint auspices of the Rothschild Hadassah Hospital and the Hebrew University another step has been taken toward the realization of a medical faculty on Mount Scopus. The institute is housed in the Ratnoff building of the Medical Center.

The head of the institute is Prof G Wertheimer, who holds at present also the chair of physiologic chemistry at the Hebrew University. Professor Wertheimer has for a long time worked together with Professor Abderhalden at Halle.

### The New Haifa Hadassah Hospital

Sir Harold McMichael, high commissioner of Palestine, opened the new Hadassah Rothschild Hospital of the Jewish Community in Haifa on Oct 26, 1942. The hospital, on a 14 donum site off Keith Roach Avenue between Mount Carmel and Hadar Hacarmel, was built at a cost of £25,000. The sum came from the Jewish emergency tax, the Haifa Jewish Community, the Hadassah organization and P I C A funds and the government. The hospital has at present 60 beds in three sections (surgical, women and children). In emergencies the bed capacity can be doubled. The final project is the expansion to 200 beds. The director of the hospital is Dr S Seide, an internist. The hospital had already proved its value during the recent outbreak of typhoid.

### Formation of a French Medical Association

A Palestine branch of the Association for French Medical Science in the Middle East was established on Oct 22, 1942 under the auspices of General Catroux, Fighting French national commissioner and Surgeon General Guirriec, director of health services to the Fighting French forces in the Levant. The aim of the association includes the fostering of contacts among the many physicians with French training now in the Middle East. On the first meeting in Jerusalem two papers were read: one by Dr Champenois, director of the French Hospital in Bethlehem, the other by Dr Bauer, head of the French Hospital in Jerusalem.

### Polish Doctors Meeting in Tel-Aviv

A conference of Polish military and refugee physicians took place on Oct 7, 1942 at the Strauss Health Center, Tel-Aviv. The main theme was the treatment of Mediterranean diseases liable to be carried back to Poland by soldiers and refugees in the Near East. The conference was opened by Dr A Wolynski and Prof A Laskiewicz. Papers were read by Prof A Mandel, Professor Dvbovski, Professor Marcus and others.

## Marriages

JAMES ALLAN FIELDS, Sanford Fla, to Miss Mona Jean Carpenter of Johnson City, Tenn, in Clearwater, Fla, in February.

LUKE W QUERA JR, Charlotte N C, to Miss Margaret Newton of Birmingham, Ala, in Fort McPherson, Ga, February 8.

WILLIAM LUTKINS JOHNSTON, Birmingham Ala, to Miss Margaret Louise Richards of Glasgow, Ky, February 23.

ROSCOE L PULLEN, New Orleans, to Miss Gwendolen Williams of Lethbridge, Alta, Canada, December 12.

SAMUEL SPRIGG JACOB III, Bethany W Va, to Miss Mary Ellen Bibbee of Athens Ohio, December 19.

BEVERLY CAROLINE PAYNE JR, Beaumont, Texas, to Miss Elizabeth Mason of Baytown, February 7.

ROBERT McCUE HALL, Raleigh, N C, to Dr JULIA ROWENA SIBBURY of Wilmington, February 27.

JOHN W R THOMAS, Springfield, Ill, to Miss Kathleen Wiggins in St Louis in February.

JOHN A SCHILLING, New York, to Miss Barbara Whipple of Rochester, N Y, February 13.

LLOYD DAVIS MILLER, to Miss Jane Evelyn Hartsell, both of Raleigh, N C, February 13.

EDWARD F HARDMAN, Youngstown, Ohio, to Miss Ann Russ in Baltimore, March 6.

SIDNEY C KEYES, Youngstown, Ohio, to Miss Alma Toepfner, February 6.



## Deaths

**John Franklin Dufferin Cook** \* Pierre, S D, College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1897, member of the House of Delegates of the American Medical Association in 1920, 1930 and 1932, superintendent of the State Board of Health and of medical licensure, secretary-treasurer of the South Dakota State Medical Association from 1925 to 1937 and in 1938 president, served as president of the Northwest Regional Conference captain in the medical reserve corps of the U S Army not on active duty, served with the same rank in the medical corps of the U S Army during World War I and as president of the medical advisory board for the counties of Day and Marshall, also as county coroner and as a member of the Marshall County Board of Health fellow of the American College of Surgeons, member of the staff of the Peabody Hospital, Webster, member of the associate staff of St Luke's Hospital, Aberdeen member of the board of directors of the *Journal-Lancet*, aged 70, died, January 27 in St Mary's Hospital following a prostatic resection

**Carl B Wagner** \* Chicago, Illinois Medical College, Chicago 1909, honorary life member of the American Academy of Ophthalmology and Otolaryngology, member of the American Association for the Advancement of Science, Chicago Ophthalmological Society and the International Congress of Ophthalmology, formerly clinical professor of ophthalmology at the Loyola University School of Medicine, member of the consulting staff of the Cook County Hospital served on the staff of the Chicago Eye, Ear, Nose and Throat Hospital aged 66, died February 1, in the Illinois Masonic Hospital of carcinoma of the prostate

**Joseph Francis Wallace**, Silver Spring Md, Georgetown University School of Medicine, Washington, D C, 1899 at one time attending physician at St Vincent's Orphan Asylum, police surgeon and secretary of the board of health in Leavenworth Kan at one time surgeon in the U S Public Health Service Reserve and the Veterans Administration, formerly manager and chief of the tuberculosis service of the Veterans Administration Facility at Castle Point, N Y served during World War I, aged 68, died February 11, of coronary occlusion

**Edward Adams**, New York Cornell University Medical College New York 1899 member of the Medical Society of the State of New York served during World War I, lieutenant colonel in the medical reserve corps of the U S Army not on active duty aged 65, died, February 7, of heart disease

**John Jeremiah Ahern**, Oldham S D, Physio Medical College of Indiana Indianapolis, 1896, Rush Medical College Chicago 1897, aged 75, died, January 14 in the Volga (S D) Hospital

**George Beal Arnold**, Cincinnati Medical College of Ohio Cincinnati, 1896, aged 69 died, December 25, of coronary embolism

**William Edwin Boozer** \* Elizabeth N J University and Bellevue Hospital Medical College, New York, 1909 fellow of the American College of Surgeons, aged 64 on the staff of the Alexian Brothers Hospital served as chief of staff and chief of the eye, ear, nose and throat department of St Elizabeth's Hospital, where he died, February 5, of coronary occlusion

**Charles Harvey Boyer**, Easton, Pa, Jefferson Medical College of Philadelphia, 1894, member of the Medical Society of the State of Pennsylvania, aged 73, died, January 13

**Marcus Carter**, Burlington Junction Mo, Kentucky School of Medicine, Louisville, 1877, also a druggist, aged 88 died January 31, of pulmonary embolus and a fractured hip received in a fall

**Thomas J Casto**, Charleston, W Va Maryland Medical College, Baltimore, 1902, member of the West Virginia State Medical Association aged 71, for many years on the staff of the Mountain State Memorial Hospital, where he died, January 20 of cirrhosis of the liver and diabetes mellitus

**Franklin T Chamberlin**, Aquia, Va Georgetown University School of Medicine, Washington, D C, 1885, U S Army Medical School, Washington, D C, 1924, aged 79, died, February 3

**Thomas Kennerly Conrad**, Chevy Chase, Md, Georgetown University School of Medicine, Washington D C, 1908, member of the Medical and Surgical Faculty of Maryland, major in the medical reserve corps of the U S Army not on active duty, served during World War I, formerly on the staffs

of the Garfield Memorial and Doctors hospitals, Washington, D C aged 65, died, January 30, in the Mount Alto Hospital, Washington, of arteriosclerosis and nephritis

**James John Cuono**, New York, Long Island College Hospital, Brooklyn, 1909, on the staff of the Columbus Hospital, aged 55, died, January 28

**Edward Jackson Davis**, St Louis, Harvard Medical School, Boston, 1899, at one time physician to the Zuni Indian Reservation at Zuni, N M, served as treasurer and member of the staff of the People's Hospital, where he died, January 18 of cerebral hemorrhage, aged 72

**Archibald Sayre Dennison** \* Lynn, Mass, Bellevue Hospital Medical College, New York, 1896, also a pharmacist, fellow of the American College of Physicians, honorary member of the Lynn Hospital, aged 73, died, January 22, of acute coronary occlusion

**Lambros G Diamessis**, Chicago National University of Athens School of Medicine Greece, 1904, aged 63, died, January 14

**William R Doyle**, Sineer, S C, Atlanta (Ga) Medical College, 1895 member of the South Carolina Medical Association, aged 72, died, January 28, of bronchiectasis

**Leonard Eskey**, Wheeling, W Va, University of the City of New York Medical Department, New York, 1882, member of the West Virginia State Medical Association, for many years company doctor for the Wheeling Fraction Company and medical examiner and company physician for the Baltimore and Ohio Railroad, one of the organizers, a director and vice president of the Center Wheeling Savings Bank, aged 92, died, January 17

**Fritz Faltitschek**, New York, Medizinische Fakultät der Universität Wien Austria, 1924, assistant physician on the staff of the Mount Sinai Hospital, aged 48, died, January 20, of subacute bacterial endocarditis

**Morris Ritner Faulkner**, Vineland, N J, Hahnemann Medical College and Hospital of Philadelphia, 1895, served during World War I was chief surgeon aboard the liner *Leathian*, formerly medical inspector of local schools, a U S Pension Examining Surgeon served as a member of the staff of the Newcomb Hospital, Vineland, and the Atlantic Shores Hospital, Somers Point, aged 70, died, January 24, of cerebral hemorrhage

**John Louis Fomorin**, Marathon, Ohio, Medical College of Ohio, Cincinnati, 1888, aged 87, died January 28

**Charles Freeman**, Steubenville Ohio, University of Georgia Medical Department Augusta, 1899, aged 68, died, January 26, of coronary occlusion and diabetes mellitus

**Lawrence Eugene Friedman**, St Louis, St Louis University School of Medicine, 1930, aged 38, died, January 27, in the Jewish Hospital of cerebral hemorrhage

**Ernest A Gates**, Springfield, Mass, Dartmouth Medical School, Hanover, N H, 1895 member of the Massachusetts Medical Society, aged 71, died, January 4

**Allen C Gillespie**, Dallas, Texas, Medical College of Alabama, Mobile 1890, at one time staff surgeon at the Agricultural and Mechanical College of Texas, College Station aged 79, died, January 9

**Alexander James Gillis**, Baltimore, College of Physicians and Surgeons, Baltimore, 1914, clinical professor of genito urinary surgery at the University of Maryland School of Medicine and College of Physicians and Surgeons, received the British Military Cross and the Purple Heart Medal for services during World War I, fellow of the American College of Surgeons served on the staffs of the Mercy and University of Maryland hospitals, aged 54, died, February 6, of coronary thrombosis

**John B Gordon**, Shawano Wis, Rush Medical College Chicago, 1903 formerly an alderman and president of the city council, aged 70, died, January 26, in a hotel in Chicago

**W O Green** \* Louisville Ky University of Louisville Medical Department, 1889, aged 76, died, January 23 of osteitis deformans

**Samuel Eugene Grout**, Docena Ala, University of Minnesota College of Medicine and Surgery, Minneapolis 1899 member of the Medical Association of the State of Alabama for many years associated with the Tennessee Coal and Iron Company, aged 69, died, February 4, of chronic cardiorenal disease

**John Mathew Hammons**, Louisville, Ky, Meharry Medical College, Nashville, Tenn, 1917, aged 51, died January 26, of chronic nephritis



**Thomas Henry Hanbidge**, Darby, Mont., Bellevue Hospital Medical College, New York, 1890, member of the Medical Association of Montana, aged 88, died December 1, of right hemiplegia

**H K Harker**, Dayton, Ohio, Pulte Medical College, Cincinnati, 1878, aged 89, died, January 16, of cardiac failure

**Charles G Harmonson**, Smyrna, Del., Jefferson Medical College of Philadelphia, 1884, member of the Medical Society of Delaware, past president of the Kent County Medical Society, vice president of the Clayton Bank and Trust Company, at one time president of the board of health of Clayton on the staff of the Kent General Hospital, Dover, aged 81, died, February 5, of coronary thrombosis

**Raymond Victor Harris**, Savannah, Ga., University of Maryland School of Medicine Baltimore 1907, member of the Medical Association of Georgia, aged 62, died, January 23 of angina pectoris

**Urban Bunyon Harris**, Evanston, Ill., University of Illinois College of Medicine, Chicago, 1914, served during World War I, member of the surgical staff and obstetric consultant at the Martha Washington Hospital, Chicago, aged 51 died, January 24, in Chicago of cerebral hemorrhage

**Frank A Hartley**, Springfield, Ohio, Starling Medical College, Columbus 1898, member of the Ohio State Medical Association and the American Academy of Ophthalmology and Otolaryngology recently appointed to the post of assistant chief of the emergency medical unit of the Civilian Defense Corps, aged 72 member emeritus on the staff of the Springfield City Hospital, where he died January 18 of coronary thrombosis

**Walter Hannibal Henning**, New York, Long Island College Hospital Brooklyn, 1903, aged 63 hanged himself January 30

**John Joseph Hickey** ☉ Peabody Mass., Harvard Medical School, Boston 1903, for many years on the staff of the Josiah B Thomas Hospital Peabody, and the North Shore Babies Hospital Salem, aged 75, died, January 17, in the Salem (Mass.) Hospital

**James E Holden**, Collins, N Y University of Buffalo School of Medicine 1896, member of the Medical Society of the State of New York served during World War I health officer of Collins, aged 79 died, January 23 in Buffalo of coronary thrombosis

**Duke Hunter Huffaker**, El Paso Texas Kansas City (Mo.) Medical College, 1894, member of the State Medical Association of Texas served as first police surgeon assistant city physician and state quarantine officer, member of the federal pension board for eighteen years served throughout World War I as a member of the Selective Service Board aged 75 died, December 29 of heart disease and hypertension

**Joseph R Hughart**, Morgantown, W Va Maryland Medical College, Baltimore, 1904 formerly county health officer of Monongalia County, aged 71, died December 2, of aleukemic leukemia

**Amy Rawson Humphrey**, Glen Alpine N C., American Medical Missionary College, Chicago 1903, for many years on the staff of the Battle Creek (Mich.) Sanitarium aged 66 died, January 23, of carcinoma of the right breast

**James Herbert Irish**, Syracuse N Y, New York Homeopathic Medical College and Hospital New York 1899 member of the Medical Society of the State of New York fellow of the American College of Surgeons served as a captain in the Syracuse Medical Unit during World War I, on the staff of the General Hospital, aged 72, died January 26, of arterio sclerotic heart disease

**Felix S Jenkins**, Pikesville Md., University of Maryland School of Medicine Baltimore, 1887, aged 80, died, January 24, of arteriosclerosis and coronary occlusion

**Wylie Little Kell**, Columbia Falls Mont., St Louis College of Physicians and Surgeons, 1909, member of the Medical Association of Montana, at one time member of the board of health of Bridgeport, Ill., attending surgeon for the Montana Soldiers' Home formerly associated with the Indian Service

on the courtesy staff of the Kalispell (Mont.) General Hospital, where he died, January 10 of cirrhosis of the liver, aged 57

**George Alexander Knox**, Santa Cruz Calif University of Southern California School of Medicine Los Angeles, 1906 veteran of the Spanish-American War aged 78 died, January 28 of coronary disease

**Edward Charles Kottcamp**, Philadelphia Jefferson Medical College of Philadelphia 1901 also a pharmacist on the courtesy staff of the Hospital of the Protestant Episcopal Church, formerly on the staff of the Kensington Hospital for Women, aged 69 died January 24 in the Jefferson Hospital of retroperitoneal carcinoma

**Florence Marion Loughton**, New York, Woman's Medical College of the New York Infirmary for Women and Children New York, 1898, member of the Medical Society of the State of New York formerly chief medical clinician on the staff of the New York Infirmary for Women and Children at one time medical examiner for the New York Life Insurance Company and the New York Civil Service Commission, aged 72, died January 15

**Charles Le Baron Jr** ☉ Major, U S Army retired Gulfport Miss., University of Alabama School of Medicine 1914 graduated from the Army Medical School in 1917 and in the same year was commissioned a first lieutenant in the medical corps of the U S Army became a captain and major the following year retired for disability in line of duty in 1936 served during World War I aged 50 died January 6 in the Veterans Administration Facility Biloxi of toxic myocarditis and pericarditis

**John Lennon**, New York, Bellevue Hospital Medical College New York 1894 member of the Medical Society of the State of New York aged 75 died January 14

**Carl Olander Lind** ☉ Seattle Rush Medical College Chicago, 1901 had been a medical missionary and teacher in Alaska under the Swedish Mission Covenant Church served during World War I aged 71 died January 25 in the Virginia Mason Hospital of coronary occlusion

**Joseph Lipshutz**, Portland Ore University of Oregon Medical School Portland 1929 member of the Oregon State Medical Society clinical instructor of pediatrics at his alma mater a member of the U S Naval Reserve since 1934 called to active duty on May 1 1941 later became a lieutenant commander had been in charge of the department of pediatrics at the Naval Dispensary at Long Beach Calif, and later was attached to the Marine

Corps aged 37 died December 17 in the South Pacific area as the result of gunshot wounds

**Edward Chung Louie**, Portland Ore University of Oregon Medical School, Portland 1939, aged 29 died, December 25, of injuries received in an automobile accident

**Ray Lyons**, Lanesboro Pa University of Pennsylvania Department of Medicine Philadelphia 1886 for many years served as county coroner aged 79 died January 21 in the Barnes Hospital, Susquehanna of coronary thrombosis

**John McColl** ☉ Wheeling W Va Hering Medical College, Chicago 1898 aged 80 died, January 19, of arterio sclerosis and coronary thrombosis

**Harvey W McKane**, Columbus Ind Indiana Medical College School of Medicine of Purdue University Indianapolis 1906, for many years director of the division of tuberculosis and communicable diseases, state board of health, formerly associated with the U S Public Health Service, aged 74, died, January 11

**Oscar Eugene McWilliams**, Anderson Ind., College of Physicians and Surgeons of Chicago School of Medicine of the University of Illinois 1899 member of the Indiana State Medical Association, during World War I served as captain in the medical corps of the U S Army formerly city health officer, president of the board of managers of the Ella B Kehrer Hospital, aged 74, died January 31 of pneumonia

# KILLED IN ACTION



LIEUT COMDR JOSEPH LIPSHUTZ  
M C, U S N R, 1905-1942

**Victor Kinnaman Martin** \* Buffalo, University of Buffalo School of Medicine 1921, on the staffs of the Millard Fillmore and Lafayette General hospitals, assistant surgeon in the eye department of the Charity Eye, Ear and Throat Hospital, aged 48, died suddenly February 2, of coronary thrombosis

**Charles Francis Metzger**, Bellevue, Pa., University of Pittsburgh School of Medicine, 1918 member of the Medical Society of the State of Pennsylvania, diplomate of the National Board of Medical Examiners, served in the U S Navy from 1909 to 1912 recently an examining physician of draft board number 14 on the staff of the Suburban General Hospital, aged 51 died February 3 in an automobile accident at Avalon

**George W Mitchell**, Aldan Pa., Hahnemann Medical College and Hospital of Philadelphia, 1902, aged 74 died January 25, of diabetes mellitus

**Samuel Shaw Moody** \* Shelbyville, Tenn Vanderbilt University School of Medicine Nashville 1909 served overseas as a captain in the medical corps of the U S Army during World War I, at one time health officer of Washington County past president of the Rotary Club of Shelbyville, aged 58, died, January 19 in the Vanderbilt Hospital, Nashville

**Sydney Clayton Moore**, Benton, Ill., Loyola University School of Medicine Chicago, 1921 member of the Illinois State Medical Society, served during World War I, aged 53 on the staff of the Moore Hospital where he died, January 30 of pneumonia

**Matthias Brickell Murfree** \* Murfreesboro Tenn Vanderbilt University School of Medicine, Nashville, 1908 during World War I served overseas as a captain in the medical corps of the U S Army attached to the 104th Infantry 26th Division on the staff of the Rutherford Hospital aged 61, was killed in an automobile accident near Woodbury January 27

**Henry Martin Norris**, East Orange N J Columbia University College of Physicians and Surgeons, New York 1923 member of the Medical Society of New Jersey member of the senior staff of the Orange (N J) Memorial Hospital aged 44 died January 29, of pernicious anemia

**William Walton Odom**, Lyons Ga University of Georgia Medical Department, Augusta, 1904 member of the Medical Association of Georgia aged 70 died in January

**Mary Goddard Potter**, New York New York Medical College and Hospital for Women New York, 1903 died January 13

**Andrew Henry Panettiere**, St Joseph, Mo., Creighton University School of Medicine, Omaha 1935, member of the Missouri State Medical Association the American Psychiatric Association and the Missouri-Kansas Neuropsychiatric Association, served as resident in psychiatry at the State Hospital number 2 captain medical corps Army of the United States began extended active duty in December, 1940, as a tribute to his courageous service the Army named their hospital at Noumea New Caledonia, the Panettiere Hospital aged 33 was killed in action in the Solomon Islands November 23

**Albert Herman Riethmuller** \* Millvale Pa., Western Pennsylvania Medical College, Pittsburgh, 1907, school physician in Millvale for many years served on the staff of St John's General Hospital Pittsburgh, aged 60, died January 28, of septicemia

**Harry Summers Shafer**, Denver Denver College of Medicine 1901, during World War I served as a first lieutenant in the medical corps of the U S Army served on the staffs of St Luke's and Denver General hospitals, aged 73 died, January 22, in the Mercy Hospital of paralysis agitans

**Clarke Wallace Stewart**, Olean N Y, Niagara University Medical Department, Buffalo 1898, aged 70, died, January 29, of coronary thrombosis

**William Joseph Sullivan**, Dunkirk, N Y, University of Buffalo School of Medicine, 1905, member of the Medical Society of the State of New York past president of the Chautauqua County Medical Society, for one term a member of the police and fire board, served as director of the Merchants National Bank and of the Chamber of Commerce

formerly on the staff of the Brooks Memorial Hospital, aged 61 died, January 14, of cerebral hemorrhage

**Ole Samuel Swennes**, Wahkon, Minn Rush Medical College, Chicago, 1894, aged 75, died suddenly, December 20, of coronary thrombosis

**Alfred H Taylor**, Salt Lake City, University of Pennsylvania Department of Medicine Philadelphia, 1895, member of the Utah State Medical Association, formerly a federal narcotic agent, aged 77, died, January 30, of complications following a fall

**John Taylor**, Asbury Park, N J, Bellevue Hospital Medical College, New York 1893, at one time on the staff of the Asbury Park Hospital, Lying-in Hospital, New York, the Dr E C Hazard Hospital, Long Branch, and the Paul Kimball Hospital, Lakewood, aged 71, died, February 11, of heart disease

**Joseph Benjamin Thompson**, Bogalusa La., University of the South Medical Department Sewanee Tenn, 1905 member of the Louisiana State Medical Society, aged 68 died January 6, in the Elizabeth Sullivan Memorial Hospital of carcinoma

**Walter Randolph Titzel**, Chicago, Chicago Homeopathic Medical College 1888, member of the Illinois State Medical Society aged 77, on the staff of the South Chicago Community Hospital, where he died January 27 of coronary thrombosis

**Robert Bruce Tule**, Milton, Pa Jefferson Medical College of Philadelphia 1891 member of the Medical Society of the State of Pennsylvania aged 76 died January 16 of chronic myocarditis

**George R Turner**, Upton Ky University of Louisville Medical Department 1888 formerly a pharmacist aged 78 died January 21 in the Kentucky Baptist Hospital, Louisville of carcinoma of the stomach

**Herbert Hector Utley**, Benson, N C Baltimore Medical College, 1906 member of the Medical Society of the State of North Carolina past president of the Johnston County Medical Society at one time county health officer for many years had served as physician for the Atlantic Coast Line Railroad aged 66 died January 15 of coronary occlusion

**Harry James Vaughan**, Dallas Texas Emory University School of Medicine Atlanta Ga, 1916 aged 50 died January 22 of pneumonia and heart disease

**Thomas H Wagner** \* Joliet Ill Northwestern University Medical School Chicago, 1898 fellow of the American

College of Surgeons for many years surgeon for the American Steel and Wire Company and for the Chicago, Rock Island and Pacific Railroad aged 67 chief of the surgical staff of St Joseph's Hospital, where he died January 18 of uremia and tumor of the bladder

**Henry Charles Young**, Hiram N Y Albany Medical College 1887 member of the Medical Society of the State of New York for fifty five years health officer of Hiram school physician, aged 81 died January 8 of carcinoma of the lung and of the tongue

### KILLED IN ACTION



CAPT. ANDREW HENRY PANETTIERE,  
M C A U S, 1909-1942

### DIED WHILE IN MILITARY SERVICE

**Bernard Weiss**, Brooklyn, University and Bellevue Hospital Medical College, New York, 1936, member of the Medical Society of the State of New York, served as resident on the staff of the Hudson River State Hospital, Poughkeepsie, N Y first lieutenant medical corps, Army of the United States stationed at Fort Niagara, N Y, where he died, December 29, of acute endocarditis aged 30

**Francis Harold Malee** Butte Mont University of Louisville (Ky) School of Medicine 1935, member of the Medical Association of Montana served on the staff of the Murray Hospital, called to active duty as a first lieutenant in the medical corps Army of the United States assigned to Camp Shelby Miss aged 33 died recently in Los Angeles

## Correspondence

### "COOLING IN SHOCK"

*To the Editor*—Congratulations on your excellent editorial entitled "Cooling in Shock" in the February 6 issue. Not only have I found the deliberate maintenance of temperatures around 90 F, rectal, in cases of severe trauma most beneficial from the standpoint of shock but apparently consciousness can be returned on a lower level of oxygen compensation, whereas in hyperthermic states there is not sufficient to maintain cerebral function.

After all these years "refrigeration" appears to be coming into a wider appreciation, and some day I hope to see recognition as to what "refrigeration" will do for burns. It controls pain, prevents infection, diminishes shock and decreases loss of serum. In addition the scar formed is pliable and soft rather than hard and firm.

I would appreciate your sending me the references for the statement "the safe range of body temperature deviates far more below than above normal, temperatures down to 90 F can be tolerated for many hours and may actually be life saving when circulation is feeble." I observed this factor during early observations on human "refrigeration."

Would you let me know if some one else has also confirmed this observation.

TEMPLE FAY, M D, Philadelphia

[NOTE—The letter was referred to Major Roswell K. Brown, who replies.]

*To the Editor*—The wide range of safe deviation of body temperature below normal was demonstrated by Temple Fay several years ago and has been demonstrated since by many others in the treatment of carcinomatosis. I am not familiar with any previous knowledge of general human refrigeration.

"Deliberate maintenance of temperatures around 90 F, rectal, in cases of severe trauma" and "what refrigeration will do for burns" should be matters of great interest. There is ample experimental support for the belief that there is an optimum "subnormal" temperature for shock states at which the metabolism is at its lowest level. Deviation from this optimum "subnormal" level, either warming or cooling lessens the chances of recovery (Elman, Robert, Cox, W. M., Jr., Lischer, Carl, and Mueller, A. J. Mortality in Severe Experimental Burns as Affected by Environmental Temperature, *Proc. Soc. Exper. Biol. & Med.* 51:350 [Dec.] 1942).

Carefully controlled assistance of the body's cooling mechanism may be quite useful in the future. The important thing right now is to stop the pernicious teaching of external heat for shock. Laymen, first aid workers, nurses and doctors are still being taught to fight against the body's natural attempt to save itself by peripheral cooling. First aid manuals should be radically revised on this point at once.

### STATISTICS ON THE PATIENT LOAD OF PHYSICIANS IN PRIVATE PRACTICE

*To the Editor*—With reference to the special article on "Statistics on the Patient Load of Physicians in Private Practice" by Ciocco and Altman, appearing in the February 13 issue of THE JOURNAL, a few comments are included which it is hoped may add to the value of this most interesting study. Assuming that it is possible to base an ideal physician distribution on the results of mathematical analysis I shall limit my comments to technical analysis of the statistics presented.

At the outset it must be emphasized that the entire scope of the study reported in this article is a cross section analysis of conditions as they reportedly existed at a given period. It would have added considerably to the value of the study if a

time series analysis could have been made as the element of trend, seasonal and cyclic deviations cannot even be reasonably estimated without such studies.

By an analysis extending over a period of time it would be theoretically possible to obtain a trend of the values for patient load by age group, hours of office work per week and so on. Of course, one should attempt to analyze in more detail the sources from which patients are being drawn, with the view of determining whether or not they would be subject to modification if local industrial conditions would change. This in turn would suggest population studies and forecasts for each area studied.

In view of the rather large coefficients of variation which one notes when the standard deviations are divided by the averages in this report, even the application of conclusions based on a time series analysis would seem rather tentative.

The authors have made a commendable and searching analysis of a subject destined to be of increasing interest as time goes on. It is hoped that officials and interested individuals will appreciate the extent of additional statistical analysis required before even tentative assertions could be made and the discrepancy which doubtless exists between actual demand for medical services and the theoretical supply demand situation calculated from statistical analyses which too often are fragmentary, distorted or biased.

T. W. FRAME, M D, Portsmouth, Ohio

### RABBITS FOR FOOD OR PREGNANCY TESTING

*To the Editor*—With American medicine girded for the war effort, the unlimited and unrestricted use of so valuable an edible animal as the rabbit for pregnancy tests seems to be exceedingly wasteful. Even if attempts are made to operate on the rabbits in an effort to reuse them, a large percentage die from the operation, a greater proportion die from infections and the remainder are usually disposed of after a few subsequent tests.

Conservative estimates reveal that in the past year alone upward of 1,000,000 pounds of rabbit meat could have been spared for general food consumption if the animals had not been used for pregnancy testing.

This is of even greater significance when one realizes that probably only a small percentage of the tests are real emergency tests. Moreover, for those instances in which a biologic test for pregnancy is indicated there are excellent time-proved substitutes such as the mouse test (forty-eight to ninety-six hours), employing immature mice, and the "frog" test (six to twelve hours), using the South African *Xenopus*. Both of these animals can be made available in large numbers to the medical profession by efforts in that direction. We have had little trouble in obtaining sufficient African frogs for our own work in pregnancy and there should be no reason why sufficient numbers could not be imported or bred in adequate quantities for general use.

It certainly appears obvious that during this great national emergency there should be a more judicious use of rabbits in pregnancy testing or, even better, one of the other accepted tests employing nonedible animals ought to be used for this purpose, at least for the duration of the war.

ABNER I. WEISMAN, M D,  
Department of Gynecology,  
Jewish Memorial Hospital

CHRISTOPHER W. COATES,  
New York Zoological Society,  
New York

## Bureau of Legal Medicine and Legislation

### MEDICOLEGAL ABSTRACTS

**Governmental Hospitals Liability of City for Negligence of Municipal Hospital Intern**—The plaintiff submitted to a colostomy in a hospital maintained and operated by the City of Miami, Florida. About two years later the incision became irritated, and possibly infected, and she reentered the hospital for treatment. An intern, assisted by attending nurses, prepared the patient for electrical cauterization of the incision. The intern sterilized the area to be cauterized with surgical alcohol 75 per cent to 90 per cent pure. After saturating a gauze sponge with the alcohol and placing it on the abdomen in close proximity to the place to be cauterized, he had the cautery connected in the electric power socket and attempted to place the hot point on the wound, but when the point approached the patient's body and the pad saturated with alcohol the pad burst into flame. The burning alcohol ran over the patient's body and she was severely burned, back and front, from her neck to her thighs. Subsequently when the city of Miami rejected her claim for damages she brought suit against the city. The trial court overruled a demurrer which the city interposed to the declaration on the ground that the city in operating the hospital was acting in a governmental capacity in the performance of its duty in caring for the public health and hence was not liable for the negligence of its servants. The city then filed pleas to the declaration setting up the defense that it had performed its sole duty when it exercised due care and diligence in the selection of its interns to serve in the hospital. In effect, these pleas were overruled. From a judgment for the patient the city appealed to the Supreme Court of Florida.

The first question for the determination of the Supreme Court was whether or not a municipality in operating a hospital acts in its governmental or its municipal corporate capacity. If it acts in its governmental capacity, there would be no liability for the defendant city. The court held, however, that in operating a hospital a municipality is acting in its municipal corporate capacity, and not in its governmental capacity, and that the liability of the city for damages occurring by reason of the negligence of its employees in operating the hospital is the same as though the hospital were a charity hospital. A previous decision by the Supreme Court of Florida (*Nicholson v Good Samaritan Hospital*, 145 Fla 360, 199 So 344) refused to exempt charitable hospitals from liability for the negligence of their servants. There can be no question, continued the court, that a hospital is as much liable under the doctrine of respondeat superior for the negligence of an intern, who is in nowise an independent contractor but a mere employee, as it is for that of a nurse under like employment. That a hospital is answerable in damages for the negligence of a nurse is well settled. (See *Pensacola Sanitarium v Wilkins*, 68 Fla 447, 67 So 124, *Parrish v Clark*, 107 Fla 598 145 So 848).

The defendant city relied on the opinion of the Supreme Court of Florida in *South Florida R Co v Price*, 32 Fla 46, 13 So 638, and *Atlantic Coast Linc R Co v Whitney*, 62 Fla 124, 56 So 937. In those cases, said the court, the plaintiffs attempted unsuccessfully to impose liability on railway companies for the negligence of physicians whom the companies had employed to give medical and surgical care and attention to their employees and to persons injured in the operation of their railroads. The rationale of those decisions is that the physicians were in nowise under the supervision and control of the employer but stood in the status of independent contractors, and the duty of the employer railroad company was to exercise only due care in selecting such employees. The court did not believe that those cases were applicable here and indicated that in the light of modern decisions it might even

reverse the views it expressed in those decisions with respect to the physicians who were alleged to be independent contractors.

Aside from all of this, said the court, the negligence complained of in this case was such that it could not be said that the intern was exercising his professional skill and judgment in applying the healing art when he did the thing complained of and which caused the injury. It did not require any knowledge or skill of medicine or surgery for any one of ordinary intelligence to know that if one saturates a gauze sponge with a large quantity of high grade alcohol and then brings a red hot iron into close proximity thereto the saturated materials will immediately ignite and burn. When the intern so carelessly and negligently saturated the materials with alcohol and placed them on the naked abdomen of the patient and then brought a red hot cautery into close proximity therewith he was bound to know what the result would be just the same as one who would drop a lighted match into a gasoline tank might expect an explosion to follow.

The judgment in favor of the patient was affirmed—*City of Miami v Oates*, 10 So (2d) 721 (Fla, 1942).

## Society Proceedings

### COMING MEETINGS

- Alabama Medical Association of the State of Birmingham April 20 22 Dr Douglas L Cannon 519 Dexter Ave Montgomery Secretary
- American Association on Mental Deficiency New York May 12 15 Dr Neil A Dayton Mansfield Training School Mansfield Depot Conn
- American Gastro-Enterological Association Atlantic City N J May 3 4 Dr J Arnold Burgen 102 Second Ave S W Rochester Minn Secretary
- American Neurological Association New York May 6 7 Dr Henry A Riley 117 East 72d St New York Secretary
- American Psychiatric Association Detroit May 10 13 Dr Winfred Overholser St Elizabeth's Hospital Washington D C Secretary
- American Society for Clinical Investigation Atlantic City N J May 3 Dr Wesley W Spink University Hospital Minneapolis Secretary
- American Surgical Association Cincinnati May 13 14 Dr Warfield M Piror Johns Hopkins Hospital Baltimore Secretary
- Arizona State Medical Association Tucson April 30 May 1 Dr Frank J Milloy 112 North Central Avenue Phoenix Secretary
- Arkansas Medical Society Little Rock April 19 20 Dr W R Brocksher 602 Garrison Ave Fort Smith Secretary
- California Medical Association Los Angeles May 2 3 Dr George H Kress 450 Sutter St San Francisco Secretary
- Florida Medical Association Jacksonville April 15 16 Dr Shaler Richardson 111 West Adams St Jacksonville Secretary
- Georgia Medical Association of Atlanta May 11 14 Dr Edgar D Shanks 478 Peachtree St N E Atlanta Secretary
- Illinois State Medical Society Chicago May 18 20 Dr Harold M Camp 224 South Main St Monmouth Secretary
- Iowa State Medical Society Des Moines April 29 30 Dr Robert L Parker 3510 Sixth Avenue Des Moines Secretary
- Maryland Medical and Chirurgical Faculty of Baltimore April 27 28 Dr W Houston Toulson 1211 Cathedral St Baltimore Secretary
- Minnesota State Medical Association Minneapolis May 17 19 Dr B B Souster 493 Lowry Medical Arts Bldg St Paul Secretary
- Mississippi State Medical Association Jackson May 11 13 Dr T M Dye Clarksdale Secretary
- Missouri State Medical Association St Louis April 18 20 Mr Raymond McIntyre 634 North Grand Blvd St Louis Executive Secretary
- National Tuberculosis Association St Louis May 5 6 Dr Charles J Hatfield 7th and Lombard Sts Philadelphia Secretary
- New Hampshire Medical Society Manchester May 11 12 Dr Carleton R Metcalf 5 South State St Concord Secretary
- New York Medical Society of the State of Buffalo May 3 6 Dr Peter Irving 292 Madison Ave New York Secretary
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## Current Medical Literature

### AMERICAN

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Titles marked with an asterisk (\*) are abstracted below.

### American Journal of Tropical Medicine, Baltimore

22 581-662 (Nov) 1942

- Preliminary Note on Complement Fixation Test for Amebiasis with Antigens Prepared from *Endameba Histolytica* Grown with a Single Species of Bacteria C W Rees J Bozicevich Lucy V Reardon and Frances Jones Bethesda Md—p 581
- Malaria Survey of Cuba H P Carr and R B Hill—p 587
- Components of B Complex in Cohn Liver Extract in Relation to Sprue E B Vedder Washington D C—p 609
- Persistence of *Trypanosoma Cruzi* in Dead Cone Nosed Bugs (Hemiptera Reduviidae) S F Wood Los Angeles—p 613
- Reservoir Hosts of Chagas Disease in State of Texas Natural Infection of Nine Banded Armadillo (*Dasypus Novemcinctus Texanus*) House Mice (*Mus Musculus*) Opossum (*Didelphis Virginiana*) and Wood Rats (*Neotoma Micropus Micropus*) with *Trypanosoma Cruzi* in State of Texas A Packham Galveston Texas—p 623
- Survival Time of Intravaginally Implanted *Trichomonas Hominis* R M Stabler and L G Feo Philadelphia—p 633
- Inoculation of Oral *Trichomonad* (*Trichomonas Tenax*) into Human Vagina R M Stabler and L G Feo Philadelphia—p 639
- Researches on Sparganosis in the Netherland East Indies C Bonne Batavia Java—p 643
- Natural Pattern of Dilution Counts of Helminth Eggs J A Scott—p 647
- Environmental Temperatures and Resistance to Infection C A Mills and L H Schmidt Cincinnati—p 655

### Archives of Dermatology and Syphilology, Chicago

47 1-158 (Jan) 1943

- Parakeratosis Mibelli Report of Three Cases in One Family Histologic Studies D Bloom and E W Abramowitz New York—p 1
- Studies on Ointments II Ointments Containing Salicylic Acid E A Strakosch Minneapolis—p 16
- Concurrent Combined and Consecutive Fungus Infections of Skin Cultural Experiences G M Lewis and Mary E Hopper New York—p 27
- Dermatitis Venenata Caused by Manzanillo Tree E M Satalisky—p 36
- Acetarsone in Treatment of Pemphigus M Oppenheim and D Cohen Chicago—p 40
- Shock Proof Roentgen Ray Apparatus in Dermatology G M McKee A C Cipollaro and A Mutscheller New York—p 43
- \*Sarcoidosis Carmen C Thomas Philadelphia—p 58
- Congenital Epidermal Canals of Perineal Raphe J H Lamb Oklahoma City—p 74
- Nodular Nonsuppurative Panniculitis J L Miller and R A Kritzler New York—p 82
- Acanthosis Nigricans A G Franks—p 97

**Sarcoidosis**—To the three chief morphologic variants of dermatologic sarcoidosis, military lupoid Besnier-Boeck sarcoid and the subcutaneous sarcoid of Darier Roussy must be added a fourth the more recently described sarcoid type of tuberculosis of the American Negro. Thomas discusses the 15 cases that she has seen in seven years. 3 patients were white and 12 were Negroes. Two were men and 13 were women. The lesions occurred between the ages of 15 and 49 in half, the initial attack occurred before 30. The course of the disease is benign. Three patients died. 1 of pulmonary tuberculosis which developed within a year of the sarcoid lesions but after all the cutaneous lesions disappeared. 1 died two years after all the cutaneous lesions disappeared and 1 died within nine days of hospitalization of pulmonary infarction due to pressure from tremendously enlarged mediastinal lymph nodes. Five patients. 2 white and 3 Negroes, had a spontaneous recovery. The cutaneous changes disappeared. The enlargement of the lymph nodes diminished and the general health improved. The condition of the remaining 7 patients was relatively unchanged. There were slight exacerbations and remissions. Several organs skin

lymph nodes lungs spleen and liver, were most frequently involved. Tuberculin tests showed only 7 patients to be anergic. 7 reacted to 1 mg or less of tuberculin. Anticubins could not be demonstrated in the serums of 4 of the anergic patients so examined. The serum protein of 3 patients was determined. There was a decided increase in the globulin fraction. The differential blood count revealed a monocytosis with a count of from 8 to 18 per cent, in more than half of the patients during the active phases of the disease. A variety of therapeutic agents was unproductive of noteworthy results.

### Archives of Internal Medicine, Chicago

71 1-136 (Jan) 1943

- \*Supernormal Circulation in Resting Subjects (Hyperkinesia) with Study of Relation of Kinetic Abnormalities to Basal Metabolic Rate I Starr and L Jonas Philadelphia—p 1
- Chronic Gastritis Simulating Gastric Carcinoma Report of Five Cases E Freedman P M Glenn and T C Laipply Cleveland—p 23
- \*Induced Thiamine (Vitamin B<sub>1</sub>) Deficiency in Man Relation of Depletion of Thiamine to Development of Biochemical Defect and of Polyneuropathy R D Williams H L Mason Marschelle H Power and R M Wilder Rochester Minn—p 38
- Urinary Sediment in Visceral Angitis (Periarteritis Nodosa Lupus Erythematosus Libman Sacks Disease) Quantitative Studies M A Krupp San Francisco—p 54
- Excretion of Coproporphyrin in Hepatic Disease III Urinary Excretion of Coproporphyrin in Hepatic Insufficiency During Episodes Characterized by Neurologic Manifestations S Nesbitt New Haven Conn—p 62
- Alkaptonuria with Hyperuricemia A Leslie New York—p 68
- Effect of Massive Doses of Vitamin D on Calcium and Phosphorus Metabolism Observations on Patients with Atrophic Spondylitis and with Degenerative Arthritis of Spine K P Klassen and G M Curtis Columbus Ohio—p 78
- Toxicity of Pyridine in Man L J Pollock I Finkelman and A J Arieff Chicago—p 95
- Allergy Review of Literature of 1942 F M Rackemann Boston—p 107

**Supernormal Circulation in Resting Subjects**—In estimating the cardiac output of 1,400 patients Starr and Jonas encountered 100 in whom the resting circulation was above normal. This condition they call hyperkinesia. The 100 patients were usually underweight and tended to have resting pulse rates above normal. Hyperkinesia was encountered in almost all patients with thyrotoxicosis without cardiac involvement, in most patients with patent ductus arteriosus often in patients with emaciation and less frequently in those with pulmonary abnormalities fever, anemia, hypertension and peripheral arteriovenous communications. For the hyperkinesia of 17 patients no complicating condition could be discovered. These patients with essential hyperkinesia resembled patients with thyrotoxicosis in appearance, but their basal metabolic rate was always normal. In uncomplicated hyperthyroidism and hypothyroidism, the relation between abnormalities of the circulation and the basal metabolic rate is almost 1 to 1; on the average an abnormal increment or decrement in the basal metabolic rate is accompanied by an equal percentage change in the circulation. In heart disease these two functions are related, but the relationship is more nearly 1 to 0.5. Under such conditions the circulation is less than normal for any given metabolic rate, and the higher the metabolic rate the greater is the circulatory deficit. Deviation from the normal 1 to 1 relationship has been observed in emaciation and in some instances of hyperthyroidism after partial thyroidectomy.

**Induced Thiamine Deficiency**—Williams and his colleagues restricted the intake of thiamine in the diet of 2 human volunteers to 0.2 mg a day (0.1 mg for each thousand calories) for one hundred and twenty days. They administered a test dose of 1 mg subcutaneously approximately every two weeks during the time of thiamine deprivation. The test dose served as a "periodic partial cure" of the thiamine deficiency, appetite would improve and activity would increase for seven to ten days after each injection. Symptoms and signs of thiamine deficiency were manifested as early as the thirtieth day of restriction. The first objective evidence of abnormality consisted in a decrease in the urinary excretion of thiamine. At the fiftieth day the urinary excretion after a test dose was reduced. After this time, whenever dextrose was given the values for pyruvic and lactic acid in the blood were abnormally high. About this time anorexia and weakness became more severe than they had been and the subjects complained of pares-

thetia of the legs. Later there was objective evidence of dysfunction of nervous pathways and after one hundred and ten days of restriction polyneuropathy (defects of the sensory nervous pathways, loss of tendon reflexes and paralysis of muscles of the legs) was clearly apparent. It responded to large doses of thiamine, but only after many weeks of continuous treatment.

### Laryngoscope, St. Louis

53 1-74 (Jan.) 1943

- Cricopharyngeal Sphincter—Roentgenologic Study F. E. Templeton and R. A. Kredel Chicago—p. 1  
Composite Postoperative Therapy for the Laryngectomized J. S. Greene New York—p. 13  
Unilateral Otosclerosis with Microscopic Description of Focus Case O. Benesi Detroit—p. 17  
Headache and Facial Neuralgia: Classification and Differential Diagnosis T. R. Gittins Sioux City Iowa—p. 27  
Consideration of Atrophic Rhinitis and Its Treatment by Use of Estrogenic Substance A. J. Wagers Philadelphia—p. 39  
Horner's Syndrome with Chronic Purulent Otitis Media: Demonstration of Diagnostic Test L. Hubert New York—p. 46  
Suppurative Ethmoiditis with Special Reference to Orbital Abscess and Treatment D. Ide New York—p. 50  
Nasometry: Testing Nasal Respiration B. M. Becker Brooklyn—p. 55  
Review of Articles on Tuberculosis in Field of Otolaryngology for Late 1941 and Early 1942 F. R. Spencer Boulder Colo.—p. 63

### Minnesota Medicine, St. Paul

26 1-144 (Jan.) 1943 Partial Index

- Progress in Internal Medicine in Minnesota E. I. Tuohi Duluth—p. 23  
Coronary Disease: Certain Significant Contributions Made During Last Quarter Century F. A. Williams Rochester—p. 33  
Neuropsychiatry Then and Now E. M. Hammes St. Paul—p. 40  
Endocrinology in Last Quarter of Century M. H. Hoffman St. Paul—p. 43  
Preventive Pediatrics in Private Practice E. J. Huenekeas Minneapolis—p. 48  
Progress in Diagnosis and Treatment of Diseases of Urogenital Tract G. J. Thomas Minneapolis—p. 74  
Progress in Orthopedic Surgery M. S. Henderson Rochester—p. 79  
Advances in Radiology in Past Quarter Century R. G. Allison Minneapolis—p. 87  
Primary Bronchiogenic Carcinoma: Report of Five Year Surgical Cure T. J. Kinsella Minneapolis—p. 90

### New England Journal of Medicine, Boston

227 1013 1058 (Dec. 31) 1942

- Bronchial Obstruction and Tracheobronchial Tuberculosis E. B. Benedict Boston—p. 1013  
\*Use of Sulfadiazine in Management of Simple Mastoidectomy Wounds C. A. Tucker and C. G. Flake Boston—p. 1021  
Chronic Biliary Tuberculosis: Report of Case E. J. Welch Boston—p. 1025  
Sulfonamides: II. Their Clinical Use C. A. Jernway Boston—p. 1029

228 1-38 (Jan. 7) 1943

- Civilian Public Health Problems in Wartime V. A. Getting Worcester Mass.—p. 1  
Hospitals and the War C. F. Wilinski Boston—p. 5  
Civilian Medical Practice in Wartime J. J. Dumphrey Worcester Mass.—p. 6  
Relation of Season, Weight and Price to Vitamin C Content of Oranges A. D. Holmes, J. A. Patch and F. Tripp Stoneham Mass.—p. 8  
Hemorrhage from Meckel's Diverticulum in Adult: Report of Case A. Servetnick and H. G. Nichols Haverhill Mass.—p. 12  
Syphilis C. G. Lane and G. M. Crawford Boston—p. 15

**Sulfadiazine in Simple Mastoidectomy Wounds**—Tucker and Flake determined the value of sulfadiazine in the management of a controlled series of mastoidectomy wounds. In 16 group A patients the wound of a complete simple mastoidectomy was closed without drainage with sulfadiazine poured in; that of 15 group B patients was sutured without drainage but the patients received sulfadiazine orally and that of 15 group C patients was only drained. The hospitalization period for group A and B patients averaged around ten days, the wounds healed primarily and the tympanic membrane was healed and dry at this time. The wound of only 1 group B patient broke down. The group C patients had the usual prolonged convalescence and their average hospital stay was twenty-one days as compared to ten and nine days respectively for group A and B patients. At this time any one method for the control of wounds in mastoidectomy cannot be advocated, although sulfonamide therapy seems to be of definite value. Certainly the prime requisite for good results is the performance of a standardized thorough, simple mastoidectomy.

### Texas State Journal of Medicine, Fort Worth

38 529 580 (Jan.) 1943

- Desirability of Early Proper Treatment of Face Injuries V. P. Blair and L. T. Byars, St. Louis—p. 533  
Tumors of Breast E. T. Bell Minneapolis—p. 537  
Elective Low Forceps T. H. Funk Fort Worth—p. 539  
Comparison of Ergonovine and Pituitary Extract Administered at End of Second Stage of Labor A. R. Bailey Fort Worth—p. 542  
Lesions of Urethra and Bladder of Women T. L. Pool Rochester, Minn.—p. 545  
Medical Aspect of Chest Injuries R. C. Giles and S. Schiffer San Antonio—p. 547  
Problems of the Newborn H. F. Nesbit Dallas—p. 551  
Irradiation Therapy in Treatment of Nonmalignant Uterine Bleeding R. E. Barr Beaumont—p. 555  
Orbital Complications in Suppurative Sinus Disease W. J. Snow Houston—p. 557  
Congenital Atresia of Esophagus C. P. Schenck Fort Worth—p. 561  
Growth of Industrial Medicine as a Force in Public Health H. F. Payner Houston—p. 563

### Union Medicale du Canada, Montreal

72 1-120 (Jan.) 1943 Partial Index

- Present Status of Arthritis and Rheumatism and Their Effective Treatment R. Pemberton Philadelphia—p. 5  
Precancer and Cancer of Face A. Marin Montreal—p. 10  
Latent Tuberculosis of Tonsils C. I. Cote Quebec—p. 16  
Tonsillectomy During Fever F. Plante Sherbrooke Que.—p. 21  
Problem of Inclosed Teeth F. Charron Montreal—p. 23  
Severe Burn in Girl Aged Six: Death on Fifty Second Day from Progressive Emaciation A. Houot—p. 25

**Latent Tuberculosis of Tonsils**—The 60 patients whose tonsils were examined by Cote varied in age between 4 and 27 years, the majority were less than 10 and only 6 were more than 20. Tuberculous lesions were found in 8 cases that is in 13.3 per cent. The tuberculous lesion was bilateral in all except 1 of the 8 cases. The presence of giant cells was common, caseation was rare even absent. The surface epithelium was invariably intact, the tubercle bacillus was often present. Of the 8 patients with tuberculosis of the tonsils 2 were more than 20 years old. The previous diagnosis had been active ulcerocaseous pulmonary tuberculosis in 1 of these 2, fibrous noncavitary tuberculosis in the other. Expectoration as well as gastric lavage gave positive results in both. The six other tuberculous tonsils were in children between 7 and 12 years of age. The clinical diagnosis in 5 of these was mild tuberculosis of the lymph nodes and of the pulmonary tissue, in 4 the tubercle bacillus was obtained from the gastric juice. The sixth had been hospitalized for purulent streptococcal tuberculosis. Cervical adenopathy was observed in 6 of the 8 patients with tuberculous tonsils. The author discusses the pathogenesis, symptomatology, complication and frequency of tonsillar tuberculosis. He concludes that in adults tonsillar tuberculosis is of slight importance, because, on the whole it is only a secondary localization in an advanced pulmonary tuberculosis. In children, however, it must be carefully investigated, because it presents either a secondary localization to pulmonary tuberculosis or a form of primary pharyngeal infection. Tonsillar tuberculosis being latent is detected only by histopathologic examination. This shows that microscopic examination of removed tonsils should be routine. This examination becomes of great importance when a cervical adenopathy exists; tuberculosis of the cervical lymph nodes and tonsillar tuberculosis being frequently associated. Every patient whose tonsils dis close tuberculosis should be subjected to a careful examination, including roentgenography. Tonsillectomy involves no risk in the presence of tonsillar tuberculosis. On the contrary the removal of such tonsils in children reduces the absorption from a tuberculous focus and may prevent the development of tuberculosis elsewhere. The removal of tuberculous tonsils from patients with other tuberculous lesions is rarely followed by aggravation.

### West Virginia Medical Journal, Charleston

39 1-36 (Jan.) 1943

- Intelligent Care of Industrial Injuries D. L. Hosmer Bluefield—p. 1  
Surgical Aspects of Chemotherapy W. H. Barker Baltimore—p. 8  
Nasal Allergy in Children A. E. Long Weston—p. 14  
Pelvic Inflammation and Associated Ovarian Cystic Disease W. N. Rowley Huntington—p. 16  
Erythroblastosis Neonatorum: Report of Two Cases A. P. Hudgins Charleston—p. 20



## FOREIGN

An asterisk (\*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

## British Medical Journal, London

2 715-744 (Dec 19) 1942

- Renal Failure After Uteroplacental Damage J Young—p 715  
Localized Typhoid Fever Outbreak in Glasgow 1942 R J Peters and D H Clutterbuck—p 719  
Jaundice Presenting Unusual Features A M Gilchrist—p 721  
Deficiency Disease and Academic Evidences of Subnormal Vitamin Metabolism R E Wright—p 723

## Journal of Physiology, Cambridge

101 257-378 (Nov 30) 1942

- Factors Affecting Bicarbonate Content Free Carbon Dioxide and  $pH$  of Urine J A Barclay—p 257  
Hemolytic Action of Potassium Salts H Davson—p 265  
Preparation and Some Properties of Hypertensin (Angiotonin) P Edman U S Von Euler E Jorpes and O T Sjostrand—p 284  
Action of Adrenalin on Transmission in Sympathetic Ganglions Which May Play a Part in Shock Edith Bulbring and J H Burn—p 289  
Mineral Metabolism on Dephytinized Bread R A McCance and E M Widdowson—p 304  
Osmotic Pressure of Fetal Horse Serum Albumin E F McCarthy—p 314  
Posterior Pituitary Principles of Species of Reptile (Tropidonotus Natrix) with Some Remarks on Comparative Physiology of Posterior Pituitary Gland Generally H Heller—p 317  
Effect of Graded Doses of Vitamin C on Regeneration of Bone in Guinea Pigs on Scorbutic Diet G Bourne—p 327  
Activity of  $L(-)$  Dopa Decarboxylase H Blaschko—p 337  
\*Significance of Urinary Calcium Magnesium and Phosphorus R A McCance and E M Widdowson—p 350  
Effect of Anesthesia on Adrenalin Content of Suprarenal Glands P C Elmes and A A Jefferson—p 355  
Effect of Variations in Subarachnoid Pressure on Venous Pressure in Superior Longitudinal Sinus and in Torcular of Dog T H B Bedford—p 362  
Acceleration of Heart by Vagus in Cats After Complete Sympathectomy G L Brown and W d A Mavcock—p 369  
Pulmonary Circulation Times Before and After Functional Closure of Ductus Arteriosus A E Barclay J Barcroft D H Barron K J Franklin and M M L Prichard—p 375

**Significance of Urinary Calcium, Magnesium and Phosphorus**—McCance and Widdowson point out that the urinary excretion of calcium, magnesium and phosphorus by normal persons rises and falls with the intestinal absorption. However the excretion of each does not rise so high or fall so low as absorption may. From the technical point of view a change in a normal person's urinary excretion should be regarded as an indirect but valuable confirmation of a change in intestinal absorption. As in so many other branches of metabolism the function of the kidney is to regulate the stability of the internal environment.

## Lancet, London

2 689-716 (Dec 12) 1942

- War and School Boys Food E M Widdowson and R A McCance—p 689  
Nutrition of Oxfordshire Children in Wartime Dagmar C Wilson—p 692  
Control of Pulmonary Tuberculosis in Industry L Banský—p 693  
\*Cold in Treatment of Damage Due to Cold R Greene—p 695  
Febrile Illness in Smallpox Contacts W F Tyrrell—p 697

**Cold in Treatment of Damage Due to Cold**—Greene points out that in true frostbite most of the affected tissue is doomed and no treatment can save it, but some is only chilled and is in the same condition as is the whole affected tissue in immersion foot and trench foot. The treatment of these conditions should therefore be identical. Ancient tradition and modern experiment suggest that while the patient himself is kept warm the affected tissue should be cooled.

2 717-744 (Dec 19) 1942

- Emotional and Cognitive Changes in Post Traumatic Confusional State A Paterson—p 717  
Cutaneous Diphtheria in Northern Palestine J D S Cameron and E G Muir—p 720  
\*Antisulfanilamide Action of Procaine in Vivo H L de Waal A C Kanaar and J McNaughtan—p 724

**Antisulfanilamide Action of Procaine Hydrochloride**—The inhibition of procaine hydrochloride on the action of sulfanilamide de Waal and his associates observed was particularly obvious in mice when the procaine was administered

in repeated large doses early in sulfanilamide therapy (5 of 6 mice died). Repeated small doses of procaine resulted in an occasional fatality among infected mice receiving large doses of sulfanilamide. It is difficult to say what constitutes a harmless dose of procaine since this will depend on the amount of sulfanilamide in the body but by comparison with the results obtained in mice, 20 cc of a 3 per cent solution of procaine should prove harmless to a patient whose concentration of sulfanilamide in the blood is 3 mg per hundred cubic centimeters. However as the sulfonamide- $p$  aminobenzoic acid ratio cannot yet be determined this dose might well be cut by half or two thirds. This amount should prove sufficient in minor surgical operations. The occasional large dose of procaine in human beings and in mice appears for the most part to have no lasting inhibitory action. Exceptionally however mice died (2 of 9) after such sporadic doses of procaine. Therefore it seems unwise to use clinically massive doses of procaine. When a massive local anesthetic is required a drug not allied to  $p$ -aminobenzoic acid, such as cocaine metacaine or pontocaine hydrochloride should be used.

## Medical Journal of Australia, Sydney

2 475-492 (Nov 28) 1942

- Achalasia of Urinary Tract in Children J W S Laidley—p 475  
Achalasia of Childhood C H Wesley—p 477  
Headaches Traumatic and Rheumatic Cervical Somatic Lesion M Kelly—p 479  
\*Shock and the Sympathetic Nervous System J W Tomb—p 483

**Shock and the Sympathetic Nervous System**—Tomb reports that he has seen the following effect of ergotamine (1.00 grain [0.001 Gm] intramuscularly) in a case of incipient shock due to crushing of the thumb. The patient was faint pale and sweating profusely. Ten to fifteen minutes after the ergotamine was given sweating ceased completely and the cutaneous circulation as evidenced by the patient's color was restored to normal, although intentionally no morphine had been given to relieve pain and to block shock impulses. The author thinks that the action of ergotamine would be still more evident in more serious cases as shock apparently is due to sympathetic overstimulation.

2 493-512 (Dec 5) 1942

- Place of History in War and Postwar Problems J Bostock—p 493  
Varicose Veins in Peace and War C H W Lawes—p 499

2 513-534 (Dec 12) 1942

- Some Factors Influencing Bacterial Survival in Presence of Antiseptics J J Graydon and C L Biggs—p 513  
Pooled Human Serum Note on Testing for Sterility in Presence of Certain Antiseptics F G Morgan R T Simmons and C L Biggs—p 515  
Further Notes on Control of Postpartum Hemorrhage by Injection of Umbilical Vein W K McIntyre—p 517

2 535-556 (Dec 19) 1942

- Meningococcal Infections in Infancy and Childhood Part I Meningococcal Meningitis Review of 117 Patients Treated with Sulfapyridine H Williams—p 535

2 557-580 (Dec 26) 1942

- Meningococcal Infections in Infancy and Childhood Part II Meningococcal Septicemia with Special Reference to Adrenal Apoplexy or the Waterhouse-Friderichsen Syndrome H Williams—p 557  
\*Antigenism Between Procaine and the Sulfonamides J W Legge and E B Durie—p 561

**Procaine Hydrochloride and the Sulfonamides**—A method for estimating procaine hydrochloride and  $p$  aminobenzoic acid in the presence of each other is presented by Legge and Durie. The method shows that procaine is hydrolyzed to  $p$ -aminobenzoic acid by an esterase present in human blood. In the mouse injected procaine is hydrolyzed to  $p$ -aminobenzoic acid, and then some of it is acetylated to  $p$ -acetylamino benzoic acid. In mice infected with a streptococcus and being treated with sulfanilamide the injection of procaine caused a slight increase in the mortality rate. With severe infection or with massive damage to tissue procaine or other similar local anesthetic agents are contraindicated if any sulfonamide drug is being used.



**Schweizerische medizinische Wochenschrift, Basel**

72 885 908 (Aug 15) 1942

- \*Determination of Duration of Renal Tuberculosis F Suter—p 885  
Nervous System and Fatigue M Monnier—p 887  
Sport and Fatigue A Jung—p 889  
Clinical Value of Phymyces Test for Determination of Vitamin B<sub>1</sub> E Deutsch—p 895  
Experiences with Compound of Dihydrodesormorphine Scopolamine Hydrochloride in Surgery G Drack—p 900  
Direct Tolerance Test Preceding Blood Transfusion R Bucher—p 903

**Duration of Renal Tuberculosis**—Suter investigated 260 surgical cases of renal tuberculosis to determine (1) the frequency of a secondary localization of tuberculosis before the outbreak of the renal tuberculosis (2) the incidence of intermediate symptoms between such a first dissemination and the onset of renal tuberculosis, (3) whether in cases of renal tuberculosis in which localization in another organ did not precede or at least was not observed there were perhaps other signs that indicated the time of renal infection and (4) the behavior of the cases in which urogenital tuberculosis was the first demonstrable secondary localization. In 73 cases renal tuberculosis was preceded by dissemination. The interval between this dissemination and the renal tuberculosis varied greatly. Intermediate symptoms were generally indicative of urogenital tuberculosis dating back only a year and a half. Although renal tuberculosis can exist a long time without manifesting symptoms it does not seem likely that this silent period will persist for ten years. Presumably the production of the specific renal focus did not take place at the first bacillary dissemination into the peripheral organs but at a later time and without causing definite symptoms. In the 187 cases in which renal tuberculosis was the first localization the time of the manifest existence of symptoms was somewhat longer, nearly two years. In 56 cases with completely destroyed kidneys the period during which symptoms existed varied between one month and fifteen years, but the average of two and one-half years was somewhat longer than in the other cases. When renal tuberculosis was associated with or preceded by tuberculosis of the prostate or epididymis, it could often be observed that the localization in the kidney did not concur with that of the genital organs but that an interval sometimes of several years' duration separated the two. The author reports cases in which first a genital and later renal tuberculosis developed. Determination of the duration of renal tuberculosis is difficult, because the infection of the organ nearly always takes place without symptoms and even the anatomic aspects do not permit a reliable determination.

**Bol del Depart de Salub Pub Mexico, D F**

5 99-185 (June) 1942 Partial Index

- \*Yellow Fever C Ortiz Mariotte—p 123

**Yellow Fever**—The incubation period of yellow fever, according to Ortiz Mariotte, is three to six days. There are no prodromal symptoms. There is a sudden onset with acute chills, followed by high fever, headache, backache, epigastric distress and vomiting. Swollen gums, leukopenia, irregular pulse, albuminuria, vomiting and jaundice occur between the second and fourth days. The classic type of yellow fever is entirely under control, but there are still two uncontrolled endemic areas of jungle type of the disease, one in Africa and the other in Brazil. Jungle type is the ordinary yellow fever from the etiologic, clinical and immunologic points of view. The author emphasizes the epidemiologic importance of (1) continuation of antimosquito campaigns in sea ports, (2) establishing these campaigns in air ports as well as in landing grounds, (3) establishing a department for examination of suspected passengers from endemic areas and places for quarantine and treatment of patients, (4) vaccination of workers in epidemic areas, and (5) viscerotomy of the liver of persons dying from suspected yellow fever. There is no specific therapy for the disease. The patient is to be kept in bed from the first day of the disease and all during it. Sponging and ice to the head are indicated to lower the fever. Pieces of ice, cocaine 0.015 Gm by mouth and 0.03 Gm hypodermically are administered to combat vomiting. Isotonic solution of sodium chloride by hypodermoclysis and intravenous injections of dextrose solution are indicated. Immune serum therapy does not influence the course of the disease when administered after onset of symptoms.

**Klinicheskaya Meditsina, Moscow**

19 3 84 (Nos 10-11) 1941 Partial Index

- Hemorrhages in Internal Medicine and Their Therapy A N Kryukov—p 3  
Morphologic Manifestations of Oxygen Hunger and Its Significance in Mechanism of Allergic Tissue Reactions Y M Lazovskiy—p 15  
\*Clinical Aspects of Transfusion of Cold Preserved Blood—A P Kiyashev—p 29  
\*Blood Transfusion in Renal Diseases Z I Chukanova—p 34  
\*Use of Carbon Dioxide-Oxygen Mixture in Low Barometric Pressure V M Tarasenko—p 39

**Transfusion of Cold Conserved Blood**—Kiyashev used unheated and refrigerated conserved blood in 155 transfusions. He began with the unheated blood and gradually decreased the temperature to 4°C. The dosage varied according to the indications. For hemostasis and for stimulation of the hemopoietic organs 100 to 200 cc was used, while patients with excessive loss of blood, progressive anemia or traumatic shock received 400 to 450 cc of blood. The rate of transfusion was 6 to 20 cc a minute. With decreasing temperature of the transfused blood the rate was slowed down and with rising temperature the rate was increased. Febrile posttransfusional reactions were observed in 53 cases (34.2 per cent). This does not exceed the percentage of reactions after transfusion of fresh citrated blood and is considerably lower than after transfusion of heated blood. In all cases the symptoms disappeared within five to six days. There were no deaths. The fact that in many cases the conserved blood had to be transported for long distances before being used may have contributed to the large number of posttransfusional reactions. The technique of transfusion and date of preservation of the blood seem to influence the outcome much more than the temperature of the blood. The transfusion of cold conserved blood calls for a simple technique is entirely safe and is biologically effective in all cases in which blood transfusion is indicated.

**Blood Transfusion in Renal Disease**—Chukanova performed forty-five blood transfusions on 24 patients. Among these 8 had lipid nephrosis, 8 had chronic nephritis with a nephrotic component and 5 had acute glomerulonephritis. Compatible blood was used in amounts varying from 100 to 200 cc. In some cases the transfusion was repeated two or three times at intervals of ten, fifteen and twenty days. In moderately severe cases of lipid nephrosis with preserved renal function, blood transfusion produced temporary improvement sometimes lasting two to three months. The patients with chronic nephritis showed an exacerbation of renal symptoms during the first few days after transfusion. These manifestations disappeared and were followed either by definite improvement or by a return to the original state. The results of transfusion were beneficial in all 5 cases of acute glomerulonephritis. The intensification of renal symptoms observed during the first days disappeared after five or six days. There was a mild febrile reaction during the first twenty-four hours. No pronounced fluctuations in blood pressure resulted from transfusion. The author considers insufficiency of the cardiovascular system, especially hypertension, and severe renal insufficiency as definite contraindications to blood transfusion in patients with renal diseases.

**Inhalation of Carbon Dioxide-Oxygen Mixture in Low Pressure Atmosphere**—Tarasenko points out that oxygen inhalation alone is not enough to prevent hypoxemia in aviators flying at an altitude exceeding 12,000 meters. Inhalation of a mixture of oxygen and carbon dioxide increases the amount of oxygen liberated by the tissues and thus to some extent compensates for the deficiency of oxygen in the inhaled air. The author carried out forty-six experiments on 16 individuals in the low pressure chamber. The atmospheric pressure was reduced to correspond to an ascent of 10,000 to 13,000 meters above sea level. In the majority of cases the carbon dioxide-oxygen inhalation stabilized the cardiac rhythm, maintained pulmonary ventilation at a higher level and increased the subjective sense of well-being as compared with oxygen inhalation. Thus, inhalation of the mixture containing gradually increasing percentages of carbon dioxide corresponding to a decreasing barometric pressure preserves the carbon dioxide of the organism and facilitates a more complete utilization of oxygen by the tissues. This was demonstrated by the maintained working capacity and the absence of any definite changes in the composition of the urine. Tarasenko attributes his three negative results to an inadequate dosage of carbon dioxide.

## Book Notices

**Food Control in Great Britain** International Labour Office Studies and Reports Series B (Economic Conditions) No 35 Paper Price \$1.25 5s Pp 272 Washington C Montreal International Labour Office London P S King & Staples Ltd 1942

Much has been said about the rationing of foods in Great Britain, and the present volume describes some of the food problems which that country is meeting. There is a chronology of all food control orders issued in Great Britain from Aug 31 1939 to the early part of 1942. It is pointed out that the first requisite of any food administrator is courage and secondly the realization that food control is intended to help maintain the physical status and the morale of consumers. The steps which Great Britain has undertaken to meet the problem are described under the headings of agricultural policies, control of supplies and of channels of distribution, rationing and priority distribution and food price control policies. There is described in precise language but not in great detail the steps that have been undertaken to provide children with milk, with sources of vitamin C and with fish liver oils or other sources of vitamin D. Point rationing which applies only to canned goods is described briefly. Meat is rationed on the basis of the amount of money that can be spent for this item. This method allows for variations in quality and for different amounts of bone and connective tissue in the different cuts of meat. Some groups in the population receive special treatment in the rationing program. These are children invalids, persons suffering from certain diseases such as diabetes or gastrointestinal disorders vegetarians and certain classes of workers. The book no doubt has received thoughtful study by persons concerned with the establishment of food rationing programs in this country.

The general reader will be most interested in knowing how the system works. Reports of British medical observers indicate that the general health of the civilian population is being maintained and the poor class of people probably have a better nutritional status than they did before the war. There is still need for education and especially for increasing and conserving the supply of vitamin C. Thus E M Widdowson and R A McCance in a report on *The War and Schoolboys Food* (*Lancet* 2 689 [Dec 2] 1942) have pointed out that the children's diets which they examined contained as much protein, calcium iron and thiamine in 1942 as did the diets of prewar days rationing having reduced the amount of meat fats and sugar in the diet and having increased the amounts of bread oatmeal cakes biscuits and root vegetables but there was some indication that some of the schools were not taking full advantage of their opportunities or assuming all their responsibilities. Among other things it was emphasized that there should be close cooperation between the garden and the kitchen. During war time, at any rate they have written, some members of the domestic staff should remain on duty during the summer holidays, to store and preserve the garden produce. At one school the entire crop of tomatoes grown in the school garden had to be given away, as the school was closed down when they ripened and there was no one available to deal with them. Of course this is simply an isolated instance but if lessons are to be learned from the experience of others it is well to know not only the successes but the failures of the procedures adopted by other countries in the rationing of food.

**The Biology of the Negro** By Julian Herman Lewis Ph D M D Associate Professor of Pathology University of Chicago Chicago Cloth Price \$5 Pp 433 Chicago University of Chicago Press 1942

Approximately one tenth of the people of the United States are Negroes. The Negro race in addition makes up a large portion of the population in other parts of the world. Although these are statements of fact it is a difficult problem to determine just what people should be included under the term 'Negro'. This book by Lewis on the biologic characteristics of the Negro fulfills a real need and helps to define the term 'Negro'. It is principally, although not exclusively a comparison between the biologic characteristics of the American Negro (who is in some respects different from his African counterpart) and the American white person.

Lewis discusses all the real and supposed biologic differences between the Negro and the white person in this country. Some

of the alleged differences he explodes as unfounded in fact and others he establishes as relatively true. The comparative nature of the study is emphasized by the statement that in the United States the people classed as Negroes are a heterogeneous group composed of various degrees of intermixture of African and white blood. Lewis discusses the inheritance of skin color, the commonly claimed differences in size and configuration of the brain in the Negro and in the white person the deeply held belief of an offensive odor which Negroes and white persons attribute to each other and many other asserted racial differences. Much space is devoted to tuberculosis and syphilis in the Negro. The incidence of these diseases in the Negro is unquestionably high. It is however questionable as to what are the relative roles played by inherited predisposition and economic squalor. Certainly the latter plays a large if not actually a predominating part.

There are a few minor criticisms. On page 78 the author uses the word interdicted when he clearly means denied. On page 154 he says ranging from an imperceptible amount of white blood to apparently full-blooded Africans when he presumably means predominating instead of imperceptible. One chapter is entitled Medical Diseases and another Surgical Diseases. It is not clear why peptic ulcer for example should be included under the surgical diseases.

This book gives a much needed and timely discussion of an important subject. At least for those with biologic training it should serve to clarify opinion on the true similarities and true differences between the Negro and the white man in America.

**A Curriculum for Schools of Medical Technology** By Isriel Davidsohn M D Director of Laboratories and Pathologist Mount Sinai Hospital Chicago Recommended by the Board of Registry of the American Society of Clinical Pathologists Second edition Paper Price \$1.75 Pp 47 Muncie Ind Registry of Medical Technologists 1942

Emphasis is placed on the presentation of an organized outline of instruction which might be looked on as a teaching plan for schools for clinical laboratory technicians. This edition has been thoroughly revised and enlarged with the assistance of many suggestions from pathologists in various parts of the United States. Considerable information is included in the introduction which is of value to the pathologists directing schools for clinical laboratory technicians and emphasis is placed on the important divisions of the laboratory training. The curriculum is adaptable to training programs ranging from twelve to twenty-four months in duration. Most of the curriculum is composed of teaching guides containing the subjects to be presented each week. Assignments are included under the heading of each subject and a bibliography is arranged so that selected references are given with each assignment. The order of progression of these assignments appears to be logical. The curriculum is recommended for instructors and will also serve as a notebook for individual students.

**Ovarian Tumors** By Samuel H Geist M D Attending Gynecologist Mount Sinai Hospital New York Cloth Price \$10.50 Pp 527 with 266 illustrations New York & London Paul B Hoeber Inc 1942

This book gives a comprehensive summary of the knowledge of ovarian tumors. The classification and the well illustrated morphologic descriptions of these tumors are based on the current conceptions of their histogenesis. Good use has been made of the large amount of material the author himself has observed and studied and the extensive bibliographies at the ends of the chapters testify to the thoroughness of his literary studies. The clinical manifestations the diagnosis and the treatment of ovarian tumors receive careful attention. Only general mention is made of radiotherapy. The book is a valuable addition to the literature in its field.

**Miracles of Military Medicine** By Albert Q Vaisel Cloth Price \$2.75 Pp 373 New York Duell Sloan and Pearce 1943

In this book the public is given information in easily understandable form regarding the development of the sulfonamide compounds, new anesthetics and surgical procedures used in the war. Several of the chapters concern the work of the Russians. Much of this report is so incomplete as to make difficult a comprehension of just what the scientific procedures really involve. Altogether however the book serves as a most useful introduction to some of the chief contributions of medical research in the war effort.

## Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT HOWEVER REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS BUT THESE WILL BE OMITTED ON REQUEST.

### POSSIBLE INCIPIENT CATARACT OR EPIDEMIC KERATOCONJUNCTIVITIS

**To the Editor**—A woman aged 55 has been complaining of blurred vision under sunlight and artificial light and also when snow is on the ground. The previous medical history and all laboratory examinations have been negative. The retinal vessels and the disks are normal. Her vision has been improved by refraction but not the blurring. She was examined by two good ophthalmologists. One diagnosed incipient cataract, the other epidemic corneal conjunctivitis. With this disagreement between specialists my patient and I are in the middle. Can you give me the differential diagnosis between the two conditions and what if anything could be done for the blurring that has been the main symptom in her case? Would vitamins help in either case and if so which ones and in what doses?

M D New Jersey

**ANSWER**—It is possible that both ophthalmologists may be right, in other words, that the patient does have both incipient cataract and epidemic keratoconjunctivitis. The latter condition nearly always is accompanied by some inflammatory symptoms, that is, some redness of the ocular conjunctiva, slight secretion and a roughness of the corneal epithelium which, however, may be rather difficult to detect without special means of examination. Incipient cataract, on the other hand, causes no congestion and can always be seen with the ophthalmoscope after the pupil has been dilated. There should be no difficulty in distinguishing between the two conditions, although modern means of examination are required. In the case of cataract the only treatment available is the proper correction in glasses, which does not do away with the sensation of blurry vision. That only minimizes it. In the case of epidemic keratoconjunctivitis the haziness of the cornea, which is the cause of the blurry vision, usually disappears almost entirely but this sometimes takes a period of weeks or even two or three months. Treatment of this condition is not satisfactory, but it does tend to heal and clear up spontaneously, in fact practically always does so. In some cases slight scarring is left in the corneal epithelium and superficial stroma, which causes the sensation of blurry vision to persist but rarely reduces vision to any serious extent.

### BREAST FEEDING OF TWINS AND TRIPLETS

**To the Editor**—Could you provide me with some information on the proper procedure of breast feeding in the case of multiple birth in which the mother wishes to nurse her babies? Would it be all right for the babies to nurse one after the other at different breasts at regular intervals? Would it be better to skip a breast feeding and give the infants bottles so that the breasts might fill or would it be best to deprive one baby of the breast and let the weaker one nurse? What would happen in the case of triplets would one see to it that each of the infants got an occasional breast feeding or should all the babies be put on a formula? What would be the best feeding schedule for a set of twins? I have consulted several books on pediatrics but have found no reference to such a feeding problem.

M D New York

**ANSWER**—For twins the best procedure is to allow number 1 to nurse at the left breast, followed by number 2 at the right breast. At the next regular feeding time number 1 nurses at the right breast and number 2 at the left. In this way differences in breast secretion are equalized. Usually fifteen minutes is ample for each nursing time, and a four hour schedule of nursing allows time for the breasts to fill. If a complementary feeding is necessary it may be given after each nursing. If one of the twins is too small to nurse properly, the milk should be expressed by hand or by pump, and the majority given to this one. The larger one can nurse, after the pumping has been done, and this will serve to stimulate the breasts.

In the case of triplets the same procedure is carried out, except that one is given an artificial feeding at each nursing time and the next time is nursed and another infant given the bottle. Occasionally a mother may have enough milk for all three to nurse, in this event the third infant should nurse from both breasts after the other two have nursed at individual breasts.

### RASH FROM DIETHYLSTILBESTROL

**To the Editor**—Can you give me any new information about the side effects of diethylstilbestrol especially cutaneous rashes? A woman had a normal delivery on Nov 22 1942. As she did not have any milk on a previous confinement, she did not want to try to nurse the baby this time. I put her on diethylstilbestrol, 5 mg three times a day for two days to suppress lactation. This she took on Nov 24 and 25, 1942. On November 26 she broke out in a fine rash on the face and upper part of the chest and later this spread over the entire body. Her tonsils had been removed several years before and her throat and tongue did not show any signs of scarlet fever. The hospital put her on infectious precautions, with gowns masks and saponated solution of cresol, which upset her nervously. She had some fever up and down for about three days which sulfadiazine cleared up. As she was nervous and upset I thought that consultation would be advisable. One of the medical chiefs of the hospital looked her over and he felt as I did namely that the rash was an untoward effect of diethylstilbestrol and not scarlet fever. The rash gradually disappeared and her skin cleared up. I spoke to several of the physicians here and none knew much about cutaneous rashes due to diethylstilbestrol. Several said that they had heard about it but none had himself seen a case. Any information you can give me will be appreciated.

G H Miller MD Cranbury N J

**ANSWER**—The use of diethylstilbestrol has been followed by a number of relatively minor complications and some mention has been made of cutaneous rashes. These are far from frequent and they are not permanent or serious. When such cause for a rash is suspected, no other suggestions seem available than the withdrawal of the synthetic estrogen to watch for the subsidence of the rash.

### GROWTH OF HAIR

**To the Editor**—Will you please advise me of the latest scientific knowledge concerning the effect of cutting on hair growth? I refer especially to head hair. During my medical training dermatologists were certain that by cutting the hair often and close the hair would thereby not be stimulated to grow faster. Beauty parlor experts beauticians and the like tell us that cutting does stimulate hair growth. What as far as is known today is the truth? Does a reasonable amount of water on the head as for shampooing have anything to do with falling hair or dandruff? provided natural oil is replaced frequently by some proper preparation? Some light here will help settle some arguments for me.

T G Harvey MD, Mars Hill Maine

**ANSWER**—Hair grows according to plan. The destiny of lanugo hair is a short growth, that of scalp hair a much greater length, varying in different races and different individuals. Left undisturbed, hair will grow to its destined length, then stop growing and after a time fall out. Investigation has shown that short hairs, such as those of the eyebrows, after growing at the regular rate for a time, may cease growing for a comparatively long time and then resume growth. Scalp hair, on the contrary, is believed to grow almost continuously for nearly its whole life, attaining its full length in four years or more and remaining only a short time before loosening and falling out (Danforth, C H. Studies on Hair with Especial Reference to Hypertrichosis, *Arch Dermat & Syph* 76 12 [Juli] 1925). Scalp hair grows about 0.4 mm a day whether cut or not. Trotter's investigation, referred to by Danforth (*ibid* p 195 [Aug] 1925) showed that the rapidity of growth varies with the diameter of the hair.

The reasonable use of water for washing the hair is beneficial, removing dirt and stimulating circulation. Water applied daily to facilitate hair dressing, to make the hair obey the lady's comb, is harmful because it permits the man to neglect brushing, one of the best stimulants for the scalp. The same criticism applies to the application of oil or grease if it allows brushing to be neglected. Most scrubs, if well brushed every day, will produce enough oil to keep the hair in place without artificial additions. There is no objection to brillianine or oil if the brushing is faithfully performed.

The wet comb method of hair dressing encourages dandruff for the same reason, because it encourages neglect of the massage obtained when the hair is well brushed. This is one of the best preventives of dandruff and the form of hair loss resulting from seborrheic dermatitis.

### DEODORANT FOR SICKROOMS

**To the Editor**—Will you kindly advise me of a medication to use in the sickroom as a deodorant for smell of cancer cases?

Elwood T Quinn MD Jenkintown Pa

**ANSWER**—Chlorinated lime, placed in wide, shallow pans or preferably china or earthenware dishes, to a depth not exceeding one half inch, is often used. It acts by oxidation and absorption of moisture and hence is most effective if humidity is relatively high. It is a bleaching agent, destructive of color and many kinds of organic materials. It should be renewed if and when the surface becomes crusted. Many hospitals use electrical units in which a fan draws the air in the room through a deodorant solution.

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## EFFECT OF SERUM GONADOTROPIN AND CHORIONIC GONADOTROPIN ON THE HUMAN OVARY

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AND

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At present, therapeutic experiments are carried out almost exclusively with two kinds of gonadotropic preparations, namely one prepared from the serum of pregnant mares and one derived from the urine of pregnant women.

In animal experiments the active principle prepared from the serum of pregnant mares—which in this paper will be designated as serum gonadotropin—has proved to stimulate the maturing of the ovarian follicles and to produce ovulation and the formation of corpus luteum.

The principle prepared from the urine of pregnant women appears to be formed in the placenta and will be designated as chorionic gonadotropin. In animal experiments its effect has differed with the species examined. From the observations reported so far it appears that chorionic gonadotropin in rodents, through cooperation with the pituitary of the animal, is able to produce a reaction similar to that obtained with serum gonadotropin. It is this effect that forms the basis for the Aschheim-Zondek test for pregnancy. In hypophysectomized animals an entirely different effect has been observed, namely luteinization of the theca without any maturing of follicles or corpus luteum formation. In experiments on monkeys, Engle<sup>1</sup> found that chorionic gonadotropin, in contrast to what might be expected, has an inhibitory effect on the ovarian function, and he even found regressive changes in the ovaries after such treatment.

Experimental studies have been carried out on human beings with both of the aforementioned gonadotropic principles. The substance was given to patients who were to be operated on, and subsequently the ovaries were examined at the operation—or, in some instances, an ovary was removed for microscopic examination.

The action of serum gonadotropin was studied in this way by Westman<sup>2</sup> who found that the substance stimulates the development of the follicles and leads to a cystic enlargement of them whereas it does not produce rupture of the follicles or formation of corpus luteum.

Also Watson Smith and Kurzrok<sup>3</sup> employing injection of the same preparation as that used by Westman found cystic changes in the follicles and luteinization of the theca and exceptionally, of the granulosa too.

Davis and Koff<sup>4</sup> were able by intravenous injection of serum gonadotropin to produce ovulation and formation of corpus luteum as well as maturing of the follicles. These observations have been confirmed by Siegler and Fein<sup>5</sup>.

Similar experiments have been carried out with chorionic gonadotropin. Hamblen and Ross<sup>6</sup> found no effect from this treatment on the human ovary. Nor was Westman<sup>7</sup> able to see any distinct effect from the injection of chorionic gonadotropin alone, in several instances on the other hand in which he first treated the patient with serum gonadotropin and subsequently with chorionic gonadotropin he found changes which he interpreted to indicate that the first substance had produced a ripening of the follicles which later went on to luteinization elicited by the chorionic gonadotropin.

Therapeutic experiments in cases of ovarian dysfunction have given rather divergent results. Positive results have been reported following treatment of amenorrhea both with serum gonadotropin<sup>8</sup> and with chorionic gonadotropin,<sup>9</sup> besides in combined treatment with these two substances (Rydborg,<sup>9</sup> Rydborg and Østergaard,<sup>9</sup> MacGregor<sup>10</sup> and Westman<sup>11</sup>).

Other authors have warned strongly against the employment of the gonadotropic substances in the therapy and in June 1940 the Council on Pharmacy and Chemistry of the American Medical Association<sup>12</sup> published a report in which it said in conclusion that the treatment of ovarian disturbances with chorionic gonadotropin for the present has no rational foundation.

In recent years in the University Clinic of Gynecology, Copenhagen we have carried out some experi-

3 Watson B P, Smith P E and Kurzrok Raphael. The Relation of the Pituitary Gland to the Menopause. *Am J Obst & Gynec* 36: 562-570 (Oct.) 1938.

4 Davis M E and Koff K. The Experimental Production of Ovulation in the Human Subject. *Am J Obst & Gynec* 36: 183-199 (Aug.) 1938.

5 Siegler L S and Fein M J. Studies in Artificial Ovulation with Hormone of Pregnant Mares Serum. *Am J Obst & Gynec* 38: 1021-1036 (Dec.) 1939.

6 Hamblen E C and Ross R A. Responses of Human Ovary to Gonadotropic Principles. *Endocrinology* 21: 722-726 (Nov.) 1937.

7 Westman A. Ueber den Luteinisierungseffekt des gonadotropen Chorionhormons auf die Ovarien der Frau. *Acta path et microbiol Scandinav* 1938, supp 37, pp 567-577. Footnote 11.

8 Siegler L S. Further Experiences with the Hormone of Pregnant Mare Serum. *Endocrinology* 27: 387-391 (Sept.) 1940.

9 Rydborg Erik. Einige Fälle von Metropathia haemorrhagica und sekundärer Amenorrhoe behandelt mit gonadotropem Hormon. *Acta obst et gynec Scandinav* 18: 123-138. Rydborg Erik and Østergaard E. The Effect of Gonadotropic Hormone Treatment in Cases of Amenorrhoea. *Acta obst et gynec Scandinav* 19: 222-246 1939.

10 MacGregor T N. Amenorrhoea. Its Etiology and Treatment. *Brit M J* 1: 717-722 (April) 1938.

11 Westman A. Die gonadotropen Hormone und ihre therapeutische Anwendung. *Geburtsh u Frauenh* 2: 595-610 (Dec.) 1940. Die hormonale Behandlung der Amenorrhoe. *Acta obst et gynec Scandinav* 21: 105-150 1941.

12 Chorionic Gonadotropin. Report of the Council on Pharmacy and Chemistry. *J A M A* 114: 2306-2307 (June 8) 1940.

From the University Clinic of Obstetrics and Gynecology, Copenhagen. Professor Rydborg, Chief.

1 Engle E T. Gonadotrope Stoffe im Blut Harn und in anderen Körperflüssigkeiten. *Arch f Gynak* 166: 131-167 1938.

2 Westman A. Untersuchungen über die Wirkung des gonadotropen Hypophysenvorderlappenhormones Antex (Leo) auf die Ovarien der Frau. *Acta obst et gynec Scandinav* 17: 492-515 1937.

ments with gonadotropic substances along various lines, an account of them has been given in several publications.<sup>9</sup>

The present work will deal with our observations as to the dosage and combination of serum gonadotropin and chorionic gonadotropin preparations, and as to the immediate effect on the functions of the ovary in cases of amenorrhea.

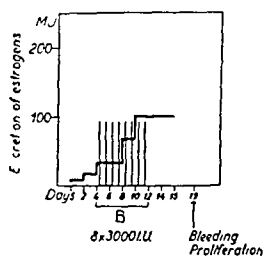


Chart 1—Case of amenorrhea treated with chorionic gonadotropins. In the charts A shows dosage of serum gonadotropin and B of chorionic gonadotropins.

The general indications for treatment and the permanent results obtained will not be dealt with here, but the reader is referred to the paper by Rydberg and Østergaard<sup>9</sup> of 1939 in which our material at that time is described and classified from clinical points of view.

In the first therapeutic experiments performed by one of us (Rydberg) only chorionic gonadotropin was employed. As a rule, 1,500 international units was injected twice a week, and the treatment was continued for several weeks. About one half of the patients treated in this way reacted with bleeding, and on microscopic examination the endometrium was found to be in the secretory phase. From the studies on this material there could be no doubt that chorionic gonadotropin alone in certain cases of amenorrhea was capable of producing true menstruation.

Owing to the experimental experiences gained in the following period, we subsequently adopted a combined method of treatment, commencing with serum gonadotropin and continuing with chorionic gonadotropin. This form of treatment proved more effective, at least as far as the immediate effect is concerned, and hence we have continued with this method.

If the doses given were sufficiently large, this combined treatment was capable in a majority of cases of secondary amenorrhea to establish a really complete cycle, in many of these cases the restored ovarian function kept on also after discontinuance of the treatment.

With the experiences gained in this way, various questions arose concerning the mode of action of these preparations and their expedient administration in therapy—questions that suggest themselves but often are difficult to answer since clinical experimentation implies a good many considerations that are absent in experiments on animals, and it thus takes a longer time to gather sufficient experiences for definite conclusions.

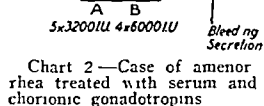


Chart 2—Case of amenorrhea treated with serum and chorionic gonadotropins.

It has already been pointed out that the gonadotropins have various actions in different kinds of animals and that the opinions of their action in the human being still are highly divergent. Naturally the fact that a given type of treatment in a number of cases results in the effect desired is not a sufficient basis for conclusions as to the mechanism of the effect of the gonadotropic preparations employed. Real insight into the action of these substances may be gained only through accurate analysis of the cases under treatment and determination of the hormone excretory products that are characteristic of the two phases of the ovarian

cycle, together with examination of the endometrium at the proper periods of time.

Some diagrams are presented of hormone-analytic records and therapeutic measures in a number of cases of amenorrhea in which rather thorough examinations have been made, in connection with the diagrams we shall present our conclusions as to the mode of action of the preparations employed and the dosage required. The cases here reported are selected from a large number of cases of amenorrhea, the total material will be worked up subsequently according to the clinical angle.

#### THE HORMONAL ANALYSIS AND THE PREPARATIONS EMPLOYED

In the studies here reported, quantitative determination was made of the estrogenic substances in the urine before and during the treatment, besides, in several cases, of pregnandiol under the treatment.

The excretion of estrogens was determined prior to the institution of treatment and throughout the treatment with gonadotropic substance in order to ascertain a possible ovarian stimulation. We have determined

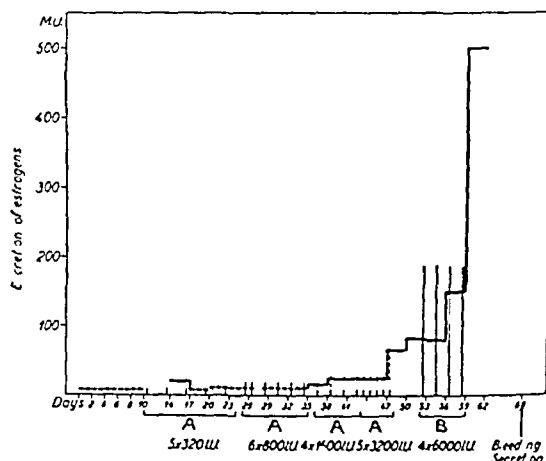


Chart 3—Case of amenorrhea treated with serum and chorionic gonadotropins.

the content of estrogenic substances in the urine after the method given by Kemp and Pedersen-Bjergaard<sup>13</sup> with this modification that the congo-acid urine before benzene extraction is mixed with an additional 80 cc of concentrated hydrochloric acid per thousand cubic centimeters of urine, so that the ensuing heating causes hydrolysis of possibly combined forms of estrogenic substances. The extracts containing the total estrogenic activity were dissolved in oil and titrated on adult castrated female mice. In normal menstrual cycles the output of estrogens demonstrated after this method is from 15 to 150 mouse units per twenty-four hour output of urine.

In some of our cases we have further determined the output of pregnandiol during the treatment in order to ascertain a possible luteinization of the ovaries. As is well known, pregnandiol is an excretion product of progesterone, isolated first by Venning and Browne<sup>14</sup> as sodium pregnandiol glyconate. The same authors<sup>15</sup> have later shown that pregnandiol is excreted normally during the latter half of the intermenstruum, i.e. in the

13 Kemp T. and Pedersen Bjergaard K. Ueber die Aufnahme und Ausscheidungsverhältnisse des Follikulins beim Menschen. *Endokrinologie* 13: 156-167, 1933.

14 Venning E. M. and Browne J. S. L. Isolation of Water Soluble Pregnandiol Complex from Human Pregnancy Urine. *Proc. Soc. Exper. Biol. & Med.* 34: 792-793 (June) 1936.

15 Venning E. M. and Browne J. S. L. Studies on Corpus Luteum Function. Urinary Excretion of Sodium Pregnandiol Glyconate in Human Menstrual Cycle. *Endocrinology* 21: 711-721 (Nov.) 1937.

corpus luteum phase We have determined the amount of sodium pregnandiol glycuronate in the urine gravimetrically after Venning's<sup>16</sup> method, this substance being shaken out of the urine by means of butyl alcohol recrystallized by means of acetone dried and weighed Pregnandiol itself, which has about the same molecular weight as progesterone, makes up about 60 per cent of the glycuronate The values given for excretion of pregnandiol in charts 9 to 14 are calculated from the values obtained for the glycuronate output In women with normal menstruation the pregnandiol output determined after this method is stated not to exceed 8 mg in twenty-four hours

The values recorded in the charts for estrogens and pregnandiol show the twenty-four hour output, they are averages of the excretions for two to three days as a rule, as is evident from the graphs The analyses were carried out in the biologic laboratory of Løvens kemiske Fabrik under the direction of one of us (Pedersen-Bjergaard) The preparations here employed are (1) serum gonadotropin and (2) chorionic gonadotropin prepared by "Løvens kemiske Fabrik"

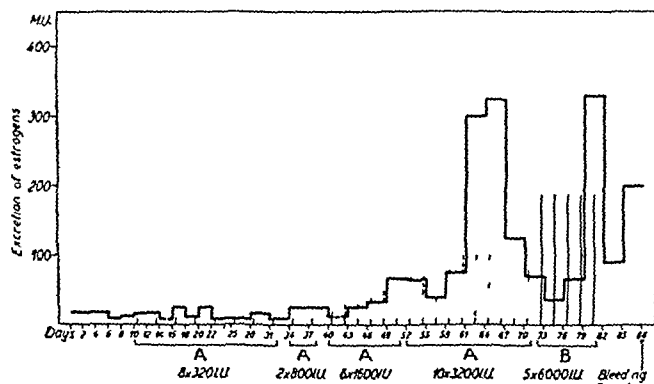


Chart 4—Case of amenorrhea treated with serum and chorionic gonadotropins

Both preparations are perfectly free from estrogens Both are standardized by comparison with the international standard preparation, and the potency is given in international units<sup>17</sup>

#### GRAPHIC PRESENTATION OF SOME TREATED CASES OF AMENORRHEA COMMENTS

*Explanation of the Signs in Charts 1 to 8*—The stepped curve gives the estrogen output in the urine per day in mouse units When this curve is drawn in a dotted line it means that the actual values were not determined and that at any rate they fall below the value indicated by the dotted line The dotted line to the extreme right in chart 7 (in continuation of the unbroken line) indicates that here it was not possible to follow the usual scale of the ordinate because of the very high values in this section The vertical dotted line indicates injection of serum gonadotropin in international units and the vertical solid line injection of chorionic gonadotropin in international units

Charts 1 and 2 illustrate two successive treatments of the same patient—a patient with primary amenorrhea First she was given chorionic gonadotropin alone

and in a subsequent treatment she was first given serum gonadotropin and, after this, chorionic gonadotropin

In this case, as will be noticed the treatment with chorionic gonadotropin alone 24 000 international units, resulted in a decided increase in the output of estrogens, and a bleeding appeared after the discontinuance of

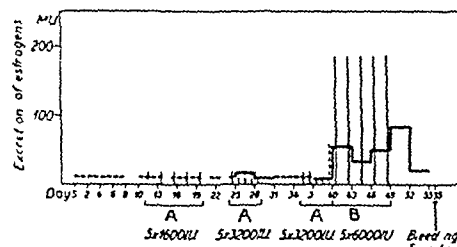


Chart 5—Case of amenorrhea treated with serum and chorionic gonadotropin

the treatment At this time, however, the endometrium was only in the proliferation phase From these results the only conclusion is that the chorionic gonadotropin in this case when given alone had a follicle stimulating effect but no luteinizing

It has already been pointed out that the follicle stimulating effect of this principle is characteristic of the rodents, while it has not been practicable by direct examination to ascertain any follicle stimulating effects on the ovaries of patients receiving this treatment In a few other cases too we have seen chorionic gonadotropin alone able to produce bleeding from the endometrium in the phase of proliferation

Now we have more effective methods for adequate stimulation of the ovary, and we presented chart 1 merely because it illustrates the fact that the chorionic gonadotropin may act exclusively as a follicle stimulating agent

Subsequently the same patient was treated first with serum gonadotropin and later with chorionic gonadotropin (chart 2) Also this treatment resulted in a considerable increase in the output of estrogens and bleeding, but this time the endometrium had undergone the clear premenstrual change at the appearance of the bleeding

Charts 3 and 4 illustrate therapeutic experiments in which the treatment commenced with relatively small

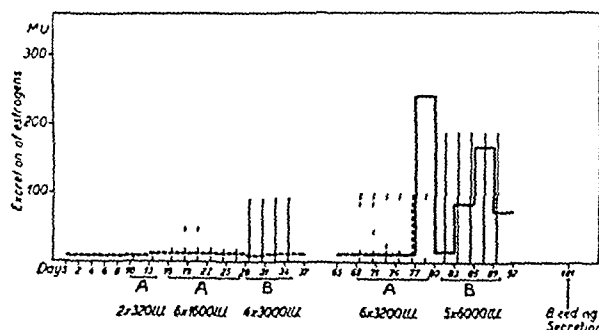


Chart 6—Case of amenorrhea treated with serum and chorionic gonadotropins

doses of serum gonadotropin the dose was then increased slowly, after which chorionic gonadotropin was given, four or five injections of 6,000 international units Here the excretion of estrogens does not rise distinctly until large doses of serum gonadotropin are given, 1 600 to 3,200 international units The following treatment with chorionic gonadotropin produces an additional rise in the excretion of estrogens in the

16 Venning E M Further Studies on Estimation of Small Amounts of Sodium Pregnandiol Glucuronide in Urine J Biol Chem 126: 595-602 (Dec) 1938

17 Memorandum on the International Standard for the Gonadotropic Substance of Pregnant Mares Serum Bull Health Organ League of Nations 8: 898-900 1939 Memorandum on the International Standard for the Gonadotropic Substance of Human Urine of Pregnancy Chorionic Gonadotropin Bull Health Organ, League of Nations 8: 884-886, 1939



first case, the other case shows at this moment a secondary rise in the excretion of estrogens after a fall coincident with the last injections of serum gonadotropin. In both cases there was bleeding from the mucosa at the stage of secretion a few days after the discontinuance of the treatment with chorionic gonado-

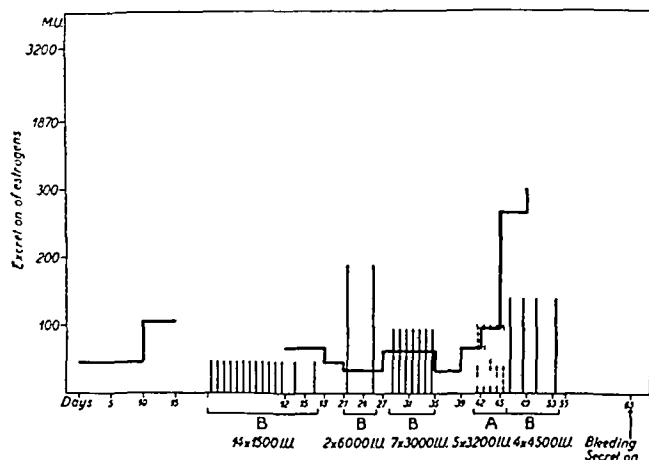


Chart 7—Case of amenorrhea treated with serum and chorionic gonadotropins

tropin. The results indicate that in stimulating treatment with serum gonadotropin the dose should not be less than about 2,000 to 3,000 international units per injection and that several such injections should be given in succession. As far as may be judged from the present cases, this form of treatment is follicle stimulating, but, as will be pointed out later, the treatment with serum gonadotropin is not sufficient to produce the complete ovarian cycle.

Chart 5 shows about the same results. In this instance a pause of some days was made between the three series of injections of serum gonadotropin, each of five injections. After the last injection of serum gonadotropin chorionic gonadotropin was given in the usual manner. A distinct rise in the excretion of estrogens was first demonstrated at the beginning of chorionic gonadotropin therapy, the rise most likely in the beginning, however, being due to the serum gonadotropin therapy. The combined treatment was followed by menstruation.

In the case presented in chart 6 the treatment was carried out after the following plan. Serum gonadotropin was given first in doses of about half the usual size, and this treatment was followed immediately by four injections of chorionic gonadotropin of 3,000 international units. This treatment gave neither any rise in the excretion of

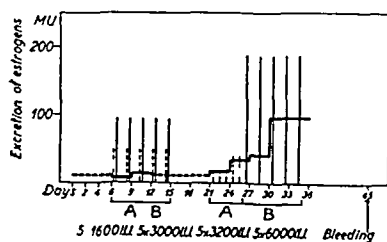


Chart 8—Case of amenorrhea treated with serum and chorionic gonadotropins

estrogens nor any bleeding. After a pause of one month the patient was given a new series of serum plus chorionic gonadotropin, and this time the doses of both preparations were doubled. The last series of injections brought about both a rise in the excretion of estrogens and menstruation. This case confirms the view that in the serum gonadotropin therapy the dose should be at least 2,000 to 3,000 interna-

tional units per injection. It is to be emphasized that the negative result of the first treatment in this case is not due to insufficiency of chorionic gonadotropin dosage, for we have found that after treatment with sufficient doses of serum gonadotropin an adequate response to injections of chorionic gonadotropin is obtained regularly when considerably smaller doses are given than those employed here. The question about the proper dosage of chorionic gonadotropin will be dealt with later. In these cases the main object was to find a suitable administration of serum gonadotropin in the combined therapy. The cited cases show, then, that five consecutive injections of 3,000 international units of serum gonadotropin seem to constitute a rational procedure when the aim is to stimulate the follicular activity in cases of failing or lowered ovarian function.

Chart 7 illustrates a therapeutic experiment in a case of amenorrhea in which the output of estrogens prior to the treatment kept at an entirely normal level. Here we commenced with chorionic gonadotropin therapy alone—which perhaps would seem quite rational in such a case—since according to experimental studies on man and animals the chorionic hormone should act particularly as a luteinizing agent. In this case, however, no effect was obtained with chorionic gonadotropin alone, although the doses here employed as will be shown later have proved sufficiently large when this treatment is preceded by injections of serum

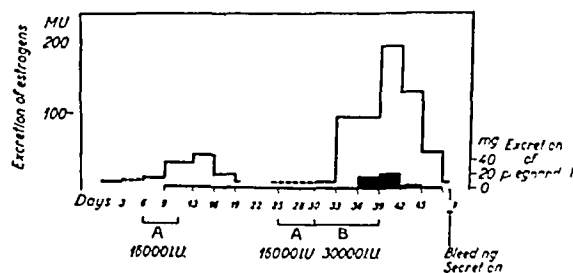


Chart 9—Excretion of estrogens and pregnandiol in the urine in a case of amenorrhea treated with serum and chorionic gonadotropins

gonadotropin. The usual combined treatment resulted in an enormous rise in the output of estrogens and menstruation. Naturally this experiment may be interpreted in various ways but at any rate it illustrates clearly the effectivity of the combined treatment.

Chart 8 presents a therapeutic experiment in which serum and chorionic gonadotropin first were given together, without any distinct effect. Then the usual successive treatment with the two preparations was given and resulted in an increased excretion of estrogens and menstruation.

This sort of experiment might indeed be varied with differing dosages, but we did not consider it likely to result in any advance.

As mentioned in the introductory remarks, some authors have made observations indicating a possible luteinizing effect of the serum gonadotropin on the human ovary. This effect if constant, would mean that this principle alone would be sufficient to produce a complete ovarian cycle and that the following chorionic gonadotropin therapy thus would not be required.

In order to see whether treatment with serum gonadotropin alone might possibly be able to replace our combined method, we gave 4 patients a preliminary treatment with 16,000 international units of serum gonadotropin, and after a pause of two weeks or a little longer we gave them our usual combined treatment, commencing with the same number of injections



of serum gonadotropin in the same doses as before and continuing with the administration of 30,000 international units of chorionic gonadotropin. During this treatment we have followed the excretion of estrogens in the urine and have also determined the output of pregnandiol. The presence of pregnandiol in the urine shows that corpus luteum is formed. The absence of pregnandiol does not perhaps indicate with absolute certainty that corpus luteum is not formed, as according to our experiences it is difficult with accuracy to determine the small amounts of this substance that correspond to the normal cycle. From charts 9 to 12, however, it is evident that the appearance of the bleedings, the condition of the endometrium and the amount of pregnandiol demonstrated in the urine clearly show the difference in the effect of serum gonadotropin alone and of serum and chorionic gonadotropins combined.

*Explanation of the Signs in Charts 9 to 12*—As in the preceding charts the stepped curve gives the output of estrogens per day in mouse units. The unbroken line on the abscissa indicates that the excretion of pregnandiol was assayed but pregnandiol was not present in any measurable amount. The black rectangular areas on the abscissa give the output of pregnandiol in milligrams per day.

Chart 9 illustrates a therapeutic experiment after the plan already given. The serum gonadotropin ther-

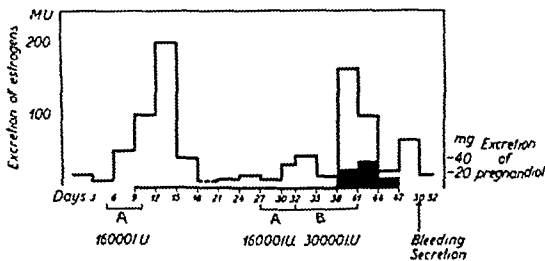


Chart 9—Excretion of estrogens and pregnandiol in the urine in a case of amenorrhea treated with serum and chorionic gonadotropins

apy produced a minor rise in the excretion of estrogens but no bleeding or any measurable output of pregnandiol. Treatment with serum and chorionic gonadotropins was followed by a greater excretion of estrogens, and a considerable amount of pregnandiol was found in the urine during and after the injections of chorionic gonadotropin, a few days later menstruation appeared.

Chart 10 illustrates the treatment in a case after the same lines as given in chart 9. The reaction is essentially the same.

In chart 11 a similar effect is seen with regard to the excretion of estrogens and pregnandiol. In this case there was a little bleeding after the serum gonadotropin therapy, but a specimen of the endometrium showed this to be in the proliferative phase, though exhibiting slight cystic hyperplastic changes. After the combined treatment a new bleeding appeared, and this time the mucous membrane was in the premenstrual phase.

In the experiment portrayed in chart 12 a trace of pregnandiol could be demonstrated in the urine after the first series of injections of serum gonadotropin alone. The appearance of bleeding at this time caused a specimen of the endometrium to be taken; this was found to be in the proliferative stage and showed no sign of secretion. The demonstrated trace of pregnandiol allows of no definite conclusion. Perhaps there was a beginning luteinization but at any rate this has

not been sufficient to bring the endometrium into the secretory phase. The subsequent combined therapy had the typical effect.

In recapitulation of the experiences from the therapeutic experiments here described—to which could be added a long series of cases confirming the results

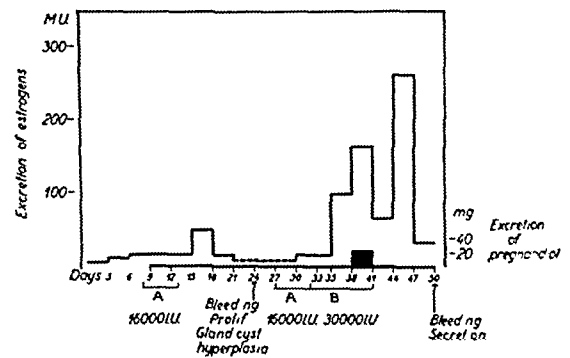


Chart 11—Excretion of estrogens and pregnandiol in the urine in a case of amenorrhea treated with serum and chorionic gonadotropins

reported—it may be said that an adequate stimulation of the human ovary, by inhibited function, to an activity similar to the normal spontaneous process, i.e., beginning with follicular stimulation and going on to luteinization, is best obtained by a combined treatment commencing with serum gonadotropin and continuing with chorionic gonadotropin. We found the suitable dosage of serum gonadotropin to be about 3,000 international units daily for some days in succession—for instance, five days. Then chorionic gonadotropin is to be employed.

It now remains to look into the dosage of chorionic hormone required for the production of luteinization as the therapeutic experiments reported tell nothing about the minimal dose of chorionic gonadotropin that with reasonable regularity produces luteinization after a preceding treatment with serum gonadotropin.

In order to elucidate this question, we have treated a series of patients first with the dose of serum gonadotropin (3,000 international units  $\times$  5) we found suitable according to the preceding experiments and then

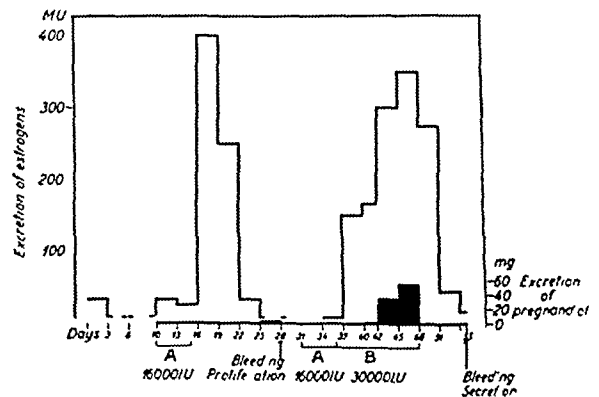


Chart 12—Excretion of estrogens and pregnandiol in the urine in a case of amenorrhea treated with serum and chorionic gonadotropins

with chorionic gonadotropin in different doses, as recorded in the accompanying table.

The first column gives the number of reactors, i.e., patients responding to the treatment with a distinct increase in output of estrogens. In this table we have included only such reactors, leaving out a small number of patients who proved quite refractory to the stimulation with gonadotropic substances. Since the

question looked into here is the proper dosage of chorionic gonadotropin required for the production of luteinization after a preceding adequate follicular stimulation with serum gonadotropin, the entirely refractory cases have to be left out of consideration.

As will be seen from the table, any dosage of serum gonadotropin under 1,500 international units  $\times 3$  is undoubtedly inadequate. With this chorionic gonadotropin dosage of 1,500 international units  $\times 3$  we obtained a complete reaction (i. e., bleeding from a mucous membrane in typical premenstrual phase) in 10 out of 12 cases. In 1 case bleeding was obtained but the mucous membrane was not of the premenstrual type, and in another case no bleeding appeared but a definite excretion of pregnandiol has to be looked on as indicating that luteinization has taken place.

We stopped at the last dosage, and the method for administration of gonadotropic substance we thus have arrived at is as follows:

Serum gonadotropin, 3,000 international units daily for five consecutive days, then chorionic gonadotropin

*Reaction of Amenorrheic Patients on Various Doses of Chorionic Gonadotropin Given After Preliminary Treatment with Serum Gonadotropin (3,000 International Units  $\times 5$ )*

	Number of Reactors	No. Bleeding	Bleeding but Mucosa Not in Premenstrual Phase	Bleeding, Premenstrual Mucosa
1 Chorionic gonadotropin $3 \times 100$ international units after preceding treatment with serum gonadotropin	5	1	4 (1 in secretion but not premenstrual 3 without signs of secretion)	0
2 Chorionic gonadotropin $3 \times 250$ international units after preceding treatment with serum gonadotropin	7	2	3	2
3 Chorionic gonadotropin $3 \times 500$ international units after preceding treatment with serum gonadotropin	10	2	6 (1 in secretion but not premenstrual 4 without signs of secretion)	3
4 Chorionic gonadotropin $3 \times 1,500$ international units after preceding treatment with serum gonadotropin	12	1 (Preg. nandiol +)	1 (Preg. nandiol 0)	10

1,500 international units every other day, three times in all.

The menstruation usually appears about ten days after the last injection of chorionic gonadotropin.

The last two graphs, charts 13 and 14, illustrate a couple of cases in which this dosage was employed.

#### COMMENT

It would fall outside the scope of this paper to discuss in detail the clinical questions connected with the therapeutic employment of gonadotropic substances.

Here it is merely to be mentioned that with this method we have been able to produce menstruation in a greater majority of our patients with secondary amenorrhea and in some patients with primary amenorrhea, and that, according to our present experiences, about one half of the patients treated in this way have continued menstruating after the treatment. We have now seen many instances of striking, truly favorable therapeutic results—for instance, pregnancy in 2 cases of primary amenorrhea and continued regular menstruation in many cases of secondary amenorrhea, also some instances of pregnancy after the treatment of secondary amenorrhea.

The treatment may give some untoward effects, the most important of which is the not altogether infrequent production of a considerable swelling of one of the ovaries or of both. The patient may then have a sensation of tension or of pain in the abdomen, and on palpation the ovary is found to be enlarged, so that it may even rise from the pelvis like ovarian cysts. Usually no great inconvenience results from this complication, the patient has to keep to her bed for a few days and then this reaction subsides rapidly. In 1 case we were able during a laparotomy to ascertain that it was a matter of lutein tumors. In this case there was an unusually strong abdominal reaction, and since we were not familiar with this effect of the treatment we thought that there were indications for the performance of a laparotomy.

A transitory rise in temperature is not infrequent. Serum gonadotropin is less active in this respect, but chorionic gonadotropin gives not infrequently a brief elevation of the temperature to 38-39°C (100.4-102.2°F). The undesirable effects mentioned have not been so bad as to keep us from giving ambulatory treatment in a good many cases. The ovarian reaction just mentioned has to be kept in mind, however, as such a lutein tumor and the resulting symptoms may easily be mistaken for other morbid conditions, and patients with any severe degree of such a reaction have to be confined to bed for some days.

#### SUMMARY

In cases of failing ovarian function in women, the gonadotropic preparations can produce an adequate reaction in the ovary followed by menstruation. By a suitable dosage it is practicable in most cases of secondary amenorrhea to set the ovarian function going at least temporarily and often permanently.

It was found most expedient to treat the patients first with serum gonadotropin and afterward with chorionic gonadotropin.

Experimental studies led to a rational dosage and a standard method for this stimulation therapy. Intramuscular injection of 3,000 international units of serum gonadotropin is given daily for five consecutive days and then 1,500 international units of chorionic gonadotropin is given every day, three times in all.

In reacting patients the menstruation makes its appearance about ten days after the last injection.

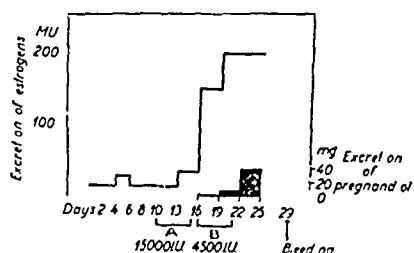


Chart 13—Course of a case of amenorrhea treated with serum plus chorionic gonadotropins as given in the text.

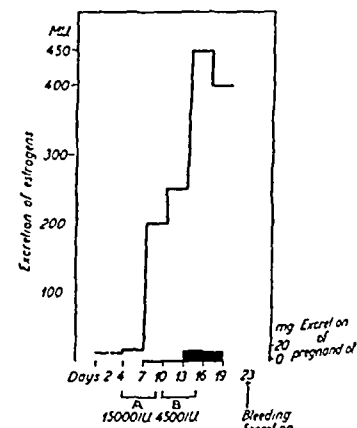


Chart 14—Course of a case of amenorrhea treated with serum plus chorionic gonadotropins as given in the text.

ADJUNCTIVE THERAPY WITH DIETHYL-  
STILBESTROL IN OBSTETRICS  
AND GYNECOLOGY

## CRITICAL EVALUATION

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Before proceeding to evaluate the present status of diethylstilbestrol in clinical obstetrics and gynecology, let us observe where diethylstilbestrol fits into our therapeutic philosophy by briefly reviewing certain significant trends in reproductive physiology, especially as regards our conception of the so-called "sex" hormones estradiol progesterone and testosterone. The guiding principle in these recent advances has been the premise that all biologic processes are essentially chemical in nature.

Basic in its significance was the demonstration that the steroid nucleus is not essential for gynecologic activity, because its implications are so broad and sweeping. In a series of investigations that forms one of the most fascinating chapters in modern medical annals, Dodds<sup>1</sup> and his co-workers chemically dissected the steroid skeleton of estradiol in a search for the chemical moiety requisite for gynecogenic activity. Among the scores of nonsteroidal chemical substances evolved, a very potent gynecogen was discovered in 4-4'-diethyl-dihydroxy-stilbene, popularly known as stilbestrol, but for which the designation diethylstilbestrol, recommended by the Council on Pharmacy and Chemistry of the American Medical Association, will be used throughout this report. Pharmacologically, diethylstilbestrol is essentially similar to estradiol in every important respect but one. Diethylstilbestrol loses little of its potency when administered orally, because unlike estradiol, it is not inactivated by the liver.<sup>2</sup>

Important also have been the findings of the biologist that each of these so-called sex hormones, as well as diethylstilbestrol, possesses bisexual properties.<sup>3</sup> Since not one of them is specific for either sex, one can no longer logically retain such terms as "male sex hormone" or "female sex hormone" for by definition,

such entities do not exist.<sup>4</sup> Each exerts both androgenic and gynecogenic activity.<sup>5</sup>

Equally significant have been the contributions of the physiologist and pharmacologist in showing that these so-called sex hormones as well as diethylstilbestrol may materially influence many diversified phases of the body economy of both the male and the female independent of any effects on the secondary sexual apparatus.<sup>6</sup> In short so great is the weight of the evidence that no one can any longer consider the genital tract as a periscope with which to view the extragenital effects of diethylstilbestrol, estradiol progesterone or testosterone. Rather, one must recognize that these chemical substances possess multiple constitutional activities that are not dependent on their effects on the secondary sex organs.

In review, then, it is noted that the nonsteroidal chemical substance diethylstilbestrol is a constitutional drug. In its influence on the secondary sexual apparatus it exhibits bisexual activity although its properties are preponderantly gynecogenic. Since the latter were the first to be recognized, diethylstilbestrol at present has found its widest use in clinical obstetrics and gynecology, especially since it is efficacious orally as well as relatively inexpensive. Growing recognition of its multiple constitutional effects, however, has brought about its introduction in several other fields such as internal medicine otorhinolaryngology, dermatology and dentistry.

Now let us note where diethylstilbestrol fits into our general plan of therapy. An adequate therapeutic regimen must include treatment of the entire patient the sum of her mental as well as physical ills, be they real or imaginary. Treatment has to be individualized because each patient presents problems peculiar to herself. Furthermore, gynecic endocrinopathies in their basic concept represent disturbances in the metabolism of the endocrine glands themselves or of the recipient organs or both. Since each patient is the metabolic sum of what she eats and drinks, it becomes clear why diet and thyroid are of fundamental importance in gynecic endocrine therapy. A diet to be adequate must not only be properly balanced but also be properly cooked so as to preserve the essential vitamins and minerals.<sup>7</sup> Caloric intake in comparison is of secondary importance.<sup>8</sup> Thyroid exerts a profound stimulating influence on the general metabolic functions of the organism.<sup>9</sup>

Equally important in the management of the patient is mental readjustment and reassurance. The physician must sweep away the cranial cobwebs spun by the spiders of folklore and superstition especially with

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Diethylstilbestrol monomethyl ether (Monomestrol) was supplied by Wallace & Tiernan Products Company.

Owing to lack of space this article has been abbreviated for publication in THE JOURNAL. The complete article appears in the authors' reprints.

Testosterone propionate and methyl testosterone were supplied as Perandren and Metandren respectively by Ciba Pharmaceutical Products Inc.

Dr Abarbanel is now associated with the Department of Obstetrics and Gynecology of George Washington University School of Medicine Washington D C.

Read before the Section on Obstetrics and Gynecology at the Ninety Third Annual Session of the American Medical Association Atlantic City N J June 10 1942.

Diethylstilbestrol was supplied as Estrobene by Mr A A Ebba of Ayerst McKenna and Harrison Ltd and as Stilbestrol Squibb by Dr J A Morrell of E R Squibb & Sons.

<sup>1</sup> Dodds E C Stilbestrol Practitioner 142 309 313 (March) 1939.

<sup>2</sup> Zondek Bernhard and Sulman Felix Inactivation of Diethylstilbestrol in the Organism Nature London 144 596 597 (Sept 30) 1939.

<sup>3</sup> Korenchevsky V Bisexual Properties and Cooperative Activity of Sexual Hormones and Their Effects on Females Brit M J 2 896-899 (Nov 6) 1937. Jacobson E Die Wirkung von 4-4'-Diethyl-Diäthylstilben auf die Hypophyse gonadectomierter Ratten, Endokrinologie 21 20 24 1938.

<sup>4</sup> Abarbanel A R Rationale for the Use of Testosterone Propionate in Immediate Treatment of Excessive Uterine Bleeding Am J Obst & Gynec. 33 243 254 (Feb.) 1940.

<sup>5</sup> The description of the action of any one of the chemical substances must be based on the specific effect of a particular substance on an individual and organ under a definite set of circumstances and then compared to what has been set up as the norm for meleness and for femaleness. If under these conditions the action is exerted in the direction of maleness it is called androgenic while if it is in the direction of femaleness it is called gynecogenic. The gynecogens are further subdivided into estrogens which bring about proliferative changes in the secondary sexual apparatus and progestogens which cause maturation or progestational changes.

<sup>6</sup> Reynolds S R M Gynecic Physiology and the Gynecologist Am J Surg 48 170 196 (April) 1940.

<sup>7</sup> If the services of an expert dietitian are not available detailed information may be secured from the Bureau of Home Economics Department of Agriculture Washington D C.

<sup>8</sup> McLester J S Nutrition and Diet in Health and Disease ed 3 Philadelphia W B Saunders Company 1939 chapter 13.

<sup>9</sup> If the patient proves sensitive to thyroid 10 to 15 drops of compound solution of iodine (Lugol's solution) or saturated solution of potassium iodide administered concurrently with the thyroid frequently helps offset the side effects.

regard to disorders of menstruation and their influence on sex. In addition, a critical analysis and adjustment of psychogenic factors deriving from marital, social or economic causes may often be essential for a successful therapeutic result.

A complete physical examination should always be performed by a competent internist preliminary to a thorough gynecologic examination which includes a speculum examination of the cervix. These should be repeated at frequent intervals.

Clearly, then, in the light of these considerations diethylstilbestrol, being but a single drug, can comprise just one adjunctive portion of a rational therapeutic regimen.

Proceeding on the general plan of therapy just outlined, the present status of the adjunctive use of diethylstilbestrol in clinical obstetrics and gynecology has been critically evaluated. This has been based mainly on our personal experience in over 700 cases (table 1).

In some individuals definite vasomotor instability may occur, noted clinically as hot flushes, sweats, chills or suffocations.<sup>13</sup> Although their exact etiology has never been clearly proved, it seems that these characteristic vasomotor phenomena appear to reflect an instability of the heat regulating mechanisms of the individual.<sup>12</sup> Any circumstance, physical or mental, which places a stress on the peripheral heat regulating apparatus will intensify those symptoms. Adjunctive therapy with diethylstilbestrol, as well as with estradiol or testosterone, helps bring about symptomatic relief by tending to stabilize heat regulating mechanisms through their action on the peripheral vascular tree. This is accomplished, according to Reynolds and his co-workers, in part by a direct action on the blood vessels themselves and in part indirectly through the central nervous system.<sup>14</sup>

The common sense management of these patients has been adequately described by Novak<sup>15</sup> and others.

TABLE 1—Various Conditions in Which Adjunctive Therapy with Diethylstilbestrol Was Employed

Indication	General Management	Total Treated	General Management		Evaluation of Adjunctive Use of Diethylstilbestrol
			Alone	Plus Diethylstilbestrol	
Climacteric vasomotor instability	Mental reassurance sedation score card diet thyroid	475	204	271	Excellent adjunctive value
Senile vulvovaginitis (including essential senile pruritus)	Establish diagnosis diet thyroid acid douches cotton tampons	32	11	15	Excellent adjunctive value
Juvenile vulvovaginitis (gonococcal)	Establish diagnosis hygienic regimen sulfonamides	21	0	21	Excellent adjunctive value
Puerperal painful engorgement of breasts	Proper uplift breast support	500	250	250	Excellent
Prevention of Relapse		100	50	50	Fairly good
Amenorrhea	Establish diagnosis mental reassurance diet thyroid, repeated biopsies				Excellent as aid in correcting mental maladjustment
Secondary		47	24	15	
Primary		6	2	4	Also physical disproportion
Induction of early abortion	Medical induction potent oxytocics	24		24	No value what over
Inhibition of onset of adequate milk secretion	Baby nursing	50	25	25	Value only temporary
Suppression of established lactation	Baby nursing	50	25	25	No value (actually stimulates lactation)
Galactorrhoea		6		6	No value
Induction of premature labor	Medical induction potent oxytocics	16	10 failed	10+6=16	Results only suggestive
Missed abortion or labor	Medical induction, potent oxytocics	4	4	4	Results quite suggestive
Uterine inertia (myometrial origin)	Establish diagnosis sedation fluids	10	10	10	Results only suggestive
Primary dysmenorrhea	Mental readjustment diet thyroid antispasmodics	21	21	21	Value very limited

In addition, we have fully utilized the extensive clinical literature as well as the personal communications of many investigators<sup>10</sup> in forming these conclusions. The detailed management of most of the conditions to be discussed may be found in several of the recent textbooks.<sup>11</sup> The physiologic considerations on which rational therapy is based has been clearly presented and adequately correlated by Reynolds.<sup>12</sup>

#### GROUP 1 CONDITIONS IN WHICH ADJUNCTIVE THERAPY WITH DIETHYLSTILBESTROL IS OF DEFINITE VALUE

1 *Climacteric*—The climacteric may occur during or after the transition period at which reproductive function usually ceases. This phenomenon is a normal physiologic one, characteristic of the process of aging.

10 Particularly Drs. R. R. Greene, M. E. Davis, C. V. MacBryde and K. J. Karnaky.

11 Novak, Emil. *Gynecology and Female Endocrinology*. Boston: Little, Brown & Co., 1941. Mazer, Charles and Israel, S. L. *Diagnosis and Treatment of Menstrual Disorders and Sterility*. New York: Paul B. Hoeber, Inc., 1941. Fluhmann, C. F. *Menstrual Disorders*. Philadelphia: W. B. Saunders Company, 1939. Hamblen, E. C. *Endocrine Gynecology*. Springfield, Ill.: Charles C. Thomas Publisher, 1939.

12 Reynolds, S. R. M. *Physiology of the Uterus with Clinical Correlations*. New York: Paul B. Hoeber, Inc., 1939.

Certain points require added emphasis. Mental reassurance is of primary and paramount importance, for it is well established that the vasomotor phenomena of the climacteric may be deeply influenced by the patient's own psyche.<sup>14</sup> Accordingly, at the very first visit an attempt should be made to evaluate the entire patient, mentally as well as physically. Once the diagnosis is established, a frank discussion with the patient of her condition is essential in securing her complete confidence and cooperation as well as in ridding her of many erroneous apprehensions regarding the cessation of menstruation.

In addition, she is instructed to keep a daily written record noting separately the number of flushes observed during the day and the number experienced after retiring at night. Supportive treatment includes a well

13 Maranon, Gregorio. *The Climacteric*. St. Louis: C. V. Mosby Company, 1929.

14 Reynolds, S. R. M., Kaminister, Sanford, Foster, Frances I. and Schloss, Stewart. *Psychogenic and Somatogenic Factors in the Flushes of the Menopausal Patient*. *Am. J. Obst. & Gynec.* 41: 1022-1028 (June) 1941.

15 Novak, Emil. *The Management of the Menopause*. *Am. J. Obst. & Gynec.* 40: 589-595 (Oct.) 1940. *Gynecology and Female Endocrinology*.

balanced diet<sup>7</sup> and the use of thyroid, especially if she is obese or tired and listless. Since bromides, in our experience, have proved far more effectual than barbiturates, 15 grams (1 Gm) of triple bromides are prescribed three or four times daily. The patient is seen two weeks later. Her response may be evaluated from her story as well as from her "score card." If she has had no flushes at all during the night, the menopausal syndrome may be considered as mild or else the flushes probably stem from some psychogenic problem. Further careful sympathetic questioning should reveal the cause. If the patient is progressing satisfactorily, therapy is continued. In this manner it was found possible to control almost 50 per cent of over 400 menopausal patients. In other words, a little over 50 per cent (221 cases) required further adjunctive therapy with diethylstilbestrol.

The initial daily dose of oral diethylstilbestrol should range from 0.1 to 0.25 mg and only enough to last two weeks should be prescribed.<sup>16</sup> Some investigators<sup>17</sup> prefer to start with a larger dose (1 mg), but this is neither desirable nor necessary.<sup>18</sup> It is better to adjust the dose to the patient than the patient to a certain dosage. Depending on her response, the dose level may be maintained or increased by doubling the initial dose. The patient should then be seen at two week intervals and the dose level adjusted until she is in good equilibrium, that is to say, she is having no flushes at night and only an occasional one during the day. The dosage required to achieve equilibrium is maintained for a month or so before it is gradually lowered. The patient should be kept in equilibrium for a minimum of three to six months or more before discontinuing diethylstilbestrol in order to reduce the possibility of a recurrence of symptoms to a minimum. Under this regimen satisfactory relief was secured in over 92 per cent of our cases.

For patients still menstruating at more or less regular intervals, the daily oral dose should not exceed 0.5 mg if troublesome bleeding is to be avoided. If 0.5 mg is insufficient, it is expedient to add 10 to 20 mg of oral methyl testosterone daily to the therapeutic regimen or else use this steroid alone. On the other hand, if a patient begins to bleed after an amenorrhea of one year or more a diagnostic biopsy or curettage should be done to rule out possible cancer.

In a very small minority it may be found necessary to give diethylstilbestrol by injection. Sesame oil should be the vehicle of choice. The initial dose should range from 0.2 to 0.5 mg weekly.

Occasionally it may be necessary to employ the subcutaneous injection of a 10 mg pellet of crystalline diethylstilbestrol. Before this is done, however, the patient must first show a satisfactory response to oral diethylstilbestrol. The pellet form of therapy yields the smoothest and best results per unit weight of any method of administration we have tried.<sup>19</sup>

**2 Essential Senile Vulvovaginitis, Including Essential Senile Pruritus**—Since this syndrome is a part of the process of aging of the individual, the entire patient must be treated not just one of her symptoms. Other constitutional and local causes must be excluded. Supportive treatment includes a well balanced, properly cooked diet, rich in vitamins and minerals, as well as small doses of desiccated thyroid. At first the patient is instructed to douche twice daily while lying flat on her back in the bathtub, using 2 quarts of a lukewarm solution containing 3 to 4 ounces of ordinary household vinegar.

If relief is not evident in two to four weeks, local therapy with an ointment containing 5 mg of diethylstilbestrol per ounce is started, as this is the most effective and efficient means of administration.<sup>20</sup> Approximately enough ointment to contain 0.5 to 1.0 mg of diethylstilbestrol is rubbed thinly over the vulva once a day, while a small amount is smeared lightly over a vaginal cotton tampon before the latter is inserted. Acid douches are continued. When kraurosis vulvae is pronounced, it may take several months to achieve complete relief. Pelvic examinations should be performed frequently to rule out a possible damming up of secretions, such as pyocolpos or hematometria.

Uterine bleeding may occur at infrequent intervals, but it rarely is alarming. Sufficient ointment to contain 4 to 8 mg of testosterone may be substituted once or twice a day for one week out of every four. In fact, when the itching is extremely pronounced about the folds of the clitoris, testosterone ointment should be used daily, for this steroid seems to stimulate the surrounding glands to produce an oily secretion which serves to relieve the dry itching skin.<sup>20</sup>

**3 Juvenile (Gonococcal) Vulvovaginitis**—After the diagnosis has been made by smear or culture, the mother is given careful detailed instructions regarding proper hygienic care of the child. A suppository containing 0.1 mg of diethylstilbestrol is inserted vaginally each night. If the child strongly resents this method of administration, 0.1 mg of oral diethylstilbestrol may be given one to three times daily. By watching the weekly progress of the disease, the dosage may be maintained or raised. Sulfonamides may be included in the therapeutic regimen. Once the smears or cultures are negative for three consecutive weeks, diethylstilbestrol may be discontinued, although the child should receive a monthly checkup for at least six months.<sup>21</sup>

**4 Painful Engorgement of the Breasts in the Puerperum**—This syndrome results from lymphatic and venous stasis, not from distention of the ducts with the milk.<sup>22</sup> By what means diethylstilbestrol may prevent or relieve this condition cannot be explained on the basis of our present day knowledge.<sup>23</sup> That it is not

16 Abarbanel A R and Klein M D. *Clinical Experiences with Stilbestrol*. New York State J Med **41**: 383-389 (Feb 15) 1941.

17 Weed J C, Weinstein B B, Lock F R, Douglas J W, and Collins C G. *The Oral Administration of Stilbestrol*. Am J Obst & Gynec **39**: 1047-1049 (Oct) 1940. Frank R T, Goldberger M A and Felshin Gertrude. *Clinical and Laboratory Investigations of Some of the Newer Sex Hormone Preparations*. Endocrinology **27**: 381-384 (Sept) 1940. Pratt J P. *A Clinical Study in Estrogenic Therapy*. J Clin Endocrinol **1**: 50-52 (Jan) 1941.

18 Greene R R and Dorr E M. *Relation of Dose and Type of Estrogen to Nausea and Vomiting*. J Clin Endocrinol **1**: 821-823 (Oct) 1941. Mazer Charles, Israel S L and Ravetz Elkin. *The Synthetic Estrogen Stilbestrol*. J A M A **116**: 675-681 (Feb 22) 1941. MacBryde C M, Castrodale Dante, Loeffel, Ellen and Freedman Harold. *The Synthetic Estrogen Diethylstilbestrol*. Clinical and Experimental Studies **117**: 1240-1242 (Oct 11) 1941.

19 Finkler R S, and Antopol William. *Histological Changes in the Senile Vagina Induced by Estrogenic Therapy Administered Orally and by Inunction*. Endocrinology **25**: 925-932 (Dec.) 1939. Greenblatt R B, Torpin Richard, and Brown W R. *Diethylstilbestrol: A Clinical Evaluation of the Various Modes of Administration*. South M J **33**: 1276-1285 (Dec) 1940. Davis and Boynton.<sup>27</sup> Abarbanel and Klein.<sup>16</sup>

20 Hamilton, J B. *Male Hormone Substance Prime Factor in Acne*. J Clin Endocrinol **1**: 570-592 (July) 1941.

21 Karnaky, J J. *Clinical Use of the New Synthetic Estrogenic Hormone Stilbestrol*. South M J **32**: 813-815 (Aug) 1939. Russ J D and Collins C G. *The Treatment of Prepubertal Vulvovaginitis with a New Synthetic Estrogen*. Preliminary Report. J A M A **114**: 2446-2448 (June 22) 1940. Abarbanel and Klein.<sup>16</sup>

22 Abarbanel A R and Goodfriend, M J. *The Effects of Stilbestrol on Lactation*. Am J Obst & Gynec **40**: 1037-1046 (Dec) 1940.

23 Meites Joseph and Turner C W. *Studies Concerning the Mechanism Controlling the Initiation of Lactation at Parturition*. Endocrinology **30**: 711-732 (May) 1942.

by inhibition of lactation has been clearly proved<sup>24</sup> As a matter of fact, diethylstilbestrol, by stimulating a definitely increased production of lactogenic hormone by the anterior pituitary, actually promotes lactation<sup>23</sup>

The management of painful engorgement resolves itself into two phases (1) prevention and (2) relief after it comes on<sup>22</sup> Every puerperal patient should be fitted with an adequate uplift breast binder that raises each breast up and mediad toward the opposite shoulder. It must fit snugly at the base and be very loose across the axillary portion of the breast. An old uplift brassiere or a proper nursing brassiere usually is quite satisfactory.

**Prevention (in nonnursing mothers)** An adequate uplift breast support is first adjusted on the patient. On the day of delivery, 10 mg of oral diethylstilbestrol is given followed by 5 mg daily for three to five days, then 3 mg daily for three days and finally 1 mg daily for three to six days. By spreading the dose schedule out over a period of about two weeks while gradually decreasing the dosage, the incidence of delayed filling of the breasts may be considerably reduced. If therapy is not started within forty-eight hours after delivery, the initial dose should be 25 mg. Delayed filling of the breasts may occur some two to twelve or more days later. As a rule it is transitory and painless, while secretion is usually slight and watery<sup>22</sup>. In the manner just outlined, good results were secured in close to 90 per cent of our patients.

**Prevention in the Nursing Mother (especially primiparas)** Beginning right after delivery, 5 mg of diethylstilbestrol is given daily for three to five days. Since actual milk secretion does not usually occur until the third or fourth day post partum, it is an excellent idea not to put the baby to breast until then, thus preventing many a cracked or fissured nipple. Adequate milk secretion will occur if the baby continues to nurse vigorously<sup>22</sup>.

**Prevention After Weaning** After an adequate uplift breast support has been applied, the patient is given 25 mg of diethylstilbestrol orally. The next day 10 mg is administered, followed by 5 mg daily for the next three days.

**Relief of Painful Engorgement After Its Onset** Here a few milligrams of prevention would have been worth several kilograms of cure. After an adequate uplift breast binder is applied, 25 to 50 mg of diethylstilbestrol is given orally. Relief may be apparent in eighteen to twenty-four hours in about 65 per cent. The next day 10 mg is administered orally, followed by 5 mg daily for three days. In about 25 per cent secondary filling may occur, while a watery secretion may persist for several days or even weeks. In contrast, when 10 to 25 mg of testosterone propionate is given by injection, or 100 mg of methyl testosterone is given orally, relief is usually apparent in two to twelve hours in close to 90 per cent, while secondary filling is rarely, if ever, noted<sup>20</sup>.

**5 Secondary Amenorrhea**—After establishing a working diagnosis of functional amenorrhea, one should secure a complete blood count, a urinalysis, the basal metabolic rate and an endometrial biopsy. An ade-

quate and properly cooked diet is prescribed together with desiccated thyroid. A thorough endometrial suction biopsy, performed regularly every four to five weeks, serves as a stimulative as well as a diagnostic measure.

If, after three to six or more months, the menses have not returned, a frank talk with the patient is in order. It must be emphasized that lack of menses does not make her one whit less a normal woman nor does it signify that she has become a sexless creature. If the mental maladjustment to the amenorrhea is still not corrected, diethylstilbestrol may be administered. (It should be noted that this may constitute just as real a symptom complex as hot flushes in the climacteric.) Many dose schedules have been recommended,<sup>26</sup> but this is the one we have found most satisfactory. Starting with 0.25 to 0.5 mg daily, the dose is gradually raised every five to seven days until 1 mg has been given daily by mouth for twenty-one days. Bleeding may occur in five to fifteen days. If not, 2 mg daily is prescribed for three weeks. With each cycle of therapy the dose may be raised by 1 or 2 mg until withdrawal bleeding does occur. After bleeding has resulted three times, the patient is given a rest for three months to note whether any improvement has occurred. If not, the patient is usually quite ready to listen to common sense and adjust herself to her amenorrhea.

**6 Primary Amenorrhea**—Complete evaluation of the patient and the contributing factors leading to the absence of menstruation determine the course of therapy. The principal indication for the utilization of the gynecogenic activity of diethylstilbestrol is as an aid to offset the physical and psychic maladjustments that may occur.

If the syndrome is functional in origin, a well balanced, properly cooked diet combined with the judicious use of thyroid over the space of many months is of prime importance. Cyclic administration of diethylstilbestrol as described may be used to accelerate the development of the secondary sexual characteristics. Since each patient presents problems peculiar to herself, therapy has to be individualized. In certain instances in which infantilism is pronounced, therapy may include the subcutaneous injection of a 10 mg pellet of crystalline diethylstilbestrol at two or three month intervals<sup>28</sup>. Rest periods from therapy of a month or so is advisable at regular intervals.

GROUP 2 CONDITIONS IN WHICH ADJUNCTIVE THERAPY WITH DIETHYLSTILBESTROL HAS BEEN SUGGESTED BUT THE RESULTS HAVE SHOWN DIETHYLSTILBESTROL TO BE OF LIMITED OR NO VALUE

**1 Induction of Early Abortion**—In 24 cases of early pregnancy in which menstruation was from one to ten weeks "overdue" and in all of which the Friedman test was positive, diethylstilbestrol was completely ineffective in interrupting the pregnancy<sup>29</sup>. The daily oral dose ranged from 5 to 100 mg for a total dosage of 50 to 500 mg. Similarly negative results have been reported with massive doses of estradiol<sup>30</sup>.

<sup>24</sup> Stewart H L and Pratt J P. Inhibition of Lactation. *Am J Obst & Gynec* 41: 555-566 (April) 1941. Abarbanel and Goodfriend.

<sup>25</sup> Abarbanel A R. Treatment of After Pains and Painful Engorgement in the Puerperium with Testosterone Propionate. *Am J Obst & Gynec* 38: 1043-1045 (Dec.) 1939. The Effects of Testosterone Propionate Methyl Testosterone Anhydro Oxy Progesterone and Progesterone on Lactation in the Nursing Human Being. *ibid* 42: 110-114 (July) 1941. Stewart and Pratt.

<sup>26</sup> Mazer Israel and Ravetz.<sup>25</sup> Karnaky.<sup>21</sup>  
<sup>27</sup> Davis M E and Boynton M W. Indications Clinical Use and Toxicity of 4,4'-Dihydroxy Diethyl Stilbene. *J Clin Endocrinol* 1: 339-345 (April) 1941.

<sup>28</sup> The technique is given by Abarbanel and Klein.<sup>26</sup>  
<sup>29</sup> Abarbanel A R. The Priming Action of Stilbestrol on the Gravid Human Uterus. *Surg Gynec & Obst* 73: 257-262 (Aug.) 1941.  
<sup>30</sup> Jeffercoat T N A. Missed Abortion and Missed Labor. *Lancet* 1: 1045-1048 (June 8) 1940.



2 *Inhibition of Lactation and Suppression of Established Milk Secretion*—Diethylstilbestrol will not inhibit the normal onset of lactation, although it will delay the appearance of the normal average amount of milk secretion until two to seven days after the drug is stopped, provided the baby continues to nurse.<sup>22</sup> Once lactation is established, however, as much as 500 mg of diethylstilbestrol will not materially affect the amount of milk secretion.<sup>24</sup>

Several reports have appeared claiming inhibition and suppression of lactation in the human being by means of diethylstilbestrol, testosterone and other steroids. Unfortunately, these investigators have not clearly differentiated the syndrome of painful engorgement from the process of lactation. Furthermore, they have failed to evaluate properly the fact that the baby was removed from the breast, a procedure which, by itself, will suppress lactation.<sup>23</sup>

3 *Galactorrhea*—Although some investigators have reported that diethylstilbestrol will alleviate this condition, we have not been successful in a single case in a series of 6. Similar observations have been noted by others.<sup>31</sup>

#### GROUP 3 CONDITIONS IN WHICH THE ADJUVANT USE OF DIETHYLSTILBESTROL HAS SHOWN PROMISE IN PRELIMINARY CLINICAL TRIALS

1 The adjuvant use of diethylstilbestrol in the management of the induction of labor is based on its sensitizing or priming action on the uterine muscle to the subsequent action of potent oxytocics. The usual indication is a toxemia of pregnancy that is not responding to conservative treatment. The patient is given 150 to 200 mg of oral diethylstilbestrol in divided doses, usually 15 to 20 mg in ten hourly doses. The next morning the patient receives a medical induction followed by small doses of a potent solution of posterior pituitary. The details have been described elsewhere.<sup>20</sup> Diethylstilbestrol alone is ineffectual, it must be followed by a potent oxytocic in order that labor may ensue.<sup>20</sup> Regardless of the type of induction used, it is felt that the preliminary priming of the uterus with diethylstilbestrol helps to insure a successful outcome. Of 16 carefully chosen cases, 12 were successful, including 7 in which a previous medical induction followed by potent oxytocics had been unsuccessful.

2 In missed abortion or missed labor the fetus dies but fails to be expelled. In the majority of cases the estrogen level becomes low or disappears.<sup>30</sup> By priming the myometrium with diethylstilbestrol, the uterine muscle becomes sensitized to the subsequent action of oxytocics. The management of missed abortion or labor is the same as that outlined for the induction of labor.<sup>20</sup>

3 Uterine inertia may result from myometrial dystonia. Uterine contractions are ineffectual.

Supportive measures must be fully adequate after the diagnosis has been established. Oral diethylstilbestrol in doses of 25 to 50 mg at one or two hour intervals for four to six doses may yield a successful result in about two thirds of the cases.<sup>20</sup> If labor ceases, the procedure outlined for the induction of labor may be used. Excellent responses were noted in 7 out of 10 carefully chosen patients.

4 Adjunctive therapy with diethylstilbestrol in the prophylaxis of postpartum and postabortal infections appears to offer great promise in the light of the published reports<sup>32</sup> and our own limited experience.

In addition to the indicated supportive measures, where infection seems most likely to ensue, such as after a criminal abortion or a difficult operative delivery from below, 5 mg of oral diethylstilbestrol is given twice on the day of delivery, then once daily for five to ten days. If an endometritis is already present 25 mg is given, followed by 5 mg daily. Oxytocics are administered daily.

#### GROUP 4

Diethylstilbestrol has been recommended as an aid in the management of several other conditions, but the number of available clinical reports, as well as our own experience, is insufficient for adequate evaluation. These include dysmenorrhea,<sup>33</sup> functional uterine bleeding,<sup>34</sup> nonpatent or stenosed fallopian tubes,<sup>35</sup> threatened abortion,<sup>36</sup> and prevention of pregnancy accidents in diabetes.<sup>37</sup> Further clinical trials are essential for the proper evaluation of adjuvant therapy with diethylstilbestrol in these conditions.

In primary dysmenorrhea, diethylstilbestrol has been recommended for such reasons as inhibition of ovulation on the one hand and stimulation of a hypofunctioning corpus luteum on the other.<sup>33</sup> In our experience, clinical trials with diethylstilbestrol have been very disappointing. Out of 21 cases, complete relief was achieved in 2 and partial relief in 5. In all 7 however, it was only temporary. In addition in 3 of the remainder premenstrual breast pain was definitely accentuated, while in 2 others premenstrual irritability was definitely aggravated. One of our patients became pregnant during treatment. It turned out to be an ectopic pregnancy. The available clinical reports are too scanty for evaluation.

In the prevention of pregnancy accidents in diabetic patients the value of diethylstilbestrol is still not settled.<sup>37</sup> In treated cases White claims a salvage of 90 per cent of the babies compared to 35 per cent in untreated cases.<sup>38</sup>

#### SIDE REACTIONS

Review of the early clinical reports on the incidence of side reactions to diethylstilbestrol revealed a great disparity.<sup>39</sup> Careful studies since then, however, have served to clarify the situation. The consensus is that, when diethylstilbestrol is compared on a potency basis or even on a weight basis with estradiol or estrone,

32 Connally H F Jr, Dann D I, Reese J M and Douglass L H. A Clinical Study of the Effects of Stilbestrol on Puerperal Women. *Am J Obst & Gynec* 40: 445-448 (Sept.) 1940. Reuss W. The Effects of Stilbestrol on Postabortal and Postpartum Endometritis. *Zentralbl f Gynak* 64: 1921-1929 (Nov 9) 1940.

33 Sturgis, S H and Albright Fuller. The Mechanism of Estrin Therapy in the Relief of Dysmenorrhea. *Endocrinology* 26: 68-72 (Jan) 1940. Westman A. Maintenance of the Corpus Luteum Function in Women by Estrogenic Substances. *Endocrinology* 26: 774-778 (May) 1940.

34 Karnaky K J. Cause of Menstruation and Uterine Bleeding. *South M J* 33: 1285-1290 (Dec.) 1940. Palmer.<sup>40</sup>

35 White M M. The Effect of Follicular Hormone on Nonpatent Fallopian Tubes. *Brit M J* 1: 342-344 (March 2) 1940.

36 Palmer Axel. Clinical Experiments with Diethylstilbestrol II. The Treatment of Uterine Bleeding. *Am J Obst & Gynec* 41: 1018-1021 (June) 1941.

37 White Priscilla and Hunt Hazel. Prediction and Prevention of Pregnancy Accidents in Diabetes. *J A M A* 115: 2039-2040 (Dec 14) 1940. Hurwitz David. Pregnancy Accidents in Diabetes. *ibid* 116: 645 (Feb 15) 1941. White Priscilla and Joslin E P. Reply to Hurwitz. *ibid* 116: 645 (Feb 15) 1941.

38 White Priscilla. Personal communication to the authors.  
39 von Haam Emmerich, Hammel M A, Rardin T E and Schoene R H. Clinical Studies on Stilbestrol. *J A M A* 115: 2266-2271 (Dec 28) 1940. Morrell J A. Stilbestrol. Summary of Some Clinical Reports on Stilbestrol. *J Clin Endocrinol* 1: 419 (May) 1941.

31 Greenblatt R B. Report of an Unusual Case of Lactation with Notes on Its Suppression. *Bull Univ Hosp Augusta Georgia* 2: 116 (July) 1940. Geschickter C F. Personal communication to the authors.



the toxic effects are similar in the experimental animal.<sup>40</sup> Detailed systematic studies in the human being have failed to reveal any true toxicity.<sup>41</sup>

Clinically, the most common side reaction encountered is nausea, especially with menopausal patients. Careful study of these patients has brought to light several important factors, each of which must be carefully evaluated. The dose level is of prime importance (table 2). A few years ago it was reported from this clinic that the higher the dosage the greater was the incidence of side reactions.<sup>16</sup> This has been amply confirmed.<sup>42</sup> Moreover, it has been found that in evaluating the incidence of side reactions the relative estrogenic potency of the substance in question must also be taken into consideration.<sup>43</sup>

Equally important in evaluating nausea is the patient herself.<sup>44</sup> Analysis of the latter reveals that two broad groups are recognizable. The first group is composed of patients in whom nausea may be considered as being incidental in nature. It includes those who are unable to take any type of oral medication including placebos, as well as those who become nauseated only when simultaneously receiving some other medication which by itself could produce nausea, such as intravenous neosarsphenamine, digitalis or ferric ammonium citrate.

TABLE 2—Relationship of Daily Oral Dose of Diethylstilbestrol to Incidence of True Gastrointestinal Side Reactions in Climacteric Patients. The Higher the Dose Level the Greater the Incidence of Nausea

Dose (Mg)	Nausea (Per Cent on Dose)
0.10	13
0.25	34
0.50	53
1.0	129
5.0	417

This group also embraces those patients who become nauseous with their flushes, for not infrequently the flushes may be accentuated at the start of treatment, thus aggravating the nausea. The nausea disappears as the flushes are relieved. These women are particularly liable to be nauseous on arising, a sort of "morning sickness" of the climacteric.

The second group comprises those patients in whom the nausea may be considered as a true side reaction. In this group the incidence of nausea is clearly related to the dose level (table 2). Further study disclosed that patients with a previous past history of sensitivity to fried and fatty foods are much more prone to develop nausea at a given dose level than those with a previously negative gastrointestinal history. This was shown to be statistically significant.<sup>44</sup>

40 Castrodale Dante, Bierbaum Olga, Helwig E B and MacBryde C M. Comparative Studies of the Effects of Estradiol and Stilbestrol on the Blood Liver and Bone Marrow. *Endocrinology* 29: 363-372 (Sept.) 1941. Page R C, Russell H K, Schwabe E L, Matthews C S and Emery F E. Chronic Toxicity Studies of Diethylstilbestrol. *Endocrinology* 29: 230-239 (Aug.) 1941.

41 Freed S C, Rosenbaum E E and Soskin Samuel. Alleged Hepatotoxic Action of Stilbestrol. *J A M A* 115: 2264-2266 (Dec. 28) 1940. MacBryde C M, Freedman Harold, Loeffel Ellen and Castrodale Dante. The Synthetic Estrogen Stilbestrol. Clinical and Experimental Studies. *ibid* 115: 440-443 (Aug. 10) 1940. Aaron A H, Meyers Frank, Lipsitz M H and Hubbard R S. Toxicity Studies on Stilbestrol. *Am J Digest Dis* 8: 437-441 (Nov.) 1941. von Harn Hammel Rardin and Schoene.<sup>39</sup>

42 Davis M E. Personal communication to the authors. Greene and Dorr.<sup>15</sup> Mazer Israel and Ravetz.<sup>18</sup>

43 Davis.<sup>41</sup> Greene and Dorr.<sup>15</sup> Mazer Israel and Ravetz.<sup>18</sup> Abarbanel.<sup>44</sup>

44 Abarbanel, A R. Clinical Evaluation of Adjunctive Therapy with Stilbestrol. Monomethyl Ether with Comments on Toxicity. *J Clin Endocrinol* 2: 386-391 (June) 1942.

Just why patients with a suggestive "gallbladder syndrome" are so much more likely to develop nausea when receiving diethylstilbestrol or estradiol remains to be clarified. It has been reported that estrogen may bring about a delay in the emptying time of the gallbladder.<sup>45</sup> Such an effect, if confirmed in the human being, would serve to explain the increased nausea in the "gallbladder syndrome" patients, for they would tend to be more sensitive.

The management of these patients should include administration of cholagogues. Two teaspoons of magnesium sulfate once or twice a day are usually effective without causing cramping or diarrhea. Mild mercurous chloride, crude bile salts or purified bile acids may also be used. The nausea experienced by patients with a previously negative gastrointestinal history does not usually present much difficulty. Its incidence may be considerably reduced by starting with a small dose level, 0.1 to 0.25 mg, and then raising it gradually if necessary. Administration of cholagogues is also helpful. With the majority of these patients the nausea is usually transient, disappearing in spite of continued treatment.

A word should be said about dosage. One mg of oral diethylstilbestrol daily is approximately equivalent to injecting either 1 mg of estrone (theelin) daily or 1 mg of estradiol benzoate about every third day. Clearly, then, a daily dose of 1 mg is a relatively large dose, especially when it is recalled that, in contrast to estradiol and estrone, stilbestrol is not inactivated by the liver. Consequently a much higher amount of active estrogenic substance is available to the body. Furthermore, it takes from three to as much as twelve days for the human being to excrete a given dose of diethylstilbestrol in contrast to the two or three days required for estradiol and estrone.<sup>46</sup> In short, a cumulative effect occurs, so that even 0.1 mg daily of oral diethylstilbestrol is not such a small dose after all.

Regarding the possible carcinogenic action of diethylstilbestrol in the human being, the discussion can best be summarized as follows. According to Geschickter, the mammary cancers induced in rats by injection of estrogenic substances are due to the physiologic changes produced rather than to the carcinogenic nature of the chemical used.<sup>47</sup> Further, Novak,<sup>48</sup> in presenting the clinical phase of the problem, succinctly concluded that "it would be carrying conservation to an extreme to deprive the menopausal patient of proper estrogen therapy merely on the basis of this slight theoretical possibility."

#### SUMMARY AND CONCLUSIONS

Diethylstilbestrol, a nonsteroidal chemical substance, is actually a constitutional drug, possessing, among other properties, potent gynecogenic activity. The latter attribute, plus the fact that diethylstilbestrol is therapeutically efficacious orally as well as inexpensive, is the cause of its widespread use in the management of certain gynecic conditions.

Diethylstilbestrol, being but a single drug, can logically comprise just one adjunctive part of a rational therapeutic regimen. The latter, in order to be ade-

45 Smith J J, Pomarane M M and Ivy A C. Influence of Pregnancy and Sex Hormones on Motility of Gallbladder. *Am J Physiol* 132: 129-140 (Feb.) 1941. von Harn Hammel Rardin and Schoene.<sup>39</sup>

46 Caffier P and Oezkayaalp E S. Zur Frage der Ausscheidung der Stilben Präparate Zentralbl f Gynak. 63: 1218-1231 (June 3) 1939. Mazer Israel and Ravetz.<sup>18</sup> von Harn Hammel Rardin and Schoene.<sup>39</sup>

47 Geschickter C F. Mammary Carcinoma in Rat Induced by Estrogen. *Science* 89: 35-37 (Jan. 13) 1939.

quate, necessitates treatment of the total patient, the sum of her mental as well as her physical ills

In the general management of a patient with one of the following conditions, adjunctive therapy with diethylstilbestrol may be of definite value (a) severe climacteric vasomotor instability, (b) essential senile vulvovaginitis including generalized essential senile pruritus, (c) juvenile vulvovaginitis, (d) prevention or relief of puerperal painful engorgement of the breasts and (e) amenorrhea, secondary or primary

The adjuvant use of diethylstilbestrol is of no value whatever in the general management of the following conditions (a) induction of early abortion, (b) suppression of lactation and (c) galactorrhea

In the management of primary dysmenorrhea, adjunctive therapy with diethylstilbestrol is of very limited value

Analysis of gastrointestinal side reactions to diethylstilbestrol, especially in climacteric patients, reveals the following (a) The higher the dose level the greater the incidence of nausea (b) The relative estrogenic potency of the substance in question must be considered in evaluating side reactions (c) Nausea may be an incidental or a true side reaction, depending on the patient (d) Patients with a previous history of sensitivity to fried and fatty foods are much more prone to develop nausea at any given dose level than those with a previously negative gastrointestinal history (e) The pregnant and puerperal patient, including those with a pronounced toxemia and even eclampsia, with evident cardiorenal and hepatic damage, may easily handle as much as 250 mg of oral diethylstilbestrol a day without evident side effects

#### ABSTRACT OF DISCUSSION

DR EMIL NOVAK, Baltimore The fact that a new hormonal chemical substance like diethylstilbestrol can produce the biologic effects formerly attributed only to the intrinsic vital principles which we recognize as hormones must have been startling to many but it has been established beyond a doubt. If there is any criticism of this paper it is that, for the sake of completeness the authors have included a discussion of many indications for the use of the drug which are of questionable value. Those of importance are those included in table 1, embracing especially menopausal symptoms, the gonorrheal vulvovaginitis of children and senile vaginitis. The authors properly stress the inadequacies of diethylstilbestrol in the treatment of amenorrhea while many of us may feel that the problem of painful engorgement of the breasts is not as frequently important as their discussion might indicate and that very simple measures will often make patients comfortable. After a number of years of clinical and laboratory study it seems definitely established that the unpleasant toxic effects discussed in the paper are never of serious import to the patient. Moreover, when the dosage is very conservative the incidence of these side effects is probably not over 10 per cent, and certainly nothing like the 80 per cent which some authors have reported in the past. By far the most frequent indication for diethylstilbestrol is in the treatment of menopausal vasomotor symptoms when these are troublesome enough to call for direct treatment. In my judgment diethylstilbestrol has been a genuine boon for this indication making unnecessary in most cases the long continued and expensive hypodermic medication on which we formerly relied. We have all seen 'estrogen addicts' created by the automatic resort to 'shots' at stated intervals regardless of whether or not the symptoms justify any medication. For similar reasons no woman should be started on diethylstilbestrol therapy in any routine fashion for an indefinite period. In few indications is individualization of treatment more important than in the management of the menopause.

DR ROBERT B GREENBLATT, Augusta, Ga The authors have pointed out the clinical indications of diethylstilbestrol therapy. I agree with them in principle. There is one point with which I take issue namely the contention that diethylstilbestrol is not of value in the suppression of lactation. In my experience diethylstilbestrol has been as effective as the gonadal steroids. Androgens and estrogens are capable of limiting the amount of lactation by preventing release of the lactogenic hormone from the hypophysis, they do not necessarily suppress it. If the sucking reflex is removed, lactation will stop by itself and so diethylstilbestrol may be used temporarily to limit milk production while the nursing infant is taken away from the mother's breast. One indication for diethylstilbestrol worth stressing is its use in dysmenorrhea. Steroid hormones are expensive and the average patient cannot afford the use of such hormones as estradiol benzoate and testosterone propionate. In selected cases diethylstilbestrol in vaginal suppository form in 0.2 to 0.5 mg dosage may be administered vaginally during the intermenstruum, and the dysmenorrhea will be alleviated in about 60 per cent of the cycles. Since diethylstilbestrol is relatively cheap, it is a boon to those who cannot afford expensive therapy. Toxic reactions are frequently observed with the oral doses formerly advocated. However when other forms of medication are used, effective results may be obtained with minimal side reactions. The percutaneous use of diethylstilbestrol in an alcohol vehicle diethylstilbestrol dissolved in alcohol for oral use, or particularly diethylstilbestrol employed vaginally as a suppository constitute effective methods which have a low incidence of toxic or side reactions. Perhaps nausea and vomiting are not entirely simple phenomena due to the action of the drug on the central nervous system. A contributing factor when oral medication is used may be the local action on the gastric mucosa. I found that when vaginal suppositories were employed, some patients complained of nausea and in addition there was vaginal soreness, indicating that the action of the drug locally was somewhat irritating. I do not feel that diethylstilbestrol is toxic in physiologic doses. Kreitmair showed that the daily administration of 1 mg per gram of body weight would kill a mouse in ten days time, but such comparatively massive doses do not constitute a priori arguments against the use of diethylstilbestrol in clinical practice. Proper dosage and not overdosage, is the essential answer to the argument.

DR JOSEPH A HEPP, Pittsburgh I have treated 343 women with diethylstilbestrol, and toxic symptoms were noted in 6.12 per cent of these patients. Early in the use of diethylstilbestrol with menopausal patients toxic symptoms were frequently encountered. I believe I tried to obtain results too quickly. Now it seems that one can secure results with a much smaller dose. Diligence to observe overtreatment should be practiced. During an observation of thirty-four months there have been no harmful effects from the use of diethylstilbestrol. The production of uterine bleeding in postmenopausal women has frequently been mentioned by investigators in the field of estrogenic therapy. This is usually due to too much medication over a prolonged period of time. There is excessive estrogen stimulation of the endometrium. Needless to say, this bleeding is a most distressing symptom to a woman who has stopped menstruating many months or even years previously. The medication should be discontinued when this type of bleeding is encountered, and the dosage should be decreased if treatment is resumed. In our group there have been a number of patients in whom there was no effect on the systolic and diastolic blood pressure, even though definite improvement was noted in the hot flushes. This absence of effect on the hypertension was observed in the physiologic menopause group as well as the induced menopause patients.

DR CARLOS A P LAMAR, Miami, Fla My experience with diethylstilbestrol for nearly three years agrees closely with that described here today. It should be stressed that, for the treatment of the climacteric very small doses should be employed. There is no need to increase the dosage to the point of producing endometrial stimulation. In cases of senile vaginitis in which larger doses may have to be tried in an attempt to produce relief and endometrial stimulation and bleeding is produced, I have found that the effect can be neutralized by the concomitant

administration of oral synthetic progesterone substances I do not quite agree with the authors' conclusions regarding the suppression of lactation with diethylstilbestrol. I find that diethylstilbestrol administered to the postpartum woman in doses of 5 mg four times a day for from four to six days suppresses lactation without the need for binders. Regarding the toxicity of diethylstilbestrol by the several routes of administration, I have found several striking facts. Certain patients will have excessive toxicity by mouth while tolerating extremely large doses parenterally.

DR KARL JOHN KARNAKA, Houston, Texas. I want to stress that the most important thing is that by giving 1 mg daily of diethylstilbestrol to the menopausal woman or any woman who still has her uterus you will produce bleeding, therefore I advocate smaller doses. The authors mentioned dysfunctional uterine bleeding. I have had more than 800 patients during the last five years. I give such a patient from 5 to 25 mg of diethylstilbestrol into the anterior wall of the cervix. I have now given more than four thousand injections into the anterior wall of the cervix without any harm whatever. For twenty consecutive nights I give a 5 mg diethylstilbestrol tablet. Two to eight days after the last tablet, she will spot for two or three days, bleed for two or three days and then spot again for two or three days. If she bleeds excessively give one half of a 5 mg diethylstilbestrol tablet every hour until the bleeding is checked. Within fourteen to twenty one days, 87 per cent of the patients had a premenstrual endometrium on subsequent examination. As a result of experience with diethylstilbestrol in the treatment of dysfunctional uterine bleeding I feel that radium or a hysterectomy is seldom indicated. I do not find curettage necessary for therapeutic purposes. In threatened abortions I give five 5 mg (25 mg) diethylstilbestrol tablets every fifteen minutes until the pain and bleeding stop, then two 5 mg tablets every hour for six doses, then one 5 mg tablet every hour for six doses and then 10 mg every night until the eighth month. As to the modus operandi of diethylstilbestrol in these conditions one must for the present resort chiefly to conjecture. The dosage determines the effect. Small amounts produce proliferation of the endometrium and large doses inhibit the pituitary oxytocins on the uterine musculature regulate the endometrial vascular system by keeping the spiral arteries dilated and stimulate natural progesterone production, which helps to complete the changes in the endometrium, which I think is one of the most important functions of the progesterone. They also inhibit the excess production of gonadotropin of the anterior pituitary, cause normal rhythmic contractions of the uterus and aid in the normal metabolism of progesterone and estrogens to estrone and estriol. I believe that diethylstilbestrol will replace corpus luteum for the treatment of threatened and habitual abortions and premature labor.

DR JOHN M. FREIHART, Waterbury, Conn. Initially I have done a pretty good job with the natural hormones. The effect of the natural hormones on the side effects of the menopause and the various functional disorders is very good. Then along came this very strong, potent synthetic hormone, which was put out without a great deal of preparation and used rather indiscriminately. The effects of the natural hormone were immediately exacerbated by the very strong synthetic hormone, not only by serious side effects as nausea and vomiting and general discomfort, but even by return of bleeding sometimes after the menopause had established itself. I don't believe that even natural hormone should be given in the menopausal state unless the pelvic organs are regressing to the natural senile state. In other words, if one takes a pelvic structure which is hypertrophying and give even the natural hormone, one has a great deal of abnormal symptomatology resulting from it. I think, therefore, that in proper cases the use of natural hormone still should supersede the giving of large doses of synthetic hormone. One should at least start patients on natural hormone when indicated instead of giving large doses of synthetic hormone indiscriminately and use the synthetic hormones in small doses to prolong the effects of the natural hormones after the desired effects have been produced.

## THE DIAGNOSIS AND TREATMENT OF PRIMARY INTRATHORACIC TUMORS

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Because the incidence of primary intrathoracic tumors is apparently increasing, and because with early recognition the great majority may be cured in competent hands with radical surgery, the diagnosis and management of this great group of tumors is becoming more and more important. The literature on this subject has become voluminous and complex, the individual reports dealing mainly with one particular type of neoplasm. When confronted with the individual case, however, the clinician must consider all the possibilities. Therefore it seems important to condense into one article a review of the practical management of this entire group of tumors. Because of the limitations of space, our case reports, covering over 40 extrapulmonary intrathoracic neoplasms removed surgically, on which this review is based cannot be included. They will be published elsewhere.

### PRIMARY TUMORS OF THE LUNG

Adenomas of the bronchi exhibit a growth potential somewhere between a purely benign tumor and one of proved malignancy. There is considerable dispute in the literature just how these tumors should be classified. We are certain that the conservative point of view is to regard them as potentially malignant. When they are entirely endobronchial, which is not common, they may be safely treated by bronchoscopic removal. However one must carefully check every case for local recurrence and extrabronchial extension. We have found the planogram of great help in demonstrating extrabronchial extension, which is an indication for pulmonary resection, either lobectomy or pneumonectomy. Pulmonary suppuration the inevitable result of chronic obstruction caused by presence of tumor in the bronchus may also make lobectomy or pneumonectomy imperative.

Clinically, the most prominent symptoms and signs of adenoma are those of bronchial obstruction. Atelectasis, lung abscess and bronchiectasis are the common findings. Thus it is the secondary changes in the lung fields, produced by bronchial obstruction that are usually seen on the chest roentgenogram rather than the tumor itself. Occasionally hemoptysis may be the presenting symptom and the x-ray examination fail to reveal the cause of the hemorrhage. Bronchoscopy is diagnostic, as the great majority arise in the main bronchus. One must not be content with a single piece of tissue for biopsy, as the cell type varies. Often only a superficial inflammatory tissue is obtained, while the real tumor is present at a level just beneath the site of the biopsy. At bronchoscopy we are accustomed to remove as much tumor as possible with the biopsy forceps. The base is then well craterized with either the electric cauterium or 50 per cent silver nitrate. How-

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ever, excessive bleeding may prevent adequate bronchoscopic removal of the tumor and be a further indication for pulmonary resection. If recurrence of the tumor occurs with or without bronchial obstruction, radical pulmonary resection is certainly the procedure of choice. Adenomas of the bronchus may grow slowly and perhaps imperceptibly for years and then as the result of some unknown growth stimulus rather suddenly undergo malignant transformation. Finally, lung suppuration secondary to neoplastic bronchial obstruction is usually the immediate cause of death, whether the tumor is benign or malignant.

For these reasons we believe in most instances that radical pulmonary resection is the safest form of treatment.

**2 Malignant Pulmonary Tumors**—The great majority of primary bronchial tumors are carcinomatous in character. At some time early in the course of their development, all bronchogenic carcinomas are confined entirely to the involved lung. A total pneumonectomy at that time would result in their complete extirpation. Many such cases well past the five year period are on record. The comparatively low operative mortality among those competent to do this work more than justifies immediate exploration in view of the fact that without extirpation death ensues. Following lung removal, it is astonishing how little the life of one who does not indulge in violent physical exertion is limited.

It is of the greatest importance, therefore, that we constantly keep in mind the early suggestive symptoms of bronchogenic neoplasms. They may be divided into two groups: (1) bronchial irritative symptoms and (2) bronchial obstructive symptoms. In the former the growth, still too small to obstruct a bronchus, irritates a vagal nerve branch, a nonproductive harassing cough results, often accompanied by wheezing, sometimes with an occasional streak of blood, more often not. If such a patient does not respond to the usual cough remedies, he should be told of the possible existence of a tumor and bronchoscopy strongly advised (regardless of the fact that he usually feels perfectly well except for the annoying cough).

Not rarely a patient states that he has had a cigaret cough for years or has had chronic bronchitis but that in recent weeks its character has changed with or without blood streaking. An early bronchogenic neoplasm may well be the cause of this change. X-ray examination of the chest often shows only increased lung markings or an irregular shadow at the hilus. Early diagnosis before metastasis has occurred can be made only with the bronchoscope.

Then there is the group in which the symptoms of bronchial obstruction are evident. The symptoms roughly fall into two classes:

1 There is sudden, acute febrile onset with chills, fever and signs of pneumonic consolidation. The type of pneumonia, however, is an atypical one and convalescence is protracted. A tragically large number of such people are told they have delayed resolution, a term that should be discarded from our nomenclature. Bronchial obstruction from malignant neoplasm is not uncommonly the causative factor. At this stage the growth may be confined entirely to the involved lung. When an atypical pneumonia shows little tendency to clear, without delay bronchoscopy should be done.

2 If pyogenic bacteria are imprisoned distal to a neoplastic bronchial obstruction, a lung abscess or pulmonary suppuration may develop. Bronchoscopy is advisable in all such cases. It is the procedure of choice

in any event since bronchial drainage from the affected area is usually more adequate thereafter.

Seventy-five per cent of these tumors can be visualized through the bronchoscope. The X-rays take up where the bronchoscopy leaves off, as the peripheral types usually cast circumscribed shadows of homogeneous density apparent on the radiolucent lung fields. However, since biopsies cannot be taken, this type is more difficult to diagnose. Needle aspiration is often followed by the development of secondary growths along the needle path and should be reserved for those cases manifestly inoperable. Careful sputum examination may show malignant cells. In many instances it is only by surgical exposure of the lung that the true identity of the growth can be determined. Too often because of this uncertainty, lung removal is postponed until extension to the mediastinum renders lung removal futile. All unexplained pulmonary masses must be considered carcinoma of the lung. If metastasis cannot be proved, exploration is indicated.

#### PRIMARY TUMORS OF THE MEDIASTINUM

The symptoms relative to these tumors are in a very large measure due to the pressure of the growth on contiguous structures. The degree of interference with the functions of the mediastinal organs varies with the location of the tumor, its size and the presence or absence of actual invasion of these organs. Their interpretation is seldom difficult. Pain may be dull or sharp, local or referred. Cough may be absent or extremely distressing. As a tumor grows, it may eventually occlude a bronchus with resultant symptoms of pulmonary infection from bronchial obstruction. Dyspnea, a common symptom, does not necessarily vary with the size of the tumor. A comparatively small growth may cause considerable difficulty in breathing if it obstructs the trachea or bronchus. Hoarseness, dysphagia and engorgement of veins of the neck may be present. If the neoplasm is a benign one, death is entirely the result of compression on surrounding organs.

When the neoplasm is seen by X-ray examination to lie within the mediastinum, it is desirable to consider the various kinds of tumors that are at some time during their existence amenable to surgical removal: their characteristics, their locations and their usual X-ray appearance. Thus by consideration and selection the correct preoperative diagnosis can frequently be made.

**1 Teratoid Tumors** (dermoids and teratomas) — Since most dermoid tumors of the mediastinum (even though they contain hair) are made up of cells representative of three germ layers, the term "teratoid" tumor as used by Harrington<sup>1</sup> is more accurate. We discuss them together, as clinically they are very similar. The "dermoids" tend to be more cystic, while the teratomas are more cellular and thus are more prone to malignant change. With few exceptions these teratoid tumors are primarily located in the anterior mediastinum from the level of the manubrium to the diaphragm. They are by far the most common benign mediastinal tumors. While they may be centrally placed and be apparent both to right and left of the mediastinal borders, as a rule they project sharply out into the lung fields with a clearcut, well defined convex border. Often trauma apparently initiates increase in size. It is probable that they are present from birth, yet it is usually during the second and third decade that progressive enlargement occurs and pressure symp-

<sup>1</sup> Harrington, S. C. Surgical Treatment of Intrathoracic Tumors, Arch Surg 19 1679 (Dec part 2) 1929

toms develop. It is unusual for these tumors to exert pressure on a bronchus sufficient to produce acute pneumonitis. They may grow to enormous size, almost completely collapsing a lung, but without obstruction to the major bronchi. Calcium is often evident in the walls of the cyst. While teeth may be present, they are not common. Hair almost always is found in the dermoids. If a dermoid ruptures into a bronchus, the presence of hair and thick cloudy fluid containing fatty material establishes the diagnosis. While sarcomatous degeneration not rarely occurs, invasion of the cyst wall is late, so that the enucleation of the tumor usually cures. Even when of huge size, they may be enucleated without great difficulty.

Shortness of breath, pain, cough—any one or all of these symptoms may be present. Of course, as in all other mediastinal tumors, other pressure manifestations may exist. The x-ray examination reveals a clearcut anteriorly located, somewhat spherical shadow, nonpulsile on fluoroscopic examination, projecting usually into the lung fields. Needle aspiration is not advisable. Often the cyst contents are too thick to be sucked through a needle even of large caliber. In addition, it is by no means certain that even the comparatively slight hemorrhage from the trauma of such a procedure may not increase the rapidity of enlargement of a tumor already enlarging. If a small "test" dose of radiation therapy is given over the tumor, in three weeks' time any appreciable radiosensitivity may be noted.

**2 Mediastinal Lipomas and Liposarcomas**—Mediastinal lipomas are very liable to sarcomatous change. The two types, therefore, are considered together. The symptoms and treatment are identical. The lipomas cause symptoms from pressure, while the liposarcomas are extremely invasive and may metastasize. At operation, even with the most careful painstaking dissection, bits of fatty sarcomatous tissue are likely to be left behind, resulting in recurrence.

Not only do these primary mediastinal tumors extend laterally into the lung fields, but finger-like processes often burrow along fascial planes to become palpable on the chest wall. Therefore any soft rather movable, mass discovered either parasternally or paravertebrally beneath the deep fascia is more than likely to be but the superficial extension of a mediastinal lipoma.

There are two roentgenologic features of mediastinal lipomas that are strongly suggestive. Since the consistency of the tumor is scarcely more solid than a fibrin clot, the transmission of the cardiac impulse is so complete that under the fluoroscope these tumors usually appear to pulsate with an undulating, wavelike motion. Indeed, if their location should conform to that of the aorta and if the Wassermann reaction should be positive, the diagnosis of aneurysm would seem to be established. The other suggestive finding is that often in an examination of the x-ray film the peripheral zone of the tumor seems thinner than its central portion.

They may grow to enormous size without giving symptoms. Eventually shortness of breath and pain develop, as well as other symptoms of pressure on neighboring organs. Prompt surgical removal is indicated, since these tumors tend to grow very rapidly when once increase in size is apparent. The danger of sarcomatous change makes their immediate excision the more desirable.

**3 Mediastinal Tumors of Neurogenic Origin**—This group is a very complex one. The tumor under consideration may be derived from a sympathetic ganglion,

the sheath of a sympathetic nerve, a spinal nerve or an intercostal nerve. The character of the tumor depends on whether it is derived from the myelin sheath, the sheath of Schwann or the connective tissue sheath. Thus a wide variety of neurogenic neoplasms may develop from the same mediastinal region, benign neurofibromas or neurogangliomas, and the malignant neuroblastomas and sympatheticoblastomas, neurogenic sarcomas, and so on.

All these tumors arise in the posterior mediastinum, usually lie in the costovertebral gutter and are more often found in the upper portion of the chest than in the lower. The benign neurofibromas and gangliomas project laterally into the lung fields and on x-ray examination present clearly defined borders, convex outward. Pain locally or along the course of an involved intercostal nerve is commonly present. Occasionally a pneumonitis from obstructive pressure against a neighboring bronchus leads to the detection of the tumor. With complete bed rest permitting the neoplasm to drop away from the compressed bronchus, the pulmonary inflammation usually clears. Surgical extirpation of the tumor should then be strongly advised before more serious pulmonary obstruction develops.

Many such tumors are picked up during a routine chest examination. They have given no symptoms. While they remain asymptomatic for years their removal is desirable if no particular contraindication exists. Certainly at regular intervals they should be checked by x-ray examination. If increase in growth becomes evident they should be removed at once. It should be remembered that neurogangliomas are frequently directly over the vertebral bodies centrally located in the mediastinum and that such a location does not necessarily indicate malignancy and inoperability. Their outline is very definite and clearcut.

In the malignant group neuroblastomas and neurosarcomas, certain signs suggest their character. Erosion of ribs or of vertebral bodies is of grave import, it is seldom present in connection with benign growths. Horner's syndrome and hoarseness usually mean that the growth is malignant in character as do dysphagia and a nonproductive, high pitched, dry, metallic cough. Radium therapy is particularly valuable in this group of cases, both as a diagnostic and as a therapeutic measure. There is little likelihood that they are surgically removable. Yet, if x-ray treatment does not clearly reduce its size and the borders of the growth are comparatively well defined, surgical exploration is indicated. Much too frequently a tumor considered though not proved to be malignant has been found at autopsy to be benign and death was due entirely to pressure on the surrounding organs.

It is important to bear in mind that the benign tumors of neurogenic origin occurring in or near a spinal foramen may extend into the spinal canal, compressing the cord. These so-called "hourglass tumors" are by no means rare. If not of too long standing, their excision can be successfully accomplished following removal of the overlying lamina. It must be remembered too that these neurofibromas may occur as a part of von Recklinghausen's disease. Finally, all these previously benign growths may undergo sarcomatous degeneration and are therefore always potentially malignant.

**4 Fibroma and Fibrosarcoma of the Mediastinum**—A simple fibroma within the mediastinum producing symptoms leading to its diagnosis is rare. In almost all such growing tumors, sarcomatous change has

already taken place. The symptoms are due to compression or interference in function of the surrounding mediastinal organs. X-ray examination shows a clear-cut or spherical shadow which cannot be distinguished roentgenographically from other circumscribed tumors. Since they may originate from a vertebra or the posterior surface of the sternum, they may be located in the posterior or anterior mediastinum. Extension may occur into a spinal foramen causing cord symptoms. For some time, even with sarcomatous degeneration present, they may remain encapsulated. During this period they can be completely enucleated without particular difficulty. When extension beyond the capsular wall has occurred, invasion into and around the surrounding structures progresses very rapidly.

**5 Tumors of the Thymus**—The most interesting group of thymic tumors is that associated with myasthenia gravis. In more than half of the patients suffering from this disease pronounced hyperplasia or neoplastic change has been found. With few exceptions the neoplasms are benign in character. Aronson<sup>2</sup> in 1937, Blalock<sup>3</sup> in 1939 and Poer<sup>4</sup> in 1941 successfully removed thymic tumors associated with myasthenia gravis. All symptoms of the disease disappeared following operation. Aronson's and Blalock's tumors were benign. Poer's showed evidence of carcinomatous change. We attempted to remove a malignant thymoma in an advanced case of myasthenia gravis. However, extensive infiltration into the mediastinal structures, especially the wall of the right innominate vein, prevented complete removal. (The patient died of a postoperative pneumonia.) Recently Blalock has removed the thymus in 6 cases of myasthenia gravis. In all some degree of hyperplasia was found. No report concerning this group has been made. While the dramatic results obtained in these 3 cases are encouraging the exact relationship of thymic neoplasms or thymic hyperplasia to myasthenia gravis is as yet not clear. Roentgenologically it is difficult to distinguish between the benign and malignant thymic tumors in all cases of myasthenia gravis with thymic tumor, exploration should be done.

Except in myasthenia gravis, benign tumors of the thymus are comparatively rare. Simple hyperplasia or persistent thymus is usually amenable to x-ray treatment. Surgical extirpation is seldom indicated nor are malignant tumors of the thymus common. Almost without exception they are inoperable when local symptoms develop.

**6 Lymphosarcoma and Hodgkin's Disease**—The most common tumors of the mediastinum are those of the lymphoma group. There still exists much confusion concerning the various types of malignant diseases arising in the mediastinal lymph nodes. Several exhaustive reports have appeared in the literature attempting to establish tables in differential diagnosis. Because of great variability in symptoms, laboratory findings and clinical course, uncertainty concerning the actual type of lymphatic involvement is usual. Only the microscopic examination of some accessible involved lymph node or occasionally a punch biopsy positively identifies it.

The usual symptoms of involvement or compression of mediastinal organs are present late in the course

of the disease. Early the symptoms of a mild pulmonary infection predominate with dry cough, continued fever and a leukocyte count to 15,000. We have not found the differential leukocyte count helpful in making the diagnosis. Occasionally mediastinal or lung abscess is suspected and the patients are referred to the surgeon for drainage. The x-ray picture varies from a circumscribed mediastinal mass to irregular densities projecting laterally into the lung fields. Rarely isolated pulmonary masses resembling metastatic malignancy are present. In the lateral films the posterior mediastinal space usually is clouded or obliterated. It is unusual for Hodgkin's disease to remain confined entirely to the mediastinum. After a period of time, frequently the axillary or cervical nodes are involved. Biopsy obtained from one of them solves the diagnostic problem. Multiple shadows confined entirely to the mediastinum are more likely to be sarcomatous in nature.

Surgery has been able as yet to offer nothing in either condition. Fortunately, almost all of these primary lymphatic malignant growths are very radiosensitive. Total disappearance under radiant therapy is by no means rare. However, permanent cure seldom results.

**7 Primary Sarcoma of the Mediastinum**—Primary sarcomas originating within the mediastinum are rare. The great majority represent malignant degeneration of neoplasms that were at first benign. These have already been described. Early in their development these primary sarcomas may prove removable. They can arise from any of the connective tissue elements of the mediastinum. If their location is lateral they extend out into the lung fields. At first before invasion of surrounding structures has occurred their boundaries are clearcut. They cannot, therefore, be distinguished from benign tumors that have been mentioned. Only their comparative rarity makes their presence unlikely.

The ideal treatment is the removal of the benign mediastinal tumor before it becomes malignant regardless of the paucity of symptoms.

#### SUPERIOR PARAMEDIASTINAL OR SUPERIOR SULCUS TUMORS

Pancoast<sup>5</sup> first described this syndrome. It was his opinion that this type of tumor arose from branchial cleft derivatives and was a definite neoplastic entity. As additional data accumulated, however, it was discovered that various tumors in this region could give the signs and symptoms described by Pancoast.

The apex of the lung lies immediately lateral to the first thoracic vertebra, protruding upward through the first rib circle. The first thoracic nerve is in contact with the pleura, and the first and second intercostal nerves are just mesial to its apex. The sympathetic trunk with its ganglions lies just mesial to it. The phrenic and recurrent laryngeal nerves are not far distant. Thus a neoplasm arising in this region may cause manifold symptoms early in its growth.

Early extension involving first thoracic and intercostal nerves and the sympathetic chain occurs. The symptoms, therefore, are predominantly mediastinal rather than pulmonary.

Pain, sometimes becoming extreme, is uniformly present in the shoulder and extending down the upper extremity and often to the base of the head. Eventually paresis of the hand may develop. Horner's syndrome is usually present. Frequently such unfortunate cases are

<sup>2</sup> Aronson S F. Myasthenia Gravis. Discussion with Presentation of a Case Associated with Thymoma. *Ann Int Med* 15: 137 (July) 1941.

<sup>3</sup> Blalock Alfred. Tumors of the Thymic Region and Myasthenia Gravis. *Am J Surg* 54: 149 (Oct) 1941.

<sup>4</sup> Poer D H. Effect of Removal of Malignant Thymic Tumors in a Case of Myasthenia Gravis. *Ann Surg* 115: 586 (April) 1942.

<sup>5</sup> Pancoast H K. Superior Pulmonary Sulcus Tumor. *J A M A* 99: 1391 (Oct 22) 1932.



treated for "neuralgia" for weeks or months. X-ray examination, however, discloses a roughly triangular shadow continuous with that of the mediastinum, corresponding closely to the so-called axygus lobe area. The following differential diagnosis of abnormal shadows of probable neoplastic origin occurring paramediastinally in this upper thoracic quadrant is of importance both from a diagnostic and from a therapeutic standpoint.

1 *Bronchogenic Carcinoma, Main Bronchus Upper Lobe*—A wide triangular shadow with its apex at the pulmonary hilus and its base above extends outward from the upper mediastinum to fill in completely the circle of the first rib. Such a shadow usually represents an atelectatic upper pulmonary lobe. A bronchogenic neoplasm obstructing the main bronchus is commonly the cause. Shoulder girdle pain and Horner's syndrome usually are absent. Cough with or without production usually but not always, is a symptom of prominence. Bronchoscopy may reveal the neoplasm. Because scarcely more than the orifice of the upper lobe bronchus can be seen, often the growth within the bronchus cannot be visualized even with the use of a 45 degree angle mirror placed in the bronchoscope to look up the branch bronchus. If such symptoms occur in conjunction with such a shadow in a person in the cancer age, neoplastic obstruction must be considered the probable causative factor. We have recently tried implantation of radium in inoperable carcinoma in a manner similar to that to be described for sarcoma. No improvement was noted. Prompt surgical exploration is the procedure of choice. Early in its course, lung removal may prove curative.

2 *Bronchogenic Carcinoma, Branch Bronchus Upper Lobe*—Occasionally a smaller shadow similar to the one described appears in this region with its base just above the hilus. Instead of involving the entire apical region with a homogeneous shadow it usually is comparatively small, with less definite borders. This shadow represents lobular atelectasis resulting from an obstructing carcinoma of a branch bronchus of the upper lobe near the mediastinum. There are no nerve pressure symptoms as a rule and often but little cough. Bronchoscopy does not demonstrate the tumor. The diagnosis is rarely made early enough to permit surgical removal.

3 *Bronchogenic Carcinoma, Peripheral Upper Lobe Along the Mediastinum*—A narrow triangular shadow may arise in the circle of the first rib with its base along the mediastinum. The apex does not extend to the hilus. The borders are indistinct because of fine processes extending out into the upper lobe lung field. This represents a bronchogenic carcinoma arising in the periphery of the upper lobe without producing a cough. The x-ray appearance represents the growth of the tumor itself. Because of few symptoms early in its course, as in the previous type just described, rarely can the diagnosis be made soon enough to allow surgical removal.

4 *Extrapulmonary Upper Mediastinal Tumor*—The fourth type of superior sulcus tumor is of mediastinal origin. There is the clearcut spherical shadow in the anterior or posterior mediastinum, projecting laterally into the lung fields in the apical region. Intercostal and even shoulder pain may be present. Indeed, it is usually the patient's chief complaint. The shadow may be small, but it is unlikely that it will be triangular. The lateral bulge and convexity strongly suggest that one is confronted with any one of the mediastinal

tumors previously described. Moreover, the pulmonary symptoms are slight, while Horner's syndrome, and pain extending down the arm, are rare. Posteriorly these tumors are usually neurogenic in origin, anteriorly either dermoids or teratomas. Frequently they can be enucleated without great difficulty. It must be remembered, however, that fibrosarcomas may also occur in this region.

Finally, an extrapulmonary upper mediastinal tumor may be of such soft consistency that the intrapulmonary pressure of the lung immediately lateral to it will mold it to a triangular shape entirely consistent roentgenologically with an atelectatic upper lobe, for example, lipoma, fibromyosarcoma, ganglioneuroma. Recently we exposed and successfully removed a ganglioneuroma following a preoperative diagnosis of probable carcinomatous obstruction of an upper lobe. The tumor was very soft and as it was released from the pressure of the contiguous lung at once assumed a roughly globular shape.

We exposed by a posterior approach another tumor corresponding in configuration and symptoms to those enumerated, that is, severe pain in shoulder and arm, Horner's syndrome. Erosion of the second rib, often noticed in these cases, was evident in the x-ray films. Biopsy at operation showed the growth to be a fibromyosarcoma. It was invasive in character and not operable. However, radon seeds on hand for that purpose were needled into it. They were so inserted as to provide a range of radiant activity of approximately 15 cm. The postoperative course was a most stormy one because of an almost lethal dose of radium. The wound broke down completely, yet eventually it healed. All symptoms, including pain which had been very severe, disappeared. For nearly two years the patient remained well. Local recurrence then appeared and death followed within a few months. His severe pain, however, did not recur. It is well to bear in mind, therefore, that definite relief may be obtained in this manner and that the possibility exists on occasion that the neoplasm may prove to be benign and removable. All attempts at extirpation of fibrosarcomas at this stage have done more harm than good.

#### PRIMARY TUMORS OF THE THORACIC CAGE

Primary tumors of the thoracic cage make themselves manifest by pain or the presence of a palpable mass, or both. Pain is the most important symptom. It is the result of involvement or pressure on an intercostal nerve by the tumor and so the pain can be located anywhere in the sensory distribution of this nerve. In the case of the upper three thoracic nerves the pain may be "referred" through the same segment of the cord to the brachial plexus and result in the sensation of pain in the arm. Therefore it is of great diagnostic importance to consider any thoracic, upper abdominal or upper extremity pain without a clearly apparent cause to be due possibly to a remotely located neoplasm in or contiguous to the chest wall. A diagnosis of neuralgia, whether the pain is located in the chest wall, abdomen or upper extremity, should never be made until careful x-ray examination reveals no evidence of thoracic neoplasm. This is a point of great importance too frequently forgotten and overlooked by the physician until tumor growth is so far advanced that the chance of successful surgical care has passed. Artificial pneumothorax helps to distinguish the chest wall neoplasms from mediastinal and intrapulmonary tumors.



**1 Bone and Cartilage Tumors** (Osteoma, Osteochondroma, Osteochondrosarcoma, Chondrosarcoma)—All these neoplasms may well be considered together. All such tumors are potentially malignant and should be extirpated as soon as discovered. Primarily they are benign. Even when sarcomatous change has occurred invasion beyond the capsule is at first relatively slow. Their removal at this stage is not difficult. If invasion of the capsular wall is apparent, however, both the parietal pleura immediately surrounding them and that portion of the bony wall to which they are adherent and from which they originate must be excised together with the intervening soft tissues. Serous or even bloody pleural fluid may be present, although it is unusual. Often these tumors are not discovered under the fluoroscope. They may cast but a thin hazy shadow, and bony structures behind or in front may conceal them. Frequently it is necessary to have both a posteroanterior and an oblique Potter Bucky film in order to reveal their exact location.

Unfortunately even highly malignant tumors of the chest wall cannot be distinguished in their roentgenologic contour from benign ones. Rarefaction of adjoining ribs is highly suggestive evidence of their true character, however. Loss of weight without other apparent cause, and bloody pleural effusion, add to the gravity of the situation. If considerable loss of weight has occurred or if actual metastases are discovered or strongly suspected, the removal of the primary growth is of course contraindicated. Otherwise wide extirpation of the tumor is advisable. X-ray treatment has proved of only temporary benefit.

**2 Fibroma**—A pure fibroma of the chest wall is rare. We have had 1 such case. A tumor roughly ovoid, 15 by 12 inches, closely embraced the ninth, tenth and eleventh ribs anterolaterally. Numerous finger-like, grayish white processes extended into muscle tissues and fascia. It seemed identical in type and in extension characteristics with the so-called desmoid that is occasionally discovered in the rectus sheath and muscle. The probability of recurrence in this type of tumor is considerable, since it is not unlikely that one or more of these long advancing tentacles may be entirely overlooked following an apparently complete and certainly painstaking dissection. Since x-ray treatment has no effect, an attempt to extirpate them surgically should be made. Recurrences, however, are to be expected and, since they represent a local growth, should be removed.

**3 Fibrosarcoma**—These tumors are not uncommon. When pain develops leading to their discovery they have become in the great majority of cases invasive. The prognosis for complete removal is bad, although it should be attempted if no evidence of metastasis exists. X-ray treatment has little influence on their course. They usually metastasize early, therefore, not infrequently even when apparently cleanly removed, a fatal outcome is not averted.

**4 Benign Giant Cell Tumors**—These growths are comparatively rare. Early their complete extirpation is possible. They are prone to sarcomatous degeneration. When definite evidence of growth increase exists, it is probable that metastasis has already occurred. X-ray treatment has proved of very great value in this type of neoplasm.

**5 Osteogenic Sarcoma**—In primary osteogenic sarcoma bone destruction occurs very early. The prognosis is thoroughly bad. X-ray treatment frequently is of

considerable help. Provided the extent of the growth or the presence of metastasis is not present as a valid contraindication, extirpation of the tumor with all of the immediately surrounding structures is the procedure of choice.

Ewing's sarcoma with few exceptions, eventually proves fatal. Uniformly it occurs in persons under 30 years of age. Bone destruction is present. Metastases occur very early. Few survive, even when the primary growth is removed widely and early. Radiant therapy is often of great benefit temporarily.

#### SUMMARY

Having taken a bird's eye view of this great group of intrathoracic neoplasms, we are now in a position to summarize the practical points concerning each of the main types.

Primary tumors of the lung of clinical importance consist of bronchial adenomas (10 per cent) and bronchogenic carcinomas (90 per cent). The signs and symptoms of the two types are somewhat similar. Those of the adenomas may extend over a period of years while those of the carcinomas are present only for a matter of weeks or months before metastasis occurs. The symptoms are mainly bronchial irritative and bronchial obstructive. The bronchial irritative symptoms are cough, or change in character of a long standing cough with or without expectoration, perhaps blood spitting. The bronchial obstructive symptoms begin with wheezing, followed by an atypical pneumonia with protracted convalescence or lung abscess.

Bronchiectasis, a finding common with chronic bronchial obstruction, is frequently seen in adenoma of the bronchus but rarely in carcinoma. It should be emphasized that pain is a late symptom of carcinoma of the bronchus. The diagnosis can be made in 75 per cent of the cases by bronchoscopy, as this percentage of tumors arises in portions of the bronchus visible with the bronchoscope. A positive biopsy can thus be obtained. The peripheral type of bronchogenic carcinoma, invisible to the bronchoscopist, casts a shadow visible on the radiolucent lung fields which represents tumor or pneumonitis distal to secondary branch bronchial obstruction. Thus the x-rays take up where the bronchoscopist leaves off. Lobectomy or pneumonectomy will be eventually indicated in cases of bronchial adenoma because of recurrence following bronchoscopic removal, hemorrhage, extrabronchial extension or chronic pulmonary suppuration. Pneumonectomy should always be performed unless the tumor is limited to distant periphery of a lobe, when the diagnosis of bronchogenic carcinoma is made, and no metastases can be demonstrated, provided no other contraindication exists.

The death rate from intrapulmonary neoplasms (predominantly bronchogenic carcinoma) will be decreased by surgical removal only with early diagnosis. Immediate and serious attention to the following two factors is therefore imperative. 1 Prompt bronchoscopy in all cases of protracted cough, expectoration and hemoptysis, regardless of an innocent appearing chest roentgenogram and apparent excellent general condition of the patient. 2 Prompt surgical exploration in all cases of solitary enlarging pulmonary shadows not otherwise explained, especially if they are circumscribed. An occasional metastatic tumor will be removed and very rarely an inflammatory lesion. But in the vast majority of cases this early surgical exploration will save the life of many a patient with bronchogenic carcinoma.

Primary tumors of the mediastinum make themselves known by pressure on the mediastinal organs. Thus dyspnea, pain in either the chest or the arm, cough, wheezing, dysphagia, hoarseness or distention of the neck veins may be present. Neuralgia in shoulder or arm is always suggestive. X-ray examination uniformly shows a mass in either the anterior or the posterior mediastinum. Dermoids and teratomas are the most common benign tumors of the anterior mediastinum. They are circumscribed, slow growing, radioresistant tumors usually presenting symptoms in the first and second decades of life. The most common benign tumor of the posterior mediastinum is neurogenic in origin. Pain is the most prominent early symptom, while the symptoms of mediastinal obstruction come on late. On x-ray examination a round circumscribed shadow is seen in the posterior mediastinum.

The lymphosarcomas are the most common malignant mediastinal tumors. They present rapidly enlarging irregular x-ray shadows extending from either the posterior or the anterior mediastinum. Their extreme radiosensitivity distinguishes them from the benign tumors, which are radioresistant. Since lymphosarcomas are inoperable as soon as they produce symptoms, a "test dose" of x-ray therapy should be tried preoperatively in all cases of mediastinum tumor where a lymphoblastoma is a possibility. All benign mediastinal tumors should be removed surgically as soon as they are diagnosed unless a definite contraindication exists, since they may eventually prove fatal from mediastinal obstruction due to their size or because of malignant degeneration. The operative mortality in experienced hands is very low. Other less common mediastinal tumors, because of their diverse characteristics, cannot be summarized here.

Superior sulcus tumors represent a variety of new growths arising in the superior paramediastinal region. Pain in the shoulder and arm, Horner's syndrome and a dry cough are the prominent symptoms. The x-ray picture is that of a triangular shadow arising from the upper superior mediastinum. Primary bronchogenic carcinomas producing either lobar or lobular atelectasis of the upper lobe of the lung account for two of the main types of shadows seen on the x-ray film. A peripheral bronchogenic carcinoma arising near the mediastinum and not causing atelectasis produces an irregular paramediastinal shadow. Any of the mediastinal tumors that have been discussed may account for the fourth main type of superior sulcus tumor. Bronchoscopy rarely aids in making a positive diagnosis of tumors in this region. After a "test dose" of x-ray therapy, surgical exploration is indicated. With the exception of the benign mediastinal tumors in this location, the results of surgery have been discouraging, as in most instances the tumors are inoperable when diagnosed.

Primary tumors of the thoracic cage are characterized by pain and often the presence of a palpable mass. The pain may be in the arm, chest or abdomen. Benign tumors of the bony cage, the chondromas and osteomas, are potentially malignant and should be removed as soon as diagnosed. They present circumscribed shadows on the ribs or cartilage without evidence of bony destruction. The malignant group (osteosarcoma and the like) usually show evidence of bony destruction if extracapsular extension has occurred. Early in their course they may have been benign and at that time were operable. The results of roentgen therapy and

radical surgery have been most disappointing in cases of malignant tumor of the bony cage. Therefore, as soon as a benign chest wall tumor is diagnosed it should be removed surgically, provided no valid contraindication exists.

#### CONCLUSIONS

- 1 The presence of an intrathoracic neoplasm can be usually detected by x-ray examination and bronchoscopy, the bronchoscopy taking up where the x-rays leave off. (When an intrathoracic tumor is suspected, the examination is flagrantly incomplete without the use of these diagnostic procedures.)

- 2 All persistent or enlarging, solitary chest wall, mediastinal or pulmonary roentgen shadows should be suspected of being neoplastic until proved otherwise.

- 3 All patients with the symptoms of persistent bronchial irritation or obstruction should early have the benefit of bronchoscopy. A negative bronchoscopic examination does not exclude its presence in an upper lobe or in the other lobes beyond where it can be visualized through the bronchoscope.

- 4 The vast majority of benign intrathoracic tumors are liable to malignant change.

- 5 Practically all enlarging centrally placed intrathoracic neoplasms, unless they are removed, cause death from pressure if they are benign, or from extension if they are malignant.

- 6 With the exception of the lymphoblastoma group, roentgen therapy is palliative and not curative. Often such therapy is needlessly prolonged until a once operable case becomes inoperable.

- 7 At some time during their growth most intrathoracic tumors can be removed.

- 8 The operative mortality is surprisingly low and is being steadily reduced as experience and improvement in surgical technique increases.

- 9 If the diagnosis of an intrathoracic neoplasm has been made by x-ray examination or bronchoscopy and lymphosarcoma and metastases are ruled out surgical exploration is at once indicated. Only a bona fide contraindication, such as cardiac decompensation, and not the apparent good general health of the patient or the reluctance of the doctor to take the responsibility, should prevent operation.

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#### ABSTRACT OF DISCUSSION

DR. ROY W. SCOTT, Cleveland: Lobectomy and pneumonectomy, impressive accomplishments of thoracic surgery in the past few years, have doubtless prolonged the lives of patients with lung cancer but in interpreting results we can speak only of survival periods and not cures. Although the primary growth and local metastasis may be removed, we have no assurance that the patient is cured, since at any time up to several years bone or other metastasis may occur just as in patients with cancer elsewhere. Squamous cell cancers of the lung rarely metastasize widely and therefore offer the best prognosis from operative removal.

CAPTAIN LYMAN A. BREWER III, M. C., A. U. S.: The chairman's remarks are true that the cures in pulmonary cancer have been few as compared to the reported deaths. The reasons are (1) failure of early diagnosis and (2) lack of appreciation that early radical surgery is curative. This is an era when tumors are treated by surgery and x-rays. With the exception of intrathoracic lymphosarcoma, roentgen therapy has been singularly ineffectual. Most benign chest tumors are potentially malignant and often cause death from pressure on mediastinal structures. Therefore, until the future brings a simpler method, we must recognize that radical surgery offers the only chance of permanent cure for intrathoracic tumors.

## ANEURYSM OF THE RENAL ARTERY

## REPORT OF A CASE

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Aneurysm of the renal artery is a rare clinical and pathologic entity. Medical literature contains reports of only 74 cases. The first account of a case of "renal" aneurysm was published by Dr. Daniel Nebel<sup>1</sup> in 1719. For two and a quarter centuries this well known case of Nebel's has been incorrectly translated and misquoted. The patient was not a physician and did not have a renal aneurysm but suffered from an aortic aneurysm. Many of the earlier papers reveal incomplete case reports and do not warrant a clinical or pathologic diagnosis of renal aneurysm. Keen<sup>2</sup> in 1900 and Morris<sup>3</sup> also in 1900, were the first to write more extensively on the subject. Summarizing articles were published by Vogeler<sup>4</sup> in 1922, Conroy<sup>5</sup> in 1923 and Gerard<sup>6</sup> in 1930. Mathe<sup>7</sup> in 1932 wrote an excellent review of the subject and tabulated 55 cases from the literature.

It is our purpose to bring the literature up to date, report our own case (diagnosed preoperatively) and briefly review the subject. The accompanying table contains a summary of 20 cases reported in the literature since Mathe's exhaustive review, these, with the 1 presented here, bring the total number of cases to date to 75.

## REPORT OF CASE

A R, a white woman aged 47, first seen in the outpatient department (urology) of the New York Hospital on Sept. 20, 1941, complained of pain in the right flank and discomfort in the right upper quadrant. She stated that her kidney trouble had begun six years before at which time she had pus in the urine and chills and fever. The pyuria and other symptoms subsided in a few weeks and she had no further trouble until July 1941 when she had dull pain in both flanks accompanied by chills and fever. The persistent gnawing pain in the right flank continued until the time of admission.

Physical examination revealed no abdominal masses. Slight tenderness was elicited in the right costovertebral angle and flank. The blood pressure was 116 systolic and 72 diastolic.

Cystoscopy and retrograde pyelography were done in the clinic. The flat plate showed both renal shadows to be normal in size, shape and position. Lying medially and outside of the right kidney was a ringlike shadow with a denser periphery and rarefaction of the center (fig. 1). The pyelogram revealed no abnormalities of the kidney proper. The area of increased density, which measured 1.5 cm in diameter, was seen to be above the right ureteropelvic junction (fig. 2). A diagnosis of calcified aneurysm of the right renal artery was made by Dr. William E. Forsythe, Jr.

The seriousness of a renal aneurysm was explained to the patient, and on October 14 she was admitted to the department of urology, James Buchanan Brady Foundation, of the New York Hospital for further study and subsequent operation.

Excretory urograms, made on the second hospital day, revealed a normally functioning upper urinary tract. The previously noted ring shaped shadow remained in the hilar region of the right kidney.

On October 20 (the sixth hospital day) under spinal anesthesia the right kidney and renal pedicle were exposed by the usual lumbar approach. Examination and palpation of the renal pedicle disclosed a faintly pulsating small swelling in the region of the hilus of the kidney. The lesion being definitely an aneurysm, nephrectomy was performed (fig. 3).

The patient had an uneventful recovery and was discharged on the fifteenth postoperative day. Since the nephrectomy she has been entirely relieved of the preoperative dull flank pain.



Fig. 1—In this flat plate medial to the right kidney shadow is a wreathlike area of increased density disrupted in one portion. This represents an aneurysm of the renal artery.

Pathologic examination of the removed kidney by one of us (E. M. C.) showed the following:

Gross. On the posterior aspect, at the bifurcation of the renal artery, was a small saccular aneurysm (fig. 4). The aneurysmal sac was yellow-red, fairly smooth in contour and firm and measured 1.4 by 1.1 by 0.9 cm. Bisection of the sac showed the aneurysmal opening to be 0.4 cm in diameter. The orifice of the aneurysm was located on the posterior wall at the point at which the artery leaves the bifurcation to proceed to the upper pole. The wall of the sac contained calcific atheromatous plaques. A longitudinal section of the kidney showed a normal renal configuration. A few discrete, pale areas were observed in the cortex. The medullary pyramids were grossly normal in appearance, and there was no flattening of the apexes. The major calices and the pelvis were not dilated. The mucosa was smooth, and there was no evidence of tumor ulceration or calculus.

Microscopic. Microscopic examination of the wall of the aneurysm revealed hyalinized collagenous tissue. Deposits of amorphous calcium salts were noted throughout the wall. Weigert stain showed absence of elastic tissue (fig. 5).

The pathologic diagnosis was true aneurysm of the right renal artery.

From the Department of Urology (James Buchanan Brady Foundation) of the New York Hospital.

Owing to lack of space this article has been abbreviated for publication in THE JOURNAL. The complete article appears in the authors' reprints.

Read before the Section on Urology at the Ninety Third Annual Session of the American Medical Association Atlantic City, N. J. June 11, 1942.

1. Nebel, Daniel. *Academiae Caesareae Leopoldinae Naturae Curiosorum Ephemerides Centuria IX et X Observations* 59: 142, 1719.

2. Keen, W. W. Nephrectomy for a Large Aneurysm of the Right Renal Artery, with a Resume of the Twelve Formerly Reported Cases of Renal Aneurysm. *Philadelphia M. J.* 5: 1038, 1900.

3. Morris, H. Aneurysm of the Renal Artery. *Lancet* 2: 1002 (Oct. 6) 1900.

4. Vogeler, K. Das Nierenaneurysma. *Deutsche Zeitschr. f. Chir.* 176: 297 (Dec.) 1922.

5. Conroy, M. J. Aneurysm of Renal Artery. *Ann. Surg.* 78: 628 (Nov.) 1923.

6. Gerard, M. Contusions renales et leurs suites éloignées. *Assoc. Franç. d'Urol.* 30: 172, 1930.

7. Mathe, C. P. Aneurysm of the Renal Artery. *J. Urol.* 27: 607 (June) 1932.

## Summary of Twenty Cases of Aneurysm of

Year	Author	Sex	Age Years	Classification and Location	History	Symptoms	Physical Findings
1902	Mathé	♂	47	True aneurysm superior main branch of left renal artery	In 1920 fell in bathtub striking left lumbar region. Immediately passed red blood in urine. repeated attacks of left renal colic	Severe attack of left renal colic	Tenderness on deep palpation in upper left quadrant and left costo vertebral angle
1904	Brinkman J Iowa M Soc 24 54 1934	♀	27		Sudden stablike pain in upper quadrant	Vomiting, pain in left upper quadrant subse quent collapse six days after discharge following exploratory operation pain recurred occasional red blood cell in urine	Evidence of free fluid in peritoneal cavity. mod erate rigidity in left renal region and left upper quadrant. urine normal
1900	Wesson and Fulmer 13	♂	78	True aneurysm left renal artery	Prostatectomy 2 months before for carcinoma generalized arterioscle rosis no trauma	Severe weakness pain in sacrum frequency nocturia	Cystoscopy purulent urine from both kidney
1906	Loughnane Brit J Urol 8 146 1936	♂	50	Aneurysm left renal artery and abdom inal aorta	Colicky pains in left loin for 2 years syphilis malaria	Pains in left flank frequency nocturia	Soft mass in epigas trum hard palpating mass in left loin
1937	Firck Zentralbl f Chir 64 1703 1907	♀	40	True aneurysm at bifurcation of left renal artery	Pulmonary tuberculosis (cured) no trauma	Asthenia anemia hem aturia symptoms of thyroid intoxication	Cachectic hypertension— systolic 90 myoma of uterus no other abnormal findings
1931	Kapel Chirurg 9 801 1907	♀	57	Calcified true aneu rysm branch of left renal artery	Left abdominal distre ss and left renal colic	Pain in left hypochon drium and flank	Negative
1937	McKay 18	♀	54	True aneurysm left renal artery	Run over by a wagon intermittent pain and discomfort in left kidney region Wasermann negative	Pain in left side hem aturia	Pain tenderness spastic ity on pressure over left kidney cysto copy bloodly reflux from left ureter no excretion of indigo carmine from left kidney
1938	Ostling 14	♀	24	Ruptured aneurysm branch left renal artery	Pregnant	Sudden pain in left abdo men vomiting symptoms of shock and collapse	Fundus of uterus 3 finger below xiphoid palpable swelling in left flank
1938	Kästner Ztschr f Urol 442 1938	♀	80	Intrarenal aneu rysm right	Episode of hematuria 6 months previous no trauma	Suprapubic distress severe hemorrhage from bladder	Hard movable tumor in right lower quadrant and flank cysto copy bleeding from right ureteral orifice
1938	Smith and Walkling Bull. Ayr Clin Lab Pennsylvania Hosp 3 903 1938	♀	50	True aneurysm superior polar acces sory renal artery	Cholecystectomy 1921 low back pain right upper quadrant pain	Pain in right upper quadrant	Acute tenderness in right flank and moderate tenderness in right upper quadrant
1938	Solis Cohen and Stein bach Radiology 31 10 1938	♀	56	True aneurysm in inferior branch right renal artery	Progressive weakness weight loss wore sup port for ptosis right kidney no trauma pain or hematuria	Nocturia weakness	Ptosis of right kidney with expandable mass the size of a lemon near the lower pole transmitting a def inite bruit and thrill
1939	McClelland Tr Am A Genito Urin Sur geons 32 169 1939	♂	61	True aneurysm intra capsular branch right renal artery	No trauma	Hematuria 1 day only	Murmur heard in upper left abdomen immedi ately under costal mar gin a systolic bruit with radiation to back
1939	Onell and Valencia 15	♀	40	Ruptured true aneu rysm left renal artery	Suspicion of congenital syphilis repeated preg nancies glomerular nephritis 6 months pregnant no trauma	Lumbar pain sudden loss of consciousness signs of internal hemorrhage	One hour after onset large hard mass palpable in renal fossa and extend ing from costal arch to iliac fossa
1940	Howard Forbes and Lipcomb J Urol 44 898 1940	♀	5	Multifocal true aneurysm left renal artery	Acute hemorrhagic ne phritis at 2 years symp toms of typical Coldblatt syndrome	Restless headaches	
1941	Howard Suby and Harberson 9	♀	54	False aneurysm branch of right renal artery	Pulmonary tuberculosis heavy fecal in right abdomen nocturia no trauma or renal tumor	Nervous and weak nausea and vomiting severe pain in bowels shock	Large mass palpable in right upper quadrant extending an inch below umbilicus and to midline later to left abdomen and down to pelvis
1941	Howard Suby and Harberson 9	♀	50	True aneurysm right renal artery	Bilateral salpingo oophor ectomy and appendec tomy 11	Persistent severe tender ness in right lower abdomen	Tenderness in right lower abdomen urine normal
	Harberson 9			True calcified aneu rysm branch of left renal artery	Two year history of diffi culty in holding fre quency nocturia 4-5 x	Inability to void	Tender palpable mass in suprapubic region pro tate hard and enlarged 2 x blood pressure 160/100
1941	Smith 9	♂	41	Aneurysm right renal artery	In 1916 wounded in right loin by shrapnel since then had nothing pain in right loin	Acute discomfort in right loin hematuria	Slight tenderness of costo vertebral angle bruit and pulsation over right loin cysto copie blood from right ureteral orifice
1942	Child (to be reported)	♀	33	True aneurysm main branch right renal artery	Nine year history of intermittent pain in right upper quadrant	Pain in right upper quadrant 3 days	Blood pressure 160/100 ill defined tender mass (2 by 5 cm) in right upper quadrant
1942	Lowsley and Cannon	♀	47	True aneurysm right renal artery	Intermittent pain in right flank chills and fever pyuria 6 years	Persistent gnawing pain in right flank slight frequency and nocturia 2 months	Slight tenderness in right costovertebral angle and flank urine 90 white blood cells 2 plus clump ing culture Escherichia coli (bladder)

the Renal Artery Reported from 1932 to 1942

Roentgen Findings	Diagnosis (Preoperative)	Treatment	Result	Pathologic Condition
Enlarged irregular left kidney 7 cal culi in upper pole ring shaped shadow with a less opaque center outside the pelvis in the parenchyma near the hilus encroaching on the infundibulum of a dilated upper primary calix	Renal calculi cal cified renal cyst	Nephrectomy	Cured	Dilated upper calix with narrow in fundibulum containing "hard calculi aneurysm superior branch of left renal artery sac 15 mm in diameter calcification of aneurysmal wall atheromatous changes in renal artery Kidney buried in huge clot
None	Renal aneurysm	Exploratory operation bloody fluid in perito neal cavity concluded hemorrhage from retro peritoneal source nephrectomy	Cured	
Flat plate shadow 15 cm in diameter with a dense periphery and a clearer center medial to catheter and over left 12th rib pyelogram shadow to medial side of left kidney at level of superior calices	Renal aneurysm	Supportive	Death postopere toscopic anuria	Renal artery soft except for 1 cm dilatation
Considerable displacement of left kid ney and ureter	Undetermined aneurysm of renal artery suspected	Laparotomy revealing both renal and abdom inal aneurysm	Death in 2 months	No autopsy
Pyelogram (1932) left renal tumor in 1936 check up revealed tumor to have enlarged	Renal tumor	Nephrectomy	Improved blood pressure fell to 130	Hypernephroma of left kidney true aneurysm left renal artery at bifur cation complete lining of intima
Circular shadow within upper kidney pole just inside renal pelvis	Calcified tuber culous focus	Nephrectomy	Cured	Nut size calcified aneurysm
Flat plate ringlike shadow dense periphery and central rarefaction right pyelogram extrarenal shadow	Undetermined	On delivering left kidney into wound hemorrhage due to rupture of aneu rysm occurred hemor rhage controlled nephrectomy	Death 4 days post operatively from pneumonia and myocardial failure	Saccular aneurysm 15 by 12 mm just proximal to bifurcation of left renal artery wide separation of inner and outer wall evidently a dissecting aneurysm involving sac
None	No diagnosis	Supportive	Death a few hours after onset	Large left retroperitoneal hema toma *
Catheter deviated toward midline low kidney right no visualization of pelvis and calices	No diagnosis	Nephrectomy	Cured	Old intrarenal aneurysm with perfora tion into renal pelvis aneurysm size of small apple wall impregnated with calcification arteriosclerosis of vessels
Ring calculus posterior and outside right kidney	Calculus in cystic duct	Nephrectomy	Cured of flank pain	Saccular aneurysm 0.7 mm in diam eter of accessory vessel thickening of intima with calcific deposits
Extrarenal dilated pelvis upper calix dilated entire midsection of kidney distorted by large cystlike area with thin partly calcified wall	Aneurysm renal artery	Nephrectomy	Cured	Large saccular aneurysm inferior branch of renal artery 7 cm in diameter wall thin and partially calcified
Circle of calcification size of 10 cent piece over right kidney and last rib ring of calcification separate from calices but in kidney substance		Nephrectomy	Cured	1 by 5 cm cyst in upper pole beneath capsule at lower pole a fluctuant area of blood two large dilated vessels with thickening of walls within pel vis †
None	No diagnosis	Pulsating mass in renal fossa hemorrhaged at operation	Death 6 hours postoperative	Hazelnut sized aneurysm of left renal artery right kidney atrophied microscopically left kidney showed nephrotic stage of chronic glomeru lar nephritis
Pyelograms negative		Craniotomy small area of necrosis in right frontal lobe right sym patectomy §	Cured blood pressure 3 months postoperative 170/90	Thin saccular multilocular aneurysm of left renal artery microscopically chronic glomerular nephritis
Large tumor in mass in right kidney urea with calcification in capsule	Calcification of solitary cyst	Emergency nephrectomy renal fascia opened with hemorrhage	Death day of operation	Aneurysmal sac adjacent to kidney measuring 2.5 by 9.5 cm covered with capsule of kidney calcification of wall
Pyelogram slight angulation of right ureteropelvic junction	Interabdominal lesion	Laparotomy revealed a round soft collapsible pulsating mass ‡	Cured	Thimble shaped pink gray yellow aneu rysmal sac true aneurysm and atherosclerosis of right renal artery
No roentgen findings	Acute urinary retention carci noma of pros tate pyelone phritis hyperten sion cardiac decompensation	Supportive	Death	Carcinoma of prostate with local extension pyelonephritis contraction and calcification of right kidney diverticulum of bladder hemorrhagic cystitis calcified aneurysm 1 cm of a branch of left renal artery
Loss of definition pelvis distorted and irregular	Aneurysm of renal artery	Nephrectomy clamp left on pedicle for 3 days	Cured	Aneurysm of right renal artery
Lateral and below right transverse process of first lumbar vertebra a ringlike shadow with increased peripheral density pyelograms nor mal gallbladder series negative	Chronic chole cystitis and cholelithiasis with hydrops	Exploratory laparotomy for a probable chronic cholecystitis di covered a calcified pulsating small renal aneurysm subsequent nephrectomy	Cured	True aneurysm (1 cm in diameter) located at bifurcation of right renal artery section through aneurysmal wall revealed hyalinized fibrous tissue no elastic tissue remained heavy deposits of lime salts
Plain x-ray lying medially and out side right kidney ringlike shadow with a dense periphery disrupted in one portion and rarefac tion in the center pyelogram increased density seen to be above the ureteropelvic junction	Aneurysm of the right renal artery	Nephrectomy	Cured	True aneurysm 14 by 11 by 0.9 cm on posterior aspect at the bifurca tion of the right renal artery wall of sac contained calcific atheromatous plaque microscopic examination of the wall of the aneurysm revealed hyalinized collagenous tissue de posits of amorphous calcium salt absence of elastic tissue

## ETIOLOGY

Most writers on aneurysm of the renal artery state that, statistically, trauma—either to the loin back or upper part of the abdomen—is the most important causative factor. In the last century, the introduction of the germ theory, and increased knowledge of the diseases of the arterial wall itself and of congenital defects of the arteries have produced new concepts of the etiology of aneurysms. It is doubtful whether trauma per se causes aneurysm. However, trauma may be the impetus for an aneurysmal dilatation in a renal artery which is already friable or otherwise weakened by congenital defect, infection or other disease. Gerard stated that 28 per cent of the cases reviewed by him were late sequelae of trauma to the kidney area. According to Mathe, 50 per cent of the 55 cases collected by him

defects of the media of the cerebral arteries at the apexes of the angles formed by arterial branching bifurcation. Undoubtedly, arterial wall defects occur at the bifurcation of the renal artery and play an important part in the production of renal aneurysms.

It is well known that arteriosclerosis and syphilis are important factors in the formation of aneurysms. However, these diseases have played a relatively minor role in aneurysm of the renal artery, only 4 patients in the reported series having had syphilis and 12 arteriosclerosis. Periarteritis nodosa although occasionally generalized, displays a particular affinity for the renal artery, and a small number of cases have shown this pathologic entity at autopsy.

## INCIDENCE

Judging from the number of reported cases, aneurysm of the renal artery is very rare. It might be questioned whether this rarity is actual or due to failure to recognize the lesion because of the obscurity or complete lack of signs and symptoms, were it not that autopsy records bear witness to the infrequency of its occurrence. Howard, Suby and Harberson<sup>9</sup> found only 10 renal aneurysms in a series of 69,819 autopsies.

Age apparently has little bearing on the incidence of this lesion. The youngest patient was 9 months and the oldest 82 years. Although 32 patients were in the fifth and sixth decades of life, it is difficult to prove that renal aneurysm of spontaneous origin is more likely to develop in this age group, since it may exist for years without producing symptoms.

Of the 72 patients whose sex was stated, 40 were males and 32 females.

## PATHOLOGY

Two fundamental factors underlie the development of an aneurysm. (1) the vascular wall is weakened by congenital defect, disease or trauma, and (2) the pathogenesis is directly related to intrinsic and extrinsic vascular pressure.

Renal aneurysms are classified as "true" and "false." A true aneurysm is any pathologic localized dilatation of the artery that retains one or more of the coats of the arterial wall. Wesson<sup>10</sup> states that the term "false aneurysm" is a misleading one and that the diagnosis should be "traumatic spontaneous rupture of the renal artery with anatomic control of hemorrhage."

A true aneurysm is the result of a congenital defect, a vascular disease, a degenerative process or inflammatory changes of the arterial coats. Its sac is a saccular or fusiform dilatation of the wall itself. True aneurysms are usually small, ranging from the size of a pea to that of an orange. They often show calcareous deposits which are opaque to the roentgen ray. In the arterio-sclerotic type of aneurysm, the beginning lesion is a subintimal plaque which progresses to implicate the vascular wall. A true arteriosclerotic aneurysm seldom perforates but, owing to its long existence and weakening of the sac, it may rupture spontaneously or perforate, from insignificant trauma, to form a false aneurysm. So long as a true saccular aneurysm remains unruptured it is not likely to produce any distinct pathologic changes. Pressure and occlusion of the aneurysm may cause thrombi and infarcts of the renal parenchyma. If the aneurysm is condensed within the capsule it may cause some pressure necrosis.



Fig 2—Pyeloureterogram showing above the right ureteropelvic junction a wreathlike shadow with a denser periphery and rarefaction of the center. The shadow is characteristic of a renal aneurysm.

presented a history of trauma. Bringing the literature up to date reduces this incidence to 33 per cent.

Intracranial saccular aneurysms occurring in the angles formed by bifurcation or branching arteries have been variously termed "congenital," "developmental," "bifurcation" and "berry" aneurysms. The exhaustive studies of Richardson and Hyland<sup>8</sup> have shown that "berry" and basal cerebral aneurysms are congenital and are caused by defects in elastic tissue and local

Footnotes to table on pages 1138 and 1139

\* A branch of left renal artery dilated into a plum sized cavity bound by a partly torn connective tissue wall. Sac contained an old blood clot, calcification and infection of exterior wall.

† No direct communication between pelvis and blood vessels. microscopic section showed vessels to be arteries.

‡ Hypertension 158/90-190/140. cerebral lesion and left sided paresis.

§ Decapsulation of right kidney, left sympathectomy, no drop in blood pressure. exploration revealed aneurysm of right pedicle, left nephrectomy.

|| Laparotomy for intestinal obstruction and Meckel's diverticulum obliterated. laparotomy for lysis of adhesions. Wassermann reaction negative.

‡ This measured 1 by 1.5 cm and consisted of right renal artery, right nephrectomy.

8 Richardson, J. C. and Hyland, H. H. Intracranial Aneurysms. *Medicine* 20: 183 (Feb.) 1941.

9 Howard, H. H., Suby, H. I. and Harberson, J. Aneurysm of the Renal Artery. *J. Urol.* 45: 41 (Jan.) 1941.

10 Wesson, M. B. in discussion on papers by Howard, Suby and Harberson and by C. A. W. Uhle. *J. Urol.* 45: 65 (Jan.) 1941.

False aneurysms of the renal artery are usually larger than true aneurysms. The smallest one in the published cases measured 10 by 15 cm., and Morris reported a false aneurysm which filled one half of the patient's abdomen. The wall of a false aneurysm is composed of condensed fibrous tissue developed around the extravasated and coagulated laminated blood. To this mass the surrounding structures become more or less firmly matted.

Whether a false aneurysm is formed as the result of trauma or disease, indirectly by the rupture of a saccular aneurysm or directly by the rupture of the artery, the resultant extrinsic pressure changes, displacement of organs and renal damage are the same. A false aneurysm may rupture into the peritoneal cavity, causing extensive hemorrhage. It may extend into the retroperitoneal space, rupture and form a large hematoma. Death by exsanguination may result if a false aneurysm ruptures into the renal pelvis. Blood may distend the pelvis and calices and produce complete absorption of the renal parenchyma. Partial or complete atrophy of the kidney may result from extravasated blood within the capsule. The hematoma may be entirely outside the renal capsule, and the kidney—if any of it remains—will be spread out in the wall of the sac. Blood may course along the vessels and thus gain entrance into the capsule of the kidney and then rupture into the calices.

#### SIGNS AND SYMPTOMS

True aneurysms present no definite syndrome of symptoms. The most constant complaint is pain referred to the upper part of the abdomen or to the lumbar region. Hematuria and the presence of a mass are infrequently observed in this type of aneurysm.

The cardinal signs and symptoms of a false aneurysm or of a ruptured aneurysm are pain, tumefaction and hematuria. Tumor masses that are progressing in size and aneurysms that have perforated give rise to pain. With slowly growing aneurysmal sacs, the pain appears only when the sac has reached a considerable size. Pain variously described as progressive, throbbing or colicky, was present in more than 50 per cent of the reported cases.

As a true aneurysm increases in size and ruptures spontaneously or traumatically to form a false aneurysm or retroperitoneal hematoma, a tumor mass becomes palpable in the flank or upper part of the abdomen. This tumefaction may develop quickly or may be progressive over a period of months. Tumors ranging from the size of an orange to one that nearly filled the abdomen have been reported. As a rule, the mass is smooth, firm, more or less tender and fixed in position and does not move with respiration. A systolic bruit or pulsation, when present, is pathognomonic. This finding was elicited (or mentioned) in only 7 of the reported cases. The absence of a bruit or pulsation is explained by the fact that a blood clot intervenes between the inner, pulsative part of the tumor and its capsule, diminishing the impulse of the systolic waves.

Hematuria is a characteristic symptom of ruptured aneurysm when the bleeding follows trauma and pre-

cedes pain and tumefaction. It occurs when the aneurysmal sac has perforated a calyx or has established a direct communication with the renal pelvis. Hematuria in cases of true aneurysm is the result of renal thrombi and subsequent infarction. The bleeding may be insignificant but usually the hematuria is more severe than that induced by stone or neoplasm. The hemorrhage may be so extensive as to result in exsanguination, and death has occurred in 14 cases.

#### DIAGNOSIS

The clinical diagnosis of renal aneurysm is difficult, and in only 12 of the 75 reported cases was the condition correctly diagnosed before operation or autopsy.

Small true aneurysms rarely present symptoms and are usually discovered accidentally during investigation

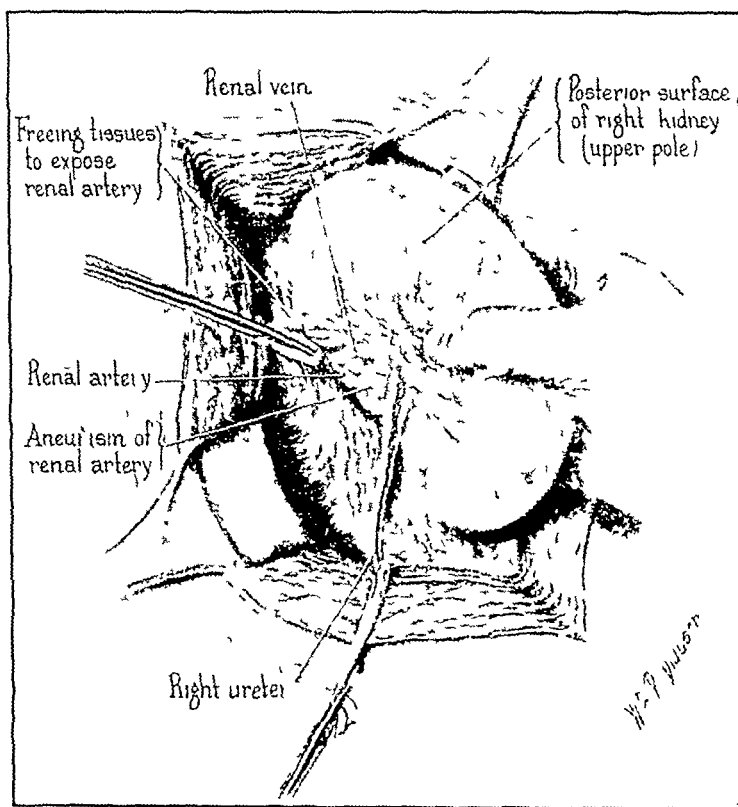


Fig. 3.—The right kidney has been exposed showing aneurysm of the renal artery.

of the kidney, or they are found at autopsy. The usual calcific deposits in the wall of the aneurysmal sac, being opaque to roentgen rays, appear as a ringlike or wreathlike shadow on the film. This shadow is suggestive of a calcified renal aneurysm, but it must be differentiated from gallstone, renal calculus, calcified lymph gland, calcification in neoplasm, calcified cyst and calcification of autonephrectomy. Opinions differ as to the diagnostic value of this finding. Soderlund<sup>11</sup> and Renck<sup>12</sup> consider a ringlike shadow, with a dense periphery, in the region of the renal pelvis as characteristic of renal aneurysm. Wesson and Fulmer<sup>13</sup> state that a calcified cortex interrupted in one portion is pathognomonic. Mathe questions the value of the sign

11 Soderlund G. A Case of Calcified Aneurysm of the Left Renal Artery. *Nord med Ark.* 58: 649, 1925.

12 Renck G. Ueber das renalis aneurysma, besonders vom rontgen ologischen gesichtspunkt. *Acta radiol.* 7: 309, 1926.

13 Wesson M. B. and Fulmer, C. C. Aneurysm of the Renal Artery. *Am J Roentgenol.* 33: 176 (Feb.) 1935.



and states that the shadow cannot be differentiated from those cast by other shadow-casting lesions. A review of the literature reveals that this ringlike shadow has been reported as being present in 12 cases. In our own case, and in the cases of Soderlund and Wesson and Fulmer, the diagnosis was made on this roentgenographic finding.

The ringlike shadow cast by a renal aneurysm has been incorrectly interpreted as a calcified tuberculous focus, a neoplasm with calcification, a calcified cyst, a calcified lymph gland and a gallstone.

False aneurysms offer a particularly perplexing problem in diagnosis, for they frequently present a clinical picture similar to that of rupture of the kidney. Traumatic rupture of a false aneurysm or spontaneous perforation of a true aneurysm is to be considered in the presence of intermittent hematuria associated with excruciating pain in the loin and a rapidly or slowly enlarging immobile tender swelling in the flank. How-

ever, five years elapsed in Keen's and Morris's cases. The usual cause of death of patients who are not operated on is exsanguination from hemorrhage of a ruptured aneurysm into the renal pelvis, retroperitoneal tissues or peritoneal cavity. Of 37 patients who underwent operation 8 died—a mortality of 21 per cent.

#### TREATMENT

Procrastination in the presence of symptoms of false or ruptured aneurysm may result in the early death of the patient. Any evidence presenting itself of an enlarging perirenal hematoma, whether it is due to rupture of an aneurysmal sac, to trauma to the kidney or to any other renal pathologic condition, demands immediate surgical investigation.

The operative approach is the usual classic flank incision. If a pulsating aneurysmal sac or a perirenal hematoma is encountered, the mass should be exposed and handled very carefully, for the slightest tear in the sac may result in brisk hemorrhage. Shock and death may occur, as in the cases of Onell and Valencia.<sup>15</sup> As soon as the presence of an aneurysm is determined, the renal pedicle should be exposed, clamped and tied, or, if the tumor is large and hemorrhage appears inevitable, the friable pedicle should be approached transperitoneally and clamped near its branching from the aorta.

Of 37 patients operated on, 8 died. Morris's patient died after an attempt was made to extirpate the sac. Two operative deaths occurred during incision and drainage of the sac (Barnard in 1900,<sup>16</sup> Chisholm in 1926.<sup>17</sup>) One postoperative death was the result of hemorrhage from the tearing of the aneurysmal sac (Onell and Valencia). McKay<sup>18</sup> encountered hemorrhage at operation, but the bleeding was controlled, the pedicle being clamped, cut and ligated. The patient left the operating room in good condition only to die four days later from pneumonia and myocardial failure.

Of the 29 patients treated by nephrectomy, 26 survived. Skillern<sup>19</sup> left pedicle clamps on because of the close relation of the aneurysm and aorta. Smith<sup>20</sup> encountered hemorrhage and left the pedicle clamps on for three days. Hemorrhage did not follow the removal of the clamps in either case. Orth<sup>21</sup> was able to evaluate the clots and successfully suture the tear in the wall of the aneurysm, and a year later he reported that the kidney was functioning satisfactorily. Callahan and Schultz<sup>22</sup> extirpated a saccular aneurysm and preserved the artery.

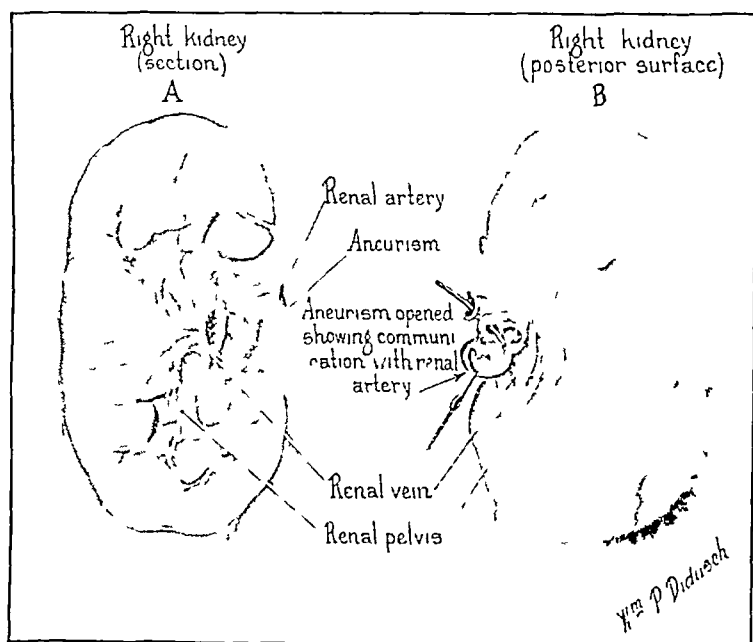


Fig. 4.—A sectional view of right kidney showing renal vein and renal artery with aneurysm. B posterior surface of the kidney showing the aneurysm opened and the communication between the aneurysm and the renal artery as indicated by the probe.

ever, this syndrome may also be presented by a ruptured kidney, so that clinical differentiation is practically impossible, and only an exploratory operation can settle the question.

In unruptured false aneurysm, the tumor mass is the most valuable sign, with the exception of a pulsating tumor, which is pathognomonic but has been noted in only 7 cases.

#### PROGNOSIS

The prognosis of symptom producing aneurysms of the renal artery is grave. In the reported cases death occurred in all in which operation was not performed. The fatal outcome may be rapid, as occurred with Ostling's<sup>14</sup> patient, who died a few hours after the onset of symptoms.

Most of the patients have died within a year of the appearance of symptoms, but some persons harboring renal aneurysms have lived for considerable periods of time before death occurred or operation was per-

<sup>14</sup> Ostling K. Ueber Aneurysmen in der Arteria renalis lunalis und hepatica. Acta obst et gynec Scandinau. 18: 444 1938.

<sup>15</sup> Onell C L and Valencia A L. Inpatient with Repeated Gravid Nephropathies and Persistent Hypertension. Rev med de Chile 67: 180, 1939.

<sup>16</sup> Barnard H L. A Calcified and Cured Aneurysm of the Right Renal Artery in a Boy. Tr Path Soc London 52: 254 1900 1901.

<sup>17</sup> Chisholm Alexander E. Rupture of an Aneurysm on a Branch of the Left Renal Artery Complicating Pregnancy. Brit M J 1: 419 (March 6) 1926.

<sup>18</sup> McKay Robert W. True Aneurysm of the Renal Artery. J Urol 37: 783 (June) 1937.

<sup>19</sup> Skillern P G Jr. A Case of Traumatic Aneurysm of the Right Renal Artery with a Review of the Literature. J A M A 46: 37 (Jan 6) 1906.

<sup>20</sup> Smith Emerson A. Case of Aneurysm of the Renal Artery. Brit J Urol 13: 11 (March) 1941.

<sup>21</sup> Orth O. Ein Fall von traumatischen Aneurysma der Arteria renalis sinistra. Deutsche Ztschr f Chir 151: 272 (Sept.) 1919.

<sup>22</sup> Callahan W P and Schultz F H. Aneurysm of the Renal Artery. Surg Gynec & Obst 43: 724 (Dec) 1926.

When a unilateral true aneurysm is suspected or diagnosed roentgenographically—even though signs and symptoms are lacking—an exploratory operation should be done and, if the impression is confirmed, nephrectomy performed. Radical surgery is indicated because a small true aneurysm the wall of which is weakened and friable may rupture in the near or remote future. A calcified aneurysm may never enlarge or perforate, but nephrectomy removes the possibility.

#### SUMMARY AND CONCLUSIONS

1 Aneurysm of the renal artery is a rare clinical and pathologic entity. Only 75 cases have been reported to date, including a case of true aneurysm diagnosed preoperatively and presented here.

2 A congenital defect in the wall of the renal artery, particularly at its bifurcation, is a hypothetical factor in the etiology of aneurysm. It is questionable whether trauma per se produces renal aneurysm.

3 Only 12 of the 75 reported cases were suspected prior to operation or death.

4 True aneurysm is usually asymptomatic. A few patients have complained of pain in the flank. The cardinal symptoms of false aneurysm are hematuria, pain and tumefaction in the flank. The pathognomonic signs—pulsation and a systolic bruit—have been present in 7 cases. The presence in the x-ray film of a ringlike shadow, with a dense periphery disrupted in one portion and a rarefaction of the center in the kidney or hilar region, is suggestive of a renal aneurysm.

5 The treatment is surgical. In the literature, all patients presenting symptoms who were not operated on died. Of the 29 patients subjected to nephrectomy, 26 survived. Of 37 patients who underwent operation, 8 died—an operative mortality of 21 per cent.

111 East Seventy-First Street

#### ABSTRACT OF DISCUSSION

DR HERBERT H HOWARD, Boston. There is little that I can add in the discussion of this paper. I should like to reemphasize that trauma and syphilis per se play an insignificant part in the etiology of this particular aneurysm. Arteriography by aortic injection was not mentioned by the authors in their methods of diagnosis and it seems to me that this is an important adjunct. Santos of Lisbon in 1930 was the first to publish a description of this procedure and he used a 100 per cent solution of sodium iodide. In the March 1942 issue of *Surgery, Gynecology and Obstetrics* Nelson of Seattle published an article on arteriography of abdominal organs by aortic injection using an 80 per cent solution of sodium iodide. I have used it on two occasions without any ill effects. If it is ever my good fortune to diagnose and operate in another case of true aneurysm of the renal artery I shall have as an assistant a cardiovascular surgeon to see if the aneurysm, provided it is extrarenal, cannot be operated on and the kidney saved. If one reviews the literature of true aneurysms of the renal artery, and I am speaking now of the extrarenal type, one will find the kidney to be a normal one.

DR O A NELSON, Seattle. My associates and I have not encountered any aneurysm of the renal artery but we have been astounded by the large number of aneurysms, most of them found in sites that were unexpected, in our work. One of the things that was encountered frequently was blockage of one or more of the large vessels, particularly in the kidneys. I am sure that arteriography will be a procedure too that will

make the diagnosis at least of aneurysm of the renal artery very easy to make. The procedure is not as hazardous as one might think.

DR VICTOR D LESPINASSE, Chicago. I have been looking for an aneurysm of the renal artery and never found one. I am interested in doing a reparative operation on the artery. I think that if the conditions are right it can be done. It is a feasible operation but the condition that one must have is normal arterial wall or relatively normal arterial wall. If the wall is calcified it cannot be manipulated. One cannot sew it. It won't hold. Then one must have a method of blood control while one is making the repair. Only one clamp is needed. It isn't like an aneurysm of the femoral. But I think that point should be in anybody's mind when one operates in 1 of these cases to try to do a reparative operation and not a destructive one. If one has that in mind I think that sooner or later somebody will be able to repair these artery aneurysms and save the kidneys.

DR OSWALD S LOWSLEY, New York. I am overwhelmed with joy to see our sister republics here in the audience and grouped on the table with us. I think this is very significant. I wish to commend my young associate Dr Cannon on the splendid job that he did on this paper, which he did and I am lending my name to it. A few points I wish to emphasize. One thing in which we take a considerable amount of pride is that our resident, at that time Dr Forsythe, made the diagnosis, and this is only one of twelve diagnoses that have been made preoperatively in the history of the world. It is rare, of course, there being only 75 cases in all the medical literature. In this particular case there was no opportunity for repair. We had it in mind at the time of operation and we hope that we shall see others and have an opportunity to repair, doing a short circuit, excising the aneurysm and leaving the artery but in this particular case it was not possible. I came home from the meeting of the French Urological Association with enthusiasm about arteriography, and I got Dr Henline interested. Dr Henline operated on 16 dogs, all of which died. Now we know that a young, healthy dog will die much easier than a sick human being. If you can get by with any operation on a young, healthy dog, you can get by with that operation on a sick human being. Dos Santos told me that at that time he had done about 150 operations and only 1 patient died. This method is safe. Dr Nelson has evidently found out how to make it safe.

**Orr's Plaster Technic**—Toward the end of the war of 1914 to 1918 the American surgeon Winnett Orr made an observation which was destined to have far reaching results. Among the soldiers who were admitted to his hospital he noticed that those whose wounds had been enclosed in a plaster cast to facilitate transport to America were generally in a better condition than others who had been treated by the orthodox methods of the time. In spite of the bacterial infection present in all these cases, the granulation process was proceeding undisturbed, the patients showed no clinical sign of sepsis and the majority were doing well. This observation led him, after the war, to develop a technic of treating infections of the extremities and in particular osteomyelitis, by the provision of drainage and complete immobilization of the limb in plaster. He also advocated this technic for infected compound fractures and later suggested that it could be applied to fractures at an early stage. His readiness to appreciate the importance of immobilization by plaster was due to his experience as a pupil of John Ridlon, who, as he writes in the preface to Orr's book *Osteomyelitis and Compound Fractures* (1929) for forty years had immobilized all his operative wounds of the soft tissues, as well as of bones, with plaster of paris casts and then watched the patients, not the wound—Trueta, Josep. *The Principles and Practice of War Surgery*, St. Louis, C V Mosby Company, 1943.

## DIVERTICULA OF THE COLON

PROCTOSCOPY AS AN AID IN THE DIAGNOSIS AND  
DIFFERENTIAL DIAGNOSIS

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Diverticula of the colon are pouchlike protrusions from the wall of the bowel which are classified as congenital and acquired. Congenital or true diverticula, of which Meckel's diverticulum is an example, are rare. Their distinguishing characteristic is that the wall of the sac contains all the normal coats of the bowel, from which the diverticulum originates. False or acquired diverticula, with which this paper is concerned, are of much more common occurrence, and their distinguishing characteristic is that the pouch is made up of mucosa and serosa, the muscular layers are absent.

These outpouchings of the colon have been a subject of discussion for a century and a half. The condition was formerly looked on as of rare occurrence, but now it is commonly encountered. Very little has been

added to Cruveilhier's<sup>1</sup> account, which was published in 1849. We hope, herewith, to make a small contribution.

SPECIAL VALUE OF  
PROCTOSCOPIC  
EXAMINATION

Although the diagnosis of diverticula of the colon is dependent primarily on roentgenologic studies,



Fig. 1—Diverticulum showing inspissated piece of stool in it.

proctoscopic examination is of more value than may be thought. It may be of use for instance when a condition which roentgenologically appears to be carcinoma is actually diverticulitis. The roentgenologic filling defect following a barium sulfate enema in the presence of diverticulitis of the colon usually is described as relatively long. This is not always true, however, and if the filling defect is short the condition may be confused with carcinoma because the other roentgenologic findings in the presence of carcinoma are similar to those of diverticulitis especially when the carcinoma is associated with inflammation. Proctoscopic examination may make the diagnosis possible.

Not uncommonly, moreover, differential diagnosis between a malignant condition and inflammation is difficult or impossible, even at the time that the surgeon explores the abdomen. In those cases in which colostomy has been performed proctoscopic examination of the distal segment of bowel by way of the anus as well as examination of both proximal and distal segments through the colonic stoma is of inestimable value in determining the degree of the inflammatory process and the amount of obstruction in the

region of inflammation. The surgeon must be informed concerning these matters before he attempts closure of the colonic stoma.

**Proctoscopic Signs**—In 1939 one of us<sup>2</sup> reported five proctoscopic signs which may determine, or lead to the strong suspicion of the presence of diverticulosis or diverticulitis. The signs enumerated are as follows:

1. Limited mobility of a segment of bowel which is normally freely movable. Relative immobility of a segment of bowel alone is insufficient evidence on which to base a diagnosis of diverticulitis, but when this is associated with one or more of the other irregularities mentioned, immobility forms strong supportive evidence. A fixed or retroverted uterus and pelvic inflammatory disease may interfere with, or even prevent, complete proctoscopic examination. It is not difficult to distinguish this type of immobility from that which is observed in the sigmoid from which inflamed diverticula originate. In those instances in which the interference is caused by pelvic disease or a fixed, retroverted uterus the obstruction is confined to the rectum. Usually in diverticulitis the rectum is unobstructed and little difficulty is experienced with the examination until the sigmoidal segment is reached.

2. Angulation of the bowel. The lumen may turn sharply at the point at which it is immobilized by diverticulitis, and advancement of a proctoscope of average caliber beyond the angulation may be difficult or impossible.

3. Reduced lumen and adherent mucosal folds. The contracture of the lumen is due to impingement on the wall of the bowel and as the lining membrane is crowded together the mucosal folds become adherent. The mucosa may be edematous. Often additional information can be gained by using an instrument of smaller caliber.

4. Sigmoidal sacculation. This peculiarity is characterized by the appearance of shallow pouches which extend partially or wholly around the wall of the bowel. The pouches are separated by ridge-like elevations, usually they are observed in a mobile sigmoid which bears no evidence of inflammatory disease. Frequently these sacculations are found in the course of postmortem examination of elderly persons. Spriggs and Marver<sup>3</sup> after making roentgenologic studies of the colon described a prediverticular state in which normal segmentation of the bowel is absent and is replaced by a ragged outline of little convex irregularities. It is doubtful whether the prediverticular stage of Spriggs and Marver is identical with the sacculation seen in proctoscopic examination and so frequently observed in postmortem examination of elderly persons.

5. Seeing the diverticula (fig. 1). One or more diverticula are actually seen more frequently than is generally believed. Whenever it is possible to discover a diverticulum however, inflammation seldom is present.

## STUDY OF FOUR HUNDRED CASES

The records of 400 consecutive patients of the Mayo Clinic who were found to have diverticula of the colon were studied in order to compare the proctoscopic with the roentgenologic findings and in this connection, to determine the value of the signs enumerated. Of these patients, 213 (53 per cent) were males and 187 (47 per cent) were females. Their average age was 56 years.

From the Section on Proctology, Mayo Clinic.  
Read before the Section on Gastro-Enterology and Proctology at the Ninety-Third Annual Session of the American Medical Association, Atlantic City, N. J., June 10, 1942.  
1. Cruveilhier, Jean. *Traité d'anatomie pathologique générale*. Paris: J. B. Baillière, 1849, vol. 1.

2. Bue, L. A. Diverticula of the Colon. *New England J. Med.* 221: 593-598 (Oct. 19) 1939.  
3. Spriggs, E. I., and Marver, O. A. Intestinal Diverticula. *Quart. J. Med.* 19: 134 (Oct.) 1925.

In 150 (38 per cent) of the 400 cases proctoscopic examination was not performed and the diagnosis was made from clinical and roentgenologic studies only (table 1). In 8 (2 per cent) of the 400 cases roentgenologic examination of the colon was not carried out and the diagnosis was made by clinical and proctoscopic examinations only. The diverticula were seen at proctoscopic examination in all 8 cases. It is with the remaining 242 cases (60 per cent) of the 400 cases in which both sigmoidoscopic and roentgenologic studies of the colon were carried out, that this study is primarily concerned.

Of the 242 cases, results of sigmoidoscopic examination were negative in 82 (34 per cent) (table 2). In the remaining 160 cases (66 per cent) of 242 some evidence of the existence of diverticula was ascertained by sigmoidoscopic examination or the diverticula were seen.

In 35 (22 per cent) of the 160 cases diverticula were observed on sigmoidoscopic examination and their presence was confirmed by roentgenologic studies of the colon (table 3). In an additional 72 (45 per cent) of the 160 cases the proctoscopist reported the presence



Fig 2—Portion of resected sigmoid showing sacculations, diverticula and strong perisigmoidal inflammatory reaction.

of sacculations of the sigmoid and the roentgenologist confirmed his suspicion as to the presence of diverticula. Parenthetically, it can be said that in 18 of the 35 cases in which diverticula were seen sacculations were seen also, making a total of 90 cases in which sacculations were observed (fig 2). In the 53 cases (33 per cent of the 160) which remained after the 35 and 72 had been subtracted, there was other sigmoidoscopic evidence which strongly suggested the presence of diverticula of the sigmoid, and roentgenologic studies of the colon confirmed the diagnosis. These findings were immobility, sharp angulation, narrowing of the lumen, mucosal edema, extrarectal mass and inability to pass the proctoscope the average distance. Although these findings may exist singly, they usually exist in combination.

It is interesting to observe that in 3 of the cases of colonic diverticula sacculations were noticed on proctoscopic examination, but the primary roentgenographic studies failed to reveal the presence of diverticula. From one to six years later roentgenologic studies of the colon revealed the presence of diverticula. It is possible, in many of the cases in which sacculations are found on proctoscopic examination, and in which diverticula cannot be demonstrated by roentgenologic studies, that these sacculations may represent a pre-diverticular stage.

#### PROCTOSCOPY AFTER COLOSTOMY

Early in this paper we pointed out the value of proctoscopic examination following colostomy. With present day medical management the use of colostomy or other emergency operation for relieving obstruction

TABLE 1—Four Hundred Cases in Which Diverticula Were Found

Method of Diagnosis	Number	Per Cent
Clinical and roentgenologic only	150	38
Clinical and proctoscopic only	8	2
Proctoscopic and roentgenologic	242	60
Total	400	100

TABLE 2—Two Hundred and Forty-Two Cases in Which Diverticula Were Found and Both Sigmoidoscopic and Roentgenologic Examinations Were Performed

Result of Sigmoidoscopic Examination	Number	Per Cent
Negative	82	34
Revealed or gave some evidence of diverticula	160	66
Total	242	100

of the lower part of the bowel has decreased considerably. There are, however, definite indications for colostomy, namely (1) acute obstruction which has failed to respond to medical management, (2) sigmoidovesical fistula and (3) extensive abscess formation. It is in these complicated conditions that preoperative diagnosis by proctoscopy is of great value.

*Special Study of Fifty Cases*—We selected for special study 50 patients on whom colostomy had been performed because of an obstructing lesion in the lower part of the bowel and in relation to which a preoperative diagnosis was impossible. The nature of the obstruction was indeterminate for the following reasons: 1. The problem was of an emergency character. Many

TABLE 3—One Hundred and Sixty Cases in Which Positive or Suspicious Sigmoidoscopic Findings Were Confirmed Roentgenologically

Result of Sigmoidoscopic Examination	Number	Per Cent
Diverticula seen (in 18 sacculations also seen)	35	22
Sacculations seen, diverticula suspected	72	45
Other suggestive sigmoidoscopic evidence	53	33
Total	160	100

TABLE 4—Fifty Cases in Which Examination Was Made After Colostomy

Method of Diagnosis	Cases	Per Cent
Proctoscopic	37	74
Pathologic	13	26
Total	50	100

patients were too sick to permit necessary diagnostic examinations to be made. 2. The attempt to relieve obstruction by medical management failed. 3. Colostomy had been performed as an emergency elsewhere. Thirty-one of the patients had been operated on at the clinic and 19 elsewhere. In many of these cases, even though the abdomen was explored at the time of colostomy, the surgeon was unable to determine the nature of the obstruction. Proctoscopic examination

by way of the colonic stoma or anus was responsible for making a diagnosis in 37 (74 per cent) of these cases (table 4). In many cases the examination had to be repeated several times, at intervals of several days or weeks, and often it was found that a loop of bowel which was found to be inaccessible at one examination because of fixation and inflammation had become, at a subsequent examination, more mobile, thus permitting more satisfactory examination. In the remaining approximately one fourth of the cases the diagnosis was made by the pathologist after the diseased segment of bowel had been resected (fig. 3).

#### SUMMARY

A study of 400 cases of diverticula of the colon has been made. The diagnosis was made clinically and by roentgenologic examinations in 150 of the cases and clinically and by proctoscopic examination in 8. In the remaining 242 cases both roentgenologic studies of the colon and sigmoidoscopic examinations were performed. In 160 of these 242 cases sigmoidoscopic examination revealed or gave some evidence of the presence of diverticula. Of these 160 cases, in 35 the proctoscopist saw diverticula (sacculations also in 18 of the 35), in 72 sacculations and in 53 one or more of the following evidences: immobility, sharp angula-

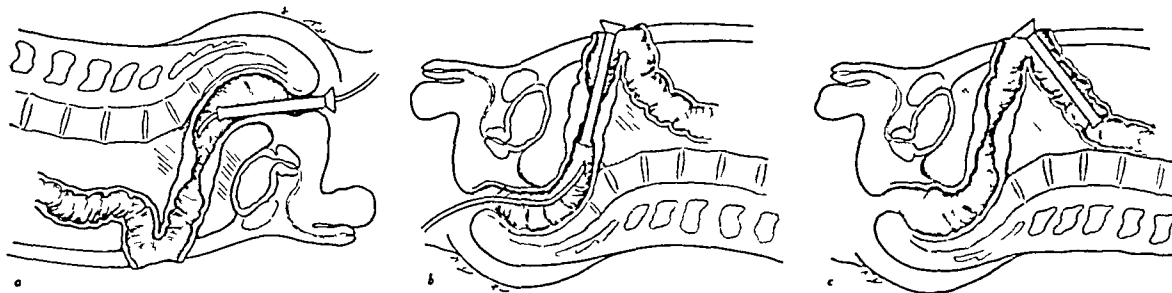


Fig. 3—Method of examination with sigmoidoscope after colostomy. *a* Sigmoidoscope inserted by way of anus and rectum leaving catheter in place to indicate that that much of the bowel was examined. *b* Sigmoidoscope inserted by way of stoma; catheter indicating that the distal segment has been completely examined. *c* Examination of the proximal loop by way of stoma.

tion, narrowing of the lumen, mucosal edema, extrarectal mass or inability to pass the proctoscope the average distance.

In another group of 50 cases in which colostomy had been performed as an emergency measure because of an obstructing lesion in the lower part of the bowel, and in which the preoperative diagnosis was indeterminate, a study was made in order to learn the value of sigmoidoscopic examination performed by way of the anus or the colonic stoma. Sigmoidoscopic examination was responsible for the diagnosis in 37 of the 50 cases.

#### CONCLUSIONS

1 Roentgenology provides the most valuable single aid in establishing the diagnosis of diverticula of the colon.

2 The most valuable single proctoscopic finding, aside from actually seeing the diverticula, is the presence of sacculations.

3 The proctoscopic findings of immobility of the bowel, angulation, mucosal edema, narrowed lumen and extrarectal mass are of value, but it should be remembered that some of these signs are observed in other diseases of the pelvic organs.

4 Our study would indicate that proctoscopy is a valuable adjunct to clinical and roentgenologic findings in determining the nature of obstructive lesions in the lower part of the bowel.

#### ABSTRACT OF DISCUSSION

DR. JOHANNES PLSSEL, Trenton, N. J. At the Graduate Hospital we don't see these diverticula quite as frequently as do Drs. Jackman and Buie. We do, however, notice edema. Our experience is that edema below malignant lesions is rare, and when it occurs we suspect an inflammatory lesion. We have found a longer proctoscope helpful, that is, preoperatively. We frequently use a 14 or 16 inch proctoscope in an attempt to view this area. I should like to mention the use of some form of atropine or belladonna for a day or two previous to a second examination. This frequently will at least diminish the amount of spasm that one encounters on the first examination and one can get a better impression of the lesion.

DR. JOHN C. M. BRUST, Syracuse, N. Y. The menace of malignancy is constantly present and must if possible be excluded. Medical students are far too often taught that diverticulitis is merely "left sided appendicitis." The frequency of bladder symptoms, rare instances of sudden profuse rectal bleeding, absence of fever and many other features combine to make diverticulitis a complex and often bizarre picture. One brief case report will illustrate many of these points. A man aged 52 had rectal pain and inability to void. The duration of illness was thirty hours. Catheterization was performed and 950 cc of concentrated urine obtained. The prostate felt normal. There was induration and tenderness felt through the posterior rectal wall in the hollow of the sacrum. The abdomen was soft and the bowel history was that of prolonged constipation. The day after admission there was increasing evidence

of fluctuation between the sacrum and the rectum. No intrinsic lesion was seen by sigmoidoscopy for 20 cm. This procedure was done under crural anesthesia because of rectal pain. A stab wound was made through an operating microscope and a hemostat passed behind the rectum through the rectal mucosa. A moderate amount of foul pus was obtained and from this retrorectal abscess cavity we obtained hundreds of tiny fecaliths about the size of grape seeds. A barium sulfate enema with a roentgenogram of the colon revealed narrowing at a point in the lower sigmoid but it did not appear malignant. No diverticula were seen. We felt that a diverticulum had perforated and an abscess had formed. The contents of the diverticulum could account for the innumerable small fecal pellets. Despite sulfamidamide therapy and general supportive and dietary measures, he continued to have retrorectal tenderness and a persistent discharge of pus. Twelve days after admission the abdomen was opened. An infected mass was found surrounding the lower sigmoid. The inflammatory reaction was pronounced. It did not feel or appear malignant. A double barreled colostomy was performed. Hot irrigations were begun. Sulfamidamide therapy was continued. We kept this man under observation and used a proctoscope at frequent intervals. We believe this was a perforation of a solitary diverticulum in the lower sigmoid. The severe reaction prevented any actual demonstration of an opening by proctoscopy but we could say with assurance that no malignancy existed. We rarely see diverticular openings if an acute inflammatory process is present. The other signs, namely sigmoidal sacculations, limited mobility, sharp angulation and reduced lumen, are of dubious value. Sigmoidoscopy properly performed is rarely productive of severe pain. One exception is acute diverticulitis.

## THE PREVENTION OF RENAL OBSTRUCTION DURING SULFADIAZINE THERAPY

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In the recent literature there are many reports of renal obstruction during therapy with sulfapyridine, sulfathiazole and sulfadiazine. This complication is attributed to the poor solubility of these drugs and their acetyl derivatives.<sup>1</sup> It is important to realize that the sulfonamide compounds differ considerably in their solubility. Sulfanilamide, for example, is a relatively soluble drug, and renal complications are rare. Sulfapyridine, sulfathiazole, sulfadiazine and their acetyl forms, on the other hand, are relatively insoluble<sup>2</sup> and renal complications occur frequently. If the solubility of these drugs in urine could be increased, this complication might be prevented. The data presented here will show that the solubility of sulfathiazole and sulfadiazine and their acetyl forms can be increased and renal precipitation thereby prevented.

The first procedure in our studies was to determine the solubility of sulfathiazole and sulfadiazine and their acetyl derivatives in normal human urine over the  $p_H$  range 5.0 to 8.0.<sup>3</sup> This proved to be the key to the problem, as seen clearly in figure 1, there is a very sudden and decided increase in the solubility of these substances as the urine is made alkaline. The explanation of this phenomenon is that these drugs and their acetyl derivatives are weak acids which ionize and form soluble salts in an alkaline medium<sup>4</sup> (e.g. sodium sulfadiazine and sodium acetyl sulfadiazine). The question then arises: How much soluble salt formation can occur in urine within the physiologic  $p_H$  range? As the  $p_H$  is raised from 5.0 to 7.0 (fig. 1) there is little salt formation and the solubility in urine is not appreciably increased, from  $p_H$  7.0 to 8.0, however, there is extensive salt formation and the solubility of sulfathiazole and sulfadiazine, both free and acetyl, is greatly increased.<sup>5</sup> In the case of sulfapyridine and its acetyl

form, on the other hand, extensive salt formation does not occur until  $p_H$  9.0 and 10.0 respectively are reached—beyond the  $p_H$  range of urine, this accounts for the failure of alkali therapy to prevent renal precipitation of this drug. With sulfanilamide, salt formation does not occur until  $p_H$  10.6 is reached but, in contrast to the preceding drugs, it is a relatively soluble substance.

In vivo this phenomenon has also been investigated in dogs.<sup>6</sup> In these experiments it was found that sulfadiazine crystalluria was produced when acid urine was excreted after the administration of ammonium chloride, conversely, crystalluria was prevented by maintaining the urine alkaline by the administration of sodium bicarbonate. Furthermore, it was noted that the  $p_H$  of the urine closely regulated the concentration of sulfadiazine that was excreted in solution in the urine, i.e., low levels were obtained in acid urine and high levels in alkaline urine during constant drug dosage.

In a study of the pathogenesis of complications in the urinary tract it is important to consider the concentration at which the drug is excreted in the urine. While blood levels of about 10 mg per hundred cubic centimeters are obtained in patients receiving 4 to 6 Gm a day, the level that is obtained in the urine varies from 100 to 300 mg per hundred cubic centimeters. Increasing the urinary output from 1,000 to 2,000 cc a day might double the quantity of sulfadiazine in solution but raising the  $p_H$  from 6.5 to 7.5 will permit more than a tenfold increase in solubility.

In view of the in vitro experiments indicating the greatly increased solubility of sulfathiazole, sulfadiazine and their acetyl derivatives in alkaline urine and the animal experiments substantiating this, it was decided to employ this method in the massive sulfadiazine therapy of subacute bacterial endocarditis in the hope that the renal complications with oliguria reported by Dick<sup>7</sup> might be prevented.

## CLINICAL PROCEDURE

Two patients whose diagnosis of subacute bacterial endocarditis was established were selected for massive sulfadiazine therapy. To induce diuresis of an alkaline urine, sodium bicarbonate<sup>8</sup> and large amounts of fluids were given prior to the administration of sulfadiazine. The  $p_H$  of each specimen was measured as soon as voided with a Beckman  $p_H$  meter and if the  $p_H$  of the urine had dropped below 7.5 additional alkali was administered. Each specimen was centrifuged and the

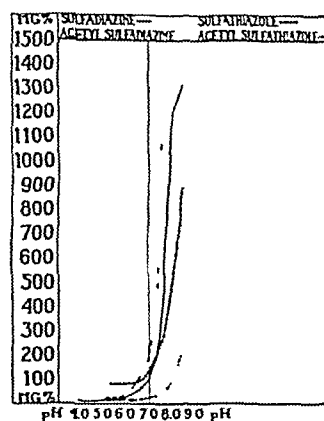


Fig. 1—The variation in the solubility of sulfadiazine and sulfathiazole and their acetyl forms in normal human urine from  $p_H$  5.0 to 8.5. Horizontal axis: Hydrogen ion concentration ( $p_H$ ) of the urine at which drug levels were determined. Vertical axis: concentration of drug in the urine (milligrams per hundred cubic centimeters) showing the great increase in the solubility of these substances in alkaline urine.

Dr. Charles Roh and Miss Margaret Boyle cooperated.

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1. Peterson O. L., and Finland Maxwell. Urinary Tract in Sulfonamide Therapy, *Am J M Sc* 202: 757-772 (Nov.) 1941. Subsequent bibliography in Wright D. O. and Kinsey R. E. Renal Complication Due to Sulfadiazine. *J A M A* 120: 1351-1354 (Dec. 26) 1942. Louria A. L. and Solomon Charles. Complete Anuria Due to Sulfadiazine. *ibid* 120: 1354-1356 (Dec. 26) 1942. Rottino Antonio and La Rotunda Oswald. A Fatal Human Case of Urolithiasis Medicamentosa Caused by Sulfadiazine, *J Urol* 48: 310-317 (Sept.) 1942.

2. Feinstein W. H., Williams R. D., Wolff R. T., Huntington Evelyn, and Crossley M. L. Toxicity Absorption and Chemotherapeutic Activity of 2 Sulfanilamidopyrimidine (Sulfadiazine). *Bull Johns Hopkins Hosp* 67: 427 (Dec.) 1940.

3. Jensen O. J., Jr. and Fox C. L., Jr. Hydrogen Ion Concentration and the Solubility of Sulfonamides in Urine. The Relation to Renal Precipitation. *J Urol* 49: 334 (Feb.) 1943.

4. Sodium Salts of the Sulfonamide Compounds, editorial J. A. M. A. 120: 1401 (Dec. 26) 1942. Fox C. L., Jr. and Rose H. M. The Ionization of Sulfonamides. *Proc. Soc. Exper. Biol. & Med.* 50: 142-145 (May) 1942. Fox C. L., Jr. The Sodium Salts of Sulfonamide Compounds. *Arch Surg* 45: 754-763 (Nov.) 1942.

5. Because the degree of ionization is dependent on the concentration and nature of buffer present which will vary with individual specimens solubilities slightly different from these may be reported from other studies. Acetyl sulfadiazine is only very slightly more soluble in water than sulfadiazine in water, 15 cf. 12 mg per hundred cubic centimeters. It is however a stronger acid than any of these compounds and hence becomes more soluble than any (except sulfanilamide itself) as the  $p_H$  is raised and salt formation occurs.

6. Jensen O. J., Jr. Factors Controlling Renal Excretion of Sulfonamides thesis, Squier Urologic Clinic, Presbyterian Hospital, New York.

7. Dick G. F. Subacute Bacterial Endocarditis. Recovery Following Intravenous Sodium Sulfadiazine. *J A M A* 120: 24 (Sept. 5) 1942.

8. Some potassium bicarbonate was given to prevent the accumulation of excess sodium ion and consequent edema. The potassium salt however produced nausea and vomiting and was discontinued. No edema or alkalosis resulted from the large amounts of sodium bicarbonate administered.

sediment examined microscopically for drug crystals. When crystals were observed a rough quantitative estimate of the degree of crystalluria was obtained by determining the concentration of sulfadiazine in the sediment and in the supernatant fluid.<sup>9</sup> When these differed by more than 5 per cent crystalluria was grossly

*The Renal Function Before and After Massive Sulfadiazine Therapy*

Case	Maximum Specific Gravity		Albumin		Crystals or Blood Cells		P S P Excretion in 2 Hours		Serum Urea Nitrogen M <sub>2</sub> /100 Cc	
	Before	After	Before	After	Before	After	Before	After	Before	After
1	1.024	1.020	0+	0+	0	0	65% in 200 cc	60% in 160 cc	17	1*
2	1.020	1.024	0	0	0	0	70% in 240 cc	80% in 200 cc	10	2*

visible. Renal function tests were done before and after treatment, the specimens were tested for albumin and the specific gravity was measured.

#### REPORT OF CASES

CASE 1—R. W., a white man aged 34 had fever, night sweats, malaise and weight loss of two months' duration, a history of rheumatic fever and chorea, signs of mitral stenosis and insufficiency and aortic insufficiency. Blood cultures contained a strain of *Streptococcus viridans*. The only signs of cardiac decompensation were a slightly enlarged liver and moderate dyspnea on exertion. There was no anemia. Before admission to the hospital he had received sulfathiazole in normal therapeutic amounts for two weeks with slight symptomatic improvement. Renal function tests were normal and are shown in the accompanying table.

Preparatory alkali therapy consisted in the oral administration of 54 Gm of sodium bicarbonate daily. After five days, however, this was insufficient to make the urine persistently alkaline, therefore 12 Gm of potassium bicarbonate was given on the day before and on the day of treatment. At the start

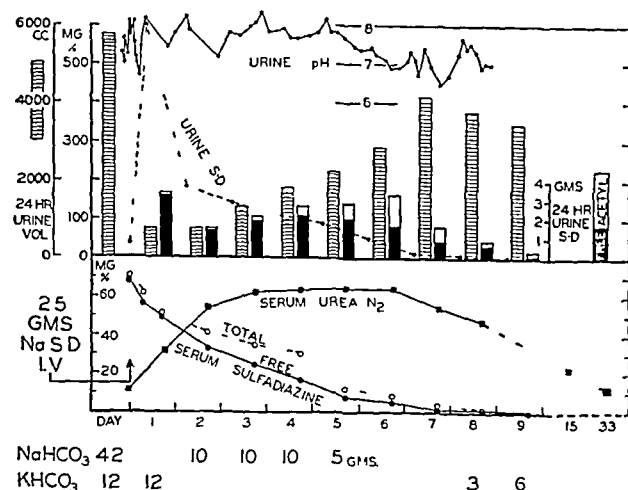


Fig. 2 (case 1).—Summary of course of therapy. Although large quantities of sodium bicarbonate were given certain specimens of urine became acid. The minimum daily output of urine was 775 cc. The blood and urine sulfadiazine levels are shown as well as the transient rise in serum urea nitrogen. The highest sulfadiazine levels in the urine did not greatly exceed the levels found during routine therapy.

of therapy the urine pH was 7.65. Fluids were forced and the day before treatment the patient voided 5730 cc. Twenty-five Gm of sodium sulfadiazine (0.454 Gm per kilogram of body

weight) was administered intravenously in 500 cc of distilled water over a period of one hour and twenty minutes. A serum level taken one hour after the infusion had been terminated was 695 mg of sulfadiazine per hundred cubic centimeters (fig. 2). For several hours thereafter the patient had frequency and burning on urination with moderately severe pain in the flank, hematuria and crystalluria. It is noteworthy that at the time these symptoms began the urine pH had fallen, varying from 6.6 to 7.46, and that the urine sulfadiazine concentration was 639 mg per hundred cubic centimeters, which is well above the solubility found in vitro at the pH of the individual voiding (fig. 1). At the same time the specific gravity of the urine varied from 1.002 to 1.006. Larger doses of potassium bicarbonate were given and the urine pH was raised, varying from 7.4 to 8.1 for the next day, with slight crystalluria persisting for that day. Sodium bicarbonate was then given intravenously on the following days. There was no oliguria, as shown by a minimum daily volume of urine of 775 cc. This is in sharp contrast to the twenty-four urine volume of 15 cc reported by Dick.<sup>10</sup> For the following three days the patient had gross hematuria and 2 to 3 plus albuminuria. Microscopic hematuria and 1 to 2 plus albuminuria persisted for

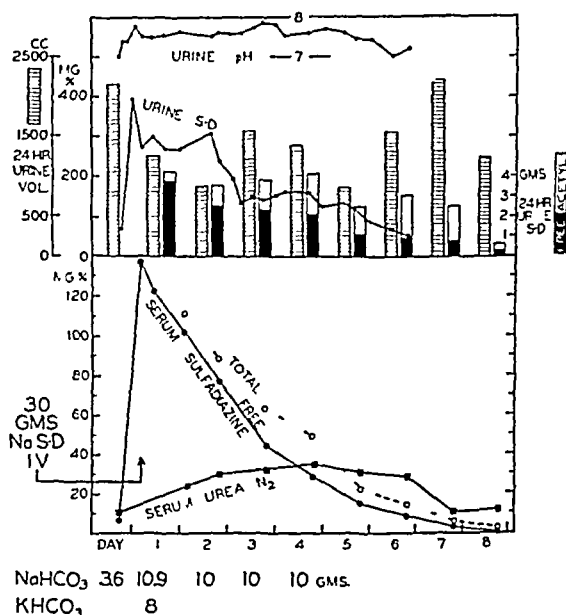


Fig. 3 (case 2).—Summary of first course of therapy. The administration of large amounts of sodium bicarbonate kept the urine alkaline. The minimum daily output of urine was 860 cc. The blood and urine sulfadiazine levels are also shown together with the transient rise in serum urea nitrogen. The highest sulfadiazine levels in the urine did not greatly exceed those found during routine therapy.

three days more. The serum urea nitrogen rose to 64 mg per hundred cubic centimeters on the fourth day and then gradually returned to normal. During the period of treatment the patient experienced slight nausea and vomiting, his temperature remained elevated and there were many embolic phenomena, whereas previously there had been but few. The blood cultures (with para-immuno benzoic acid added to the mediums) were negative for one week and then again became positive.

CASE 2—B. B., a white schoolgirl aged 16 had fever, malaise and an occasional sore finger tip for two months, a history of rheumatic fever, signs of mitral stenosis and insufficiency and aortic insufficiency, blood cultures yielded a strain of *Streptococcus viridans*. There was no evidence of cardiac decompensation. Prior to admission to the hospital she had received sulfadiazine in the usual doses for a total of two weeks, with temporary symptomatic improvement. There was no anemia and the renal function tests were normal, as shown in the table.

Preparatory alkali therapy consisted in the oral administration of 45 Gm of sodium bicarbonate and 80 Gm of potassium bicarbonate for two days. At the start of therapy the pH was

9. The sulfonamide levels were determined by the method of Bratton and Marshall (A New Coupling Component for Sulfanilamide Determination J. Biol. Chem. 128: 537 [May] 1939) with the Klett-Summerson photoelectric colorimeter.



775 Fluids were forced and a diuresis of 2150 cc was obtained. Thirty Gm of sodium sulfadiazine (0.52 Gm per kilogram of body weight) was given intravenously in 600 cc of distilled water over a period of one and one-half hours. One hour after the infusion was terminated the serum sulfadiazine level was 138 mg per hundred cubic centimeters (fig 3). The patient had no specific urinary symptoms but experienced slight discomfort in the left upper quadrant of the abdomen similar to that which she had noted before the administration of sulfadiazine. Nausea and vomiting appeared after the termination of the infusion and lasted one week. The daily fluid balance was maintained by the administration of parenteral fluids. There was gross hematuria and 2 to 3 plus albuminuria for three days. The  $p_H$  of the urine remained above 7.5 and there was no oliguria—the minimum daily volume of urine was 860 cc. Sodium bicarbonate (10 Gm a day) was given intravenously for the next four days in the late evening in an attempt to counteract the usual acidity of the early morning specimens. Microscopic hematuria and 1 plus albuminuria were noted in the next three days. A rare sulfadiazine crystal was seen in only one of the urine specimens during the week following the infusion of the drug, and during this period all of the urine sulfadiazine levels fell within the *in vitro* solubility curve (fig 3). The serum urea nitrogen was 36 mg per hundred cubic centimeters on the fourth day after treatment and returned to normal on the seventh day. Renal function studies after massive sulfadiazine therapy were normal (table 1).

Following the massive intravenous dose of sulfadiazine the patient had a normal temperature and negative blood cultures for one week, but then fever reappeared and the blood cultures became positive. Although the single massive dose had not been followed by oliguria, there was definite evidence of temporary disturbance of renal function. Accordingly smaller daily doses of the drug were given. There was no reaction to a trial dose of 1 Gm of sulfadiazine and, after fluids had been forced and the urine had been made alkaline, 10 Gm of sodium sulfadiazine was given intravenously (fig 4). A serum level of 383 mg per hundred cubic centimeters was obtained, and on the following day 10 Gm was again given intravenously, and one hour later the serum level was 545 mg per hundred cubic centimeters. Transient hematuria and albuminuria followed both infusions. The serum level fell rapidly and it was therefore decided that a uniformly higher serum level could be maintained with large divided oral doses. After another infusion of 5 Gm of the sodium salt, the patient was maintained on daily doses of from 8 to 20 Gm of sulfadiazine for seventeen days the average dose being 13.7 Gm a day (0.25 Gm per kilogram of body weight). The average serum sulfadiazine level was 25 mg per hundred cubic centi-

of the first voiding each morning, which ranged from 6.4 to 7.4 (average 7.0), despite the administration of as much as 3.6 Gm of sodium bicarbonate at 2 a m. During this period there was gross crystalluria on six occasions but no flank pain, dysuria or hematuria occurred. The serum urea nitrogen was not elevated and repeated urea clearance tests were normal. On the seventeenth day of therapy crystalluria with hematuria, flank pain and dysuria developed. At this time the level of sulfadiazine in the urine was 445 mg per hundred cubic centimeters but the  $p_H$  was only 7.0 which is not high enough to keep this concentration of sulfadiazine in solution (fig 1). Sulfadiazine was stopped but the administration of sodium bicarbonate was continued and the hematuria and flank pain subsided in one day. The urine volume fell to 750 cc for one day but there was no nitrogen retention. Following this episode an intravenous pyelogram showed normal excretion from both kidneys without filling defects. During the seventeen day period the patient was afebrile but following cessation of the drug fever reappeared and the blood cultures once again became positive.<sup>10</sup>

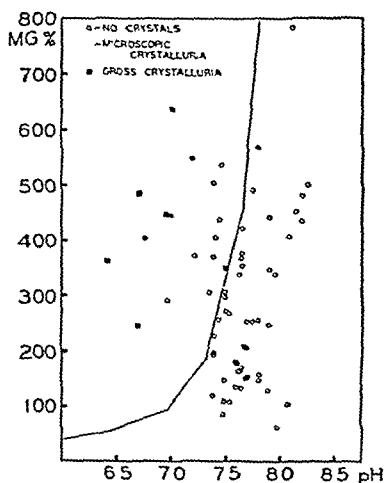


Fig 5—The occurrence of crystalluria in relation to the  $p_H$  and drug concentration of the voided urine. The solid curve is the *in vitro* solubility of sulfadiazine from figure 1. Gross crystalluria occurred when the  $p_H$  was lower than (to the left of) the *in vitro* solubility curve. Of the specimens to the right of this curve which contained crystals, one half were voided immediately after a specimen to the left of the curve containing gross crystals.

#### COMMENT

It is apparent that in these 2 cases renal obstruction during massive sulfadiazine therapy was prevented. The role of  $p_H$  in preventing crystalluria is clearly demonstrated by figure 5, which relates the  $p_H$  and drug level of each specimen to crystalluria. It has been shown that the solubility of sulfadiazine *in vitro* in human urine can be increased many times by increasing the  $p_H$ . Figure 5 shows that this applies also to human urine excreted during therapy. In comparing these specimens with the *in vitro* solubility curve, it will be seen that 48 per cent of the specimens in which the  $p_H$  was lower than (to the left of) the solubility curve contained gross or microscopic crystals, whereas only 7.2 per cent of the specimens in which the  $p_H$  was higher than (to the right of) the solubility curve contained microscopic crystals. Of these, one half were voided directly following a specimen that contained gross crystals. It is also significant that in case 1 the urine  $p_H$  was lowered and crystalluria occurred when the *in vitro* solubility was exceeded.

This relationship between the  $p_H$  of the urine and the solubility of sulfadiazine is vividly demonstrated by the fact that a specimen containing 788 mg per hundred cubic centimeters free (60 times the water solubility) and 192 mg of acetyl sulfadiazine per hundred cubic centimeters (13 times its water solubility) was voided without occurrence of crystals. When the  $p_H$  of this specimen was lowered 0.2  $p_H$  unit by addition of a small amount of acid, the clear specimen immediately became milky turbid as crystals of sulfadiazine appeared.

<sup>10</sup> Subsequently, with average doses of 4 to 6 Gm daily the blood cultures became negative.

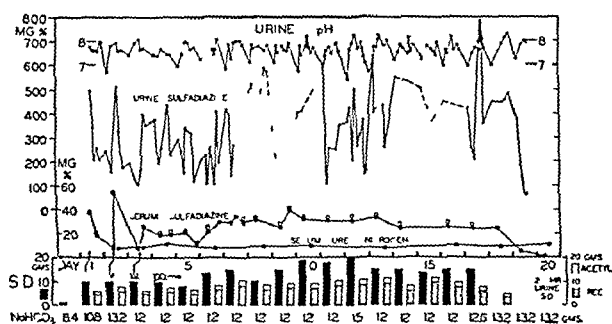


Fig 4 (case 2)—Summary of therapy with large daily doses. More constant high serum levels of sulfadiazine resulted from divided oral dosage. Higher urinary levels (crystal free) were obtained with this form of therapy. The large daily doses of sodium bicarbonate needed to keep the urine alkaline are shown. The serum urea nitrogen did not become elevated.

meters and the daily urine volume varied from 1200 to 3300 cc with the exception of the final day of treatment. The average daily intake of sodium bicarbonate was 121 Gm. There was no edema or clinical evidence of alkalosis and the serum carbon dioxide combining power varied from 53.2 to 72.7 volumes per cent. The urine  $p_H$  was maintained above 7.5 with the exception

There are several practical points which may be mentioned. The "routine" use of alkali will probably not keep the urine alkaline and avoid crystalluria. The quantity of alkali needed should be governed primarily by the  $p_H$  of the urine (which should be measured frequently) and not by the amount of sulfadiazine given. Since the morning specimen has the lowest  $p_H$  and the highest concentration of sulfadiazine, this seems to be the specimen most apt to contain crystals.<sup>11</sup> Thus of 22 specimens containing crystals, 17 were morning specimens. For this reason it is advisable to administer alkali at night to counteract this tendency.

Although previous papers have suggested the advisability of adjuvant alkali therapy in patients receiving the sulfonamide compounds, this has not been generally accepted as a method of preventing urinary complications. Two reasons become evident. When used with sulfapyridine, alkalis do not and cannot prevent urinary complications because they do not sufficiently increase the solubility of sulfapyridine and acetyl sulfapyridine within the physiologic range of urinary  $p_H$  to prevent renal precipitation. Secondly with sulfathiazole and sulfadiazine, the usual quantities of alkali given are

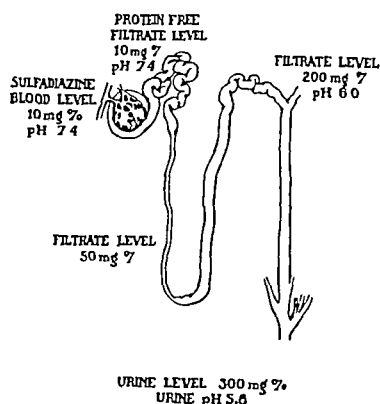


Fig. 6—Diagrammatic representation of the renal excretion of the sulfonamide compounds. As the urine is formed the concentration of the sulfonamide may be increased thirty times or more. Precipitation will depend on the solubility of the particular drug at the concentration and  $p_H$  resulting from urine formation.

insufficient to maintain the urine consistently alkaline, in the 2 cases reported here large amounts of bicarbonate were needed to keep the urine at  $p_H$  7.5.<sup>12</sup> It is important to realize that as these drugs are excreted by the kidney (fig. 6) a concentration of 10 mg per hundred cubic centimeters in the blood may be increased to 300 mg per hundred cubic centimeters in the urine as a result of

reabsorption of water by the tubules. In addition base is also reabsorbed and the  $p_H$  may be lowered from that of the blood (7.4) to as low as 5.5, commonly found in the urine. By thus lowering the  $p_H$  in the case of sulfathiazole, sulfadiazine and their acetyl forms, the soluble salts are converted to the relatively insoluble acids, and precipitation takes place. The function of the alkali is to prevent this fall in  $p_H$  during the formation of urine.

These studies also suggest a most valuable aid in the lavage therapy of acute or impending renal blockage. Instead of using warm water or warm saline solution in which these drugs are but very slightly soluble sodium bicarbonate or sodium carbonate solution should be used to dissolve the crystals, the more concentrated the solution, the greater the solvent action.<sup>13</sup>

<sup>11</sup> This was also observed during routine therapy with sulfadiazine (Anderson D and Rose H M. Unpublished data).

<sup>12</sup> Additional alkalis are also needed when sulfadiazine is administered by mouth in the form of the sodium salt. Apparently a large excess of alkali is required to neutralize the usual acidity of the urine. Although the possibility of producing alkalosis and edema might be an objection to the simultaneous use of large amounts of alkali, none was detected in these and numerous other patients to whom similar amounts of alkali were given.

<sup>13</sup> It is of interest to note that just recently Wright and Kinsey described large orange yellow crystals in their case 4 which dissolved readily when the urine was alkalinized.

## SUMMARY

1 There is great variation in the urinary solubility of sulfadiazine, sulfathiazole and their acetyl forms over the physiologic  $p_H$  range.

2 Since the solubility of these drugs is greatly increased in alkaline urine, maintenance of a consistently alkaline urine was tried as a means of preventing renal obstruction during sulfadiazine therapy.

3 Two patients with subacute bacterial endocarditis were given massive doses of sulfadiazine and with certain exceptions their urine was maintained consistently alkaline with large doses of bicarbonate (10 to 20 Gm daily). No alkalosis or edema resulted.

4 High concentrations of sulfadiazine were held in solution in alkaline urine, oliguria and renal obstruction were prevented. Crystalluria occurred in those urine specimens in which the  $p_H$  fell below the in vitro solubility limits.

5 The quantity of bicarbonate to be given should be judged by the  $p_H$  of the urine. To maintain sulfadiazine in solution during full therapeutic dosage, a  $p_H$  of 7.5 or higher is essential.

6 When alkaline urine is voided with high concentrations of sulfadiazine in solution, decreasing the  $p_H$  slightly will immediately precipitate the drug.

7 In the renal (pelves and ureters) lavage therapy of renal obstruction caused by one of the sulfonamide compounds, alkaline bicarbonate or carbonate solutions are recommended since these will dissolve drug crystals much better than warm water or isotonic solution of sodium chloride. Utilization of this information in routine therapy with sulfathiazole and sulfadiazine in average doses would remove the hazard of their renal complications.

## Clinical Notes, Suggestions and New Instruments

### ESTIVO AUTUMNAL MALARIA WITH FRONTAL LOBE SYNDROME

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AND  
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Since the mobilization program started there has been a shifting of large numbers of men not only within the country but to many points throughout the world. With this wartime flow of population and with extension of the war to more and more tropical and subtropical countries the incidence of malaria can be expected to increase steadily.

Many physicians in the armed forces serving in localities far removed from their home have had limited experience with the disease and have had little opportunity to observe the varied fashions in which it may manifest itself. Members of the medical profession in military service must be familiar with the protean manifestations of malaria so that their function to preserve the fighting strength of our forces will not be impaired.

The following case is reported to illustrate that malaria may manifest itself primarily by a syndrome of disease of the frontal lobe of the brain. We have been unable to find a similar case recorded in the literature, though many cases of cerebral malaria have been described.

#### REPORT OF CASE

W. S., a white soldier aged 24, a native of Texas, had been in the Army for six months serving with an engineer battalion.

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when he became ill. On Oct 15, 1941, during the Carolina maneuvers, he was admitted to an evacuation hospital complaining of severe low backache, pain in the eyes and fever of three days' duration. The patient was dull and confused. He was transferred to the Station Hospital at Fort Bragg, North Carolina, the following day with a diagnosis of influenza and possible encephalitis.

On physical examination the soldier was well developed and well nourished and appeared acutely ill. The skin was flushed and hot. There was no rash. Eye, ear, nose and throat examinations gave negative results except for moderate inflammation of the pharynx. The lungs were clear and the heart was normal. There was no lymphadenopathy. The liver was felt 2 cm below the right costal margin. The spleen was not palpable. There was a moderate degree of mental confusion and some increase in motor activity, and it was difficult to keep the patient in bed.

Examination of a blood smear on admission showed many parasites of the *Plasmodium falciparum* type. Blood studies showed 4,210,000 red blood cells per cubic millimeter, hemoglobin 90 per cent and 4,850 white blood cells per cubic millimeter. The differential count was 64 per cent polymorphonuclear leukocytes, 24 per cent lymphocytes and 12 per cent monocytes. Urinalysis was negative.

The patient was treated with atabrine dihydrochloride 1½ grains (0.1 Gm) three times a day by mouth for five days. A blood smear on October 17 was again positive for *Plasmodium falciparum*. No parasites were demonstrated in the blood after completion of the course of atabrine. The patient, however, continued to manifest abnormal behavior characterized by increased psychomotor activity, euphoria and slight confusion. He was given quinine 5 grains (0.3 Gm) three times a day for one week and two doses of plasmochin. By October 30 his mental state had improved somewhat but he complained of generalized malaise and weakness. He was discharged from the hospital to duty on November 8.

On return to his organization he again manifested abnormal behavior and was again referred to the hospital and admitted November 10. The patient complained chiefly of headache and vomiting. The oral temperature was 99.4 F, pulse rate 100 and respiratory rate 20.

On examination he was amenable and cooperative, lying quietly in bed. He was definitely tremulous, with a fairly constant coarse tremor of the extremities on the right side. The patient was unable to give an adequate or coherent story of the events which led up to his hospitalization, though he was oriented in all spheres. There was a decided memory defect, especially for recent events, and some of his replies were irrelevant. He did not recognize one of the physicians who had examined him a half an hour before. He expressed no ideas of reference, no hallucinations and showed no disturbance in affect. Neurologic examination elicited a Babinski sign on the right. The reflexes were slightly less active on the right than on the left side, and the abdominal reflexes on the right were slightly diminished. The red blood cell count was 4,360,000 per cubic millimeter, hemoglobin 90 per cent and the white blood cell count 11,400 with 54 per cent polymorphonuclear leukocytes, 36 per cent lymphocytes, 6 per cent eosinophils and 4 per cent monocytes. Urinalysis was negative. The Kahn reaction of the blood was negative. A blood smear was negative for malarial parasites.

The nature of the illness was not recognized immediately and malarial treatment was not instituted because he was unable to give an adequate history and because he was admitted to a section of the hospital different from the first admission. The following day he was still confused, neurologic signs persisted and the temperature was 102 F. A lumbar puncture was performed on November 12. Spinal fluid was clear and colorless and under normal pressure. There were 64 cells with 40 per cent polymorphonuclear leukocytes and 60 per cent lymphocytes. There was a heavy trace of globulin. Repeated blood smears for malarial parasites were negative. After several days of low grade fever without chills the temperature became normal.

On November 14 neurologic examination revealed a partial mixed aphasia, alexia and agraphia. He had extreme difficulty in expressing himself, in naming objects and in reading newspaper headlines and was unable to write his name correctly. There was still a definite memory defect for recent events. Babinski and Chaddock signs were elicited on the right and Oppenheim signs and forced grasp reflexes bilaterally, greater on the right than on the left. There was no papilledema or nuchal rigidity. On November 17 he appeared greatly improved. He was more alert and was able to read and write much better. A five day course of atabrine was given as before. On November 22 his mental condition had improved further. A Babinski sign was still present on the right side and the abdominal reflexes were depressed on the left. There was almost complete recovery from the alexia, agraphia and aphasia. On November 25 neurologic examination was negative except for diminished abdominal reflexes and delayed plantar flexion on the right side. He had, however, become definitely euphoric, overproductive and elated and showed a decided increase in his psychomotor activity. He made grandiose plans and was typically hypomanic. Slight difficulty in reading was still present and he would leave out occasional words in writing. By November 30, overactivity had increased to the point at which it became necessary to transfer the patient to the psychiatric ward. He was very distractible and euphoric and stated that he had never felt better in all his life.

A sample of writing addressed to his fiancée during this time is as follows: "Honey, never have I been so happy in all my life. Captain B is ready to see if we are still going to marry. You did not say one word about it, but honey, I already had another hunch that I have been having. I have as much sense as anybody now. Boy that Captain B has been my very best friend in an hour of need. He and I have grown to be very close friends. We want to get that camera and take some of the scenery of all nurses and doctors. Since that night I told those nurses that I could not sleep I read an article in the paper on a man who never sleeps. He does nothing but sip his old tea. Don't try to force any man to sleep when a man has the fantastic ideals always and craved ideals of my time that would be one unfortunate moment alive."

In the psychiatric ward he showed gradual improvement. He became less talkative and his judgment improved. As the mental condition improved, he began to complain of malaise, ready fatigue, paresthesias on the left side of the body and pain in the lower extremities. Neurologic examination, however, was unrevealing. By December 26 his memory was good. The pain and paresthesias were less pronounced. He was quiet and cooperative and had developed insight into his mental upset. Improvement continued until Jan 10, 1942, when he was discharged from the hospital.

His family history and previous personal history were obtained through the assistance of the American Red Cross. The patient's grandparents had died of natural causes at advanced ages and there was no history of mental or nervous disorder in his parents and five siblings.

The patient's birth and early development were normal. He had completed one year of college. His attendance, study habits and behavior were considered perfectly normal. He had never manifested any mental abnormality and had suffered no serious injuries or disease, was not addicted to the use of alcohol and had been considered well adjusted.

#### COMMENT

The patient's illness began with symptoms which suggested influenza. A blood smear was done shortly after admission to the hospital because the ward officers considered the possibility of malaria. Symptoms of cerebral involvement were manifest almost from the beginning but did not command serious attention and consideration until the second hospital admission, when they dominated the clinical picture.

The fairly rapid response to specific therapy left little doubt concerning the nature of the illness. The manic psychosis which the patient developed is believed to have been secondary

to organic brain disease, especially in view of the completely negative past history of any mental disorder

It is generally accepted that estivoautumnal malaria is responsible for the major portion of deaths due to uncomplicated malaria and that fatal cases are usually associated with cerebral involvement.<sup>1</sup> In cases in which there is cerebral localization of the parasites, the onset is usually rapid with delirium or coma, and death frequently ensues without a return to consciousness. This is commonly the course in drug addicts who become directly inoculated with infected blood. Many different types of atypical malaras with symptoms in the nervous system have been described. They have been classified as (1) meningitic type, (2) monoplegic or hemiplegic type, (3) myelitic type, (4) ataxic type, (5) disseminated sclerotic type, (6) bulbar type, (7) cerebellar type, (8) cerebral type, (9) polyneuritic type, (10) Korsakoff type and (11) aphasic type.

The classification indicates that the disease may involve any part of the nervous system and resemble many different disease entities. The symptoms produced depend on the anatomic localization of the disease.

In fatal cases, the brain shows a gross brownish discoloration of the gray matter with macroscopic punctate hemorrhages into the white matter. Stained sections reveal the capillaries filled with parasites in various stages of development.<sup>1</sup>

In the present case, observations indicate that the predominant involvement was in the frontal lobes. The picture is one of rather diffuse organic brain disease complicated by the development of an organic psychosis and terminating with recovery.

#### SUMMARY

A puzzling case of organic disease of the brain, manifested by aphasia, alexia, agraphia, memory defect and confusion associated with involvement of the pyramidal tracts and bilateral forced grasp reflexes and complicated by an organic psychosis proved to be one of cerebral malaria. Cure was effected by the early administration of atabrine.

#### TWO CLINICALLY USEFUL SIGNS

- 1 THE WHISTLE-SMILE REFLEX IN THE PARKINSONIAN SYNDROME
- 2 THE NEPHRITIC STARE IN CHRONIC NEPHRITIS

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1 When the normal individual is requested to whistle he does so and then smiles, probably as a mimetic response to the absurdity of unmotivated whistling. The patient suffering from the parkinsonian syndrome does not smile after whistling. For many years I have employed this simple test as an aid to rapid orientation and have found it to be very helpful and reliable.

2 While I was serving as a house officer at Johns Hopkins Hospital in 1909 a patient was admitted in a suburemic state, showing definite exophthalmos.<sup>1</sup> Under treatment she improved and concomitantly the proptosis became less pronounced. After some months she was readmitted and died in uremia. An autopsy confirmed the clinical diagnosis of chronic glomerulonephritis. The thyroid was normal.

Thirty years experience with the eye signs of Bright's disease, which are similar in every way to those seen in toxic goiter, has proved that they are frequently useful in differentiating cardiac breakdowns as a result of chronic kidney disease from those due to other causes. Cardiac or cerebrovascular syndromes frequently mask the basic renal background in chronic glomerulonephritis, nephrosclerosis, necrotizing arteriolitis and pyelonephritis until the onset of renal decompensation.

The 'nephritic stare' does not serve to differentiate various types of nephritis. My assistant Dr. Joseph Stevens studied in this clinic 100 instances of chronic Bright's disease, with especial reference to eye signs. Forty-three of these showed the 'nephritic stare,' some with varying degrees of proptosis,



Fig. 1—The nephritic stare in a patient with chronic glomerulonephritis.

as measured by the ophthalmometer. Thirty of these patients came to autopsy, with the following anatomic diagnoses:

Chronic glomerulonephritis with 'nephritic stare' and proptosis 16



Fig. 2—Exophthalmos in a patient with chronic glomerulonephritis proved by autopsy.

Chronic glomerulonephritis with 'nephritic stare' and no proptosis 0

Arteriosclerotic nephritis with 'nephritic stare' and proptosis 7

1 Coggeshall, L. T. *Malaria in Cecil*, R. L. A Textbook of Medicine Philadelphia W. B. Saunders Company.

2 Hespert, Milton. *Malaria Among Drug Addicts in New York City*. Pub. Health Rep. 49: 421 (March 30) 1934.

3 Castellani, Aldo and Chalmers, A. M. *Manual of Tropical Medicine*. New York: William Wood & Co. 1919.

From the Department of Medicine, Duke University School of Medicine.

1 Barker, L. F., and Hanes, F. M. Exophthalmos and Other Eye Signs in Chronic Nephritis. *Am. J. M. Sc.* 138: 469 1909.

Arteriosclerotic nephritis with "nephritic stare" and no proptosis 5

Pyelonephritis with "nephritic stare" and no proptosis 2

Negro patients 14, white patients 16

Although I have used the term "exophthalmos" it is more correct to refer to the sign as the "nephritic stare" (fig 1), for proptosis is as a rule, not measurably present, even when the fixed stare is clinically obvious. The stare is indistinguishable from that often seen in early toxic goiter from which, of course it must be differentiated. On the other hand Plummer and Wilder<sup>2</sup> are in error when they say that the clinical impression of proptosis in such patients is very seldom confirmed by exact measurements with the exophthalmometer. A measurable grade of exophthalmos is not rare (fig 2), though the 'nephritic stare' may be clearly discernible in the absence of proptosis.

The factor that leads to the characteristic appearance of the 'nephritic stare,' exclusive of actual proptosis, is retraction of the upper lid (Dalrymple's sign). This lid retraction may produce the appearance of exophthalmos when no proptosis is actually present.

## Council on Industrial Health

THE COUNCIL ON INDUSTRIAL HEALTH HAS APPROVED PUBLICATION OF THE FOLLOWING SPECIAL WARNING BULLETIN ON EPIDEMIC KERATOCONJUNCTIVITIS

C. M. PETERSON, M.D., Secretary

### EPIDEMIC KERATOCONJUNCTIVITIS

This report is issued jointly by the U. S. Public Health Service and the Committee on Industrial Ophthalmology of the Section on Ophthalmology, American Medical Association. It is recognized that relatively few cases of epidemic keratoconjunctivitis will be reported in areas which are not essentially industrial, but the condition has appeared so extensively throughout the country that the agencies sponsoring this report hope that physicians everywhere will be prepared to apply the recommendations listed below promptly and effectively.

#### INCUBATION PERIOD

The incubation period in epidemic keratoconjunctivitis ranges from five to ten days.

#### CLINICAL MANIFESTATIONS

The onset may be preceded by a low fever and mild generalized malaise. The local ocular symptoms are merely those of a foreign body or conjunctival irritation. One eye is usually affected first, and in a large percentage of cases the second eye becomes infected within five to eight days. Preauricular and submaxillary glandular involvement with tenderness is common in a high percentage of cases.

Edema of the lids and the conjunctiva, especially the transitional fold, is very frequent. The conjunctiva presents the appearance of a simple purulent conjunctivitis but with little or no formation of pus. Small areas of pseudomembrane are not infrequent and when removed leave either small white dotted points or some bleeding points. The bulbar conjunctiva becomes edematous early. At this stage there is some lacrimation and photophobia but real pain and blepharospasm do not appear until the cornea becomes involved.

The proportion of cases in which corneal involvement occurs varies from 50 per cent to 90 per cent. In six to twelve days after the conjunctivitis appears the cornea becomes involved by the appearance of discrete gray infiltrates that lie in and immediately under the epithelial layer of the cornea. They may be confined to the periphery of the cornea but in a large percentage of cases involve the pupillary area of the cornea directly. These infiltrates are discrete and seldom become complicated by an erosion of the corneal epithelium with

resultant staining with fluorescein. The extent of visual impairment depends on the number of infiltrates and their location.

#### CLINICAL COURSE

The disease is self limited. In the majority of instances the conjunctivitis disappears spontaneously in fourteen to eighteen days. The corneal complication may disappear in seven days or may last for many months. The longer they persist the greater is the danger of permanent visual impairment.

#### LABORATORY FINDINGS

Scrapings of the conjunctiva show a preponderance of monocytes. Cultures and smears either are negative or show the usual contaminations.

#### TREATMENT

There is no specific treatment that has shown a definite influence on the course of the disease. During the acute stage the eyes should be kept clean with irrigations of boric acid isotonic solution of sodium chloride or 1:5000 mercuric oxy-cyanide. If there is much photophobia 1 per cent holocaine may be instilled at frequent intervals. Five per cent sulfathiazole ointment has been used as has 5 per cent solution of sodium sulfathiazole sesquihydrate. For persistent corneal infiltrates, the X-rays have seemingly yielded some results.

#### PERIOD OF INFECTIVITY

It is not yet known how long the danger of transmission to others exists. At present for practical purposes a sufferer from epidemic keratoconjunctivitis may be allowed to return to work when the active conjunctivitis has disappeared.

#### PREVENTIVE MEASURES

At present the only preventive measure known is complete isolation of infected persons. As the disease has been transmitted through medical personnel the most meticulous asepsis must be insisted on. Not only must physicians and nurses wash their hands thoroughly with soap and water after each patient, but also eye droppers, solutions and instruments must be sterilized to prevent infection of noncontaminated persons. The infected individual must be told of the danger of transmission of this disease to others not only in the plant, but even in the home surroundings. It is suggested that in industrial plants where epidemic keratoconjunctivitis has made its appearance the following methods of procedure be adopted:

1. In smaller plants with a limited personnel every individual with a red eye should be stopped at the entrance of the plant and sent direct to the plant physician to determine whether or not epidemic keratoconjunctivitis is present. In larger plants where such a procedure is not possible supervisors and foremen should be instructed in detail to make rounds immediately when a fresh shift starts and send any individual with a red eye to the medical office.

2. If the cases are to be treated at the medical department of the plant a separate room should be set aside for such cases and in that room there must be exercised the most scrupulous asepsis even to washing the arms of the chairs in which the patients sit. Aside from the aseptic and separate care of the recognized cases of the disease, special cleanliness of the hands of the physician in the general clinic should be maintained with the use of an effective disinfectant between cases lest the infection be spread by means of undiagnosed cases, especially those suspected of having foreign bodies in the eye.

3. Every case of epidemic keratoconjunctivitis should be excluded from the communal facilities of the plant until the inflammation has subsided to the point where the plant physician considers it no longer transmissible.

4. Explicit instructions should be given to every individual regarding the danger of transmission and emphasizing the decrease in the war effort as a result of the time lost from epidemic keratoconjunctivitis.

5. The local health authorities should be notified immediately of the existence of individual cases.

<sup>2</sup> Plummer W. A. and Wilder R. M. Etiology of Exophthalmos, Arch. Ophth. 13: 835 (May) 1935.

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SATURDAY, APRIL 3, 1943

## NEUROPSYCHIATRY IN THE ARMY

Under Medicine and the War in this week's issue of THE JOURNAL appears a brief report of the establishment of a special school for neuropsychiatry under the auspices of the United States Army Medical Corps. Psychiatric problems represent today some of the most important of those that confront our armed forces. In 1918 there were 7 men of each thousand discharged for psychiatric reasons, whereas in 1942 the rate was 4 per thousand. At the time of induction in 1918 only 20 men of each thousand were discharged for psychiatric reasons, now about 75 of each thousand are rejected for such causes. This does not mean that more men are now mentally unfit, our scientific methods have improved sufficiently in the interval to enable more accurate detection of such cases. The indications are that 30 per cent of the casualties now arriving from the war zones are psychiatric in character or have some well defined psychiatric aspects. Nervous and mental disorders are major causes of medical discharge from the Army. Conceivably the technic developed for induction, including the filtering by the local draft boards and the induction boards, has not been sufficient to prevent entrance into the service of a large number of unstable persons. The service in this respect is improving, but, unless the deficiencies are fully recognized, those who are striving for this improvement may be handicapped and delayed in accomplishing a satisfactory result.

The detection of the mentally unsuited or the potential psychiatric casualty at induction is one of the most important tasks of military neuropsychiatry. The lack of sufficiently trained examiners, the lack of technic for securing necessary historical information about inductees, the large numbers inducted and the short period of time during which induction occurred are all contributory factors in the failure to control properly the admission of those not mentally qualified. The fault cannot be credited to any single agency. Every-

thing possible was done by Selective Service headquarters and by cooperative efforts between the armed forces and Selective Service. No doubt the training of many more men in the special problems of psychiatry related to the armed forces will help this situation.

The need for special consideration of neuropsychiatric problems was recognized early after our entrance into the war with the establishment of a committee for this purpose in the Division of Medical Sciences of the National Research Council. In February 1942 a Neuropsychiatry Branch was established in the Surgeon General's Office under Lieut. Col. Patrick S. Madigan, who had many years of experience in this specialty in the Regular Army. As the problem grew and became more definitely recognized an assistant chief, Lieut. Col. Malcolm J. Farrell, was appointed in April 1942. Then in August 1942 Col. Roy D. Halloran was assigned to duty as chief of this branch. Among the most important duties of the branch are (1) giving advice to the Surgeon General and other governmental agencies on neuropsychiatric matters, (2) recommending policies for the Army in neuropsychiatric matters, (3) inspecting neuropsychiatric facilities in hospitals and clinics, (4) making recommendations for circular letters and directives regarding neuropsychiatric matters, (5) reviewing neuropsychiatric information coming into this office, (6) maintaining a card index of location and qualifications of neuropsychiatric officers, (7) consulting with the personnel division and recommending assignments and transfers of neuropsychiatric officers, (8) reviewing and approving scientific publications submitted by neuropsychiatric officers and (9) attending and participating in National Research Council meetings.

As this section of the Surgeon General's Office became oriented in its responsibilities, consultants were appointed to coordinate and supervise clinical and administrative neuropsychiatry. Thus far four consultants have been appointed: Lieut. Col. Franklin G. Ebraugh, M. C., to the eighth service command, Lieut. Col. William C. Meisinger, M. C., to the fourth, Major Garland H. Pace, M. C., to the seventh and Lieut. Col. Douglas A. Thom, M. C., to the second. In the European theater of operations Lieut. Col. Lloyd I. Thompson acts as consultant in neuropsychiatry and in the Southwest Pacific theater of operations Lieut. Col. Samuel A. Challman.

Most important in this service has been the establishment of the School of Military Neuropsychiatry, which has already been mentioned. More than a hundred and twenty officers have already been trained in this course. A neuropsychiatric unit at the Thirty-Sixth Station Hospital has been organized under the command of Lieut. Col. Ernest H. Parsons. This unit is functioning as a neuropsychiatric center in the European theater.

and is providing indoctrination instruction for newly arrived neuropsychiatric officers so that they may familiarize themselves quickly with the problems and case material. Especially qualified trained psychiatrists have been assigned to carry out planned mental hygiene programs at replacement training centers.

The question of morale is being met by liaison established between the Neuropsychiatric Branch, represented by Lieut. John Appel, and the Special Services Branch of the Army, which is under the direction of Gen. Fred Osborn.

Finally, neuropsychiatry in the armed forces must be especially concerned with problems of delinquency. The crude methods of the past have given way to more humane and satisfactory handling of the problems of the homosexual. No longer is it necessary to subject cases that are so definitely in the medical field to the routine of military court martial.

The development of the Neuropsychiatric Branch of the United States Army Medical Department represents one of the most important achievements in the advancement of military medical science. All of those officially responsible merit commendation for their cooperation in the significant results that have already been secured.

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#### EXTENSION OF PUBLIC HEALTH COVERAGE TO THE NATION

Forty million of our people live in communities or in areas in which there is no access to the full time services of a professionally trained medical officer of health and the associated sanitarians and public health nurses of a local health department of civil government. On June 10, 1942 the House of Delegates of the American Medical Association unanimously voted its approval of extension of such services. Now the Committee on Administrative Practice, one of the standing committees of the American Public Health Association, has offered a plan to improve the situation.

Tax supported public health services have been distributed unevenly and not in all respects in relation to sanitary needs or in proportion to the population units of local government. In fact, there are conditions of local government, cities, townships and counties, in which duplicating and to some extent conflicting health services are provided because of local rivalries of a political nature. State laws in some instances do not authorize cooperative arrangements for a single health officer for adjacent communities or counties. Good health service for prevention of communicable, occupational, nutritional and other preventable diseases, and for the protection of the health of mothers and children, cannot be achieved for a state solely or effectively or economically by a state department of health unless the counties and cities are sufficiently concerned with

local health conditions to support their own community health services. By the same token federal programs for a higher level of national health fail in effectiveness for lack of facilities of local government through which federal grants can be used by agreement with the state.

In July 1942 some 62 million people living in the continental United States were provided by local governments with full time medically officered health protection. In addition 16½ million persons were served by county or district health departments operated by a state department of health, and about 12 million more people living in cities with full time health services. There remain 41,052,600 persons, or 31 per cent of our population, in 1,687 counties in 41 states for whom no full time health service is provided by either local or state government.

The committee of the American Public Health Association presents a half dozen basic principles of health administration and suggests that not more than 1,127 units of local health jurisdiction are needed for the total coverage of the continental United States. The units are, of course, in addition to the respective state departments of health and the health services of the various bureaus and departments of the federal government. It is to be assumed that a city and the county within which it is located shall have a single headed health service. It is suggested that a unit of less than 50,000 population can rarely maintain an efficient tax supported local health service and that counties with small populations should be authorized by state law to combine with adjacent counties to support and be served by a single district or multicounty health department.

Among the 3,070 counties of our states there are many with populations so small and economic resources so slender as to preclude the possibility of supporting even the minimum personnel and functions of a local health department. The basic public health law of each state should not only permit but specifically authorize the creation of local health units of population size and area compatible with efficient and economical public service. The law should provide furthermore for the selection of professional personnel on a sound civil service or merit system and authorize the levying of taxes to support the health services.

The American Public Health Association, through its Subcommittee on State Health Administration, has recently completed a study of state health administration in Illinois, undertaken at the request of the state director of public health with the approval of the governor. A summarized report of this study discloses a recommendation that legislation be enacted to permit the establishment of full time county or combination of county health departments. Following a distribution of this report, the Research Department of the Illinois Legislative Council made available a factual study of



county health departments in the state for use by the general assembly in considering any legislation that might be proposed. Now a bill has been introduced by Senator Searcy, as S 244, authorizing the establishment and maintenance of county and multiple county health departments in the state.

Permissive in form, this legislation proposes that county full time health departments may be created either by resolution of a county board or by the voters of a county and that multiple county health departments may be set up. If four or more counties wish to associate themselves in establishing and maintaining such a department, prior approval must be obtained from the state department of public health. Provision is made for the levying of a special tax not to exceed 1 mill on the dollar on all taxable property in the county or counties involved to finance the operation of the department. Existing full time health departments in cities, villages or public health districts with less than 500,000 inhabitants may be retained or they may be abandoned and become integrated in the county or multiple county health department. Health departments in communities with a population of 500,000 or over will apparently not be affected by the bill. Each county health department will be managed by a board of health appointed by the president or chairman of the county board. At least two members must be physicians licensed in Illinois to practice the healing art in all its branches and at least one member must be a dentist licensed in Illinois. All members must be chosen for their special fitness for membership on the board. Multiple health departments are to be managed by a board of health consisting of three members appointed from each county by the president or chairman of the county board.

Provision is made for the appointment of medical, dental and nonmedical advisory committees and for the appointment, for each department, of a chief medical officer to act as executive officer, and of such other officers and employees as may be approved by the executive officer, all appointees to meet the qualifications prescribed by the Illinois State Civil Service Commission. The functions to be exercised by the departments are set forth in broad groupings, including the right to pass such rules as may be necessary for the improvement and protection of the public health. The people of Illinois may well reflect on the importance of this proposal, establishing as it does a framework on which may be constructed a comprehensive public health program to function in the interest of the health of all the people of the state. Legislation with a similar objective, although differing in detail and approach, was proposed this year in the states of Arkansas, Georgia, North Dakota, Utah, Washington and Wyoming.

Each state medical society may with advantage avail itself of the detailed information in the hands of the American Public Health Association and analyze its own situation in conference with its own state health officer. Permissive or enabling legislation to provide for local health units and their support should be supported by the professional influence of the physicians of the state, unless existing laws are adequate.

The career of public health as a specialty of medicine requiring graduate university training and practical experience is so far accepted as part of the pattern of preventive medicine that the survival of the part time general practitioner as the local administrator of a health department cannot be encouraged by the medical profession or be recommended to the taxpayer as the best his money can buy in public health.

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### FOOD POISONING

During the present mobilization the incidence of food poisoning in U S Army troops is much less than that being experienced by other armed forces engaged in the present conflict. However, many food poisoning outbreaks are due to (1) carelessness in the handling of sanitation involved in the processing or serving of food and (2) the presence of unrecognized human carriers of enteric pathogens in the permanent food handler group.

The Army has focused the attention of medical officers and personnel involved in the operation of all messes on the necessity of protecting food adequately from contamination by processing and serving under sanitary conditions and by preventing undue retention of food that may be potentially contaminated prior to its being served. Laboratory facilities have been made available for the investigation of these outbreaks when they occur, and every effort is being made to determine their source.

In general food as delivered by the manufacturer or wholesaler for processing in army kitchens has not been found to be an important factor in the cause of these outbreaks. Most of the outbreaks that have occurred have been due to the fact that foods such as potato salad, ground meat and sliced ham have been processed too long in advance of serving or have been stored under conditions favoring bacterial growth. Those outbreaks that have not been satisfactorily worked out with regard to the cause and the source of infection have in many instances been due to the fact that personnel involved have been convinced that physical factors or bacteria such as the staphylococcus were the only agents involved in the outbreak. Staphylococcus food poisoning does occur, and this type of infection is important as an etiologic agent of food poisoning. However, when mediocre bacteriology is done in con-

nection with the investigation of the outbreaks the individuals conducting the investigation usually isolate a coccus which by gross methods of examination is identified as a staphylococcus. This finding, in conjunction with perfunctory examination for the *Shigella* and *Salmonella* organisms, leads to the conclusion that the outbreak is essentially staphylococcal in origin. These conclusions are not justified in many instances. The findings of more thorough examinations definitely proved that the outbreak itself was not due to staphylococci but to *Shigella* or *Salmonella*.

The detection of permanent food handling carriers of *Shigella* or *Salmonella* and their removal from this type of work definitely limit the possibilities of subsequent outbreaks. If the examination of the outbreak is perfunctory and staphylococci are blamed for the outbreak without adequate investigation for other possible organisms, corrective action will not be taken and the outbreaks will continue to occur. Medical schools and other scientific organizations should bring to the attention of physicians the necessity for insisting on thorough investigations of food poisoning outbreaks and not accept perfunctory explanations with regard to their cause.

## Current Comment

### INVALID DIETS AND FOOD RATIONING

Physicians who are especially concerned with diets for invalids should note that ration order 13, issued by the Office of Price Administration under date of Feb. 9, 1943, covering all canned, dried and frozen fruits and vegetables, permits under article II, section 25, extra rations for invalids. The order reads:

Consumers who need more processed foods because of illness may apply for more points. (a) Any consumer whose health requires that he have more processed foods than he can get with War Ration Book Two may apply for additional points. The application must be made, on OPA Form R-315, by the consumer himself or by some one acting for him and may be made in person or by mail. The application can be made only to the board for the place where the consumer lives. He must submit with his application a written statement of a licensed or registered physician or surgeon showing why he must have more processed foods, the amounts and types he needs during the next two months and why he cannot use unrationed foods instead.

(b) If the board finds that his health depends on his getting more processed foods and that he cannot use or cannot get unrationed foods, it shall issue to him one or more certificates for the number of points necessary to get the additional processed foods he needs during the next two months.

The application form referred to OPA Form R-315, is apt to be somewhat confusing to patients. It is titled "Sugar Special Purpose Application" and was developed primarily to meet the need for home canning. It is being used temporarily, until a more adequate form can be developed. The procedure indicated in section 25 may be changed somewhat in the future in which case due notice is to be provided.

### THERAPY OF SEVERE BURNS

Generally it is believed that severely burned patients should be kept warm because of the fall in body temperature commonly accompanying shock. This conventional belief is now challenged by Elman and his co-workers<sup>1</sup> of the Department of Surgery, Washington University School of Medicine, St. Louis as a result of their study of the effects of different environmental temperatures on the mortality rate of severely burned laboratory animals. In the course of a study of chemical changes following severe burns, the St. Louis surgeons noted an increased mortality of their experimental animals during several hot days of the summer when the environmental temperature rose to 95 F. The suggested deleterious effect of such high temperatures was tested on groups of rats placed after burning in rooms at different constant temperatures. Summarizing their experimental data, Elman concludes that the least mortality occurs at an environmental temperature of 75 F, increasing to a 100 per cent mortality with either an increase or a decrease of 20 degrees F from that therapeutic optimum. Their most favorable temperature (75 F) is but slightly higher than the level accorded to be the normal average for human comfort. The St. Louis surgeons conclude that "the commonly used heat tent which increases the environmental temperature above that point will be deleterious by increasing the mortality in severe burns" and that the room temperature should be lowered for burned patients in climatic extremes where the environmental temperature rises much above 75 F.

### TETANUS IN THE MIDDLE EAST

In the British army each man is inoculated with two doses of 1 cc of tetanus toxoid at an interval of six weeks. A "boosting" third dose is given not earlier than six months later. Although the procedure is voluntary, probably over 95 per cent of the soldiers, according to Boyd and MacLennan,<sup>1</sup> are inoculated. Only recently have a large percentage received the third dose. Each wounded man is given a dose of 3000 international units of tetanus antitoxin. Further weekly doses of the antitoxin are given to the patients who have not been actively immunized. Despite the relative rarity of tetanus bacilli in soil samples of the Middle East (88 per cent of ninety-one samples of earth collected between Daba and Benghazi) the organisms are not uncommonly found in wounds. In a series of 214 wounds of a severe type, *Clostridium tetani* was found in 18 (8.4 per cent). During the first two years of war in the Middle East 18 cases of tetanus were reported in the fighting forces. Of these 13 were in the nonimmunized group, while 5 occurred among the actively immunized. The former group had six fatalities and the latter three. From these figures active immunization, while effective in preventive tetanus, apparently has definite limitations. The authors emphasize that 1 of the 3 who died did not have his third dose, while the other 2 in all probability succumbed to an overwhelming infection resulting from masses of

<sup>1</sup> Elman, Robert, Cox, W. M. Jr., Lischer, C. E. and Mueller, A. J. *Proc. Soc. Exper. Biol. & Med.* 51: 350 (Dec.) 1942.  
<sup>1</sup> Boyd, J. S. K. and MacLennan, J. D. *Tetanus in the Middle East. Effects of Active Immunization.* *Lancet* 2: 745 (Dec. 26) 1942.

necrotic tissue in their wounds. Boyd and MacLennan stress therefore the necessity of careful surgical treatment with removal of all dead tissue as an important factor in preventing the development of tetanus. The importance of the third, the "boosting," dose of the toxoid, because of its augmenting effect on antitoxin production, is generally accepted.

### THE SUPPLY OF PHYSICIANS

Elsewhere in this issue (p. 1160) appears a report released by the Office of War Information concerning the supply of physicians in the United States at this time. Significant is the opinion of the governmental agency that the health of the nation as a whole has not been seriously impaired by any shortage of doctors, that the number of communities critically in need of doctors is not great compared with the total number of communities in the country, and that it might have been better if there had been from the first an agency capable of protecting the needs of the civilian population in the recruitment of doctors. Thus far the relocation of physicians has not wholly solved the problems that prevail. The situation is not now out of control, but luxury medicine is out for the duration. Evidence is not available as to the nature of the personnel utilized by the Office of War Information in making this survey or as to the technique used by the surveyors in securing information. Apparently the investigators failed to utilize fully the facts and data of the Procurement and Assignment Service. For example, the figures of percentage attainment of quotas on Dec. 1, 1942 are at variance with those tabulated by the Procurement and Assignment Service from the Adjutant General of the U. S. Army and the Surgeon General of the U. S. Navy. Frequently throughout the release, isolated or remote communities are cited with low physician population ratios and given as evidence of the breakdown of Procurement and Assignment Service. Upon closer inspection it becomes evident that many of these communities did not have more favorable ratios prior to the war. Rather too great emphasis seems to have been placed on a statement from one county medical society in a Southern state which was certainly not typical of the vast majority of medical societies in this country. Moreover, the investigators seem to have been a little naive in accepting such statements as that of the physician who is said to have slept only three hours a night for a considerable period. The report will, of course, come to the attention of the Procurement and Assignment Service for Physicians, Dentists and Veterinarians, which is the governmental agency charged with the problem of supplying physicians for the armed forces, industry and the civilian population. As a branch of the War Manpower Commission, with which also is associated the Selective Service System, there seems to be no reason why this agency should not be able to meet needs as they develop, keeping in mind always, however, the fact that the first problem of the nation is the winning of the war and that it is the duty of civilians in wartime to sacrifice largely in maintaining the armed forces at the utmost peak of health and physical fitness.

### THE INCREASING INCIDENCE OF BACILLARY DYSENTERY

Recently Silverman and Friedrichs<sup>1</sup> reported a study of some 700 bacteriologically proved cases of bacillary dysentery or *Bacterium dysenteriae* infection of the bowel. The latter term is reserved by the authors for cases of chronic infection with the bacillus of dysentery in the absence of diarrhea or the classic syndrome of dysentery. The responsible organism in the cases of dysentery observed by Silverman in a previous report was *Bacterium flexneri*. At a later period the predominant organism was found to be the lactose fermenter of Duval. At present the cases show increased virulence and more frequent incidence of complications, the predominant strains being those of *Bacterium shigae* and of *B. flexneri*. Although these observations are confined to the New Orleans area the disease shows a definite tendency, as predicted by Silverman in an earlier report (1926), to become endemic in many states of the Union. This prophecy has been borne out by the reports of cases from the states of New York, New Jersey, Illinois, California, Vermont, Missouri and Virginia. The authors advance the concept that arthritis, myocarditis, vascular dysfunction and even obstructing spasm of the colon as seen in chronic dysentery are probably manifestations of protein hypersensitivity to the bacillary dysentery infecting the patient. Silverman treats such manifestations as allergy by desensitization of the patient with autogenous vaccine. It has not been generally appreciated that these infections may cause deeply penetrating lesions in the bowel with consequent perforation. A person with bacillary dysentery infection of the bowel in a period of remission, following treatment or without treatment, is always a potential victim of this most serious complication. The problem posed by the increase in incidence of bacillary dysentery is pertinent to the aggregation of great numbers of men in the different camps and various communities. The authors believe that the possibility of the spread of this infection from a local community to one of the camps is great. Close vigilance should be observed, should dysentery appear, the patient should be isolated and every effort be made to prevent the spread of the disease.

### NEW JOURNAL OF GASTROENTEROLOGY

The council and members of the American Gastroenterological Association have felt the need of a journal with editorial and advertising policies directly under their control. The first issue of the new journal under these auspices, entitled *Gastroenterology*,<sup>2</sup> has now appeared. It contains articles by a number of specialists in the field of gastroenterology. A further list of interesting articles is scheduled for appearance in later issues. As pointed out by Dr. W. C. Alvarez, the editor, the success of the journal now will depend on the degree of interest shown in it by those physicians who are concerned with the advancement of gastroenterology.

<sup>1</sup> Silverman, D. N. and Friedrichs, A. V. The Increasing Incidence and Complications of Chronic Bacillary Dysentery. *New Orleans M. & S. J.* 95: 401 (March) 1943.  
<sup>2</sup> *Gastroenterology*, official journal of the American Gastroenterological Association. Williams & Wilkins Company, Mount Royal and Guilford Avenues, Baltimore.

# MEDICINE AND THE WAR

*In this section of The Journal each week will appear official notices by the Committee on War Participation of the American Medical Association announcements by the Surgeon Generals of the Army, Navy and Public Health Service, and other governmental agencies dealing with medicine and the war and such other information and announcements as will be useful to the medical profession*

## ARMY

### SCHOOL OF MILITARY NEURO- PSYCHIATRY

COLONEL ROY D HALLORAN

Medical Corps, Army of the United States  
AND

LIEUT COL MALCOLM J FARRELL

Medical Corps, Army of the United States

The Neuropsychiatric Branch of the Surgeon General's Office announces the opening of a School of Military Neuropsychiatry at the Lawson General Hospital Atlanta, Ga. The clinical and administrative practice of military neuropsychiatry presents many new and difficult problems to the newly commissioned neuropsychiatrist. The civilian professional experience of neuro-psychiatrists varies considerably—psychoanalysts, neurologists, state hospitals, prison psychiatry, child guidance and similar specialties. On entering the Army they are faced with common problems such as the selection and detection of mental misfits, the necessity for short periods of observation, puzzling and bizarre clinical manifestations peculiar to the military service and the administrative machinery set up to provide for the disposition of neuropsychiatric cases. It has been necessary, therefore, to provide some means whereby the practice of neuro-psychiatry in the Army could be made more standard and uniform, to provide the individual officer with an opportunity to review subjects which he did not require in civilian life and to introduce him to the various administrative procedures which will bewilder him if no assistance is provided.

In recognition of these difficulties and to prepare the officer better for the handling of combat casualties, the School of Military Neuropsychiatry, which is unique in Army history and has already gained international attention, was developed with the active interest and support of Major Gen James C Magee, the Surgeon General, and Brig Gen Charles C Hillman, Chief Professional Services, Office of the Surgeon General, to provide practical instruction for already trained and qualified specialists.

Brig Gen William C Sheep, the commanding general of Lawson General Hospital, a well known military neuropsychiatrist, is commandant; the assistant commandant is Col William C Porter, also a prominent military neuropsychiatrist, who is in direct charge of the school. Colonel Porter teaches the military aspects of neuropsychiatry, based on his broad experience. Dynamic psychiatry, from a military point of view, is taught by Lieut Col M Ralph Kaufman and psychiatry from an organic point of view is taught by Major Joseph L Fetterman. Neurology is taught by Major William H Everts. Lectures on other related subjects are given by specially selected officers, while certain members of the class relate special experiences such as neuropsychiatry in the Air Corps, Tank Destroyer, Ranger and other special training camps. While these subjects are covered by some didactic lectures, much time is devoted to seminars and round table conferences. Clinical material of a type obtainable only in Army hospitals is provided, since experience has shown that the best method of teaching military neuropsychiatry is by constant reference to and the use of military casualties. In this manner the military administrative considerations which have presented or may present difficulties are thoroughly discussed. Thus the various aspects of military

neuropsychiatry which confront the new officer and present difficulties to the older officers are well coordinated by excellent and experienced teachers. The advantages of mutual exchanges of experiences and opinions in the interest of uniformity and professional progress cannot be overestimated.

The quota of officers selected for each intensive four weeks' course, which began Jan 2 1943, include officers from each service command and the Air Corps together with newly commissioned officers from training pools in general hospitals. In this manner new officers have the advantage of the experience of older officers and the older officers have in turn the opportunity of evaluating their experiences and methods in the light of experiences and methods of others. Here is demonstrated the adaptation of clinical teaching the bedside method to the field of military neuropsychiatry.

### PSYCHIATRIC OUTPATIENT DEPARTMENT AT MITCHEL FIELD

The 'outpatient department of psychiatry at Mitchel Field N Y, where soldiers with emotional and mental problems may receive advice and treatment without hospitalization was established five months ago. Among 100 soldiers who have consulted the medical officers many have been helped to make the transition from civilian to military life and to ease over emotional barriers that might have become serious. The chief of the Neuropsychiatric Service at Mitchel Field is Major Benjamin H Balser who directs the outpatient department in addition to the regular ward for mental cases both under the general supervision of Lieut Col Oliver K Niess, surgeon of Mitchel Field. On the neuropsychiatric staff are First Lieut William L Fearing of the Medical Corps and Second Lieut Margaret L E Kram of the Army Nurse Corps. All the officers have had extensive training and experience in neurology and psychiatry. The provost marshal refers certain soldier prisoners to the clinic taking into account the possibility of mental illness as a basis for misbehavior, and seeks a recommendation from the psychiatrist. In many cases the punishment will be qualified accordingly. The psychiatrist is frequently called on to testify at courts martial involving such prisoners.

### MEDICAL OFFICERS PROMOTED TO BRIGADIER GENERALS

In an announcement sent from the White House on March 25 it is stated that the President recommended to the Senate the promotion of the following medical officers from the rank of colonel to brigadier general (temporary):

Col George F Lull now in charge of personnel in the Office of the Surgeon General  
Col James S Simmons epidemiologist  
Col Norman T Kirk commanding officer of the Percy Jones General Hospital Battle Creek Mich  
Col Leon A Fox recently assigned to the special commission on typhus fever

Brig Gen Norman T Kirk, commanding officer of the Percy Jones General Hospital, Battle Creek Mich, has been designated by the Surgeon General as chief consultant in orthopedic surgery. This is in addition to his duties as commanding officer of the Percy Jones General Hospital. In his service as consultant he will not be dislocated from his present station.

## OFFICE OF WAR INFORMATION

## THE SUPPLY OF PHYSICIANS

## An Official Release from the Office of War Information

Approximately one third of the doctors in active full time practice in the United States have now been called to the colors. The Office of War Information has just completed a survey to determine the effect on the civilian population of this extensive depletion of the number of physicians and surgeons in private practice.

Between 40,000 and 45,000 doctors have entered the armed services. As the size of the Army and Navy increases, more will be called. The men in the uniform of the United States have been and will continue to be the best cared for medically in the world. But in total war the health and working power of the civilian is as important as the health and striking power of the fighter. The available supply of doctors must be fairly apportioned between them. The Office of War Information made its survey in some sixty communities in twenty states where shortages of doctors have been reported.

OWI representatives traveled through the South and the Midwest and the West the Eastern Seaboard—in three distinct types of communities: farming regions, where health problems existing for years have been intensified by war; small, quiet, towns that have mushroomed overnight into close packed centers around war industry and military encampments; large cities where ordinary congestion has been aggravated by war activity.

## CONCLUSIONS

From first hand operation from the examination of authentic figures from protracted inquiries in these communities the following conclusions emerge:

1 Although there are areas critically in need of doctors because of withdrawals for the armed forces—a need frequently increased by expansion of population for war industry—so far the health of the nation as a whole has not been seriously impaired by the doctor shortage. Doctors these days are not only working overtime, they are—most of them—working practically all the time and in total disregard of their own health.

2 The number of communities critically in need of doctors is not great compared with the total number of communities in the United States. Those in need are, however, among those most vital to our war program.

3 In too many cases physicians were recruited for the armed services without sufficient regard for the welfare of the civilian population. There are, however, enough doctors remaining in private practice to give adequate care to the civilian population, provided they can be properly distributed numerically and according to special abilities.

4 The voluntary relocation of physicians from communities where there is an abundance of doctors to areas in acute need of doctors has proved extremely difficult and has not resulted in a solution to the problem.

5 In some communities local medical groups have resisted attempts to relocate outside doctors in their locality.

6 The situation as a whole is not now out of control but unless remedial steps are taken soon it will grow progressively worse. More physicians will be recruited for the armed forces and doctors in critical areas—many of them elderly—may succumb to exhaustion from overwork.

7 Luxury medicine, to which some Americans have become accustomed, is out for the duration. We can no longer afford to call doctors for imaginary ailments, and we must make the best and most efficient use of the medical facilities we have.

8 Medical shortages are not due in all cases to the war, although frequently the war has intensified them. For instance, many rural areas have never had a sufficient number of doctors. It is not the purpose of this report to recommend that long-standing problems be solved in time of war except as they relate to our progress toward victory.

## PLACES VISITED BY OWI REPRESENTATIVES

One of our American traits is "doing the best we can with what we have." This is exemplified in a number of communities visited by OWI representatives. Faced with the possibility of

getting along with too few physicians or with none at all, these communities initiated classes in home nursing, they established health centers presided over by trained nurses, they taught infant care to mothers, they encouraged health building activities, through the local chapters of the Red Cross, nurses were supplied when doctors were not available.

One of the first places visited by OWI representatives was on the outskirts of a great aircraft plant near a large Atlantic seaboard city. Originally this community was a small country village about 12 miles from the center of the city. When the aircraft company went into war production, the whole area became a hive of hurrying humanity. As the village itself could not expand to meet the housing shortage, four trailer sites, with 1,500 trailers housing some 5,000 persons, were established. Many of these trailers are homelike, with tiny gardens and fences around them. There is also a housing project, which is being rapidly opened up. The total population for the area is approximately 25,000 and is increasing daily. The natural result of this mushrooming was a doctor shortage particularly of general practitioners and obstetricians. Something had to be done to provide medical care for these thousands of war workers and their families, in the trailer camps living conditions were especially precarious. A committee consisting of nearby doctors and the county health officer was organized to recommend ways of relieving the situation. There were six doctors living within the immediate area. Four left but were replaced. The committee arranged for nine others nearby to be on call. For three of these it meant setting up new offices in the district. There are, therefore, fifteen doctors now available all of whom do obstetric work. If it is possible women about to have children are sent to their home communities. If this is not feasible they are delivered in the trailer, or, if the case is complicated they are taken to a hospital in the neighboring city. A specialist in obstetrics has recently opened an office in the area and takes cases on a consulting basis when they are referred to him by the local doctors. A trailer has been fitted up by the local doctors at their own expense to serve as a general office. This has some surgical equipment and each doctor has office hours one day a week. The telephone numbers of all fifteen doctors—the six in the area and the nine from nearby—are posted in all the outdoor telephone booths of the trailer camp and in the project manager's office.

One of the difficulties in this section is that of persuading the people—many of whom come from sparsely settled rural areas—to seek medical care when they need it. Some of them have a distrust of doctors. A public health nurse has been assigned full time to the trailer camps, and one of her jobs is to try to overcome this prejudice. She also does follow up work for the doctors, checking to see that directions are being carried out, giving advice on child feeding and care, arranging for x-ray examinations and in general being a mother confessor for the family. Many problems of this community still remain to be solved. Postpartum care is one of them. But at least effort has been made to coordinate medical facilities as effectively as possible.

There are many regions where conditions have not been improved. The OWI found sections where there was only one doctor to 5,000 or 6,000 persons with people frankly apprehensive over what might happen if any number of them became ill at the same time. They found doctors literally working themselves sick attempting to care for the scores of new patients brought to them by a swollen war industry area. They found places—such as a huge bomber plant on the outskirts of a large Middle Eastern city—where the thousands of persons living in trailers have no sewerage system, where sanitary facilities are inadequate and where there is a possibility of drinking water contamination. They found areas where reports by authorities as to the adequacy of medical care and the number of doctors available were completely misleading. One community near the Canadian border—present population 24,000, an important shipping center and adjacent to an Army encampment and several airfields—was reported as having eighteen doctors. Actually but six of these are effective, the others being too ill or too old to continue full time duty. The only surgeon in the community was recently commissioned for service in the Navy. All the

obstetric work is being done by one young doctor crippled by arthritis and heart trouble, who lately had cataracts removed from both eyes. Despite these ailments he is carrying on to the extent that he is actually endangering his life.

In another county on the West Coast, near a navy yard there has been an increase in population from 44,400 in 1940 to 110,000, and during 1943 it is expected that 25,000 more persons will move into this area. The present ratio of doctors is one to 4,000, not including the Navy personnel, who are cared for by Navy physicians. The hospital situation is critical revolving around antiquated equipment, one hospital having 108 beds and another, a private hospital, 18. The larger hospital is selecting some cases for treatment and turning away others equally in need of care. Hospitals in neighboring cities are high priced, crowded and reached by a long ferry or automobile ride. There are eight hundred trailers in this area. People living in them are having a difficult time keeping warm and protecting themselves against insanitary conditions. There are also housing projects where 6,000 people live, eventually 7,500 more people will live there in new projects. But regulations limit occupancy to war workers, and there are many workers essential to the community—such as bus drivers, grocers and policemen—who are not eligible for the project houses. Many among the several thousand women employees of the nearby navy yard, unaccustomed to performing manual work, have developed ailments which, although in most cases minor, demand treatment. Yet Navy doctors and the Navy hospitals are authorized to extend routine medical care only to male industrial casualties; women are treated only in emergencies. In all other cases they are expected to find their own doctor and go to the local hospital.

In one large Middle Western city it was found that a serious situation was relieved by the success of the county medical society in persuading outside doctors to come there. The site of important war plants with consequent increase in population, the city in some sections has a ratio of only one doctor to 5,000 persons, although the total ratio is one to 1,170. The county medical society journal carried appeals to physicians to settle in this city, with the result that four already have done so and two more are arriving in the near future. Two doctors who were recruited by the Army have been allowed to return to private life and their resumption of practice will further help the situation.

#### RELOCATION

Relocation of doctors to areas in need is never a simple procedure. Rural areas where there were too few doctors before the war were usually in low income sections which had never been able to support a doctor properly. Physicians are not willing, for the most part, to leave lucrative practices to move to such areas, the difficulty of finding modern housing for their families frequently adds to their hesitancy in relocating. Doctors who already have gone to war sometimes—and quite understandably—show a definite antipathy to permitting outside doctors to come into their home communities and take over their practice. This is illustrated by a petition from members of a county medical society in a Southern state who are now with the armed forces. The petition reads in part:

We, having abandoned our homes and practices for service in the armed forces of our country, believe that we have the right to demand protection of our practices and do therefore petition that any doctor under 45 years of age moving into County immediately be put on the available list and quickly inducted into the service.

This system, whereby a physician is "put on the available list and quickly inducted into the service" after being declared not essential to his community by the Procurement and Assignment Service is one method for obtaining doctors for the Army and Navy. It is a system which, in combination with other factors, has resulted in too many doctors being taken from some sections and not enough from others. The U. S. Public Health Service can, under certain conditions, send physicians as commissioned officers into areas of need. Usually this action follows a disaster such as fire, flood or epidemic. In the present emergency the Public Health Service has sent three physicians and one dentist into critical areas. There are however no more funds available to the Public Health Service for this purpose. One of these physicians may have to be withdrawn because of budgetary restrictions. An added difficulty found in a number

of instances by the OWI is the disinclination of medical groups to allow a physician paid by the Public Health Service to practice medicine in a particular community.

The system in use at present to apportion doctors between the armed forces and the civilian population is inadequate. This system was set up in October of 1941 with the creation of the Procurement and Assignment Service, a committee of four doctors and one dentist, in the Office of Defense Health and Welfare Services. This committee, which was transferred to the War Manpower Commission the following April, was charged with supplying doctors for the armed services while maintaining an adequate supply for the civilian population.

The Procurement and Assignment Service works through state and local committees of leading doctors whose responsibility it is to declare doctors of military age either "essential" to their communities or available to the armed services. Procurement and Assignment has no authority either to assign a doctor to the armed forces or to keep him in practice in his home community. At present however neither the Army nor the Navy will grant a commission to a physician until that physician has been declared not essential to his community by Procurement and Assignment.

On April 21, 1942 the War Manpower Commission announced that the Procurement and Assignment Service had started its machinery to secure sixteen thousand physicians for the armed forces before the end of 1942 without weakening the medical structure for civil and industrial population. Of these, five thousand were to be obtained within the next sixty days. In June the goal for 1942 was increased to thirty-five thousand physicians. As the armed forces were enlarged, Procurement and Assignment could not obtain physicians rapidly enough by this voluntary method. The Army in April dispatched recruiting teams through the United States to stimulate recruiting of doctors. These teams recruited at the rate of about one hundred physicians a week. In certain cases pressure was applied to doctors who were reluctant to enter the service. If a doctor was declared not essential to his community by the Procurement and Assignment Service that doctor if within the age limit, was expected to apply for a commission. If he did not apply, his status was reported to the draft board and reclassification recommended. A Chicago physician last January was ordered by his draft board to report for induction into the Army as a private in one of the few such actions in the nation. The doctor had been declared available for military service by the Procurement and Assignment Service, and when he failed to file an application for a commission his draft board was advised by the state Selective Service medical director that he could be taken. Three deferments were granted the doctor after he reported for induction and subsequently he filed for a commission.

Usually doctors needed no pressure to enlist in the service of their country. They went because they felt it was their duty. These voluntary enlistments combined with urging by Army recruit boards resulted in severe depletion of physicians in some areas. Especially was this true of the South and of small rural communities the very places which needed their doctors most.

#### THE QUOTAS OF VARIOUS STATES

A quota was set in each state for the recruiting of doctors, and the states were not supposed to go beyond these quotas. In many cases they did. Procurement and Assignment committees in two Southern states were not even aware of their quotas until they were oversubscribed. Another factor in uneven withdrawals was the failure to establish the quotas until after the Army recruiting teams began their work of urging doctors to accept commissions. As of Dec. 1, 1942 thirty-eight states and the District of Columbia had gone over their quotas. Alabama went 109 per cent over, Arizona 64 per cent over, Arkansas 27 per cent over, Colorado 28 per cent over, Delaware 59 per cent over, the District of Columbia 4 per cent over, Florida 23 per cent over, Georgia 54 per cent over, Idaho 73 per cent over, Illinois 2 per cent over, Indiana 35 per cent over, Iowa 27 per cent over, Kansas 23 per cent over, Kentucky 70 per cent over, Louisiana 118 per cent over, Maine 32 per cent over, Maryland 14 per cent over, Michigan 50 per cent over, Minnesota 5 per cent over, Mississippi 63 per cent over, Missouri



15 per cent over, Montana 22 per cent over, New Jersey 18 per cent over, New Mexico 129 per cent over, North Carolina 65 per cent over, North Dakota 14 per cent over, Ohio 24 per cent over, Oklahoma 35 per cent over, Oregon 24 per cent over, Pennsylvania 5 per cent over, South Carolina 76 per cent over, South Dakota 41 per cent over, Tennessee 73 per cent over, Texas 57 per cent over, Utah 21 per cent over, Virginia 42 per cent over, Washington 40 per cent over, West Virginia 61 per cent over and Wyoming 71 per cent over. Nine states as of Dec 1, 1942 were under their quotas. California, Connecticut, Massachusetts, Nebraska, Nevada, New Hampshire, New York, Vermont and Wisconsin. Rhode Island had just 100 per cent of its quota. The Procurement and Assignment Service has announced that recruiting of physicians for the armed forces during 1943 will take place only in those states in which no over-all shortage of physicians exists.

As far as relocations are concerned, the Procurement and Assignment Service is now doing what it can under the handicaps imposed. On December 15 last a statement by Procurement and Assignment contained this: "Procurement and Assignment Service cannot, in all probability, secure on a voluntary basis all the physicians required for private practice, for industry and for staffs in institutions and agencies. Oftentimes where the need is most acute the conditions of practice are not attractive financially or otherwise. Physicians will neither seek nor be sought by some communities where, nonetheless, medical services are needed. Under such circumstances it may be necessary to invoke compulsion." Thus far, no means of invoking that compulsion has been devised.

There are five categories in the manpower pool from which doctors can be drawn to assist the relocation process. Those possibly available are (1) physicians in communities which can 'make do' with fewer doctors, (2) interns and residents with physical disabilities which prevent military service, (3) physicians who have retired from practice but are willing to resume, (4) women doctors and (5) refugee doctors.

The Public Health Service has estimated that there are some eight thousand women physicians in the country, none of whom are at present eligible for military service. Some of the women doctors, of course, are not in practice. There are approximately six thousand refugee doctors in the country, several thousand of these are licensed to practice in the states where they reside. Because they are not citizens of the United States, they are not permitted now to accept commissions in the Army or the Navy.

Procurement and Assignment last December and January held meetings throughout the country in an effort to get doctors to relocate voluntarily to areas of need. It reported three hundred and forty physicians relocated through its efforts during 1942 and two hundred and forty seven relocated by other means.

England in the early days of the war depended, as we do now, on voluntary relocation. England now has authority to send physicians where needed on recommendation of the Central Medical War Committee, although so far doctors generally have relocated without compulsion. It should be pointed out that England—unlike the United States—has a sweeping manpower law which gives the government power to require all persons to 'place themselves, their services and their property at the disposal of His Majesty.' Thus the minister of labor may direct any person of any age to perform any service which that person is capable of performing.

Because of our federal system and the individual laws of the separate states, the problems of relocation in this country are somewhat more involved than in Great Britain. Normally a physician from one state cannot practice in another without passing that state's medical tests. There are exceptions, such as reciprocal agreements, practice by Public Health doctors under federal commission, and enactment by state legislatures of a law permitting out of state physicians licenses which would expire with the end of the emergency. Such a law has been recommended by Procurement and Assignment to state legislatures for enactment when necessary. Very few legislatures have taken action.

The personal element is also important in attempting relocations. Not only do people become accustomed to a particular doctor—"and he's the only doctor who really understands my condition"—but doctors also become attached to communities.

It is hard for a physician long established in one place to uproot himself and his family and go to another in greater need of his services. The only answer to this is, of course, that in war many things are hard for many people but they have to be done just the same. One fact which should be realized is that "luxury" medicine is out for the duration. Doctors will have to restrict their attentions to those actually in need of them, and patients must no longer insist on one particular "favorite" physician.

The problem of medical care in rural regions is quite different from the problem in cities or in large industrial areas. This is recognized by Procurement and Assignment, which has set smaller quotas of physicians for the armed forces in states whose population is distributed over many miles. Unfortunately, in many of these very states recruitment of doctors has been beyond the quotas established.

#### A COMMUNITY IN A SOUTHERN STATE

A typical case history of a rural community expanding under war industry with consequent intensification of medical shortages was found in a Southern state. In considering this example, as well as in considering other examples, it should be remembered that areas investigated were those where doctor scarcity had been specifically reported. The people of this community before the war were tenant farmers living in poverty. The several textile mills were, for the most part, closed during the depression years. Tuberculosis is prevalent. The manager of one of the textile mills said "The people around here have no vitality." Before the war this community had a population of approximately 40,000 and was medically undersupplied. Now the textile mills are going full blast and a large chemical warfare and an ordnance plant, supervised by the government, have located on the outskirts. There has been a huge influx of workers who are living in crowded and sometimes insanitary conditions. The population has increased to roughly 55,000. With this increase of more than 35 per cent there has been a decrease of one third in the number of effective doctors. Four went into the Army and one died recently. There is now approximately one doctor to each 3,200 persons. Of those available at present, three are 65 years old or older and one is ill and capable of only part time practice. The health department in this community has undertaken a drive to establish sanitary conditions in the most crowded sections; many of the houses have never had toilets or running water, and workers are being jammed into shacks and abandoned stores for lack of other accommodations. As more workers move in and fatigue reduces resistance to disease, the situation may become more serious. A responsible doctor in this community told the OWI that although the doctors were very much overworked he would be reluctant to bring in "outsiders." Asked about the possibility of using women doctors, he said they "might be willing to try one." When the question of refugee doctors was brought up, the doctor replied "Absolutely not. We will not have those men coming in here, taking the places of our men in the Army."

A number of doctors questioned were against allowing refugee physicians to practice in their communities, despite the obvious need for additional medical care.

One area visited in the Middle South has a population of 12,000 and at present is entirely without a doctor. The nearest hospital—a small private one—is 20 miles away. Twenty years ago the country thereabouts was swamp and thicket. A big drainage project opened up the county and brought in land speculators. The population has increased 700 per cent in the past twenty years. Most of the inhabitants are cotton farmers. The one doctor who had been serving this entire area was recently declared nonessential to his community by Procurement and Assignment. He therefore applied for a commission as a doctor in the Army and was accepted. Before he left, however, he brought another doctor—a friend—to this community. The man was 28 years old and within a few months he also was taken by the Army.

The people of this community have tried all possible ways to get their original doctor released by the Army, but without success. They have appealed to Procurement and Assignment for a doctor willing to relocate there but none has been found. The area would not attract the average doctor. There is no



hospital, no nurse. The rough roads make travel most difficult. Frequently the regular physician before he was called to the Army, went on a night call riding on a tractor. For childbirth cases this doctor carried a folding delivery table. His wife, a trained nurse, went with him. For a clinic he had a small four room brick building next to the drugstore on the main street, of which he was as proud as another doctor might be of the finest metropolitan hospital. Now the clinic is deserted. In the small waiting room dust lies thick on the oak desk and the chairs. The examining room with its operating table, baby scales and enamel cupboard is covered with dust. The druggist next door is doing his best to carry on. Now he practices emergency medicine, for there is no one else to do it. "I may go to jail for this," he says, "but somebody has to take care of the people." The mayor of the town is standing by him—not only standing by, but helping when he has to. The night before the OWI representative visited the town a man came into the drugstore with a deep head wound. The druggist poured on iodine and pasted the gash together with adhesive tape. Another night a woman was brought in severely lacerated and bleeding profusely. The druggist got his friend the mayor and together they did what they could, keeping life in the woman until she could be taken to the hospital 20 miles away.

Rural regions which are not defense areas are finding it very difficult to obtain doctors. This particular section is not classed as a defense area, as short staple cotton is not considered a war commodity. The cities in this state are fairly well supplied with doctors and fourteen doctors have been relocated, four of them in communities where there are factories making arms and ammunition. The state Procurement and Assignment chairman has received a number of applications from doctors willing to go into war plants as industrial physicians, where they would work eight hours a day for a fixed salary. But there are few applications for relocation to rural districts, where a doctor may have to ride to his patient on a tractor.

A similar problem was found in another Southern state. In a county with a population of some 15,000, the only industry is cotton textile manufacturing. There is no war industry and no increase in population, therefore, under the present system, this section is unlikely to get emergency aid. Yet the situation here is desperate. In 1941 this county had six doctors. Three of these were taken by the Army. One of the doctors still there is 74 and suffers from a disability which limits his practice to ordering prescriptions over the telephone from druggists. Of the two doctors remaining one lives on the far eastern side of the county. On the other falls practically all the medical work of the area. He averages about three hours' sleep a night. He tells prospective mothers quite frankly that he will do the best he can for them but he cannot promise to be on hand in a crisis. In 1 case when arrangements had been made long in advance the doctor arrived three days after the birth of the child.

The women of the county take courses in home nursing and nutrition. They are doing the best they can. Through the state Procurement and Assignment the manager of the cotton mill secured the names of eleven doctors who had signified their willingness to be relocated. The manager wrote to all of them pointing out that the doctor would have charge of the mill's medical service as well as private practice and could make a minimum of \$8,000 his first year there. Only one of the eleven answered—a young man who had just finished his internship and had been rejected by the Army. He paid the county a visit. For a time hope rose high among the residents. Then one day the mill manager received a letter. Because of the lack of hospital facilities in the county the young man had decided to locate elsewhere. They are still trying to get a doctor.

#### A NEED FOR GENERAL PRACTITIONERS

The age of specialization in medicine also has had an effect on doctors who might be available for relocation. OWI representatives discovered time and again a need for general practitioners even in cities otherwise well supplied with doctors. In some cities it was found that the actual ratio of physicians to population was well within the one to 1,500 ratio established as a guiding figure for the nation as a whole and yet there was in reality a medical shortage because of a lack of

general practitioners many of whom were taken by the armed forces.

Brig Gen Larry B. McAfee, assistant to the Surgeon General of the Army, has stated that 65 doctors for each thousand soldiers is the lowest ratio the Army feels is consistent with efficiency. The ratio as of last December was slightly less than 8 per thousand.

As of Sept. 30, 1942, there were considered to be 135,932 effective physicians in the United States. The total number of physicians was 179,039, but some of these are of advanced age, are suffering from physical disabilities or for other reasons are not practicing. There were on active duty with the Army 31,400 with the Navy 6,104 and in the U. S. Public Health Service 1,069, a total of 38,573. Since Sept. 30, 1942, the date of this estimate, additional doctors have been enlisted. Procurement and Assignment has estimated that if the ratio of one physician to each 1,500 persons in the country is preserved—and this ratio is simply a measuring stick susceptible to variations—the maximum number of physicians who can be withdrawn from civil practice during 1943 is 11,455.

In a number of communities investigated groups of nurse's aides—patriotic townswomen who are trained to perform simple nursing duties in hospitals and clinics and thus relieve registered nurses for more important work—were of distinct help in relieving a nurse shortage. These women, many of them housewives, give patients baths, take temperatures, serve meals and carry out other routine duties which otherwise would occupy the time of a regular nurse. Efforts are being made in other communities to recruit more women for this work. As additional nurses are called for service with the armed forces, the work of these nurse's aides is becoming increasingly important.

Besides this method of alleviating the situation the OWI found many instances of "making do with what we have." These include posting the names of available doctors in prominent places, agreements among certain doctors to be on call during alternate periods of the day, teaming of doctors particularly in rural areas, so that a doctor nearest a patient will take a call, creation by doctors of an alternating system for night calls so that at least one doctor will be on duty at all times, establishment of group clinics. Public health nurses are helping with baby deliveries, doing follow up work for doctors and educating the public in child care and other health programs. Newspapers in many localities periodically campaign for public cooperation in conserving doctors' time.

In one community near a huge Army encampment this "make do" plan has been unusually successful. The situation here was similar to many others found to exist around large military training centers. Thousands of women and children, the families of soldiers and civilian workers at the camp, have invaded the area creating serious problems of housing, sanitation, water supply and eating facilities in addition to the problem of medical care. In this particular area, in which the fort is permanent but has been vastly expanded, the population of the county has increased from 26,604 in 1940 to about 40,000. There are thirteen doctors practicing in the county, nine of them in the most thickly settled area around the post. Although the ratio is roughly one doctor to 3,000 persons, this is deceptive. Eight of the thirteen doctors are 60 years old or over and one of them is 80. Four of the eight practice only half time or less. Families of service men and of civilian workers have not been eligible for medical care at the post since October 1942.

A housing development adjacent to the post has for some time been seeking a doctor but in vain. Recently this community decided to take things into its own hands. It advertised in the Army post newspaper and on the post bulletin board for registered nurses. Three responded—wives of army officers. The community hired two of these and set up an emergency aid station with the aid of Army Emergency Relief funds. The nurses have office hours twice a day, make house calls and hold a baby clinic once a week. Last December they handled 892 calls—520 at the clinic and 366 in homes. Forty-five of the calls were at night. Twenty cases were referred to a doctor obtained from another community. In the beginning supplies and equipment were lent by the post medical authorities and transportation for the nurses was supplied by the

Red Cross. Now the community is providing both out of its own funds. Plans are under way to enlarge the service by opening another emergency station and hiring the third nurse. The community still hopes that a doctor will relocate there.

#### THE GROUP PLAN

Prepaid insurance for doctors care is being utilized by thousands of war workers particularly on the West Coast, where there are areas as critically in need of doctors as anywhere in the United States. Before the war began medical societies of two West Coast states were supporting group plans for industrial workers group plans which have proved increasingly beneficial as population figures grew. Doctors throughout these states who cooperate in the plans are assigned to care for groups of individuals and are paid by funds from the association.

The group plan in one of these states is proving especially capable of adapting itself to the rapidly changing needs of the population. Before the war medical insurance was provided for industrial workers and farmers. Now this has been extended to take care of residents of emergency housing projects. It was found that many housing units had been located in regions where the available doctors were already taxed to the limit of their endurance where the distance from the project to doctors offices was too great and where most residents were migrants unable to work out their medical care problems in new surroundings without help. For such 'mushroom' communities the statewide physicians' service and the Federal Public Housing Authority have cooperated in a plan which brings onto the grounds of the housing project itself a resident doctor, who is paid on straight salary basis and nursing staff. For special care beyond the resident doctors attention, patients are referred to a panel of local physicians who cooperate in the state service program. The plan embraces a wide variety of medical treatment chronic illness hospital treatment antepartum care, childbirth and much more. The FPHA collects dues along with the rents. Thus the medical profession itself has adapted a group care plan to an important war emergency. So far it operates in four large and congested areas of this state where not quite 90 per cent enrollment of housing project residents has been reached. War workers elsewhere in the state may soon be given doctors help under this plan.

Employers holding war contracts have shown widely divergent attitudes toward safeguarding the health of their workers, ranging from complete indifference to highly conscientious and efficient action. Here again the West Coast offers examples of outstanding achievement. One shipbuilder surveyed the medical facilities of the communities in which his yards were to be built just as he surveyed all other facilities which would

affect either his men or his materials and ultimately his production. In some places the local doctors and hospitals seemed numerous enough to care for the incoming workers, but in two districts where a shortage of both doctors and hospitals appeared unavoidable the employer decided to build his own hospital and hire his own staffs of doctors and nurses. Over 100,000 workers in the shipyards which these two hospitals serve pay a fee each week for medical care. This is deducted from wages. Currently nearly 150,000 treatments are given each month by seventy-two doctors and nearly two hundred and fifty nurses. In addition to the two main hospitals and one field hospital first aid stations are operated throughout the yards which provide quick attention to injuries and also offer preventive medicine which considerably reduces the illness rate and the time required away from work for treatment.

The general conclusion drawn from this investigation is that while there is not at present a serious breakdown in the health of the nation due to the doctor shortage there is a probability of slow deterioration of health in communities suffering from medical shortages. Long hours of work in war plants are a contributing factor in health breakdown. The problem of absenteeism in war factories due to illness is a serious impediment to the success of the war.

It is also evident that we can no longer afford to look tolerantly on the scarcity of medical care in rural areas. Farmers have become as important as the man on the fighting front or the man in a shell factory.

Antepartum and postpartum care for mothers has assumed added importance. And as is usual in wartime our birth rate is soaring. These new citizens must be properly cared for as must their mothers, thousands of whom are working side by side with their menfolk in war plants.

The medical situation in this country as a whole is not now serious. It can however interfere with our war production unless we initiate some method of appraising the problem in its entirety and deciding on the best plan for meeting it.

The war has brought many new problems to America and has intensified old ones. Comparisons with what happened to this country during the last war are frequently unavailing for this war is not like the last war. It is infinitely more difficult it involves infinitely more people. It cannot be run successfully on a makeshift basis. Whenever possible problems must be met—and in many cases are being met—before they develop into serious situations. Recognition that a medical problem exists before it reaches the danger stage is all important.

It is recognized that relocation of doctors is not the whole answer to the problem of medical care for the civilian population in wartime. Nurses hospitals clinics nutrition sanitation preventive medicine all play vital parts. To the subjects the Office of War Information may return in a later report.

## MISCELLANEOUS

### PUBLIC HEALTH UNDER HITLER

According to NDZ of January 20 in the *Gesundheitsführung*, the president of the Reich Board for the Fight Against Rheumatic Ailments Prof. Dr. Geronne stresses the great social importance of this work. About 12 per cent of all cases of illness in large enterprises are due to rheumatic diseases. The significance of this from the social point of view is not so apparent in the death rate as in the large number of resulting cases of heart disease. The most important problem is early diagnosis and early treatment of rheumatic ailments. Health insurance societies must be obliged to keep a special register of these cases of illness. It is necessary too to organize large sections in hospitals to deal with cases of rheumatic disease. For the time being it will probably suffice to open three or four of these special sections in each gau, with the object of procuring the best possible early treatment and, at the same time, continuing the training of doctors. The campaign against rheumatic ailments will start with the setting up of these special sections in hospitals in all gau. In addition it will be necessary later on to organize observation centers in suitable hospitals. These will collaborate with the special sections in their practical work. Finally, preventive measures must be extended by

popular enlightenment strengthening resistance promotion of physical fitness care of the teeth and hygienic working and living conditions.

NDZ of January 18 states that in the fight against tuberculosis series of x-ray examinations made with the schirm bildgerät have proved the best means of discovering the persons suffering from this disease. To insure that the scheme is carried out systematically, the Reich health leader has issued an order stating that the examination of the population by means of x-ray series photos will be undertaken by the x-ray sturmtrupp. These examinations include all examinations of the inhabitants of densely populated centers, especially of entire gau towns and kreise. They do not comprise examinations of certain groups of the population which are made by the health offices, or of party formations factory workers and civil servants. The Reich health leader has created within his office a service unit for x-ray series examinations of the people, consisting of party members Drs. Blome, Walter and Hofelder. This service unit will be responsible for the execution of the scheme.

According to Zora of January 5, the government has fixed prices for medicines and will pay the difference between the fixed price and the cost price from the equalization fund.

# ORGANIZATION SECTION

## THE HOUSE OF DELEGATES SESSION

AMERICAN MEDICAL ASSOCIATION, CHICAGO

BEGINNING JUNE 7, 1943

### OFFICIAL CALL

#### TO THE OFFICERS, FELLOWS AND MEMBERS OF THE AMERICAN MEDICAL ASSOCIATION

The regular annual session of the House of Delegates of the American Medical Association will be held in Chicago, beginning Monday, June 7, 1943

In the House the representation of the various constituent associations for 1941, 1942 and 1943 is as follows

Alabama	2	New Hampshire	1
Arizona	1	New Jersey	5
Arkansas	2	New Mexico	1
California	8	New York	19
Colorado	2	North Carolina	3
Connecticut	2	North Dakota	1
Delaware	1	Ohio	7
District of Columbia	1	Oklahoma	2
Florida	2	Oregon	1
Georgia	3	Pennsylvania	11
Idaho	1	Rhode Island	1
Illinois	9	South Carolina	2
Indiana	4	South Dakota	1
Iowa	3	Tennessee	2
Kansas	2	Texas	5
Kentucky	3	Utah	1
Louisiana	2	Vermont	1
Maine	1	Virginia	2
Maryland	2	Washington	2
Massachusetts	6	West Virginia	2
Michigan	5	Wisconsin	3
Minnesota	4	Wyoming	1
Mississippi	2	Alaska	1
Missouri	4	Hawaii	1
Montana	1	Isthmian Canal Zone	1
Nebraska	2	Philippine Islands	2
Nevada	1	Puerto Rico	1

The sixteen scientific sections of the American Medical Association, the Medical Corps of the Army, the Medical Corps of the Navy and the Public Health Service are entitled to one delegate each

There will be no Scientific Assembly of the Association in 1943, but the President-Elect, Dr James E Paulin, will be installed as President in the Ball Room of the Palmer House, Chicago, at 8 p m, Tuesday, June 8, 1943

FRED W RANKIN, President  
H H SHOULDERS, Speaker House of Delegates  
OLIN WEST, Secretary

#### MEMBERS OF THE HOUSE OF DELEGATES

##### A Preliminary Roster of the Legislative Body of the American Medical Association

The list of members of the House of Delegates for the session is incomplete as a number of the state associations are yet to hold their meetings at which delegates will be elected. The following is a list of the holdover members of the House of Delegates and of the newly elected members who have been reported to the Secretary in time to be included

#### STATE DELEGATES

ALABAMA	Charles E Mongan Somerville
Lloyd Noland Fairfield	Walter G Phippen Salem
A. A Walker Birmingham	Allen G Rice Springfield
ARIZONA	Richard H Miller Bo ton
Harold W Kohl Tucson	MICHIGAN
ARKANSAS	Leo G Christian Lansing
Edward E Barlow Dermott	Frank E Reeder Flint
CALIFORNIA	Henry A Luce Detroit
Edward N Ewer Oakland	T K Gruber Eloise
Robert A Peers Colfax	Clude R Keyport Grayling
William R Molony Sr, Los Angeles	MINNESOTA
COLORADO	James M Hayes Minneapolis
John Andrew Longmont	Francis J Savage St Paul
Walter W King Denver	W A Coventry Duluth
CONNECTICUT	A W Ad on Rochester
Thomas P Murdock Meriden	MISSOURI
James R Miller Hartford	Arthur R McCombs Sturgeon
DELAWARE	Warren L Allee Eldon
Laurence L Fitchett Milford	MONTANA
DISTRICT OF COLUMBIA	J H Irwin Great Falls
Henry C Macatee Washington	NEBRASKA
FLORIDA	Roy W Fouts Omaha
Meredith Mallory Orlando	Karl S J Hohlen Lincoln
Edward Jelks Jacksonville	NEW HAMPSHIRE
GEORGIA	Deering G Smith Nashua
Olin H Weaver Macon	NEW JERSEY
William A Mulhern Augusta	Andrew F McBride Paterson
Allen H Bunce, Atlanta	Lucius F Donohoe Bryn Mawr
IDAHO	Thomas A McGoldrick Brooklyn
Edward N Roberts Pocatello	Samuel J Kopetzky New York
ILLINOIS	John J Masterson Brooklyn
Edwin S Hamilton Kankakee	John T Donovan Buffalo
Charles H Phifer Chicago	Frederic E Sondern New York
John J Pflock Chicago	Walter W Mott White Plains
C Henry Mundt Chicago	NEW MEXICO
Rollo K Packard Chicago	H A Miller Clovis
INDIANA	NEW YORK
Don F Cameron Fort Wayne	Louis H Bauer Hempstead
F S Crockett La Fayette	James M Flynn Rochester
H G Hamer Indianapolis	George W Kosmah New York
George R Dillinger French Lick	Thomas A McGoldrick Brooklyn
IOWA	Samuel J Kopetzky New York
Thomas F Thornton Waterloo	John J Masterson Brooklyn
Arthur D Woods State Center	John T Donovan Buffalo
KANSAS	Frederic E Sondern New York
Forrest L Loveland Topeka	Walter W Mott White Plains
J F Hankins City	NORTH CAROLINA
KENTUCKY	William T Rainey Fayetteville
Virgil E Simpson Louisville	Wilbur C Davison Durham
LOUISIANA	OHIO
James O Graves Monroe	George A Woodhouse Pleasant Hill
Leon J Menville New Orleans	Harry V Parvack Cleveland
MAINE	Carl R Steink Akron
Thomas A Foster, Portland	OKLAHOMA
MARYLAND	Walter A Howard Chelsa
Alfred T Gundry Baltimore	OREGON
Thomas S Cullen Baltimore	John H Fitzgibbon Portland
MASSACHUSETTS	PENNSYLVANIA
David D Scannell Boston	Charles G Strickland Erie
Dwight O Hara Boston	Robert L Anderson Pittsburgh
	J Newton Hunsberger Norristown
	William L Estes Jr Bethlehem
	Joseph Scattergood Jr, West Chester
	Alexander H Steward Harrisburg
	Francis F Borzell Philadelphia
	James H Corwin Washington

Walter F. Donaldson Pittsburgh  
Charles H. Henninger Pittsburgh  
Leonard G. Redding Scranton

**RHODE ISLAND**  
Guy W. Wells Providence

**SOUTH CAROLINA**  
Joseph H. Cannon Charleston

**SOUTH DAKOTA**  
Velus J. Nessa Sioux Falls

**TENNESSEE**  
Elbert G. Wood Knoxville

**TEXAS**  
Howard R. Dudgeon Waco  
Alonzo A. Ross Lockhart  
Edward H. Cary Dallas

**UTAH**  
John Z. Brown Salt Lake City

**VERMONT**  
Benjamin F. Cook Rutland

**VIRGINIA**  
Walter B. Martin Norfolk  
J. Morrison Hutcheson, Richmond

**WASHINGTON**  
John H. O. Sher Spokane  
R. L. Zech Seattle

**WEST VIRGINIA**  
Ivan Fawcett Wheeling  
Walter E. Vest Huntington

**WISCONSIN**  
Joseph T. Smith Wausau  
Stephen F. Cravin Fond du Lac  
James C. Sargent, Milwaukee

**WYOMING**  
George P. Johnston Cheyenne

**HAWAII**  
F. J. Finlerton, Honolulu

### DELEGATES FROM THE SECTIONS AND GOVERNMENT SERVICES

**PRACTICE OF MEDICINE**  
Fred M. Smith Iowa City

**SURGERY GENERAL AND  
ABDOMINAL**  
Henry W. Cave New York

**OBSTETRICS AND GYNE  
COLOGY**  
Jean Paul Pratt, Detroit

**OPHTHALMOLOGY**  
Arthur J. Bedell Albany, N. Y.

**LARYNGOLOGY, OTOLGY  
AND RHINOLOGY**  
Burt R. Shurly Detroit

**PEDIATRICS**  
William Weston, Columbia, S. C.

**EXPERIMENTAL MEDICINE  
AND THERAPEUTICS**  
O. P. J. Falk St. Louis

**PATHOLOGY AND  
PHYSIOLOGY**  
L. W. Larson Bismarck, N. D.

**NERVOUS AND MENTAL  
DISEASES**  
Henry R. Viets Boston

**DERMATOLOGY AND  
SYPHILIOLOGY**  
Clude L. Cummer Cleveland

**PREVENTIVE AND INDUS  
TRIAL MEDICINE AND  
PUBLIC HEALTH**  
Stanley H. Osborn Hartford Conn.

**UROLOGY**  
Roy B. Henline New York

**ORTHOPEDIC SURGERY**  
J. Archer O'Reilly St. Louis

**GASTROENTEROLOGY AND  
PROCTOLOGY**  
Louis A. Bue Rochester Minn.

**RADIOLOGY**  
F. H. Slinger Kansas City, Mo.

**ANESTHESIOLOGY**  
H. S. Ruth Merion Station Pa.

**UNITED STATES ARMY**  
Jarry L. McFee Washington  
D. C.

**UNITED STATES NAVY**  
Harold W. Smith Washington  
D. C.

**UNITED STATES PUBLIC  
HEALTH SERVICE**  
Warren F. Draper Washington  
D. C.

## OFFICIAL NOTES

### DOCTORS AT WAR

Radio broadcasts of Doctors at War by the American Medical Association in cooperation with the National Broadcasting Company and the Medical Department of the United States Army and the United States Navy are on the air each Saturday at 5 p. m. Eastern War Time (4 p. m. Central War Time, 3 p. m. Mountain War Time, 2 p. m. Pacific War Time). An exception is the Chicago area, where the broadcasts are heard by transcription at 10:30 p. m. (formerly heard at 8 p. m.) Saturdays over Station WMAQ.

The titles and guest speakers for the next four programs are as follows:

April 10 Battle Stations at Home  
Speaker: Col. George Bachr, Chief Medical Officer, Office of Civilian Defense

April 17 Stratosphere Flight  
Speaker: Brig. Gen. David N. W. Grant, Air Surgeon, United States Army

April 24 Sharp Eyes  
Speaker: Lieut. Col. Harold C. Lueth, Liaison Officer, Procurement and Assignment Service, Chicago

May 1 'Jungle Death'  
Speaker: Brig. Gen. C. C. Hillman, Chief of the Professional Services Office of the Surgeon General, United States Army

### BEFORE THE DOCTOR COMES

The American Medical Association program on Radio Station WLS (890 kilocycles) entitled 'Before the Doctor Comes' will be on the air every Thursday morning at 9:45 up to and including May 27. Common home health problems are discussed in an interview program in which Dr. W. W. Bruer, Director of the Bureau of Health Education, is interviewed by Mrs. June Merrill. The titles for the next four programs are:

April 8 What to Do About Cuts and Scratches  
April 15 What to Do About Bad Bumps  
April 22 What to Do About Choking  
April 29 What to Do About Bleeding

## MEDICAL LEGISLATION

### MEDICAL BILLS IN CONGRESS

**Changes in Status**—S. 400 has been reported to the Senate in an amended form with recommendation that it pass, a bill providing for the organization and functions of the United States Public Health Service. One amendment provides that for the duration of the present war and for six months thereafter graduates of reputable osteopathic colleges shall be eligible for appointment as reserve officers in the Public Health Service. S. 495, a bill to establish a Women's Army Corps for service in the Army of the United States, has been reported, with amendments, to the House of Representatives. One amendment provides that physicians and nurses shall not be enlisted in the corps. S. 675 has been reported to the Senate, a bill to amend the Selective Training and Service Act so as to extend the benefits of the United States Employees' Compensation Act to conscientious objectors. H. R. 1857 has been reported to the House with an amendment providing for the commissioning of female physicians and surgeons in the Medical Corps of the Army and Navy. The amendment strikes from the bill the restriction that such female physicians may be assigned to duty only in hospitals or other stations where female nurses are employed. H. R. 1749 has been approved by the President to amend Veterans' Regulations so as to grant hospitalization, domiciliary care and burial benefits to any person who served

in the active military or naval service of the United States on or after Dec. 7, 1941 and before the termination of the present war. H. R. 2218 has been reported to the House, a bill to provide a method for the payment currently of individual income taxes. One section of this bill proposes an additional exemption for persons in military or naval service of so much of his service pay as does not exceed the sum of \$3,500 over the personal exemption.

**Bills Introduced**—The President has submitted to the Congress a supplemental estimate of appropriations for the Public Health Service in the amount of \$2,294,000 for pay of personnel and maintenance of hospitals. S. 897, introduced by Senator Bailey, North Carolina, proposes an amendment to the Insecticide Act providing that any white powder insecticide or fungicide containing arsenic in its elemental form or in any of its combinations, or fluorine in any of its combinations shall, unless deemed unnecessary by the Secretary of Agriculture for the protection of the public health be deemed to be adulterated unless it is distinctly colored in accordance with regulations promulgated by the Secretary of Agriculture. S. 910, introduced by Senator Downey, California, proposes to amend the Social Security Act so as to provide that each state shall have the exclusive right to adopt its own interpretation of the phrases "needy individuals who are blind" and "blind individuals who

are needy" The purpose of the bill is to encourage the states to make more adequate provision for blind persons H J Res 103, introduced by Representative Carson, Ohio proposes the establishment of a Division for the Physically Handicapped in the United States Employment Service H R 2084 introduced by Representative Hagen, Minnesota, would extend the status of veterans of the World War to persons enrolled or enlisted and serving on United States Shipping Board vessels during the World War in war zones H R 2248, introduced by Representative Hare, South Carolina, provides for disability compensation for certain injuries sustained by civil employees of the United States government H R 2251, introduced by Representative Spence, Kentucky, proposes to create a Division of Water Pollution Control in the United States Public Health Service H R 2276, introduced, by request, by Representative Pace, Georgia, proposes an appropriation of \$1,000,000 annually for the duration of the emergency for allotment to the states to promote the development of better diets and an improved nutritional status for the people of the United States H R 2285 introduced by Representative Tolan, California, would establish an Office of War Mobilization and create therein an Office of Scientific and Technical Mobilization to effect the full and immediate mobilization of scientific knowledge, techniques and personnel for the prosecution of the war and for making adjustments necessitated by war conditions

## STATE MEDICAL LEGISLATION

### California

*Bill Introduced*—S 1077 proposes the creation of a state board of naturopathic examiners and defines naturopathy as the treatment of the sick and afflicted by the use of such substances as light, air, water, clay, heat, rest, diet, herbs, electricity, massage, Swedish movements, suggestive therapeutics, magnetism and physical and mental culture Naturopaths would be authorized to execute birth and death certificates and to have the same rights as other physicians to practice under any governmental plan or system created for the purpose of providing medical care or treatment. Approved naturopathic colleges would have the right to receive dead bodies for the purpose of instruction and study in like manner and under the same provisions of law as other institutions

### Connecticut

*Bill Enacted*—S 261 has become chapter 45 of the Laws of 1943 It amends the premarital examination law by providing that the required certificate shall be signed by a physician licensed to practice medicine or osteopathy in Connecticut or in any other state or territory of the United States or the District of Columbia

### Indiana

*Bill Enacted*—S J Res 7 was adopted, February 26 It resolves that the general assembly go on record as urgently requesting the Congress of the United States to pass legislation to establish a pharmacy corps in the army

### Iowa

*Bill Enacted*—S 82 was approved, March 16 It amends the income tax law by authorizing taxpayers to deduct expenses for the medical care of the taxpayer, his spouse or a dependent and defines the term medical care as amounts paid for the diagnosis, cure, mitigation, treatment or prevention of disease or for the purpose of affecting any structure or function of the body

### Kansas

*Bills Introduced*—H 366 proposes to extend the scope of osteopathic practice by authorizing present and future licentiates to administer and prescribe narcotics and biologicals and to register and practice under the laws of the United States governing the administering and prescribing of narcotics Biologicals are defined as medicinal preparations made from animal juices, tissues or serums H 394 proposes to require each applicant for a marriage license to present a certificate from a duly licensed physician certifying that the applicant and the proposed marital partner are, in the opinion of such physician and based on a standard serologic test for syphilis, not incapacitated to marry

*Bill Passed*—H 332 passed the house on March 3 and the senate on March 17 It proposes to require every physician to take or cause to be taken a sample of blood of any woman whom he diagnoses as being pregnant such sample to be taken within fourteen days after the diagnosis is made and only with the consent of the patient

*Bills Enacted*—H 120 was approved, March 10 It excuses physicians in the military service from renewing their licenses annually and prohibits revocation of such licenses during the period of their military service H 121 was approved March 10 It amends the medical practice act by eliminating the requirement that no two of the required four six month periods which must be spent in the study of medicine and surgery may be given within the same twelve months The purpose of this law is to enable graduates of accelerated medical courses to obtain licensure in Kansas

### Maine

*Bill Passed*—S 304 passed the house March 10 To amend the osteopathic practice act, it proposes to authorize approved osteopathic schools to give a course of instruction for a total of thirty-six months within a three to four year period when such school has adopted compressed or accelerated courses as a war emergency measure

### Maryland

*Bills Introduced*—H J Res 20 proposes a request to the legislative council to make a study looking toward the enactment of a law to reimburse nonprofit hospitals for expenses incurred in treating indigent patients suffering from injuries from automobile accidents H 499 proposes the creation of a state board of naturopathic examiners and defines naturopathy as a branch of the healing art embracing the diagnosis and practice of physiologic, physical, mechanical and material methods and agencies of healing The bill would further provide that nothing therein should be held or construed to authorize any naturopathic physician licensed thereunder to use drugs or surgery H 663 proposes to repeal the existing law requiring all children to produce certificates of vaccination before being admitted to any public school

*Bills Passed*—S 339 passed the senate March 16 It proposes to prohibit teachers from receiving into the public schools any child between the ages of 5 and 10 who does not present the certificate of a registered practicing physician of the state of Maryland or of the county health officer that such child has received an inoculation of toxoid or other approved immunizing agent to protect against diphtheria, at least one of said inoculations having been given after the age of 5 years S 360 passed the senate, March 19 It proposes that no persons shall sell, dispense or give away any drug or medicine for the treatment or cure of venereal disease or any sulfonamide drug except on the written prescription of a physician licensed to practice medicine H 524 passed the house March 12 It proposes to require the state department of health to furnish insulin to all residents who are suffering from diabetes and who are unable because of their financial condition to purchase such insulin provided that any person who is financially able to pay for the drug may obtain it from the state department of health at actual cost

### Massachusetts

*Bills Introduced*—H 1382 to amend the law relating to aid to dependent children proposes to authorize payment for medical and hospital care to be made directly to the person furnishing such services in certain instances H 1387 proposes to authorize the department of public health to establish and maintain cancer clinics and to provide therein services and treatment for cancer

### Michigan

*Bills Introduced*—H 250, to amend the crippled children's act, proposes among other things to limit professional fees for major operations to \$75 and to \$200 for any one physician for any one patient in any year H 266 proposes a completely new act providing for the payment of compensation to employees who sustain disabilities from injuries or diseases during the course of their employment H 343 proposes to prohibit any minor from purchasing and any person from selling to a minor any alcoholic beverage except pursuant to a prescription

or a duly licensed physician. H. 359, to amend the premarital examination law, proposes to require applicants for a marriage license to present a certificate of a reputable physician to the effect that such person is free from venereal diseases and is mentally sound. H. 373, to repeal certain sections of the existing law relating to the licensing of pharmacists and to reenact a new law on the same subject, proposes, among other things, that the phrase "practice of pharmacy" shall mean the manufacture, compounding, dispensing, sale or distribution of drugs, medicines or poisons to be used for man or other animal.

**Bills Passed**—S. 113 passed the senate on March 9 and the house on March 17. To amend the medical practice act, it proposes to authorize the Michigan state board of registration in medicine to suspend in whole or in part the educational requirements prescribed by the act at any time during the state of war now existing between the United States and various other nations. S. 192 passed the senate on March 9 and the house on March 17. To amend the osteopathic law, it proposes to authorize the Michigan state board of osteopathic registration and examination to modify, by order, the educational requirements prescribed by the present act, during the present emergency. H. 264 passed the house, March 11. It proposes that, where persons entitled to hospital service under a contract for such service are unable to obtain admittance to any hospital because of lack of facilities or accommodations, such contract may provide a method by which such persons may be reimbursed in whole or in part for the expense of nursing and other nonmedical care restricted to the equivalent of hospital care required from the illness or injury entitling such person to hospital service. H. 277 passed the house, March 20. It proposes to prohibit druggists and pharmacists from selling barbituric acid and any of its derivatives, chloral hydrate or paraldehyde except on prescription of a licensed physician, dentist or veterinarian.

#### Minnesota

**Bills Introduced**—S. 703 proposes to amend the law prohibiting any county official or deputy or clerk or such official from being directly or indirectly interested in any contract work, labor or business to which the county is a party or in which it may be interested in the furnishing of any article or the purchase or sale of any property or of which the construction, price or expense is payable from the county by excepting therefrom county coroners, their deputies or county physicians, for medical services performed by them for indigent persons receiving public relief or in appearing in insanity or incompetency hearings. S. 764 proposes to prohibit any persons from practicing or holding themselves out as practicing the Sister Kenny technique of treating infantile paralysis without first being authorized so to do and further proposes that any registered nurse who has received at least two years' additional training in an accredited institute or hospital using such technique may, on receiving a degree from said institute or hospital, engage in such practice. S. 825 to amend the law relating to coroners, proposes that any coroner or deputy coroner who is a duly licensed and registered physician and surgeon shall not be disqualified from rendering medical care or hospitalization to a recipient of public relief, from being appointed an examiner in insanity or incompetency hearings or from being compensated therefor. H. 334 proposes to authorize licensed insurance companies to write policies to insure against loss or damage for medical, hospital, surgical or funeral expense. H. 362 proposes to prohibit the operation of a nursing home, convalescent home and rest home for hire without being authorized so to do by the commissioner of charities and corrections. H. 578 and S. 581 propose to authorize any subordinate lodge of a fraternal organization to provide medical services for members and their families and to contract with physicians to perform such services. H. 718 and S. 564 propose to transfer from the director of social welfare to the director of public institutions all powers and duties respecting mental hygiene work. H. 935 proposes to amend the law requiring corporations to be licensed before being authorized to operate a hospital nursing home or

the like by including municipal corporations, and all state subdivisions, departments, boards and agencies. H. 979, to amend the law relating to the fees of coroners, proposes that physicians called by the coroner to make an autopsy shall be allowed a fee of \$15 per day plus mileage and that a coroner or deputy coroner who is a duly licensed physician and surgeon shall not be disqualified from rendering medical care or hospitalization to a recipient of public relief, from being appointed an examiner in insanity or incompetency hearings, or from being compensated therefor. H. 985 proposes to transfer from the director of public institutions to the director of social welfare all powers and duties with reference to the state sanatorium for consumptives.

**Bill Enacted**—H. 273 has become chapter 121 of the Laws of 1943. It provides that physicians in the armed forces shall not be required to renew their annual licenses during the term of such service and shall be exempt from payment of all renewal fees.

#### Montana

**Bills Enacted**—S. 63 has become chapter 102 of the Laws of 1943. It authorizes certain institutions of higher learning in Montana to obtain custody of unclaimed human bodies for use in the teaching and demonstration of anatomic science by professional instructors. S. 97 has become chapter 106 of the Laws of 1943. It relieves physicians in the military service of the United States from paying annual license fees during the period of such service. H. 91 has become chapter 125 of the Laws of 1943. It authorizes the creation of a division of Dental Health under the supervision of the state board of health, the director to be a regularly licensed dentist who shall have had at least one school year of training in an accredited school of public health and the duties of the new division shall be the development and promotion of those activities which result in the protection and improvement of the dental health of the people of the state. H. 118 has become chapter 132 of the Laws of 1943. It amends the medical practice act by authorizing the board of medical examiners to prescribe and enforce reciprocity requirements current with changes in standards of the practice of medicine and surgery. H. 128 has become chapter 126 of the Laws of 1943. It authorizes state, county and local health officers to detain and examine prostitutes and females suspected of engaging in promiscuous sexual intercourse who are infected or thought to be infected with a venereal disease and to require such persons to report for treatment until cured. Such examinations may be repeated as often as deemed advisable or desirable. H. 134 has become chapter 225 Laws of 1943. It amends the law relating to the state board of health by increasing the membership thereof from five to seven, the two additional members to be the president of the Montana state board of pharmacy and the president of the Montana state board of food distributors. It also decreases from five to three years the term of office of the members of such board. H. 245 has become chapter 165 of the Laws of 1943. It amends the law governing insane asylums by providing among other things that it shall be the duty of the hospital medical staff to examine all patients who have curable diseases every six months and to file a written report thereon.

#### Nebraska

**Bill Introduced**—Legislative bill 417 proposes to authorize the board of control to place in the Nebraska Institution for the Feeble-minded any spastic person when on written application and after due investigation the board is of the opinion it is for the best interests of such person. The proposal would further require that a separate ward for spastic persons be provided at such institution.

**Bill Passed**—Bill 40 passed the house, March 23. It proposes to require each applicant for a marriage license to present a certificate signed by a duly qualified physician licensed to practice medicine and surgery in any state or United States territory certifying that the applicant is not infected with syphilis in a communicable stage.

## Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST SUCH AS RELATE TO SOCIETY ACTIVITIES NEW HOSPITALS EDUCATION AND PUBLIC HEALTH)

### ARKANSAS

**Personal**—Dr William H Toland, Nashville, has been appointed health officer for Howard County—Dr Henry E Mobley has been elected a director of the Morrilton Chamber of Commerce—Dr William G Hancock, Rison, has been named health officer of Cleveland County

**State Medical Meeting**—The Arkansas Medical Society will hold its annual session in Little Rock, April 19-20 Dr Rufus B Robins, Camden, is president of the association The program includes the following speakers

Dr John Harry Hayes Little Rock Analysis of Thyroid Surgery  
Dr Merlyn J Kilbury Little Rock, Leukemia and Aleukemic Diseases  
Dr Allie C Kolb Little Rock, Care of the Insane in the State of Arkansas  
Dr Davis W Goldstein Fort Smith Industrial Dermatoses  
Dr Robert L Sanders Memphis Tenn Surgery of the Gallbladder and Common Duct  
Dr John H Musser New Orleans The Doctor's Heart.  
Dr F Walter Carruthers Little Rock New Concepts in the Diagnosis and Treatment of Poliomyelitis  
Dr Louie G Martin Hot Springs National Park A Safe and Sane Method of Treatment in Neurosyphilis

### CALIFORNIA

**New Secretary of California Board of Examiners**—Dr Frederick N Scatena, Sacramento, has been elected secretary-treasurer of the California Board of Medical Examiners He succeeds Dr Charles B Pinkham, Sacramento, who retired on February 1 after thirty years' continuous service to the state (THE JOURNAL, January 23, p 270) Dr Scatena, who has been a member of the board since 1941, graduated at the University of California Medical School, San Francisco in 1914 Dr John R Walker, Fresno, was recently appointed to the board by the governor to succeed Dr William A Swim, Los Angeles, whose term expired

**Arrested for Impersonating a Physician**—Reginald T King was recently arrested for impersonation of an army officer by agents of the federal bureau of investigation, the Los Angeles Daily News reported He was said to be wearing a caduceus on his army uniform at the time of his arrest The report stated that King had "dressed himself up in an army uniform, posed as an officer of the medical corps, went lecturing at a high school, assumed the privileges of a doctor in a hospital attended medical conferences and was very generally accepted" At one time he was a laboratory and x-ray technician in the office of a physician in Vallejo and was listed in the telephone directory as Dr R B King, 327 Georgia Street He is reported to have been arrested for practicing medicine without a license and to have served a sentence of nine months in the Los Angeles County Jail Investigations by the FBI revealed that "he was a doctor at the Naval Pacific Air Base Hospital in Hawaii from June to October 1941," when he was asked to resign On Dec 12, 1941 he was arrested by military police and later sentenced by a military tribunal to prison Court evidence showed that he was not a doctor of medicine but a registered nurse It is alleged that King used many aliases including Theodore King, Theodore Bullock and Reginald Belford King

### FLORIDA

**State Medical Meeting**—The seventieth annual meeting of the Florida Medical Association will be held at the George Washington Hotel, Jacksonville April 15-16, under the presidency of Dr Gilbert S Osmeup Orlando Dr Charles W Roberts, Atlanta will address the first general session on "Medical Stewardship in War and Peace" Dr George Baehr, chief medical officer, U S Office of Civilian Defense, Washington, D C, will speak at the second general session on "British and American Experiences in Civil Defense" Col Sanford W French, M C U S Army will address the third general session on "The Doctor in the War Effort" Reference committees and the house of delegates will hold sessions on Thursday The association dinner will be held Thursday evening and the election and installation of new officers will be held following the third general session on Friday

### GEORGIA

**Conservation of Manpower**—A series of industrial health institutes for the conservation of manpower was held in Augusta on March 11 Savannah on March 12 Atlanta on March 15 and Columbus on March 16 The program was sponsored by the Medical Association of Georgia, the state department of public health and the Associated Industries of Georgia and was designed for the physician, industrial management and industrial labor The local medical society and health department and chamber of commerce cooperated in each institute Among the speakers who participated in the programs were

Dr Thomas F Abercrombie Atlanta Community Health Problems Affecting Industry  
J J Bloomfield, sanitary engineer U S Public Health Service Bethesda Md Wartime Health Problems Within Industry  
Dr Lester M Petrie Atlanta Health Services Available to Industry in Georgia  
A J Schroder II, personnel manager Brunswick Pulp & Paper Company Brunswick Management's View of the Physician's Function in Industry  
W Cicero Kendrick, editor of the Journal of Labor Atlanta Labor's View of Industrial Health  
Dr Lloyd Noland Fairfield Ala Recent Developments in the Handling of Industrial Injuries  
F Ruth Kahl public health nursing consultant industrial hygiene section National Institute of Health Bethesda Nursing Aspects of Health Program for Industry  
J G Williams DDS director of the division of dental health education state department of public health Atlanta Dental Aspects of Health Program for Industry  
Dr Carl M Peterson Chicago secretary of the Council on Industrial Health American Medical Association Medical Aspects of Health Program for Industry  
Dr Raymond Hussey Baltimore Occupational Diseases and Their Control

### ILLINOIS

**Dr Pettit Chairman of Cancer Board**—Dr Roswell T Pettit, Ottawa, was recently elected chairman of the advisory board to the division of cancer control in the state department of public health to succeed Dr David J Davis, dean of the University of Illinois College of Medicine

### Chicago

**The Capps Prize**—The Institute of Medicine of Chicago announces that competition is now open for the annual Joseph A Capps Prize of \$400 Graduates of Chicago medical schools who completed full internship or one year of laboratory work in 1941 or thereafter are eligible The prize is for investigation in medicine or in the specialties of medicine and may also be in the fundamental sciences, provided the work has a definite bearing on some medical problem Manuscripts must be submitted to the Secretary of the Institute of Medicine of Chicago, 80 East Randolph Street, not later than December 31

### KENTUCKY

**Occupational Diseases Now Reportable**—The reporting of occupational diseases is now required by law in Kentucky according to Industrial Medicine Thirty-four diseases in this classification have been declared dangerous to the public health, it was stated

**Doctors Day**—Doctors Day, honoring all members of the medical profession in Kentucky will be observed by the woman's auxiliary to the Kentucky State Medical Association on April 13, giving special recognition to Dr William A McDowell, Cynthiana, author of A Demonstration of the Curability of Pulmonary Consumption in All Its Stages—Comprising An Inquiry into the Nature, Causes, Symptoms Treatment and Prevention of Tuberculosis Diseases in General The book was published in Louisville by Prentice and Weissinger in 1843

### MASSACHUSETTS

**Dr Thorn Given Chancellor's Medal for Achievement**—At the recent graduation ceremonies of the University of Buffalo the chancellor's medal, awarded annually by the university council for outstanding achievement, was presented to Dr George W Thorn, Hersey professor of the theory and practice of physic in the Harvard Medical School and physician in chief of the Peter Bent Brigham Hospital, Boston

**New Health Officers**—Dr Harold W Stevens, Middleboro was recently elected president of the Massachusetts Public Health Association to succeed Dr Henry D Chadwick Waltham, who retired after two terms Other officers include Drs Lawrence Jackson Smith, Springfield, and Charles F Wilmsky, Boston, vice presidents, and Raymond S Patterson Ph D, who was chosen secretary to succeed G Donald Buckner SB, Worcester, who retired on account of his removal to Worcester to become secretary of the Southern Worcester County Health Association Mr Buckner had held the secretaryship since 1934



## MICHIGAN

**Personal**—William J. Burns, LL.B., executive secretary of the Michigan State Medical Society, Lansing, has been appointed a member of the public relations committee of the State Bar of Michigan.—Dr. Wilfrid Haughey, Battle Creek, has been elected editor of the *Journal of the Michigan State Medical Society*, succeeding Dr. Ray H. Holmes, Muskegon, who has entered army service.

**Changes in Health Personnel**—Dr. N. Berneta Block, Lansing, a member of the staff of the state department of health since 1937, has been named director of the Alge-Schoolcraft health department with headquarters in Manistique. Dr. Block succeeds Dr. Jean B. Ruhl-Koupal, who has been named director of health district number one including Crawford, Kalkaska, Missaukee and Roscommon counties.

**Motor Vehicles Lead Accidental Deaths**—Motor vehicles accounted for 1,295 deaths in 1942 out of the total of 3,591 accidental deaths for Michigan as a whole. Although leading the list of accidental deaths, this is the smallest total in this group in the last nine years. Accidents in the home were second in the list of causes with a total of 1,254 deaths. According to an announcement from the state department of health, 366 occupational deaths are listed in the accidental death summary as follows: manufacturing 94, agricultural 81, transport and public utilities 47, extractive industries (others than mining and quarrying) 28, construction 22, mining and quarrying 19, trade 18, clerical and professional service 3 and all others 54.

## MISSOURI

**State Medical Meeting**—The Missouri State Medical Association will hold its annual session in St. Louis, April 18-20, under the presidency of Dr. Homer L. Kerr, Crane. The preliminary program includes the following discussions: the sulfonamides by Drs. Henry L. Barnett, St. Louis, and Walter S. Sewell, Springfield, burns by Drs. Robert Elman, St. Louis, Francis T. H'Doubler, Springfield, and Earl C. Padgett, Kansas City, poliomyelitis by Lloyd R. Jones, Ph.D., St. Louis, Drs. John Albert Key, St. Louis, and Damon O. Walthall, Kansas City, industrial medicine as related to physical examination and industrial hazards by Dr. Edwin C. Funsch, St. Louis, syphilis by Drs. Joseph F. Bredeck and Arthur W. Neilson, St. Louis, anesthesia by Drs. Joseph A. McNearney, St. Louis, and Paul H. Lorhan, Kansas City, respiratory disease by Drs. Robert A. Moore and Henry Pinkerton, St. Louis, and a discussion on transfusions by Drs. Carl V. Moore and Raymond O. Muehler, St. Louis.

## NEW YORK

**Teaching Day on Chemical Warfare**—A teaching day for physicians and nurses on "Medical Aspects of Chemical Warfare" will be held at Syracuse University College of Medicine, April 9. Consisting of a three hour review session with discussion of new developments, the instruction will be presented by the college of medicine in cooperation with the health preparedness commission of the state war council, the Medical Division of the Office of Civilian Defense and the state department of health.

**Commissioner of Mental Hygiene Resigns**—Dr. William J. Tiffany, Albany, has resigned as commissioner of mental hygiene, effective April 1. A graduate of Columbia University College of Physicians and Surgeons, Dr. Tiffany has been in charge of the state department of mental hygiene since 1937. He entered the state hospital service in 1906 and served on the staffs of the Binghamton State Hospital, Binghamton, the Manhattan State Hospital, New York, and the Kings Park State Hospital, Kings Park, of which he was made superintendent in 1926. In 1931 he was appointed head of the Pilgrim State Hospital, Brentwood.

**Program on Plasma Therapy and Blood Transfusion**—Plans have been completed to present to the medical profession of the state the latest information on blood therapy and whole blood transfusion under the auspices of the state medical society, the Office of Civilian Defense, the Health Preparedness Commission of the State War Council and the state department of health. Expenses of the speakers are to be paid by the state medical society and the state department of health. The lectures may be arranged as special single sessions or in connection with formal courses or for a special or regular meeting of county medical societies. The physicians available for lectures and demonstrations attended a meeting on February 26 in the State Office Building, Albany, to hear discussions on plasma therapy and whole blood transfusion.

## New York City

**The Seventh Harvey Lecture**—Dr. Oswald H. Robertson, professor of medicine, University of Chicago School of Medicine, will deliver the seventh Harvey Society Lecture of the current series at the New York Academy of Medicine on April 15. His subject will be "Sterilization of Air with Glycol Vapors."

**Navy Officers Study Hygiene to Protect Workers**—A group of naval officers are studying industrial hygiene for the protection of civilian workers in shipyards, arsenals and other naval stations at the De Lamar Institute of Public Health, Columbia University College of Physicians and Surgeons. The sixteen medical officers will train for three months at Columbia. The course will include the study of the causes of absenteeism, occupational skin diseases, ventilation and temperature, and the hazards present in toxic volatile materials in the manufacture of explosives.

**Postgraduate Courses**—The Long Island College of Medicine and the Medical Society of the County of Kings, Brooklyn, opened a spring program of postgraduate courses in March. Subjects covered by the series include regional anesthesia, allergy, clinical cardiology, electrocardiography and clinical cardiology, gastroenterology, diseases of the peripheral blood vessels, peripheral vascular diseases, diabetes hypertension and nephritis, female sex endocrinology, gynecologic pathology, endocrine diseases and disorders in children and adolescents, diseases of children, cardiovascular roentgenology, x-ray diagnosis, fractures, proctology and urology.

## VIRGINIA

**Annual Spring Graduate Course**—The Gill Memorial Eye, Ear and Throat Hospital, Roanoke, will conduct its seventeenth annual spring graduate course in ophthalmology, otology, rhinology, laryngology, faciomaxillary surgery, bronchoscopy and esophagoscopy, April 5-10. Among the speakers will be:

Dr. Theodore F. Walsh, St. Louis, Prophylaxis and Treatment of Upper Respiratory Infections.  
Dr. John K. Lindsay, Chicago, Management of Acute Suppuration in the Middle Ear and Petrous Pyramid Including Common Complications.  
Rear Admiral Luther Sheldon Jr., medical director U.S. Navy Washington, D.C., Relationship of Otolaryngology to Naval Medicine.  
Dr. Perry G. Goldsmith, Toronto, Commentary on the Relationship Between Accessory Sinus Diseases and General Medicine.  
Lieut. Comdr. Charles H. Best, R.C.N.V.R., Toronto, Physiology in War Medical Research.  
Dr. John R. Richardson, Boston, Applied Anatomy of the Head and Neck.  
Dr. French K. Hansel, St. Louis, Diagnosis of Allergy of the Nose and Paranasal Sinuses.  
Dr. Albert A. Cinelli, New York, Treatment of Recent Fractures of the Nose and Fractures Extending into the Maxillary Accessory Sinuses.  
Dr. F. Bruce Israel, Ann Arbor, Michigan, Surgical Anatomy of the Eye and Adnexa.  
Dr. Peter C. Kronfeld, Chicago, Classification of Glaucoma.  
Dr. George P. Gubor, Chicago, Physiologic Principles Used in the Diagnosis of Motor Disturbances and Their Practical Applications.  
Dr. John M. McLean, New York, Intraocular Tumors and Recent Advances in Their Treatment.  
Dr. Robert J. Masters, Indianapolis, Practical Application of Slit Lamp Microscopy in Routine Practice of Ophthalmology.  
Dr. Albert L. Brown, Cincinnati, Ocular Therapeutics.  
Dr. Ramon Castroviejo, New York, Lid Surgery.  
Dr. Willis S. Knighton, New York, Refraction Routine Procedures.

The annual banquet will be held at the Hotel Roanoke, Tuesday, April 6, with an address by Drs. James A. Babbitt, Philadelphia, and Warren F. Draper, assistant surgeon general, U.S. Public Health Service, Washington, D.C., on "Problems of Current Interest in Public Health and Medical Care for the Civilian Population."

## WISCONSIN

**Registry of Tropical and Exotic Diseases**—Dr. Harry Beckman, professor of pharmacology, Marquette University School of Medicine, Milwaukee, is working on the establishment of a registry of all cases of tropical and exotic diseases such as malaria, Weil's disease, filariasis, relapsing fever, giardiasis, strongyloides dysentery, fluke and rare worm infections, histoplasmosis and endemic flea borne typhus. Any physician reporting such cases to Dr. Beckman will be given credit the information to be placed in the archives of the American Society of Tropical Medicine and prepared as a compilation of cases for Wisconsin.

**Industrial Clinic**—The second postgraduate industrial medical and surgical clinic will be held at the Loraine Hotel, Madison, May 5, and at the Conway Hotel, Appleton, May 6. "Keep 'em Working" is the theme of the clinic as it was for the first one held last November. In addition to the scientific program which has been arranged for physicians a special

program has been arranged for employers, nurses, personnel directors and others interested in industrial health problems. The clinic is sponsored by the council on scientific work and the committee on industrial health of the state medical society and the industrial hygiene unit of the state board of health.

**Distinguished Service Pin Awarded to State Cancer Commander**—Mrs G E Stoddart Beaver Dam, regional deputy commander and state commander of the Wisconsin division of the Women's Field Army of the American Society for the Control of Cancer, was presented with the society's distinguished service pin during its recent meeting in New York. The decoration, which was given for outstanding service during the previous year in the cause of cancer control, is presented annually. Mrs Stoddart is the second Wisconsin woman to be so honored. Mrs Frederick H Clausen, Horicon, was awarded the pin in 1939 in recognition of her efforts in establishing the *Bulletin* of the Women's Field Army of Wisconsin.

### GENERAL

**Dental Association Moves**—The American Dental Association has moved into a new five story building at 222 East Superior Street, Chicago.

**Journal of Aviation Medicine**—With the beginning of volume 14 (February issue) the *Journal of Aviation Medicine* will be published six times a year instead of four.

**Dr Weed Named Chairman of Red Cross Advisory Committee**—Dr Lewis Hill Weed, professor of anatomy, Johns Hopkins University School of Medicine, Baltimore, has been made chairman of the Medical and Health Advisory Committee of the American Red Cross.

**Hospital Standards Bureau Publishes Service Bulletin**—The Hospital Bureau of Standards and Supplies, New York, brought out a new monthly service bulletin in January called the *Bureau News*. The first issue contains announcements concerning threatened food shortages, frozen and dehydrated foods, coffee stretchers and point rationing, discussions on various hospital necessities and consideration of miscellaneous subjects of interest to buyers and managers.

**Women's Work Clothes Standardized**—The American Standards Association has been requested by the Office of Price Administration to initiate a war project to standardize women's work clothes. The request carries the endorsement of the War Production Board and seeks among other things a standard to protect the workers adequately against specific occupational hazards, thus preventing accidents and reducing absenteeism resulting from accidents.

**Cancer Control Month**—President Roosevelt has designated the month of April as "Cancer Control Month" and, in his proclamation on March 22, called on the governors of states, territories and possessions to authorize local observances. The President also asked the medical profession, schools and colleges, press, radio, motion picture industry and all agencies and individuals interested in a national campaign for the control of cancer to spread the knowledge of the early symptoms of the disease and to publish information about the location and function of clinics and other health facilities engaged in the warfare on cancer.

**Survey Shows Opposition to Hospital Plan**—Results of a survey completed by *Hospital Management* reveal overwhelming opposition to the proposed expansion of the Social Security plan to cover hospitalization and a corresponding opinion that the voluntary "Blue Cross" plans can meet the need for hospital insurance. According to *Hospital Management* the survey shows a strong vote in favor of expanding the Social Security old age and survivorship benefits to cover hospital employees and a considerable majority in favor of federal aid to the states for the hospitalization of the indigent as preferable to a federally operated hospitalization plan. The survey indicates that "the doors of the hospital are open to all, regardless of the ability of the patient to pay and regardless of the fact that approximately one out of eight localities has no form of aid to the hospital for such cases. In 7 out of 8 cases some form of aid ranging from tax supported hospitals to payment of a part of the cost to voluntary hospitals, is provided for the care of the indigent sick."

**Response to Requests for Parasitological Specimens**—The Distributing Center for Parasitological Specimens formed under the auspices of the National Research Council and the Association of American Medical Colleges in October 1942, wishes to acknowledge the cooperation displayed by various institutions in sending specimens. Considerable material has been forwarded to the center and is being redistri-

uted to the various medical schools teaching tropical medicine and parasitology in accordance with their requests. The center is located at the Army Medical School, Army Medical Center, Washington, D C, and is operated by the school's department of parasitology and tropical medicine. The center was set up as a collecting and distributing agency for gross and microscopic specimens of value to medical schools needing additional material for the teaching of tropical medicine. The center wishes to acknowledge the following institutions, departments and/or individuals for their generous cooperation in supplying much needed material.

#### Medical Schools

Baylor  
California  
Chicago  
Columbia  
Indiana  
Maryland  
Minnesota  
Missouri  
New York Univ  
Tennessee  
Yale

#### Zoology Departments

U of Calif at Los Angeles  
Iowa State  
Johns Hopkins  
Michigan  
Pennsylvania  
Rice Institute  
Tulane

#### General Hospitals

Letterman

#### Station Hospitals & Service Command Labs

Puerto Rican Dept. Lab  
4th Service Command Lab

#### Other

Army Medical Museum  
Dept of Parasitology AMS  
Med Dept. Prof Service Schls  
AMC  
Virus Lab AMS  
Board of Health Lab Canal Zone  
Bureau of Animal Industry  
National Institute of Health  
New York Public Health Service  
U S Public Health Service

More than 1,200 items had been shipped to fifty-seven institutions on February 12. All shipments are sent as gifts. Major George W Hunter III, sanitary corps, U S Army is in charge of the Distributing Center for Parasitological Specimens.

**Activities of Nutrition Foundation**—The Nutrition Foundation Inc, has authorized grants totaling \$148,550 including \$110,700 for the renewal of twenty-eight projects supported by the foundation during 1942 and \$37,850 for fifteen new research projects. The announcement followed a meeting of the board of trustees at the Waldorf-Astoria Hotel, New York, March 12. The foundation has given \$316,000 in research grants to forty universities since its organization a year ago. Institutions which received new grants were the University of Wisconsin Madison, Harvard University, Cambridge, Mass, University of Toronto, Columbia University, New York University of California, Berkeley, Johns Hopkins University, Baltimore, New York University, Massachusetts State College, Amherst University of Chicago, Yale University, New Haven, Cornell University, Ithaca, Oregon State College, Corvallis, and Oklahoma Experiment Station, Stillwater. Oliver C Carmichael, LL.D, chancellor of Vanderbilt University, Nashville, Tenn, and Dr Frank G Boudreau, New York executive director of the Milbank Memorial Fund and vice chairman of the Committee on Food and Nutrition of the National Research Council, were chosen public members of the foundation, and Dr Virgil P W Sydenstricker, Augusta professor of medicine, University of Georgia School of Medicine, was appointed a member of the scientific advisory committee. The Container Corporation of America, Chicago and the Pillsbury Flour Mills, Minneapolis, were elected founder members. The National Sugar Refining Company, New York, P Duff & Sons, Pittsburgh, R B Davis Company, Hoboken, N J and the Curtiss Candy Company, Chicago, were elected sustaining members. New members of the board of trustees, representing the new members of the foundation, were announced as follows: Ellsworth Bunker, president, National Sugar Refining Company, Walter P Paepcke, president, Container Corporation of America, William H Duff II, president, P Duff & Sons Inc, B E Snyder, treasurer, R B Davis Company, Philip W Pillsbury, president, Pillsbury Flour Mills Company, and Otto Y Schinnering, president Curtiss Candy Company. Among the more important studies in which progress has been made is one carried on by William C Rose, Ph.D of the University of Illinois, Urbana, and bearing on the human requirement of amino acids the "building blocks of proteins," which occur in such foods as milk, meat, eggs and fish. Coincident with Dr Rose's work showing specific amino acids to be essential in human nutrition, Vincent du Vigneaud, Ph.D, Cornell University Medical College, New York has clarified some of the important functions of amino acids in the human body, following earlier studies on the effects of these same acids on experimental animals. Other studies in which excellent progress has been made include the problem of supplying fats to the armed forces in all sections of the world on nutrition problems relating to aviation and desert warfare and on the effect of extremes of environment on nutritional requirements.

## Foreign Letters

### LONDON LETTER

(From Our Regular Correspondent)

Feb 20 1943

#### Stamping Out of an Imported Outbreak of Smallpox

Smallpox has been stamped out of this country, but cases arrive from time to time from other countries. A ship from Bombay and Capetown docked on May 29 at Glasgow with 1000 passengers and 200 crew. A sick engineer was found to have confluent smallpox which proved fatal. All on board were immediately vaccinated but on June 23 another 7 of the crew, 2 passengers and a contact medical officer had developed the disease. This was disappointing for in 5 of the cases vaccination must have been done early in the incubation period—between the first and fifth days—when it usually confers protection. On the other hand, smallpox did not attack any of the 163 members of the crew who had been vaccinated on a previous voyage in 1940. Of those attacked 1 was a Polish officer who had been vaccinated nine years previously for the third time, while the medical officer, aged 34 had been vaccinated in infancy. The other 8 had never been vaccinated.

The sequel was alarming. From June 26 onward, cases of smallpox cropped up in different parts of Glasgow without any apparent connection with the ship or with one another. At first only the usual precautions were taken: contacts and neighbors were kept under surveillance and were offered vaccination so as to form a cordon of protected persons round each focus of infection. But the foci multiplied and the situation was deemed so serious as to require vaccination on a large scale. Twenty-five vaccination stations were opened, to which 282,255 persons came in the first week of July. Including those attending private physicians it is believed that half a million were vaccinated during the month.

In view of the virulence of the infection, which was fatal in 6 out of 25 cases, the usual single stroke method of vaccination was abandoned for three strokes  $\frac{1}{8}$  inch long and  $\frac{1}{8}$  inch apart. It was also felt that unless there was a history of recent vaccination a single unsuccessful attempt should not be taken as evidence of immunity and vaccination was repeated if no reaction was seen within four days. These comprehensive measures were successful. The 21 apparently primary cases gave rise to only 4 secondary ones and by July 31 the outbreak had ceased.

The Glasgow health officer points out that much would be gained if ships' doctors could diagnose smallpox at once and vaccinate all on board. But it is still better to immunize before the disease breaks out, and he holds that all passengers and crews from Eastern ports should be vaccinated as a condition of travel.

#### American War Blinded to Be Cared for at St Dunstan's

The institute for those blinded in the war known as St Dunstan's was founded twenty-five years ago by Sir Ian Fraser, who was blinded in the first world war and has presided over its activities ever since. His recollection is that fear of blindness is the worst part of eye injuries. It is an economic fear and a fear of loneliness and dependence. To avoid this reaction any one whose eyes are seriously damaged should go to St Dunstan's which is a training center where they will see others who have overcome the handicap of blindness incurred in the first world war. They act as instructors in braille, type-writing, shorthand, massage, joinery and other handicrafts. Living in a world of the blind the newcomers soon begin to concentrate on the things they can do and forget the things they cannot do. They are amazed at the variety of occupations open to the blind. They quickly learn to read, write and get about by themselves. Not all those admitted become blind.

St Dunstan's has a hospital and half the patients admitted have left after a few months' treatment with vision sufficiently restored to go back to military or civil life. St Dunstan's has, with the consent of the German authorities and with the help of the Red Cross, established a school in Germany for blinded British prisoners of war. It has been arranged that American blinded in the war are to be admitted to St Dunstan's.

In a luncheon at St Dunstan's Sir Ian Fraser said that in this war presumably owing to the increased use of armor in tanks and planes, fewer men were blinded by fragments of metal than in the last war. But a larger proportion were blinded by concussion causing collapse of the eye or irreparable damage from hemorrhage. About 288 had come under the care of St Dunstan's in this war. Of these 88 had recovered some useful sight and 200 would not recover any sight at all. Of the 200, half are being trained or have been trained at St Dunstan's and 30 are in Germany as prisoners of war. It has been arranged that all American soldiers who may be temporarily or permanently blinded shall be sent to St Dunstan's for three to six weeks while awaiting to return home. Brig Gen Paul Hawley, chief surgeon of the United States Army in the European theater of operations, said that the great shock to the blinded American soldier would come when he returned home handicapped and helpless to his family. Now he would be able to return after his St Dunstan's training walking with confidence and facing the world with courage.

#### Annual Congress of Ophthalmological Society

Another illustration of the fact, shown in previous letters, that we do not allow the war to interfere with normal activities when they do not impair our fighting powers is shown by the holding of the annual congress of the Ophthalmological Society in London, which will be held on April 30 and May 1. Discussions will take place on "Thyrototoxicosis in Its Relation to Ophthalmology," to be opened by Dr Russell Bram and Mr H. L. Savin, and on "The Scientific and Clinical Aspects of Night Vision," to be opened by Prof W. J. B. Riddell and Air Commodore P. C. Livingstone.

#### Men with Amputations in German Prison Camps

The temporary artificial limbs supplied by the Germans to British prisoners were found to be badly fitting. For a time the Red Cross sent limbs by post in response to measurements. This was not successful, so last year it obtained permission to visit the camps and make a survey. Swiss orthopedic specialists were sent and worked out every detail for 430 men. They suggested that a new set of limbs should be made by Swiss experts who would visit the camps and fit them. This is being done.

#### New Appointment for Professor Ryle

Dr J. A. Ryle, regius professor of physics, University of Cambridge, has been elected professor of social medicine at Oxford.

## Marriages

JAMES W. CHAMBERS, Fort Riley, Kan., to Miss Molhe Bauman of Des Moines, Iowa, in Whittemore, Iowa, February 4.  
 RUDOLPH MATAS LANDRY, New Orleans, to Miss Jane Eleanor Willius of Rochester, Minn., February 27.

HOWELL HOOD SHERRON, Johnson City, Tenn., to Miss Alice E. Simpson at Strawberry Plains, February 26.

THOMAS NOBLE WARREN, Wilmington, Del., to Miss Jean Duncan Drysdale of Lynchburg, Va., March 1.

PIERRE FABIAN LA BORDE JR., Columbia, S. C., to Miss Virginia Adams of Charleston in March.

JOHN RANDOLPH KIGHT, Norfolk, Va., to Miss Nancy Pearis Edgar of Charlottesville, March 6.

GUY O. PFEIFFER, O'Fallon, Ill., to Miss Mary Kathryn Kubitschek of St. Louis, March 9.

## Deaths

**Charles Francis Yerger**, Chicago, Ph G, Northwestern University School of Pharmacy, Chicago, 1898, M D, Northwestern University Medical School, Chicago, 1905 member of the Illinois State Medical Society, in 1930 joined the faculty of Loyola University School of Medicine as a clinical instructor in ophthalmology and later became an associate clinical professor of ophthalmology, formerly instructor in medicine instructor in operative surgery, instructor and associate in laryngology, rhinology and otology at the University of Illinois College of Medicine instructor in otolaryngology at Rush Medical College, 1912-1913, specialist certified by the American Board of Ophthalmology and the American Board of Otolaryngology, member of the Chicago Otolaryngological Society and the Chicago Ophthalmological Society, for many years on the staff of the Illinois Charitable Eye and Ear Infirmary, attending physician to the Juvenile Detention Home and Juvenile Court since 1914, served as attending otolaryngologist and ophthalmologist to the Cook County Hospital, attending ophthalmologist to the Chicago State Hospital and the Lutheran Memorial Hospital, on the staff of the Hospital of St Anthony de Padua, a medical examiner of the Cicero Selective Service Board, 1917-1918, aged 63, died, March 16, of uremia and hypertension

**Ezra Kimball Sprague** \* Medical Director, U S Public Health Service, retired, Brooklyn, College of Physicians and Surgeons, Boston, 1890, joined the U S Public Health Service as an assistant surgeon in 1893, was promoted through the various ranks and retired in 1932 with the title of medical director, served in various posts in the United States, at Antwerp, Belgium, and Calcutta, India, professor of tropical medicine at the Detroit Medical College, 1901-1902 studied bubonic plague in Calcutta, 1903-1904, chief medical officer at Ellis Island from 1925 to 1928 and a director of the North Atlantic district of the Public Health Service from 1928 to 1932, in charge of extra cantonment zone sanitation at Camp Devens, Ayer, Mass, and Camp Dodge, Des Moines, Iowa, during World War I, made reports on drinking water which resulted in the installation of a filtration plant at Washington D C, in 1898, aged 76, died, February 2, of carcinoma of the colon

**Franklin Paradise Johnson** \* Portland, Ore Johns Hopkins University School of Medicine, Baltimore, 1920, assistant clinical professor of urology at the University of Oregon Medical School from 1908 to 1910 Austin teaching fellow at Harvard Medical School Boston, and instructor of histology and embryology from 1910 to 1912, assistant professor of anatomy in 1912, associate professor in 1913 and professor 1919-1920 at the University of Missouri, Columbia, specialist certified by the American Board of Urology, Inc member of the American Urological Association and the American Association of Anatomists, fellow of the American College of Surgeons, received the Ph D degree from Harvard University, Boston, in 1912, collaborator in the writing of a number of medical books, member of the staffs of the Multnomah Hospital and the Good Samaritan Hospital where he died, February 12, of coronary thrombosis, aged 55

**John Frank Fraser** \* New York, Bellevue Hospital Medical College, New York, 1892, specialist certified by the American Board of Dermatology and Syphilology, member of the American Academy of Dermatology and Syphilology, formerly assistant professor of clinical medicine (dermatology), Cornell University Medical College, and associate professor of clinical dermatology and syphilology at the New York Post-Graduate Medical School, Columbia University, served as a major in the medical corps of the U S Army during World War I, an associate attending physician in dermatology, New York Hospital, aged 75, died January 31, in the French Hospital of pulmonary embolism following an appendectomy

**Elwood Tracy Easton** \* Boston, Harvard Medical School, Boston, 1899, specialist certified by the American Board of Ophthalmology, member of the New England Ophthalmological Society, professor emeritus of ophthalmology at the Tufts College Medical School, where he served as professor and instructor of ophthalmology, for some time consulting oculist to the Parental School in West Roxbury, served as consulting surgeon in ophthalmology, ophthalmic surgeon and on the outpatient staff of the Massachusetts Eye and Ear Infirmary, for many years a trustee of the Gordon College and of the Baptist Home of Massachusetts, aged 66, died, January 31, of angina pectoris and arteriosclerosis

**Charles Shorey Butler** \* Boston, Harvard Medical School, Boston, 1898 treasurer of the Massachusetts Medical Society, for many years assistant in anatomy at his alma mater, served for seven years as assistant surgeon in the Massachusetts Volunteer Militia and later as a captain and assistant surgeon in the Eighth Infantry Regiment, was made a Chevalier of the Legion of Honor by the French government for his service in the French Army, lieutenant colonel in the medical reserve corps of the U S Army not on active duty, served during World War I, aged 72, died, February 23, of coronary disease

**George Wilder Appleby**, Waterloo, Iowa, Chicago Medical College, 1885, aged 82, died, January 22, of coronary occlusion

**William Thomas Bailey**, Boston, Harvard Medical School, Boston, 1900 member of the Massachusetts Medical Society, past president of the Boston Anesthesia Society aged 73, died, January 16 in the Massachusetts General Hospital, Phillips House, following an operation for carcinoma

**Charles Stephen Bartholomew Cassasa** \* New York, Columbia University College of Physicians and Surgeons, New York, 1912, for many years instructor of pathologic anatomy at the Cornell University Medical College, an assistant medical examiner for the City of New York from 1918 to 1930, surgical director and chairman of the medical board of the Harlem, Lutheran, Mother Cabrini, St Elizabeth and Knickerbocker hospitals, aged 57, died, February 22, of coronary thrombosis

**Gilbert de Leverance Forbes** \* Kendall, N Y, University of Buffalo School of Medicine, 1909, for thirty years health officer of Kendall and school physician at the Kendall High School for twenty-five years, past president of the New York Association of School Physicians, aged 61, died, February 10, of heart disease and hyperthyroidism

**Thomas Jonathan Long** \* Denison, Texas, Medical Department of Tulane University of Louisiana, New Orleans, 1902, fellow of the American College of Surgeons, mayor of Denison, formerly president of the Chamber of Commerce, served as chief of staff of the Missouri, Kansas, Texas Railroad Employees' Hospital and the Long-Sneed Clinic Hospital, aged 68, died, January 10, in Whitesboro of angina pectoris

**Paul Otto Luedeke**, Rochester, N Y, University of Buffalo School of Medicine, 1901, member of the Medical Society of the State of New York, aged 73, died, January 25, of coronary occlusion and arteriosclerosis

**Clarence J Stanley**, Camp Wood, Texas State University of Iowa College of Medicine, Iowa City, 1902, aged 69, died, January 9, of heart disease

**Wilson E Van Loon**, Philadelphia, University of Pennsylvania Department of Medicine, Philadelphia, 1891, aged 76, died recently in the Presbyterian Hospital of arteriosclerotic cardiovascular renal disease

**Frederick George Vogel** \* Waterloo, Ill, St Louis University School of Medicine, 1906, aged 74, died, January 30 in St Louis

**Hugh S White** \* El Paso, Texas, University College of Medicine, Richmond, 1900, past president of the El Paso County Medical Society, fellow of the American College of Surgeons, served on the board of health of El Paso County for many years and as city and county health officer, member of the staff of the El Paso Masonic Hospital, Hotel Dieu Sisters' Hospital and the Southwestern General Hospital, on the board of the El Paso City-County Hospital, aged 67, died, January 22, of heart disease

## DIED WHILE IN MILITARY SERVICE

**Arthur Pickens Vandergrift Jr**, Memphis, Tenn University of Tennessee College of Medicine, Memphis 1939, member of the Mississippi State Medical Association, served as director of the De Soto County health unit at Hernando, Miss, began active duty as a first lieutenant in the medical corps, Army of the United States and later became a captain aged 28, was killed in an army bomber crash near Columbia, S C, January 27

**T Dwight Hunt**, Madison, Wis, University of Oregon Medical School, Portland, 1935, member of the State Medical Society of Wisconsin, was called to active duty in September 1942 as a first lieutenant in the medical corps, United States Army Air Corps, aged 35, stationed at Pueblo, Colo, where he was killed in an airplane accident, January 24

## Medical Examinations and Licensure

### COMING EXAMINATIONS AND MEETINGS

#### BOARDS OF MEDICAL EXAMINERS

##### BOARDS OF EXAMINERS IN THE BASIC SCIENCES

Examinations of boards of medical examiners and boards of examiners in the basic sciences were published in THE JOURNAL, March 20, page 974

#### NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS Various centers having 5 or more eligible applicants June Sec Dr J S Rodman, 225 S 15th Street Philadelphia

#### EXAMINING BOARDS IN SPECIALTIES

AMERICAN BOARD OF OPHTHALMOLOGY Parts I and II New York City June 4 5 October 8 9 Sec, Dr John Green 6830 Waterman Blvd St Louis

AMERICAN BOARD OF PATHOLOGY Chicago June 2 3 Final date for filing application is April 15 Sec, Dr F W Hartman Henry Ford Hospital Detroit

AMERICAN BOARD OF PEDIATRICS Written Locally Oct 8 Oral New York, Nov 20 21 Final date for filing application is Aug 1 Starting July 1 1943, Group I will be abolished Sec, Dr C A Aldrich 707 Fullerton Ave, Chicago

## Bureau of Legal Medicine and Legislation

### MEDICOLEGAL ABSTRACTS

**Medical Practice Acts Unlicensed Practice by Chiropractor**—The defendant, a chiropractor, was convicted of practicing "chiropractic and medicine" in Virginia without the license required by law and appealed to the Supreme Court of Appeals of Virginia, which reversed and remanded the case (*Grosso v Commonwealth*, 177 Va 830, 13 S E (2d) 285, J A M A 116 2103 [May 3] 1941). He was again tried and convicted and again appealed to the Supreme Court of Appeals of Virginia.

The defendant contended, among other things, that the evidence adduced at the trial was not sufficient to sustain the conviction. It appeared from the evidence that he had rented rooms in an office building and had fitted them out with appropriate appliances. He had a secretary, and he listed himself as a chiropractor in the local telephone book and by publications kept the public advised of his movements. Furthermore, the defendant held himself out as being competent to treat a wide variety of cases, extending from backache to heart disease, and he published testimonials to the effect that he could and did cure disorders which did not yield to conventional treatment. On the basis of this evidence the court held that the verdict was plainly supported.

It was next contended that the trial court erred in admitting evidence tending to show the conduct of the defendant immediately before Dec 11, 1939, which was the date on which it was charged that the chiropractor violated the medical practice act. Of course, said the court, the commonwealth must prove, and it did prove, that he violated the medical practice act. If Dec 11, 1939 had been curtailed off, the jury could not have told what it was all about. When the defendant set himself up in business and held himself out as a chiropractor, without having obtained a license to follow that vocation, his offense was a continuing one. Accordingly, evidence of his conduct immediately prior to Dec 11, 1939 was admissible in evidence.

Finally, it was contended that the defendant and his school of medicine were discriminated against in that chiropractic was not recognized in the medical practice act as a worth while school of the healing art. The chiropractor's approach is wrong, said the court. The chiropractor's real complaint is that no

special provision is made in the medical practice act for him. A chiropractor can be licensed to practice when he meets the requirements of the board of medical examiners. Under the provisions of the medical practice act, an applicant to be licensed must show that he has studied medicine not less than four school years, including four satisfactory courses of at least eight months each in four different calendar years in a medical school registered as maintaining a standard satisfactory to the state board of education. The defendant, it appeared, had graduated from the Palmer School (a full three year course) at which school was taught "a course of anatomy, histology, physiology, embryology, and chemistry." The defendant had not applied to the board of medical examiners for a certificate and with no training other than what he possesses he could not have applied successfully. Statutes designed to preserve the people's health must be very arbitrary to be unconstitutional. New schools must prove their worth to the satisfaction of the legislature before they are recognized. They come and go and "continue not in one stay." It is within wide limits for the legislature to say when their worth has been sufficiently established and what are the tests they must undergo. Certainly, the court concluded, the science of medicine is not static, but society must protect itself against those who are unable or unwilling to undergo that training and to measure up to those requirements now fairly universally recognized. Accordingly the judgment of conviction was affirmed—*Grosso v Commonwealth*, 21 S E (2d) 728 (Va, 1942).

**Medical Practice Acts Unlicensed Practice as Violation of Act in Absence of Express Prohibition Against Unlicensed Practice**—Miller, a chiropractor, was convicted of unlawfully practicing medicine in Virginia in violation of the medical practice act of that state in that he had not taken and passed the examination which persons who desire to practice medicine in Virginia must take and pass before the Virginia state board of medical examiners. He appealed to the Supreme Court of Appeals of Virginia, contending that no statute in Virginia required him to take and pass an examination before the board of medical examiners as a condition precedent to the practice of medicine.

In passing on the validity of the chiropractor's contention it was necessary for the court to consider the legislative history of the laws regulating the practice of medicine in the state. Briefly, the first medical practice act enacted in Virginia was enacted in 1884 (Acts of Assembly, 1883-84, p 79), and that act contained a specific section (seven) which, in effect, prohibited any person who commenced the practice of medicine after Jan 1, 1883, from practicing for compensation "without first having obtained a certificate" from the board of medical examiners. In 1912 the 1883 act and the amendments thereto were repealed and a completely new medical practice act was adopted. That new act provided for a board of medical examiners to examine and license applicants for licenses to practice medicine. Provision was made for "legal practitioners of medicine practicing under the provisions of previous laws." The board was given authority, in its discretion to arrange for the issuance of licenses by reciprocity. The board was authorized for stated causes to refuse to examine applicants or to revoke or suspend licenses already issued. A section denominated certain classes of persons who were exempt from the provisions of the act under stated circumstances. Licentiates who were graduates of sectarian schools were not permitted to administer drugs or practice surgery unless authorized to do so by the board. The penalty section merely provided that any person practicing medicine in the state in violation of the act should be subjected to a certain penalty. The act was amended from time to time but in no way material for the purposes of the present discussion. In 1942 the legislature filed a bill which would

have amended the medical practice act so as specifically to make it unlawful for any person to engage in the practice of medicine in the state without first having obtained from the board of medical examiners a license or certificate to do so. The gist of the chiropractor's argument was that since the medical practice act of 1912, as amended, did not specifically prohibit practice without complying with the provisions of the act—that is, with respect to a person not entitled to reciprocity or not exempted from the act—without first submitting to and passing an examination by and being licensed by the board of medical examiners, no penalty could be imposed on a person who practices medicine without submitting to and passing an examination and being licensed by the board of medical examiners.

The original medical practice act, said the Supreme Court of Appeals, specifically made it unlawful for a person to commence the practice of medicine or surgery after Jan 1, 1883 for compensation without first having obtained a certificate from the board of medical examiners. Plainly the medical practice act of 1912, which repealed the prior act, was intended to regulate properly the practice of medicine and surgery. The necessity for regulation is made plain by the fact that the act was an emergency act. It was intended to put up bars and not let them down. Conditions under which certificates might be obtained were made more stringent. If the chiropractor's contention is sustained, then the net effect of the 1912 act was to make the suppression of incompetent followers of the healing art impossible. To attribute to that act any such purpose is unthinkable. If the contention of the chiropractor with respect to the 1912 act, as amended, is sound, then any one, at his election, be he snake doctor or magician, can hold himself out as a qualified practitioner of medicine and follow that vocation, all the trouble that the legislature has taken to safeguard the profession and to make an efficient aid to public health is but a futile gesture. As was said by the Supreme Court of Appeals of West Virginia in *Newhart v Pennybacker*, 120 W Va 774, 200 S E 350:

Where a particular construction of statute will result in an absurdity, some other reasonable construction which will not produce the absurdity will be made.

The 1912 statute, which became a law thirty years ago, continued the court, has been everywhere construed as the Commonwealth contends that it should be construed as prohibiting unlicensed practice. That construction which for a long period of time has been accepted by bench and bar as the true construction of a statute becomes a canon of construction, unless some paramount reason is advanced for a change of the conclusion. *St Joseph's Soc v Virginia Trust Co* 175 Va 503, 9 S E (2d) 304. Again, the legislature has seen fit to except from the operation of the medical practice act stated types of physicians under stated circumstances. Such physicians are not required to secure certificates from the examining board under the circumstances stated. Such an exception would be wholly unnecessary if no one was obliged to secure a certificate. Again, authority is given the board in its discretion to arrange for reciprocity with the authorities of other states and territories having requirements equal to those established in Virginia. Obviously, no reciprocity would be necessary if anybody could practice medicine in the state. The legislature, continued the court, had occasion to consider this subject at its 1942 session when it had before it the bill previously referred to which specifically proposed to prohibit a person practicing in the state without being licensed to do so by the board of medical examiners. Since it refused to pass that bill, it must be presumed that it was not thought necessary to pass such a measure because the matters dealt with in the bill had theretofore been amply covered by the statute.

For the reasons stated, the judgment of conviction was affirmed—*Miller v Commonwealth*, 21 S E (2d) 721 (Va, 1942).

## Society Proceedings

### COMING MEETINGS

- Alabama Medical Association of the State of Birmingham April 20 22 Dr Douglas L Cannon 519 Dexter Ave Montgomery Secretary  
American Association of Industrial Physicians and Surgeons Rochester N Y May 25 27 Dr E C Holmblad, 28 East Jackson Blvd Chicago Managing Director  
American Association on Mental Deficiency, New York May 12 15 Dr Neil A Dayton Mansfield Training School Mansfield Depot Conn  
American Gastro-Enterological Association Atlantic City N J May 3 4 Dr J Arnold Bergen 102 Second Ave SW, Rochester, Minn Secretary  
American Neurological Association New York May 6 7 Dr Henry A Riley 117 East 72d St New York, Secretary  
American Psychiatric Association Detroit, May 10 13 Dr Winfred Overholser St Elizabeth's Hospital, Washington D C, Secretary  
American Psychoanalytic Association Detroit May 9 11 Dr Leo H Bartemeier General Motors Bldg Detroit Secretary  
American Society for Clinical Investigation Atlantic City, N J, May 3 Dr Wesley W Spink University Hospital Minneapolis Secretary  
American Surgical Association Cincinnati May 13 14 Dr Warfield M Piror Johns Hopkins Hospital, Baltimore Secretary  
Arizona State Medical Association, Tucson April 30 May 1 Dr Frank J Milloy 112 North Central Avenue Phoenix Secretary  
Arkansas Medical Society Little Rock April 19 20 Dr W R Brocksher 602 Garrison Ave Fort Smith Secretary  
California Medical Association, Los Angeles May 2 3 Dr George H Kress 450 Sutter St San Francisco Secretary  
Connecticut State Medical Society New Haven May 25 27 Dr Creighton Barker, 258 Church Street New Haven Secretary  
Florida Medical Association Jacksonville April 15 16 Dr Shaler Richardson 111 West Adams St Jacksonville Secretary  
Georgia Medical Association of Atlanta May 11 14 Dr Edgar D Shanks 478 Peachtree St NE, Atlanta Secretary  
Illinois State Medical Society, Chicago May 18 20 Dr Harold M Camp, 224 South Main St Monmouth Secretary  
Iowa State Medical Society Des Moines April 29 30 Dr Robert L Parker 3510 Sixth Avenue Des Moines Secretary  
Maryland Medical and Chirurgical Faculty of, Baltimore April 27 28 Dr W Houston Toulson 1211 Cathedral St, Baltimore Secretary  
Massachusetts Medical Society Boston May 24 26 Dr Michael A Tighe 8 Fenway Boston Secretary  
Minnesota State Medical Association Minneapolis May 17 19 Dr B B Souster 493 Lowry Medical Arts Bldg St Paul, Secretary  
Mississippi State Medical Association Jackson May 11 13 Dr T M Dye Clarksdale Secretary  
Missouri State Medical Association St Louis April 18 20 Mr Raymond McIntyre 634 North Grand Blvd St Louis Executive Secretary  
National Tuberculosis Association St Louis May 5 6 Dr Charles J Hatfield 7th and Lombard Sts Philadelphia Secretary  
New Hampshire Medical Society Manchester May 11 Dr Carleton R Metcalf 5 South State St, Concord Secretary  
New Jersey Medical Society of Newark May 25 26 Dr Alfred Stahl 55 Lincoln Park Newark Secretary  
New York Medical Society of the State of Buffalo May 3 6 Dr Peter Irving 292 Madison Ave, New York Secretary  
North Carolina Medical Society of the State of, Raleigh May 10 12 Dr Rocoe D McMillan Red Springs Secretary  
North Dakota State Medical Association Bismarck May 10 11 Dr L W Larson 221 Fifth Street Bismarck Secretary  
Northern Tri State Medical Association Ann Arbor Mich April 13 Dr F R Nicholas Carter 105 East Jefferson Blvd South Bend Ind Secretary  
Oklahoma State Medical Association Oklahoma City May 11 12 Dr Lewis J Moorman 210 Plaza Court Bldg Oklahoma City Secretary  
Texas State Medical Association of Fort Worth May 3 6 Dr Holman Taylor 1404 West El Paso St Fort Worth Secretary  
West Virginia Medical Association Charleston May 17 18 Mr Charles Lively 1031 Quarrier St Charleston Executive Secretary

### CENTRAL SOCIETY FOR CLINICAL RESEARCH

Fifteenth Annual Meeting held in Chicago No 6 and 7 1942

The President, DR ARLIE R BARNES, Mayo Clinic, Rochester, Minn., Presiding

#### Calcium, Phosphorus and Vitamin D Therapy in Hyperthyroidism

DR ITALO D PUPPEL, DR HAROLD T GROSS, EMMA K MCKORMICK, MSc, and DR GEORGE M CURTIS, Columbus, Ohio. The calcium balance of 3 normal persons, 7 persons with exophthalmic goiter and 4 with toxic nodular goiter was determined under variations of calcium, phosphorus and vitamin D feeding over a total period of about five hundred days.

The disturbances of calcium metabolism in hyperthyroidism usually consisted principally of an increased excretion of calcium through both the gastrointestinal and the urinary system. The blood calcium and phosphorus usually remained within normal limits. These abnormal findings differ greatly from those in hyperparathyroidism, in which the increased excretion occurs almost quantitatively through the urine while both the blood



calcium and phosphorus levels are usually disturbed. They lead to definite differences in the clinical manifestations of the disturbed calcium metabolism in these two disease entities. In hyperparathyroidism with its usual hypercalcemia and hypophosphatemia metastatic calcification frequently results. Urinary stones occur in about half the cases and constitute one of the most dreaded complications of this disease. In hyperthyroidism, with its usual eucalcemia and euphosphatemia even in the presence of increased calcium excretion equal to or often greater than in hyperparathyroidism, metastatic calcification is rarely observed. Urinary stones occur rarely and are probably only coincidental.

The real danger in feeding high calcium and phosphorus preoperatively in hyperparathyroidism is this increased predisposition to metastatic calcification. In hyperthyroidism there is no such danger, and we have therefore given many of our patients with hyperthyroidism a high calcium, phosphorus and vitamin D diet preoperatively for several years. Not one of these patients has developed the so called thyroid crisis.

The disturbance of calcium metabolism in hyperthyroidism varies greatly. It is usually temporary, preventable and reversible. It can easily be controlled by ingestion or parenteral administration of extra amounts of calcium supplied in various forms such as calcium in milk, calcium gluconate, calcium lactate with a preparation of crystalline vitamin D and dicalcium phosphate with vitamin D by mouth, as well as by calcium chloride intravenously. The disturbance is usually temporary in its effect on bones, but at times and particularly in long standing hyperthyroidism in the presence of insufficient calcium intake permanent bone changes may occur which are not amenable to therapy of any type. Practically this far advanced stage can be treated best by prevention with extra calcium feeding combined with early diagnosis and treatment of the hyperthyroidism.

Administration of extra calcium phosphorus and vitamin D is of particular value in hyperthyroid patients who refuse operation in inoperable cases in patients who are being treated medically or by x-ray therapy, as well as during the preoperative and postoperative management of the usual hyperthyroid patient until the basal metabolic rate returns to normal.

#### DISCUSSION

DR CECIL STRICKER, Cincinnati: Were there any x-ray studies of bone showing deposition of calcium following treatment?

DR HENRY T. RICKLITS, Chicago: How low were the low calcium diets and what happened to the hyperthyroidism on a diet of normal calcium content?

DR JOHN TUCKER, Cleveland: Was calcium administered to the hyperthyroid patients without giving the usual preoperative doses of iodine? If this was done, did the calcium have any beneficial effects on the symptoms prior to operation?

DR R. D. TAYLOR, Indianapolis: What was the effect of the administration of iodine on the calcium metabolism in hyperthyroidism? Does calcium metabolism directly parallel the basal metabolic rate?

DR ITALO D. PUPPEL, Columbus, Ohio: Several patients had hyperthyroidism for several years prior to thyroidectomy and calcium therapy and had moderately severe osteoporosis. The evidences by x-ray examination of recalcification after five months of adequate calcium therapy were often not convincing but were present occasionally. It is possible that the degree of calcium loss prior to thyroidectomy was so great that a longer period of time will be required to replace the loss. The relatively low calcium diet which we gave the hyperthyroid patients averaged 520 mg of calcium daily. Our normal controls remained in equilibrium with this amount of calcium. The hyperthyroid patients, however, showed severe loss of calcium. One exophthalmic goiter patient was provided 800 mg of calcium daily, an amount which easily kept normal controls in positive calcium balance. This patient also showed a loss of calcium with a negative balance of 330 mg of calcium daily. Our high calcium diets for the hyperthyroid patients ranged from 1,800 to 3,160 mg of calcium daily. These diets permitted them to retain calcium. Calcium therapy does improve the musculoskeletal symptoms. With bed rest, high caloric and

high calcium intake we usually obtained definite improvement in the general symptomatology and a decrease in the basal metabolic rate of hyperthyroidism. However, when iodine was then supplemented, usually there was further amelioration of symptoms and further decrease of the basal metabolic rate. Calcium does have a definite place as replacement therapy in hyperthyroidism. On the other hand, we do not advocate its use in place of iodine. If iodine administration returns the basal metabolic rate of hyperthyroidism to normal, a decrease in the calcium excretion usually occurs. Increased iodine feeding to 1 patient with severe exophthalmic goiter produced no appreciable change in the basal metabolic rate. The loss of calcium by this patient remained as high as previous to iodine medication.

#### Classification and Treatment of Male Gonadal Failure

DRS CARL G. HELLER, RICHARD M. JOHNSON and GORDON B. MYERS, Detroit: Fifty one men with sexual impotence and other features of gonadal failure were classified into eight different clinical syndromes on the basis of skeletal development, secondary sex characteristics, urine gonadotropic titer and symptomatology. The series included 16 eunuchoids. They were about equally divided between primary pituitary gonadotropic failure and primary testicular failure. Thus, 8 excreted amounts of gonadotropic hormone far below normal levels and 8 excreted amounts above normal levels and equal to estrate excretion. Similarly some instances of adult gonadal failure were associated with low gonadotropic excretion levels and others with estrate (high) excretion levels.

The gonadotropic titer proved to be a reliable therapeutic index. Each patient with pituitary gonadotropic failure responded well to chorionic gonadotropic therapy. No case with initially high pituitary gonadotropic output responded to administered gonadotropins. Both types responded to substitution therapy with testosterone propionate. Since the gonads are still capable of responding at any age (from 15 to 52 years) it is suggested that in lieu of hormone assays a therapeutic trial of chorionic gonadotropins be given all patients with gonadal failure before substitution therapy is resorted to.

Gonadal failure resulted in the androgen withdrawal symptoms of the male climacteric in 18 of 24 adult cases. Sixteen had elevated gonadotropic titers and 2 had diminished titers. Chorionic gonadotropins alleviated climacteric symptoms in the 2 cases due to pituitary failure. Testosterone propionate was effective in 14 of the 16 cases of primary testicular failure. From comparisons with normal men it was concluded that the male climacteric does not occur physiologically and is a definite disease entity.

#### DISCUSSION

DR M. A. BLANKENHORN, Cincinnati: What are your criteria for satisfactory treatment in the hypogonadal eunuchoid type?

DR W. E. BROWN, Omaha: Chorionic gonadotropins in women cause general gonadal atrophy. How was success measured with gonadotropins in men? Also is the therapy not associated with subsequent atrophy such as found in women?

DR DANIEL L. SEXTON, St. Louis: What criteria do you have for a good result in those adults that are given chorionic gonadotropins?

DR CARL G. HELLER, Detroit: There are two treatments for patients with hypogonadism: stimulatory and substitutional. If endocrine studies are not available, the rational approach is to try stimulation first (with gonadotropic hormone). This therapy might produce pubertal changes which are maintained. We have had a patient go four months without treatment and maintain sexual potency and secondary sex characteristics. Large doses, 1,500 units of pregnancy urine extract, are used for six weeks. If the gonadotropic hormone treatment fails then substitution therapy with testosterone propionate is begun. The criteria of success consist in increase in size of the penis, increase in sperm count, increase in body hair and a change in the pitch of the voice. The high pitched voice is a definite and serious handicap, it is the reason the patient is discriminated against. We have had difficulty growing beards. It seems that the growth of beard hair occurs slowly, if at all, with any form of therapy. We have taken testicular biopsies after treatment with chorionic gonadotropins and found evidence of stimulation of the testes.

(To be continued)



vein may result from retrograde circulation which is common in the presence of incompetent venous valves. Some of the platelets also may result from the breaking up of agglutinated groups and by passage through dilations that amount to minor arteriovenous anastomoses. I am assuming that the finer capillary beds give a relative index of the damage to the tissues themselves. In a portion of these cases tests were taken from the center of sclerosed areas. These counts corresponded closely to the toe counts.

Since these smallest of blood cells are held back when polymorphonuclears and erythrocytes are able to pass through the smaller capillaries, it is probable that they are retained by adherence and dissolution. Their products and the tissue catabolites, therefore, form the waste that accumulates as the vicious circle revolves. The platelet loss in the capillary areas of the skin may explain the purpuric breakdown of the varicose ulcer.

The method of counting used is reported by the collaborating author.

#### LABORATORY PROCEDURE

**Technic**—A drop of freely flowing blood from a deep stab wound, made with a number 11 Bard Parker knife was obtained from the ear and fourth toe of each foot after a thorough cleansing with 50 per cent ethyl alcohol. This blood was drawn to the 0.5 mark of a certified<sup>10</sup> Thoma erythrocyte diluting pipet, immediately diluted with Rees-Ecker<sup>11</sup> fluid to the 101 mark and shaken vigorously for thirty seconds. The pipet was labeled, capped with a rubber band and placed in the refrigerator at 4 C, unless counted at once. At the time of the counting the pipet was brought to room temperature, shaken by hand for thirty seconds and then by mechanical shaker for five minutes, and the two sides of a certified,<sup>10</sup> improved Neubauer type hemocytometer were correctly filled. After the hemocytometer had stood (in a Petri dish containing moist filter paper) for a period of fifteen minutes, the number of platelets in the center square millimeter of 400 squares was counted on each side of the hemocytometer and the average of these numbers was multiplied by 2,000, giving the number of blood platelets per cubic millimeter of blood. The normal count is 200,000 to 400,000.

Pipets were cleaned after each count by drawing them full of cleaning solution (commercial sulfuric acid saturated with potassium dichromate) and withdrawing after one hour. A quantity of distilled water was then run through them until no trace of acid remained. They were then rinsed with acetone and dried with air by suction. Hemocytometer surfaces were cleaned with cleaning solution, rinsed with distilled water and wiped dry with a soft lintless cloth.

The diluting fluid of Rees and Ecker<sup>11</sup> is prepared by dissolving the following constituents in 100 cc of distilled water and filtering and refiltering weekly: sodium citrate 3.8 Gm, formaldehyde neutral, 40 per cent, 0.2 cc, brilliant cresyl blue 0.1 Gm.

**Choice of Technic**—The method used is one that the technologist (N. H.) previously adopted and used for clinical blood platelet counts. When this series of counts was started a critical review of methods was made and this method continued on the basis of accuracy, speed and adaptability to this problem and general clinical use.

Use of a direct method was confirmed after consideration of the literature and Tocantins'<sup>12</sup> brief of 116 technics, including that of Olef.<sup>13</sup> Conclusive evidence presented by Tocantins shows that direct methods are more accurate than indirect methods in experienced hands. Volume per cent methods were not used, as they may be 56 per cent in error.<sup>14</sup> A capillary source of blood was essential, as venipuncture would defeat the purpose of the study. Standard certified pipets and hemocytometers are available and adequate.<sup>15</sup> A magnification of 430 diameters using the high dry objective is best, since it avoids errors of overmagnification and undermagnification when continuous use is made of the fine adjustment of the microscope.

Rees-Ecker diluting fluid met all the necessary criteria since it is isotonic and has an anticoagulant, sodium citrate, a fixative, neutral formaldehyde, to prevent morphologic changes and disintegration of platelets for twenty-four hours, ease of preparation and relative stability without precipitation, and a dye to facilitate counting. The dye may be omitted after some practice or may be added as only 0.05 per cent brilliant cresyl blue. Prewetting of the pipet with diluting fluid by the method of Wright and Kinnicutt<sup>16</sup> was found unnecessary in a series of 10 control counts.

TABLE 4—Correctness of Diagnosis Based on Platelet Counts

	Cases	Per Cent
Distribution (right or left leg) of disorder correctly indicated by low count	61	75.4
Distribution not correctly indicated	10	16.4
Normal counts found in	5	8.2
	76	

Finally our purpose in this series was to obtain comparative blood platelet counts, and since the identical technic was used throughout the relationship of the counts from the various sources is valid, even if the absolute number of platelets would vary with another method.

**Checks on Technic**—Five clinically normal persons were rechecked first, then 3 with thrombopenic purpura and 3 with thrombocytosis, all values being within expected limits and confirmed by gross correlation with Wright's stained coverslip smears. For the first 41 counts, including the foregoing, two pipets were filled from each source and the two values checked within 10,000 or plus-minus 2.5 per cent. The same check was obtained against three other technologists using this method. During the series repeat counts were made at brief intervals on the same patient and found to fall within the 2.5 per cent variation. Needless to say, all recorded counts checked within 1 per cent on the values obtained from the two sides of the hemocytometer. If the first preparation did not check, another was made.

That the method is accurate and usable is confirmed by the recently published results of 126 preliminary and 1,034 final counts made by Pohle<sup>17</sup> and a technician at the Harvard School of Medicine using the direct method. The same technic is used in New York,<sup>18</sup>

12 Tocantins L. M. Technical Methods for the Study of Blood Platelets Arch Path 23 850 (June) 1937

13 Olef Isadore Blood Platelets An Improved Indirect Method for Their Enumeration Arch Int Med 46 585 (Oct.) 1930

14 Olef Isadore J Lab & Clin Med 23 166 (Nov.) 1937

15 Tocantins Technical Methods p. 857

16 Wright J. H. and Kinnicutt Roger New Method of Counting the Blood Platelets for Clinical Purposes J A M A 56 1457 (May 20) 1911

17 Pohle Frederick J. Am J M Sc 197 40 (Jan.) 1939

18 Paddock F. K. and Smith K. E. Am J M Sc. 198 372 (Sept.) 1939

10 Certified correct by United States (National) Bureau of Standards  
11 Rees H. M. and Ecker E. E. An Improved Method for Counting Blood Platelets J A M A 80 621 (March 3) 1923

London<sup>19</sup> and Uppsala,<sup>20</sup> with consistent results. That the method is superior to the "true indirect" technic of Olef<sup>21</sup> is indicated by his own high values and the variable normals<sup>22</sup> (328,000 to 1,206,000) of experienced workers using Olef's method. Finally, Tocantins'<sup>23</sup> last comprehensive treatise again confirms use of the direct method, even with cutaneous blood.

#### GENERAL CONSIDERATIONS

Since the first question to arise is bound to be one of laboratory error, the checks on the method are given by the collaborating author, and I believe them to be adequate. Furthermore, the close correlation of the three diverse counts on normal persons has shown any significant error to be largely absent. The further agreement of the findings with the distribution of the disease signifies that actual changes have taken place. Both of us have repeatedly been able to indicate the extremity having pathologic conditions from the counts made, even though the side was otherwise unknown. I have also in several instances found changes developing on the patient's "good side" when a low count has indicated damage. In 1 case subsequent ulceration developed in an untreated leg having a low count, although the treated one had long been healed.

TABLE 5—Responses of Platelet Counts to Treatment (Ascorbic Acid and Support)

	Before Treatment	Interval	Subsequent Count
1 H D	Far 175 Right foot 162 Left foot 170	8 weeks	300 275 210
2 D K	Far 96 Right foot 96 Left foot 94	weeks	194 121 102
3 C H	Far 144 Right foot 102 Left foot 60	4 weeks	116 165 153
4 J W	Far 210 Right foot 178 Left foot 56	12 weeks	291 216 119

The low ear counts in many of these cases raises an interesting speculation, and that is "Does platelet loss in a damaged area exceed platelet production in a sufficient amount to depress the normal total count?" If one system continually filters out the platelets from the circulating blood, does the whole circulatory structure suffer?" That this does happen is suggested by the lowered ear counts in long-standing cases.

Another problem is "How low may a platelet count fall before tissue breakdown occurs?" Tocantins<sup>24</sup> states "Spontaneous bleeding into the skin and mucous membranes often appears when the platelets in cutaneous blood drop below 50,000 per cubic millimeter and disappears when they return to normal."

Petechial tests have also been done in 2 cases, with positive results relative to the concentration of the platelets. It would be interesting if it could be shown that a local scurvy is responsible for damage to the blood vessels.

Since pathologic conditions were indicated in about 4 out of 5 patients examined by a comparison of regional platelet counts, it may be possible on the basis of a thrombocyte deficit for a physician to predict whether or not injection of varicose veins surgical intervention or other radical procedure can be done without sloughing or failure of success. Furthermore a degree of prognosis should be possible. I believe that my follow-up of these cases justifies the following statements. If the count does not increase within three to six weeks with supporting measures and administration of ascorbic acid in large doses, the prognosis is poor for complete recovery. If the count shows a progressive fall, the prognosis is bad. I feel that in any instance in which there is a low count in an extremity a surgical or an injection procedure not immediately necessary should not be carried out until the thrombocytes have shown a substantial increase.

#### THERAPEUTIC PROCEDURE

I have routinely applied full elastoplast (Duke Laboratory) bandages for support of the circulation and have administered 200 mg. of vitamin C (ascorbic acid) a day. A few illustrative responses are shown in table 5. Clinical response has paralleled the improvement in the thrombocyte count.

It is important that I am not misunderstood in my use of ascorbic acid. I have not used it in expectation of stimulating platelet production but possibly to aid in the repair of vascular damage. The improvement in the platelet count probably results from an acceleration of the blood flow which keeps the platelets from adhering to the intima. Thus secondary dissolution is avoided. Furthermore, the drain on the rest of the circulation ceases, since platelets are no longer being lost and an increase in the total count results as production again exceeds destruction.

I am not prepared to say whether the circulatory support or the ascorbic acid is responsible but it is probable that both help. The support permits better maintenance of venous flow and the ascorbic acid may assist in the vessel repair. Roentgen therapy has been used in some cases to assist in the softening of sclerotic areas or help the healing of eczemas. I have used it sparingly but believe that it has a place in treatment if intelligently used.

#### COMMENT

This study must be considered a clinicophysiology experiment. It points out first that tissues are not all bathed alike in a uniform flow of blood constituents. Second, this flow is altered by the withdrawal or dissolution of blood platelets in long-continued slowing of the blood stream in the extremities. This change not only affects the regional blood itself but ultimately results in the lowering of the total number of circulating platelets. The clinical and physiologic conclusions are still hypothetical but, if used as an approximate index of the degree of a pathologic process, are of some clinical importance.

#### CONCLUSION

Regional diminution of thrombocytes in the circulating blood of capillaries is found in certain diseases of the extremities. The local diminution often parallels the local clinical conditions, the most important of which probably is the vicious circle of vascular stasis. This diminution probably is an indication of the degree of vascular damage. It should have therapeutic and prognostic significance.

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<sup>19</sup> Rowlands R. A. and Vaizey J. M. *Lancet* 2: 1217 (Nov. 26) 1938.

<sup>20</sup> Kristenson A. Studien über die Anzahl der Blutplättchen beim Menschen. Akademische Abhandlung. Uppsala: Appelbergs Boktryckeri Aktiebolag, 1924.

<sup>21</sup> Olef Isadore J. *Lab. & Clin. Med.* 20: 416 (Jan.) 1935.

<sup>22</sup> Lee Pearl and Erickson Betty Nims J. *Lab. & Clin. Med.*

24: 821 (May) 1939.

<sup>23</sup> Tocantins L. M. *Medicine* 17: 199 (May) 1938.

<sup>24</sup> Tocantins L. M. *Medicine* 17: 229 (May) 1938.

## ABSTRACT OF DISCUSSION

DR THEODORE CORNBLEET, Chicago Best showed that there are physical changes, such as of the surface tension, which cause the platelets to stick to injured vessels. Injured surfaces too have increased permeability, permitting, no doubt the smallest formed elements of the blood to escape. It is difficult to show this escape because these elements disintegrate so rapidly. Just what purpose their arrest at the pathologic site serves is not known but it may be to prevent hemorrhage, since the phospholipid content of platelets induces clotting. They seem also to contain a water soluble material, which acts oppositely on the clotting mechanism inhibiting it. The latter substance may prevent clotting in legs whose tissue becomes diseased. The presence of histamine in platelets would further act to increase permeability, though much recent work ascribes to the eosinophils dominance as carriers of histamine in the blood stream. Zon and others have shown that platelets carry histamine in rabbits' blood. In other species examined, including man, the eosinophils have this function. Accurate and reliable platelet determinations cannot be done easily and routinely in office, clinic or hospital practice, and this difficulty limits procedure to only a few with especially trained technicians. Could other tests more easily done substitute without any sacrifice? One which might possibly do so is the determination of sedimentation rates on the blood from the extremities. It would be well to have differential counts made on the same blood samples used for the platelet counts. In leukemia purpura may not be present when high or not too extremely low platelet counts are present. This shows that there are other factors present determining bleeding when it does occur in leukemia, in addition to the mere number and quality of platelets. Dr Maynard has charted a most interesting point to be used with other ones yet to be found to form a line pointing beyond academic interest to clinically useful information.

DR MERLIN T R MAYNARD, San Jose, Calif I thank Dr Cornbleet for raising all these questions. I have thought of every one of them. Being a clinician, I hope that somebody with more laboratory time than I have will be able to dig into this side of it. I have always had the one technician do every count and she has been accurate. We can recheck the same individual over and over again and get the count within a very small margin of error. That has all been done on the laboratory side. Tourniquet tests? Yes, I would like to do them, and I would like to get some purpuras. I have done intracutaneous vitamin C tests, but they have not been very successful. The dye seems to be dispersed almost as rapidly in the pathologic areas as in the normal skin. I would like to see sedimentation rates done. The capillary microscope too. I did some of that work many years ago and I haven't thought of it in this case. We have done the differential counts and the interesting thing is that we get perfectly normal white cell and red cell counts, but the platelets are deficient. The platelets are the only ones that are severely interfered with in their distribution.

**Skin Grafts**—The skin graft was first used in 1847 by the American surgeon F H Hamilton. In 1869, two years after he had demonstrated the parasitic properties of skin, Reverdin of Geneva introduced the so called malpighian graft, 2 to 6 mm in size. The technic of skin grafting was improved by Karl Thiersch of Munich, professor of surgery in Erlangen, who in 1874 described the method which has since been known by his name but with which Ollier's name should also be associated for this great French orthopedic surgeon had already described a method exactly similar in 1872. The "pinch" graft, consisting of a small conical graft of skin about half a centimeter in diameter, is generally attributed to Staige Davis (1919). More recently the grafting of small pieces of skin was greatly improved by my own teacher Manuel Corachan, who in 1933 published an account of the technic with which he had obtained highly successful results. Since 1917 the chief exponent of the whole thickness living graft in the form of tubed pedicle flaps has been Sir Harold Gillies, to whose school the progress of modern plastic surgery has been so largely due.—Trueta, Joseph. *The Principles and Practice of War Surgery*, St Louis, C V Mosby Company, 1943.

IRRADIATION OF THE SPLEEN AND  
PITUITARY FOR CONTROL OF  
PUBERAL BLEEDINGBIRTH OF A NORMAL CHILD FOLLOWING  
TREATMENT OF THE MOTHERIRA I KAPLAN, M D  
NEW YORK

An entirely unwarranted fear that irradiation may do harm to the generative organs is one of the main reasons why this well tested method is not more generally utilized in the treatment of irregular bleedings in young girls. While it is true as Halberstaedter<sup>1</sup> reported early after the advent of x-rays, that these exercise a selective action on the ovaries nevertheless, when roentgen therapy is properly employed, permanent suppression of ovarian function and damage rarely occur.

In 1939 I reported the case of a young woman who, intensely irradiated over the pelvic area at 4 years of age, nonetheless menstruated at 12 years and now, at the age of 17½ years, continues to have regular periods. Commenting on this case, Dr George L Streeter<sup>2</sup> of the Carnegie Institute of Embryology states:

"I believe the factor involved in your case is the principle that the more primordial the cells the more resistant they are to x-rays, whereas ova in the later stages of their differentiation are easily destroyed by x-rays, and the primordial cells which will produce their successors are perhaps not so easily affected. In your case the heavy treatment that the patient received certainly killed off all the follicles but in the course of time the primordial ovarian tissue produced a new crop of eggs along with their accessory cells and this finally resulted in the resumption of menstruation."

It has been our experience<sup>3</sup> that the younger the woman treated for sterilization the less permanent is the menstrual suppression. It would appear as Streeter states that, while destruction of follicles does occur, primordial cells in the course of time develop new follicles and normal menstruation takes place. This evidently occurred in a case I<sup>4</sup> reported in 1930 in which after a total sterilizing dose of x-rays, the patient resumed normal menstruation and subsequently gave birth to a normal child.

From my experience irradiation of young women and girls may be employed for gynecologic dyscrasias provided the dosage and method are properly selected. Not always is irradiation required directly over the ovaries. Beclere<sup>5</sup> was one of the first to demonstrate that irradiation of the pituitary may have an effect on menstruation. Since it has been established that the pituitary plays an important role in regulating the menstrual function under normal conditions roentgen therapy has been applied to this area in an attempt to control menstrual disorders, thereby avoiding direct action on the ovaries. This method is especially effective in some cases of dysmenorrhea. In 1929 Ford and Drips<sup>6</sup> reported definite relief of menstrual irregular-

Read before the joint meeting of the Section on Obstetrics and Gynecology and the Section on Radiology at the Ninety Third Annual Session of the American Medical Association Atlantic City, N J June 12 1942  
1 Halberstaedter L Berl klin Wchnschr 42 64 66 1905  
2 Kaplan I I Am J Obst & Gynec 37 158 160 (Jan) 1939  
3 Streeter George L Personal communication to the author in 1938  
4 Rubinfeld Sidney and Maggio R J Am J Obst & Gynec 26 237 243 (Aug) 1933  
5 Kaplan I I Surg Gynec & Obst 50 492 493 (Feb) 1930  
6 Beclere A Paris med 13 97 1926  
7 Ford F A and Drips Della G Radiology 12 393-402 (May) 1929

ties from roentgen irradiation of the pituitary along with irradiation of the spleen.

Definite information about the spleen function is still lacking, but, owing to the relationship between the spleen and the blood vascular system and thrombopenic purpura, splenic irradiation has been used for the control of various types of hemorrhages, especially those associated with ovarian or uterine origin. The effect is not entirely due to increasing coagulation nor does irradiation of the spleen produce a specific coagulation effect. Action through the lymphocytes is probable.

In 1923 Nurnberger<sup>8</sup> reported on the favorable results of irradiation to the spleen in internal hemorrhages and believed it due to the indirect effect on the ovaries and an increase of the blood coagulability. Borak<sup>9</sup> in 1924 recommended splenic irradiation for refractory gynecologic bleeding and suggested that the response was due to x-ray reaction on the nuclear substance, which produced a styptic effect. Seitz<sup>10</sup> reported the hemostatic effect of splenic irradiation in uterine bleeding. Martius<sup>11</sup> reported irradiation of the spleen not only effective in juvenile uterine hemorrhage but also effective in 75 per cent of the cases of bleeding due to ovarian conditions. Werner<sup>12</sup> found that hemorrhage at puberty was quite amenable to irradiation of the spleen and that 70 per cent of the cases responded to a single treatment. He believed that the effect was due to temporary disturbance of the control mechanism. He also noted the favorable effect of pituitary irradiation for such conditions.

Treatment over the spleen can be administered without much hazard of affecting the ovaries, the indirect effect on the ovaries being considerably less than the supposed damage resulting from direct ovarian irradiation in young women and girls. In menorrhagia at puberty or just beyond this period, roentgen therapy to the spleen and on the pituitary can be safely administered without interfering with subsequent ability to bear children.

The following case is an illustration of this sequence.

F. R. (now F. R. C.), a young Jewish girl aged 14½, was referred to me on Nov. 17, 1931 with a note from her physician stating that she started her menstrual history in January of that year. Her first two periods were characterized by slight staining and the last three or four periods were marked by profuse hemorrhages lasting for seven days or more followed by irregular staining.

She was kept in bed for several weeks and treated with various glandular medicaments without avail, also injections were given to raise the blood calcium, and as a last resort she was referred for roentgen therapy.

She was one of three children. The mother's menstrual history was normal. The patient as a child was frequently ill and at 4 suffered from chorea. She looked pale although her blood examination showed only a mild anemia.

The patient was thin, pale and nervous. No vaginal examination was done. The abdomen was soft and no masses were felt. The spleen was not palpable. Rectally there was no pelvic abnormality discernible.

It was decided to institute roentgen treatments to forestall further bleeding. High voltage roentgen therapy was administered over the splenic area, the rest of the pelvis where the ovaries lay was not covered. The factors used were 180 kilovolts, 5 milliamperes, 0.5 mm. of copper and 2 mm. of aluminum filter, at 30 cm. distance through a 6 by 8 cm. port. An 18 per cent skin erythema dose was given (the roentgen measurement was not employed at that time).

On Dec. 11, 1931 she reported that menstruation had started on November 20, lasted but five days and was not so profuse as the previous one. Although she was requested to continue further treatments, the patient did not report again until Jan. 6, 1932, when she stated that, following the November 1931 menstruation she did not bleed again for two months, after which menstruation was irregular until August 1932 when she bled for three weeks into September 1932. In October menstruation lasted four days. The following period was delayed till Dec. 25, 1932 when she started to bleed and was still bleeding profusely on Jan. 6, 1933, when she again reported to me for treatment. This was administered with a 20 per cent dose to the spleen and a 15 per cent dose to the pituitary area. I advised further treatment because it was felt that the single small dose would not be sufficient to give sustained control of the irregularity. However the patient was not seen again until Sept. 20, 1933 when she reported having menstruated irregularly about every two months until September 5 when profuse bleeding started. She was treated with a 20 per cent dose of x-rays to the spleen and, as before, failed to return again until June 27, 1934, when she did so only because she had had continuous bleeding since June 17, 1934. A dose of 15 per cent roentgen therapy was given to the spleen and pituitary areas. Normal menstrual periods followed in July and August. On Nov. 2, 1934 severe bleeding started and on November 15 roentgen treatment was administered to the spleen (20 per cent dose) and to the pituitary (15 per cent dose). Normal menstruation followed until January 1935.

Severe bleeding appeared on Feb. 16, 1935. On March 13 a dose of 15 per cent was administered to the spleen and pituitary areas. Normal menstruation followed in April and May. In June there was no menstruation, on July 13 she began to bleed and continued until Aug. 2, 1935, when treatment was again given in 15 per cent doses to the spleen and pituitary areas. Bleeding lasted for ten days and then stopped. She then menstruated regularly for five to eight days until July 8, 1936 when bleeding was prolonged. On July 20, 1936 80 roentgens was given to the spleen. Regular periods followed until August 1937. On Aug. 10, 1937 70 roentgens was given to the spleen with partial control of bleeding. On August 28 sudden hemorrhage occurred and continued until Sept. 21, 1937, when treatment was given to the spleen and pituitary areas, a dose of 150 roentgens and 75 roentgens administered to each area respectively. Bleeding stopped the next day.

Following this last treatment normal menstruation was established lasting two to three days and continued regularly thereafter. In September 1939, at the age of 22 she married and regular menstruation continued. In May 27, 1941 she reported having skipped two menstrual periods and examination revealed a pregnancy. She carried this normally and on Feb. 6, 1942 was delivered of a normal, full term baby girl.

#### COMMENT

Since x-rays are known to have a selective action on the ovaries, the use of this modality in the treatment for irregular bleeding in young girls has been deemed inadvisable and other areas to be irradiated were sought for controlling puberal bleeding. However, even though in some instances radiation must be administered directly to the ovaries, seldom is sterilization in young women permanent and whereas ova in the later stages of their differentiation are readily destroyed by irradiation, the primordial cells which will produce subsequent ova are not affected. The ova will develop later and, when impregnated, produce normal children.

Because of the recognized controlling influence of the spleen in hemorrhage, roentgen therapy to the spleen has been employed with good results in gynecologic bleedings. The pituitary too is definitely related to the reproductive organs and has been shown to have a pronounced influence on menstrual function. Irradiation of the pituitary has been found to affect favorably gynecologic dyscrasias. Treatment of the spleen and pituitary offers a readily available and effective method

<sup>8</sup> Nurnberger, L. *Zentralbl. f. Gynec.* Jan. 6, 1923, abstr. *Am. J. Roentgenol.* **10**: 931 (Nov.) 1923.

<sup>9</sup> Borak, J. *Munchen med. Wchnschr.* **71**: 1119-1121 (Aug. 15) 1924.

<sup>10</sup> Seitz, L. *Strahlentherapie* **24**: 227-252, 1926.

<sup>11</sup> Martius, H. *Strahlentherapie* **21**: 242-259, 1926.

<sup>12</sup> Werner, P. *Am. J. Obst. & Gynec.* **13**: 54-60 (Jan.) 1927.

for treating puberal bleeding without direct irradiation of the ovaries, thus removing any fear of possibly adverse effect on the result of future pregnancy

#### SUMMARY

A young woman, suffering from irregular menstrual bleeding and hemorrhage for nine years, previously having been treated with medication without response, was moderately controlled by roentgen therapy to the spleen and pituitary and eventually resumed normal menstruation. She married at 22½ years and gave birth to a perfectly normal child about two years later. Roentgen therapy, while controlling the uterine bleeding, has no injurious effect on the reproductive organs of the mother or on the child.

While I have treated a considerable number of girls for puberal bleeding, this case has been singled out for a detailed report because it is the first in the series in which the patient has married and borne children, thereby substantiating the repeatedly voiced opinion that roentgen therapy when properly administered will control abnormal puberal bleeding and leave no injurious effect either on the reproductive organs of the mother or on her children.

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#### ABSTRACT OF DISCUSSION

DR RICHARD W. TELINDE, Baltimore. In the last five years in no instance have I used irradiation for the treatment of functional bleeding in women under 35 years of age. I believe it practically never is necessary and the likelihood of the menopause cannot be predicted with certainty. Women are variable in their susceptibility and even with carefully regulated small doses intended to produce temporary amenorrhea I have seen some very tragic permanent amenorrheas in young women irradiated by excellent radiologists. I can't agree with Dr Kaplan when he speaks of supposed damage of x-rays to the ovary. It is not a supposition, it is real. We can see the histologic changes under the microscope and we can follow our cases clinically and see amenorrhea of varying lengths of time with distressing menopausal symptoms.

DR JOHN T. MURPHY, Toledo, Ohio. With regard to the pituitary irradiation of Dr Kaplan, my experience has been that we are able, at least in the majority of cases, at the first treatment to control for varying periods of time the menstrual cycle. However, I have also had the experience of recurrent bleeding in which irradiation was not effective. There again it may be that we don't know the proper dosage to use, and I feel that that may be an answer to that.

DR WILLARD M. ALLEN, St. Louis. I have been much interested in Dr Kaplan's results from irradiation of the pituitary. He had recurrences in his patients the same as in these cases which I have followed. This indicates a fundamental defect in these particular patients in the pituitary relationship.

DR IRA I. KAPLAN, New York. The question of the advantage and disadvantage of treating young women with x-rays has been gone over completely during the last number of years, and we haven't made any definite decision as to what is what. As yet nobody has been able to produce for observation the second or third generation of human beings from people with hormone dyscrasias who have been irradiated. I have a large series of amenorrhea and sterility cases and a large number of children who have been born from these women who have been stimulated, as we call it, by x-rays to the ovary and the pituitary. We are not sure what the pituitary function is. We know it has a definite relation to ovarian function or menstrual function, or even the birth function in the female. It is too soon to state definitely what the after generation of human beings will show, but we can say that so far none of these children show abnormal effects. The oldest child is a boy normally well developed. Boys don't marry as young as girls, so we can't tell much about them except from the anatomic standpoint. The oldest girl I have in my series is

now about 15. She is menstruating normally. I have a group of them now that are commencing menstruation and they are menstruating normally. This is the first generation of the irradiated mother. I can show a girl who at 4½ had a sarcoma of the pelvis, who was one of the fortunate ones that survived. She had intensive irradiation with complete disregard of any ovarian protection. It was to save her life and keep her going because the parents wanted her to live. She had radium and x-rays. She had radium in the rectum, she had x-rays through the pelvis, two intensive courses, enough to warrant a first degree burn of the skin. Now at 17½ she is menstruating normally. One thing about our work in radiation has been left out in all these discussions. No gynecologist ever sends a patient to a radiation therapist unless he has exhausted everything else in the way of treatment and so in every one of the cases that we have reported treatment has been administered by everything else that is known. Irradiation properly given, should not be looked on as a death dealing ray, as something one should avoid.

DR CONRAD G. COLLINS, New Orleans. It is gratifying to find that in relatively few cases, let's say, of puberty or puberal bleeding we need to use surgery or irradiation, and it can be adequately controlled by endocrine measures in a large number of cases, but perhaps some of the gains made in that area have been lost at the menopause when too much endocrine therapy has been used in an attempt to control bleeding where it may do good temporarily but where the diagnosis is not made correctly, where a few cases of carcinoma are overlooked, where the results are not permanent, and here at this age of life surgery primarily, irradiation secondly, are indicated.

## THE DURATION OF PASSIVE TETANUS IMMUNITY

AND ITS EFFECT ON ACTIVE IMMUNIZATION WITH TETANUS TOXOID

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In the treatment and prophylaxis of tetanus there are several questions of considerable clinical importance for which there are insufficient data to warrant definite answers. Among these may be mentioned:

1. What is the duration of antitoxic immunity after the usual therapeutic dose of tetanus antitoxin?
2. Does any stimulation of antitoxin accompany an attack of clinical tetanus?
3. Can an active antitoxic immunity against tetanus be produced by repeated subcutaneous or intracutaneous injections of toxoid with sufficient rapidity so that such a method could be used as a prophylaxis for wounds?
4. Does the presence of heterologous antitoxin from passive immunization interfere with active immunization against tetanus by toxoid?
5. Has Ramon's "simultaneous serovaccination" against tetanus any merit?

In this paper we wish to report observations on the immunization of children with clinical tetanus and of normal children which give information on these questions.

#### MATERIAL AND METHODS

The observations here reported include more than four hundred tetanus antitoxin titrations made on 9 children with clinical tetanus treated in the St. Louis

From the Department of Pediatrics, Washington University School of Medicine, the St. Louis Children's Hospital, and the Shriner's Hospital for Crippled Children, St. Louis, and the Lilly Research Laboratories, Indianapolis.

Children's Hospital and on 30 children, aged 8 to 15 years, in the Shriner's Hospital for Crippled Children who were in good health and under orthopedic treatment for various deformities. Permission to carry out experimental tetanus immunizations on the latter was given by the chief of staff, Dr C H Crego. The antitoxin determinations were done under the direction of one of us (F G J) and expressed as American units. The titers given represent minimal values in units per cubic centimeter, since the titrations were done at the following levels: 50, 30, 20, 10, 7.5, 5, 2, 1, 0.5, 0.2, 0.1, 0.05, 0.02, 0.017, 0.01 and 0.003 units. A reading of 0.2 would mean, for example, more than 0.2 unit and less than 0.5 unit. Less than 0.003 unit is tabulated as 0.

In the first series of experimental immunizations (table 3) in which toxoid was injected subcutaneously and intracutaneously plain (fluid) rather than alum precipitated toxoid was used, since it was considered that a more rapid absorption of the antigen might make the observations more definite than the prolonged and lingering action of the insoluble alum precipitated toxoid. The intracutaneous injection of 0.5 cc produced no special discomfort.

In the later series on experimental "simultaneous" and delayed immunization (table 4) with toxoid, the insoluble alum precipitated form was used because it was considered desirable to have a more prolonged and continuous action.

For simplicity in presentation, the results will be given in tabular form, and condensed protocols of the observations on the patients with tetanus will be appended at the end of the paper.

#### THE DURATION OF PASSIVE ANTITOXIC IMMUNITY

Passive immunization with tetanus antitoxin is generally believed to be of short duration. For example in standard works on immunology Zinsser<sup>1</sup> states "In ordinary human cases, the antitoxin injected into man may be expected to disappear from the circulation within about three weeks," and Topley and Wilson, "Passive immunity conferred by a single injection of (tetanus) antitoxin wears off in about a fortnight or three weeks." In support of such statements are quoted the observations of Glenny and Hopkins,<sup>2</sup> in which 3 rabbits were given 0.5 cc (375 units) of diphtheria antitoxin and an initial value of 6 to 11 units of antitoxin per cubic centimeter in the blood was reduced to 0 in eleven to sixteen days and of Smith,<sup>3</sup> who reported that after the subcutaneous injection of 9,000 units of diphtheria antitoxin a man showed 1.13 units on the 4th day, 0.08 unit on the 20th day and none on the 27th day after the injection. From clinical observation also it has been noted that diphtheria or tetanus may occasionally develop two to three weeks after a prophylactic antitoxin injection of 500 to 1,500 units has been given. Recently Bigler and Werner<sup>4</sup> carried out antitoxin titrations on the blood of 64 children aged 3 to 10 years at varying times after the

injection of 1,500 units of tetanus antitoxin. They found a wide variation in antitoxin titers in different children and found that some responded less well than others. During the 3d week the tendency was for the level to fall to 0.01 unit, although some remained as high as 0.1 unit and others fell to 0.003 unit or less. In those cases in which there is a more rapid disappearance of passive immunity, the possibility of a previous injection of serum should be kept in mind since under such circumstances the injected serum is destroyed more quickly, as shown by Siquepce and Jude,<sup>5</sup> who made a similar study on adults after passive prophylaxis with 3,000 (international) units of tetanus antitoxin. There seems little question that with such relatively small doses of antitoxin passive immunity is of short duration. On the other hand when larger doses of antitoxin are given, there is evidence that, although the early high titers fall within a short period, lower levels of antitoxin may persist in the blood for a much longer time.

Actual titrations of antitoxin levels in man after passive tetanus immunization with large doses of antitoxin in clinical tetanus are relatively few although Dean<sup>6</sup> demonstrated tetanus antitoxin (amount not stated) twenty-three and thirty-nine days after the intravenous injection of 30,000 units and Cole and Spooner<sup>7</sup> made observations on 4 patients each given 200,000 units of tetanus antitoxin and in all instances found 10 units after seven days, 3 to 5 units after fourteen days and in 3 cases 1 to 3 units after one month while the fourth patient had 0.33 unit on the 22d day and more than 0.1 unit on the 41st and 63d day. Ramon and his associates<sup>8</sup> have reported antitoxin titers on 2 adults each given 150,000 (international) units of tetanus antitoxin. (The international unit is half the strength of the American unit.) In 1 of these a titer of 0.1 unit was found on the 49th day and 0.03 unit on the 70th day, while in the other at least 0.1 unit persisted for thirty-seven days and 0.03 unit for forty-nine days. Two other adults who had had serum injections some time previously were also observed after the injection of 150,000 units of tetanus antitoxin. In these the antitoxin disappeared much more rapidly and 0.01 to 0.1 unit persisted for only twenty-eight days. The more rapid disappearance of antitoxin in animals and persons who have had previous serum injections is the rule and to be expected. Solier and Jude<sup>9</sup> followed the antitoxin in a patient who received 1,254,000 units of tetanus antitoxin over a period of eleven days and reported 1 unit present after thirty-nine days, and 0.01 unit was found on the 86th and again on the 106th day after the last antitoxin injection.

The actual level of antitoxin in the blood required to produce clinical immunity to tetanus has not been definitely established, but there is conclusive evidence that higher values are necessary in passively immunized animals than in those actively immunized. The evidence for this conclusion from animal experiments will

1 Zinsser, Hans and Byne Jones Stanhope. *Textbook of Bacteriology*, ed 8, New York and London D Appleton Century Company 1939 p 163.

2 Topley, W W C and Wilson G S. *The Principles of Bacteriology and Immunity*, ed 2 Baltimore William Wood & Company 1937 p 1367.

3 Glenny, A T and Hopkins B E. *Duration of Passive Immunity* J Hyg 21 142 (Nov) 1922.

4 Smith J H. *On the Absorption of Antibodies from the Subcutaneous Tissues and Peritoneal Cavity* J Hyg 7 205 (April) 1907.

5 Bigler J A and Werner Marie. *Active Immunization Against Tetanus in Infants and Children* J A M A 116 2355 (May 24) 1941.

6 Siquepce I and Jude A. *Sur l'immunité conférée par le sérum antitétanique* Rev d'immunol 3 444 (Sept) 1937.

7 Dean R H. *Report on Twenty-Five Cases of Tetanus to the Medical Research Committee* Lancet 1 673 (May 5) 1917.

8 Cole Leslie and Spooner F T C. *The Treatment of Tetanus with Observations on the Fate of Injected Antitoxin* Quart J Med 4 295 (July) 1935.

9 Ramon Gaston Kourilsky Roux Richou R and Kourilsky, Simone. *Recherches immunologiques sur la sérothérapie antitétanique* Rev d'immunol 5 432 (Sept) 1939.

10 Solier R and Jude A. *Recherches sur le sort de l'antitoxine chez un tétanique traité par la sérothérapie spécifique associée à l'analyse générale* Bull et mem Soc med d'hop de Paris 1 80 (Jan 14) 1938.



be published in detail by one of us (F G I) in a future paper. From our present knowledge it would appear a valid assumption that in human beings clinical protection from tetanus requires a titer of 0.01 to 0.1 unit of passively introduced antitoxin while an active immunity of 0.001 to 0.01 unit is sufficient.

#### PASSIVE IMMUNITY AFTER LARGE DOSES OF ANTITOXIN

In table 1 are shown tetanus antitoxin titrations on 8 children who were given 100,000 units or more in the treatment of clinical tetanus and in whom the rate of disappearance of the passive immunity was followed for a number of weeks. With these larger doses there was remarkable constancy in the rate of decrease in antitoxin, although in those given more than 100,000 units (cases 1 and 2) there was a higher early level and a somewhat longer persistence of the passive immunity. It will be noted that, while the high initial titers fall quickly, as much as 1 unit remained from three to four weeks after the injection, 0.1 unit from six to ten weeks and 0.01 unit from eight to eleven weeks. In the single observation after 150,000 units was given, the antitoxin persisted longer than in the others after 100,000 units. In case 2 also the concentration of

0.01 unit remains for eight to ten weeks. It was observed in 1 case also that even with a blood antitoxin titer of 30 to 50 units the spinal fluid contained only 0.2 unit, and another patient showed 0.017 unit in the spinal fluid at a time when the blood contained 70 units. In this connection it is of interest that Solner and Jude<sup>10</sup> found only 0.03 to 0.1 unit per cubic centimeter in the spinal fluid of their patient at a time that the blood showed 50 to 100 (international) units, in spite of the fact that 50,000 units had been injected intrathecally sixteen hours previously.

#### THE ABSENCE OF ANY ANTITOXIN STIMULATION BY AN ATTACK OF CLINICAL TETANUS

It has long been recognized that tetanus infection does not produce a permanent antitoxic immunity, since a demonstrable antitoxin does not persist in the blood after recovery. The usual explanation is that tetanus toxin is so potent that the absorption of an amount sufficient to produce clinical symptoms is too minute a quantity of antigen to stimulate the production of antitoxin. However, it might be possible for sufficient antigen to be absorbed to produce a primary antigenic stimulus such as occurs after an initial dose of toxoid and which sensitizes the cells to a later, more effective

TABLE 1—Serum Tetanus Antitoxin Titrations in American Units in Eight Children After Passive Immunization with 100,000 Units or More

Case	Age yr	Units of Antitoxin Given	Day After Antitoxin Injection																						
			1	3	4	7	9	12	14	17	21	24	28	32	35	37	42	47	49	57	63	68	76	80	
1 Ruby C	5	200 000						20		10															
2 Noreen B	8	150 000		50			30	20		10		0.5									0.1		0.01		
3 Ruth R	10	100 000		20			10	7.5	5			2		1.0		0.5		0.2		0.1		0.01			
4 Clement H	13	100 000			20		10		5				0.5				0.1			0.01					
5 Charles H	13	100 000		30						2		1													
6 Geneva G	3	100 000				20			5		2		1		0.2		0.2		0.1						
7 Raymond	7	100 000	70																						
8 Mary W	6	100 000			40		10		5		2		1		0.5		0.2		0.1		0.017				

antitoxin in the spinal fluid was determined on two occasions. On the 3d day the blood showed 50 units, and on the 9th day the blood titer was 30 units, and on both these occasions the spinal fluid had a titer of 0.2 unit per cubic centimeter. Another patient (case 7) had only 0.017 unit in the spinal fluid when the blood titer was 70 units.

When only moderately large doses of antitoxin were given (10,000 units) the duration of a more prolonged passive immunity was somewhat less constant than after 100,000 units or more. In table 2 are collected observations on 21 children after receiving 10,000 units, and the duration of titers as high as 0.1 unit and 0.01 unit is shown. These are summarized from data in tables 3 and 4, which will be mentioned later. It will be noted that in 14 of the 21 children a titer of 0.1 unit persisted for from four to six weeks and a titer of 0.01 unit from six to ten weeks. None of these had had a previous serum injection, while of the 7 subjects whose antitoxin disappeared more rapidly only 2 had had horse serum previously. One other child, a girl aged 14 years, was of special interest, since she showed less than 0.003 unit when tested only two weeks after receiving 10,000 units intramuscularly. Careful inquiry elicited no history of a previous serum injection.

To summarize these observations, it was found that after the injection of 10,000 to 150,000 units the tendency is for tetanus antitoxin to persist in the blood in a titer of 0.1 unit for four to eight weeks, and

secondary stimulus. This could be determined by a toxoid injection after recovery from tetanus. In all, we have made observations on 4 children with clinical tetanus, and none showed any development of tetanus antitoxin when toxoid was given some time after recovery. Two of these (table 1, cases 2 and 3) already mentioned received toxoid injections during the first week of observation, and neither responded

TABLE 2—Duration of Titers of 0.1 and 0.01 Unit of Tetanus Antitoxin in the Serum of Twenty-One Children After the Injection of 10,000 Units Intramuscularly

	Weeks After Administration									
	<2	2	3	4	5	6	8	9	10	
Number with 0.1 unit	1	6		9	1	4				
Number with 0.01 unit	1		1	5		3	5	2	4	

by a rapid development of antitoxin when given a stimulating dose of toxoid two and one-half to three and one-half months later. A third (case 4) had 100,000 units of tetanus antitoxin, all of which had disappeared from the blood in four months, at which time a subcutaneous injection of 1 cc of toxoid was given, but no antitoxin had developed two months later. One child (case 5) had typical but mild tetanus of two weeks' duration when first seen. He was given no antitoxin and recovered within two weeks, without



the developing of any demonstrable antitoxin in the blood. About seven weeks after the first symptoms, a subcutaneous injection of 1 cc of toxoid was given, but no antitoxin developed during the following nine weeks.

These observations confirm the prevailing belief that immunity to tetanus does not follow an attack of the disease and in addition indicate that the amount of tetanus toxin antigen absorbed is so small as to produce no primary stimulus or sensitization to tetanus immunization.

#### THE POSSIBILITY OF RAPID DEVELOPMENT OF ACTIVE TETANUS IMMUNITY FOR PROPHYLAXIS

The use of toxoid immunization for prophylaxis after wounds has never been seriously considered by immunologists as a substitute for passive immunization with antitoxin, because the time required for the development of active immunity is considerably longer than the incubation period of tetanus. However, the question is sometimes raised by clinicians whether by repeated intracutaneous toxoid immunization a more rapid production of antitoxin could be stimulated. In the group of 4 children (group 3, table 3) observed after the intradermal injection of 1 cc of tetanus toxoid every 2d day until four doses had been given it was found that the blood titer of antitoxin remained below 0.003 unit for the following seven weeks. Another group (group 1, table 3) immunized by subcutaneous injection of toxoid showed a similar lack of antitoxin production. There is no evidence from these observations that either repeated subcutaneous or intracutaneous injections of tetanus toxoid stimulate a more rapid development of antitoxin.

#### THE EFFECT OF PASSIVE IMMUNITY ON ACTIVE IMMUNIZATION WITH TETANUS TOXOID

The early observations of Glenny and Sudmerson<sup>11</sup> on immunization of guinea pigs against diphtheria with toxin or toxin-antitoxin showed that an animal slightly immunized by a previous dose of antigen responds promptly to a second later injection by a rapid production of antitoxin, but if passively immunized with antitoxin when the first antigen was given a later antigen injection stimulates no secondary type of response and in fact no antitoxin may be produced at all. This principle of the inhibition of active immunization by the presence of passive immunity has been rather generally accepted, and it is only in recent years that reports, chiefly by Ramon<sup>12</sup> and his associates, have advocated combining active and passive immunization by the simultaneous injection of antitoxin and toxoid in diphtheria and tetanus. This consists of an initial injection of antitoxin and one of toxoid followed after an interval by a second toxoid injection and preferably later a third dose of toxoid.

The previous work along this line especially with diphtheria, has been summarized and reviewed in a recent paper by Downie and his associates,<sup>13</sup> who made an extensive series of observations on the combined active and passive immunization of 300 young adults against diphtheria. They conclude from the papers

reviewed and from their own work that the simultaneous administration of antitoxic serum with the first dose of toxoid interferes somewhat with the primary response of the tissues but does not destroy it. Although there may be some delay and slight degree of inhibition in the formation of antitoxin, the final degree of immunity following a later dose of toxoid does not appear to be much inferior to that resulting from active immunization alone. A similar interference with the development of active immunity against tetanus by antitoxin was found by Otten and Hennemann.<sup>14</sup>

Many workers have concluded that only free toxoid can produce the primary sensitization of tissues for an active immunity response to a later injection and that if an excess of antitoxin is present the neutralized toxoid has little sensitizing effect. In this connection two considerations are of some importance: (1) the fact that small doses of antitoxin persist in the body for a much shorter time than large doses as discussed previously, and (2) the fact that, although plain (fluid) toxoid when injected is either immediately neutralized by any antitoxin present or combines rapidly with tissue cells to sensitize them, alum precipitated toxoid is insoluble and remains for some days or weeks at the site of injection and only as the insoluble precipitate goes slowly into solution does the toxoid gradually become available either for neutralizing antitoxin or for sensitizing tissues. In almost all the experimental observations the dose of antitoxin has been 1,500 units or less, and in some of them especially the later ones, alum precipitated toxoid has been used. It is apparent that the inhibiting effect of antitoxin on the sensitizing action of early injections of toxoid might be more certainly observed by the use of a moderately large dose of antitoxin and plain toxoid, since alum precipitated toxin presumably has a more continuous and prolonged absorption.

Our first observations on combined immunization were carried out on 18 healthy children and are summarized in table 3, in which is shown a comparison of the effect of toxoid alone with serovaccination by making weekly titrations of tetanus antitoxin in the blood.

In group 1 each of 4 children received 1 cc of plain (fluid) tetanus toxoid subcutaneously every 2d day until four doses had been given, and eight weeks later a single subcutaneous dose of 1 cc of toxoid. As will be noted, no tetanus antitoxin was detectable in the blood following the first series of injections but appeared quickly after the stimulating dose given eight weeks later.

In group 2 the same procedure was followed except that each of the 4 children received 10,000 units of tetanus antitoxin on the first day on which toxoid was given. There was a progressive decrease in (passive) antitoxin titer, and in 1 child (case 3) who had had a previous serum injection the antitoxin had disappeared entirely at the end of five weeks. In none did the toxoid given after eight weeks stimulate the production of any antitoxin within a period of two weeks.

Groups 3 and 4 were identical with groups 1 and 2 except that in them the initial series of toxoid injections was given intracutaneously. The results were the same in that no antitoxin appeared after the later

<sup>11</sup> Glenny A. T. and Sudmerson H. J. Notes on the Production of Immunity to Diphtheria Toxin. *J. Hyg.* **20**: 176 (Oct.) 1921.

<sup>12</sup> Ramon Gaston. Combined (Active Passive) Prophylaxis and Treatment of Diphtheria or Tetanus. *J. A. M. A.* **114**: 2366 (June 15) 1940.

<sup>13</sup> Downie A. W., Glenny A. T., Parish H. J., Smith W. and Wilson G. S. Combined Active and Passive Immunization Against Diphtheria. *Brit. M. J.* **2**: 4220 (Nov. 22) 1941.

<sup>14</sup> Otten L. and Hennemann I. P. Combined (Simultaneous) Immunization Against Tetanus. Mededeel. d. dienst d. volksgezondh. in Nederl. Indie **28**: 283 1939. abstr. *J. A. M. A.* **114**: 1028 (March 16) 1940.

stimulating dose of toxoid in the children who had received a dose of antitoxin at the outset, although those to whom antitoxin had not been given responded promptly in the usual manner by the development of an active immunity.

The results of these experiments were clearcut and definite. They show that the presence of any considerable quantity of injected antitoxin prevented the primary sensitization or "primary response" of the body cells by doses of toxoid injected during the 1st week, so that a later single dose of toxoid was ineffective in stimulating active antitoxin production.

Further observations on the inhibiting effect of antitoxin on immunization by alum precipitated tetanus toxoid were made on 2 children with clinical tetanus treated with antitoxin and given toxoid simultaneously. Brief protocols of these 2 cases (2 and 3) are given later.

The second child (case 3), a girl aged 10 years was given 50,000 units of tetanus antitoxin on the first day of observation and the same amount on the following day. Alum precipitated tetanus toxoid (0.5 cc) was given intracutaneously on the first day and on each of the following six days. In table 1 are given the blood antitoxin titers, which fell to 0.017 unit on the 76th day. On the 111th day less than 0.003 unit was found, and at this time 1 cc of alum precipitated tetanus toxoid was given subcutaneously. One week later the blood still showed no antitoxin, although four weeks after the toxoid injection (141st day) the serum titer was 0.2 unit, which had decreased to 0.05 unit after five and one-half months. At this time a final dose of 1 cc of plain tetanus toxoid subcutaneously was followed by a titer of 2 units after one week and 5 units after two weeks. In this case the early injections of toxoid apparently produced no primary sensitization, since a

TABLE 3—Comparison of Tetanus Toxoid Immunization Alone and "Seroimmunization" Both Subcutaneous and Intracutaneous Injections Being Used

Day of observation		Blood Tetanus Antitoxin Titrations in Units														
		1	2	3	5	7	8	10	22	28	30	42	49	56	63	70
Group 1																
1	Boy 9 yrs	0*		*	*	*	0	0	0	0	0	0	0	0*	0.05	0.1
2	Boy 11 yrs	0*		*	*	*	0	0	0	0	0	0	0	0*	0.1	0.2
3	Girl 9 yrs	0*		*	*	*	0	0	0	0	0	0	0	0*	0.1	0.2
4	Girl 14 yrs	0*		*	*	*	0	0	0	0	0	0	0	0*	0.017	0.1
Group 2 †																
1	Girl 9 yrs	0*	2.0	*	*	*	1.0	0.5	0.2	0.2	0.1	0.1	0.05	0.05*	0.05	0.017
2	Girl 11 yrs	0*	1.0	*	*	*	1.0	0.1								
3	Boy 13 yrs	0*	2.0	*	*	*	0.5	0.2	0.05	0.017	0	0	0	0*	0	0
4	Boy 15 yrs	0*	0.5	*	*	*	1.0	0.2	0.1	0.1	0.05	0.017	0.017	0.017*	0.01	0.003
Group 3																
1	Girl 11 yrs	0†		†	†	†	0	0	0	0	0	0	0	0*	0.05	0.2
2	Girl 13 yrs	0†		†	†	†	0	0	0	0	0	0	0	0*	0.1	0.5
3	Boy 11 yrs	0†		†	†	†	0	0	0	0	0	0	0	0*	0.1	0.2
4	Boy 10 yrs	0†		†	†	†	0	0	0	0	0	0	0	0*	0	0.017
Group 4 †																
1	Girl 12 yrs	0†	1.0	†	†	†	2.0	0.5	0.2	0.1	0.05	0.05	0.017	0.017*	0.003	0
2	Girl 10 yrs	0†	5.0	*	†	*	2.0	0.5	0.2	0.2	0.1	0.05	0.05	0.05	0.017	0.017
3	Boy 9 yrs	0†	2.0		†	*	2.0	0.5	0.2	0.2	0.1	0.1	0.05	0.05*	0.017	0.017
4	Boy 13 yrs	0†	1.0		†		0.5	0.1	0.017	0	0	0	0	0*	0	0
Group 5 † (control)																
1	Boy 14 yrs	0	1.0				1.0	0.5	0.2	0.1	0.05	0.017	0.017	0.017*	0.003	0
2	Boy 12 yrs	0	2.0				1.0	0.2	0.1	0.1	0.05	0.05	0.017	0.017*	0.01	0.003

\* 1 cc of fluid tetanus toxoid subcutaneously † 10,000 units of tetanus antitoxin intramuscularly  
 ‡ 1 cc of fluid tetanus toxoid intracutaneously (2 areas 0.5 cc each)

The first child (case 2), a girl aged 8 years, was given 100,000 units of tetanus antitoxin the first day of observation and 50,000 units two days later. Alum precipitated tetanus toxoid (0.5 cc) was injected subcutaneously the first day and on each of the succeeding six days. Determinations of tetanus antitoxin in the blood (table 1) showed a decreasing titer, until on the 68th day 0.1 unit was present. Six days later (74th day) 1 cc of alum precipitated toxoid was given subcutaneously, but the antitoxin continued to fall to 0.017 unit on the 80th day and to 0.003 unit on the 125th day. This indicated that the sensitizing effect of early doses of alum precipitated toxoid had been prevented by antitoxin. On the 125th day 0.5 cc of alum precipitated tetanus toxoid was given subcutaneously with the development of 0.5 unit antitoxin two months later (177th day), at which time an additional subcutaneous injection of 0.5 cc of alum precipitated toxoid resulted in an antitoxin titer of 5 units two weeks later (185th day).

stimulating dose of toxoid three and one-half months later resulted only in the type of response often seen from the first antigen injection. The rapid stimulation of the typical "secondary" response followed a later dose of toxoid.

The observations on these 2 children show that the presence of heterologous tetanus antitoxin inhibited the sensitizing effect of alum precipitated tetanus toxoid given subcutaneously or intracutaneously daily during the first week of such passive immunity, so that a later injection of toxoid did not stimulate antitoxin formation in the prompt manner to be expected from a secondary response.

#### DEVELOPMENT OF ACTIVE IMMUNITY IN PASSIVELY IMMUNIZED PERSONS

In spite of the inhibition of (passive) antitoxin immunity on the sensitizing effect of early administration of toxoid, it is apparently possible to overcome this inhibition by repeated toxoid injections so that

a state of passive immunization can pass into one of active immunity. This appears to be more readily accomplished when small amounts of antitoxin are given than after large doses. Sacquepée and Jude,<sup>1</sup> for example, treated 240 wounded soldiers prophylactically for tetanus by giving 1.5 cc of anatoxin (toxoid) subcutaneously together with "the dose of serum indicated by the circumstances." On the 20th day and again on the 30th day, 2 cc of toxoid was given subcutaneously. Antitoxin titrations done six months later showed that 97 per cent of the subjects had 0.065 to 0.2 (international) unit of tetanus antitoxin. After one year an additional dose of 2 cc of toxoid was given and six months later, when 51 were retested, 96 per cent had more than  $\frac{1}{10}$  unit and 76 per cent 1 unit or more.

TABLE 4—Combined Passive and Active Tetanus Immunization: Comparison of Simultaneous Sero-vaccination with Delayed Toxoid Injections After 10,000 Units of Antitoxin in the Production of Active Immunity

Elapsed week of observation	Blood Tetanus Antitoxin Titration in Units						
	0	2	4	6	8	10	12
Group 1*							
1 Girl 13 yrs	†	†	†	†	†	†	†
2 Girl 10 yrs	0	1.0	0.0	0.1	0.0	0.017	0.1
3 Boy 14 yrs	0	0.5	0.0	0.003	0	0.2	0.1
Group 2*							
1 Girl 12 yrs	†	†	†	†	†	†	†
2 Girl 13 yrs	0	0.5	0.0	0	0.2	0	1.0
3 Boy 9 yrs	0	0.2	0.1	0.017	0.01	0.2	0.5
Group 3*							
1 Girl 12 yrs	†	†	†	†	†	†	†
2 Girl 14 yrs	0	0	0	0	0	0.1	0.2
3 Boy 9 yrs	0	0.5	0.1	0.003	0	0.1	0.2
Group 4*							
1 Girl 10 yrs	†	†	†	†	†	†	†
2 Girl 14 yrs	0	1.0	0.1	0.017	0.003	0	0.2
3 Girl 8 yrs	0	0.5	0.1	0.017	0.003	0	0.2
Group 5*							
1 Girl 14 yrs	†	†	†	†	†	†	†
2 Girl 10 yrs	0	0.017	0	0.1	0.0	0.5	0.5
3 Boy 15 yrs	0	0.017	0	0.003	0.1	0.2	0.5

10,000 units of tetanus antitoxin intramuscularly  
 † 0.5 cc of tetanus toxoid (alum precipitated) subcutaneously  
 1 500 units of tetanus antitoxin intramuscularly

When larger (therapeutic) doses of antitoxin are given together with toxoid, the development of demonstrable active immunity may require a prolonged period of repeated antigen injections and the lapse of several months. The observations by Ramon,<sup>2</sup> who has advocated this procedure of simultaneous immunization are the only ones reported in sufficient detail to be of value for analysis. This report comprises 14 patients each of whom received 150,000 (international) units of tetanus antitoxin together with 2 cc of anatoxin (toxoid). At weekly intervals increasing doses of toxoid were given (3 cc in one week, 4 cc in two weeks, 5 cc in three weeks, 5 cc in four to seven weeks and sometimes 5 cc later) and titrations of tetanus antitoxin followed. The early high antitoxin titers

fell rapidly to lower levels and the later decrease in titer was more gradual. In every instance there was eventually an increase in antitoxin as evidence of the production of an active immunity which appeared two weeks after a toxoid injection. Most cases, however, required a total of six injections of toxoid (24 to 29 cc), and the development of active immunity was not demonstrated for four months or more (seventeen weeks 2, nineteen weeks 3, twenty-three weeks or more 4), although 3 patients showed some increase in antitoxin at the end of eight weeks and 2 others at ten weeks. It was of interest also that in most instances the (passive) antitoxin had fallen to a relatively low level before a stimulating dose of toxoid caused a rise in titer. For example, in 5 cases the titer had reached less than 0.01 unit, while in 7 others it had fallen to 0.1 unit or less. It was assumed by Ramon that the early 'simultaneous' dose of toxoid was necessary or at least played a very important part in the sensitization. It may be pointed out, however, that the evidence previously mentioned of the inhibiting effect of antitoxin on sensitization by early doses of toxoid, the multiple doses of toxoid given at intervals during the period of decreasing passive immunity and the considerable delay in the development of active immunity all suggest that one of the later doses of toxoid may have initiated the sensitization and that the initial "simultaneous" toxoid may have been entirely without effect. Experiments were carried out to study this possibility.

#### EXPERIMENTAL OBSERVATIONS ON "SIMULTANEOUS" SERO-VACCINATION AND DELAYED IMMUNIZATION AFTER ANTITOXIN

These were planned on the hypothesis that since the presence of an excess of passive antitoxin inhibits the production of active immunity with toxoid, the stimulation of active antibodies will occur only when the passive immunity has reached a low level. If this is correct, there is an optimum time after passive immunization at which the inhibition disappears and the stimulation of an active immunity becomes effective, while toxoid given before this time is rendered inert by the heterologous antitoxin. Several properly spaced injections of toxoid, delayed until the approximate time of low passive immunity, would therefore be as effective as when the toxoid was started simultaneously with the antitoxin injection. For this it seems preferable to use alum toxoid which is insoluble and presumably is dissolved and absorbed slowly and continuously over a period of time so that antigen will become available for the stimulation of an active immunity as soon as the inhibition by antitoxin disappears. It is apparent that when smaller amounts of antitoxin have been given a shorter delay in starting toxoid is indicated than after large doses.

The effect of "simultaneous sero-vaccination" was compared with that resulting from a delay in the start of toxoid immunization for two, four and six weeks after the antitoxin injections in the following manner.

Twelve healthy children (from the Shriner's Hospital) were each given 10,000 units of tetanus antitoxin intramuscularly and separated into four groups of 3.

GROUP 1—Each child was given 0.5 cc of alum precipitated tetanus toxoid subcutaneously at the time of the antitoxin injection and every two weeks thereafter for a total of six injections.

GROUP 2—Toxoid was started two weeks after the antitoxin and continued every two weeks for a total of five injections.

15 Sacquepée E. and Jude A. Sur la valeur et la durée de l'immunité antitétanique après injection de rappel chez l'homme immunisé contre la tétanos par l'emploi simultané du sérum et de l'anatoxine tétanique. *Compt. rend. Soc. de biol.* 125: 711 (June 26) 1937.

GROUP 3—Toxoid was started four weeks after the antitoxin and given again every two weeks for a total of four injections

GROUP 4—Toxoid injections were delayed until six weeks after the antitoxin, and a total of three doses was given

An additional group of 3 children (group 5) was given only 1,500 units of antitoxin and toxoid was started two weeks later and continued at two week intervals for a total of five doses

The observations covered a period of twelve weeks and antitoxin titrations were done on the blood of each child at the start of the experiment and at two week intervals thereafter

The observations in these five groups have been collected in table 4, in which the biweekly antitoxin titrations are shown. The early high levels of antitoxin fell gradually, and the variation observed in the rate of disappearance of antitoxin in different children could not be related to a previous dose of horse serum since only 1 child (group 5, case 2) had had such an injection (diphtheria antitoxin). The complete destruction of 10,000 units of antitoxin within two weeks of its injection in 1 child (group 3, case 1) was quite unexplained, since she had received no previous horse serum. This child had severe serum sickness seven days after the antitoxin injection, but this occurred also in 7 other children in the series. The earliest increase in antitoxin titer is indicated in heavier type and is taken as the first development of an active immunity.

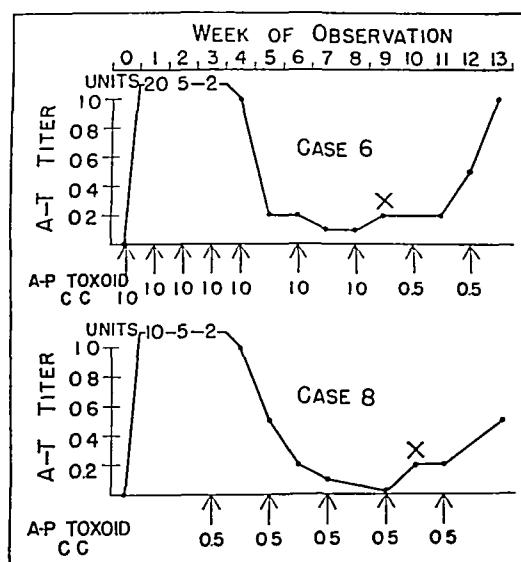
The results in this series also appear quite clearcut and definite. It will be noted that in the first four groups of children passively immunized with 10,000 units of antitoxin, all began to have an active immunity from the 8th to the 12th week of observation. While there was some inconstancy in the onset of active immunity in the different groups, this variation was no greater than that shown by the children in the same group. In these children, then, an active immunity developed at approximately the same time, whether the toxoid was started simultaneously with the antitoxin injection or two, four or six weeks later. On the other hand one of the relatively constant and striking features was the low titer of passive antitoxin reached before the appearance of an active immunity. This was 0 in 7 children, 0.017 unit in 3, 0.01 unit in 1 and 0.05 unit in 1, which suggests that the disappearance of the inhibiting effect of passive antitoxin is more important in the early development of active immunity than the time at which the immunization is started. This is emphasized by the 3 children in group 5, each of whom was passively immunized with only 1,500 units of antitoxin. In them the passive immunity disappeared more quickly than in those given larger doses and fell to 0 in from four to six weeks. Although toxoid was not started until two weeks after the antitoxin, active immunity had begun to develop in all six weeks later.

Further observations of a comparison between "simultaneous serovaccination" and delayed immunization were possible on 2 children with clinical tetanus each of whom was given 100,000 units of antitoxin (cases 6 and 8). The detailed data of these 2 children are given in the protocols at the end of the paper, but a graphic representation of the results is shown in the accompanying chart. In case 6 active toxoid immunization was started simultaneously with the antitoxin injection and continued once weekly for five injections and thereafter once every two weeks. In case 8 toxoid was first given three weeks after the antitoxin and

again every two weeks afterward. Antitoxin titrations were done at weekly intervals during a period of thirteen weeks and are expressed in units.

The antitoxin curves in these 2 cases show a striking similarity. From an early level of 20 to 40 units the titers fell to 1 unit at the end of four weeks and to 0.1 unit at seven weeks. In the first child (case 6) in whom toxoid immunization was started simultaneously with the antitoxin, the first demonstrable increase in antitoxin (active immunity) appeared nine weeks later following the seventh toxoid injection while in the second child (case 8) in whom the toxoid immunization was delayed for three weeks an active immunity developed in the 10th week of observation following the fourth toxoid injection. In both instances the appearance of an active immunity was delayed until the passive immunity had reached a low level and the early toxoid injections in the first case produced no appreciable acceleration in its development.

These results tend to confirm the relative inefficacy of toxoid given during moderate and high concentrations



Transition from passive to active tetanus immunity (indicated by X) after 100,000 units of antitoxin. Comparison of simultaneous serovaccination (case 6) with delayed toxoid immunization (case 8) by blood antitoxin titer.

of passive antitoxin and suggest that only when such passive immunity has reached a relatively low titer is active immunization with toxoid effective. They give no support to the value of "simultaneous" serovaccination and indicate that a transition from passive to active immunity is readily accomplished by delaying the start of active toxoid immunization from two to four weeks after the passive immunization depending on the dose of antitoxin given.

#### SUMMARY

In a study of active and passive tetanus immunity on 39 children on whom more than four hundred tetanus antitoxin titrations were done, the following observations were made:

1. Although passive immunization with the usual prophylactic dose of 1,500 units or less produces an immunity of only approximately three weeks, larger doses cause a much more prolonged immunity. After the administration of 100,000 units or more it was found that the blood serum showed as much as 1 unit per

cubic centimeter for from three to four weeks, 0.1 unit from six to ten weeks and 0.01 unit from eight to eleven weeks. With a dose of 10,000 units the passive immunity was somewhat less prolonged, although in most instances 0.1 unit persisted for from four to six weeks and 0.01 unit from six to ten weeks.

2. Antitoxin in the spinal fluid of 2 children was determined during passive immunization. In 1 the spinal fluid contained 0.2 unit per cubic centimeter when the blood antitoxin titer was 30 to 50 units, while in the second the spinal fluid titer was 0.017 unit and the blood 70 units.

3. In 4 children with clinical tetanus it was observed that not only did antitoxic immunity not follow recovery but the amount of antigen (toxigen) absorbed during a tetanus infection was so small as to produce no primary antigenic stimulus or "sensitization" to later active tetanus immunization.

4. Repeated subcutaneous or intracutaneous injections of tetanus toxoid did not produce an antitoxic immunity within several weeks. Such injections are of value in tetanus prophylaxis only when the subject has had one or more previous "sensitizing" toxoid inoculations.

5. When passive immunization was produced with 10,000 units or more of antitoxin, multiple injections of toxoid given subcutaneously or intracutaneously during the week following had no demonstrable immunologic effect. Such subjects did not have any active immunity for a period of many weeks and even when given a later "stimulating" dose of toxoid failed to respond by producing antitoxin. Control groups of children given toxoid in the same manner without being passively immunized reacted to the later dose by developing an active immunity in a short time. It was concluded that the presence of any considerable quantity of heterologous antitoxin prevents the usual "sensitization" of the body cells by toxoid and renders it inert as an antigen.

6. A passive immunity can be converted into an active immunity by toxoid injections. It was observed, however, that this transition can be produced as readily and as rapidly when the initial active toxoid injection is delayed several weeks as when it is started simultaneously with the antitoxin injection. After passive immunization with 10,000 units of antitoxin and with toxoid injections at two week intervals an active immunity developed in from eight to twelve weeks regardless of whether the first toxoid was given simultaneously with the antitoxin or whether it was delayed two, four or six weeks. The same similarity of active antitoxin response was found in 2 children passively immunized with 100,000 units. In 1 of them toxoid was started simultaneously with the antitoxin injection while in the other the initial injection was delayed three weeks but in the two the active immunity developed at about the same time.

It was concluded that these results were explained by the previously mentioned observations of the inhibition of larger amounts of heterologous antitoxin on the antigenic action of toxoid and that only when such passive antitoxin titers have reached a relatively low level is active toxoid immunization effective. This hypothesis was supported by the observation that a much more rapid active immunity could be produced after passive immunization with only 1,500 units of

antitoxin. Under such circumstances the passive antitoxin titer falls more quickly, and children in whom toxoid was started two weeks after the antitoxin injection had an active immunity more quickly than those who had received larger doses (10,000 units) of antitoxin. These observations tend to refute the value of "simultaneous serovaccination" in the production of active tetanus immunity and show that a delay of active immunization of from two to four weeks following the antitoxin injection is indicated.

#### BRIEF PROTOCOLS OF CASES OF CLINICAL TETANUS IN WHICH IMMUNITY STUDIES WERE MADE

All 9 children in this group recovered except 1. They were given avertin with amylene hydrate for varying periods, but the details of therapy are omitted. All lived in rural or suburban localities at some distance from St. Louis and in some of them prolonged observation was not possible. The immunologic data are collected in table 1 and those on cases 6 and 8 shown graphically in the chart.

CASE 1—Ruby C. aged 5 years with tetanus of four days duration was given 200,000 units of antitoxin intramuscularly over a period of four days. Twelve days after the first serum was given the blood showed 20 units and five days later 10 units. No further tests were done.

CASE 2—Norton B. a girl aged 8 years with tetanus of three days duration was given 90,000 units of antitoxin intravenously and 10,000 units subcutaneously on the first day of observation and 50,000 units intravenously two days later. Alum precipitated tetanus toxoid was given subcutaneously each day for the first seven days in 0.5 cc doses. On the 3d day the blood showed 50 units of antitoxin and the spinal fluid 0.2 unit; on the 9th day the titer was 30 units in the blood and still 0.2 unit in the spinal fluid. Examination of the blood showed 20 units on the 13th day, 10 on the 15th, 0.5 on the 30th day and 0.1 on the 68th. On the 74th day, 1 cc of alum precipitated toxoid was given subcutaneously and six days later (80th day) the antitoxin titer was 0.017 unit while on the 125th day it had fallen to 0.003. At this time another dose of 0.5 cc of alum precipitated toxoid was given subcutaneously. Two months later (177th day) 0.5 unit was found in the blood and a final dose of 0.5 cc of alum precipitated toxoid was injected subcutaneously with the development of an antitoxin titer of 5 units two weeks afterward (185th day).

CASE 3—Ruth R. aged 10 years with clinical tetanus of eight hours duration was given 20,000 units of antitoxin intravenously and 30,000 units intramuscularly on the first day of observation and 50,000 units intramuscularly the day following. Daily doses (0.5 cc) of toxoid alum precipitated were given intracutaneously for the first seven days. The serum titers of antitoxin showed the following: 3d and 4th days 20 units; 5th to 10th day 10 units; 12th day 7.5 units; 15th day 5 units; 20th and 24th day 2.5 units; 27th and 32d day 1.0 unit; 37th day 0.5 unit; 47th day 0.2 unit; 57th day 0.1 unit; 76th day 0.017 unit and 111th day less than 0.003 unit. On this day 1 cc of alum precipitated tetanus toxoid was given subcutaneously, and seven days later (118th day) the blood still showed no antitoxin although thirty days after this injection (141st day) the serum titer was 0.2 unit. No further observations were made for five and one half months, at which time the blood showed 0.05 unit. A final dose of 1 cc of alum toxoid was given subcutaneously and the antitoxin increased to 2 units after one week and to 5 units after two weeks.

CASE 4—Clement H., a boy aged 13 years with clinical tetanus was given 100,000 units of antitoxin on the first day of observation. The serum antitoxin titers were as follows: 4th day 20 units, 9th day 10 units, 14th day 5 units, 29th day 0.5 unit, 43d day 0.1 unit, 57th day 0.01 unit, 85th day less than 0.003 unit. One month later the blood still

showed no antitoxin, and 1 cc of plain tetanus toxoid was given subcutaneously. After two months the titer was still less than 0.003 unit.

CASE 5—Charles K., a boy aged 13 years, with clinical tetanus, received 50,000 units of antitoxin intravenously the first day of observation and 50,000 units by the same route the day following. On the 3d day the serum showed 30 units, on the 17th day 2 units and on the 24th day 1 unit. No further observations were possible.

CASE 6—Geneva G., a Negro girl aged 3 years, was burned severely over the abdomen and legs. Clinical tetanus developed eighteen days later for which she was given 40,000 units of tetanus antitoxin intravenously and 60,000 units intramuscularly together with 1 cc of alum precipitated tetanus toxoid subcutaneously. She received weekly subcutaneous injections of alum precipitated toxoid during the next four weeks (five injections), and these were continued at biweekly intervals subsequently. Antitoxin titrations of the blood done weekly are shown in table 5.

TABLE 5—Weekly Antitoxin Titrations of the Blood

Day of Observation	Blood Antitoxin Titer Units	Alum Precipitated Toxoid Cc
0-1	0	1
7	20	1
14	5	1
21	2	1
28	1	1
35	0.2	
42	0.2	1
49	0.1	
56	0.1	1
63	0.2	
70	0.2	0.5
77	0.2	
84	0.5	0.5
91	1.0	

TABLE 6—Antitoxin Titrations (Case 8)

Day of Observation	Blood Antitoxin Titer Units	Alum Precipitated Toxoid Cc
0-1	0	
4	40	
9	10	
14	5	
21	2	0.5
28	1	
35	0.5	0.5
42	0.2	
49	0.1	0.5
63	0.017	0.5
70	0.2	
77	0.2	0.5
91	0.5	

CASE 7—Raymond N., a boy aged 7 years, with very severe tetanus, was given 50,000 units of antitoxin intravenously and the same amount intramuscularly. The following day his blood showed 70 units per cubic centimeter and the spinal fluid 0.017 unit. Death occurred on the second day, apparently from peripheral circulatory collapse.

CASE 8—Mary W., aged 6 years, with clinical tetanus, received 100,000 units of antitoxin half intramuscularly and half intravenously. Active immunization with toxoid was started three weeks later. The antitoxin titrations are shown in table 6.

CASE 9—Clyde C., a boy aged 6½ years, had mild clinical tetanus of two weeks' duration when first seen and was given no antitoxin. His blood showed no antitoxin when examined on the 4th, 13th, 20th and 37th days of observation. On the 37th day he was given 1 cc of tetanus toxoid subcutaneously and no antitoxin developed by the 44th, 51st or 100th day.

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## THE SYNDROME OF UNILATERAL RUPTURE OF THE SIXTH CERVICAL INTERVERTEBRAL DISK

WITH COMPRESSION OF THE SEVENTH CERVICAL NERVE ROOT

A REPORT OF FOUR CASES WITH SYMPTOMS SIMULATING CORONARY DISEASE

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Rupture of a cervical intervertebral disk into the spinal canal has been reported many times. With few exceptions, however, the symptoms were due to compression of the spinal cord rather than the nerve roots. Adson,<sup>1</sup> Elsberg,<sup>2</sup> Stookey,<sup>3</sup> Peet and Echols,<sup>4</sup> Mixer and Ayer,<sup>5</sup> Hawk,<sup>6</sup> Love and his co-workers<sup>7</sup> and Bradford and Spurling<sup>8</sup> all have reported 1 or more cases of rupture of the cervical disks. Of all these cases only 4 seem to have had nerve root compression without involvement of the spinal cord, and of these 1<sup>9</sup> was a rupture of the sixth disk. In this particular case the description of the exact radiation of the pain and of the sensory findings was quite limited. Two of the cases<sup>10</sup> were not proved pathologically, but there seems to be very little doubt of the diagnosis.

From a review of the literature, therefore, it would seem that most of the ruptured disks in the cervical spine produce either bilateral or unilateral cord pressure and that disks causing nerve root symptoms alone are very rare. Indeed, such statements have been made by several of the authors who have written on this subject, namely Stookey,<sup>11</sup> Love and Walsh<sup>12</sup> and Bradford

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From the Department of Neurological Surgery, University of Tennessee, College of Medicine, and the Baptist Memorial and the John Gaston Hospitals.

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Since this paper was written 7 additional cases have been seen. Four of these have been proved at operation. The remaining 3 have not yet come to operation.

1. Adson, A. W. and Ott, W. O. Results of the Removal of Tumors of the Spinal Cord. *Arch. Neurol. & Psychiat.* 8: 520-537 (Nov.) 1922.

2. Elsberg, C. A. Diagnosis and Treatment of Tumors of the Spinal Cord. *Northwest Med.* 24: 309-317 (July) 1925.

3. Stookey, C. A. Tumors of the Spinal Cord. New York: Paul B. Hoeber, Inc. 1925.

4. Peet, M. M. and Echols, D. H. Herniation of the Nucleus Pulposus. Cause of Compression of the Spinal Cord. *Arch. Neurol. & Psychiat.* 32: 925-932 (Nov.) 1934.

5. Mixer, W. J. and Ayer, J. B. Herniation or Rupture of the Intervertebral Disk into the Spinal Canal. *New England J. Med.* 213: 385-393 (Aug. 29) 1935.

6. Hawk, W. A. Spinal Compression Caused by Ectochondrosis of the Intervertebral Fibrocartilage with a Review of the Recent Literature. *Brain* 59: 204-224 (June) 1936.

7. Love, J. G. Protrusion of the Intervertebral Disk (Fibrocartilage) into the Spinal Canal. *Proc. Staff Meet. Mayo Clin.* 11: 529-535 (Aug. 19) 1936.

8. Bradford, F. K. and Spurling, R. G. The Intervertebral Disk. Springfield, Ill.: Charles C. Thomas, Publisher, 1941.

9. Stookey, Byron. Compression of the Spinal Cord Due to Ventral Extradural Cervical Chondromas. *Diagnosis and Surgical Treatment.* *Arch. Neurol. & Psychiat.* 20: 275-291 (Aug.) 1928.

10. Mixer, W. J. and Ayer, J. B. Bradford and Spurling.<sup>8</sup>

11. Stookey, Byron. Compression of Spinal Cord and Nerve Roots by Herniation of the Nucleus Pulposus in the Cervical Region. *Arch. Surg.* 40: 417-432 (March) 1940.

12. Love, J. G. and Walsh, M. N. Protruded Intervertebral Disks. A Report of One Hundred Cases in Which Operation Was Performed. *J. A. M. A.* 111: 396-400 (July 30) 1938.

and Spurling.<sup>8</sup> We believe, however, that exactly the reverse is true. We believe further that an undetermined number of patients with pain in the precordium, in the shoulder and in the arm, who heretofore were thought to have coronary thrombosis, angina pectoris, arthritis of the cervical spine, brachial plexus neuritis and neuralgia, bursitis, scalenus anticus syndrome, cervical rib or discogenetic disease will be found to have a rupture of one of the lower cervical disks.

Unilateral rupture of the sixth cervical disk with compression of the seventh cervical nerve root causes a definite syndrome as similar lesions of the fourth and fifth lumbar disks. This report is based on 3 such cases proved at operation. One other case as yet unverified by operation is included, because the similarity of the history and physical findings to the 3 proved cases makes the diagnosis almost certain. All 4 cases are practically identical.

#### ANALYSIS OF CASES

Three of the patients were men and 1 was a woman. Two of the patients were physicians. The youngest was 40 years of age and the oldest 51. In all cases the pain was on the left side. The duration of symptoms varied from seven years to three weeks.

Each patient gave a history of numerous cricks in the neck recurring intermittently for months or years preceding the attack of radiating pain. The onset was precipitated in 1 case when the neck was jerked suddenly while the patient was driving a car and in another when the patient bent over to tie his shoe. In the 2 remaining cases there was no definite movement or injury to which the onset could be attributed. Each patient had a particularly severe crick in the neck before the rather sudden onset of the disabling pain. The pain radiated in each case to three general regions: (1) the precordium, (2) a point just medial to the upper angle of the scapula and (3) down the lateral and medial surfaces of the arm. In each instance there was considerable difficulty in breathing and a sense of impending death and in 1 case cyanosis. At the beginning of the attack, the pain in the precordium was most intense and every patient thought that he had had a heart attack. After a few days or weeks this pain abated to some extent and that in the rhomboid region and arm became more pronounced. All pain was intensified by moving the neck, sneezing, coughing and straining. Three patients complained of definite numbness and weakness in the index finger and slight numbness in the middle finger. The same 3 patients also stated that the involved arm was always cold.

Examination showed severe muscle spasm in the neck and shoulder. The neck was held rigidly and abduction of the neck from the side of the lesion caused an exacerbation of the pain, while traction on the head relieved the symptoms to some extent. In each patient there was an exquisitely tender point just posterior to the scalenus anticus muscle over the exit of the seventh cervical nerve from the spinal canal. There was also a point of tenderness over the painful area in the rhomboid region. In 3 cases pronounced hypesthesia and hypalgesia were found over the entire index finger which extended to the metacarpophalangeal joint. In these same 3 cases there was slight reduction of sensation in the middle finger. In 1 case no objective sensory disturbance was found. In 3 cases there was weakness in the movement of the index finger, particularly in flexion. The reflexes were normal in all cases and there was no evidence of muscular atrophy. There were no

findings in any case suggestive of spinal cord pressure, although 1 patient had a conditional tremor in the opposite hand, which is still unexplained.

X-ray examination of the cervical spine showed a straightening of the cervical curve in each instance. There was no evidence of hypertrophic arthritis in any of these cases at the beginning of symptoms. In 1 case, however, reexamination of the neck seven years after the onset and shortly before operation showed narrowing of the fifth and sixth disks with lipping of the edges of the adjacent vertebrae. Another patient is beginning to show spur formation on the sixth and seventh vertebrae one year after the operation.

Lumbar puncture was performed on all 4 patients. The total protein was increased in 2 and was normal in 2. The dynamics of the fluid were normal in all 4 cases.

The diagnosis of this condition was made solely on the basis of the history and physical findings. No contrast medium in the spinal canal was used by us although in 1 case iodized poppy seed oil had been injected elsewhere with negative results. In this case and in 1 other the ruptured disk was so far out in the intervertebral foramen that the nerve alone was compressed. Contrast mediums could not have shown these lesions but in a third case there was some slight indentation of the dura which might have produced a filling defect.

The operative procedure was carried out under local anesthesia. The lower cervical laminae on the side of the lesion were exposed and the involved nerve root was identified by the patient when gentle pressure was applied on the ligamentum flavum reproducing the exact pain. In each instance the ruptured disk was found directly beneath. This test was made before any bone was removed, eliminating the necessity of exploring several interspaces. A small portion of the adjacent laminae was removed and the interlaminae portion of the ligamentum flavum was excised. As this was done, the nerve root came into view, pushed up against the ligamentum flavum and was flattened out by the nodule of disk.<sup>13</sup> The nerve root then was injected with procaine hydrochloride and almost instantaneously all pain was relieved. Approximately half of the articular facets and the capsular portion of the ligamentum flavum were removed and the nerve root was retracted upward or downward, exposing the nodule of disk without difficulty. These herniated disks differed from those found in the lumbar region only in size, being smaller than the latter. The loose fragments of fibrocartilage were removed, thus relieving the pressure on the nerve.

Two of the 3 patients operated on now are relieved completely of all of their original pain, whereas the third although relieved of the shoulder pain still has some discomfort in the arm and occasional pain in the precordium. He states, however, that this is not nearly as intense as before the operation and feels that the operation was well worth while. The patient who was not operated on was seen by us before the cause of her pain was recognized. She gradually has improved to the point at which she is able to continue her work but still has occasional pain at intervals, especially after periods of activity.

13 It should be remembered that in the cervical region the nerve roots emerge from the dura at the level of the foramina through which they make their exits and are compressed as they go through the foramina, whereas in the lumbar region the nerve roots come out of the dura and are compressed by the ruptured disks a segment above the points of their exit from the canal.



## REPORT OF CASES

**CASE 1**—*History of cricks in neck for three years prior to onset of severe pain in neck, rhomboid region, arm and precordium, which lasted seven years, injection of iodized oil with negative results, scalenus anticus section without relief, removal of rupture of sixth cervical disk with partial relief of symptoms*

**History**—J W B, a white man aged 41, a surgeon admitted to the Willis Campbell Clinic on Aug 2, 1933, complained chiefly of violent pain in the left side of the neck the precordium, the rhomboid region and the left arm. During the last three years the patient had had three very severe cricks in the left side of the neck.

Three weeks before admission the patient had a severe crick in the neck and a few days later experienced intense pain associated with muscle spasm in the left rhomboid region. A short time thereafter an extremely violent radiating pain occurred in the precordium and down the left arm. This pain completely incapacitated him and he spent most of the time in bed, taking large doses of codeine and soluble pentobarbital. One week before admission he consulted an internist because he thought he had a coronary occlusion with an atypical distribution of pain. Complete investigation of the heart, however, failed to reveal any evidence of coronary disease.

**Examination**—The neck was held rigidly and there was considerable muscle spasm in the left rhomboid region. There was definite tenderness over the brachial plexus and over the painful area in the rhomboid region. There was no weakness in the hand nor was there any change in sensation in the arm or fingers. All reflexes were normal.

X-ray examination of the cervical spine showed that it was held in slight flexion but was otherwise negative.

**Diagnosis**—Brachial plexus neuralgia, cervical arthritis and like conditions were considered.

**Course**—Injection of procaine hydrochloride into the brachial plexus, head traction and a Thomas collar were tried, with only temporary relief. The pain continued in such intensity that it was impossible for him to continue his practice. Many internists, neurologists and neurosurgeons in various parts of the country were consulted in the next six or eight months. At one clinic an exploration of the rhomboid region was made, which was entirely negative. During the next three years he spent his winters in Arizona and summers in Wisconsin, where he thought the pain was less severe than at his home in Arkansas. A conditional tremor of the right arm and hand developed during this period. During the winter of 1937 the pain again became almost unbearable and he was referred to yet another neurosurgical clinic for investigation.

Neurologic examination was again entirely negative, but examination of the spinal fluid showed a consistently high total protein of 60 mg per hundred cubic centimeters, and it was felt that there was some pressure on the fifth or sixth cervical nerve root. Intraspinal injection of iodized poppy seed oil was carried out with negative results. The tremor in the right arm was thought to be functional. In 1938 the patient returned to Memphis and a section of his scalenus anticus muscle on the left was carried out without relief of symptoms.

In September 1940 the patient experienced an exacerbation of the pain so intense that he was certain this time that he did have a coronary occlusion. Again investigation of his heart failed to reveal any abnormality. There was no change in the neurologic findings, and the spinal fluid protein was again found to be 60 mg.

X-ray examination at this time showed a very definite narrowing of the fifth and sixth cervical disks with considerable spur formation along the edges of the fifth, sixth and seventh cervical vertebrae.

It so happened that the patient's return to Memphis for investigation coincided with the admission of L G (case 2) to the John Gaston Hospital. Comparison of the symptoms and physical manifestations in these 2 cases showed that they were identical, with the exception of the lack of sensory change in the first case. Five days after the removal of the sixth cervical disk in case 2, J W B's sixth cervical disk was explored and a very definite rupture of the disk was found and removed. When the seventh cervical nerve root was injected with procaine hydrochloride, the relief of pain was instantaneous, the

index finger became almost anesthetic and the middle finger hypesthetic. Some pain in the arm recurred immediately following the operation. The pain in the neck and in the rhomboid region was relieved entirely and only occasionally did he have any pain in the precordium.

One year after the operation the patient writes that he has felt fairly well during the summer. He still has moderate pain in the arm and occasional pain in the precordium, which is brought on by exertion. He feels that, although he is not relieved entirely, the operation has been well worth while. The conditional tremor in the right arm continues and is still unexplained.

**CASE 2**—*History of cricks in neck intermittently for three or four years followed by violent pain in the left shoulder, precordium and left arm for two weeks, removal of rupture of sixth cervical disk with complete relief*

**History**—L G, a white man aged 45, a carpenter, admitted to the John Gaston Hospital Sept 17, 1940, complained chiefly of a crushing pain in the neck, precordium, shoulder and arm.

For the last three or four years the patient had had frequent cricks in the neck which lasted only a few days and had not been incapacitating. In addition, he had had occasional sharp pains in the precordium and left arm which lasted only a few minutes at a time.

Two weeks before admission the patient bent over to tie his shoe and was seized suddenly with a violent pain in the left side of the neck, which radiated into the heart, the left shoulder and the left arm. The pain was so intense that at times it was difficult for him to breathe. He called a physician, who gave him a large dose of morphine with some relief. The following day, however, the pain was as intense as ever and he noticed that the index finger on the left hand was quite numb and that the middle finger was slightly numb. Since the onset the pain had been agonizing and completely disabling. He had been able to sleep very little except when under the influence of opiates. He noticed that any movement of the neck accentuated the pain and that supporting the left arm with the right gave him some relief. Coughing, sneezing or straining aggravated the symptoms. Since the onset of pain the patient had noticed that his left hand and arm felt cold all the time.

**Examination**—The patient was in obvious pain. The neck was held rigidly toward the left and slightly forward. The left arm was supported by the right. Passive movement of the neck or traction on the involved arm intensified the pain. There was considerable muscle spasm in the neck and in the left shoulder, and there was a point of definite tenderness over the brachial plexus just posterior to the scalenus anticus muscle. The entire left index finger was almost completely anesthetic, and there was moderate hypesthesia of the left middle finger. There was slight weakness of the index finger on flexion but no other weakness in the arm. The reflexes were normal and no temperature change in the arm was noticed. Blood pressure was the same (125 systolic and 85 diastolic) in both arms and the radial pulse was felt easily.

X-ray examination of the cervical spine showed a loss of the normal cervical curve but was otherwise negative.

Spinal fluid examination showed normal dynamics and a total protein of 50 mg per hundred cubic centimeters.

The diagnosis was rupture of the fifth or sixth cervical intervertebral disk.

**Course**—An exploration of the spinal canal was advised. To this the patient readily agreed, stating that he could not bear the pain much longer.

On September 24 a subtotal hemilaminectomy was performed. When the ligamentum flavum between the sixth and seventh cervical laminae on the left was pressed on, the old pain was reproduced in all its intensity. A small part of the adjacent laminae was removed and when the ligamentum flavum was dissected out the seventh cervical nerve root was exposed. It was pushed backward and flattened out by rupture of the sixth disk. The loose fragments of fibrocartilage were removed without difficulty, and the nerve root was completely decompressed.

Following the operation the patient was entirely relieved of all of his pain and has remained so to the present time. The muscle spasm in the neck and shoulder subsided as the sore-

ness from the operative wound diminished and the sensory disturbance in the index and middle fingers began to clear up.

One year after the operation the patient states that he never has any more pain in the left arm, shoulder or precordium but recently has begun to have a little pain in the right side. The left index finger is still slightly hypesthetic over the distal phalanges, the middle finger is entirely normal. X-ray examination of the cervical spine now shows beginning spur formation along the edges of the sixth and seventh cervical vertebrae.

*CASE 3—Three year history of cricks in the neck culminating in a violent attack of pain simulating coronary occlusion removal of rupture of sixth cervical disk with complete relief of pain*

*History*—R. B. McC., a white man aged 47, a pediatrician, admitted to the Baptist Memorial Hospital Aug. 16, 1941, complained chiefly of violent pain in the neck, precordium, left shoulder and left arm.

For the past seven years the patient had had attacks of mild precordial pain with no radiation whatever. Electrocardiograms had been made during this period which failed to reveal any changes suggestive of coronary disease. For the past three years the patient had had twenty or thirty cricks in the left side of the neck. Neither of these disturbances, however, incapacitated him, and he was able to carry on a very active practice.

Three weeks before admission, while driving his car, the patient received a severe jar to his neck. A few hours later what he thought was a typical crick in the left side of the neck developed. Three days later, while playing pool he missed the cue ball entirely, again jerking his neck forward, and instantly experienced such an agonizing pain in the neck that it almost knocked him down. The pain radiated to a point just medial to the upper angle of the left scapula and continued throughout his illness.

On the day before admission he noticed a burning sensation in his left arm from the elbow to the finger tips. A few hours later his left index finger became almost entirely anesthetic and the left middle finger became slightly numb. During the night before admission he was awakened by a violent pain in the left shoulder, precordium and left arm. After he had taken a sedative, the pain abated to a certain extent. Shortly after he arrived at his office the next morning, the pain again became so violent that he was able to breathe only with the greatest difficulty. Several physicians were summoned hurriedly and they found the patient in excruciating pain, quite cyanotic and breathing with considerable difficulty. The blood pressure was 132 systolic and 80 diastolic. The heart was regular with a rate of 70.

He was given a quarter of a grain (0.016 Gm.) of morphine sulfate and as soon as the pain subsided to some extent he was moved to the Baptist Memorial Hospital. When he lay down in bed the pain almost disappeared, but when he sat up it would recur. An electrocardiogram was made on admission and revealed the following abnormalities. In lead I the T wave was barely above the isoelectric line. In lead 4 the R wave was 3 mm. in height, otherwise the tracings were normal. It was felt that he had coronary occlusion and during the next three days he was kept in an oxygen tent most of the time. The pulse ranged from 66 to 90. There was no fever, no shock, no pericardial friction rub, no leukocytosis or any other constitutional evidence of infarction. On the second hospital day another electrocardiogram showed that the T waves in leads 1, 2 and 3 had become flattened and that the R wave in lead 4 was 3 mm. in height as before. On the third day after admission it became increasingly evident that the pain was not that of coronary occlusion but was explainable on the basis of involvement of the cervical nerves. Five days after admission we were called in to see the patient.

*Examination*—The neck was held rigidly and slightly to the right. There was definite muscle spasm in the left side of the neck and in the left shoulder. Any movement of the neck precipitated a severe attack of pain and traction downward on the left shoulder did likewise. Traction on the head gave considerable relief. There was a point of exquisite tenderness over the brachial plexus just posterior to the scalenus anticus muscle and one of moderate tenderness over

the scalenus anticus muscle itself on the left. There was also a tender area just medial to the upper angle of the scapula over the left rhomboid muscles. There was some weakness of the left index finger, particularly on flexion. Sensory examination showed almost complete anesthesia of the entire left index finger and slight reduction of sensation in the left middle finger. The reflexes were normal and the blood pressure in the two arms was the same.

X-ray examination showed loss of the cervical curve but otherwise was negative.

Spinal fluid examination showed normal dynamics, normal cell count and a total protein of 25 mg. per hundred cubic centimeters.

The diagnosis was rupture of the sixth cervical disk with compression of the seventh cervical nerve root.

*Course*—Head traction was applied. This was followed by considerable relief of pain for several days. Injection of procaine hydrochloride into the painful area just medial to the upper angle of the scapula gave immediate and complete relief of all pain for several hours. Electrocardiograms on the seventh ninth and seventeenth days after admission revealed a gradual return of normal pattern. Head traction was continued for about three weeks, however during the latter part of this time the pain again became more intense and it was decided that removal of the disk should be undertaken.

On September 12 under local anesthesia the laminae of the sixth and seventh cervical vertebrae on the left were exposed. Pressure on the ligamentum flavum between the sixth and seventh cervical laminae immediately reproduced all of the old pain. Approximately half of the sixth and seventh cervical laminae was removed and the ligamentum flavum dissected out revealing the seventh cervical nerve root pushed backward against the edge of the articular facets and the remaining ligamentum flavum by a small mass approximately a quarter of an inch in diameter. The nerve root was injected with procaine hydrochloride and about half of the articular facets removed. The nerve root then was retracted upward revealing a typical ruptured disk. The capsule of the disk was incised and three small fragments of loose fibrocartilage were lifted out. Following this, the nerve root was quite free in all directions and no attempt was made to remove the remainder of the nucleus between the vertebrae.

Since the operation the patient has been entirely free of pain. The sensory disturbance of the index finger is improving while that of the middle finger has disappeared. Six weeks after the operation he resumed his practice and has continued it without difficulty.

*CASE 4—Agonizing pain in neck, left shoulder, precordium and left arm for three months procaine injection of thoracic sympathetic ganglions and brachial plexus diathermy and other therapy without relief, gradual recovery over a period of three years*

*History*—Mrs. F. S., a white woman aged 51, an organist, admitted to the Girty-Ramsay Hospital May 26, 1938, complained chiefly of agonizing pain in the left side of the neck, left shoulder, left arm and precordium for three weeks. She had had occasional cricks in the neck for years.

Three weeks before admission to the hospital the patient had a severe pain in the left side of her neck which radiated to the base of the skull. Two days later, while driving her car, she experienced a sudden violent pain which shot from the neck into the precordium to the shoulder and down the medial and lateral aspects of the left arm to the finger tips. Pain was so intense that she could hardly breathe and she was quite certain that she had a heart attack and surely would die. She was taken home and put to bed where much to her surprise the pain was relieved to a considerable extent but would recur as soon as she assumed the upright position. Her physician who was called felt that she did not have a heart attack but rather some type of neuritis of the brachial plexus. Large doses of opiates were given, with partial relief. The following morning the patient noticed that there was no feeling in the entire left index finger and that she could move it only with the greatest difficulty. There was also some numbness in the left middle finger. The pain soon became constant, whether the patient was in the upright or the prone position.

## Current Medical Literature

### AMERICAN

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Titles marked with an asterisk (\*) are abstracted below.

### American Journal of Clinical Pathology, Baltimore 12 597-642 (Dec) 1942

- Monilia Osteomyelitis. Report of Case Resulting from Thrush. J S Weingart, D C Wirtz and N W Irving. Des Moines, Iowa—p 597.  
Auricular Scabies (Psoroptic Otacariasis) of Rabbit. W Kaufmann. New York—p 601.  
Relation of Allergy to Immunity in Experimental Tuberculosis. E F Geever. Denver—p 606.  
Effect of Urine Extracts on Prevention and Healing of Experimental Ulcers in Dogs. D C Beaver, D J Sandweiss, H C Saltzstein, A A Farbman and A W Sanders. Detroit—p 617.  
Intracellular Inclusion Bodies in Carcinoma of Adrenal Gland. Case of Multiple Primary Tumors. R J Stein, Newport, Vt—p 630.

### American J Digestive Diseases, Fort Wayne, Ind 10 1-44 (Jan) 1943

- \*Present Status of Serum Lipase Test. T A Johnson and H L Bockus. Philadelphia—p 1.  
External Pancreatic Fistula. Report of Case with Physiologic Observations. M W Comfort, A E Osterberg and J T Priestley. Rochester, Minn—p 7.  
External Secretion of Pancreas and Diabetes Mellitus. H M Pollard, Lila Miller and W A Brewer. Ann Arbor, Mich—p 20.  
\*Gastric Mucosa. Gastritis and Ulcer. S Wolf and H G Wolff. New York—p 23.  
Peptic Ulcer in the Aged. Clinical and Postmortem Study. J Meyer and O Saphir, Chicago—p 28.  
Unusual Vascular Diseases Within Abdomen. S Kimball, M H Lipsitz and K Terplan. Buffalo—p 30.

**Present Status of Serum Lipase Test**—Further confirmation of the specificity of the serum lipase test is presented by Johnson and Bockus, who from some twelve hundred determinations utilize for their discussion 21 cases of acute pancreatitis, 1 of chronic pancreatitis and 30 of pancreatic cancer. The serum lipase value was above 1 cc at least once during the course of the illness in 17 (81 per cent) of the 21 cases of acute pancreatitis and in 16 (53.3 per cent) of the 30 with cancer of the pancreas. Analysis suggests that the decrease in serum lipase concentration, following an initial elevated serum lipase, may be due to the subsiding of an inflammatory process or to complete destruction of the pancreas. The serum lipase curve in the 1 case of chronic pancreatitis was indistinguishable from that in cancer of the pancreas. The serum lipase curves in pancreatic cancer suggest that its initial elevation is due to an obstruction to the free flow of pancreatic juice. The subsequent decrease is due either to replacement of pancreatic tissue by the malignant process or to impaired pancreatic function secondary to prolonged pancreatic duct obstruction.

**Gastric Mucosa, "Gastritis" and Ulcer**—Wolf and Wolff describe the changes to various stimuli of the gastric mucosa of a 57 year old subject with a permanent gastric fistula 3.5 cm in diameter, surgically produced in 1895 because of benign stricture of the esophagus. The congested mucosa was especially susceptible to injury; this suggests that vascular engorgement might predispose to the development and persistence of erosions and changes secondary to inflammation. Sustained hyperemia of the gastric mucosa was accompanied by symptoms of abdominal discomfort and pain. However, after a fast of twelve or more hours that is, resting gastric mucosa, if the mucosa was struck a sharp blow with the side of a glass rod the area struck became blanched and depressed within one second. It remained so for one to five seconds depending on the force of the blow. Following this, a slight transitory hyperemia occurred in the same region, which lasted for three to ten seconds. Strong irritants and corrosive agents failed to cause more than a slight

to moderate erythema in the gastric mucosa, while they caused a decided reaction with destruction of tissue when applied in similar concentration to the skin. This indicates that the cells lining the stomach are endowed with some special protection against chemical injury. Presumably the special protection is afforded by the thick layer of tenacious mucus adherent to the lining of the stomach and is elaborated in increasing amounts in response to physical and chemical stimuli. To test this protective power, a part of the gastric mucosa was deprived of this covering and then the area was subjected to 10 normal hydrochloric acid. Within two minutes a thick layer of grayish opaque mucus appeared over the area exposed to the acid. The application of the drops of acid was increased from twelve to twenty a minute, while the accumulated mucus was sucked away through a pipet. Within five minutes the mucosa beneath became moderately reddened and edematous. Then a mustard suspension was applied, and within five minutes the redness and edema was further accentuated and minute bleeding points became evident as pinpoint black specks on the mucosa. A sharp blow with a glass rod to the gastric mucosa at this time induced minute bleeding points. Rubbing with the blunt end of a glass rod also caused hemorrhage and these mechanical stimuli applied to such an area caused pain. Two of these small hemorrhagic lesions kept in contact with gastric juice for half an hour caused a sharp acceleration of acid secretion and concomitant hyperemia of the whole gastric mucosa which persisted for half an hour after submersion of the hemorrhagic lesions was discontinued. In this phenomenon may lie an explanation of the persistent hyperacidity regularly present in persons suffering from "gastritis" and peptic ulcer. The fact that the base of an ulcerated lesion constantly bathed in acid gastric juice stimulates acid secretion indicates that afferent impulses subserve this reflex without any resulting sensation. Pain probably would follow an adequate chemical stimulus. A small erosion on the peripheral edge of the mucosa lacking in mucus was exposed to the digestive action of gastric juice for four days, when it exhibited the typical punch-out appearance of a chronic peptic ulcer with well defined edges and a granulating base. Traction or pressure on this lesion caused dull gnawing pain. Throughout the four days the whole mucosa was relatively engorged and the rate of acid secretion was significantly elevated. At the end of the four days the ulcer and surrounding area were covered with a protective petrolatum dressing, and within three days healing was complete.

### American Journal of Diseases of Children, Chicago 65 1-194 (Jan) 1943

- Basal Heat Production in Relation to Growth. Longitudinal Study on Normal Infants Six to Twenty Months of Age. Helen R Benjamin and A A Weech. New York—p 1.  
Diabetic Coma. Acute Pancreatitis and Bacillus Welchii Peritonitis. M M Steiner and P C Tracy. Chicago—p 36.  
Studies on Oxyuriasis. XVIII. Summary and Conclusions. Eloise B Cram, Bethesda, Md—p 46.  
Streptococcal Antifibrinolysin in Newborn Infants. True and False Tests. J A Lichty Jr, Rochester, N Y and G K Anderson. Chapel Hill, N C—p 60.  
Intractable Hypophosphatemic Rickets with Renal Glycosuria and Acidosis (the Fanconi Syndrome). Report of Case in Which Increased Urinary Organic Acids Were Detected and Identified with Review of Literature. D J McCune, H H Mason and H T Clarke. New York—p 81.

### American Journal of Ophthalmology, Cincinnati 26 1-118 (Jan) 1943

- Edward Jackson. Student and Teacher. W H Crisp. Denver—p 1.  
Granuloma Inguinale of Eyelid. Report of Case. A L Weiner, I E Gaynon and M S Oshervitz. Cincinnati—p 13.  
Practical Importance of Aniseikonia. E Jackson. Denver—p 18.  
Ocular Findings in Childhood Endocrinopathies. C Apple and I P Bronstein. Chicago—p 21.  
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Case Report of Congenital Grouped Pigmentation of Retina with Maculocerebral Degeneration. G T Schwarz, Cleveland—p 72.

## Archives of Ophthalmology, Chicago

29 1-170 (Jan) 1943

- \*Toxoplasmic Encephalomyelitis VII Significance of Ocular Lesions in Diagnosis of Infantile or Congenital Toxoplasmosis F L P Koch St Paul A Wolf D Cowen and Beryl H Page New York —p 1
- Medical Considerations of Some Geriatric Problems G M Piersol Philadelphia —p 26
- \*Fibroblastic Overgrowth of Persistent Tunica Vasculosa Lentis in Premature Infants II Report of Cases—Clinical Aspects T L Terry Boston —p 36
- \*Id IV Etiologic Factors T L Terry Boston —p 54
- Relation of Diet to Lenticular Changes in Larvae of Amblystoma Tigrinum Esther M Patch Haddonfield N J —p 69
- Fundus Oculi in Hypertensive Vascular Disease M Cohen New York —p 85
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- Scleral Disease in Rheumatoid Arthritis Report of Three Cases in One of Which Both Eyes Were Studied Post Mortem J W Smoleroff New York —p 98
- Emmetropia E S Munson New York —p 109
- Clinical Significance of Aniseikonia H M Burian Hanover N H —p 116

**Toxoplasmic Encephalomyelitis**—Koch and his associates describe the ocular changes in 6 cases of infantile toxoplasmic encephalomyelitis compare and arrange them in a sequence and point out in what way they may be unique and diagnostic. The essential lesion is a focal toxoplasmic chorioretinitis, bilateral and frequently multiple. Almost invariably the macular region in each eye is involved first, but more peripheral lesions often occur. The remaining portion of the retina and the vasculature are normal. Toxoplasmic chorioretinitis is an important diagnostic feature of infantile toxoplasmic encephalomyelitis and it first suggested the presence of the disease in 4 of the 6 cases presented. Toxoplasmic chorioretinitis must be differentiated ophthalmoscopically from pseudoglioma, intraocular tumors, traumatic birth lesions, hereditary cerebromacular degeneration and congenital developmental defects. The diagnostic intraocular lesions in infants and children are severe and extensive focal chorioretinal lesions, bilateral involvement of the macular region, peripheral involvement of one or more quadrants of the retina and choroid, punched out appearance of large and small lesions in the late phase, massive chorioretinal degeneration associated congenital ocular defects, rapid development of sequential optic nerve atrophy and usually a constant clarity of the media. The pathologic changes are necrotizing and inflammatory lesions in the retina and in the choroid similar to those found in the brain.

**Tunica Vasculosa Lentis in Infants**—Seven instances of a fibroblastic sheath behind the crystalline lens in both eyes of infants born about eight weeks prematurely are reported by Terry. The syndrome, which is usually bilateral, is composed of widespread primary and secondary manifestations related to persistence of the hyaloid artery and tunica vasculosa lentis, growth of embryonic connective tissue behind the lens and persistence of fetal fibrillar vitreous. It is usually observed four to six months after birth. The condition must be differentiated from retinoblastoma and congenital cataract. Glaucoma is an important complication. Treatment has been temporization, irradiation and closure of the hyaloid artery by diathermy. Complete excision of the membrane seems unwise, as pathologic specimens show that ciliary processes and retina adhere to the fibroplastic membrane. Intraocular hemorrhage and inflammation were found in the embryonic connective tissue of some pathologic specimens. A search for the essential etiologic factor or factors discloses that prematurity, often with twinning, is an important predisposing, but not invariably an essential, factor. The degree of prematurity appears to influence the nature of the involvement. The outstanding theoretical cause is a precocious increase in blood pressure brought on before the hyaloid artery and the tunica vasculosa lentis disappear, initiated by such normal factors as adaptation to extrauterine life or such abnormal factors as patent ductus arteriosus, dehydration or use of drugs. After the development of increased blood pressure hypertrophy of the hyaloid arterial system takes place, causing the fibrillar vitreous and the growth of supporting embryonic connective tissue to persist.

## Canadian Medical Association Journal, Montreal

48 1-92 (Jan) 1943

- Restoration of Functional Capacity of Stomach When Deprived of Its Main Arterial Blood Supply B P Brubkin J C Armour and D R Webster Montreal —p 1
- Work of the Medical Branch of the Royal Canadian Navy A McCallum Ottawa —p 11
- \*Plastic Film Treatment of Experimental Burns H G Skinner and R A Waud London Ont —p 13
- Royal Canadian Navy Color Vision Test Lantern D Y Solandt and C H Best Toronto —p 18
- Complication of Mumps—Swelling Over the Manubrium Sternum C S Barker, St Thomas Ont —p 22
- Death Following Sulfathiazole Therapy M A Simon and M Kraufmann Montreal —p 23
- Bronchomoniliasis W A Farrell Port William Ont —p 28
- Note on Rose Hips and Fvergreens as Sources of Vitamin C C Hunter and J Tulha Edmonton Alta —p 30
- Use of Evaporated Half Skimmed Milk in Infant Feeding C F Snellings Toronto —p 32
- Method of Treating Psoriasis P A O'Leary Rochester Minn —p 34
- Obscure Pains in Chest Back or Limbs T G Allen Winnipeg Man —p 36
- Effective Use of Vitamins C W Scull Abington Pa —p 39
- Prevention of Bullous Impetigo in Hospital Nurseries R P Kinsman Vancouver B C —p 41
- Strangulated Hernia with Gangrenous Bowel Treated by Multistage Operation A W S Hays Petawawa Ont —p 46
- Maternity Statistics J S Hobbs Vancouver B C —p 48
- Tuberculin Testing of Young Adults with Particular Reference to Yoller Patch Test I G Ledy Montreal —p 52

**Plastic Film Treatment of Experimental Burns**—Skinner and Waud compare the healing power anti-infective ability and other properties of five agents on the healing of experimentally produced wounds in rabbits. Data show that burns treated with two sulfonamide trichloroaluminum burn fluids which result in a film when dry healed at least five days before those treated with tannic acid ten days before those treated with weak triple dye solution and forty days before those treated with strong triple dye solution. The anti-infective ability of strong triple dye solution is upheld but this fact does not overcome its adverse effect on healing time. Of the burn fluids the one that contained phemerol appeared to be of more value against infection. Weak triple dye or tannic acid was not as effective against infection as the other burn fluid. The burn fluids were more easily applied and gave a most satisfactory eschar which was easy to remove with warm saline solution without damage to the surface of the wound. All the other methods caused damage to granulation and epithelium when the eschar was removed.

## Illinois Medical Journal, Chicago

83 1-76 (Jan) 1943

- Treatment of Soft Tissue Injuries F W Slobe Chicago —p 21
- Management of Burns B B Reeve Chicago —p 26
- Minimal Fracture Requirements J J Callahan Chicago —p 31
- Preventive Therapy in Recurrent Urinary Lithiasis E H Droege-mueller Elmhurst —p 34
- Technique in Treatment of Infants and Children A J Fletcher Danville —p 38
- Virus Pneumonia H N Krumm Chicago —p 41
- Theory of the Origin of Cancer Preliminary Report A L Magnolia J H Kaplan and E Hixon Rockford —p 43
- Considerations Regarding Depth of Anesthesia W H Cassels Chicago —p 46
- Myth of Postoperative Pneumonia J R Buchbinder Chicago —p 50

## Journal of Nervous and Mental Disease, New York

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- Didactic Note on Alcoholism M Moore Boston —p 1
- Myasthenia Gravis Including Case Report and Neurologic Autopsy H G Hadley Washington D C —p 6
- Neurologic Effects of Syphilis S H Epstein Boston —p 11
- Rorschach Examinations in Acute Psychiatric Admissions K S Hitchcock Joseph T Robinson Ark —p 27
- Treatment of Psychotic Patients in General Hospitals and Sanitariums (Statistics and Implications) J Weinberg and H H Goldstein Chicago —p 40
- Analysis of Disturbances of Higher Cortical Functions Agnosia Apraxia and Aphasia H A Fesselbaum Baltimore —p 44
- Comparative Study of Combined Metrazol Hypoglycemic Shock Treatment and Spontaneous Improvements in Schizophrenia J Notkin I E Watts G W Shannon C E Niles and F J DeNatile Poughkeepsie N Y —p 62

## New Orleans Medical and Surgical Journal

95 305-356 (Jan) 1943

- Future of Patient with Coronary Occlusion C A Stone Galveston Texas—p 305
- Rational Management of Bronchiectasis C R Gowen Shreveport La—p 311
- War Wounds of Chest H W Harrison Shreveport La—p 315
- \*Surgical Treatment of Pelvic Thrombophlebitis Ligation of Inferior Vena Cava and Ovarian Veins Preliminary Report C G Collins J R Jones and E W Nelson New Orleans—p 324
- \*Use of Darkfield Microscope for Diagnosis of Generalized Secondary Lesions of Syphilis O F Agee New Orleans—p 329
- Mumps Relationship Between Submaxillary Gland Involvement and Incidence of Orchitis A Oppenheim Arcadia La and H H Golz Fort Oglethorpe Ga—p 332
- \*Meningitis Caused by the Higher Fungi J E Skogland New Orleans—p 334
- Cruveilhier Baumgarten Syndrome F E Bruno New Orleans—p 339

**Surgical Treatment of Pelvic Thrombophlebitis**—Collins and his co workers present 3 cases of pelvic thrombophlebitis treated by ligation of the ovarian veins and the inferior vena cava. One case was postpartal, 1 followed an attempted criminal abortion and 1 followed a vaginal hysterectomy. The 3 patients have fully recovered and do not show any ill effects from the ligation. However the venous pressure in the lower extremities of the 3 is elevated, but there is no edema. The venous pressure has decreased in all as the interval from the date of the operation increases. This suggests that in the near future the venous pressure may return to or vary little from the normal. Following vena cava ligation, bilateral lumbar sympathetic block should be carried out to enhance the development of collaterals and to relieve any postoperative edema. If a patient feels faint and anxious while the block is being administered, the procedure should be discontinued immediately and attempted again in forty-eight hours. Roentgen examination of the chest is imperative in all cases, as emboli and infarction may be present without clinical symptoms.

**Secondary Lesions of Syphilis**—The use of the darkfield microscope on secondary dry or closed cutaneous syphilitic lesions can expedite treatment by obtaining a positive darkfield report instead of waiting for a positive serologic test. Agee reports 10 cases, 8 were seen in the New Orleans Health Department Clinic and 2 in the Tulane Clinic at Charity Hospital. For the test, the surface of the lesion must be abraded vigorously with a scalpel or dry gauze. If serum does not exude freely the area is squeezed to express sufficient material. The treponemes do not seem quite as active as those from open lesions perhaps because of the pressure exerted.

**Meningitis Caused by the Higher Fungi**—The four higher fungi causing meningitis that Skogland discusses are *Actinomyces*, *Blastomyces*, *torula* and *coccidioides*. Man apparently acquires actinomycotic meningitis from contact with infected hay or grain. Infection almost always occurs following a primary infection elsewhere in the body which spreads to the meninges by direct extension. The symptomatology of actinomycosis of the central nervous system depends on the several forms (meningitis, cerebral abscess and cerebellar abscess) that the pathologic reaction may take. The prognosis is poor all cases terminate fatally. Therapy is entirely symptomatic, although empirically iodides may be prescribed. Infection with *Blastomyces* (*Oidiomyces*) is cutaneous with primary involvement usually on the face or hands and in a systemic form in which widespread dissemination of the organism occurs following invasion through the respiratory tract. The pathologic changes in the central nervous system are usually non-specific and closely resemble those associated with tuberculous meningitis. It is characterized by the usual symptomatic course lasting several months. There is no satisfactory therapy, and it is doubtful that roentgen therapy, excision and iodides have any beneficial effect after the meninges have been invaded. *Torula* meningitis is most common in male adults. The respiratory tract is the usual port of entry. Dissemination then takes place through the blood stream or lymph nodes when the central nervous system of at least half the cases is involved, other organs also are involved. The pathologic changes in the central nervous system are variable and the symptomatology varies with their nature and extent. There is no specific treatment

but symptomatic measures may produce temporary relief. *Coccidioides* granuloma, an endemic disease, occurs principally in the San Joaquin Valley, California. The fungus gains entrance through the lungs or the skin and subsequently is carried by the blood stream to other organs. In approximately 25 per cent of patients the meninges are involved. The disease occurs usually in adults and is more common in men. The pathologic changes vary with the duration of meningeal involvement. The symptoms are nonspecific but are similar to those of other chronic meningitides, often with superimposed evidence of internal hydrocephalus. *Coccidioides* meningitis always terminates fatally. Symptomatic therapy is the same as for other forms of meningitis. When localized spinal compression exists, laminectomy, in an attempt to remove granulomatous tissue, may be justified.

## North Carolina Medical Journal, Winston-Salem

4 1-40 (Jan) 1943

- The Bookish Theoric J L Ward Asheville—p 1
- Chemical Warfare in Civilian Defense G T Harrell Winston Salem—p 4
- Tetanus and Essentials of Its Successful Treatment V S Caviness Raleigh—p 6
- Stimulating Influence of Sodium Citrate on Cellular Repair in Kidney Injured by Uranium Nitrate G L Donnelley and R L Holman Chapel Hill—p 11
- Diagnosis and Treatment of Thyroid Diseases P McBee Marion—p 12
- Medical and Health Evolution in Durham N C W C Davison Durham—p 14
- Glance at Ancient Medicine A C Mitchell Chapel Hill—p 17

## Ohio State Medical Journal, Columbus

39 1-96 (Jan) 1943

- Auricular Fibrillation C F Garvin Cleveland—p 18
- Treatment of Arterial Hypertension with Potassium Thiocyanate H Kotte Cincinnati—p 20
- Osteoarthritis of Hip with Observations on Certain Features Which It Has in Common with Charcot's Disease L C Kelly New York—p 26
- Report of Four Outbreaks of Epidemic Diarrhea of the Newborn in Ohio Susan P Souther Columbus—p 30
- Ocular Manifestations of Syphilis C J Streicher Canton—p 32
- Penile Cancer Report of Case in a Luetic Review of Literature Discussion and Treatment V C Laughlin Cleveland—p 35
- Contact Dermatitis H L Claassen Cincinnati—p 40
- Treatment of Herpes Zoster B F Barney Columbus—p 42
- Anesthetics in Appendicitis from the Cleveland Appendicitis Survey H R M Watkins Cleveland—p 43
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- Importance of Copper in Nutrition J Forman Columbus—p 48
- Carcinoma of Suprapapillary Portion of Duodenum T C Lippitt Cleveland—p 50

## Psychiatric Quarterly, Utica, N Y

17 1-224 (Jan) 1943

- Psychoanalysis of Psychoses I Errors and How to Avoid Them P Federu New York—p 3
- Preliminary Curarization in Electric Convulsive Shock Therapy P T Cash and C S Hoekstra—p 20
- Dissociated Personality Case Report S Lipton Cincinnati—p 35
- Diagnosis of Psychogenic Factors in Disease by Means of Rorschach Method M R Harrower Erickson Madison Wis—p 57
- Abnormal Brachial Blood Pressure Response to Postural Change in Patients Suffering from Psychoses of the Senium Control by Thyroid D E Cameron D Mele H S Hirst and F Feldman Albany N Y—p 67
- Note on Pneumoencephalogram and Electroencephalogram Findings in Chronic Mental Patients E V Semrad and K H Finley Boston—p 76
- Rorschach Diagnosis of Cerebral Arteriosclerosis K S Hitch Fort Dix N J—p 81
- Psychology of Dementia Praecox P Milici Kings Park N Y—p 87
- Convulsions Following Abrupt Withdrawal of Barbiturate Clinical and Electroencephalographic Studies S R Brownstein and B L Pacella New York—p 112
- Interpretation of Antisemitism G M Davidson Ward's Island N Y—p 123
- Schizophrenia in Cryptogenic Narcolepsy Report of Case S R Lehman Toledo Ohio and E J Weiss Washington D C—p 135
- Results with Electric Convulsive Therapy in 200 Cases of Schizophrenia L B Kalinowsky and H J Worthing West Brentwood N Y—p 144
- Outcome of Electric Shock Therapy in New York Civil State Hospitals B Malberg Albany N Y—p 154
- Evaluation of Factor of Depression of Brain Metabolism in Treatment of Schizophrenia C H Belfinger C F Terrence Brooklyn B Lipetz and H E Himwich Albany N Y—p 164

**Public Health Reports, Washington, D C**

58 33 68 (Jan 8) 1943

Distribution of Health Services in Structure of State Government  
Chapter VIII—Industrial Health Activities by State Agencies J W  
Mountain and Evelyn Flook—p 33

58 69 120 (Jan 15) 1943

Public Health Service Drinking Water Standards Report of Advisory  
Committee on Official Water Standards—p 69  
Manual of Recommended Water Sanitation Practice—p 83**South Carolina Medical Assn Journal, Florence**

39 1-28 (Jan) 1943

Story of Appendicitis R Fitz Boston—p 1  
Bilateral Castration for Carcinoma of Prostate J F Boone Columbia  
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Sulfadiazine in Treatment of Pneumococcal Meningitis C D Johnson,  
Spartanburg—p 7**Surgery, St Louis**

12 841-1000 (Dec) 1942

- \*Ligation of Patent Ductus Arteriosus Report of Results in Seven Cases  
G H Humphreys New York—p 841
- Experimental Study of Shock with Special Reference to Its Effect on  
Capillary Bed G T Root and F C Mann Rochester Minn—p 861
- \*Effects of Concentrated Serum in Contrast to Iso Osmotic Plasma on  
Normal and Dehydrated Dogs in Shock S O Levinson R E Wes-  
ton Martha Janota and H Necheles Chicago—p 878
- \*Surgical Excision of Primary Tumor (Hamartoma) in Infant Seven  
Months Old with Recovery C D Benson and G C Penberthy,  
Detroit—p 881
- Gastric Secretory Depressant in Gastric Juice A Brunswick R A  
Rasmussen E J Camp and R Moe Chicago—p 887
- Halsted Radical Mastectomy Five Year Results in 246 Consecutive  
Operations at the Same Clinic B F Hoopes and A B McGraw  
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- \*Peritoneal Response to Locally Implanted Crystalline Sulfonamide Com-  
pounds T D Throckmorton Rochester Minn—p 906
- Comparative Blood Concentrations of Sulfaguanidine Sulfanilamide and  
Sulfathiazole After Administration Orally Peritoneally and Pleurally  
to Dogs A M Ambrose Louisville Ky and H B Hargraves Richmond  
Va—p 919
- Drainage of Exteriorized Liver (External Hepatostomy) Palliative for  
Jaundice W W Babcock Philadelphia—p 925
- Surgical Approach to Lesions of Upper Sciatic Nerve and Posterior  
Aspect of Hip Joint H C Vaffziger San Francisco and A C Nor-  
cross Mare Island, Calif—p 929
- Postoperative (Anesthetic) Paralysis of Brachial Plexus Review  
of Literature and Report of Nine Cases E G Clausen Oakland  
Calif—p 933
- Platybasia Report of Case Treated Surgically with Improvement  
R H Stevens Boston—p 943
- Preervation of Transversalis Muscle in Gas Gangrene of Trunk C  
Lyons Boston—p 952
- Extensive Mutilating Facial Defect Cosmetic Correction with Latex  
Mask A M Brown Chicago—p 957

**Ligation of Patent Ductus Arteriosus**—Humphreys obliterated surgically a patent ductus arteriosus eight times in 7 children between 9 and 13 years of age. Roentgen, electrocardiographic and electrostethographic studies aided in proving the diagnosis. In several children one or more of the usual diagnostic criteria were absent, yet a patent ductus was always found. A low diastolic pressure was the most consistent observation. Associated skeletal anomalies were present in 3 and a congenital squint and torticollis in 1. Six ligations were carried out because of systemic effects of the mechanical circulatory abnormality and two to overcome subacute bacterial blood stream infection which had resisted adequate sulfonamide therapy. There were no postoperative deaths. The operation overcame the mechanical circulatory symptoms of 4 patients and the improvement has been maintained for twenty-eight, twenty-two, twenty and seventeen months, respectively. In 1 the patency recurred, apparently the result of cutting through the ligature, this was subsequently ligated successfully. In 1 the result is uncertain. In the 2 in whom infection was present at the time of operation, subsequent blood cultures have not shown organisms and the patients are conspicuously improved six and seven months after operation. In the year that has elapsed since the article was written, all but 1 of the patients continue in good health, the 1 in whom the result was uncertain died of complications arising from a postoperative aneurysm of the ductus. Nine additional patients have since been operated on without operative mortality. Five, operated on because of systemic symptoms, have shown moderate to pro-

nounced benefits. Four were operated on because of subacute blood stream infection, 1 has been free of infection for nine months, 1 died two months after operation of bacterial endocarditis due to an associated interventricular septal defect, 1 is living six months after operation with persistent murmur and subacute blood stream infection and 1 is in the postoperative period.

**Serum and Plasma in Shock**—On the basis of their experience with shock in dogs produced by graded hemorrhage, Levinson and his associates feel that concentrated blood protein solutions must be used circumspectly, especially in dehydrated individuals. Concentrated plasma or serum was less effective in alleviating shock and in maintaining life thereafter than was normal plasma or serum. The state of hydration was an extremely important factor in the ability of an animal to withstand shock and its response to therapy. A more profound state of shock developed in dehydrated animals. Their response to plasma or serum infusion, and particularly to concentrated solutions, was decidedly poorer than that of normal animals. Therefore when concentrated plasma or serum is administered, particularly to dehydrated individuals, the degree and duration of improvement are apt to be incomplete and transient. If only concentrated serum or plasma is available additional normal plasma or saline solution should be administered at the earliest possible moment. The amount of citrate contained in plasma may be sufficient to produce tetany if large amounts are administered rapidly.

**Surgical Excision of Hamartoma in Infant**—Benson and Penberthy report the successful and complete excision of a primary encapsulated tumor (hamartoma) of the liver in an infant of 7 months. Three months after discharge the infant was in excellent health. All such infants deserve exploratory laparotomy because, in spite of the fact that hepatic tumors in them carry a poor prognosis occasionally a benign tumor will be found. Hamartoma of the liver can be considered benign because it is well encapsulated, it has embryonal characteristics, it does not tend to invade neighboring tissue, no mitotic figures are found microscopically, metastasis does not occur and symptoms are due to the progressive displacement of neighboring structures by the tumor.

**Peritoneal Response to Sulfonamides**—Throckmorton studied the peritoneal response of albino rats to crystalline sulfonamide compounds, with special regard to the drugs possible effects on the local peritoneal defense mechanism. The animals withstood laparotomy very well. Peritoneal fluid was obtained in all instances by puncture. The drugs, 1 Gm per kilogram of weight implanted intraperitoneally at laparotomy, were sulfanilamide, sulfathiazole, sulfapyridine, sulfadiazine, sulfamethyl-diazine and sulfamylguanidine. Each of them produced some peritoneal reaction, cellular changes in the peritoneal fluid. These reactions are nonspecific and depend on a foreign body reaction of the tissues to the drug and on the innate irritant properties of some of the compounds. The response produced by the rapidly dissolving and inert sulfanilamide is meager, but that initiated by sulfapyridine is so violent that masses of drug are walled off from the general peritoneal cavity. Between these two responses is the cellular response of sulfathiazole, which is the equal of peritoneal vaccination. The ability of sulfathiazole to enhance the local cytologic defense mechanism, and the prolonged bacteriostatic property of sulfonamides, would seem to make it the sulfonamide compound of choice for intraperitoneal use. The actual killing and disposal of the attenuated bacteria are performed by the local cellular defense mechanism. The vigorous response of sulfapyridine causes it to be walled off from the general peritoneal cavity so rapidly as to reduce even its effectiveness as a bacteriostatic agent.

**War Medicine, Chicago**

3 1-112 (Jan) 1943

- Nutrition in Aviation Medicine H R Bierman—p 1
- Neuropsychiatric Program for a Replacement Training Center L E  
Stilwell and J Schreiber—p 20
- Effects of Centrifugal Acceleration on Living Organisms G C Ham  
Charlottesville Va—p 30
- Cryptic Nostalgia C I Wittson H I Harris and W A Hunt  
—p 57
- d-Desoxyephedrine Review A C Ivy and F R Goetzl Chicago  
—p 60



## FOREIGN

An asterisk (\*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

## Journal of Hygiene, London

42 451-570 (Oct.) 1942

Influence of Social Conditions on Diphtheria, Measles, Tuberculosis and Whooping Cough in Early Childhood in London. G. P. Wright and Helen Payling Wright.—p. 451.

\*Staphylococcus Aureus in Milk of Nursing Mothers and Alimentary Canal of Their Infants. Report to the Medical Research Council. J. T. Duncan and Jacqueline Walker.—p. 474.

Some New Observations Bearing on Nature of Pleuropneumonia-like Organism Known as L1 Associated with Streptococcus Moniliformis. Emmy Klieneberger.—p. 485.

Reclamation of Used Agar. J. Brodie and D. Stiven.—p. 498.

Fluorosis and the Parathyroid Glands. L. Spira.—p. 500.

\*Anemia in Women and Children on Wartime Diets. Lucy Wills, Helen M. M. Mackay, Kathleen Bingham and R. H. Dobbs.—p. 505.

Cultural Characters and Pathogenicity for Some Laboratory Animals of Vole Strain of Acid Fast Bacillus. A. S. Griffith.—p. 527.

Studies in Immunization by a Species Antigen. I. Preparation of Species Antigen from Pneumococci. H. B. Day.—p. 532.

Comparative Studies on Salmonella Strains Isolated in Palestine from Camels and a Human Being. L. Olitzki.—p. 547.

Indexes of Physical Development in Children. A. W. Tuxford.—p. 549.

Bacteriologic Classification of Principal Cultures Used in Rat and Mouse Control in Great Britain. P. H. Leslie.—p. 552.

**Staphylococcus Aureus in Milk of Nursing Mothers.**—Duncan and Walker tried to determine the incidence of Staphylococcus aureus in the intestine and throat of morbid and healthy newborn infants and in the milk of their mothers, from January 1940 to January 1941 more than 2,500 swabs of materials from these sources were examined. During the last eight months, when the work was interrupted by enemy action, 82 mothers and their babies were examined at one hospital, from only 3 of the 82 mothers or babies Staphylococcus aureus was not obtained. At another hospital, situated approximately 26 miles away, the incidence was less but still high. With few exceptions the coccus cultivated from the mother's milk was of the same kind as that from the baby's throat and usually also that from its rectum. In a series of 87 mothers and their babies the coccus was found first in the throats of 33 babies, first in the milk of 15 mothers and simultaneously in the mother and the baby in 39 instances. The presence of Staph aureus was not associated with any serious disturbance of health, although the types of the organism identified were also found in some inflammatory and suppurative conditions in the women and their babies. The transmission of the staphylococci among the babies and from the baby to the mother may also be effective for the transmission of more virulent or toxigenic staphylococci, with graver consequences.

**Anemia in Women and Children on Wartime Diets.**—Between September 1941 and January 1942 Wills and her co-workers estimated the hemoglobin of 544 women and 530 children by the Haldane method. The values obtained were compared with those of similar groups investigated before the war. The mean hemoglobin value for the women was 89.5 per cent, the range was from 56 to 120 per cent. The mean is similar to that obtained by Davidson and his associates in 1937 for a group of nulliparous women from the poorest class in Aberdeen. In 1931 the mean figure of 98.3 per cent was obtained by Price-Jones for 100 supposedly healthy nurses and women students, and a mean figure of 100.5 per cent for 116 women was obtained by Jenkins and Don in 1933. The hemoglobin percentage was below 90 in 54 per cent and below 80 in 10 per cent of the present authors' subjects. In Price-Jones's series no hemoglobin value was below 90 per cent, though in Jenkins and Don's series it was below 90 in 9 per cent and below 80 in 1 per cent. The curve of the mean hemoglobin values of 364 children between 6 months and 5 years of age at successive ages approximates the curves of ten years ago for British children not receiving medicinal iron. The average hemoglobin level at 6 to 12 months was 75.4 per cent, between 1 and 2 years 72.8 per cent and thereafter it gradually rose until between 4 and 5 years it reached 81.8 per cent. The lowest levels were among children less than 2 years of age. The hemoglobin level of these children must be considered pathologically low. The incidence of severe anemia was lower in a welfare group of children than in other groups and was highest among children in residential nurseries. The mean

hemoglobin level of 90 school children from 5 to 13 years of age was 80.3 per cent (about 10 per cent lower than Davidson's 1935 mean for poor children in Aberdeen) of 38 school children from 13 to 15 it was 89.3 per cent and of 38 adolescent girls working at a factory it was 98.7 per cent. The authors believe that the general lowering of the mean hemoglobin value of older subjects and the low curves obtained for the younger children are the expression of a nutritional anemia and that iron deficiency is one important etiologic factor, but that other factors have also played a part in the production of this anemia. It is probable that among women and school children other dietetic deficiencies are implicated, and that in nurseries a high incidence of infection has increased the incidence and severity of an anemia primarily due to an iron deficiency. The bearing of this anemia on the health of the nation is of sufficient importance to call for immediate official action and further investigation.

## Lancet, London

2 745-772 (Dec 26) 1942

\*Tetanus in the Middle East. Effects of Active Immunization. J. S. K. Boyd and J. D. MacLennan.—p. 745.

Long Incubation Period of Syphilis and Elusive Primary Sore. Mary Michael Shaw.—p. 749.

\*Zinc Peroxide, Proflavine and Penicillin in Experimental Clostridium Welchii Infections. J. McIntosh and F. R. Selbie.—p. 750.

Control of Pulmonary Tuberculosis in Mental Hospitals. W. P. Berlington and C. E. Greenwood.—p. 752.

Slit Lamp Microscope in Nutrition Surveys. Observations in School Children. J. H. Kodicek and J. Yudkin.—p. 753.

**Active Immunization Against Tetanus.**—Boyd and MacLennan record the incidence of tetanus during the first two years of war in the Middle East and assess the part played by active and passive immunization in its prevention. Despite the fact that Clostridium tetani is relatively rare in samples of soil in the Middle East, it is found in wounds. In 214 cultures of wounds received from different hospitals C. tetani was found in 18 (8.4 per cent). In another hospital swabs from 494 cases revealed one or more species of clostridium in 66 including 20 terminal spored anaerobes, 2 of these were C. tetani. In the period under review 18 cases of clinical tetanus have been reported and the evidence in favor of active immunization appears to be definite. Of the 18 5 were in men who had been actively immunized 4 with two doses and 1 with three doses. However, none of the 5 received the 3,000 prophylactic units of tetanus antitoxin after being wounded. Of these 5 2 recovered. Of the 13 patients who had not been immunized 1 received a single dose of 1 cc of tetanus toxoid three and a half months before he was wounded, 3 were Italian prisoners and 1 an Eritrean prisoner regarding whose inoculation history nothing is known. There were six fatalities. It is known that 3 of these 6 received prophylactic tetanus antitoxin. None of the 7 patients who recovered seem to have received any prophylactic tetanus antitoxin. There was a general tendency toward a long incubation period in all the patients. This cannot be attributed to antitoxin treatment but may in some way be related to effective surgical removal of all but the most trivial foci of infection. Evidently the protection afforded by active immunization has its 'ceiling'. It appears capable of inactivating toxin from a wound from which the bulk of necrotic tissue has been removed, but not from one forming massive quantities of toxin in extensive necrotic areas. The closed plaster technique was not without danger to 1 of the patients; a mass of necrotic tissue was unsuspected until symptoms supervened when it was too late for benefit to ensue from its removal. The little that is known about tetanus in the British Expeditionary Force in France during 1939-1940 reveals 8 cases among the unprotected 10 per cent and none among the 90 per cent actively immunized.

**Zinc Peroxide in Clostridium Welchii Infection.**—McIntosh and Selbie found that the local application of zinc peroxide was apparently of no value in preventing the development of experimentally produced Clostridium welchii infection in mice when the organism had invaded the tissues. Proflavine was of greater value than sulfanilamide and was at least as good as sulfathiazole in the local prophylaxis and treatment; therefore its use as a wound dressing should be further explored. Penicillin injected at the site of infection within three hours of infection was a powerful prophylactic and in this respect it was superior to proflavine and the sulfonamides.



## Presse Medicale, Paris

50 145 168 (Feb 11-14) 1942

- Problem of Herpetic Meningitis. Clinical and Experimental Studies. M. Janbon, J. Chaptal and M. Labraque Bordenave—p. 145
- Case of Glandular Bisexuality in a Boy. Human Pseudohermaphroditism. Costantini and Toreilles—p. 148
- \*Two Simple Procedures of Extemporaneous Sterilization of Drinking Water. H. Violle and R. Seigneurin—p. 150
- New Roentgenologic Method of Topographic Marking and Localization. P. J. Coletos and L. H. Coletos LaFay—p. 151

**Sterilization of Drinking Water**—The procedure suggested by Violle and Seigneurin has the advantage of being able to sterilize extremely contaminated water in fifteen minutes and does not require filtration. The authors found that 1 liter of water containing 12 billion of *Escherichia coli* is sterilized in fifteen minutes by the addition of 1 mg. of potassium permanganate and 15 Gm. of citric acid. Typhoid, paratyphoid A and B, dysentery bacilli and cholera vibrios are destroyed by the same dose. The advantage of the method lies in the fact that the amount of permanganate used is only one fiftieth of that utilized in other procedures of water sterilization. Decolorization by hyposulfite is unnecessary, because it takes place spontaneously in about fifteen minutes. Filtration is superfluous, because the quantity of manganese oxide formed is harmless. The water so treated is rather acid (pH about 4.2). In order to render it more potable it can be neutralized with sodium bicarbonate. The method can be simplified by combining 15 Gm. of citric acid and 1 mg. of potassium permanganate in a tablet with 0.5 Gm. of lactose as an excipient. This tablet, when placed in water, produces first a rose color and then a yellowish brown, but at the end of fifteen minutes the water is again transparent. At this time a tablet containing 2 Gm. of sodium bicarbonate and 0.25 Gm. of lactose is added. This effects neutralization of the citric acid and a slight liberation of carbonic gas. The simplicity, efficacy and rapidity make the method valuable for explorers, in floods, epidemics, wars and whenever industrial purification is inadequate or nonexistent. The second procedure has the advantage of requiring only a single tablet which produces its effect in twenty minutes. The composition of this tablet is potassium permanganate 0.001 Gm., citric acid 0.02 Gm., potassium iodide 0.02 Gm., potassium iodate 0.01 Gm. and lactose 0.15 Gm. This form of sterilization (single tablet) can be used whenever, as is usually the case, the water does not contain more than 1 billion of *Escherichia coli* or of typhoid bacilli.

## Bol del Inst de Clinica Quirurgica, Buenos Aires

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- Diagnosis of Acute Appendicitis. O. Ivanisovich—p. 467
- Biologic Treatment of Tuberculosis. C. Robertson Lavalle—p. 472
- \*Value of Cystostomy in Treatment of Ruptures of Urethra. R. L. Roccatagliata—p. 485
- Closure of Anterior Thoracotomies. Technical Detail. M. M. Brea—p. 533
- Star Shaped Laparotomy of Arce. C. I. Rivas—p. 535
- Symptomatology of Tumors of Mammary Gland. C. I. Rivas—p. 540
- \*Surgical Treatment of Cancer of Esophagus. R. C. Ferrari—p. 545

**Cystostomy for Rupture of Urethra**—Roccatagliata analyzes 35 cases of rupture of the urethra. He concludes that 1. Diagnosis of the existence, localization and severity of a urethral rupture is to be based exclusively on the clinical symptoms and their interpretation. 2. The symptoms determine the treatment to be employed. 3. Early endourethral exploration is not to be practiced. 4. Urinary retention demands an immediate cystostomy. 5. Large hematomas should be incised and drained, following hypogastric evacuation of the urine, however, in case of small hematomas an expectant attitude is justified. 6. Hemorrhage from the urethra does not endanger life and does not require local treatment. Urethral lavage and catheterization have been discarded. 7. Urethral repair by suture should be postponed for at least six weeks. 8. A permanent endourethral tube should never be left in contact with the suture. 9. Endourethral examination should not be done too soon after trauma or suture. It should not be practiced before inflammation of the scar has completely subsided, because the resulting irritation would produce hypertrophy, which would lead to

stenosis of the passage. Dilations should not be begun before six weeks have elapsed. 10. In cases in which extensive destruction prevents the approximation of the two ends, their suture to the perineum and a secondary urethral reconstruction, according to Guyon-Legueu, is recommended (perineal urethrostomy). 11. Early hypogastric cystostomy is most important in the surgical treatment of urethral ruptures; it prevents infection and urinary continuation of the lesion and contributes much to successful repair. It made possible elimination of the permanent catheter.

**Surgical Treatment of Cancer of Esophagus**—Successful extirpation of cancer of the esophagus was performed in 1913. The 2 cases reported in that year remained a bold surgical adventure for a long time. Up to 1930 only 3 similar successes were reported. Recent advances in endothoracic surgery, according to Ferrari, led to successful extirpation of esophageal cancers. Garlock, Churchill and Phemister have reported impressive series of cases. Since 1940 extirpation of cancer of the thoracic esophagus has been done a number of times in Argentina; the first 2 of these patients are still well and now there are 5 more who have been saved from death by this procedure. The operation is not necessarily grave; its mortality is low and would be still lower if early operation were the rule. Two factors interfere with the successful surgical treatment of cancer of the esophagus: (1) The patient asks for medical advice relatively late and (2) the physician as well as the patient is hesitant in accepting the operation. Many physicians lack confidence in the merits of the operation, their attitude being much the same as that which prevailed thirty years ago with regard to rectal cancer. Today extirpation of rectal cancer is no longer disputed. In some respects extirpation of esophageal cancer is less difficult than that of rectal cancer. The esophagus is less septic and less vascular, and diffuse infection of the pleural cavity is avoided much more readily and better tolerated than that of the peritoneal cavity. Early clinical manifestations which permit earlier diagnosis, lesser malignancy and lesser tendency to metastatization are other factors that make the problem of esophageal cancer less serious than that of rectal cancer. Ferrari stresses that the possibility of esophageal cancer should be considered in the presence of dysphagia. Such patients should be referred at once to a center where thorough examination by roentgenography, esophagoscopy and biopsy is possible.

## Revista de Neuro-Psiquiatria, Lima

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- \*Acute Cerebral Edema After Neosphenamine Therapy. L. D. Espejo and J. Voto Bernales—p. 315
- Experimental Catlepsy Produced by Nicotine. C. Gutierrez Noriega—p. 323

**Acute Cerebral Edema**—According to Espejo and Voto Bernales acute cerebral edema after neosphenamine therapy is a rare but a grave complication. The condition may develop as a reaction of the nervous tissue to neosphenamine when the injection is given too rapidly and in the presence of an individual predisposition, as well as in certain diseases and infections. A constitutional vasomotor instability, especially in young persons, hyperthyroidism, toxic goiter, thymolympathic disorders and alcoholism are the most frequent predisposing factors. The author reports 3 cases. The total dose reached before the appearance of acute cerebral edema was 0.9 Gm. or more. The symptoms appeared after the third injection in all of the cases. The prodromal symptoms consisted of acute headache, vomiting, epigastric pain, diarrhea, insomnia and incapacity for work. The acute symptoms were those of the apoplectic, convulsive and pseudoepileptic type. There was definite dissociation of the albumin component of the cerebrospinal fluid and increase in glycogen in all cases. The precipitation curve of the colloidal benzoic test was carried out in only 1 case. It was of the left (parenchymal) type. Two of the patients aged 28 presented vasomotor disorders. One was cured. The authors believe that acute cerebral edema after neosphenamine therapy is a local allergic phenomenon.

## Book Notices

**Manual of Oxygen Therapy Techniques Including Carbon Dioxide Helium and Water Vapor** By Albert H. Andrews Jr. M.D. Director Oxygen Therapy Department and Assistant Attending Otolaryngologist St. Luke's Hospital Chicago. Cloth. Price \$1.75. Pp. 191 with 33 illustrations. Chicago: Year Book Publishers Inc. 1943.

In the preface Dr. Andrews points out that "correct administration of oxygen therapy requires attention to many details which are overlooked so frequently that a manual of this type has been considered necessary." The result appears to be an excellent compendium of a considerable amount of useful information not otherwise readily available to the technician, the nurse or even the physician who has occasion to operate oxygen therapy equipment. It should be valuable to those specializing in inhalation therapy. Except for a short section on the physiology of respiration and rationale of gas therapy the manual has been limited to a discussion of the mechanical aspects and recommended safety precautions of administering oxygen. Instructions and descriptions are supplemented by numerous illustrations and charts. The author has been quite thorough in his description of technics for operating a wide variety of modern and generally accepted types of equipment and in many instances presents special instructions which are required for specific makes of equipment. The book also includes operating data useful to those interested in carbon dioxide therapy, helium-oxygen therapy and water vapor therapy. Suggestions for handling administrative and clerical details of oxygen therapy in hospitals are doubtless based on the author's own practical experience and should prove extremely valuable to others. A chapter is devoted to a description of the organization and activities of an oxygen therapy department within the hospital. Another chapter describes various charts and records used for the recording of patients' progress and for the accumulation of statistical results of gas therapy. There are also chapters containing descriptions of and suggestions affecting the purchase of therapeutic gases, pressure regulating devices and gas piping systems as well as useful hints on the handling and maintenance of oxygen equipment. Though already widely used in the treatment of many different diseases and conditions, oxygen therapy seems on the way to still greater use, and this book should contribute much toward its effective, safe and economical application, without which oxygen therapy becomes merely a medical gesture.

**Biochemistry and Morphogenesis** By Joseph Needham F.R.S. Cloth. Price \$12.50. Pp. 787 with 328 illustrations. New York: Macmillan Company. Cambridge: University Press. 1942.

The printing of this book in Great Britain amid the disruption caused by a world war shows definitely that the British set a high and proper value on the maintenance of facilities for publishing an important scientific work not directly related to the war effort. The book is a painstaking analysis of the biochemistry of the morphogenic hormones in a search for a physicochemical causal basis for morphogenesis. As such it comes as a suitable supplement to the author's earlier three volume *Chemical Embryology*, in which the discussion was limited largely to the consideration of paracrystalline aggregates, colloidal miscelles, fibrous macromolecules and protein structure and the study of the chemical changes which go on in embryonic development.

Of the three parts into which the present book is divided, part I is devoted to the morphogenic substratum, including under this head such topics as the constitution of the egg of invertebrates and of vertebrates, particularly the hen's egg, environmental factors, mortality curves, embryonic nutrition and the mammalian placenta. Part II, dealing with the morphogenic stimuli, occupies the major part of the book. At this point the author's apology "on the part of one whose training was not morphological" seems quite unnecessary in view of the author's adequate presentation of the morphologic background. This part of the book discusses the general concepts of causal morphology and the extent to which biochemistry can be utilized as a source of causal factors in development. The evidence for the presence of organizers under various circumstances is fully

treated, including the relation of organizers to genes and their possible role in carcinogenesis. Of the special technics employed, mention should be made of the successful use of a refinement of the cartesian diver manometer in the determination of oxygen consumption in small pieces of embryonic tissue. Part III, concerned with the morphogenic mechanisms, deals with the facts and theories of dissociability, heterauxesis, respiration metabolism and polarity. The basic aim of the book as a whole is to show that organizing relations exist at the molecular and paracrystalline levels as well as at the morphologic levels that chemistry and morphology are closely related. The usefulness of the book is heightened by its clear concise English and by the inclusion of a glossary of terms, a bibliography of seventy pages, a general index and separate indexes of animals, plants and genes.

**Radio Broadcasting A Critical Study of Health Education by The Medical Profession The Official Health Organizations The Voluntary Health Agencies** Paper. Pp. 81. New York: New York Academy of Medicine. 1942.

This study was made under the supervision of the Committee on Medical Information of the New York Academy of Medicine with the aid of a grant from the Rockefeller Foundation, Division of Humanities. The study is divided into a chapter on background facts, one on opinions of experts gathered by personal interview, a chapter on critical study of the radio health education program of the New York Academy of Medicine called "Highways to Health," an interpretation of the opinions expressed by the experts, an evaluation of the data gathered from the study of the academy broadcasts, a chapter on the objectives of radio health education, one on technics in radio, one on the radio audience, one on radio and the printed word, one on the economics of radio health education, and a summary and conclusions.

The author presumably considers that, in general health education by radio is not a success but that it could be made successful. This conclusion is based on the opinions of the experts whose names are listed in an appendix and who constitute in truth an impressive list of personalities in medicine, public health, radio and educational circles. Impressive as this list is, it adds nothing to the report because the reader cannot tell what any of these eminent persons actually contributed, since each is identified only by one star, two stars or three stars representing respectively the opinion that radio in health education is virtually valueless, that radio in health education does fairly well but could do better, that radio as an instrument of health education is doing very well indeed. If an eminent authority in public health with little or no radio experience is to be accepted at the same value as one who knows much about radio and little about health education, such a classification might be acceptable, but any one who is experienced in both radio and health education will not be satisfied by any such ambiguity.

The author is particularly critical of those who believe that it is necessary to attract audiences by radio presentations which have some of the features of commercial programs, namely, entertainment. In the introduction he refers contemptuously to this idea "cap and bells make a poor miter for the teacher's toga." Throughout the report he appears to be sharply critical of any one who would attempt to lure the radio audience with any of the bait to which this audience is so susceptible. Although he points out that studies by Lazarsfeld of the Columbia School of the Air indicate that the lower the scale of culture in the home the greater the amount of radio listening, he scorns the idea of appealing to these nonintellectual listeners with the daytime serials so dear to their hearts. He overlooks completely the fact that, no matter how excellent may be the educational material presented, it will be of little use if the only audience is the little man who wasn't there.

The purpose of drama, Dr. Schultz totally fails to recognize, is not to convey health information but to make reasonably sure that some one will be listening when the health education is conveyed. Dramatization will accomplish this, is demonstrated by the radio programs of the American Medical Association to which audience response when asked is so great that it can seldom be asked for fear of overwhelming the resources available for handling and replying to audience mail.

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- \*Two Simple Procedures of Extemporaneous Sterilization of Drinking  
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- New Roentgenologic Method of Topographic Marking and Localization  
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**Sterilization of Drinking Water**—The procedure suggested by Violle and Seigneurin has the advantage of being able to sterilize extremely contaminated water in fifteen minutes and does not require filtration. The authors found that 1 liter of water containing 12 billion of *Escherichia coli* is sterilized in fifteen minutes by the addition of 1 mg of potassium permanganate and 15 Gm of citric acid. Typhoid, paratyphoid A and B, dysentery bacilli and cholera vibrios are destroyed by the same dose. The advantage of the method lies in the fact that the amount of permanganate used is only one fiftieth of that utilized in other procedures of water sterilization. Decolorization by hyposulfite is unnecessary, because it takes place spontaneously in about fifteen minutes. Filtration is superfluous, because the quantity of manganese oxide formed is harmless. The water so treated is rather acid ( $pH$  about 4.2). In order to render it more potable it can be neutralized with sodium bicarbonate. The method can be simplified by combining 15 Gm of citric acid and 1 mg of potassium permanganate in a tablet with 0.5 Gm of lactose as an excipient. This tablet, when placed in water, produces first a rose color and then a yellowish brown, but at the end of fifteen minutes the water is again transparent. At this time a tablet containing 2 Gm of sodium bicarbonate and 0.25 Gm of lactose is added. This effects neutralization of the citric acid and a slight liberation of carbonic gas. The simplicity, efficacy and rapidity make the method valuable for explorers, in floods, epidemics, wars and whenever industrial purification is inadequate or nonexistent. The second procedure has the advantage of requiring only a single tablet which produces its effect in twenty minutes. The composition of this tablet is potassium permanganate 0.001 Gm, citric acid 0.02 Gm, potassium iodide 0.02 Gm, potassium iodate 0.01 Gm and lactose 0.15 Gm. This form of sterilization (single tablet) can be used whenever, as is usually the case, the water does not contain more than 1 billion of *Escherichia coli* or of typhoid bacilli.

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- Star Shaped Laparotomy of Arce C I Rivas—p 535
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- \*Surgical Treatment of Cancer of Esophagus R C Ferrari—p 545

**Cystostomy for Rupture of Urethra**—Roccatiglitza analyzes 35 cases of rupture of the urethra. He concludes that 1. Diagnosis of the existence, localization and severity of a urethral rupture is to be based exclusively on the clinical symptoms and their interpretation. 2. The symptoms determine the treatment to be employed. 3. Early endourethral exploration is not to be practiced. 4. Urinary retention demands an immediate cystostomy. 5. Large hematomas should be incised and drained, following hypogastric evacuation of the urine, however, in case of small hematomas an expectant attitude is justified. 6. Hemorrhage from the urethra does not endanger life and does not require local treatment. Urethral ligation and catheterization have been discarded. 7. Urethral repair by suture should be postponed for at least six weeks. 8. A permanent endourethral tube should never be left in contact with the suture. 9. Endourethral examination should not be done too soon after trauma or suture. It should not be practiced before inflammation of the scar has completely subsided, because the resulting irritation would produce hypertrophy, which would lead to

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The author would like to divide health agencies neatly into three groups, the voluntary health agencies whose primary purpose is to agitate and to campaign, the medical organizations whose function is to instruct from the heights of Olympus, and the health departments and other governmental agencies which can do a little of each. He believes that a medical society has no right to view with alarm, whereas a tuberculosis association or a health department may properly get excited about bad health conditions in the community. He divides the radio audience into numerous groups and goes so far as to advise that radio presentations should be aimed at specific groups rather than at wide audiences. Although he mentions the necessity for correlating radio with other health education activities he treats radio throughout as if it were expected to accomplish the whole job of health education by itself, whereas it is in fact merely an attention catching medium which serves its most important function by attracting attention of indifferent persons and stimulating in them a desire to know something more about a subject important to them though not previously interesting.

The author says that dramatization is unwieldy and costly and that it obscures the educational purpose in radio health programs. Properly handled dramatization does none of these things. It is not unwieldy and need not be costly if community cooperation and ingenuity are appropriately substituted for dollars. With the author's contention that much interview and conversation are but shoddy imitations of genuine give and take on the air, this reviewer is in hearty accord. With the author's statement that a good health talk is better than a poor dramatization there can be no honest disagreement. But the fact remains nevertheless that good radio dramatizations interwoven with information have attracted the attention of millions of listeners who would otherwise have given no attention whatever to health talks or even interviews.

The most important points in this study are those which concern the defects and limitations of radio presentations, especially radio talks. These have too often been hastily and carelessly prepared and poorly delivered. The apparent but fictitious "expenselessness" of radio broadcasting has led to indifference and neglect in the preparation of radio material as compared with the care and expense lavished on printed matter and visual aids in health education. The author's recommendation for community cooperation in radio broadcasting looking toward better coordination of the quantity, quality and proportion of radio material broadcast in a given community is sound.

There are numerous criticisms in the report which are leveled at individual abuses. Since these abuses are not general, such criticism should either have been omitted or made specific. A case in point is the following: "Some medical societies are putting on dramatic programs which burlesque and belie medical research and which attempt to persuade the public that the doctor is a sort of hybrid Horatius at the Bridge and the humble St. Francis." The accusation is leveled at medical societies in plural. This reviewer, who is reasonably familiar with the national situation, knows of but few such instances. Other medical societies not guilty of this sort of thing should not have the finger of scorn pointed at them.

**Texto de bacteriología.** Por los doctores Arturo Curbelo y Hernandez y Giraldo Insua y Cartaya profesores auxiliar y agregado de la Cátedra de bacteriología de la Escuela de medicina de la Universidad de La Habana. Cloth. Pp. 610 with illustrations. Habana, Cuba. M. V. Fresnoeda. 1943.

This excellent book combines the usual subjects included in general bacteriology with those of infection and resistance. The book is written for students. The authors describe the subjects with great clarity according to established facts. The presentation is excellent, the printing is clear, most of the illustrations are new and the diagrams are didactic. The chapter on Rickettsia, probably the best, reveals familiarity with the subject, certainly not surprising, since typhus fever has been studied in Cuba since 1938.

One would like to see this book improved and enlarged in further editions. The reader may indulgently smile when in the listing of highlights in the history of bacteriology the authors quote the finding of bacillary dysentery in Cuba next to the discovery of sulfonamide compounds and the crystallization of tobacco mosaic virus, but this attitude may change in other

passages of the book. The question of size of filtrable viruses—which poses basic problems concerning their nature—is dismissed with the statement that for most of them it ranges between 20 and 40 millimicrons, the filtrability of tubercle bacilli is accepted without much discrimination, too much space is devoted to agglutinins, possibly just a word to designate a heterologous group of substances. Important phenomena such as the Shwartzman phenomenon are not mentioned.

The sources of the book are almost exclusively American and North American. Yet for the first time in a book on bacteriology the reader comes frequently across names and contributions from Latin America, some known, like Finlay's, others still obscure for most readers, like the group of Mexican and Cuban workers responsible for establishing the spirochetal etiology of Pinto's disease. In this respect the book is representative of the newer trends of scientific thought in Latin America, which in quest of information, is swinging from the old to the new continent.

**Understand Your Ulcer. A Manual for the Ulcer Patient.** By Burrill B. Crohn, M.D., F.A.C.I., Associate in Medicine, Gastro-Enterology, Mount Sinai Hospital, New York. Cloth. Price \$2.50. 1p. 199 with 19 illustrations. New York: Sheridan House, Inc. 1943.

In line with the present tendency to give the layman an opportunity to know something about many ailments, Dr. Crohn presents a short description of peptic ulcer. The well known role of acidity, the bad effects of excessive or even ordinary smoking, the influence of psychic upsets or mental strain, the tendency toward recurrence of the ulcer, seasonal influence, the part played by age and occupation and the clinical course are well described not alone for the layman but also for the physician. If any criticism should be leveled at the treatment of the subject it might be that too much attention has been placed on the description of the pathology and x-ray examination which are not well comprehended by the layman. The discussion of the various methods of treatment of ulcer is well presented and its value is enhanced by part II, which is an appendix on diets by Sylvia Brand, consulting dietitian. Here are mentioned lists of foods allowed and to be avoided and the manner of preparation of the diet adequate for treatment of ulcer. It would not be amiss for the practitioner to acquaint himself with this section of the book. The makeup of the book is excellent and its value improved by several illustrations. It can serve a good purpose for the layman and nurses or even for some physicians.

**Sanitary Inspectors Manual.** Louisiana State Department of Health, New Orleans, La. [Including] Supplement I. Act 142 of 1936 as Amended by Act 191 of 1942. The State Food, Drugs and Cosmetic Act. Supplement II. Act No. 202 of 1942. Enrichment of Flour and Bread. Supplement III. Act No. 203 of 1942. Enrichment of Oleomargarine. Prepared 1942 by Ben Freeman, M.D. Paper. Pp. 3+0. 22 8 2 with illustrations. New Orleans, Louisiana: Fearless Printing Co. 1942.

For use of sanitary inspectors of the Louisiana State Department of Health, the author has compiled a manual covering every phase of the sanitarian's work. The chapters include bacteriology, bacteriology of water and milk, control of food and milk supplies, sewage disposal, food handling, meat control and the control of rodents and insect pests and of communicable diseases. There are sections on housing, vital statistics and numerous formulas. Special supplements cover the legislation of the state of Louisiana affecting the work of the sanitarian. A number of supplements are also included from official publications of the American Public Health Association. The work is so practical that its immediate application to the duties of the sanitarian is obvious. A similar publication for sanitarians in other states, modeled on this publication, will be well worth while.

**Heating Your Home in Wartime for Comfort Economy Health.** A Bulletin Prepared for Governor Harold E. Stassen by the Scientific Advisory Committee to Minnesota War Industries. Paper. Pp. 32 with 5 illustrations. St. Paul, Minnesota: Resources Commission. 1942.

This pamphlet contains information about heating the home. It is written in a popular style with brief descriptions of different methods for avoiding heat loss from structures and for saving fuel by modification of operating conditions. A brief discussion of comfort and health factors in relation to house heating is also included.

## Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT HOWEVER REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS BUT THESE WILL BE OMITTED ON REQUEST.

### COMMON COLD, ATYPICAL PNEUMONIA AND SULFONAMIDE ADMINISTRATION

To the Editor—For the past several months I have observed many cases of acute respiratory infection which did not conform with the ordinary chest cold that have been seen so frequently in the past. In talking with other physicians in this neighborhood I find that they also are experiencing this peculiar type of respiratory infection. One of the unusual things about these cases is that a large number of them are associated with moderate hemoptyses. It has been called to my attention that most of these cases in which hemoptyses occurred were also cases in which a sulfonamide drug had been administered. In view of this finding I am beginning to be curious as to the possibility of the drug being in some way responsible for the hemoptyses.

W L Howard MD Battle Creek Mich

ANSWER—In the absence of any details describing the acute infection of the respiratory tract referred to, which seems to differ from the ordinary "chest cold," one could guess that the query deals with the newly recognized syndrome called "primary atypical pneumonia" or "viral" pneumonia, which has assumed epidemic proportions in recent months particularly in military camps. However, hemoptysis, although it may occur, is not particularly characteristic of this infection. There is no reason to suppose that the use of sulfonamide compounds is connected with the spitting of blood in such cases, at least, no mention of it has as yet appeared in the literature. The question may be asked why sulfonamide compounds were given to such patients at all.

The query touches on the controversy concerning the use of sulfonamide compounds routinely for the common cold either in the hope of influencing the disease itself or to prevent the development of pneumonia. Convincing evidence has not yet appeared to show that the indiscriminate use of sulfonamide compounds is helpful in the common cold and all authors agree that they have no effect on the syndrome called viral pneumonia, yet they are widely used for both conditions. In the state of present knowledge there is no justification for the use of chemoprophylaxis in colds to prevent pneumonia. In the first place only about 1 in 1,000 patients with colds develop clinical pneumonia, and not all pneumonias which so develop are amenable to chemotherapy. Thus far in the current season for example from 60 to 75 per cent of pneumonias have been of unknown cause. The mortality rate in these cases was nil even in those untreated with sulfonamide compounds. Secondly there is incomplete knowledge at present as to the incidence and degree of sensitization to sulfonamide compounds after they are given empirically in trivial diseases, which may cause a dangerous reaction if chemotherapy is given later for a really serious infection in which it is urgently needed. There are, no doubt certain selected cases of the common cold in which chemoprophylaxis seems to be indicated: (1) in severe cases with fever and symptoms which show a tendency to increase with increasing leukocytosis and evidence of spread into the bronchi and lungs, (2) when an epidemic of pneumococcal pneumonia or meningococcal meningitis coexists and, according to Spink (Use and Abuse of Chemotherapy, *Minnesota Med* 25:988 [Dec] 1942), (3) in patients who have valvular heart disease and (4) in obstetric patients who develop colds at or near term.

In the average case of the common cold an alert physician by clinical observation alone can usually decide whether or not to withhold chemotherapy until actual indication for its use arises. His judgment is greatly aided by roentgenography when available and by laboratory studies to discover the cause. With regard to the latter point it is evident from the studies of Faller, Quickel and Smith (*Pennsylvania M J* 46:339 [Jan.] 1943) that physicians in general are deplorably indifferent. In their survey, attempts to discover the causative agent by which the selection of specific therapy can be controlled, were made in only 17 per cent of cases of pneumonia.

### OZENA

To the Editor—A patient has ozena. Will you kindly send me the treatment for this condition?

A A Lepis Lieutenant M C A U S

ANSWER—There is no completely satisfactory or even simple answer to the query. First of all one must consider the numerous notions regarding the causation of ozena, if one means by that term an atrophic rhinitis accompanied by crusting and a

fetid odor. Cullom in a recent article mentions at least ten theories concerning etiology. Among these are:

- 1 Too great shortness and width of the nostrils
- 2 Purulent rhinitis of childhood
- 3 Purulent disease of the nasal accessory sinuses
- 4 Infection due to specific bacteria such as (a) *Bacillus mucosus* (Abel), (b) *Bacillus fetidus ozenae* (Hayek), (c) *Coccobacillus fetidus ozenae* (Perez). The following may be added: (d) endocrine disturbances and vitamin deficiencies.

Each proponent of a theory bases his therapy in large part on what he considers to be the chief causative factors. This leads some to stress the treatment of a concomitant purulent sinusitis, others to the giving of various vitamins and still others to the use of various endocrine preparations. In this connection it may be wise to mention Crowe's warning that estrogenic injections and implants for the treatment of ozena in the young may cause harmful disturbances in the long bones and genitalia which outweigh any nasal benefits. Modern conservative treatment may be summed up as follows: Surgical procedures which aim to narrow the nasal passages should be reserved for those cases which resist all simpler measures. Purulent sinusitis should be searched for and if present should be handled according to accepted standards.

The patient's general health should be considered. The nasal cavities should be thoroughly cleansed in the office by the removal of crusts and secretion, and the patient may be instructed in the use at home of saline irrigations and douches. Following this some bland vegetable oil such as oil of sesame may be sprayed in the nose. Mineral oils should be avoided so as not to risk the possibility of lipid changes in the lungs. Iodine in glycerin in strengths varying from 1 to 5 per cent is used by many as drops in the nose or applied with a swab. Scarlet red as a 5 per cent ointment is recommended by some, and still others use 10 to 20 per cent dextrose solutions in glycerin as drops to abate the objectionable odor.

### References

- Cullom M M. Ozena. *THE JOURNAL* Sept 20 1941 p 987.  
Lederer Francis L. Diseases of the Ear, Nose and Throat. Philadelphia F A Davis 1938.

### POSSIBLE LATE COMPLICATIONS OF ANAPHYLACTIC REACTION

To the Editor—A patient who has been a laborer all of his life now aged 65 has been in good health as far as he is aware. On Aug 7 1942 he smashed the second and third fingers of his right hand between a stone and the rear of a truck. He was sent to the office of a doctor who after dressing the injured fingers gave him two intramuscular injections of antitoxin one in the arm and one in the buttock—from what I understand they were to prevent tetanus. On his way home he began to vomit and have chills. He went to bed the next day his eyes began to swell and he had a generalized urticaria. The chills and later fever continued for three days and the urticaria subsided soon thereafter. He has remained in bed off and on since then. I examined him at his home on September 27 when he complained of generalized muscle pain and weakness severe pain in the injured hand occasional dizzy spells loss of appetite and strength irritability and nervousness. Objectively he appeared to be weak and apprehensive. There was a generalized muscle tenderness on deep pressure moderate swelling and thickening of the terminal phalanges of the injured fingers but no evidence of any infection a fine tremor of the eyelids tongue and fingers and increased knee jerks. The blood pressure was 200/100 the pulse rate 64 the heart sounds were distant but regular with a systolic murmur at the apex the heart was not enlarged and there was generalized arteriosclerosis. The blood Wassermann reaction was negative blood sugar 73 mg nonprotein nitrogen 27.9 mg. Present examination reveals that his general condition is about the same as that reported. There is no question in my mind that the hypertension and the arteriosclerosis existed prior to the injury to the right hand and the anaphylactic reaction following the injection of the antitoxin but here is a man who did laboring work all his life and apparently was in good physical condition who following the occurrences mentioned is today totally disabled. My purpose in sending this information is to ascertain what effects on anaphylactic reaction would have on his preexisting condition. Is there any literature that would aid me in this matter?

P F Cardinale MD Elizabeth N J

ANSWER—It is not entirely certain from the facts at hand whether the patient had an accelerated form of serum sickness or an immediate type of serum reaction due to a previously existing sensitiveness. In either type of reaction a number of complications have been described. It is possible for the anaphylactic type of reaction whether due to serum or to other antigens, to result in various profound responses such as abortion, pronounced gastroenteritis, protracted nervous and toxic states and interference with the normal functions of the liver, kidneys and blood vessels. Serum sickness has been not infrequently reported to cause neurologic complications and particularly neuritis. Among other occasional effects that have been noted as a result of serum sickness may be mentioned edema of the larynx, abdominal pain, gastrointestinal hemorrhage, local purpura, hematuria, jaundice, liver atrophy, optic neuritis, laryn-



geal nerve paralysis, Meniere's syndrome and psychoses. There is no doubt that the patient in question had a preexisting arteriosclerosis and hypertension. This abnormal vascular state may have been the underlying basis favoring the results that followed the serum reaction, but it must be appreciated that it is possible perhaps for similar effects to be produced without any previously existing organic states.

#### References

- Doyle J B. Neurological Complications of Serum Disease. *Am J M Sc* 185:484 (April) 1933.  
Wilson George and Hadden S B. Neuritis and Multiple Neuritis Following Serum Therapy. *THE JOURNAL* Jan 9 1932 p 123.  
Wadsworth G H and Brown C H. Serum Reaction Complicated by Acute Carditis. *J Pediat* 17:801 (Dec) 1940.  
Parrasi Gino. Serum Sickness of Central Nervous System. *Munchen med Wchnschr* 87:1176 (Oct 25) 1940.

#### DIAGNOSIS OF TYPE OF ANEMIA

To the Editor—A woman aged 77 has an anemia with 2,438,000 red blood cells and 40 per cent hemoglobin. Neither blood smear nor color index is indicative of pernicious anemia. She has a chronic valvular heart disease with no decompensation, a blood pressure of 100/60 and normal urine. The vaginal examination is negative except for prolapse of the uterus. From the history and examination I was unable to find any place where she could be losing blood except a history of vomiting blood four years ago. Later x-ray examinations of the gastrointestinal tract were negative and she has not lost weight since. What type of iron and liver therapy is indicated? Considering her age and the myocardial damage, is a blood transfusion advisable?  
M D Pennsylvania

ANSWER—It would not be possible to say what type of therapy is indicated until the anemia is carefully classified as to morphology and etiology. The mainstay in the differential diagnosis of such an anemia is the laboratory examination. Such determinations as the volume index, saturation index, icterus index, reticulocyte count, platelet count and a careful study of the blood smear should give a clue as to the type of anemia. Further studies such as sternal puncture with examination of the bone marrow, stool examinations and renal function tests, may also be necessary.

The age of the patient and the condition of the heart are not contraindications to giving a blood transfusion. However, if the type of anemia is such that it would respond to specific therapy, transfusions would not be necessary.

References to classifications and the laboratory diagnosis of anemia

- Osgood E E. Laboratory Diagnosis. Philadelphia: Blakiston Company, 1940.  
Wintrobe M M. Clinical Hematology. Philadelphia: Lea & Febiger, 1942.

#### COBRA VENOM FOR ANALGESIA

To the Editor—In the *Journal of International College of Surgeons* (3:357 [Aug] 1940) Paul Butler of Orlando, Fla., makes the following assertions as to the remarkable properties of snake venom. He maintains that it has recently been proved that cobra venom has a higher analgesic action than morphine. Believing therefore that the analgesic effect of snake venom and its value in therapeutics cannot alone explain its curative effects and that the evidence indicates a deep effect on the metabolic processes in the human body, I looked through the pages of *New and Nonofficial Remedies* and the only reference to snake venom concerned Lederle's moccasin for hemorrhage (not recommended). Butler appends two references: Burkhardt, Albrecht. Treatment of Rheumatic Disorders with Snake Venom, *Deutsche med Wchnschr* 61:1159 (July 19) 1935, and Spangler R H. Intramuscular Injection of Foreign Protein. Crotalin in 300 Cases of Epilepsy, *New York M J* 107:727 (April 20) 1918. I should like to know if there is any truth in Butler's contention. Has any experimental work been done of sufficient value to entitle it to deserve his encomiums? It seems to me from the paucity of literature that there has not.  
Thomas I O'Drain M.D. Philadelphia

ANSWER—The use of cobra venom in clinical therapeutics has been developed in the last eight years by both American and foreign investigators. The most prominent publications from French writers were those of Charles Taguet (*Bull et mem Soc med d hop de Paris* 137:310 [April 29], 651 [Dec 8] 1933) and Albert Calmette and A. Ortuconi (*Presse med* 42:112 [Jan 20] 1934).

In this country practically all of the publications have been by Macht and his collaborators (Macht D I. *Proc Nat Acad Sc U S* 22:61 1936; Macht D I, and Spencer Elizabeth C. *J Am Pharm A* 31:146 [May] 1942). The last mentioned is his most recent publication. Other investigators in India and in Argentina have also studied the analgesic effects of cobra venom. According to Macht and his collaborators cobra venom injected in small doses produces analgesia and therefore suitable preparations were first employed for the relief of intractable pain suffered by patients with malignant disease. Macht maintains that he has shown experimentally

that this relief of pain is not due to a peripheral effect on the nerve endings or nerve fibers but to a direct action of the drug on the brain, and the hypothalamus is the center of the cobra venom analgesia.

Cobra venom solution was discussed in a preliminary report of the Council on Pharmacy and Chemistry (*THE JOURNAL*, Oct 5, 1940, p 1196). It was concluded that purified cobra venom is of some value for the relief of pain, especially that of inoperable cancer (its use in the early stages would tend to delay curative measures), that it does not displace morphine completely in more than relatively few cases but it is of value in these few, that it appears to be of limited value in the treatment of trigeminal neuralgia and the various conditions commonly grouped loosely under the names of "rheumatism" and "arthritis", that its therapeutic effects are variable and uncertain in all painful conditions that the disagreeable side actions, including nausea, vomiting, diarrhea and pain of injection—even intense pain at times, mentioned in medical journals—must be brought to the attention of those who use cobra venom, that it must not be recommended for those who are severely ill except those suffering from inoperable malignant tumors or from incurable disease, that the optimum dosage (after the first single dose) remains to be determined, and that the effects are not immediate but may take hours to appear.

#### CHOREA WITH EMOTIONAL BEHAVIOR DISTURBANCE

To the Editor—Two years ago I saw a girl aged 12 with chorea. After intramuscular magnesium sulfate injections and several hyperthermic treatments she apparently made a recovery and I lost sight of her. Now her mother states that she developed the present symptoms within the past year. She has some purposeless explosive movements, the most distressing of which is a sudden explosive speech outburst during which the patient suddenly uses vulgar or curse words. During conversation she will talk quite intelligently but in the middle of a sentence she will suddenly say "G—d—d—" and then proceed to finish the sentence also while sitting quietly. She will suddenly explode in this manner. The patient does not seem to be psychotic. She lives quietly at home with her grandparents. Her mother works. The patient realizes that this condition is abnormal and expresses a real desire to get well so that she can attend school, go to shows and otherwise mingle with others. I shall appreciate any suggestions you may have to offer along the line of treatment. The parents are too poor to afford a special school for the girl.  
M D Arkansas

ANSWER—The patient has a recurrence of chorea with emotional behavior disturbances. The latter occurs in a mild way in many cases of chorea. The use of vulgar or curse words in this disease is not rare. The possibility of a degenerative or Huntington's chorea must be thought of, although it is improbable because of her age. The following treatment is suggested. The patient should have absolute rest in bed for six weeks in a darkened room. No visitors and no exciting radio stories or plays should be allowed. One and the same person should act as nurse. The patient should sleep alone in her room. She should eat alone. She should sleep from fourteen to sixteen hours daily. Solution of potassium arsenite in doses of 5 to 7 drops three times daily can be given for thirty days or 5 grains (0.3 Gm.) of acetylsalicylic acid three times daily for twenty days. Lukewarm baths for twenty minutes once daily can also be given for its sedative effect. Insomnia may be treated by bromides or phenobarbital. The heart should be studied to rule out an associated endocarditis.

#### OVARIAN NEOPLASM

To the Editor—I should like to take exception to the form of treatment as outlined in Queries and Minor Notes in the Jan 30 1943 issue under the heading Probable Ovarian Neoplasm. Under the description of the patient's pelvis there is apparently a cervical polyp or other neoplasm partially extruded from the uterus into the cervix. Laparotomy regardless of the associated conditions almost without exception should be postponed until the intrauterine and intracervical tumors are removed by the vaginal route. When submucous myomas have been partially or completely extruded through the cervix they are almost always infected and laparotomy carried out in these conditions is hazardous. In this particular case it would appear to me to be advisable to remove the intra-cervical tumor await the closure of the cervix and then perform the necessary abdominal procedure.  
C D Berry M.D. Orlando Fla

#### WASHING HYPODERMIC NEEDLES TO PREVENT CLOGGING

To the Editor—In doing intradermal tests for allergies there results the problem of washing out each needle so that the test solutions do not become contaminated. I have devised a neat quick way of washing out our needles. The needles are stuck into the lumen of a piece of old duodenal tube. When the tube is clamped shut on one end and a luer syringe applied to the other end alcohol can be swished in and out through the needles thereby cleaning them thoroughly. The needles are then left sticking in the tube as this is an excellent place to keep them until next used.  
Anton W Oelgoetz M.D., Columbus, Ohio



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## SULFATHIAZOLE THERAPY OF FIVE HUNDRED PROSTITUTES WITH CHRONIC GONORRHEA

THE CONTROL OF VENEREAL DISEASE  
IN WARTIME

HYMAN STRAUSS, M D  
AND  
ISAAK GRUNSTEIN, M D  
BROOKLYN

Medical history shows that there is a great increase of venereal disease during wartime. Prostitutes are a danger to our military and industrial army. Detailed histories of some of our cases reveal twenty to thirty exposures during a twenty-four hour period. In a metropolitan city like New York with huge naval, military and industrial developments, a center for the armed forces on leave or embarkation, this problem assumes such serious significance that it requires immediate and proper attention.

This paper is based on a study of 615 women, culturally positive for the gonococcus, who were hospitalized at the Kingston Avenue Hospital. They had been arrested for actual or attempted prostitution, tried at the Jefferson Market Court and found not guilty or given suspended sentences. However, since they had gonorrhea, the Health Department immediately ordered them hospitalized for treatment as a means of controlling the spread of venereal disease.

Only 20 per cent of these patients, all culturally positive, were noted to have clinical evidence of gonorrhea at the time of the initial examination at our hospital. Repeated examinations revealed a greatly increased percentage of clinically positive cases, owing partly to the discovery and discounting of deceptive methods employed by the patients and partly to the greater accuracy resulting from repeated checkups.

On admission a complete history, including the gynecologic and sociological aspects, was taken, and a general physical examination was done. Then a thorough gynecologic examination, which included the urethra, Skene's and Bartholin's glands, the cervix, corpus and adnexa, was made by both the resident and the visiting staff. Spreads and cultures were taken from the urethra, cervix and, when indicated, from Skene's and Bartholin's glands. Blood for the Wassermann test and the complement fixation test for gonorrhea as well as complete blood counts and urinalyses were performed routinely. When indicated, additional cultures and spreads, sedimentation rates, blood chemical examinations and sulfathiazole determinations were done.

The routine treatment was the administration of sulfathiazole orally in four doses between 6 a m and 10 p m. The patients were ordered to take a minimum of 1,500 cc of fluids daily and to report a diminished urinary output, hematuria or other toxic symptoms. They were advised to avoid direct sunlight. About 20 per cent of these girls received mapharsen concurrently for their syphilis. Urinalyses and blood counts were repeated routinely during the course of treatment. Dosage was not based on body weight.

These 488 patients were divided into three groups among which the duration of treatment and/or the daily dosage varied. Group 1 received 45 grains (3 Gm) daily for ten days, group 2 received 60 grains (4 Gm) daily for ten days and group 3 received 60 grains daily for seven days. Local therapy was not used in this series nor was sulfanilamide. Sulfapyridine, because of its greater toxicity, was used only in some cases when sulfathiazole failed.

The first smear after completion of treatment was taken on the fifth day. At four day intervals thereafter both smears and cultures were taken. At least one smear and culture was taken during or immediately after menstruation. Careful speculum examinations emphasizing the amount, consistency and color of the discharge were made during and after chemotherapy by several members of the staff.

Specimens for culture consisted of swabs taken from the source of the discharge. These were placed in tubes containing 1 to 2 cc of 2 per cent proteose peptone No 3 solution in 0.5 per cent sodium chloride. They were thus transported to the laboratory, where they were inoculated in less than two hours after delivery.

The medium employed was the Difco product recommended by Carpenter. Difco proteose peptone No 3 agar is prepared double strength. Equal quantities of this and a 2 per cent bacteriohemoglobin are mixed under aseptic conditions and plates poured. The swab was removed from the tube and streaked over two thirds of the plate and was rolled from side to side to insure inoculation of all the material. The plate was streaked with a platinum wire at right angles to the original streak to insure dilution and growth of discrete colonies. Approximately 12 per cent of the air was removed and replaced by carbon dioxide. The plates were incubated at 35 C for forty-eight hours in air tight jars. At the end of this time the plates were read first by direct inspection and then with a 1 per cent solution of dimethylparaphenylenediamine monohydrochloride poured over suspected colonies by medicine dropper. If a smear from an oxydase positive colony showed typical gram negative biscuit shaped diplococci and a subculture from such a colony failed to grow on nutrient agar at room temperature, such a culture was considered to be a gonococcus. However, if repeated cultures continued to be positive, further subcultures were made to chocolate agar, plain agar and sugar fermentation mediums (dextrose, maltose and saccharose).

The cultures taken in this laboratory are repeat cultures. The primary cultures were taken by the New York City Health Department.

From the Department of Hospitals City of New York.  
From the Department of Gynecology Kingston Avenue Hospital Brooklyn.

The minimum requirements for discharge from Kingston Avenue Hospital were four consecutive negative smears and three cultures. In addition it was required that there should be no gross clinical evidence of the disease (Even all of the foregoing prerequisites in our opinion do not constitute adequate proof of cure because of the relatively brief period of observation.)

When the dosage was raised from 45 grams daily (group 1, total 30 Gm) to 60 grams daily (group 2 total 40 Gm) for ten days the percentage of apparent

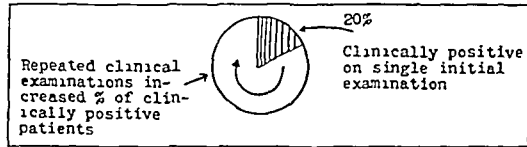


Chart 1—Culturally positive 100 per cent

cures was raised by 8.1 and there was no appreciable increase in toxic symptoms. Then the period of treatment was decreased from ten days to seven days with the daily dosage remaining at 60 grams (group 3). The total dosage dropped from 40 Gm to 28 Gm. The 27 per cent increased cure rate, however, has no statistical significance, in our opinion.

In only 2 cases in the entire series did toxic symptoms necessitate interruption of therapy. The first patient had a mild secondary anemia before taking sulfathiazole, i.e. 45 grams daily for ten days. Later since she represented a failure 60 grams of sulfapyridine was given for only three days because she developed a pronounced secondary anemia necessitating a blood transfusion. Without further therapy her cultures became negative and she was discharged. The second patient on the fourth day after taking 240 grams (15 Gm) developed hyperpyrexia, reddened throat, stiff neck, pain and tenderness in the lower part of the abdomen and in the renal areas. She recovered promptly on stopping the sulfathiazole. Symptoms recurred after a repetition of only 60 grams of the drug.

Minor toxic symptoms (i.e. headache, dizziness, slight nausea, faint and transient rashes) were occasionally encountered. However, in none of these cases was it necessary to discontinue treatment.

The vast majority of the patients felt well, had no complaints and usually gained weight. The average net gain in body weight was 2.83 pounds (the maxi-

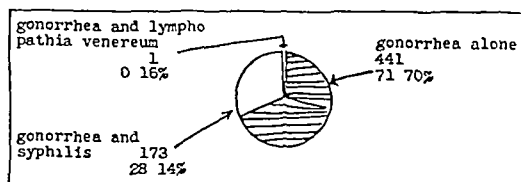


Chart 2—Six hundred and fifteen patients with positive gonococcus culture: 441 (90.4 per cent) had gonorrhea alone, 173 (28.14 per cent) had gonorrhea and syphilis, and 1 (0.16 per cent) had gonorrhea and lymphopathia venereum.

imum being 21 pounds and the minimum  $\frac{1}{4}$  pound). The average period of hospitalization for those with gonorrhea alone was thirty-one days and for those with gonorrhea and syphilis was forty-five days. Most of the patients were between 20 and 30 years of age (the youngest 16 years and the oldest 49 years).

Of the 488 patients having completed treatment and discharged after four consecutive negative smears and three negative cultures, 441 (90.4 per cent) were

negative after the first course of sulfathiazole and 47 (9.6 per cent) were failures after the first course. Of the 47 failures (after the first course) 42 became negative after the second course. [The second course was sulfathiazole in 39 cases. The second course was sulfapyridine in 8 cases, 7 of which were rendered negative immediately. The eighth one required focal therapy in addition and a third course of a sulfonamide compound (sulfathiazole).]

By giving a second course of sulfonamide compounds to the failures on the first course, the number rendered bacteriologically negative was raised from 441 to 483 and the percentage increased from 90.4 to 98.9. Five of the 47 were not bacteriologically negative after the second course. Of the 5 failures after the second course, 3 became negative after the third course of sulfonamides (the first and second courses were sulfathiazole and the third was sulfapyridine). One became negative after cervical cauterization, having failed to respond to two previous courses of sulfathiazole. One failed after a third course (the first course was sulfathiazole, the second sulfapyridine, the third sulfathiazole) but became negative after cervical coagulation.

Bacteriologic analysis of the 47 failures after completion of the first course of sulfathiazole therapy revealed that on the first bacteriologic check-up only 17 cases were positive, on the second check-up 10 more

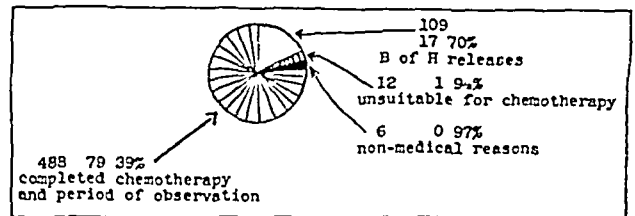


Chart 3—Six hundred and fifteen patients with positive gonococcus culture.

cases were found positive, on the third check-up 18 additional cases were positive and on the fourth check-up 2 more cases were positive. The first check-up was made five days after completion of therapy and the subsequent ones at four-day intervals.

It is obvious, therefore, that one or two negative bacteriologic observations are insufficient to determine cure. Negative evidence here as elsewhere has value only if it is corroborated by repeated identical findings. It follows that increasing the period of surveillance, allowing for more check-ups, diminishes the possibility of overlooking the asymptomatic carrier (latent cases).

The clinical picture may be distorted in some cases because of associated *Trichomonas vaginalis* vaginitis which was present in 67 per cent of our cases on admission and which almost invariably persisted despite the sulfathiazole therapy.

In over 60 per cent of the cases a purulent cervical and urethral discharge which was not caused by *Trichomonas* persisted after completion of sulfathiazole treatment despite repeated negative cultures for the gonococcus. This persistent discharge was presumably due to sulfonamide resistant secondary invaders or to an inflammatory reaction caused by the preceding gonococcal infection. It seems advisable to apply in addition local treatment in order to eradicate this discharge.

If Skene's or Bartholin's glands were affected discharge (though gonococcus negative) or swelling likewise persisted in many cases after sulfathiazole therapy.

Bartholin's gland abscess was present in approximately 1 per cent of our cases. The incidence of adnexal involvement and postmenstrual flare-ups has diminished definitely since sulfonamide medication has been instituted.

The persistence of a discharge which culturally appears nonspecific throws a heavy responsibility on the clinician when he is asked whether a patient is still infectious. If these patients were observed for a longer period of time, some of those with negative cultures might become positive again. All of us have observed on occasion a reversal of cultural findings after the first or second were negative. Perhaps this is because sulfathiazole is only bacteriostatic, and virulence may be subsequently restored because of failure of biologic response. This phenomenon seems to be partly substantiated by the observation that negative cultures have been found when the smears were simultaneously positive.

Since the immediate success or failure is not always related to the degree of sulfonamide concentration in

smears and clinical observations over a sufficient period of time before passing final judgment. The almost incredible percentage of apparent cures should not cause us to relax our vigilance. We have found positive cultures, smears and/or clinical evidence after three negatives. We have also found little or no tox-

TABLE 1—Patients Studied from July 1941 to June 1942  
Inclusive

Of these 615 patients:	
441 had gonorrhea alone	71.70%
173 had gonorrhea and syphilis	28.14%
1 had gonorrhea and lymphopathia venereum	0.16%
Of the 615 patients:	
109 were discharged by special release issued by the Director of the Bureau of Social Hygiene of the Department of Health before treatment was completed	
12 were considered as not suitable for chemotherapy and were excluded from this series	
6 did not complete treatment for nonmedical reasons	
4 were sent to prison for arson	
1 escaped	
1 was transferred to another hospital	
127 therefore did not complete the treatment	
488 patients completed treatment and remained in the hospital an average of twenty one additional days	

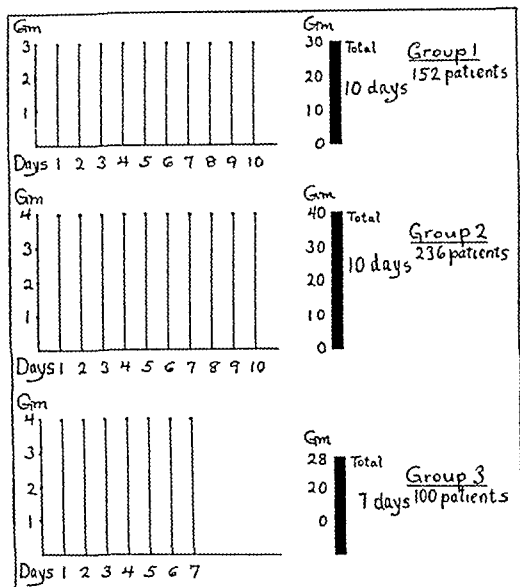


Chart 4—Treatment of 488 patients with sulfathiazole

the blood, we may assume that the fluctuations in cultural findings may be caused by immunologic changes producing increased resistance throughout the body or only in the affected mucous membranes or by a diminution in the viability of the gonococcus. Therefore the result of this therapy is either death of all the gonococci (i.e. definite cure) or only attenuation of the organism (i.e. an asymptomatic carrier). In either case the cultures may be found negative. In order to detect this asymptomatic carrier, who is a continuous source of infection, we must try to improve our diagnostic methods (cultural technic, culture mediums, provocatives and so on).

This resolves itself into the problem as to when these patients are no longer infectious. We must consider, first, clinical, bacteriologic and symptomatic cure for the patient's own sake, second, noninfectivity to others as a public health concern.

It has been well established that a known positive untreated case may yield negative cultures and since we have no one test such as animal inoculation which definitely marks the time of clinical cure, we are left with but one alternative—we must use repeated cultures,

icity in this large series of patients who are otherwise healthy except for this usually local pathologic condition. Because of these two factors one should not hesitate to treat even doubtful cases.

In our opinion at least four consecutive negative cultures and smears should be made at weekly intervals and the patient should be clinically negative and be under a further period of observation of at least six weeks before she can be reasonably regarded as non-infectious. Additional studies will prove whether it is safe to decrease the dosage, treatment time and the period of observation. The ultimate desideratum of cure in female gonorrhea will be the failure to reproduce the infection after human exposure.

With respect to the 109 infected patients discharged by the Department of Health by special releases before treatment was completed the following is evident:

Assuming that only 100 of these 109 girls return to prostitution as a livelihood, and allowing them sixty-five days for idleness and menses, and granting the average number of daily exposures to be even less than

TABLE 2—Treatment with Sulfathiazole

Groups	Total Dosage Gm	Number of Patients	Negative on 3 Consecutive Cultures After a Single Course of Therapy	
			Number	Percentage
1—45 grains daily for 10 days	40	152	178	64.2
2—60 grains daily for 10 days	40	236	218	92.381%
3—60 grains daily for 7 days	42	100	95	95.027%
Total		488	441	Average 90.5

their admitted minimum of twenty, approximately half a million men could be infected in a year while the girls are under private medical care and yet continue to practice their profession at the same time. The futility of follow-up in ambulant patients whose very livelihood depends on deliberate and persistent reexposure is obvious. When, in addition, the asymptomatic carrier is considered, the problem is complicated many fold.

It is clear, therefore, that prostitution by its very nature requires adequate hospitalization if there is to be not only proper treatment but also control of the spread of infection. Repeated offenders endangering the nation's health in wartime should be interned for the duration and educated to do useful work for the war effort. Above all this may lead to their permanent rehabilitation. Equally obvious is the fact that the added cost of such hospitalization and rehabilitation will be more than offset by considerations of health and the undoubted prevention of loss of time and efficiency in our war industries and armed forces on whom our national safety depends.

#### SUMMARY AND CONCLUSIONS

A study of 615 hospitalized gonorrheal patients shows that 60 grams of sulfathiazole daily for one week gives a 95 per cent apparent cure rate. The administration of sulfathiazole or sulfapyridine to the failures increases this rate to 98.9 per cent.

This very high cure rate must, however, be carefully scrutinized in order to determine the permanence of our immediate results. It must be ascertained in each case whether there has been sufficient treatment and an adequate period of observation.

Furthermore, and most important, it must be determined whether the criteria of cure employed are sufficient to insure protection of the public against further infection. The difficulty in detecting the asymptomatic carrier cannot be emphasized too strongly. Health departments defeat their own purpose by hospitalizing patients to control infection and then releasing them before cure in the custody of a private physician because of an interpretation based on the present law.

We feel that a prostitute, although treated, remains potentially infectious for approximately three months, during which time, if at large, she is a source of infection and as such forfeits her right to the benefit of doubt.

The cure of an infected prostitute requires adequate compulsory hospitalization. Repeated offenders should be interned for the duration and compelled to aid in the war effort. If the law now does not adequately remove this public health hazard as it does in most contagion, remedial statutes should at once be enacted toward that end.

If the state can call on a man for his life in this grave emergency, surely the common welfare demands that the "right" of an infected prostitute to be at liberty while still infectious be disallowed, at least for the duration of the war.<sup>1</sup>

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<sup>1</sup> Dr. E. A. Horowitz granted the use of those patients who were in his service. Dr. Julius Sass, pathologist, and Miss Lillian Robbins, bacteriologist, rendered assistance.

**Choice of Words**—It is customary to describe one whose powers of expression are above the average as having a good 'choice of words'. This goes to the heart of the matter. Choice means careful selection and requires thought. The doctor who expresses himself with clarity and precision thinks before he speaks. He has established a lifelong habit which gives him speed in choosing the right word for any shade of meaning. Many have not acquired this habit and rely on the stereotyped solecisms of a strictly limited medical jargon, which comes so easily to the tongue. Too often these unworthy phrases find their way into print. No doubt the pendulum will swing again and the profession demand a higher standard of literary expression than at present prevails.—The Decay of Medical Language, editorial, *New Zealand M. J.* 41:237 (Dec.) 1942.

## TOXIC REACTIONS FOLLOWING THERAPY WITH SULFAPYRIDINE, SULFATHIAZOLE AND SULFADIAZINE

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The value of the sulfonamide drugs in the treatment of many infectious diseases is evidenced by their widespread use. As these drugs have been employed more frequently, physicians have become increasingly aware that certain toxic effects may follow their administration. A variety of toxic reactions have been described in the literature, all of which rightly serve to make physicians conscious of the hazards to be encountered when these compounds are given to patients. And yet, reports of individual instances or of groups of cases in which a complication occurred following the use of one of the sulfonamides will not serve to show the relative frequency of these complications or their severity and importance. These can best be portrayed from a study of a large group of patients treated and observed under uniform conditions. The present paper is an analysis of the toxic reactions encountered in all the patients treated with sulfapyridine, sulfathiazole or sulfadiazine whose treatment was personally observed by one or both of us up to Jan. 1, 1943 either at the Gallinger Municipal Hospital<sup>1</sup> or in private practice. Most of these patients were treated for pneumonia, but a great many were given sulfonamides for other infectious diseases such as meningitis, endocarditis, gonococcal arthritis and pyelitis. A few of the patients were ambulatory. All patients had complete blood counts and urinalyses before the sulfonamides were started and frequently usually every alternate day, thereafter as long as the drugs were being given. Determinations of the free blood sulfonamide level were done on hospital patients usually daily during the course of therapy. On a few of the patients determinations of free and combined sulfonamides were made. Hospital patients were observed and questioned daily for the presence of toxic reactions, and ambulatory patients three times a week.

Table 1 shows the incidence of toxic reactions for each of the three sulfonamide drugs used. When two or more courses of a sulfonamide were given, only the first course is included in the table. It will be seen that the toxicity from sulfadiazine was less than that following sulfathiazole, which in turn was less than that obtained with the use of sulfapyridine. Among 498 patients treated with sulfapyridine, toxic reactions occurred in 149, or 29.9 per cent. Fifty-eight, or 11.8 per cent, of the 321 patients receiving sulfathiazole suffered from toxic effects while among the 660 patients to whom sulfadiazine was administered only 51, or 7.7 per cent, experienced toxic symptoms. These differences were found to be significant when tested by the chi square method. The greatest difference

Miss Ruth Mayer rendered technical assistance and Miss Louise Mause assisted in the tabulations.

Dr. Lewis K. Sweet cooperated in the treatment of the patients from the Infectious Disease Service who are included in this report.

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<sup>1</sup> Several of our former colleagues have cooperated in this work at different times including Drs. T. J. Abernethy, Harry A. Feldman, Clarence R. Hartman, Frank A. Jenkins and Samuel J. Sugar.

<sup>2</sup> The sulfadiazine and sodium sulfadiazine used in this study were furnished by the Lederle Laboratories, Inc.

in the toxic effects of the three drugs was to be found in the incidence of vomiting, which was present in 20.5 per cent of the patients treated with sulfapyridine, in 5.9 per cent of those receiving sulfathiazole and in 1.4 per cent of the patients given sulfadiazine. These differences are statistically significant. The frequency of vomiting in our series was less for all three drugs than that found by other investigators. This is probably due to the high proportion of Negro to white patients in our series (more than 2 to 1). An analysis of our patients treated with sulfapyridine showed that vomiting occurred in 37.6 per cent of the white patients and in only 2.2 per cent of the Negroes receiving this drug. It is our experience that the same relationship holds for the other sulfonamides also.

The presence of a renal calculus was diagnosed when gross hematuria, anuria or pronounced unexplained oliguria, pain over the kidneys or ureters or any combination of these was encountered. Neither the presence of sulfonamide crystals in the urine nor microscopic hematuria was considered indicative of the presence of a calculus, since these elements are present in the urine of a great many patients receiving the sulfonamide drugs under consideration. Using the criteria that have been named for diagnosis, we found kidney stones in 1.6 per cent of the patients receiving sulfapyridine, 2.8 per cent of those receiving sulfathiazole and 1.5 per cent of those receiving sulfadiazine. These cases will be discussed later in more detail.

We have placed in one group all the patients with fever, dermatitis and conjunctivitis (or episcleritis) resulting from the use of the sulfonamides, since these complications often occur simultaneously and since all three phenomena are apparently due to a similar type of sensitivity to these drugs. The incidence of these reactions following sulfapyridine and sulfadiazine was relatively low, 2.4 and 2.0 per cent respectively, as compared with 6.2 per cent in the patients receiving sulfathiazole. These differences are significant by the chi square test when the reactions following sulfathiazole are compared with those following sulfapyridine or sulfadiazine but not in the case of sulfapyridine as compared with sulfadiazine.

In the presence of a severe infectious disease, disorientation and mental confusion resulting from the use of drugs is difficult to evaluate. Nevertheless, after studying this symptom carefully in its time relationship to sulfonamide administration we are reasonably certain that these drugs contributed to the presence of mental confusion in 2.4 per cent of the patients receiving sulfapyridine, in 1.6 per cent of those given sulfathiazole and in 1.5 per cent of those to whom sulfadiazine was administered. These differences are not statistically significant.

The incidence of hematologic complications was not especially different for any of the three drugs except for the occurrence of 7 cases (1.4 per cent) of acute hemolytic anemia following sulfapyridine and only 1 each following sulfathiazole and sulfadiazine (0.3 and 0.2 per cent respectively). Leukopenia with a drop in the white blood cells below 4,000 per cubic millimeter was observed in 6 patients (1.2 per cent) receiving sulfapyridine, in 4 (1.2 per cent) receiving sulfathiazole and in 6 (0.9 per cent) receiving sulfadiazine. Granulopenia in addition to the neutropenia occurred in 4 of these sulfapyridine treated patients, in 2 of the sulfathiazole treated patients and in 3 of the sulfadiazine treated patients. The only difference which is sig-

nificant in the aforementioned group is the higher incidence of acute hemolytic anemia following sulfapyridine as compared with that following the other two drugs.

A definite leukocytosis, independent of the disease for which treatment was being given, developed in 2 patients to whom sulfadiazine was administered. There were increases in the leukocyte counts to 57,000 and 63,700 respectively and an increase in the mature polymorphonuclears and band forms. These counts returned to normal within three days after the cessation of sulfadiazine therapy.

Less frequent toxic complications were yellow vision in 1 patient who received sulfathiazole and 1 who received sulfadiazine and peripheral neuritis in 1 patient who was given sulfapyridine. This case has been reported elsewhere by Sugar.<sup>3</sup>

#### RENAL CALCULI

The symptoms which led to the diagnosis of sulfonamide calculus in our patients were pain over kidneys and/or ureters in 7 cases, gross hematuria in 6 gross

TABLE 1—Toxic Reactions Following the Administration of Sulfapyridine, Sulfathiazole and Sulfadiazine

Toxic Reaction	Sulfapyridine		Sulfathiazole		Sulfadiazine	
	No. of Patients	Per Cent	No. of Patients	Per Cent	No. of Patients	Per Cent
Vomiting	102	20.1	19	5.9	9	1.4
Renal calculus	8	1.6	9	2.8	10	1.5
Drug fever, dermatitis and/or conjunctivitis	12	2.4	20	6.2	13	2.0
Mental confusion	12	2.4	5	1.6	10	1.5
Leukopenia (with or without granulopenia)	6	1.2	4	1.2	6	0.9
Acute hemolytic anemia	7	1.4	1	0.3	1	0.2
Leukocytosis	0	0	0	0	2	0.3
Yellow vision	0	0	1	0.3	1	0.2
Peripheral neuritis	1	0.2	0	0	0	0
Total patients with toxic reactions	149	29.4	58	11.8	51	7.7
Patients with no toxic reactions	350	70.6	263	88.2	600	92.3
Total patients treated	508	100.0	321	100.0	651	100.0

hematuria and kidney pain in 4, anuria or definite oliguria in 3, anuria and kidney pain in 3 and oliguria and gross hematuria in 2. The condition of 1 other patient was not diagnosed during life. This patient showed nothing suggestive of a calculus except nitrogen retention and microscopic hematuria but after death from endocarditis she was found to have a sulfadiazine calculus in the pelvis of one kidney. The only other death in this group was of a patient with a pneumococcal pneumonia who died following the formation of a sulfathiazole calculus. The death of each patient was attributable to the original disease and not to the kidney stone.

The symptoms of calculus formation began anywhere from the first to the tenth day of treatment. Every patient who developed calculi had received doses of the drug of 1 Gm. or more every four hours, sometimes supplemented by the sodium salt intravenously, and every patient was either dehydrated before treatment began or received insufficient fluids in proportion to the dose of the drug given. Calculi were particularly likely to occur in patients who were being treated for

3 Sugar, S. J. Peripheral Neuritis Following the Administration of a Glucose Sulfapyridine Compound. *New England J. Med.* 226: 1021-1022 (June 25) 1942.

meningitis or endocarditis, because these patients were often given large amounts of the drugs so that high blood levels might be maintained. Among the 82 patients receiving sulfadiazine for meningitis or endocarditis, 5 (6.1 per cent) developed renal calculi, while among the remaining 578 patients who were given sulfadiazine for other illnesses the 5 patients who developed calculi represented only 0.9 per cent of all the patients treated. Nine patients with meningitis or endocarditis were given sulfapyridine and 1 (11.1 per cent) developed a calculus. Among the remaining 499 patients who received sulfapyridine 7, or 1.4 per cent developed calculi. Only 4 patients received sulfathiazole for the treatment of endocarditis or meningitis. None of these developed calculi. Among the 317 patients receiving this drug for other diseases 9 or 2.8 per cent, developed calculi.

When all the patients developing calculi are considered, with the exception of those treated for meningitis and endocarditis, the difference between the sulfadiazine and sulfathiazole treated groups is the only one which is significant.

excessively or is already dehydrated at the start of treatment the urinary output may become too small to keep the crystals in solution.

Brown, Thornton and Wilson<sup>4</sup> showed that the higher the level of sulfapyridine in the blood the greater was the possibility of calculi being formed. From table 2 it will be seen that this same relationship holds in our patients treated with sulfapyridine, sulfathiazole and sulfadiazine. Among 117 patients whose maximum free blood sulfonamide levels were between 1 and 3.9 mg per hundred cubic centimeters none developed renal calculi. In the groups of patients whose highest free sulfonamide levels were 4 to 6.9 or 7 to 9.9 mg per hundred cubic centimeters there were 1.1 and 1.3 per cent of the patients respectively who developed renal calculi. Among the 290 patients whose highest free blood sulfonamide level was 10 mg or more per hundred cubic centimeters 10 or 3.4 per cent, developed calculi. It is also interesting that whereas 3 patients whose free blood sulfapyridine levels were between 4 and 6.9 mg per hundred cubic centimeters developed calculi no patients with these maximum levels following

TABLE 2—Incidence of Renal Calculi in Patients Treated with Sulfonamides According to the Highest Blood Level Attained

Drug Used		Highest Blood Level Attained							
		1-3.9 Mg. per 100 Cc.		4-6.9 Mg. per 100 Cc.		7-9.9 mg. per 100 Cc.		10 Mg. per 100 Cc. and Above	
		Cases	Per Cent	Cases	Per Cent	Cases	Per Cent	Cases	Per Cent
Sulfapyridine	Patients with calculi	0		0		1	1	2	2.0
	Total patients	61		8		1		71	
Sulfathiazole	Patients with calculi	0		0		1	1.0	0	0.7
	Total patients	51		77		21		20	
Sulfadiazine	Patients with calculi	0		0		0		2	1.3
	Total patients	2		11		1		10	
All drugs	Patients with calculi	0		0		1	1.3	10	1.7
	Total patients	117		270		2		200	

The treatment given 20 of the 26 patients with calculi was merely the discontinuance of the offending sulfonamide and the forcing of fluids. Three patients who had been treated with sulfathiazole and the 1 who had been given sulfadiazine required cystoscopy with catheterization and lavage of the ureters. One of these patients with a sulfathiazole calculus required this procedure twice. It was effectual in starting the urinary flow in all cases. The disease of 1 patient with renal colic during the treatment of meningococcic meningitis with sulfadiazine was considered more serious than the complication, and the drug was continued while fluids were given at the rate of 5,000 cc a day. The pain disappeared and no further symptoms occurred during the remainder of the sulfadiazine therapy. As stated before, 1 patient died in whom the calculus was not diagnosed and who consequently received no treatment for it.

The formation of renal calculi is a serious and sometimes lethal complication of sulfonamide therapy. The mechanism is the crystallization of the sulfonamide or its acetyl derivative in the pelvis of the kidneys, ureters or collecting tubules. The urinary flow is diminished or stops completely, nitrogen retention develops and death may ensue unless the obstruction is removed. If fluid intake and consequently fluid output through the kidneys is sufficient to keep these crystals in solution calculi will not form. If the fluid intake is insufficient or if the patient is vomiting, has diarrhea, is sweating

sulfathiazole or sulfadiazine therapy developed calculi. In the sulfathiazole treated group no patients developed calculi unless their maximum free blood sulfathiazole levels were 7 mg or more per hundred cubic centimeters. In the sulfadiazine treated group none developed unless the corresponding blood sulfadiazine levels were 9.2 or more.

It is apparent that when the intake and consequently the blood levels and urinary output, of the sulfonamides are kept low, renal calculi occur rarely if at all. This is borne out by the fact that, among the 182 patients whom we have treated with sulfadiazine in doses of 0.5 Gm or less every four hours there has not been a single instance of renal calculus formation. The same is true for the 43 patients receiving sulfathiazole in similar low doses.

Our observations indicate that sulfadiazine administered in these low doses is as effective against pneumococcic pneumonia as when 6 Gm a day is given. We have now treated 123 patients with pneumococcic pneumonia in this way with eleven deaths, or a 9 per cent case fatality rate. This compares favorably with our results and those of others in the treatment of pneumococcic pneumonia with higher doses of sulfapyridine.

4 Brown W. H., Thornton W. B. and Wilson J. S. An Evaluation of the Clinical Toxicity of Sulfonamide and Sulfapyridine. *J. A. M. A.* 115: 1605-1611 (April 27) 1940.

5 Dowling H. F., Hartman C. R., Feldman H. A. and Jenkins F. A. The Comparative Value of High and Low Doses of Sulfadiazine in the Treatment of Pneumococcic Pneumonia. *Am. J. M. Sc.* 205: 197-203 (Feb.) 1943.

diazine<sup>6</sup> If further observations confirm our findings, the administration of these smaller doses should be the optimal way to treat patients with pneumococcal pneumonia

The other method of preventing renal calculi following sulfone treatment is to give sufficiently large amounts of fluids to insure an adequate renal output no matter how high the dosages of the drug In every case in which a sulfonamide calculus occurred among our patients, the patient was dehydrated or took insufficient fluids after therapy began, or a large intravenous dose of the sulfonamide had been given without sufficient fluids to take care of adequate renal output We recommend a total of 3,000 cc of fluids a day for patients receiving the sulfonamides, or enough fluid to insure a urinary output of at least 1,200 cc a day We have been able in several instances to give sufficient sulfadiazine to keep the free blood sulfadiazine level constantly at 20 mg per hundred cubic centimeters or above, without evidence of renal calculus formation, by giving large amounts of fluids at the same time The proper relationship between fluids and sulfonamide intake is the key to the prevention of calculi

#### DERMATITIS, CONJUNCTIVITIS AND DRUG FEVER

In table 3 are shown the cases of dermatitis, conjunctivitis and/or drug fever encountered by us Since reactions following second and successive courses of the sulfonamides are included in this table, the totals are greater than those in table 1, which includes only the first courses of the three sulfonamides Sulfathiazole was responsible for a larger number of these reactions than either of the other drugs, and the reactions were more varied in type when they followed sulfathiazole While sulfapyridine caused only maculopapular rashes and sulfadiazine both maculopapular and erythematous (scarlatiniform) types, sulfathiazole therapy was followed by 3 erythematous, 4 maculopapular, 7 nodular, 1 urticarial and 1 petechial rash In patients receiving the first course of a sulfonamide, the onset of the rash occurred between the second and sixteenth day of treatment with the drug, nearly two thirds occurring between the sixth and tenth days In the patients developing rash or fever following the second course of sulfathiazole, the reaction in 1 patient began on the third day of the second course, in other patients on the fourth, fifth and seventh days, while 1 patient developed a rash with itching two hours after the first dose of the second course was taken

Leukocyte counts during the height of the rash, drug fever or conjunctivitis ranged from those within normal limits to one which reached 64,700 per cubic millimeter, the majority being below 14,000, however In the cases of conjunctivitis without dermatitis there was no leukocytosis unless drug fever was also present In no instance was there an eosinophilia

In every case the rash and fever subsided within four days after the cessation of sulfone therapy The fact that no cases of exfoliative dermatitis occurred may be

attributed, for the most part at least, to the fact that sulfonamide therapy was stopped promptly as soon as the rash appeared

#### HEMATOLOGIC COMPLICATIONS

In all of the cases of leukopenia which developed, the leukocytes remained above 3,000 per cubic millimeter except in 1 patient, in whom they reached 2,340 per cubic millimeter at the lowest level The onset of leukopenia occurred anywhere from the third to the sixteenth day of sulfonamide treatment There was no case of agranulocytosis in the series, a fact which may have been due to prompt detection of the abnormality in its milder stages and immediate discontinuance of the sulfonamide In many instances the leukocyte count was again within normal limits on the day following discontinuance of sulfonamide therapy, although in the majority of cases a longer interval was required, the longest being six days

An acute hemolytic anemia with a drop of 1 million or more red blood cells, occurred in 7 patients receiving sulfapyridine and in 1 each receiving sulfathiazole and

TABLE 3—*Dermatitis, Conjunctivitis and Drug Fever Following Sulfonamide Therapy*

	Sulfa pyridine	Sulfa thiazole	Sulfa diazine
Complication			
Dermatitis alone	5*	7†	5*
Conjunctivitis alone	0	3	0
Drug fever alone	3	5	0
Dermatitis and conjunctivitis	0	1†	0
Dermatitis and fever	4	6	5
Conjunctivitis and fever	0	3	0
All three complications	0	2	0
Total	12	27	15
Type of rash			
Erythematous or scarlatiniform	0	3	3
Maculopapular or morbilliform	9	4	6
Nodular	0	7	0
Urticarial	0	1	1
Petechial	0	1	0

\* Two had fever from disease † Four had fever from disease  
‡ Fever present from the disease

sulfadiazine These anemias began on the second to the seventh day following the commencement of treatment Sulfonamide therapy was discontinued promptly in every case, but the erythrocyte counts remained low and in some cases continued their downward courses In 1 patient the red blood cells reached 1,700,000 per cubic millimeter with a hemoglobin of 34 per cent and the patient died, presumably as a result of his pneumonia and the added burden of the anemia In most instances transfusions were employed to bring the red blood cells up to normal levels, although they usually rose slowly without this assistance

#### AGE AND SEX DISTRIBUTION OF TOXIC REACTIONS

We have computed the relative number of toxic reactions occurring in males as compared with females There was no significant difference in the percentage of any of the toxic effects in the two sexes with the exception of vomiting This occurred more than twice as frequently in females as in males, regardless of the drug used It was present in 15 per cent of the male patients receiving sulfapyridine and in 33.5 per cent of the females The corresponding figures for sulfathiazole were 5.2 and 11.3 per cent and for sulfadiazine 1.2 and 3.1 per cent

There was no apparent difference in the number of toxic reactions in the various age groups, although

6. Dowling H F, Hartman C R, Sugar S J and Feldman H A The Treatment of Pneumococcal Pneumonia with Sulfadiazine J A M A 117 824-826 (Sept 6) 1941 Ensworth H K, Kalkstein Mennsch Barefoot S W, Liebmann James and Plummer Norman Sulfadiazine in Pneumonia Treatment in 239 Cases Am J M Sc 204 179-185 (Aug) 1942 Finland Maxwell Strauss Elias and Peterson O L Sulfadiazine Therapeutic Evaluation and Toxic Effects on 446 Patients J A M A 116 2641-2647 (June 14) 1941 Flippin H F, Rose S B, Schwartz Leon and Domm A H Sulfadiazine and Sulfathiazole in the Treatment of Pneumococcal Pneumonia Am J M Sc 201 585-592 (April) 1941



the lowest age group was poorly represented, there being only 33 patients under 10 years of age in the entire study

#### COMMENT

Although the sulfonamides have been used extensively for several years and nearly every physician has had some experience with them, nevertheless there is no common agreement as to the seriousness of their toxic effects. It is the common practice of many physicians to use them in a great variety of diseases, even when the indications for their use are not specific (or, indeed, very clear), since these drugs have, as they say, practically no toxic effects. On the other hand many physicians particularly those who have seen fatalities attributable to these drugs, believe that they may cause serious or fatal complications even under the most careful regulation of treatment and observation of the patient. We believe that the figures which we have presented do not support either of these extreme views. We have shown that toxic reactions occur following the use of sulfapyridine, sulfathiazole and sulfadiazine in descending order of frequency, but that the serious complications are few in number when the patients are watched closely, when the drugs are stopped promptly if reactions occur, and especially when sulfadiazine is used. Only 3 patients in the entire group died at a time when a complication of sulfonamide therapy was present. In 2 of these who had renal calculi the deaths were unquestionably due to the diseases for which the sulfonamides were being given. In the third patient, who developed acute hemolytic anemia in the course of sulfapyridine therapy for pneumonia death may have been contributed to by the drug reaction. Thus it is seen that 1564 courses (including second and later courses) of the sulfonamides were administered to a large group of patients for the most part under the conditions which exist in a city hospital with a minimum of serious toxic reactions and only one fatality which might have been due in part to the sulfonamide administered.

The question of how best to avoid toxic reactions is best answered in two parts. First, renal calculi may be avoided by the use of sulfadiazine in preference to sulfathiazole and sulfapyridine, and by preserving the proper balance between the amounts of drug and fluids given. When good results can be expected from the treatment of a disease with relatively small doses of a sulfonamide, as we have shown to be the case with sulfadiazine in pneumococcal pneumonia, this method of avoiding renal calculi should be taken. When larger doses are needed they can be used without the formation of calculi if careful attention is paid to fluid intake and output.

Secondly, with regard to other complications, vomiting is almost completely absent when sulfadiazine is used, while the chances of producing drug fever, dermatitis, anemia and leukopenia following sulfadiazine therapy are either the same as or less than if other sulfonamides are used. Even with sulfadiazine a few toxic reactions of this sort will nevertheless occur. Serious and fatal results can be almost completely prevented by having blood counts taken every other day and by careful examination of the patient every day and by discontinuing the drug promptly if toxic reactions appear. We believe that in the light of present knowledge only by the use of the measures outlined can sulfonamides be given with the maximum of safety to allow them to be properly used in all cases where they are needed to achieve their full therapeutic effects.

#### SUMMARY AND CONCLUSIONS

1 Sulfapyridine was administered to 498 patients with toxic effects in 29.9 per cent, sulfathiazole to 321 patients with toxic effects in 11.8 per cent and sulfadiazine in 660 patients followed by toxic reactions in 7.7 per cent. Detailed analysis was made of the toxic reactions encountered in the use of each of these drugs.

2 Renal calculi were found least frequently in patients treated with sulfadiazine or sulfapyridine. Their frequency varied in direct proportion to the maximum level of free sulfonamide in the patient's blood. None occurred in patients given 0.5 Gm. of sulfadiazine or sulfathiazole every four hours or less. When larger doses of these drugs were given renal calculi occurred when fluid output was diminished for some reason.

3 Blood dyscrasias occurred less frequently following sulfadiazine and sulfathiazole. The only death in the entire series which might be partly attributable to sulfonamide therapy occurred in a patient with acute hemolytic anemia following sulfapyridine therapy.

4 The optimal therapy for most infectious diseases at the present time involves the use of sulfadiazine, in low doses whenever possible but in high doses when necessary, provided there is careful regulation of fluid intake and output and frequent blood counts and urinalyses, combined with close observation of the patient.

#### THROMBOCYTE DEFICIT

THE BEHAVIOR OF THE BLOOD PLATELETS  
IN DISEASES OF VASCULAR STASIS  
OF THE EXTREMITIES

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This report is rather incomplete in its data and conclusions because the two years in which I have been collecting cases have not permitted the detailed anatomic and physiologic searchings that seem indicated. However, I feel that in these days of marching feet any research that will contribute to our knowledge of the circulation of the lower extremities is worth while. The basis of this study has been a comparison of the platelet counts on blood taken from the ear of patients with circulatory diseases of the legs with counts on blood taken immediately from the right and the left foot.

If the circulation of blood is sufficiently slowed or otherwise becomes incompetent in an extremity and thereby reduces the nutrition of an area to a point of tissue damage, certain phenomena will occur. These phenomena are dependent on failure of oxygen supply and failure of removal of carbon dioxide and catabolic products. The result is a disturbance of normal cell function, accumulation of fluid and of serum proteins, inflammation and finally tissue death. Within these areas the blood vessels suffer as a part of the processes of decompensation. The *vasa vasorum* fail to keep up a healthy state of nutrition, and vascular tone is lost. With this loss of tone dilatation occurs, and the blood flow is further slowed. As the blood in the large veins becomes further charged with carbon dioxide and waste products damage to the intima appears.

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With this slowing of the blood flow the thrombocytes drop from the axial stream and adhere to areas of intimal damage, and white thrombi form. Partial thrombocyte disintegration occurs in these thrombi, and the products of the dissolution enter the blood stream in increasing concentration.

If one accepts the observations of Ceder, Zon and Crigler,<sup>1</sup> who demonstrated rather competently that thrombocytes are the main and probably the sole vehicles for histamine in the circulating blood, one can recognize the role that this potent substance must play in the development of the sensitization of the skin.

This is the picture of circulatory stasis disease of the lower extremities the result of which is edema, dermatitis and ulceration—also pigmentation and hemorrhage and accumulation of serum protein in extravascular areas. The dermatitis may not be confined to the area of stasis alone but, owing to the catabolites acquired through disturbed nutrition and cellular disintegration may develop on other areas of the body, most usually on those areas exposed to light. The solar sensitivity of the patient with varicose dermatitis is well known. The other products of disturbed cellular metabolism with changes in hydrogen ion concentration are likewise to be considered a source of trouble but are not investigated in the development of this paper.

The accidental observation that thrombocytes were definitely diminished within the capillaries of the feet of persons who suffered from chronic stasis diseases of the leg and of those with lichen chronicus simplex of the same areas led to a procedure which I have designated the "thrombocyte deficit" test. The results of this test in more than 200 cases have helped me to construct a picture of the degree of damage suffered by an extremity from such stasis and occasionally predict its chances of repair. This has been useful in the clinical management of cases presenting involvement of the leg. I reported a smaller series of cases before the dermatologic section of the California Medical Association in May 1940. This paper was not published and has been developed to include the larger studies in the present paper.

Something should be said regarding the origins and behavior of blood platelets that are definite problems in an investigation of this type.

1 Platelets may be formed from the breaking up of megakaryocytes but may be caused to clump together again only to break apart a second time and reform as individuals within the course of a few minutes. This suggests that the platelets in the cases considered are not undergoing dissolution, however, the reduction of the ear count considerably below normal in long standing cases indicates an actual loss of the platelet itself.

2 Platelets may fragment into smaller forms while passing through capillaries. This presumably gives an apparent increase in count in some circumstances, a skilful technician will avoid this pitfall, however.

3 Agglutination of platelets may be precipitated by a slight modification of plasmatic equilibrium. Agglutination is lessened by experimental asphyxia and in anaphylactoid purpura. We would therefore expect a lessened agglutination in these affected legs, for asphyxia is certainly present.

4 The distribution of platelets in the vessels of different organs varies widely. There are variations in parts of the circulation or even in the same vessel at the same

time. Showers of platelets appear, only to be followed by an extreme scarcity within a short interval. Vasomotor changes, stagnation or agglutination occurs frequently. Tocantins<sup>2</sup> found that the number of platelets in arterial blood of the upper extremity was significantly higher than in venous or cutaneous blood. This was not true of the erythrocytes. The taking of the several counts should therefore be done within a short time of

TABLE 1—Platelet Counts in a Series of Twenty Cases

Case	Sex	Age	Platelet Count— Thousands	Description of Pathologic Condition
1 C J L	♀	45	Ear 120 Right foot 85* Left foot	*Eczematoid eruption of ankle epidermophytosis
2 W E P	♂	65	Ear 178 Right foot 64* Left foot 135	*Sclerotic and ulcer varicose dermatitis
3 G E	♂	63	Ear 145 Right foot 83 Left foot 65*	Slight chronic edema *Heavy woody edema der- matitis varicosities
4 W M C	♂	56	Ear 310 Right foot 51* Left foot 68*	*Itching of both ankles edema and punctate pig- mentation of both ankles
5 K E A	♂	35	Ear 166 Right foot 164 Left foot 92*	*Old ulcer punctate hemor- rhages pigmentation
6 J B	♂	58	Ear 240 Right foot 74* Left foot 144*	Hemorrhagic lesions of both legs and ankles no edema
7 H P	♂	35	Ear 172 Right foot 126 Left foot 71*	Edema mild *Ulcer and stasis
8 C W (see 9) 12/29/35	♂	78	Ear 215 Right foot 186* Left foot 213	*Ulcer Scaly edema
9 C W 12/29/39			Ear 155 Right foot 144 Left foot 115*	Healed *Ulcer and sclerosis
10 C J H	♂	39	Ear 144 Right foot 102 Left foot 60*	Schamberg's disease mild *Schamberg's disease defi- nite eruption
11 F J W	♂	75	Ear 242 Right foot 175 Left foot 86*	*Moderate lichenification *Severe lichenification amy- loidosis
12 M F	♂	55	Ear 215 Right foot 174 Left foot 116	Contact dermatitis (wool) of both legs resistant to treatment
13 S J	♂	65	Ear 118 Right foot 55* Left foot	*Lichen chronicus simplex
14 D B	♂	33	Ear 151 Right foot 46* Left foot 134	*Thick lichen simplex ankle Normal leg
15 R M T	♂	62	Ear 114 Right foot 86* Left foot 96	*Varicose dermatitis and edema *Varicose veins
16 A R T	♀	50	Ear 205 Right foot 97* Left foot	*Punctate hemorrhages
17 F F M	♂	48	Ear 122 Right foot 60* Left foot	*Lichen planus hyperten- sion edema
18 A S C	♂	78	Ear 156 Right foot 56 Left foot 36*	Varicosities *Sclerosis and pigmentation, edema
19 P J W	♀	38	Ear 210 Right foot 146* Left foot 136*	*Erythema induratum of both legs
20 E P	♀	45	Ear 206 Right foot 169 Left foot 86*	Slight varicose *Ulcer varicose veins edema

\* Indicates leg of chief complaint

\* Indicates leg of secondary symptoms

each other. The consistency of the findings by repetition in the same case indicates that a reasonable constancy of count can be expected.

5 Seasonal variation, time of day, activity, menstruation, digestion, age, race, posture, temperature, altitude, pregnancy and various diseases may be lumped together as other factors of definite influence on the counts.

It is our object in this paper to present as a preliminary report a method of comparison of platelet

1 Zon, Leo, Ceder, E. T., and Crigler, Catherine W. The Presence of Histamine in the Platelets of the Rabbit. *Pub. Health Rep.* 54: 178 (Vol. 3) 1939.

2 Tocantins, L. M. *Proc. Physiol. Soc. Philadelphia Am. J. M. Sc.* 192: 150 1936.

counts on a person at relatively the same time and under the same conditions

This method gives first a survey of anatomically extreme areas of cutaneous vessels which will indicate any general abnormality of platelet count and at the same time indicate with fair degree of certainty a localized change

TABLE 2—Low Platelet Counts in Series of Sixty-One Cases in 1939

Number of cases studied	61
Number of cases with counts in one extremity below 100 000	20
Number of cases with counts in one or both extremities above 100 000 and below 150 000	35
Number of cases with low counts in ear and both extremities	3
Total cases with low counts	58
Number of cases with approximately normal counts	3
	61

Although variations of platelet counts in extremities relative to postural changes are discussed by Tocantins,<sup>3</sup> a search of the literature has not disclosed any similar investigation. Other studies and reports of changes in the circulatory blood in areas presenting cutaneous disease have been made and reported by Kovacs,<sup>4</sup> Piscane,<sup>5</sup> Helmrich,<sup>6</sup> Ratschow,<sup>7</sup> David<sup>8</sup> and Knott and Pearson.<sup>9</sup>

Kovacs compared the local blood picture in the presence of different cutaneous diseases with finger blood in 50 cases. He investigated the changes in the blood cell counts in the location of the disease. The neutrophils, eosinophils, basophils, monocytes and lymphocytes were studied in 6 cases of psoriasis, 5 cases of erythema induratum, 6 cases of erythema multiforme, 6 cases of urticaria, 3 cases of prurigo, 2 cases of pityriasis rosea, 5 cases of chronic eczema, 2 cases of lichen ruber planus, 4 cases of dermatitis herpetiformis, 4 cases of dermatitis artificialis, 2 cases of arsenphenamine dermatitis and 1 case each of neurodermatitis, erythema elevatum diutinum, mycosis fungoides and parapsoriasis.

Analysis of this study shows that in only the chronic type of lesion was there any variation in the blood cell counts. Evanescent or noninfiltrative diseases such as urticaria and pityriasis rosea showed no change in cellular types. The cases are too few in number for practical interpretation.

Piscane found that the venous pressure was elevated in all forms of varicosities. Capillary pressure was normal.

Helmrich directed attention to the blood picture in the pathologic cutaneous area "in loco" by examining the blood in the papule of a tuberculin reaction and found an increase in the lymphocytes.

Ratschow examined the blood flow in diseased extremities by means of roentgen rays.

David compared blood taken from the finger tip, as did Kovacs, with the blood of a pathologic cutaneous area and concluded that, as would be expected, there was a fixed deviation in the proportion of the local blood

structure and the foreign (finger tip) picture. The search was not sufficiently followed to develop a method for differential diagnosis.

Knott and Pearson found increases in eosinophils following the injection of histamine or proteins in sensitized persons.

These studies which compare finger tip blood with lesion blood show that such blood cell changes are found, as might be expected, in lesions that show similar alterations in a biopsy, they do not give an index of changes dependent on blood velocity and nutritional damage. I believe that it will readily be seen that the studies are not comparable. Furthermore, reference to the thrombocytes has not been found in these reports.

A series of 20 cases is presented for the purpose of illustration in table 1, and a summary of 61 cases collected in 1939 is given in table 2. Table 3 shows the distribution of the counts according to the clinical results and table 4 the distribution of the pathologic condition in relation to the counts.

In 2 cases finger counts were done in addition to the others. The finger blood corresponded to the ear count in these cases, so that I did not continue the practice. This is further borne out by numerous relatively normal counts on blood taken from the leg of persons not exhibiting any apparent vascular anomaly. Bleeding times were also studied for a while, but when it was found that they gave no significant information they were stopped.

Counts of the white and red corpuscles were also done with a few of the platelet counts, but the variation in

TABLE 3—Clinical Correlation of Counts

	No. of Cases
1 Soft edema and dermatitis	29
Counts below 100 000	6
Counts below 150 000	9
Counts below 200 000	3
Counts above 200 000	2
2 Sclerosis and woody edema	13
Counts below 100 000	3
Counts below 150 000	7
Counts below 200 000	2
Counts above 200 000	1
3 Cases of ulcer	15
Counts below 100 000	3
Counts below 150 000	7
Counts below 200 000	6
Counts above 200 000	2
4 Chronic stasis with pigment (progressive pigmentary dermatosis type of Schamberg)	18
Counts below 100 000	0
Counts below 150 000	8
Counts below 200 000	0
Counts above 200 000	0
5 Ear counts	82
Below 100 000	4
Below 150 000	9
Below 200 000	19
Normal	50
6 Lichen chronicus simplex (on affected side)	29
Counts below 100 000	0
Counts below 150 000	14
Counts below 200 000	4
Counts normal	2

these cells was in no wise proportionate to the platelet count. The variations were largely within a normal margin of error.

The venous blood of the dorsalis pedis vein has shown a platelet count comparable to although consistently lower than the ear count. This would seem to indicate that the sharp reduction of platelets in the smaller capillary areas is secondary to the development of a congestive sclerosis. The number of platelets in the

3 Tocantins L. M. *Am. J. Physiol.* **119**: 439, 1937.

4 Kovacs Zsigmond. Das örtliche qualitative weisse Blutbild bei verschiedenen Hautkrankungen. *Arch. f. Dermat. u. Syph.* **176**: 130, 137, 1937.

5 Piscane C. *Boll. della Sez. Region*, April 1932, supplement to *Gior. ital. di dermat. e sif.*

6 Helmrich. *Wien. klin. Wchnschr.* **2**: 1679, 1930.

7 Ratschow. *Arch. f. Dermat. u. Syph.* **177**: 133, 147 (May), 1938.

8 David M. Ueber das Lokal Blutbild der Hautkrankheiten. *Dermat. Wchnschr.* **109**: 943 (Aug. 12), 1939.

9 Knott F. A. and Pearson R. S. B. Eosinophilia in Allergic Conditions. *Guy's Hosp. Rep.* **84**: 230 (April), 1934.

Complete investigation of the heart, including an electrocardiogram, was negative. She was given numerous diathermy treatments to the neck, shoulder and arm with little relief.

**Examination**—Three weeks after the onset of symptoms, the patient was in severe pain. The neck was held toward the left and the left arm was supported by the right. Any movement of the neck to the right or traction on the left arm accentuated the pain. There was considerable muscle spasm in the neck and in the left shoulder girdle. There was exquisite tenderness over the brachial plexus posterior to the scalenus anticus muscle as well as over the scalenus anticus itself. The left index finger was almost completely anesthetic, anteriorly and posteriorly, and sensation was reduced in the middle finger. The index finger could be moved only with the greatest difficulty. Complete flexion of this finger could not be carried out. There was no other weakness of the arm or hand and no disturbance of the reflexes could be made out.

X-ray examination of the cervical spine was negative except for loss of the cervical lordosis.

Spinal fluid examination showed normal dynamics, cell count and protein and the Wassermann reaction was negative.

**Diagnosis**—A rupture of one of the lower cervical intervertebral disks was suspected at the time but it was felt that the pain in the heart could not be explained on this basis.

**Course**—Procaine injection of the scalenus anticus muscle, the cervical plexus and the first five thoracic sympathetic ganglions failed to relieve the pain. Diathermy, massage and large quantities of opiates were continued for several weeks after which time the pain began to abate. Since then there has been gradual improvement in her symptoms, until in the last six months she has been relatively free of pain, however, when she becomes tired after considerable activity the old pain recurs for a short time.

Examination on Sept. 29, 1941 failed to reveal any muscle spasm in the neck or shoulder. Pressure over the seventh cervical nerve root however, still reproduced the pain. There was no weakness in the arm, all reflexes were normal and the sensation in the index and middle fingers had returned to normal. The patient now continues her occupation as a church organist without difficulty.

#### COMMENT

Descriptions of this syndrome have appeared in the literature from time to time during the last few years, but no one to our knowledge has proved before that it could be due to a rupture of one of the lower cervical intervertebral disks. Nachlas<sup>14</sup> in 1934 described a syndrome of pseudoangina pectoris originating from demonstrable hypertrophic changes in the cervical spine. He felt that the irritation and compression of the cervical nerve root, secondary to these arthritic changes, were the cause of the radiating pain. Hanflig<sup>15</sup> in 1936 described a group of 30 cases presenting pain in the shoulder girdle, arm and precordium due to hypertrophic arthritis of the lower cervical spine. He thought that these cases were frequent and representative of a large group of persons with symptoms commonly classed as neuritis. Reid<sup>16</sup> in 1938 stated that pressure on the brachial plexus by a cervical rib and scalenus anticus muscle could cause pain simulating angina pectoris or coronary thrombosis. Numerous authors have reported cases somewhat similar to ours due to the scalenus anticus syndrome.<sup>17</sup>

Finally, in a series of papers which were published between 1936 and 1940, Turner and Oppenheimer<sup>18</sup> reported a series of 50 cases presenting symptoms quite like those reported by us. They believed that the arthritis which was found in the cervical spines of their patients was the result of thinning of the intervertebral disks and actually played no part in the production of symptoms. They cited the works of Keyes and Compere,<sup>19</sup> who showed that destruction of or injury to the intervertebral disk could produce hypertrophic arthritis. Turner and Oppenheimer believed that narrowing of the intervertebral foramina, which resulted from thinning of the intervertebral disk, caused the nerve root pressure. They called this condition discogenetic disease.

As a result of our experience with a large group of ruptured intervertebral disks in the lower lumbar region, we, like Turner and Oppenheimer, have come to believe that hypertrophic arthritis rarely causes nerve root pain. We are also in complete agreement with Keyes and Compere, having watched spur formation develop along the edges of vertebrae adjacent to a ruptured disk in several cases. We do not agree, however, that narrowing of the intervertebral foramina, which results from thinning of the intervertebral disks, often produces nerve root pressure. Such narrowing can occur only in the vertical diameter. Study of the foramina of the cervical spine is sufficient to convince one that this diameter is adequate for the passage of the nerve at all points even though the disk space is obliterated completely. Destruction of the adjacent surfaces of the vertebrae, however, which sometimes follows thinning of the disk can result in further narrowing of the vertical diameter of the intervertebral foramina sufficient to produce constriction of the nerve. On the other hand, the horizontal diameter may become inadequate for the nerve root if there is any encroachment on it by the disk. This diameter is smallest at the points of maximum lordosis of the spine, namely the lower cervical and lower lumbar regions, and is the result of the projection of the articular facets toward the floor of the canal. The poker spine, which is seen in both the lumbar and the cervical ruptured disks, is probably an attempt of the body to increase the distance from the facets to the disk and thus relieve the pressure on the nerve root.

We do not wish to infer that all cases which heretofore have been diagnosed as cervical rib or scalenus anticus syndrome are ruptures of the cervical disks. It is undoubtedly true, however, that an undetermined number of these patients have ruptured disks. Two of our cases were diagnosed elsewhere as scalenus anticus syndrome. On the other hand rupture of a cervical disk will cause spasm of the scalenus anticus muscle (Note the spasm of the sacrospinalis and ilioband in ruptures of the lumbar disks). The relief of symptoms following section of the scalenus anticus muscle in such cases might be explained on the same basis as the relief of pain from the Ober fasciotomy in the case of ruptured disk in the lumbar region.

14 Nachlas I W. Pseudoangina Pectoris Originating in the Cervical Spine, *J A M A* 103: 323-325 (Aug. 4) 1934.

15 Hanflig S S. Pain in the Shoulder Girdle, Arm and Precordium Due to Cervical Arthritis, *J A M A* 106: 523-526 (Feb. 15) 1936.

16 Reid W D. Pressure on the Brachial Plexus Causing Simulation of Coronary Disease, *J A M A* 110: 1724-1726 (May 21) 1938.

17 Ochsner Alton, Gage Mims and DeBakey Michael. Scalenus Anticus (Naffziger) Syndrome, *Am J Surg* 28: 669-693 (June) 1935. Naffziger H C. Scalenus Syndrome, *Surg Gynec & Obst* 64: 119-120 (Jan.) 1937. Spurling R G, and Bradford F K. Scalenus Neurocirculatory Compression, *Ann Surg* 107: 708-715 (May) 1938. Naffziger, H C and Grant W T. Neuritis of the Brachial Plexus Mechanical in Origin. *The Scalenus Syndrome Surg Gynec & Obst* 67: 722-730 (Dec.) 1938.

18 Turner E L and Oppenheimer Albert. A Common Lesion of the Cervical Spine Responsible for Segmental Neuritis, *Ann Int Med* 10: 427-440 (Oct.) 1936. Oppenheimer, Albert, and Turner, E L. Discogenetic Disease of the Cervical Spine with Segmental Neuritis, *Am J Roentgenol* 37: 484-493 (April) 1937. Oppenheimer, Albert. Discogenetic Disease, *Am J Surg* 47: 642-650 (March) 1940.

19 Keyes D C and Compere E L. Normal and Pathological Physiology of Nucleus Pulposus of Intervertebral Disk. *Anatomic Clinical and Experimental Study J Bone & Joint Surg* 14: 897-938 (Oct.) 1932.

Perhaps the most fascinating implication of this study is the possibility that many cricks in the neck are not, after all, the result of sleeping in a draft, some focus of infection or fibrositis, but are due to stretching or tearing of the annulus fibrosus of one of the cervical disks. Certainly in our 4 cases the numerous cricks in the neck of which these patients complained were in no way different from those seen almost daily. Perhaps it is not stretching the imagination too much to think that such a crick may be comparable to lumbago, which is doubtless the forerunner of ruptured disks in the lumbar spine in many cases.

Of all of the mistaken diagnoses made in this condition, that of coronary disease is most logical. It is not surprising that when a patient with agonizing pain in the heart and arm associated with extreme difficulty in breathing, presents himself, the first thought is of coronary disease. The fact that the 2 patients who are physicians believed in the beginning of the attack that they had coronary occlusion is most significant.

Of particular interest is the sensory disturbance resulting from pressure on the seventh cervical nerve root. The degree of sensory loss of the index finger in these cases is out of all proportion to that which we have seen elsewhere in the trunk or extremities when a single spinal sensory root has been sectioned. This suggests that the seventh cervical nerve root is almost entirely responsible for the innervation of this finger, in many persons at least. Such a conception is at variance with the work of Head,<sup>20</sup> Foerster<sup>21</sup> and Sherrington<sup>22</sup> and is subject to further proof. The pattern of the sensory disturbance of the seventh cervical root is also different from that described by Sherrington<sup>22</sup> and Tilney and Riley,<sup>23</sup> being limited to the index and middle fingers without involvement of the thumb, the hand or the forearm.

The pathway of the radiation of pain to the precordial region is not definitely known. Nachlas<sup>24</sup> suggests that the mechanism of the reference of this pain is as follows: The pathway is along the lateral anterior thoracic and medial anterior thoracic nerves, the former originating in the sixth and seventh cervical segments and the latter in the eighth cervical and first thoracic segments. Although these nerves are known to be motor nerves, it has been well established that such nerves possess protopathic sensation so that pressure on them will produce definite pain, diffuse in character but referable to the terminal portions of the nerve. This and other possible pathways of the radiation of this pain are being investigated at the present time.

Herniation of one of the lower cervical disks was suspected for several years before it was confirmed finally in our first patient (case 1) because the symptoms and physical manifestations were analogous in every respect to those caused by ruptures of the lower lumbar disks. We now believe that the diagnosis can best be made by clinical means alone and that the use of contrast mediums is unnecessary, as we have previously shown in the diagnosis of ruptured disks in the

lumbar region.<sup>1</sup> There is reason to believe that the percentage of error with contrast mediums will be even greater in the cervical spine than in the lumbar region. There are 3 causes for this: (1) The lesions are smaller, (2) they may be so far lateral that they are not in contact with the dura and (3) there is difficulty in filling the cervical canal with contrast mediums.

The presence of a unilateral rupture of one of the lower cervical disks is not in itself an indication for its removal unless it is causing incapacitating pain. Undoubtedly as this condition becomes more widely recognized many patients with pain less intense than that described here will be seen and will respond to more conservative measures. We recently have seen such a case which is not included in this report.

Unquestionably, the operative approach of choice is subtotal hemilaminectomy. It provides ample exposure and at the same time affords considerable protection to the spinal cord. It reduces also the postoperative soreness and possible weakness of the neck which might follow a complete laminectomy. We prefer local anesthesia in spite of the fact that there is some pain incident to exposure of the nerve root before it is injected with procaine hydrochloride. This anesthesia allows one to confirm the localization of the lesion before any bone is removed and affords further protection to the spinal cord. When the nodule of disk is exposed, only the loose fragments of fibrocartilage and those protruding from the disk space are removed. No attempt is made to curet out the remainder of the nucleus pulposus, as we do routinely in the lumbar region. Only the future will disclose whether this procedure is adequate for a permanent cure.

#### CONCLUSIONS

- 1 Unilateral rupture of the sixth cervical intervertebral disk produces a syndrome characterized by pain in the neck which radiates to the shoulder, precordium and arm and by sensory changes in the index and middle fingers.

- 2 The diagnosis of this condition can be made more accurately by clinical means than by the use of contrast mediums.

- 3 The operation of choice is subtotal hemilaminectomy under local anesthesia.

- 4 The localization of the lesion can be verified at operation before the removal of any bone.

- 5 Hypertrophic arthritis and/or narrowing of the intervertebral disk seldom causes nerve root pressure.

- 6 Rupture of any intervertebral disk may result in hypertrophic changes on the edges of the adjacent vertebrae.

- 7 The degree of sensory change in the index finger, which results from compression of the seventh cervical nerve root, in our experience, is more pronounced than that produced by interruption of any other single spinal nerve root.

- 8 The pathway over which the pain radiates to the precordium has not been ascertained.

- 9 An undetermined number of patients who heretofore have been thought to have coronary occlusion, angina pectoris, hypertrophic arthritis of the cervical spine, neuritis of the brachial plexus, bursitis, scalenus anticus syndrome or cervical rib have a rupture of one of the lower cervical intervertebral disks.

20 Head H and Campbell A W. The Pathology of Herpes Zoster and Its Bearing on Sensory Localization. *Brain* 23: 353-523 (part 3) 1900.

21 Fender F A. Foerster's Scheme of Dermatomes. *Arch Neurol & Psychiat* 41: 688-693 (April) 1939.

22 Sherrington C S. Experiments in Examination of the Peripheral Distribution of the Fibers of the Posterior Roots of Some Spinal Nerves. *Phil Tr Roy Soc London* s B 184: 641-763 1894.

23 Tilney Frederick and Riley H A. The Form and Functions of the Central Nervous System. New York: Paul B Hoeber Inc. 1921.

24 Semmes R E. Diagnosis of Ruptured Intervertebral Disk With out Contrast Myelography and Comment on Recent Experience with Modified Hemilaminectomy for Their Removal. *Yale J Biol & Med* 11: 433-435 (May) 1939. Murphey Francis. Rupture of the Intervertebral Disk: the Common Cause of Low Back Pain and Sciatica. *Memphis M J* 15: 182-184 (Nov.) 1940.

THE USE OF PENTOTHAL SODIUM  
ANESTHESIA IN THORACIC  
SURGERY

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The selection of an anesthetic for thoracoplasties presents a problem differing from that in other types of surgery in that the patient is more or less debilitated by long-standing infection and there is apt to be damage to the kidneys, liver and heart owing to the effects of prolonged toxemia or involvement with tuberculosis. The most important difference is the presence of infection in the lungs and the necessity of avoiding irritating inhalants which might in any way adversely affect the pulmonary lesions. The administration of ether by the drop method is not recommended because of its irritating effect on the mucous membranes. Beecher and Adams advocate its use by closed system apparatus (carbon dioxide absorption technic) and report 61 per cent pulmonary complications.<sup>1</sup>

Infiltration of procaine hydrochloride and nerve block have the disadvantage that few patients escape without considerable shock and pain. The operation is prolonged and tissue resistance may be reduced, fostering wound infection. A spinal anesthetic has been successfully used by Ackman<sup>2</sup> with relatively low mortality and few complications, however, the hazard of this anesthetic bears less relationship to the condition of the patient, and it still seems that the margin of safety is low.

To have the patient under general anesthesia is desirable. Nitrous oxide, cyclopropane and ethylene are now most widely used. Each of these anesthetics has certain advantages and in selected cases may be preferred. We used procaine hydrochloride and the inhalation anesthetics in our work before 1935. However, we have come to use, more than any other, pentothal sodium without procaine, according to the following method.

## TECHNIC

One and one-half grains (0.1 Gm.) of phenobarbital is given the night before operation. A light breakfast is frequently served two or three hours before the operation. One-eighth to  $\frac{1}{8}$  grain (0.008 to 0.01 Gm.) of morphine is administered. We do not use pre-operative barbiturates because we feel that the more rapidly eliminated pentothal sodium works as well without them and that the postoperative recovery time may be delayed by them. Position and preparation of the patient is completed before the injection of 5 per cent pentothal sodium into the cubital vein is started. Blood pressures are checked. Two to 4 cc. of pentothal sodium is given, then a pause of sixty seconds or more permits the anesthetist to judge the patient's sensitivity. Usually 8 or 10 cc. is injected before the operation is begun, then 0.25 to 1 cc. a minute is given during the remainder of the operation as the patient's condition

indicates. The deepest anesthesia is often needed at the beginning of the operation to control the reaction to the cutaneous incision. The amount of anesthetic necessary to prevent coughing is usually about the amount needed to prevent movement of the patient and to maintain satisfactory anesthesia. Because of the patient's position constant vigilance is necessary to maintain a free airway. Rarely is a pharyngeal airway required but an attendant at the patient's head is desirable to maintain the position of the head and jaw. Oxygen is administered by nasal catheter if cyanosis appears, about half the cases requiring oxygen during the anesthetic. Seldom has methamidate or metrazol been used, but a positive pressure apparatus should be available and has been useful on a few occasions. Administration of the anesthetic is discontinued five to ten minutes before completion of the cutaneous sutures, and the patient frequently moves on the table with the last sutures. The patient is placed on the operated side with a pillow under his head as he is returned to his bed. Intranasal oxygen is administered until the patient is sufficiently aroused to insure full respiratory movements. The patient is turned every few hours to encourage bronchial drainage. One thousand cc. of 5 per cent dextrose and 500 cc. of blood are administered in practically every instance. More intravenous fluids are not necessary in the majority of instances, since patients are rarely more than slightly nauseated for a brief period and fluid intake by mouth is adequate.

## RESULTS

One hundred and twenty-three thoracoplasties performed on 53 patients with the removal of from two to six ribs have been reviewed in which the anesthetic agent was pentothal sodium. There were no operative deaths. The average duration of the operation was forty-nine minutes, the longest being one hundred and fifteen minutes and the shortest twenty minutes. The average amount of pentothal sodium used was 24 cc. Only 1 case required more than 40 cc., 50 cc. having been used in this instance.

Some degree of cyanosis was occasionally seen during the early stages of operation associated with light anesthesia, and sometimes breath holding or coughing, but this was always easily controlled by increasing the depth of anesthesia. Postoperative nausea was less than that noted following inhalation anesthetics, 5 patients had rather severe nausea, 45 had very slight nausea and 66 had none. It was thought that in many instances the nausea was due to the opiate rather than to the pentothal sodium.

Four patients had postoperative shock of rather severe degree, and minor degrees of shock were noted in several patients, but the impression gained in observing the patient's condition as he comes out of the anesthesia is that there is less tendency to the symptoms of falling blood pressure, rapid pulse and shortness of breath than is seen in the course of these operations following other anesthetics. The patient's awakening is gradual and not unpleasant, and there is less need for morphine to control pain during the first few hours.

One patient showed some necrosis around the cubital vein from extravasated pentothal sodium solution, and one experienced postoperative mental excitement with disorientation lasting several hours.

1 Beecher, H. K. and Adams, Ralph. Ether Anesthesia in the Presence of Pulmonary Tuberculosis. *J. A. M. A.* 118:1204-1209 (April 4) 1942.

2 Ackman, Douglas. Results of Thoracoplasty in Advanced Pulmonary Tuberculosis. *Canad. M. A. J.* 45:422-425 (Nov.) 1941.



In 2 cases in which expectoration was profuse from empyema with bronchial fistula, pentothal sodium was found to be disadvantageous. Immediately after the pleura was opened the respirations became difficult, and it was necessary to aspirate mucus and pus from the pharynx and hurry the operation. As soon as the empyema pocket was emptied of pus, the patient's condition became less precarious. These patients might have done better under infiltration of procaine hydrochloride.

Roentgenograms were made after most of the stages of the operation, and immediately whenever early symptoms of dyspnea or pain in the chest plus physical signs indicated a possible atelectasis or any other complication.

There is apparently reduced incidence of postoperative spread, only 3 cases being noted in which spread of tuberculosis occurred within two months.

Atelectasis of a lobe occurred in 2 cases. In these 2 cases the atelectasis was on the same side as the operative procedure. In both cases the lung was found to be clear at the end of one month. There was 1 case of postoperative pneumonia which turned out to be spread of tuberculosis and left extensive residual disease in both lower lobes.

The incidence of postoperative atelectasis following a general operation under various types of anesthesia is given variously as follows: by Frias and Fernandez,<sup>3</sup> 3 per cent in 556 cases, by Clegg,<sup>4</sup> 2.14 per cent in 653 cases, by Eliason and McLaughlin,<sup>5</sup> 0.36 per cent in 8,864 cases, by Rovenstine and Taylor,<sup>6</sup> 0.44 per cent in 7,874 cases and by Hand and Sise,<sup>7</sup> 1.11 per cent in 180 cases. In thoracic surgery, Brunn and Brill<sup>8</sup> report atelectasis in 4.82 per cent in 456 surgical cases and Berry<sup>9</sup> 2.12 per cent in 188 cases. The percentage of atelectasis in our series was 1.7.

#### REPORT OF CASES

**CASE 1—Atelectasis.** C. F., a white man aged 27, height 5 feet 9 inches (175 cm), weight 135 pounds (61 Kg), had a history of tuberculosis for one year before operation. The amount of expectoration daily was 45 cc. There was moderate dyspnea with apparently asthma-like attacks. Physical examination revealed a fair general condition, preoperative x-ray examinations showed a cavity of moderate size in the central portion of the upper left lobe with considerable infiltration throughout the lobe. The lower lung was clear except for a few minimal small discrete shadows. A left phrenicotomy, five and a half months before, had resulted in moderate elevation of the diaphragm and fixation. Thirteen cc of pentothal sodium was administered before the operation was started, and a total of 24 cc was used. The pulse remained between 80 and 90 during the operation. There were 26 inches of ribs removed. The temperature rose to 103.6 F the second postoperative day, the x-ray examination showed complete opacity of the left lung with displacement of the heart toward the left.

<sup>3</sup> Frias E. and Fernandez F. Postoperative Plate-like Atelectasis. *Anesth. & Analg.* 19: 98-101 (March-April) 1940.

<sup>4</sup> Clegg C. G. Postoperative Atelectasis. *U. S. Naval M. Bull.* 38: 531-538 (Oct) 1940.

<sup>5</sup> Eliason E. L. and McLaughlin C. W. Jr. Postoperative Pulmonary Atelectasis. *S. Clin. North America* 14: 112 (Feb) 1934.

<sup>6</sup> Rovenstine E. A. and Taylor I. B. Postoperative Respiratory Complications: Occurrence Following 7,874 Anesthetics. *Am. J. M. Sc.* 191: 807-819 (June) 1936.

<sup>7</sup> Hand L. V. and Sise L. F. Nupercaine Anesthesia. *Surg. Gynec. & Obst.* 71: 9-21 (July) 1940.

<sup>8</sup> Brunn H. and Brill S. Observations on Postoperative Pulmonary Atelectasis. *Ann. Surg.* 92: 801-833 (Nov) 1930.

<sup>9</sup> Berry F. B. Massive Atelectasis Complicating Paravertebral Thoracoplasty for Pulmonary Tuberculosis. *Arch. Surg.* 18: 257-270 (Jan. pt. 2) 1929.

Attempted aspiration failed to yield any fluid. One month later the lower part of the lung was found to be clear. Fixation of the left diaphragm undoubtedly favored production of the atelectasis.

**CASE 2—Atelectasis.** R. F., a white man aged 38, had had tuberculosis for seven years. Expectoration amounted to 60 cc daily and was positive for tubercle bacilli. There was a cavity 2 inches in diameter in the upper part of the left lung. Following removal of four ribs in the second stage of the operation atelectasis of the lower lobe on the left side developed, which cleared up in one month, and exceptionally rapid closure of the cavity was obtained and the patient was back at work in six months. The patient has been well two years.

**CASE 3—Pneumonia followed by spread.** B. S., a Negro woman aged 42, expectorated 30 cc of sputum daily, she had a cavity in the upper left lobe 3 inches in diameter. Removal of four ribs, 16 inches, in the first stage was followed by pneumonic consolidation of both lower lobes. Two months later x-ray examination showed partial clearing but extensive tuberculous shadows.

Of some interest in assessing the value of the anesthetic may be the late postoperative results. These, however, are so dependent on the classification of the patient's condition prior to operation that for purposes of comparison similar criteria must be utilized. Following the National Tuberculosis Association classification all but 1 of the 53 patients were in the far advanced stage. Twenty-eight were classed as bilateral, 8 of whom had collapse therapy of the lung contralateral to thoracoplasty. Seven had tuberculous empyema. Of those operated on more than six months ago, 50 per cent have arrested or apparently arrested tuberculosis. The condition in 16 per cent is quiescent, and that in 18 per cent is classified as unstable, in half of which there is improvement. Fifteen per cent of the patients have died; 2 patients within two months. Of these 2, 1 died of wound infection and the other a very poor surgical risk, of reduced vital capacity and insufficient cardiac reserve. Five died in from one to six years.

#### COMMENT

Certain attributes are desired in an anesthetic for thoracoplasty. First, the anesthetic must be nonirritating to the respiratory tissue. We have found that patients coming out of the anesthetic following pentothal sodium have no hypersecretion and there is no change in the character of the sputum.

With other types of anesthesia patients usually go through a period of excitement during which secretions may be dislodged and coughing may be troublesome. During surgery hyperventilation of the lung with excessive mobility is to be avoided. This is accomplished better with pentothal sodium than with any other anesthetic. In fact the depression of respiration is apparently an advantage in that it prevents dislodgment of purulent material which may be present under the operative site.

To attempt to give any anesthetic so lightly that the cough reflex is not abolished is unsatisfactory because the half-hearted attempts of the patient to free himself of sputum when semiconscious may do more harm than good.

Electrocoagulation is found very useful in accomplishing hemostasis. Failure to dry the wound carefully before final closure delays wound healing and makes for a greater chance of the wound breaking down.



and becoming infected. Several minutes may be cut from the operating time by using electrocoagulation.

Several minutes may also be saved in the induction of anesthesia since pentothal sodium provides surgical anesthesia within two or three minutes after it is started.

The absence of postoperative nausea constitutes an advantage which we consider extremely important in combating the discomfort and shock of the operative procedure. It is hardly necessary to point out that if one starves a normal, healthy person for twenty-four hours considerable weakness results. If this is added to the effects of the operation, delayed recovery is to be expected. With pentothal sodium, a small breakfast given two or three hours before operation seems perfectly safe, and many patients eat solid food within two hours after the operation, and most of them eat the regular evening meal. Patients' spirits are correspondingly good the evening of the operation.

Awakening from this anesthetic is more like awakening from a night's sleep than from an artificially imposed anesthesia, and when operative procedures require repetition—sometimes five or six stages—the patient's morale is less likely to be destroyed than with an unpleasant anesthetic experience.

We believe that pentothal sodium is to be recommended for thoracoplasty.

1005 Professional Building

## Clinical Notes, Suggestions and New Instruments

### NEUROFIBROMA (NEURINOMA) OF THE FOOT

EMIL D. W. HAUSER, M.D. CHICAGO

An 11 year old girl was brought in Aug. 2, 1939 because of pain in the ball of the right foot, which had been present for six months. The family physician had taken roentgenograms, which were negative, and he was of the opinion that she had a calcified bursa on the plantar surface of the foot. With no improvement after six months the parents consulted another physician, who referred her to me. She gave a history of having had pyelitis and on getting up after prolonged bed rest the foot was painful. She also had had some callus form under the anterior arch, which had since disappeared. There was some pain in the region of the longitudinal arch.

Examination showed a definite tumor on the plantar surface of the foot which was very tender. This tumor was beneath the shaft of the first metatarsal bone and was felt to be about the size of a bean. The possibility that this might be a ganglion was considered. She also had a slight valgus deformity and a slight lowering of the arch of the right foot. It was thought that she had some foot strain with beginning pes valgoplanus. The foot strain was relieved by means of adhesive strapping, but the pain and swelling beneath the head of the first metatarsal bone did not subside. Surgery was advised. The possibility that this might be a glomus tumor, neuroma fibroma, ganglion and inflammation of the bursa with calcification was considered.

Under ethylene anesthesia the tumor was exposed and a small, encapsulated tumor, about  $\frac{1}{2}$  inch in diameter, was removed. It was found to be attached to the plantar fascia. The tumor contained a thick mucinous-like material. At the time of operation it had the appearance of a small ganglion. The report of Dr. Donald O. Manshardt, pathologist, stated

that the tumor consisted of irregular shaped, firm cauliflower-like, white tissue. Intermingled strands of what appeared to be adult connective tissue were found in these sections. In places these were in poorly formed whorls in which there was some suggestion of palisading of nuclei. Rarely there was definite palisading. There was also some hyalinized connective tissue which divided this more cellular tissue into capsules or poorly defined bundles. About the periphery of these areas there were smaller clusters of cells, arranged in whorls, which superficially resembled the psammomatous type of meningioma except that there was no calcification. These whorls occurred in long channel-like formation, composed of interlobular connective tissue. The entire structure resembled nerve in its architectural configuration. No normal nervous elements were seen.

The diagnosis was made of a large neurinoma from the plantar region of the right foot. (Note: The term "neurinoma" avoids the implications as to the origin of the tumor cells suggested by "neurofibroma" or schwannoma.) The wound

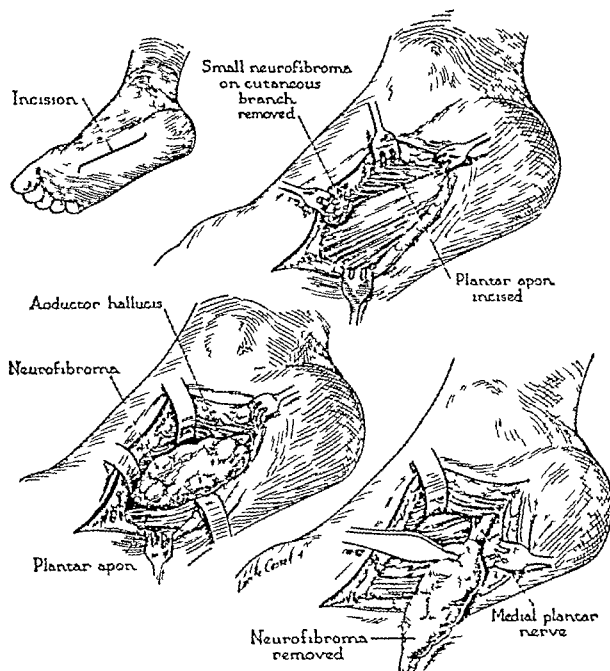


Fig. 1—Operation for neurofibroma of the foot

healed without any difficulty and pads were placed in the shoes to avert any further development of foot strain. The child stayed free from symptoms until six months later when she again noticed pain and tenderness underneath the arch of the right foot.

The pain increased, so that on June 7, 1941 she returned for examination. At this time the slightest pressure over the plantar surface beneath the navicular bone caused intense pain. There was a definite fulness in this area which was visible and palpable.

In view of the fact that previously a neurofibroma had been removed from this foot it was thought that a similar tumor might have occurred higher along the nerve. She entered the hospital on June 11, 1941 for operation. A longitudinal plantar incision was made and a small area of fibrous tissue was found where the previous tumor had been removed (fig. 1). The plantar fascia was distended and a tumor could be felt beneath it. The plantar fascia was incised and a large tumor the shape of a sausage was exposed. It consisted of a lobulated soft mass which was well encapsulated. The tumor was easily dissected from the tendon sheaths in the area and was traced up until it ended in the deep plantar nerve. Normal ne

tissue was seen to end where the tumor started. The plantar fascia and skin were closed. Convalescence was uneventful and the patient left the hospital in about twelve days. There was a slight amount of paresthesia in the area of the operation.

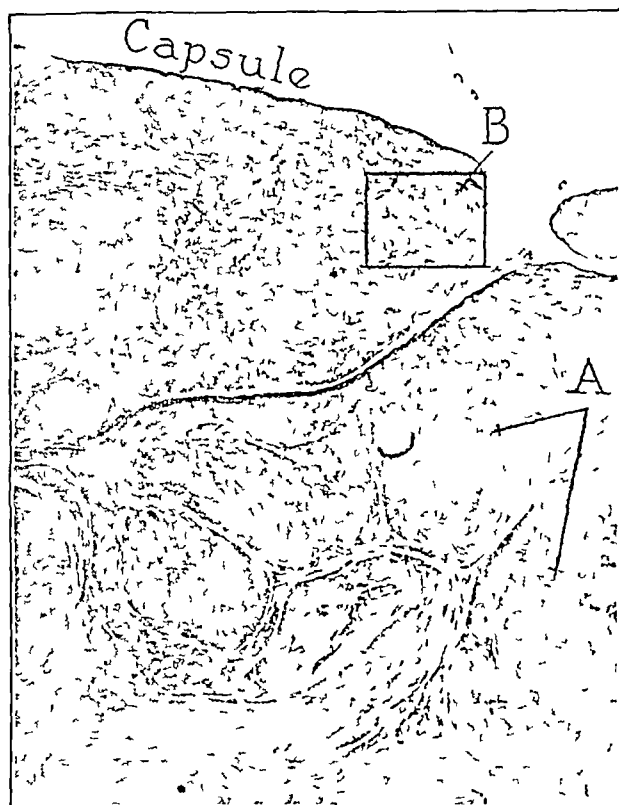


Fig. 2—Low power section of tumor stained with hematoxylin and eosin. A, large whorls; B, section taken for figure 3.

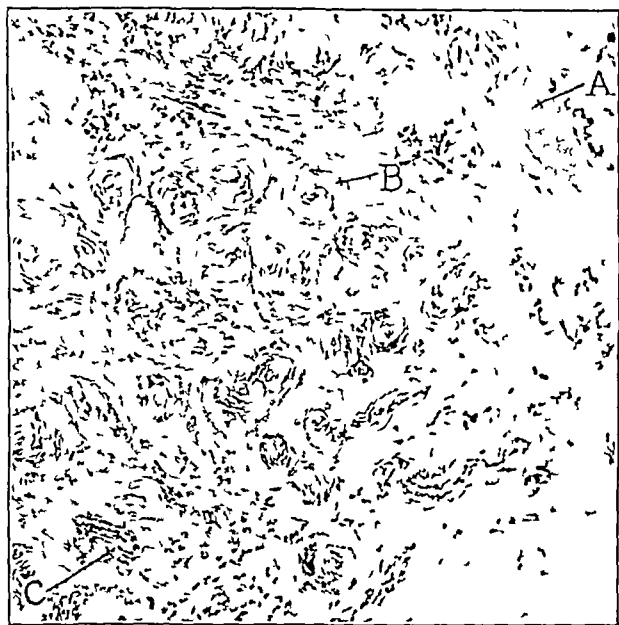


Fig. 3—Section slightly reduced from a photomicrograph with a magnification of 85 diameters, stained with hematoxylin and eosin. A, blood vessel; B, proliferation about nerve axons; C, palisades of nuclei.

Dr. Manshardt's report on the specimen stated that the tumor was a large, elongated, firm, encapsulated, pearly white mass whose external surface was loosely lobulated and irregular (figs. 2, 3 and 4). The mass measured 6.5 by 2 cm. On the

cut surface there were numerous circumscribed gray white whorls of tissue. Two blocks, six sections, were made. The first block was of a well encapsulated lobulated mass of tissue composed of cells having large, vesicular, elongated nuclei of oval or spindle shape. These were arranged in large concentric whorls with rather abundant mucoid intercellular substance. The cells were rather uniform in appearance throughout the section. In some regions small concentric whorls were seen, but for the most part the tumor cells were rather loosely arranged showing a slight tendency toward palisading of the nuclei. There were no areas of increased density, increase in mitotic figures or invasion of the capsule to indicate that the tumor might be malignant.

Sections stained with van Gieson's stain showed the presence of a moderate amount of collagen in the tumor. Davenport's nerve fiber stain revealed the presence of occasional nerve fibers. In the area pictured in figure 3 (magnified 85 times) a nerve

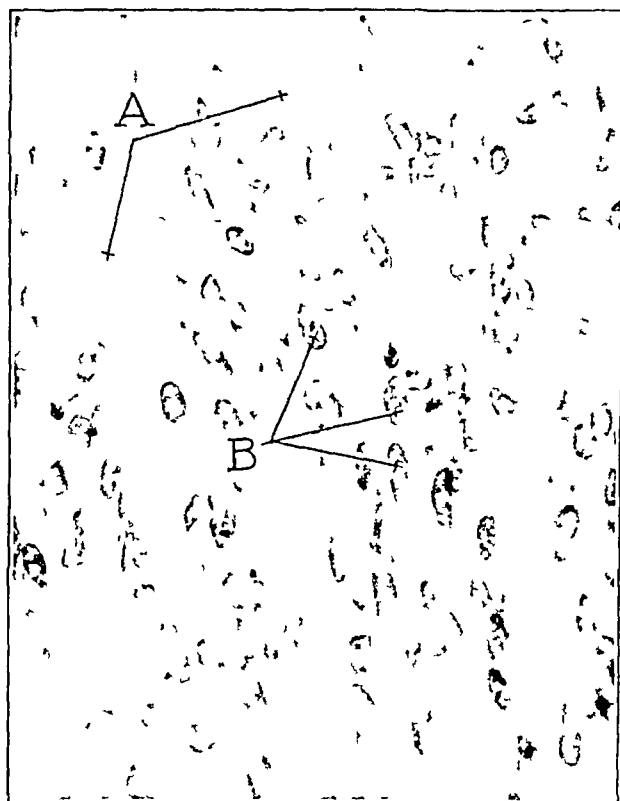


Fig. 4—Section magnified 660 times, stained with hematoxylin and eosin. A, mucinous intercellular substance; B, neurinoma cells.

fiber is found at the center of each of the small whorls surrounded by concentric layers of cells. Diagnosis was made of a large neurinoma from the plantar area of the right foot. Ewing<sup>1</sup> states that this type of tumor affects mainly the larger nerve trunks and occurs in nearly all parts of the body, forming encapsulated slowly growing firm or soft masses attached to the nerve trunk. They have a definite tendency to recur locally from remaining tumor tissue if not completely removed and may become malignant and locally invasive following recurrence. It is rather common to find a new tumor develop higher up in the nerve trunk. This may be the result of a new growth or extension of the original tumor cells within the epineurium.

A neurofibroma of the deep plantar nerve is a rare tumor. Neurofibromas have been reported in many nerves of the body, and it is not unusual to have recurrences in the nerve proximal to the original tumor, as was seen in this case. The possibility of another recurrence higher up with more serious complica-

<sup>1</sup> Ewing, James. *Neoplastic Diseases. Treatise on Tumors*, ed. 4. Philadelphia: W. B. Saunders Company, 1940.

tions must still be kept in mind. The patient has been kept under observation for two and one-half years after the second operation and has shown no sign or symptom of recurrence, so that the possibility of recurrence has become quite remote.

8 South Michigan Avenue

## Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT

HOWARD A. CARTER, Secretary

### E & J RESUSCITATOR, INHALATOR, ASPIRATOR (FOX MODEL) ACCEPTABLE

Manufacturer: E & J Manufacturing Company, 139-141 South Verdugo Road, Glendale, Calif.

The E & J Resuscitator, Inhalator and Aspirator, Fox Model, is designed to be used in emergencies in which natural respiration has failed with resulting asphyxia. It is similar in operation to the E & J Resuscitator and Inhalator which was accepted by the Council (THE JOURNAL, May 13, 1939) for use only by professional or other adequately trained personnel. In construction the Fox Model is different from the earlier one in that a venturi is used in place of the piston to create the suction; it is available in portable and hospital models.

In the Council's investigation of the apparatus it was found that the unit was sturdy in construction and appeared to be capable of withstanding ordinary wear and tear. There are yokes to accommodate two high pressure oxygen cylinders, or cylinders of mixed gases (sizes A to E). A pressure gage which registers the approximate pressure of gas in the open cylinder serves to warn when the cylinder is becoming depleted.

Mechanically, the E & J Resuscitator, Inhalator and Aspirator, Fox Model utilizes gas pressure in the cylinder to control delivery of (1) alternating positive and negative pressure through two tubes to the face mask, (2) constant flow of oxygen (or any gas mixture) to the face mask and (3) negative pressure said to be equal to 16 ounces per square inch, available in a separate tube designed to suck mucus from the air passages to a trap bottle furnished with the apparatus. Three positions of a lever determine which one of these three functions is in action at a given time. No two can be available simultaneously. The intricate mechanism which secures negative pressure for suction and for the expiratory phase of artificial respiration apparently is operated on the so-called Venturi principle, after the fashion of the steam injector or a Chapman vacuum pump. The manufacturer claims that positive pressure of 13 mm of mercury and 9 mm of mercury negative pressure is delivered to the mask alternately. Experiments with the model submitted have verified this claim to be substantially correct. Variations did not exceed 2 or 3 mm of mercury under varying conditions in human subjects. Investigations included records made of pressure in the bronchus when no respiratory activity of the human subject was present. These positive and negative pressures are permanently adjusted at the factory and cannot be changed by the operator. The actual negative pressure for suction corresponds to that claimed in the pamphlet. It can be asserted that the apparatus furnishes adequate pulmonary ventilation provided airtight contact of the mask is maintained with a patient whose air passages are unobstructed. The positive and negative safety flow-off valves are set at 18 mm of mercury.

The masks for an adult and an infant are adequate for the purpose. They are provided with an exit valve which is easily closed tight during use of the machine for artificial respiration and, when opened, acts freely when the lever is in the position for inhalation of oxygen by the patient. An inlet valve at the machine end of the connecting tubing permits inhalation of

environmental atmosphere if the supply of gas in the cylinders becomes exhausted during use of the "inhalator."

It is obvious that negative pressure to provide suction of foreign liquids from the respiratory tract is desirable for depressed patients. Two characteristics of such negative pressure are important: (a) actual pressure provided, (b) the volume of atmosphere moved at this pressure in a given time. To remove vomitus or other fluids quickly and safely the actual negative pressure should be moderate and the volume of atmosphere sucked in a given time should be maximal.

It can be stated that the Fox Model E & J Resuscitator does what is claimed for it: namely, it maintains adequate pulmonary ventilation when properly used. The term "properly used" means that the mask is kept in airtight contact with the face and that the air passages are free of obstruction.

The evidence that has been made available indicates quite clearly that the machine has demonstrated its worth in trained hands. The critical data consisted of many reports on the use of the resuscitator in the fields of surgery and obstetrics.

It must be pointed out, however, that the process of blowing oxygen into the lungs and aspirating it has a reverse effect on the circulation from that of normal respiration. Normal respiration tends to facilitate the exchange of gases in the lung capillaries. When the lung is inflated, even at very moderate pressures, circulation through the lung capillaries is retarded for an instant, since the blood pressure in these capillaries is very small. Stoppage here necessarily affects the entire circulation. However, periodic stops last only a moment, since the peak pressure (14 mm of mercury) is maintained for only a short part of the cycle.

Another point should be borne in mind. While artificial respiration has been maintained by systems of this type in physiologic laboratories where experiments are performed on animals with the chest opened, the pressure required for adequate ventilation in such cases is much less than that required to distend the lung when the diaphragm must be forced down against the pressure of the abdominal contents and the bony thorax distended by pressure exerted by the lung from within.

In accepting the apparatus, the Council wishes to stress two points: (a) No artificial resuscitator or inhalator should replace the training of medical men and first aid men in the prone pressure method of resuscitation, (b) it is very important that this machine be used by well trained operators who have received their instruction from competent physicians.

The acceptance of this apparatus therefore is not to be regarded as a recommendation to abandon prone pressure methods of artificial respiration. In cases needing resuscitation the prone pressure method should be instituted immediately pending the arrival of any type of resuscitator, inhalator or respirator, provided the patient's condition permits.

It is manifestly impossible to apply prone pressure artificial respiration in all conditions which arise in medical practice as instanced in surgical operation on the abdomen when respiration fails. In such cases a mechanical resuscitator device for maintaining artificial respiration over short periods may be very desirable. Operators who are trained to use the mechanical resuscitator should also be equally well trained in the prone pressure method of artificial respiration.

The Council on Physical Therapy voted to accept the E & J Resuscitator, Inhalator, Aspirator Fox Model, for inclusion in its list of accepted apparatus with an understanding of the limitations and hazards of positive pressure resuscitators with the expectation that it will be used only by professional or other adequately trained personnel.



E & J Resuscitator  
Hospital Model

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SATURDAY, APRIL 10, 1943

## FURTHER EXPERIMENTAL STUDIES OF BLAST INJURIES

The basic experiments of Hooker and of Zuckerman demonstrated that the effects on the body of explosions both in air and in water are primarily due to the externally applied pressure wave. Williams<sup>1</sup> observed that pressures set up by an explosion at some depth in water create a new factor. When the pressure wave reaches the surface, transmission of the pulse to air does not occur but there is reflection as a wave of tension at an angle equal to the angle of incidence. The human body, according to Williams, has roughly the same density as water. When the pressure wave impinges on the body reflection does not follow but the pulse will be transmitted through the tissues without displacement just as if the body were so much water. However, when the transmitted pulse encounters an air cavity in the body as, for example, the lungs, the static wave of pressure will change into a wave of kinetic energy in the layers of tissues lining that cavity and a disruptive effect will occur. Hence the lungs and other gas filled cavities in the body are particularly susceptible to damage from the pressure wave even though the body itself may not be deeply immersed.

Greaves and his associates<sup>2</sup> exposed rats and guinea pigs to explosions of tetryl (dinitrophenylmethylnitramine) in a welded steel tank 70 by 48 by 42 inches filled with water. The charge was detonated 20 inches below the surface while the animals were swimming within a 2 foot circle beyond the point directly over the charge. Goats were exposed to the effects of a 300 pound depth charge exploded 50 feet below the surface in water 100 feet in depth. Lethal, sublethal and minimum lesions were induced and studied. The lesions in the lungs included diffuse hemorrhage

throughout the entire parenchyma. Microscopic studies of these lesions revealed that the first evidence of injury was rupture of the capillaries and hemorrhage into the interalveolar septum. Similar observations were reported by Cameron, Short and Wakeley.<sup>3</sup> Two types of lesions were seen in the gastrointestinal tract in the lethal cases: hemorrhagic discolorations of the bowel wall and perforations. Both types were definitely related to the presence of gas within the lumen. When 20 cc of air was injected into the peritoneal cavity of a rat which was then subjected to a lethal underwater blast laceration of the liver and spleen and extensive hemorrhage into the abdominal wall resulted. Injuries of these structures were not seen when normal animals were blasted. Four short segments of normal rabbit intestine were removed and ligated at both ends after the first was completely collapsed, the second filled with air, the third with isotonic solution of sodium chloride and the fourth with air and saline solution. They were then submerged and subjected to underwater blast. The collapsed segment and the one filled with saline solution were unaffected but the two containing air were ruptured. These investigators also found that kapok and foam rubber are best capable of preventing or minimizing the injurious effects of the compression wave in the experimental animals.

Both clinical and experimental evidence has established that immersion blast produces abdominal trauma in addition to the chest lesions seen in air blast. Friedell and Ecklund<sup>4</sup> were particularly interested in factors which lead to the production of intestinal perforation. They attempted to determine by animal experiments whether the perforations occurred immediately or were the delayed effect of severe intestinal trauma. Reports of hemorrhagic areas in the bowel following blast injury created the impression that the hemorrhage was followed by necrosis of the wall with perforation and peritonitis. Experiments were performed in a large steel tank measuring 8 by 6 feet filled with water to a depth of 4 feet. Postmortems on guinea pigs which died immediately or shortly after exposure in a water filled tank to a blast caused by detonating caps containing a charge of 35 grams of fulminate of mercury revealed that the abdominal wall was uninjured but that there were areas of subserous hemorrhages over the colon and small bowel and especially over the enlarged appendix. Most serious changes were noted over fecal collections. The lungs had symmetrical hemorrhagic areas. Microscopic studies did not reveal perforations of the intestinal tract. Abdominal lesions were not pro-

<sup>1</sup> Williams E. R. P. Blast Effects in Warfare. *Brit J Surg* 30: 38 (July) 1942.

<sup>2</sup> Greaves, F. C., Drieger R. H., Brines O. A., Shaver J. S. and Corey E. L. An Experimental Study of Underwater Concussion. *U. S. Nav. M. Bull.* 41: 339 (March) 1943.

<sup>3</sup> Cameron G. R., Short R. H. D. and Wakeley C. P. G. Pathological Changes Produced in Animals by Depth Charges. *Brit J Surg* 30: 49 (July) 1942.

<sup>4</sup> Friedell M. T. and Ecklund A. M. Experimental Immersion Blast Injury. *U. S. Nav. M. Bull.* 41: 353 (March) 1943.

duced except when the lungs were so severely damaged that death ensued. To eliminate the severe lung injury these investigators devised a chamber which minimizes the effects of blast on the thorax. With this chamber the lungs were protected so that previously fatal explosive conditions were no longer lethal. The abdominal lesions were present, however, and as the force of the charge seemed to grow greater the hemorrhagic lesions gave way to perforations.

In the cases observed by these authors at the hospital it was felt that possibly the life jacket prevented such severe injuries to the lungs as to cause death and that the abdomen, which was unprotected, bore the brunt of the explosion. This seems to be borne out by their experiments in which the previous lethal condition was repeated except that the chest was protected. Perforations were then found in the intestinal tract, and the animal survived the immediate explosion. They therefore conclude that the perforations are an immediate result of the blast and do not occur later as a result of necrosis of the bowel wall. These perforations therefore demand early surgical intervention, hemorrhagic lesions do not require surgical treatment. It is suggested that extension of the life jacket to cover the abdomen would be beneficial. The authors did not find evidence in their experiments that water was forced through the anus with rupture of the bowel. The lesions seemed to be a direct effect of the explosive force transmitted through the elastic walls of the abdomen and thorax.

Observations on the occurrence of intracranial trauma following blast injury are few. Unfortunately Wilson and Tunbridge<sup>5</sup> did not have opportunity to examine the brain and spinal cord in their necropsies on 12 persons who died as a result of blast injury. In Ascroft's<sup>6</sup> fatal case of multiple injuries due to the explosion of a hand grenade at short range, in addition to the extensive infiltration of the lungs, a peculiar discoloration of large areas of the cerebral hemispheres was found as the result of the great numbers of minute hemorrhages confined to the gray matter of the cortex. This observation seems to be unique. The lesion did not resemble any hitherto described as following death from blast. Zuckerman reported pial hemorrhages on the surface of the cortex and hemorrhages from the tela choroidea, but hemorrhages did not occur in either the gray or the white matter of the brain in monkeys subjected to blast pressures as high as 110 pounds per square inch. Friedell and Acklund did not note hemorrhages into the brain in their experimental animals which died primarily as a result of a blast. They felt that a blast wave sufficiently forceful to produce

intracranial trauma would with certainty cause fatal lesions of the intrathoracic and intraperitoneal structures.

Abbott, Due and Nosik<sup>7</sup> call attention to a small group of patients with a history of exposure to severe concussion, loss of consciousness for a period varying from a few minutes to several days, persistent headaches, memory loss and irritability. Positive neurologic signs are minimal. The most common are a slight facial palsy, a transient hemiparesis and occasionally a transient change in reflexes. There is a history of coma, syncope or convulsions which did not exist prior to the blast and a definite departure from a stable personality. Such patients are often regarded as having a functional disturbance—a psychoneurosis or traumatic neurosis. These authors advance the idea that these symptoms are characteristic of a subdural hematoma or a subdural effusion. Pneumoencephalography will demonstrate a characteristic filling defect over the cerebrum in these cases with a distortion of the ventricular system in some. A trephine opening over the indicated superior temporal area, with incision of the dura, will permit the escape of either old blood or xanthochromic fluid. Of 10 cases in which this procedure was performed, 7 resulted in subdural effusions, 2 were instances of subdural hematoma and 5 were bilateral. There were no operative fatalities. The symptoms were promptly relieved. The last quoted reports suggest that cerebral lesions must be taken into consideration as possible direct or contributing factors in the mechanism of death in blast injuries and as a cause of certain late complications, such as subdural hematoma and subdural effusion.

Obviously, the difficulty of diagnosis in such obscure conditions should not be increased by a too liberal use of narcotics. Surgeons have suggested that morphine is contraindicated in the acute phase of blast injuries because it tends to accentuate the pulmonary edema and obscures the symptoms of abdominal and cerebral complications. Its use would seem to be justified only in the presence of painful injury or excessive restlessness.

The numerous reports now appearing in medical periodicals and the many unanswered questions that are being raised relative to the effects of blast on various systems in the human body indicate the need for further investigation, both clinical and experimental. The approach through special committees or subcommittees of the Office of Scientific Research and Development and the Division of Medical Sciences of the National Research Council, which has been so successful in other problems, might well be applied in the case of blast.

5 Wilson J V and Tunbridge R E. Pathological Findings in a Series of Blast Injuries. *Lancet* 2: 257 (Feb 27) 1943.  
6 Ascroft P B. Blast Injury of the Lungs with a Curious Lesion of the Cerebrum. *Lancet* 1: 234 (Feb 20) 1943.

7 Abbott W D, Due F O and Nosik W A. Subdural Hematoma and Effusion as a Result of Blast Injuries. First Preliminary Report. *J A M A* 121: 664 (Feb 27) 1943. Second Preliminary Report. Diagnosis by Psychiatric Examinations. *ibid* 121: 739 (March 6) 1943.

## Current Comment

### PLANS FOR THE WAR BLINDED

Among the casualties of war few merit more immediate consideration than that given to those who become sightless as a result of their participation in the national defense. In World War I, according to available figures, less than 250 Americans were blinded. Thus far the number of British soldiers who have become sightless, including the men from Great Britain and the colonies, is somewhat less than a few hundred. Planning bodies, therefore, estimate that the number of Americans in the armed forces who become totally blind will not exceed a few hundred. For the past six months representatives of the Surgeon Generals of the Army, the Navy and the Public Health Service, the administrator of the Veterans Administration, the Federal Board of Hospitalization and the ophthalmologic committee of the Division of Medical Sciences of the National Research Council have been engaged in a study of the problem. An elaborate program has been developed to rehabilitate socially and economically those who become sightless. Sufficient funds have been provided by the Congress to meet every possible need. The plans contemplate utilization of existing agencies which deal with the blind. However, public fund raising campaigns are unnecessary since the over-all need is hardly sufficient to demand special expansion for this purpose in the services of unofficial agencies. In accordance with the executive order of the President, the social rehabilitation of the blind becomes a function of the Veterans Administration and is to be handled by the Division of Educational Rehabilitation and not the medical division. Through the cooperative effort now in process of development the rehabilitation will begin just as soon as the diagnosis is made and will continue from the time of reception of the invalid by the armed forces until the man can be discharged from the Veterans Administration physically, mentally and socially rehabilitated.

### THE DISTINGUISHED SERVICE MEDAL

The Distinguished Service Medal of the American Medical Association will be presented for the sixth time at the meeting on Tuesday night, June 8, in the ballroom of the Palmer House, Chicago, during the regular session of the House of Delegates of the American Medical Association in Chicago, beginning June 7, 1943. The medal was awarded, for the first time, in 1938 to Dr. Rudolph Matas of New Orleans, in 1939 to Dr. James B. Herrick of Chicago, in 1940 to Dr. Chevalier Jackson of Philadelphia, in 1941 to Dr. James Ewing of New York and last year to Dr. Ludvig Hektoen of Chicago. This award is recognized as one of the most distinguished honors within the gift of the American Medical Association. Any Fellow of the Association may submit nominations, which should be sent, together with a record of the scientific services of the nominees, to the chairman of the Committee on Distinguished Service Award, Dr. A. A. Walker, 2250 Highland Avenue, Birmingham, Ala., or to the Secre-

tary of the Association at 535 North Dearborn Street, Chicago. Of all nominations received by the committee, five are submitted to the Board of Trustees of the Association, from which the Board selects three to be submitted to the House of Delegates at its first meeting at the time of its regular session. Immediately on submission of the nominations by the Board of Trustees, the House of Delegates by official vote selects the recipient of the honor, to whom the Distinguished Service Medal is presented at the meeting at which the President-Elect is installed as President, which is usually on Tuesday evening of the week of an annual session. An extended list of distinguished physicians nominated for this award will enable the committee, the Board of Trustees and the House of Delegates all of whom participate in the selection, to determine for 1943 a recipient of distinction, whose nomination will reflect favorably on himself and on the Association.

### LEGAL MEDICINE IN PHILADELPHIA

The coroner of the county of Philadelphia, the first physician to hold the office since 1878, has developed a program that may be expected to increase the efficiency of his office and will in addition contribute materially to the dissemination of knowledge of the subject of legal medicine. In an effort to put the functioning of his office on a scientific, efficient basis he has created an advisory board consisting of the president of the county medical society, the director of legal medicine at Temple University, a professor of sociology who is also an authority on criminology, an associate professor of medicine, and the president of the College of Pharmacy. Special consultants have been named who will be able to bring to the work of the coroner's office specialized knowledge whenever the occasion demands, consultants in toxicology, consultants in ballistics and consultants in medical and legal research. Realizing the potential value for purposes of instruction of the material that passes through his office, the coroner has formulated a plan under which the six medical schools of the city may have access to that material by conducting classes each week in the morgue. A series of lectures on legal medicine under his direction has recently been concluded. The lectures were given in the headquarters of the Philadelphia County Medical Society under the sponsorship of that society, the six medical and two law schools, the bar association, the College of Pharmacy and the office of the district attorney. The lectures were well attended by medical, law, pharmacy and police students and by physicians and lawyers. No admission charge was made. A tentative selection has been made for a similar series to be given in the fall, and plans are being considered to repeat the program annually. In integrating as he is the various groups in the community that should be concerned in the development and dissemination of knowledge of legal medicine and in associating the coroner's office so intimately with that development, Dr. Herbert M. Goddard may well be constructing a pattern that will be followed elsewhere.

# MEDICINE AND THE WAR

*In this section of The Journal each week will appear official notices by the Committee on War Participation of the American Medical Association, announcements by the Surgeon Generals of the Army, Navy and Public Health Service, and other governmental agencies dealing with medicine and the war and such other information and announcements as will be useful to the medical profession*

## ARMY

### INTERNS AND RESIDENTS IN AIR FORCE HOSPITALS

#### Policy to Be Followed in Placing Present Interns and Residents Who Will Be Assigned to the Army Air Forces

Those interns and residents who are ordered to duty with the Army Air Forces are to be given a period of training which will augment the training received in civilian life. The first six months of this training will have a distinct military character and will be carried out as follows:

1 A policy of indoctrination and assignment of interns and residents entering the Army Air Forces is to be established in specified Army Air Force hospitals.

2 The purpose of this plan is to acquaint the newly assigned officers with army hospital routine and to give them further concentrated professional training. Such placement will materially aid the permanently assigned officers in the Army Air Force hospitals with their routine work.

3 The program will function as follows:

(a) Men will be assigned from Carlisle Barracks to designated Army Air Force hospitals by the Air Surgeon at the approximate ratio of 15 officers per hundred hospital beds.

(b) These officers will serve as junior assistants for a period of approximately six months in the larger hospital installations.

(c) These junior officers will be assigned to ward work under a senior officer, preferably one who has had some teaching experience or who is personally adaptable to teaching. He will act as consultant and adviser for the junior officer or officers under him. The junior officer will keep records, make physical examinations and take over all routine work under the direction of his senior officer.

(d) The detailed division of training should be approximately as follows:

(1) Routine ward work, five hours daily (example: 0800 to 1200, routine work, 1600 to 1700, afternoon ward rounds).

(2) Drill or physical education, one hour daily.

(3) Lectures on x-ray, laboratory, medical, medical administrative or military subjects, two hours daily. In this period could be included firing on the range and work with field units.

(e) Regular staff conferences should be held at specified times covering x-ray, electrocardiography, clinical pathology and general medical and surgical problems.

4 The general division of time in the six months training period for junior officers will be divided approximately as follows and the men should rotate through the entire service whenever possible:

	Per Cent
Medical service	40
Surgical service	20
Dispensary service	10
Eye, ear, nose and throat service	10
X-ray service	10
Venereal disease control and immunization	10

5 Junior officers will be graded weekly by their consultants and at the end of a six months period a final grade will be given to each junior officer by the post surgeon. Professional ability, adaptability to army routine and qualities of leadership will be considered in the final evaluation. Military necessities permitting, the upper third of the class will be allowed to choose between a second period of six months in a preferred straight residency in the same hospital installation or of being assigned to the School of Aviation Medicine, preference of service being

given in the order of class rank. The remaining members of the class will then be assigned, by the Air Surgeon, to smaller hospitals serving the flying fields, in order that they may gain some first hand knowledge of this type of service. After an additional period of service at this type of installation they will be further classified for the School of Aviation Medicine or a general duty assignment. Residents whose civilian training has been interrupted will when possible continue training in that specialty.

6 This program is designed to mature the younger medical officers more quickly and to utilize their efforts in the best way possible from the onset of their assignment. Such utilization under supervision will relieve the senior officers from much of their routine work and release them for more important professional duties. The junior officers thus assigned should profit tremendously by the experience and personal guidance of their seniors.

### TRAINING FOR FIELD WORK

Three hundred and twenty-two more officers of the Medical Department qualified on March 11 for duty with medical units in the field when they were graduated from the Medical Field Service School at Carlisle Barracks, Pennsylvania. The officers completed six weeks of grueling training. These experienced physicians, dentists and sanitary engineers left immediately after the exercises for their respective units. The training course here in medical field work taught them the military knowledge necessary for them to be efficient Medical Department officers, capable of carrying out medical preventive measures and caring for the sick and injured under war conditions. The subjects taught included training medical support tactics, military sanitation, logistics, field medicine and surgery, and administration presented in an intensive six weeks program of daily lectures, home study and field demonstrations.

### AT A JUNGLE FIRST AID STATION IN PANAMA

An army doctor at a jungle outpost in the Panama Canal Department is a military tactician as well as a physician, as with his help it is possible to maintain gun and searchlight positions in the jungle. The officers and enlisted men of the medical department have hacked their way through the jungle, built first aid stations and are largely responsible for the lowest malaria rate in the history of the Army in Panama. Ambulances can now reach many of these positions to bring in soldiers requiring hospitalization, while formerly litter bearers had to carry a sick man for miles. Army doctors attached to one Coast Artillery unit still must travel 225 miles a day to cover a few of the emplacements in the jungle. These officers daily look for mosquito breeding places. Continuously they move first aid stations into different positions in the jungle. A first aid station which can be packed into two trunks is built near emplacements. Emergency operations can be performed at a moment's notice in these aid stations. One jungle position for over a year has had a perfect sanitation record, and not one man has had malaria. Occasionally natives living in the jungle call at first aid stations to be treated. The dentists who visit the emplacements regularly carry their equipment in a trunk containing a folding steel chair, foot engine and surgical dental equipment. The biggest problem confronting the jungle medical detachment now is transportation. The positions are so tattered that much time is taken up by traveling.



## THE VALLEY FORGE GENERAL HOSPITAL

One hundred and sixty-five years after General Washington made his famous encampment at Valley Forge, the new U S Army Valley Forge General Hospital was officially opened, February 22, at Phoenixville, Pa., which is only a short distance from the historic region. This vast army hospital has a capacity of about 2,000 beds in two story brick structures connected by hallways. The commanding officer of the Valley Forge General Hospital is Col. Henry Beeuwkes of Jamesburg, N. J., honor graduate of the Army Medical School in the class of 1909 and personal physician to General Pershing during the first world war. Colonel Beeuwkes later resigned his commission in the Army to become associated with the International Health Board of the Rockefeller Foundation and for many years carried on research in yellow fever for that organization in Africa. The administrative work of the Valley Forge General Hospital is carried on by twenty-three medical administrative, quarter master engineer and finance officers.

As of March 15, the professional staffs of the hospital were as follows:

### EXECUTIVE AND ADMINISTRATIVE SERVICE

Col. Henry Beeuwkes, commanding officer  
Lieut. Col. Robert D. Smith, executive officer  
Major Alfred G. Gillis, director of medical training  
Major Arthur Heyman, director of dietetics  
Major Bernard M. Murphy, receiving and disposition officer

### MEDICAL SERVICE

Lieut. Col. Marshall A. Fulton, chief of medical service  
Major Maurice A. Schmitzer, assistant chief of medical service and chief of general medical service  
Major Seymour Fisher, station surgeon and outpatient service  
Major Samuel Morrison, chief of gastrointestinal section  
Capt. Louis K. Alpert, chief of cardiovascular renal section  
Capt. Michael J. Lepore, chief of officers and women section  
Capt. Raymond J. Rickloff, chief of communicable disease section and consultant in dermatology  
Capt. Russel W. Lyster, assistant chief of general medical section  
Capt. Paul A. Morrow, assistant chief of communicable disease section  
1st Lieut. Loren F. Blanev, ward officer cardiovascular renal section  
1st Lieut. Allen S. Cross, ward officer officers and women section  
1st Lieut. Elliot D. Giddon, ward officer general medical section  
1st Lieut. William G. Layton, ward officer communicable disease section  
1st Lieut. Dean Rizer, ward officer cardiovascular renal section  
1st Lieut. Robert E. Westmoreland, ward officer gastrointestinal section

### SURGICAL SERVICE

Lieut. Col. Ralph J. Haws, chief of surgical service  
Major Charles M. Robbins, assistant chief of surgical service and chief of general surgical section  
Major Spencer T. Snedcor, chief of orthopedic section  
Major Irvin S. Koll, chief of urologic section  
Major Charles W. Boyd, chief of eye, ear, nose and throat section  
Capt. Albert J. Abbot, ward officer eye, ear, nose and throat section  
Capt. John M. Borbonus, chief of officers and women section  
Capt. Merian Gearhart, ward officer, general surgical section  
Capt. Philip E. Lear, ward officer general surgical section  
Capt. Charles D. Lenhoff, ward officer urologic section  
Capt. Willis H. McKean, ward officer general surgical section  
Capt. Phillip J. Morgan, ward officer general surgical section  
1st Lieut. Francis L. Coffey, ward officer orthopedic section  
1st Lieut. Walter C. Graham, ward officer orthopedic section  
1st Lieut. Clinton A. Hays, chief of septic surgery  
1st Lieut. George E. Lowery, chief of physical therapy  
1st Lieut. Stephen M. McCoy, ward officer officers and women section  
1st Lieut. Karl S. Russell, chief of operating and anesthesia section

### NEUROPSYCHIATRIC SERVICE

Capt. Walter E. Barton, chief of neuropsychiatric service  
1st Lieut. Dallas Pratt, ward officer neuropsychiatric service  
1st Lieut. Daniel S. Jaffe, ward officer neuropsychiatric service

### X-RAY SERVICE

Capt. John Francis Miller, chief of x-ray service  
1st Lieut. Edward H. Gregman, assistant chief of x-ray service

### LABORATORY SERVICE

1st Lieut. Hans G. Schlumberger, chief of laboratory service  
1st Lieut. Robert D. Johnston, assistant chief of laboratory service  
2d Lieut. Edmund P. Finch, laboratory service

### DENTAL SERVICE

Lieut. Col. Pope B. Holliday, chief of dental service  
Major George R. King, assistant chief of dental service  
Capt. John C. Breuker, Jr., dental officer  
1st Lieut. Robert E. Connell, dental officer  
1st Lieut. Michael L. Di Napoli, dental officer  
1st Lieut. Julius Eingorn, dental officer

## VISIT BY GENERAL MORGAN

Brig. Gen. Hugh Jackson Morgan, Medical Department who was professor of medicine at Vanderbilt University, Nashville, Tenn., before called to duty as chief consultant in medicine in the Surgeon General's Office, Washington D. C. on March 10, completed a visit at Carlisle Barracks, Pennsylvania, to study the work of the Medical Field Service School and the Medical Department Equipment Laboratory. General Morgan addressed the three basic officers classes on "The Mission of a Medical Officer." He was accompanied by Lieut. Col. B. Roland Carter, Medical Corps, assistant to the consultant in surgery in the Surgeon General's Office. In the first world war General Morgan a senior at Johns Hopkins University enlisted for service with Base Hospital No. 18 and was sent overseas in the American Expeditionary Forces. In May 1918 he was commissioned a first lieutenant in the Medical Corps at Longres France. Colonel Carter was assistant professor of surgery at the University of Cincinnati before being called into military service about a year ago.

## NUTRITION PROGRAM AT WRIGHT FIELD

A display of nutrition exhibits prepared by Dr. Bruno Gebhard and lent by the Cleveland Health Museum is the first step in a campaign designed to increase the efficiency of workers and reduce sickness and absenteeism at Wright Field, Ohio. The opening phase of the campaign came with the announcement of food rationing and it has given field workers information on selecting nutritious food within the rationing limits.

Illustrated in the exhibits are types of protective foods, caloric values of protective foods and the caloric requirements for eighteen different activities in the home, at work and at play, also shown are values of food containing iron, calcium, protein and vitamins. Other exhibits expose common food fallacies and show how to get double food value for less money. The nutrition exhibit is based on five rules for a good lunch:

1. Your lunch should give you one third of your total daily food.
2. It should include milk in some form.
3. It should include whole grain.
4. It should include some kind of protein as meat, eggs, cheese or beans.

Specially prepared pamphlets on nutritional problems, including planned diets have been made available to field workers under the new program. Heading the health and nutrition program at Wright Field is Major Zolton T. Wirtschafter, chief of the Civilian Medicine and Industrial Hygiene Section and former instructor at the Cleveland City Hospital, Western Reserve University Medical School.

## CLASS OF MEDICAL INSPECTORS

Forty-six medical officers comprising the fourth class of medical inspectors graduated March 13 from a special training course at the Medical Field Service School at Carlisle Barracks, Pennsylvania. Following the exercises, the men left for their new posts. The duties of medical inspectors are to supervise sanitation and other medical preventive measures in army camps. Twenty-two of the forty-six officers had graduated previously from the basic course for officers at the Medical Field Service School. The class included eight majors and thirty-seven captains, all of the Medical Corps, and one captain of the Sanitary Corps. The officers represented twenty-six states. Another class of medical inspectors numbering about fifty officers started on March 22.

## ARMY LEASES PART OF MICHIGAN'S LABORATORY FACILITIES

Manufacture by the Army Medical Department of biologic products to be used by the Army, Navy and Coast Guard using facilities of the Michigan Department of Health Laboratories in Lansing, is to begin soon. Leasing two floors of the new Groesbeck serum and vaccine laboratory building now nearing completion, the Army will use its own equipment. The Lansing laboratories of the state department will continue the manufacture of biologic products for state distribution and its other routine services.

## NAVY

### NEW NAVAL HOSPITAL FACILITIES

The Bureau of Medicine and Surgery of the U S Navy, Washington, D C, announced on March 11 that three new hospital ships had been authorized and on March 5 that a new 1,000 bed naval hospital would be constructed at Pleasanton (Livermore), Calif. The Bureau of Medicine and Surgery at that time expected the early authorization of plans to expand the bed capacity of two other East coast and six West coast naval hospitals, including hospitals at Philadelphia, San Diego, Long Beach, Seattle, Treasure Island, Corona and Santa Margarita.

A new naval hospital with 1,500 beds was formally opened on February 15 in Queens, New York. The hospital had already admitted several hundred patients. The thirty-five wards are of one story wooden barracks type. The commanding officer is Capt L L Pratt, U S N, and the executive officer is Capt B H Adams. The superintendent of nurses is Lieut Comdr Anna Keating, U S N, and the seventy some medical officers on the staff are mostly prominent men in the various specialties. In all there are 71 nurses, 317 members of the navy hospital corps and 235 civilian employees. The hospital is built on one of the fine golf courses on Long Island and is complete in all respects for handling any class of patients. The community in this area and the national organizations have made many donations to the Red Cross unit of the hospital and to the Secretary of the Navy for various forms of equipment.

The U S Navy has opened a new hospital at Key West, Fla, and the Marine Hospital formerly in operation at Key West has been closed. Rear Admiral Luther Sheldon Jr of the Navy Medical Corps, who recently inspected the naval medical facilities in the seventh naval district, reported that he was favorably impressed by the new hospital in Key West.

The Colorado Hotel at Glenwood Springs, Colo, is being prepared as a U S Navy hospital with a 500 bed capacity.

It was announced by representative Lex Green of Florida, February 25, that St Mary's Hospital in West Palm Beach, which was built in 1938, will be taken over by the Navy.

### NAVAL DENTAL CORPS REAR ADMIRAL

Recent legislation authorized the temporary appointment of a rear admiral in the dental corps of the U S Navy. A selection board met early in March at the Navy Department and selected for nomination as rear admiral Capt Alexander Gordon Lyle, D C, U S N. Dr Lyle was born at Gloucester, Mass, in 1889, graduated from Baltimore College of Dentistry in 1912 and was commissioned lieutenant (jg) in the Dental Corps of the Navy in 1915. During the first world war Captain Lyle served with the marines in the second division in France and was awarded the Medal of Honor and two Silver Star medals for extraordinary heroism under fire. He served on various ships later and again with the marines in Shanghai, China, and for four years ended in August 1936 was head of the dental department of the U S Naval Hospital, Newport, R I. The following year he completed the course in the Army Industrial College and recently has been head of the dental department of the Naval Air Station, Quonset Point, R I.

### WAVES FOR THE HOSPITAL CORPS

A Hospital Corps School for Waves to be established at the Naval Medical Center, Bethesda, Md, has been authorized and construction is expected to start soon. The school will accommodate training classes of 500 students. On March 8 there were 209 Hospital Corps Waves, of whom 97 were on active duty at that time and 122 were undergoing indoctrination at Bethesda and San Diego. The Bureau of Medicine and Surgery expected another 150 on March 22, which would be assigned to indoctrination classes at the naval hospitals at Great Lakes, Ill, New York and Chelsea, Mass. Another group of 150 waves was expected from the Wave School at Cedar Falls, Iowa, on April 5.

### NAVAL MEDICAL NEWS LETTER

*Bumed News Letter*, edited by Capt W W Hall, M C, U S Navy, is issued by the Bureau of Medicine. The letter contains information of importance to all medical officers, especially those isolated by war from the usual sources of medical information. Abstracts of important articles in current medical and scientific periodicals are included. The present microfilm letter, reproduced from material supplied by the Committee on Medical Information of the National Research Council, Division of Medical Sciences, is incorporated with this publication. It is distributed by regular and by V mail to naval medical officers ashore and afloat.

### NAVY PERSONALS

Dr Lewis H Wright, head of the department of anesthetics of E R Squibb & Sons, New York, entered the U S Naval Reserve with the rank of lieutenant commander on March 1. Dr Wright joined the anesthetic department of E R Squibb & Sons in 1930 and for several years has been the head of that department.

Air Commodore C P Symonds of the R A F, consultant in neuropsychiatry, visited on March 18 the Bureau of Medicine and Surgery in Washington. Commodore Symonds was in the United States also for the purpose of giving the Dunham Lectures at Harvard University.

Lieut Comdr Clement C Clay of the Navy Medical Corps Reserve has been assigned to the Personnel Division at the Bureau of Medicine and Surgery.

Lieut Gerald J Sullivan, M C, U S Naval Reserve has been assigned to duty at the Naval Dispensary in Washington.

Lieut Comdr Charles Wheatley, M C, U S Navy, retired, has been assigned for duty to the correspondence course section at the Bureau of Medicine and Surgery.

Capt Robert W Wimberly, M C, U S Navy, has reported for duty to the Naval Dispensary, Washington, D C.

Comdr Omar J Brown, M C, U S Navy has been assigned as head of the new section of tropical medicine of the Division of Preventive Medicine of the Bureau of Medicine and Surgery, Washington, D C, and Lieut John F Shrouts, U S Naval Reserve, has been assigned to the section of Venereal Disease Control, replacing Lieut George W Mast, M C, U S Navy, who has been assigned in charge of the section of audiovisual education.

Lieut Comdr W H Schwartz, M C, U S Navy, has been assigned to the Venereal Disease Section in the Bureau of Medicine and Surgery, and Comdr Ladislaus Adamkiewicz, M C, U S Navy, to the research division.

### MEDICAL FIELD SETS DONATED TO COAST GUARD

The Illinois Opera Guild Ferry Command and the Drake Hotel Red Cross Unit have presented emergency medical field sets to the U S Coast Guard at Chicago. In forwarding these sets from the Medical and Surgical Relief Committee of America in New York Mrs Huttleston Rogers, executive chairman, writes that the War Shipping Administration has made a request for twenty-four emergency medical field sets to be sent to Casablanca, Dakar, Cape Town, Murmansk, Trinidad and other distant ports. The Anglo American Commission also has requested thirty-six of these units for use in the Caribbean area. The committee requests that physicians and surgeons, particularly, and any other persons who may have scalpels, splinter forceps, probes, grooved directors, scissors and other instruments of this nature send them promptly to the committee's headquarters at 420 Lexington Avenue, New York City. These instruments need not be new, as facilities are available for their repair.

## CIVILIAN DEFENSE

BRITISH METHOD OF BLANKETING  
A CASUALTY

The British (Wanstead) method of blanketing casualties mentioned in Circular, Medical Series No 20, U S Office of Civilian Defense, is described herewith. Using two blankets as described, there are four thicknesses beneath the patient and two above. The feet are tucked in and kept warm by the use of this technic, and the head is protected against cold. When the blanket fold is completed, it securely fixes the extremities and trunk so that it can be used as a blanket carry, if necessary.

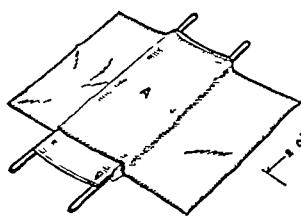


FIGURE 1

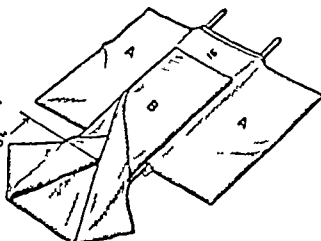


FIGURE 2

## PREPARING THE STRETCHER

1 Place blanket *A* lengthwise across the stretcher with one side close to the head end of the stretcher, and one end of the blanket having a slightly longer overlap of the stretcher than the other end (fig 1).

2 Fold blanket *B* in thirds lengthwise and place over *A*, the upper edge of this folded blanket being about 15 inches below the upper edge of blanket *A* (fig 2). For very tall persons it is necessary to lay blanket *B* farther down on the stretcher to permit its lower end to extend a sufficient length below the patient's feet so that it may be folded up and around them in the manner to be described.

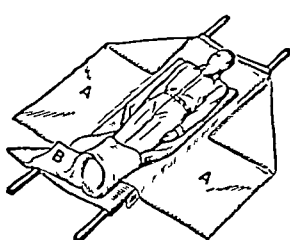


FIGURE 3

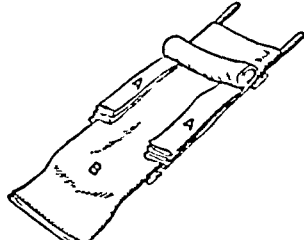


FIGURE 4

3 Open the folds of blanket *B* for about 2 feet at the foot end (fig 2).

## WRAPPING A PATIENT

1 Bring the foot of blanket *B* up over the feet, with a small fold between the feet.

2 Tuck the two open folds of blanket *B* closely over and around the feet and ankles (fig 3).

3 Turn in upper corners of ends of blanket *A* (fig 3), wrap shorter end of blanket *A* over patient and then the longer end and tuck well in at side (fig 4).

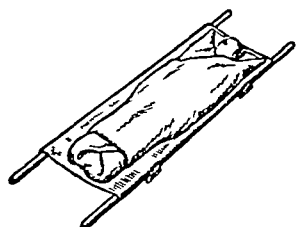


FIGURE 5

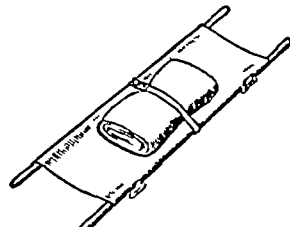


FIGURE 6

## BLANKET ASSEMBLY FOR TRANSIT

1 Proceed as under 1 and 2 for preparing a stretcher.

2 Fold in the two ends of blanket *A* in accordion pleats (fig 5), fold in the foot end of blanket *B*, then roll the blanket and make secure (fig 6). A hot water bottle may be placed in the center of the blanket pack to keep it warm.

## TRANSPORTATION FOR CASUALTIES

Transportation for casualties from scenes of disaster to hospitals and for injured persons or other patients removed from casualty receiving hospitals to emergency base hospitals is included in plans for emergency transport service during war disasters described in recent operations letters issued by the Office of Civilian Defense.

Plans for local transportation are centered in the transport officer of the U S Citizens Defense Corps. It is the duty of the transport officer to maintain inventories of local equipment that can be used by the various emergency services of the Citizens Defense Corps, and he is responsible for organization, training and supervision of volunteer drivers units. Such equipment may include passenger cars, station wagons, motorcycles, ambulances and other private vehicles.

Through joint action of the Office of Defense Transportation and the Office of Civilian Defense, local commercial motor vehicles, including taxicabs and trucks of small operators which are now under the jurisdiction of the Office of Defense Transportation, have been released to the transport officer for local service in case of war emergency. He may make use of such vehicles immediately without application to the ODT.

For transport facilities needed outside the local area such as might be required for evacuation of civilians or for transfer of injured persons to emergency base hospitals in other areas, the OCD and the ODT are organizing motor transport units in the larger common contract and private motor carriers of the critical areas of the country. These units will be trained in convoy service. ODT is developing an organization in the critical areas under which its district managers will make contact with the local transport officers to make certain that each community is organized to function under the plan.

Operations Letter No 114, issued March 3, urges cooperative planning between the Citizens Defense Corps and the American Red Cross, the Women's Defense and Ambulance Corps and local or state automobile associations or clubs in order that several agencies may not seek to mobilize the same equipment independently but may do so in cooperation.

IDENTIFICATION OF VEHICLES  
IN BLACKOUT

A uniform system of identification of emergency vehicles operating during real or practice air raid and blackout was announced by the Office of Civilian Defense in Operations Letter No 111. The primary identifying device is a white pennant measuring 18 inches along each side with a 6 inch base. Civilian Defense insignia, that is the letters CD in red inside a white triangle superimposed on a red circle. The pennant is to be attached to the left front portion of the vehicle. To identify emergency vehicles at night the operations letter prescribes a headlight mask over the right headlamp for use where blackout regulations permit the use of headlights in coastal dimout areas it should be used in conjunction with dimout equipment. The design of the mask embodies the CD insignia  $2\frac{1}{2}$  to 3 inches in diameter in green.

Vehicles entitled to use the emergency identification include (a) vehicle of the armed forces of the United States or of the Allies or other vehicles acting under orders, (b) vehicles of fire departments and governmental police agencies, (c) ambulances and rescue cars and other vehicles converted to such use in emergency services, (d) public utility repair vehicles operating in emergency service and (e) vehicles in emergency service as defined by state civilian defense authorities.

The operations letter recommends that all states adopt the definition of emergency motor vehicles and the methods of identification prescribed. Although many states have already adopted different methods of identifying emergency motor vehicles, it was urged that all states adopt the new devices. A uniform system is important in order that emergency motor vehicles which may be crossing state lines may not face unnecessary interference.

## MISCELLANEOUS

## AN APPEAL FOR EMERGENCY MEDICAL SUPPLIES

The medical supplies on the French warships now in our ports for repairs are seriously depleted and, at the request of the chief medical officer of the battleship *Richelieu*, the Medical and Surgical Relief Committee of America, with headquarters at 420 Lexington Avenue New York City, has supplied the ship with a complete operating set, including rubber gloves, sutures, needles, antiseptics, thermometers and vitamins.

The chapter of the American Women's Voluntary Services in Winter Park, Fla., has sent to the Medical and Surgical Relief Committee twelve submarine chaser medical kits, three emergency medical field sets and thousands of dressings.

At the request of the British War Relief, the Medical and Surgical Relief Committee of America has sent twelve complete dental units, one hundred extraction forceps and one hundred hypodermic syringes and needles to North Africa.

The Washoe County Medical Society has raised funds to purchase a complete operating set and emergency medical field set for use on board the cruiser *Reno*. The presentation was made at the headquarters of the Medical and Surgical Relief Committee of America, New York City, to a representative of Rear Admiral Melhorn of the Navy Medical Supply Depot in New York.

Many women's clubs throughout the country are conducting special campaigns by placing collection tins and posters in department stores in which the public may donate old scissors, knives, safety pins, bandages, tweezers and fishing tackle for forwarding to the Medical and Surgical Relief Committee of America at 420 Lexington Avenue, New York City, where they will be repaired if necessary and used to equip emergency kits for use on submarine chaser and coast guard patrol boats.

## MORE NURSES NEEDED

At a meeting of the directors of the National Nursing Council for War Service in New York, March 19, it was reported that schools of nursing throughout the country admitted 5,000 more students during the current year than they did the year before. However, the total of 49,169 is nearly 6,000 less than the quota which the nursing profession and the government estimated necessary to meet war needs.

"Since 6,000 young women who were needed as nurses are doing something else instead of taking no part in the war effort," said Katherine Faville, chairman of the Council's Committee on Recruitment of Student Nurses "some new element must be added if we are to secure the greatly increased number of new students, 65,000, who should begin nursing educations during the school year that opens June 1. The modest government stipends for student nurses that it suggests should enable more of those qualified to enter nursing and should help meet the competition of high salaried war industry or the various military auxiliary services which offer women a soldier's pay even during training."

The school admissions figures were reported by the Department of Studies of the National League of Nursing Education on the basis of questionnaires sent to the 1,300 state accredited schools of nursing in the country. The admissions for the period June 1, 1942 to June 1, 1943 total 49,169, or 89 per cent of the quota sought. Eight states reached or passed the quotas assigned to them. They are Arkansas, Idaho, Iowa, Minnesota, New Mexico, North Carolina, Oklahoma and West Virginia. Other states which reached 90 per cent or more of their quotas are California, Colorado, Delaware, District of Columbia, Illinois, Indiana, Maine, Massachusetts, Mississippi, Montana, Ohio, Pennsylvania, Rhode Island, Utah and Virginia. The New York State percentage was 86. The Committee on Recruitment of Student Nurses, now launching a heightened spring campaign will study the areas where success was achieved in comparison with states where fewer girls entered nursing, to seek light on reasons, and to devise better methods.

## HEALTH UNDER HITLER

It is reported from Presov, according to *Grenzboten* Bratislava, of Nov 24, 1942, that all persons between 2 and 80 were compulsorily inoculated against typhus. Simultaneously the inoculation of all dogs against rabies was decreed.

*Donauzeitung*, Belgrade, of Nov 12, 1942 reports that the Rumanian cabinet has resolved to set up a commission to purchase medical supplies, bandages and medical instruments. This purchasing commission has been instructed to purchase the necessary materials for the social central insurance office from Germany and Italy.

DNB of January 7 states that the systematic care for the health of young persons has now been enriched by a work unique in various respects and of fundamental significance for the future. It is the "Principles Laid Down by the Reich Health Leader and Reich Youth Leader on Health Services for Youth," which the reich minister of the interior has made obligatory. For the first time a large scale scheme which comprises an entire nation and makes use of all means at the disposal of modern science has been devised providing for periodic free medical examinations for all boys and girls from their sixth to their eighteenth year as a joint task of the party and the state. During the war this health scheme will comprise only certain age groups, while it is to be put into practice fully after the war. In his introduction, Conti states that care for the health of youths is the core of the entire health service. It constitutes, as Reich Youth Leader Axmann points out in his preface, one of the foundations of the work of the Hitler Youth and its promotion should be the main task of every doctor and youth leader. A sufficient number of doctors for juveniles will have to carry out the medical service according to the "Principles." The task of the official (staatlich) doctor for juveniles—a profession now coming into existence—is one of the highest responsibility toward the community. To start with, a series of five examinations is envisaged for peacetime. The juveniles are to be examined at the ages of about 6, 10, 14, 15 and 18. To this must be added five to six "medical roll calls" for children up to the age of 14 and, furthermore, yearly "dental roll calls." The examinations are based on the youth health record sheet, which is uniform throughout the reich; the latter is covered by the doctor's obligation for secrecy and every child from his sixth to his eighteenth year will have one.

The wartime reich physician of the Hitler Youth, Ministerialrat Dr. Liebenow, who compiled the "Principles" in collaboration with competent authorities, calls this series of examinations the core of the Youth Health Service. These examinations which make use of x-ray photography too, deal with the juvenile's general constitution, environment, internal organs, sight and hearing, muscles, skeleton, wrong carriage, complexion—in short, with everything which is significant for a general medical supervision. The examinations pursue the following aims: exact medical reports which take into consideration hereditary factors, assessing physical capacities, making available measures necessary to improve the state of health, entries into fitness certificates in which the points that call for consideration are stated as far as necessary, and the supply of material for the health statistics concerning the juvenile population. In the case of the 10 year old child it will be possible to include at the same time a statement on the child's fitness to join the "Jungvolk" or the "Jungmadelbund," or for the hauptschule, while with regard to the 14 year old child his fitness for work will be stated. In the case of the 15 year old child attention will be paid to the influence of the first year of employment on his working capacity and development. It is left open to the parents to give written information regarding the wishes or ailments of the child. The "medical roll calls" are intended to fill the gaps between the series of examinations as far as is possible. The doctor for juveniles is expected to discern health defects at an early stage and give helpful advice for the child's development, while any actual medical treatment which may become necessary is to be left to the doctor chosen by the family.

# ORGANIZATION SECTION

## OFFICIAL NOTES

### ABSTRACT OF MINUTES OF MEETINGS OF BOARD OF TRUSTEES HELD

FEB 18-19, 1943

Careful consideration was given to the business of the Association at the annual meeting of the Board of Trustees, which was held in the headquarters office on February 18-19, preceded by a full day meeting of the Executive Committee

#### FURTHER TRAINING OF PHYSICIANS BOTH IN AND OUT OF THE ARMED FORCES

The Board voted to sponsor plans for the further training of physicians both in and out of the armed forces in cooperation with the American College of Physicians and the American College of Surgeons. It elected Dr Edward L Bortz of Philadelphia to act as its representative and made an appropriation to aid in putting the plan into effect

#### NATIONAL CONFERENCE ON PLANNING FOR WAR AND POSTWAR MEDICAL SERVICES

The Board also voted to cooperate with other organizations in the medical and allied fields in sponsoring a conference on planning for war and postwar medical services to be held in New York on March 15

#### POSTWAR PLANS FOR MEDICAL CARE

Drs Roger I Lee (Chairman), James E Pullin, Fred W Rankin and H H Shoulders were appointed a committee on postwar plans for medical care with authority to enlarge the committee to eight or more persons. This committee will cooperate with similar committees which will be appointed by the American College of Physicians and the American College of Surgeons

#### DINNER FOR HOUSE OF DELEGATES

The Executive Committee was authorized to arrange for a dinner for the House of Delegates on Monday evening June 7, and for a meeting immediately thereafter to which will be invited as guest speakers persons who can inform the House on questions of current interest, and if, because of war restrictions it is impossible to arrange for a dinner, to plan simply for the evening meeting with guest speakers

#### RECORDING OF BROADCASTS FOR THE USE OF COUNTY SOCIETIES

Authorization was given by the Board for the recording of some of the interview programs over WLS under the title "Before the Doctor Comes," in which Dr W W Bauer is cooperating, and for procuring copies of each recording with a view to furnishing these to county medical societies or local stations which may at the present time have difficulty in securing persons to broadcast

#### APPROPRIATIONS

Appropriations were made for the conduct of the work of the various councils, bureaus and departments in the headquarters office for regularly held conferences, for the committees on Scientific and Therapeutic Research and for some special research projects

#### COMMITTEE ON CONSERVATION OF VISION

The Committee on Conservation of Vision and Prevention of Blindness that was appointed by the Board of Trustees in 1940 in accordance with a resolution from the Section on Ophthalmology adopted by the House of Delegates, which has failed to function, was discontinued by the Board and a new Committee on Conservation of Vision was appointed consisting of Dr Lawrence T Post, St Louis, Dr Conrad Berens, New York,

Dr J V Cassidy, South Bend Ind, Dr E C Ellett, Memphis, Tenn, Dr Harry S Griddle, Chicago, and Dr R S Irvine, San Francisco

#### INVESTMENTS

Consideration was given to the matter of investing some of the funds of the Association, and a selection of eight bonds was made to add to the Association's portfolio

#### APPOINTMENTS

The following appointments were made to fill vacancies on various councils, committees and editorial boards (the appointee succeeded himself unless it is otherwise stated)

*American Journal of Diseases of Children* Dr Oscar M Schloss, Dr A A Weech of Cincinnati to succeed Dr A Gracie Mitchell (deceased), and Dr James L Wilson of Detroit to succeed Dr Horton R Casparis (deceased) *Archives of Dermatology and Syphilology* Dr C Guy Lane *Archives of Ophthalmology* Dr David G Cogan *Archives of Pathology* Dr James Lwing *Archives of Surgery* Dr Arthur W Allen and Dr Albert J Scholl of Los Angeles to succeed Dr Wallace I Terry (resigned) *Archives of Internal Medicine* Dr N C Gilbert *Archives of Otolaryngology* Dr Ernest M Seydell of Wichita Kan, to succeed Dr W P Wherry (deceased) *Archives of Neurology and Psychiatry* Dr Wilder Penfield, and Dr Charles D Aring of Cincinnati to succeed Dr S W Ranson (deceased) Council on Physical Therapy Dr John S Coulter, Dr W W Coblenz and Dr W E Garvey Council on Foods and Nutrition Dr George R Cowgill and Dr Lydia J Roberts Council on Pharmacy and Chemistry Dr H A Cole, Dr C S Keefer and Dr Stuart Mudd Council on Industrial Health, Dr Everett D Bristol Dr Stanley J Seeger and Mr Philip Drinker Committee on Scientific Research, Dr John J Morton Committee to Study Air Conditioning, Dr Alvan L Barrich of New York as an additional member Joint Committee on Health Problems in Education of National Education Association and American Medical Association, Dr A J Chesley American Documentation Institute Dr Ludwig Heiktoen Chicago Foundation for the Study of Cycles Dr Kenneth Marx Special Committee on Hospital Libraries, Dr William G Hibbs Chicago

#### DISCONTINUATION OF TRANSACTIONS OF SECTION ON LARYNGOLOGY, OTOTOLOGY AND RHINOLOGY

Authorization was given for the discontinuation of the Transactions of the Section on Laryngology, Otology and Rhinology unless the number of orders is increased sufficiently to indicate that specialists in this field are interested in having the Transactions in book form

#### UNITED STATES OF AMERICA & AMERICAN MEDICAL ASSOCIATION

The Board unanimously adopted the following statement regarding the decision of the Supreme Court of the United States in the case of the *United States of America v the American Medical Association and the Medical Society of the District of Columbia*

The decision of the Supreme Court in regard to the case involving the Medical Society of the District of Columbia and the American Medical Association was announced January 18 and was published in THE JOURNAL on January 23. On the advice of Counsel a check for \$2 500 has been sent to pay the fine assessed by the District Court against the American Medical Association. Following further advice of Counsel analysis or interpretation of this decision has not been made. The policies of the American Medical Association in the standardization of medical education hospitals or other aspects of medical care are established by the House of Delegates. In the conduct of its defense in this case the Board acted on the authority of the House of Delegates in each instance given unanimously

Many other subjects were discussed some of which will receive further consideration in the future

## MEETING OF THE COUNCIL ON INDUSTRIAL HEALTH

The eleventh meeting of the Council on Industrial Health was held on January 10 at the Palmer House in Chicago. Council members in attendance were Stanley J. Seeger, chairman, Harvey Bartle, Leverett D. Bristol, Warren F. Draper, Philip Drinker, Leroy U. Gardner, Raymond Hussey, Anthony I. Lanza, Robert T. Legge, Clarence D. Selby, William D. Stroud and Carl M. Peterson, secretary.

### REPORT OF THE COMMITTEE ON RULES

The Committee on Rules presented a report, rearranging the tenure of service of members of the Council on Industrial Health at four years, so staggered that three appointments expire each year.

### REPORT OF THE COMMITTEE ON NOMENCLATURE

After extended discussion the Council resolved (1) to defer publication of the dictionary on industrial health until Dr. Henry Kessler can resume active direction, (2) that the Council discharge its current obligations for services rendered in this direction, (3) that the material remain in the chairman's hands or such additions and revisions as may profitably be added from time to time and (4) that a small additional appropriation be requested as recompense for additional editorial and clerical services.

### REPORT OF COMMITTEE ON PROFESSIONAL RELATIONSHIPS

Since early February, forty-two state medical societies have been visited, eighteen of them two or more times. Seven state medical societies appointed committees on industrial health during the year, making a total of forty-five. Loss of committee members to military service and for other reasons required reorganization of the established committees in eight states.

Field procedure in the various states depended on the amount of previous activity and the needs of the area. In almost every state the chairman and members of the committee on industrial health, secretary and other officers of the state medical society, and the bureau of industrial hygiene were visited. Where indicated and possible, the deans of medical schools, state health commissioners and industrial organizations were contacted. Emphasis was placed on better health in relation to war production, the need for better medical organization and leadership, education of the medical profession, industry and other interested agencies, and active cooperation with state procurement and assignment agencies in solving medical problems in industry.

Similar activities are planned for the coming year assisted, as soon as possible, by additional personnel already authorized by the Board of Trustees. It is planned to stimulate reorganization of those state committees which have not been active and to encourage broader and more comprehensive programs in those which have shown progress.

The advisory committees representing the sections in the Scientific Assembly of the American Medical Association are of great assistance to the Council in its educational and organizational activities. This phase of the program will be pressed during the months ahead.

Considerable discussion occurred about the status of the Council in relation to the War Participation Committee of the A. M. A. respecting (1) local organization for industrial health service in a small plant and (2) a program of training and procurement of physicians for industry.

Principal concern referred to recent arrangements under which the U. S. Public Health Service and the Procurement and Assignment Service will jointly undertake studies of war industry and extracommunity areas from which shortages of medical and allied professional personnel are reported. As reported these studies shall be made jointly by the Procurement and

Assignment Service and representatives of the U. S. Public Health Service. The state medical society and the state health department will each be invited also to designate a representative to participate in such studies.

In the discussion of this important statement of policy, the Council received instruction on two main points: (1) whether this language superseded past resolutions of the Procurement and Assignment Service which called on the Council on Industrial Health and the state medical society committees on industrial health to undertake certain functions in respect to procurement training and assignment of physicians for industry, and (2) whether this statement coincided with sentiment developed through field activity of the Council that the resources of county and state medical societies had not been fully explored as a means for bringing willing physicians and industrial opportunities together.

Reassurance was received that such facilities as the Council and its cooperating state agencies could bring to bear on this troublesome problem would be welcome. It was further suggested that the Central Board of Procurement and Assignment should be asked to reinform its regional and state chairmen to this effect.

### REPORT OF COMMITTEE ON EDUCATION AND PUBLICATIONS

Evidence was presented indicating that additional progress had been made in the development of courses of instruction in medical schools. A syllabus for a course in industrial health recently submitted to all approved medical colleges in the United States and Canada was ordered to be revised according to new advances made in the field.

The report also reviewed progress in postgraduate industrial medical teaching ranging from refresher courses to intensive teaching. Attention was called to the fact that there are at the present time no training appointments in the industrial field offering acceptable internship or residency experience. It was thought desirable to approach the Council on Medical Education and Hospitals for advice and encouragement along these lines.

The desirability of preparation of local health officers for industrial hygiene was reaffirmed as a means toward better acquaintance with industrial health problems by the profession at large. Particular mention was made of the difficulties of establishing a certification program in the industrial health field and the present status of that program.

The Council noted with interest the progress made toward the development of a joint program with the Council on Pharmacy and Chemistry with a view to preparing and publishing an industrial medical formulary. Steps required to appoint a suitable committee representing the Council on Industrial Health and the presentation of a proper request to the Council on Pharmacy and Chemistry in order that a similar subcommittee be set up in that body were approved.

The secretary was also instructed to obtain advice and active cooperation from the Bureau of Health Education of the A. M. A. in respect to a program of health education for labor organizations.

### REPORT OF COMMITTEE ON PHYSICAL EXAMINATIONS

In consideration of the importance of industrial physical examinations the committee was asked to continue its consideration of the subject with a view toward publication of a report at the earliest possible time.

### REPORT OF COMMITTEE ON OCCUPATIONAL DISEASE REPORTING

The Council registered its understanding that occupational disease reporting included absenteeism studies and expressed the hope that recommendations may be developed to improve medicine's contribution in this field.

## REPORT OF COMMITTEE ON WORKMEN'S COMPENSATION

A program for coordination of effort between the Council on Industrial Health, the Bureau of Legal Medicine and Legislation and the Council on Physical Therapy in the related fields of workmen's compensation and rehabilitation was regarded as a definite step forward.

The preparation of reviews concerning best prevailing medical opinion on medical subjects having some legal connotation was again proposed. It is the intention of the committee to proceed along these lines at the earliest opportunity. In this connection again the necessity for close cooperation with the Bureau of Legal Medicine and Legislation was emphasized.

The committee also recommended as a possible development for the future, a special conference to discuss the whole problem of workmen's compensation with regard to improved medical relationships and many other details of administration. Augmentation of the present personnel of the Committee on Workmen's Compensation to include experts in the fields of medicine, management, insurance, labor and others was looked on as urgently necessary.

It was pointed out that the National Tuberculosis Association is attempting to collaborate with the Council through the appointment of editorial writers to introduce the subject of industrial medicine in monthly publications. In addition, the Trudeau Society has appointed a Committee on Industrial Tuberculosis.

## REPORT OF COMMITTEE ON RESEARCH

The chairman reported several conferences with the chairman of the Committee on Occupational Pathology regarding the development of a registry of lung tissue from persons subjected to various industrial exposures.

The Committee on Research was instructed to interest itself in the possibility of clinical investigation through the cooperating committees in the sections of the A. M. A. and the availability of funds within the Association itself for the carrying on of such research.

## REPORT OF COMMITTEE ON AVIATION MEDICINE

The Council discharged its Committee on Aviation Medicine.

## INDUSTRIAL NURSING

The Council ordered the preparation of an Outline of Procedure for Nurses in Industry. It was recommended that in the preparation of this material special care be taken not to duplicate activity taking place in other organizations. In this connection consideration was given data submitted by the Committee to Study the Duties of Nurses in Industry of the Nursing Section of the American Public Health Association.

## NUTRITION IN INDUSTRY

The first meeting of the Joint Committee on Nutrition in Industry, made up of representatives from the Council on Industrial Health and the Council on Foods and Nutrition was described, together with plans for a symposium on nutrition in industry to be sponsored by this committee at the fifth Annual Congress on Industrial Health.

## INDUSTRIAL MEDICAL SERVICE PLANS

As soon as conditions warrant, information will be collected from likely sources on industrial medical service plans.

## LABOR ORGANIZATIONS AND INDUSTRIAL HEALTH

The general impression was that there should be closer contact with labor organizations and that some effort should be made to enlist their cooperation, both in the maintenance of industrial health services within the plant and in general programs of health education covering nonoccupational disability.

## REHABILITATION COUNCIL

The attention of the Council was directed to the formation of a Rehabilitation Council representing thirty-eight national agencies interested in the vocational and reconstructive phases of rehabilitation. Because of the Council's interest in the sub-

ject, and because the Council on Physical Therapy is represented on the Rehabilitation Council, and since furthermore, the question of rehabilitation will be of unusual importance during the present legislative year it was decided to create a liaison committee with the Council on Physical Therapy as a means of maintaining close contact with activities in the rehabilitation field and for the purpose of formulating reports and specific recommendations.

## THE U. S. MARITIME COMMISSION

The U. S. Maritime Commission wishes to enlist the help of the Council on Industrial Health to instruct physicians in the neighborhood of shipyards about special care required for workers who suffer from exposures which may not manifest themselves until after the men have left work.

## THE U. S. CHAMBER OF COMMERCE

Plans for an advisory health council in the Chamber of Commerce of the United States were described with particular reference to a subcommittee on industrial health and the possibilities for integrated educational programs for employers and physicians.

Dr. Stanley I. Seeger and Dr. Raymond Hussey were unanimously reelected as chairman and vice chairman respectively.

Names were submitted as nominations for expired terms in accordance with recently revised rules of the Council.

The next meeting of the Council was set tentatively for Sunday, June 6 in Chicago, just preceding the meetings of the House of Delegates.

## DOCTORS AT WAR

Radio broadcasts of Doctors at War by the American Medical Association in cooperation with the National Broadcasting Company and the Medical Department of the United States Army and the United States Navy are on the air each Saturday at 5 p. m. Eastern War Time (4 p. m. Central War Time, 3 p. m. Mountain War Time, 2 p. m. Pacific War Time). An exception is the Chicago area where the broadcasts are heard by transcription at 10-30 p. m. Saturdays over Station WMVQ.

The titles and guest speakers for the next four programs are as follows:

- April 17 Stratosphere Flight  
Speaker: Brig. Gen. David A. W. Grant, Air Surgeon, United States Army
- April 24 Sharp Lives  
Speaker: Lieut. Col. Harold C. Lueth, Liaison Officer, Surgeon General's Office, United States Army
- May 1 Jungle Death  
Speaker: Brig. Gen. C. C. Hillman, Chief of the Professional Services Office of the Surgeon General, United States Army
- May 8 'Drugs March to War'  
Speaker: Dr. Austin I. Smith, Secretary, Council on Pharmacy and Chemistry

## BEFORE THE DOCTOR COMES

The American Medical Association program on Radio Station WLS (890 kilocycles) entitled Before the Doctor Comes will be on the air every Thursday morning at 9-45 up to and including May 27. Mrs. June Merrill will interview Dr. W. W. Bruer, Director of the Bureau of Health Education, Dr. Edwin P. Jordan, Assistant Editor of THE JOURNAL or Dr. Austin I. Smith, Secretary of the Council on Pharmacy and Chemistry on common home health problems. The titles for the next four programs are:

- April 15 The Listless or Irritable Child  
(Jordan)
- April 22 What to Do About Bad Bumps  
(Bruer)
- April 29 What to Do About Bleeding  
(Bruer)
- May 6 What to Do About Foreign Bodies in Nose, Ear, Throat or Eyes  
(Smith)



## MEDICAL ECONOMIC ABSTRACTS

RETURN AND PAYMENT OF VICTORY  
TAX BY EMPLOYER

Physicians who have withheld the victory tax from wages paid employees must make a return and transmit that tax to the collector of internal revenue having jurisdiction on or before April 30, using form V-1 Return of Victory Tax Withheld. This form may be obtained from the collector's office and must be signed and sworn to by the employer. The duplicates of receipts given employees (form V-2) need not be forwarded to the collector at this time, they should be retained by the employer until the final return is made for the year, on or before Jan 31, 1944. In view of the severe penalties that may attach in event an employer neglects to transmit the withheld victory tax on or before the required date, physicians should transmit promptly the tax withheld during the months of January, February and March of this year.

MEDICAL CARE FOR WIVES AND  
CHILDREN OF ENLISTED MEN

The President on March 18 approved a deficiency appropriation bill making available to the Children's Bureau \$1,200,000 for grants to states to provide medical nursing and hospital maternity and infant care for wives and infants of enlisted men in the armed forces of the fourth, fifth, sixth and seventh grades. This appropriation will permit the continuation until June 30 of a program initiated last year and financed to date by federal allotments totaling \$390,177 set aside from the regular appropriation authorized for maternal and child health services under part 1, title V, of the Social Security Act. No more funds were available from that source hence the appeal to Congress for this deficiency appropriation. Legislation is pending in Congress to authorize additional funds so that the program may extend beyond the present fiscal year.

Regulations have now been promulgated by the Department of Labor, dated March 26, for the allotment of the \$1,200,000 to the several states.<sup>1</sup> These regulations provide that the sums paid to the states for emergency medical and infant care shall be used exclusively for medical, nursing and hospital maternity and infant care for wives and infants of enlisted men in the armed forces of the United States of the fourth, fifth, sixth or seventh grades, for whom similar care is not readily available from the medical or hospital facilities of the Army or Navy or from facilities provided by or through official state or local health agencies. The Secretary of Labor will allot to each state submitting a plan approved by the chief of the Children's Bureau a sum based on the estimated number of applications for care during the period covered by the plan and the esti-

mated cost of providing such care. A state plan must, among other things provide that the cost of administration in the state will be met from funds other than the sums allotted for emergency maternity and infant care that emergency maternity and infant care will be authorized under the plan as requested by or in behalf of any wife or infant of an enlisted man in the indicated grades, irrespective of legal residence, when similar care is not otherwise readily available and must provide for cooperation with medical nursing and welfare groups and organizations.

The chief of the Children's Bureau Katharine F. Lenroot appeared before a subcommittee of the House Committee on Appropriations, February 11 in support of the request for this additional appropriation. She pointed out that plans at that time had been approved and programs were going forward in twenty-seven states and that similar programs would be developed in at least sixteen additional states if more funds become available. A table was supplied to the subcommittee indicating that for the period August 1942 to February 1943 a total of 2,840 obstetric cases had been authorized for medical and hospital care in twenty-one states. Experience obtained during the then five past months Miss Lenroot said, showed that the demand for services was very great and that the sums available had not been sufficient to enable some states to accept all the cases for which application had been made. While the exact data on waiting lists were not available from all the states, it was known that one state had in December 1942 a waiting list of 300 and another of 400. Still another state was receiving applications at the rate of 12 a day and estimated an increase to 20 a day. At the request of the chairman of the subcommittee Miss Lenroot inserted in the record the requirements exacted of a state board of health as a condition to cooperation on the part of the Children's Bureau in connection with this program. The following was submitted in compliance with that request:

The Children's Bureau has informed the state health departments that the state plans for obstetric or pediatric medical and hospital care for women or children when the father is an enlisted man of the fourth, fifth, sixth or seventh grades in the Army of the United States, the United States Navy, the Marine Corps or the Coast Guard should provide efficient methods of administration of the plan by the state health agency including acceptance of cases regardless of legal residence, the establishment of methods of authorization for medical or hospital care, methods of referral of cases to public health nursing and social services as needed, the establishment of fixed rates of reimbursement for services rendered under the plan, safeguards of the quality of medical and hospital care.

Grants in aid will be made quarterly to the states on the basis of (1) current experience in each state with respect to the number of birth certificates issued showing the father to be in military service, (2) the cost of service per case within limits based on average cost of care for the area and (3) the number of authorizations per month.

It is expected that the administration of these funds will be in accordance with the conditions laid down in the Social Security Act, title V, part I, section 503 (a) items (2) through (6) inclusive under which the existing services comparable to those to be provided under this proposed appropriation are now administered.

1 8 Fed. Reg. 3859 March 30 1943

## WOMAN'S AUXILIARY

WOMAN'S AUXILIARY TO THE AMERICAN  
MEDICAL ASSOCIATION

Twenty-First Annual Meeting, June 7-9, 1943  
Drake Hotel, Chicago

A most cordial invitation is extended to all Auxiliary members and the wives of physicians attending the American Medical Association meeting to attend the sessions of the twenty-first Annual Meeting of the Woman's Auxiliary to the American Medical Association. Mrs. Rollo K. Packard is chairman of the Chicago Committee.

Headquarters will be in the Grand Ballroom of the Drake Hotel, where all meetings will be held. Please register early and obtain your badge and program. Tickets may be purchased at the registration desk.

All meetings will convene at the time scheduled. Please be prompt.

Registration, in the French Room Foyer

Sunday 2 to 4 p m  
Monday, 8 30 a m to 4 p m  
Tuesday, 8 30 a m to 4 p m

## Preconvention Meetings

SUNDAY, JUNE 6

3 p m Nominating Committee meeting, Parlor H (east mezzanine), chairman Mrs. Robert E. Fitzgerald  
7 p m Finance Committee meeting, chairman Mrs. Harold F. Wahlquist

## PROGRAM

MONDAY, JUNE 7

9 a m Meeting of the Board of Directors, Parlors F-G (east mezzanine), Mrs. Frank N. Haggard presiding  
12 30 p m Luncheon in honor of the past presidents of the Woman's Auxiliary to the American Medical Association. Gold

Coast Room Tickets \$2.25 (subject to market conditions and food administration regulations) Guest speaker Dr. Frank P. Hammond, chairman of the Advisory Committee of the Women's Auxiliary to the Illinois State Medical Society. Subject: Doctors' Wives—Medicine's Closest Ally.

### Convention Meetings

MONDAY, JUNE 7

2 p. m. Opening meeting of the House of Delegates of the Woman's Auxiliary to the American Medical Association, Grand Ballroom (lobby floor east), Mrs. Frank N. Haggard, President.

Invocation: Rev. Harrison Ray Anderson, Fourth Presbyterian Church, Chicago.

Address of Welcome: Hon. Edward J. Kelly, Mayor of Chicago.

Tribute to Deceased Members.

Introduction of Mrs. Rollo K. Packard, chairman of the Chicago Committee.

Presentation of the President-Elect, Mrs. Eben J. Carey.

Minutes of the Twentieth Annual Meeting: Mrs. Carlton F. Potter, Secretary.

Roll Call: Mrs. Carlton F. Potter.

Convention Rules of Order: Mrs. Silas S. Smith.

Credentials and Registration: Mrs. Arthur I. Edison.

President's Message: Mrs. Frank N. Haggard.

Reports of Officers:

Recording Secretary: Mrs. Carlton F. Potter.

Corresponding Secretary: Mrs. Scott C. Applewhite.

Treasurer: Mrs. David W. Thomas.

Auditor: to be read by the recording secretary.

Reports of Directors:

Mrs. R. E. Mosiman.

Mrs. James P. Simonds.

Mrs. John Baron Farley.

Mrs. W. K. West.

Mrs. Frank I. Davis.

Mrs. David B. Allman.

Mrs. William J. Butler.

TUESDAY, JUNE 8

9 a. m. General session of the Woman's Auxiliary to the American Medical Association, Grand Ballroom, Mrs. Frank N. Haggard presiding.

Minutes: Mrs. Carlton F. Potter.

Announcements.

Credentials and Registration: Mrs. Arthur I. Edison.

Resolutions: Mrs. James P. Simonds.

Reports of Chairmen of Standing Committees:

Finance: Mrs. Harold F. Wahlquist.

Hygiene: Mrs. George R. Dillingler.

Legislation: Mrs. Luther H. Rice.

Organization: Mrs. T. Mitchell Burns.

Press and Publicity: Mrs. George H. Hall.

Program: Mrs. William Hibbitts.

Public Relations: Mrs. Frank P. Dwyer.

Revisions: Mrs. Eustace A. Allen.

Report of Historian: Mrs. John J. Ryan.

Report of Bulletin Circulation and Central Office: Miss Margaret Wolfe.

Reports of state presidents.

12:30 p. m. Luncheon in honor of Mrs. Frank N. Haggard, President, Gold Coast Room. Tickets \$2.25 (subject to market conditions and food administration regulations).

Guest Speakers: Brig. Gen. Fred Rankin, President American Medical Association; Dr. James I. Paullin, President-Elect American Medical Association; Dr. Morris Fishbein, Editor THE JOURNAL and HEALTH.

## MEDICAL LEGISLATION

### MEDICAL BILLS IN CONGRESS

*Change in Status*—S. 400 has passed the Senate, a bill to reorganize the United States Public Health Service. The amendment declaring osteopaths eligible for appointment as reserve officers in the service was retained in the bill as passed by the Senate.

*Bills Introduced*—S. 927 introduced by Senator Thomas Oklahoma provides that the amount of disability compensation or disability allowance payable to any veteran under the World War Veterans' Act, 1924, as amended and supplemented shall not be reduced if such veteran (1) has attained or hereafter attains the age of 40, and (2) has received for a total period of five years or more disability compensation or a disability allowance for total permanent disability resulting from tuberculosis. H. R. 2308, introduced by Representative Lesinski, Michigan provides vocational rehabilitation for members of the Regular Establishment after termination of hostilities in the present war. H. R. 2326, introduced by Representative Bolton Ohio, provides that for the purpose of assuring a supply of nurses for the armed forces, governmental and civilian hospitals, health agencies, and war industries there will be authorized such annual appropriations as may be necessary. Such sums will be used in making payments to schools of nursing or other institutions which have submitted and had approved by the Surgeon General of the United States Public Health Service plans for nurses training. A plan for training of nurses may be limited to student nurse training or to postgraduate or refresher-nursing courses or may include both. The plans to be approved must provide, among other things, that the institution will pay student nurses a stipend at not less than the following monthly rates: \$15 for the first nine months of study; \$20 for the following fifteen to twenty-one months of combined study and practice depending on the curriculum of the institution. A plan must provide too that the institution will either afford student nurses under the plan an opportunity to complete their course of training until graduation and will pay such student nurse a stipend at a monthly rate of not less than \$30 for

the period following the period of combined study and practice prior to graduation or will transfer such student after completion of the period of combined study and practice prior to graduation, for training in some other institution. H. R. 2330 introduced by Representative Somers New York, would authorize an appropriation of \$1,500,000 to construct in the borough of Brooklyn, city of New York a modern, fireproof general medical and surgical hospital and domiciliary facility for the care and treatment of veterans with a capacity of at least 500 beds.

### STATE MEDICAL LEGISLATION

#### Kansas

*Bills Enacted*—S. Res. 25 was adopted March 12. It directs the legislative council to study the advisability and necessity for the inclusion in the benefits of the workmen's compensation act of workmen suffering from occupational diseases and further directs that the council make a report of its study at the next regular session of the legislature together with such recommendations as it may see fit to adopt. H. 332 was approved March 22. It requires every physician to take or cause to be taken a sample of blood of any woman whom he diagnoses as being pregnant such sample to be taken within fourteen days after the diagnosis is made.

#### Maine

*Bill Introduced*—H. 632 to amend the premarital examination law, was amended in the house by eliminating therefrom the provision authorizing a doctor of the armed forces of the United States to execute the required certificate.

*Bill Enacted*—S. 304 has become chapter 155 of the Public Laws of 1943. It amends the osteopathic practice act by authorizing approved osteopathic schools to give a course of instruction for a total of thirty-six months within a three to four year period when such school has adopted compressed or accelerated courses as a war emergency measure.

**Maryland**

*Bill Introduced*—H 644 proposes certain regulations concerning advertising by persons practicing medicine and surgery

**Michigan**

*Bills Enacted*—S 113 has become Public Act No 33 of the Acts of 1943. It amends the medical practice act by authorizing the Michigan state board of registration in medicine to suspend in whole or in part the educational requirements prescribed by the act at any time during the state of war now existing between the United States and various other nations. S 192 has become Public Act No 44 of the Acts of 1943. It amends the osteopathic law by authorizing the Michigan state board of osteopathic registration and examination to modify, by order, the educational requirements prescribed by the present act, during the present emergency.

**Minnesota**

*Bill Introduced*—S 1079 proposes the creation of a committee at least two members of which shall be doctors of medicine appointed by the council of the Minnesota State Medical Association, for the purpose of establishing standards and prescribing scientifically approved methods to secure the selection of children with an impaired sense of hearing and to institute an educational program for the prompt medical correction thereof.

**Missouri**

*Bills Introduced*—S 79 proposes a new law to be known as the Missouri Food, Drug and Cosmetic Act. Among other things, it proposes that a drug shall be deemed misbranded if it is sold at retail and contains any quantity of aminopyrine, barbituric acid, cinchophen, dinitrophenol, sulfanilamide, or their derivatives or any other drug which has been found by the board to be dangerous to health when used in the dosage or with the frequency or duration prescribed, recommended or suggested in the label thereof, unless such drug is sold on a written prescription signed by a licensed physician, dentist or veterinarian and its label bears the name and place of business of the seller, the serial number and date of such prescription, and the name of such physician, dentist or veterinarian. When sold on such written prescription such drug shall be exempt from the other provisions of the proposal. S 98 proposes the creation of a state board of examiners in the basic sciences to examine, in the subjects of anatomy, physiology, chemistry, bacteriology and pathology, all applicants for a license to practice any form of the healing art.

**Nebraska**

*Bills Enacted*—Bill No 40 was approved March 27. It requires each applicant for a marriage license to present a certificate signed by a duly qualified physician licensed to practice medicine and surgery in any state or United States territory, or any other person authorized by the laws of Nebraska to make such certificate, certifying that the applicant is not infected with syphilis in a communicable stage. Bill No 41 was approved, March 27. It requires every physician, or other person authorized by law to practice obstetrics, attending a pregnant woman to take a sample of blood of such woman at the first examination and submit such sample to an approved laboratory for a standard serologic test for syphilis.

**Nevada**

*Bill Enacted*—A 141 was approved March 20. It authorizes the board of medical examiners to grant qualified physicians a temporary license to practice medicine, surgery or obstetrics in any particularly specified part of the state for and during the period of time limited by the license. The law further authorizes the board of medical examiners from time to time to restrict, enlarge or change the territorial limits stated in such temporary license.

**New Jersey**

*Bills Introduced*—S 95 proposes the establishment of an elective system of compensation for silicosis and asbestosis. S 143 proposes to authorize the state department of health to

require a person suspected of suffering from a communicable disease, or suspected of being a carrier of such disease, to submit to a medical examination made by a physician or laboratory selected by the state department of health or the local board of health. S 158 proposes the establishment within the department of institutions and agencies of a division whose duty it shall be to study the causes, mortality rate, treatment, prevention and cure of cancer and allied diseases and proposes to authorize the department to make a careful study of the cancer situation in the state, organize cancer clinics at various points throughout the state, conduct a program of public education regarding the care, treatment and prevention of cancer and erect and maintain a state hospital wherein cancer patients may be received for care and treatment.

*Bill Enacted*—A 93 has become chapter 17 of the Laws of 1943. It amends the medical practice act by granting an extension of two years within which a licensee must furnish proof of his actually having become a citizen.

**New York**

*Bills Passed*—A 335 passed the assembly on March 16 and the senate on March 17. It proposes to authorize the state commissioner of health to employ necessary medical and health personnel for rendering services in areas designated by the governor as being emergency health and sanitation areas by virtue of an inadequacy of medical facilities or personnel therein. Compensation to such employed medical personnel may be paid by the state department of health. A 1923 passed the assembly on March 24 and the Senate on March 26. To amend the mental hygiene law, it proposes to eliminate the existing requirement that the head of the department be a reputable physician with at least ten years experience in the actual practice of his profession and at least five years actual experience in the care and treatment of persons afflicted with mental disease in an institution for their care and treatment. It then proposes to provide for the appointment of a medical director who shall be a reputable physician, a graduate of an incorporated medical college, with at least ten years experience in the actual practice of his profession and at least five years actual experience in the care and treatment of persons afflicted with mental disease in an institution for their care and treatment. The duties of the proposed medical director would be to advise with the commissioner on all matters affecting medical policy within the department, have direct charge and control, under the general departmental direction of the commissioner, of medical administration, care and treatment and of medical and nursing personnel and perform such other duties in the place and stead of the commissioner as may lawfully be assigned to him.

**North Carolina**

*Bills Enacted*—S 211 was ratified March 6. It amends the law relating to the incorporation of nonprofit hospital service corporations so as to authorize the operation of nonprofit medical service plans as well. The term 'hospital service plan' is defined as including the contracting for hospital care, laboratory facilities, x-ray facilities, drugs, appliances, anesthesia, nursing care, operating and obstetric equipment, accommodations and any other services authorized or permitted to be furnished by a hospital under the laws of North Carolina and approved by the North Carolina Hospital Association or the American Medical Association. The term medical service plan is defined as including the contracting for medical, obstetric, surgical and any other professional services authorized to be furnished by a duly licensed physician. S 254 was ratified, March 10. It authorizes the creation of a Hospital Authority to engage in hospital construction, maintenance and operation. H 174 was approved February 15. It amends the law relating to the disposition of dead bodies by, among other things, making available for distribution to medical schools for dissection purposes, by the Board of Anatomy, the bodies of Confederate soldiers and of soldiers, sailors and marines of the World War and their wives. Such bodies were not available under the prior law.

## Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST SUCH AS REFLECT TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

### ARIZONA

**State Medical Meeting**—The fifty-second annual meeting of the Arizona State Medical Association will be held at the Pioneer Hotel, Tucson, April 30 May 1 under the presidency of Dr. E. Payne Palmer, Phoenix. The preliminary program includes the following speakers:

- Dr. Clarence E. Rees, San Diego, Calif.: A New Method of Tendon Suture.
- Dr. Charles S. Kibler, Tucson: Demonstration of Heart Disease.
- Dr. Adrian E. Clark, Globe: A Case of Banti's Disease with Apparent Recovery.
- Dr. E. Henry Running, Phoenix: Vomiting During the First Few Days of Life.
- Dr. Melvin I. Kent, Mesa: Intractable Cystitis—Report of a Case.
- Dr. James M. Owens, Phoenix: Irritated Intervertebral Disk Diagnosis and Treatment.
- Dr. Archie P. Kimball, Yuma: An Outline of the Medical and Surgical Aspects of Commonly Used Sulfonamides.
- Dr. James Lytton Smith, Phoenix: Common Errors of Orthopedic Surgery.
- Dr. Howard C. James, Tucson: Maternal Deaths.
- Dr. Alexander N. Shoun, Benson: Rheumatic Heart Disease in Arizona.
- Dr. Paul Henry Case, Phoenix: Recent Advances in Ophthalmology of Interest to the General Practitioner.
- Dr. Charles A. Thomas, Tucson: Collapse Therapy for the Treatment of Tuberculosis in Patients of Advanced Years.
- Dr. Archie E. Cruthirds, Phoenix: A Brief Summary of the Present Treatment of Chronic Sinusitis.
- Dr. Philip H. Jovelsky, Morenci: A Case of Abdominal Pregnancy.
- Dr. Earle W. Phillips, Phoenix: Relief of Allergic Premenstrual Headache.
- Dr. Victor S. Randolph, Phoenix: Results of Thoracoplasty—A Five and Ten Year Study.

### CALIFORNIA

**Court Nullifies Revocation of License**—A writ of mandate, issued by the San Francisco Superior Court, nullifying the revocation of the license of Dr. George C. H. McPheeters, Fresno, by the state board of medical examiners has been entered in the medical register in the Fresno County clerk's office, newspapers reported February 6. Dr. McPheeters' license to practice was revoked by the state board Oct. 21, 1942 following a hearing in Sacramento in which he was said to have been found guilty of offering to procure an abortion.

**Increase in Infant Mortality**—With 21 infant deaths reported for the week ended March 13, the San Francisco Department of Public Health announces a new high in infant mortality. This group brings the total for the first ten weeks of the year to 120 infant deaths under 1 year, 50 for January, 38 for February and 32 for the first two weeks of March. The department points out that of the 120 deaths, 27 were among nonresidents of the city and county of San Francisco. Fifteen of the group of infants died from enteritis (under 2 years) and 10 of congenital heart disease. Thirty-four deaths were attributed to prematurity.

### FLORIDA

**Personal**—Dr. Henry E. Palmer, Tallahassee, was guest of honor at a dinner recently in recognition of his completion of fifty years in the practice of medicine.—Dr. Elwyn Thomas Sellers, Jacksonville, was recently guest of honor at a gathering given to celebrate his fifty-sixth birthday. Dr. Robert B. McIver, Jacksonville, was host to the one hundred and seventy-five physicians who attended.—Dr. Noble A. Upchurch, who has been health officer of Jacksonville since 1925, resigned January 1 on account of ill health. He has been succeeded by Dr. Wieland W. Rogers, who has been connected with the department for about fourteen years.—Dr. P. T. McClellan was recently appointed health officer of Vero Beach.

**Resolution on Temporary Licenses**—The Lake County Medical Society on March 4 expressed its opposition to the licensing of or granting temporary permits to physicians who have not provided themselves with licenses through the regular channels provided by the state laws, except in counties in which there is an actual shortage of physicians. The society recommended that the county medical society in that county in which "emergency exists" shall request that a temporary permit be granted to physicians who have not provided themselves for licenses through the regular state channels. The resolution adopted by the society urged that such temporary

permits be terminated at the end of the present emergency. The society expressed its agreement with the state board of medical examiners in its effort to protect the interests of Florida licensed physicians both at home and in the armed forces.

### NEVADA

**New Secretary of State Association**—Dr. Moreton J. Thorpe, Reno, has been appointed secretary of the Nevada State Medical Association to succeed Dr. Roland W. Stahr, Reno, who has been called to active military duty. Dr. Thorpe graduated at the University of California Medical School, San Francisco, in 1932.

### NEW HAMPSHIRE

**Personal**—Dr. Gene B. Haber, formerly of Philadelphia, U. S. Public Health Service, was recently assigned as health officer of the Eastern District of the New Hampshire State Board of Health with headquarters at Exeter. He succeeds Dr. Edward W. Colby, who is now in charge of the division of epidemiology of the state board of health at Concord.

**Name of Department of Health Changed**—Under the terms of a recently enacted law which becomes effective on July 1 the state board of health is for administrative purposes to be officially known as the "State Department of Health of New Hampshire." The title of the executive officer will be state health officer instead of secretary as in the past. The act also prescribes that the latter who also serves as secretary to the board, shall be a physician and a person with knowledge of and experience in public health work and sanitary science and shall be the registrar of vital statistics of the state. As in the past the board is composed of the governor and the attorney general as ex officio members and with five others of whom three are physicians, one a civil engineer and one who is neither a physician nor a civil engineer (the latter at the present time a pharmacist). According to *New Hampshire Health News* a new division of diagnostic laboratories is now located at the state hospital, Concord.

### NEW JERSEY

**Dr. John Baker Lectures for Cereal Chemists**—John C. Baker, Ph.D., chief chemist of Wallace & Tiernan Company, Inc., Newark, was chosen by the American Association of Cereal Chemists to lecture throughout the country on "Gluten and Its Relation to Flour Constituents in Bread Making." Dr. Baker spoke in Columbus, Ohio, March 27; Fort Worth, Texas, March 31; Manhattan, Kan., April 3; Winnipeg, Canada, April 5; Minneapolis, April 7; and Chicago, April 9. This is the second year that the American Association of Cereal Chemists has chosen one of its members to lecture to its sections throughout the country on special research work.

### NEW YORK

**County Society Votes to Bar Alien Physicians**—The Erie County Medical Society recently unanimously voted to bar from its membership "physicians who are not United States citizens." The action was taken "to protect the postwar interests of the physicians called to war," it was reported.

**Amebic Dysentery at State Hospital**—An investigation is under way at Creedmoor State Hospital, Queens Village, to determine the cause of an outbreak of amebic dysentery. Since last June 97 cases have occurred. Of this number 16 patients and 6 employees had been "clinically sick," with 11 employees and 26 patients mildly affected, newspapers reported. In addition 38 "carriers" of the organism were found. On March 18 only 1 person at the hospital was actually ill with the disease, although 35 to 40 patients and employees were still isolated.

### New York City

**Personal**—Dr. Howard Fox has been appointed consultant in tropical medicine to the Secretary of War.—Dr. Thomas A. Gonzales, chief medical examiner of the City of New York, has been made an honorary member of the Asocacion Medica Argentina.

**Physicians' Orchestra Suspends Activities**—The Doctors Musical Society of Brooklyn has been compelled to suspend activities for the duration because of the loss of many of its members to the armed services.

**Missing in Action**—Capt. A. Leonard Hymes, M. C., Army of the United States, Brooklyn, while on active duty with the air corps somewhere in the South Pacific has been reported missing in the service of his country. Captain Hymes graduated at the New York University College of Medicine in 1939.

**The First Bela Schick Lecture**—Dr William E Ladd, professor of child surgery, Harvard Medical School Boston, will deliver the first Bela Schick Lecture at Mount Sinai Hospital, April 13 His subject will be 'Time and Choice of Operation in Early Life' The lecture is one of a series planned in honor of Dr Bela Schick now consultant and formerly pediatrician in chief at the Mount Sinai Hospital and is made possible by a fund contributed in 1942 by friends and associates of Dr Schick

### OHIO

**Missing in Action**—Lieut Aaron S Michelson Cincinnati, medical officer of the destroyer U S S *Laffey* has been officially reported missing The *Laffey* was one of seven U S destroyers lost in an engagement at Guadalcanal Press reports indicate that Lieutenant Michelson was trapped below deck while helping remove wounded sailors from the doomed vessel Before entering the Navy in May 1942, he had been chief resident at the Jewish Hospital, Cincinnati and assistant clinician in general medicine at the Cincinnati General Hospital

**Personal**—William S Keller senior surgeon, U S Public Health Service Reserve regional medical officer, Fifth Civilian Defense Region, Cleveland recently bestowed a citation on Dr Clyde M Fitch chief of emergency medical service in Portsmouth and Dr Orville J Walker, chief of emergency service in Youngstown for "outstanding accomplishments and efficiency in organizing the civilian defense setup"—Dr Irvin Abell, Louisville, Ky, was presented with an honorary degree of doctor of laws during the recent annual commencement of the University of Cincinnati College of Medicine

**Institute of Medical Research Dedicated**—The Institute of Medical Research at the Toledo Hospital, Toledo was dedicated on March 27 The institute is housed in a new two story building made possible by an endowment from the late Frank Collins of the National Supply Company, Toledo The staff includes a biochemist, nutritionist, bacteriologist, pathologist and biophotographer under the direction of Dr Bernhard Steinberg, Toledo The staff will be augmented by a physiologist, biophysicist and pharmacologist Provision has been made to accept fellows in medical and dental research The institute will not be devoted to the study of a single disease but will maintain interest in diseases in general, depending on the availability of the personnel Dr Cyrus C Sturgis professor of internal medicine and director of the Thomas Henry Simpson Memorial Institute for Medical Research University of Michigan Medical School, Ann Arbor, gave the dedicatory address on "The Future of Medical Research" Other speakers included Frank Adams, chairman of the research board Reverend Russell J Humbert, pastor of the Epworth Methodist Church, and the Honorable Lloyd Roulet, mayor of Toledo

### PENNSYLVANIA

**Society News**—Dr Benjamin H Shuster, Philadelphia discussed vertigo before the Reading Eye, Ear, Nose and Throat Society recently At a meeting of the Fayette County Medical Society in Uniontown, April 1, Dr Joseph V Marnell spoke on diagnosis and management of deep neck infections

### Philadelphia

**Committee on Physicians' Health**—The Commission of Physicians' Health of the Philadelphia County Medical Society has been temporarily disbanded because of the number of physicians in the vicinity who are in the armed forces and the death of the chairman of the commission Dr James Alexander Clarke Jr One of the commission's principal objectives was to carry out periodic health examinations of members of the society

**Annual Postgraduate Institute**—The Philadelphia County Medical Society will hold its eighth annual postgraduate institute at the Benjamin Franklin Hotel, May 11-14 About seventy speakers will participate, their presentations covering a wide range of medical subjects On Monday evening May 10 a joint meeting of the Philadelphia Health Association and the section on medicine of the Philadelphia College of Physicians will be addressed among others by Dr Clarence E de La Chapelle New York, on the 'Treatment of Coronary Thrombosis'

**Herbert Fox Memorial Fellowship**—David L Coffin, DVM, instructor in veterinary pathology at the University of Pennsylvania, has been appointed to the Herbert Fox Memorial Fellowship in comparative pathology at the Zoological Society of Philadelphia Dr Coffin who is the first incumbent of the fellowship, will serve as assistant to Herbert L Ratchiffe ScD, recently appointed director of the Penrose Research Laboratory of the Zoological Society and assistant

professor of comparative pathology at the University of Pennsylvania The fellowship was established in 1942 by the Zoological Society in memory of Dr Herbert Fox, pathologist and director of the Penrose Laboratory from 1907 to 1942 and professor of comparative pathology at the university from 1927 to 1942 It provides for half time work at the Zoological Garden by faculty members of the School of Veterinary Medicine of the university who are interested in the diseases of wild animals

### Pittsburgh

**Hospital News**—A new addition to St Joseph's Hospital and Dispensary costing \$500,000 was opened on March 19 The new unit offers advanced facilities for the treatment of pediatric, gynecologic and maternity patients as well as for general and special x-ray diagnosis and therapy The hospital, with the new addition now has a capacity of 250 beds

**Society News**—The Pittsburgh Surgical Society was addressed March 25 by Drs Theodore S Swan on 'Surgical Aspects of Diverticulitis' William S McElroy dean of the University of Pittsburgh School of Medicine Effect of the Army and Navy Collegiate Program on Medical Education and Herbert Frankenstein, 'Acute Inflammation of the Appendices Epiploicae'

### VERMONT

**New Blood Bank at Medical School**—A blood plasma bank was formally opened on March 19 in space provided by the University of Vermont College of Medicine Burlington The bank is a cooperative one in which the state contributed \$3000 of the \$30,000 which was collected in a statewide campaign Dr Wendell E James, associate professor of bacteriology and clinical pathology at the school is director of the bank and processing laboratory There are fourteen hospitals in the state that are cooperating and the bleeding is to be done at these hospitals, the donors registering with the local Red Cross agencies The blood is to be shipped to the laboratory for processing and each hospital is allocated 1 unit for each bed until the total bank reaches 2000 units Plasma will be available not only for civil defense but for civilian needs also and if, as is expected there is a surplus above this point it will be donated to the military service

### VIRGINIA

**Stuart McGuire Lectures**—Dr Philip D Wilson, clinical professor of orthopedic surgery, Columbia University College of Physicians and Surgeons, New York gave the fourteenth annual Stuart McGuire Lectures at the Medical College of Virginia, Richmond February 25-26, on 'The Treatment of War Injuries, Especially Compound Fractures' and 'Amputations in Wartime' The lectures were given in conjunction with the spring postgraduate clinic, consisting this year of a symposium on low back pain Speakers in the symposium included Dr Emil J C Hildenbrand associate professor of clinical surgery Georgetown University School of Medicine Washington D C from the point of view of the physical therapist and the following physicians from the staff of the medical school Drs Henry Page Mauck professor of clinical orthopedic surgery Claude C Coleman professor of neurologic surgery James Asa Shield assistant professor of neuropsychiatry, and Randolph H Hoge, assistant professor of gynecology

### WEST VIRGINIA

**Medical Consultant for Bureau of Hygiene**—Dr Henry M Brown, industrial physician at the du Pont plant at Belle, has been appointed medical consultant for the bureau of industrial hygiene of the West Virginia State Department of Health While he has been appointed to succeed Dr John W Crosson, who was director of the bureau until his resignation to become industrial consultant for Sharp & Dohme, Philadelphia, Dr Brown will serve in a consulting capacity only

**Personal**—Norman H Baker DDS Charleston has been reappointed as the dental member of the Public Health Council of West Virginia for the term ending June 30 1945—Dr Benjamin E Hodge, Clarksburg representing the West Virginia State Medical Association has been appointed a member of the West Virginia State Nutrition Committee succeeding Dr James Lewis Blanton Fairmont who has entered the U S Army Medical Corps—Dr Erlond H Hedrick has been appointed medical superintendent of Pinecrest Sanitarium Beckley succeeding Dr Kyle M Jarrell, who had held the position since 1933

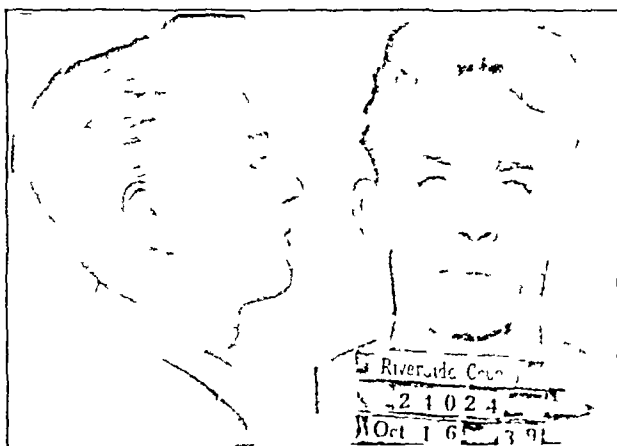
**Committee to Study Medical Care and Hospital Service**—A fact finding and planning committee has been appointed by Dr Robert J Wilkinson Huntington president of the state medical association, to study prepayment plans

providing medical care and hospital service. The appointment of the committee followed the recent passage of a bill providing for the operation of hospital service plans in West Virginia. The bill is effective only until Feb 28 1945 and the new committee will endeavor to draft a bill for introduction to the next session of the legislature that meets with the approval of the medical profession and hospitals in West Virginia. The committee will also study the possibility of establishing a full time trained health personnel for every county or group of counties in the state, the treatment and control of tuberculosis together with the problem of handling tuberculous patients and the management of state tuberculosis sanatoriums and hospitals for the treatment of mental diseases. Members of the new committee are Drs Ray M Bobbitt Huntington chairman Delwin A MacGregor Wheeling Thomas L Harris Parkersburg John P Helmick Fairmont Frank A Langfitt Clarksburg Carl E Johnson Morgantown Frank J Holmrod Princeton Benjamin H Swint Charleston and Hu C Myers Philippi.

### GENERAL

**Meetings Canceled**—The American Society for Clinical Investigation has canceled its thirty-fifth annual meeting which was scheduled for Atlantic City May 3.—The Association of American Physicians has canceled its annual meeting scheduled for Atlantic City N. J., May 4-5.

**Seek Apprehension of Male Nurse**—Robert Edward White nurse and ex convict is wanted by the San Francisco Police Department because of an alleged theft of \$1400 from



Robert Edward White

a patient. White disappeared and according to Charles W. Dullea, chief of police of San Francisco, is expected to seek employment in a hospital as soon as the money is gone. His social security number is 526 22-9810. He is 42 years old, 5 feet 5½ inches tall, weighing 150 pounds and has blue eyes and brown bushy hair. A peculiarity is that his eyebrows run across his nose. He is a native of Missouri. Any one recognizing this man is urged to communicate with the local police department immediately.

**Lilly Prize Awarded to Dr Carter**—Herbert E. Carter, Ph.D., assistant professor of chemistry, University of Illinois Urbana, will be presented with the \$1000 Lilly & Co. Prize in biological chemistry for 1943 at the annual meeting of the American Chemical Society, Detroit, April 14. Dr. Carter, who is 32 years of age, was awarded the prize in recognition of his studies on amino acids, the building blocks of proteins and of fatty acids.

**The Interne Continues Publication**—The Association of Internes and Medical Students announces that despite a rapidly changing staff the *Interne*, the official journal of the association, will continue publication, featuring articles on the armed services and other aspects of the war effort which are of particular interest to medical students and physicians. The present staff includes Dr. Jerome M. Schneek and Nathaniel Gottesman, editors; Dr. Kenneth L. Zisler, Baltimore, features; Dr. John L. Simon, Brooklyn, books; Dr. Leon N. Greene, New York, humor; and Mr. Julian Farren, managing editor. Communications should be addressed to Dr. Schneek, 40 East Tenth Street, New York.

### CANADA

**Woman Graduate Honored**—Dr. Augusta Stowe Gullen, Toronto, Ont., reported in the *Canadian Medical Association Journal* as the first woman to obtain her medical degree from a Canadian university was recently paid special tribute in recognition of her sixtieth anniversary of graduation from medical school. Dr. Gullen's mother, Dr. Emily Howard Jennings Stowe, was the first woman to practice medicine in Canada but she obtained her degree in New York according to the *Canadian Journal*. At the opening of the Ontario Medical College for Women, Toronto, Dr. Gullen was appointed demonstrator of anatomy, later lecturer on children's diseases and subsequently professor of pediatrics, a position she held until the women's medical college was amalgamated with the University of Toronto. She served in the senate of the University of Toronto from 1910 to 1922.

**Canadian Association Holds Special Meeting of Council**—For the first time the council of the Canadian Medical Association called a special meeting, January 18-19, to discuss health insurance and other urgent matters under consideration by the executive committee. Unanimous approval was given to a resolution that the association adopt the principle of health insurance favoring a plan 'which will secure the development and provision of the highest standard of health services, preventive and curative, in such plan be fair both to the insured and to all those rendering the services.' At this meeting a report of the department of cancer control was submitted which urged that cancer be made a reportable disease in the Dominion and the appointment of a commission whose responsibilities would be to correlate all data incident to cancer for educational and statistical purpose, to establish cancer treatment centers to administer all grants, gifts and bequests for cancer work, to concern itself with the problem of the transportation of patients who live at a distance from a treatment center and to foster research in cancer. The association decided to let its annual meeting in Montreal take the form of a business meeting; the executive committee will meet June 12-13 and the general council June 14-15.

### Deaths in Other Countries

**Major General Amin Fahd Maluf Pasha, M.D.** formerly principal medical officer of the Iraqi army, died at his home in Helopolis, Egypt, on January 21 in his seventy-first year. He began his career in military medicine as an officer in the Egyptian army and served a few years in the Sudan. On the Arabian revolt in the last war he resigned his position in the Egyptian army and joined King Faisal's troops as a surgeon. He was decorated ten times. A graduate of the American University Beirut, Major General Maluf was elevated from a colonelcy and created a pasha on his retirement about fifteen years ago. His latest works are 'An Arabic Zoological Dictionary' and 'An Astronomical Glossary.'

## Government Services

### Dr. Sherman Heads Bureau of Human Nutrition

Henry C. Sherman, Sc.D., Mitchell professor of chemistry, Columbia University, New York, has been appointed head of the newly established bureau of human nutrition and home economics of the United States Department of Agriculture, Washington, D.C. Dr. Sherman has been at Columbia University since 1897.

### Dr. DeLien Named Assistant in Office of Indian Affairs

Dr. Horace DeLien, special expert in tuberculosis in the Office of Indian Affairs, has been appointed assistant to the director of health, Dr. John R. McGibony, Chicago, succeeding Dr. Lawrence W. White, Chicago. Dr. DeLien graduated at the University of Minnesota Medical School, Minneapolis, in 1933 and engaged in private practice in Moberly, S.D., for several years. Prior to entering the Indian Service in 1938 he was director of the Pennington County Health Unit in South Dakota, with headquarters in Rapid City. In 1941 he was transferred from his work as special physician in tuberculosis control of the Indian Service for California, Nevada and Utah to additional responsibilities as special expert in tuberculosis.

## Foreign Letters

### SWITZERLAND

(From Our Regular Correspondent)

Feb 20, 1943

#### Nutrition of Infants and Children in Wartime

The nutrition of infants and children in wartime was discussed at the latest meeting of the Swiss Society of Pediatrics. On the basis of the papers read the resolutions stressed the importance of breast milk for nurslings. Adults can live without milk, children cannot. All milk products are to be reserved for infants and patients, and their sale to other persons is to be prohibited. A ration card for infants and a similar one for children to the end of the fifth year of life were proposed. They provide the following:

(a) A rationing card for infants which is to be used to the end of the first year of life

	Per Day	Per Month
Milk	660 Gm	20 liters
Sugar	40 Gm	1 200 Gm
Rice	20 Gm	600 Gm
Grits	20 Gm	600 Gm
Flour	20 Gm	600 Gm
Butter	10 Gm	300 Gm
Cheese	5 Gm	150 Gm
Cocoa or tea		100 points
Eggs		2

(b) A ration card for children, which is to be used to the end of the calendar year in which the child completes its fifth year

	Per Month
Cereaceous foods	
Rice, oats or barley	750 Gm
Flour, grits, maize	750 Gm
Baked foods	250 Gm
Bread	4 500 to 6 000 Gm
Sugar	1 000 Gm
Milk	20 liters
Oil or fat	100 Gm
Butter	400 Gm
Potatoes	4 500 Gm
Cheese	150 Gm
Meat	500 Gm
Legumes	100 Gm
Eggs	4
Cocoa or chocolate	200 points

Lactic acid is to be reserved for the preparation of lactic acid milk for nurslings and for the preparation of lactic acid powdered milk.

Pediatricians have lodged a complaint regarding the advertising methods of manufacturers of special food preparations for children. The pediatric society passed a resolution which objected to the practice of certain producers of special nutrient substances for children. The resolution points out that their propaganda methods are no longer compatible with the welfare of the population in general. It is intolerable that representatives of these manufacturers or children's nurses who have been hired for the purpose, urge mothers to depart from the food formulas prescribed by physicians and use their canned products instead.

Swiss pediatricians emphatically object that physicians or the editors of periodicals who point out that the healthy child does not need special nutritional preparations and that they represent an unnecessary increase in food costs are called to account by these manufacturers of special nutrient substances and are threatened with legal and economic reprisals.

Swiss pediatricians are of the opinion that manufacturers of nutrient substances are not dependent on such methods of advertising and therefore urge these firms to refrain from this practice.

#### Feeding of Patients Under Swiss Food Rationing

A committee for war nutrition has existed in Switzerland since the beginning of the war. Prof. Dr. Alfred Fleisch, physiologist of the University of Lausanne is its president. This committee has formulated guiding principles for physicians on the feeding of patients under food rationing. In October 1942 new regulations became necessary because the food supply of the country had taken an unfavorable turn and a number of new measures became necessary, for instance bread and milk had to be included in the rationing. Whereas formerly 3 000 calories was regarded as a basis for the daily requirements, it became necessary to reduce it to 2 400 calories (protein 80 Gm, fat 55 Gm and carbohydrates 400 Gm). Additions can be granted only if the health of a person makes this absolutely essential. Excessive special grants may jeopardize the entire food balance of the country. Instead of computing optimum figures the physician must now consider minimum figures.

Exact regulations have been formulated with regard to permits for additional rations by physicians. These are based as far as possible on the principle of compensation, that is one food is exchanged against another one that is more suitable in the particular disorder. The measures to effect savings go so far that for bedridden patients from 1 800 to 2 000 calories is estimated as adequate. Only patients with prolonged disorders are entitled to special rations. For short illnesses rations are not usually granted. Convalescents likewise are not entitled to special rations. Only five groups of patients are to receive special rations: those with gastrointestinal disorders, diabetes, hepatobiliary disorders, renal diseases and tuberculosis. In other types of disorders special rations are to be granted only in exceptional cases. Officially approved physicians are to make the decisions regarding requests for special rations. A detailed table has been made up to estimate rations for patients and this table has been further amplified by special regulations. These amplifications are concerned with the granting of eggs instead of meat, with nutritive preparations, children's foods, coffee, tea, cocoa, honey and oils and fats for medical purposes. Other regulations are concerned with the consumption of meat on meatless days, special rations for blood donors, white bread for persons with gastrointestinal disorders, children's rations, sweetening substances for diabetic patients and so on. All this indicates that in Switzerland it has become necessary to introduce extreme restrictions even as regards patients.

#### Porphyrins in the Healing of Wounds

Prof. Dr. Emil Buerger of Bern discussed the use of porphyrins in the healing of wounds in the Medical Society of Bern on the basis of observations made in the Pharmacologic Institute of which he is the head. The porphyrin ring develops when four pyrroles are linked together by CH groups. Depending on whether the free valences of the N atoms in the ring are replaced by iron or magnesium there develops blood pigment, chlorhemin or chlorophyll.

The tonizing and wound healing action of the porphyrins was studied in 300 rabbits in which two pieces of skin were cut out on symmetrical sites of the back. The defects were subjected to comparative treatment by porphyrin ointments, pure ointment bases and other ointments. The efficacy of the examined substances could be estimated only on the basis of rapidity and perfection of the resulting regeneration because every wound left to itself heals automatically. Furthermore, individual differences in the reaction capacity of the individual animals had to be considered.

Studies were made on chlorophyll, blood pigments and muscle porphyrins. The raw chlorophylls, the pure extracts as well as the water soluble chlorophyll sodium which contain magnesium in the porphyrin ring, have an excellent curative effect on



wounds. Other plant pigments such as carotene and vitamin A have only a slight effect, and riboflavin and vitamin C have no influence at all.

The blood pigments exert the same effect on wounds as does chlorophyll. However, it is peculiar and unexplainable that the nonferric derivatives of hemoglobin, hematoporphyrin and even bilirubin have a noticeable healing effect on wounds, whereas phenophytin, which is free of magnesium, has no effect whatever. The muscular porphyrins and muscular pulp were found extremely effective. The porphyrins greatly stimulate the formation of granulations, but they influence epithelialization only slightly. Their toxicity is negligible. A disinfecting action of the porphyrins could not be ascertained, in contradistinction to the observation of the American Gruskin.

## BRAZIL

(From Our Regular Correspondent)

March 17, 1943

### Vital Statistics of Rio de Janeiro

Provisional vital statistics for the city of Rio de Janeiro for the year 1942 are now available. The figures may be compared to those for 1941 (*THE JOURNAL*, May 2, 1942, p. 96). The population of the city as of July 1, 1942 was 1,853,264. The number of deaths from all causes was 32,502, giving an annual crude death rate of 17.54 per thousand of population, which is slightly lower than that of the previous year (17.89) and that of the average for the five year period 1937-1941 (17.60). The number of live births registered was 39,211, giving a birth rate of 21.15, which is a much better figure than that of the previous year (19.28). The vital index was 121, an improvement over the 1941 figure (108). The number of deaths in the age group 0-1 year was 6,015, which corresponds to the high rate of 153 infant deaths per thousand live births, nevertheless a little better than the rate for the previous year (180). The fetal mortality was 77.73 per thousand total births, as 3,304 stillbirths have been registered. The number of deaths from causes related to pregnancy, childbirth and the puerperium was 304 corresponding to a maternal mortality rate of 7.75 deaths per thousand live births, or 1 maternal death in 129 live births.

First as a cause of death are "all forms of tuberculosis," with a total of 5,773 deaths (5,606 from tuberculosis of the respiratory apparatus), or 17.76 per cent of the total of deaths from all causes—a crude specific death rate of 312 per hundred thousand of population as against 316 in the previous year. Tuberculosis is still a very important problem of the city in spite of the efforts made by the health department in the past years. The rest of the "infectious and parasitic diseases" caused 4,571 deaths, which, with the deaths from tuberculosis, gives a total of 10,344 deaths from infectious and parasitic diseases (31.83 per cent of the deaths from all causes). Of this total 116 were from typhoid, which corresponds to an annual death rate of 6.26 per hundred thousand, against 7.17 in 1941 and 7.10 in the five year period 1937-1941. The other principal infections were dysentery, mainly bacillary, with 334 deaths (18.02 per hundred thousand), measles with 322 deaths (17.37 per hundred thousand), whooping cough with 277 deaths (14.95 per hundred thousand), diphtheria with 143 deaths (7.72 per hundred thousand), malaria with 195 deaths (10.52 per hundred thousand), influenza with 1,222 deaths (65.94 per hundred thousand), leprosy with 52 deaths (2.81 per hundred thousand) and poliomyelitis with 3 deaths (0.16 per hundred thousand). Tetanus (about 50 per cent umbilical) caused 210 deaths (11.33 per hundred thousand). The annual death rates from these infections for 1941 and for the five year period 1937-1941 were respectively,

dysentery 14.06 and 14.40 per hundred thousand, measles 12.02 and 14.61, whooping cough 15.60 and 15.42, diphtheria 10.59 and 8.41, malaria 12.07 and 12.50, influenza 60.65 and 55.30, leprosy 3.14 and 3.62, poliomyelitis 0.05 and 0.41 and tetanus 11.69 and 10.11. In 1942 cancer caused 1,248 deaths, or 67.34 per hundred thousand (66.44 in 1941), thus being on a continuous increase since 1903-1907, when the mean annual crude death rate was 34.75.

The second most important single group of causes of death is that of the diseases of the circulatory system, represented by a total of 5,717 deaths, or 17.59 per cent of the deaths from all causes, which corresponds to the rate of 308 per hundred thousand (308 in 1941). Out of this total 4,533 deaths have been reported as due to diseases of the heart which corresponds to the rate of 245 per hundred thousand (217 per hundred thousand in 1941). This represents a new increase in the number of deaths from diseases of the heart. The crude annual specific death rate from diseases of the cardiovascular system is on a rapid increase in Rio de Janeiro as clearly shown by these figures: 178 in 1932-1936, 235 in 1937-1941 and 308 in 1942.

The third leading group of causes of death is that of the diseases of the digestive apparatus represented by 5,139 deaths, or 15.81 per cent of the deaths from all causes which corresponds to the rate of 277 deaths per hundred thousand of population (275 in 1941). The bulk of these deaths is reported under the title of "diarrhea and enteritis under 2 years" (3,573 deaths), which is the largest contribution to the infant mortality—an average of 39 per cent of the infant deaths in Rio de Janeiro are classified as due to diarrheal diseases. The number of deaths registered as caused by appendicitis was 99 (102 in 1941), and that caused by diseases of the liver and the biliary ducts was 409 (418 in 1941), which correspond respectively to 5.34 and 23.63 per hundred thousand of population. The diseases of the nervous system have caused 1,222 deaths, or 65.94 per hundred thousand (71.17 in 1941), the largest contribution being from "intracranial lesions of vascular origin" (876 deaths, or 47.27 per hundred thousand). The total number of deaths registered as caused by diseases of the respiratory apparatus was 3,724 or 11.45 per cent of the total from all causes, and a death rate of 201 per hundred thousand (215 in 1941). The diseases of the genitourinary system have caused 1,431 deaths, or 4.40 per cent of the total from all causes which corresponds to 77.21 per hundred thousand (74.93 in 1941).

Puerperal septicemia and infection were the cause of 126 deaths, or 41.45 per cent of the maternal deaths (one death in 321 live births as against one in 282 in 1941). Violent deaths were 1,214, or 3.73 per cent of the total of deaths from all causes, which corresponds to the rate of 65.51 per hundred thousand (66.44 in 1941). Out of this total, 198 deaths have been caused by motor vehicle accidents, or 10.68 per hundred thousand, as against 17.92 in 1941, the decrease corresponding to the sharp reduction in automobile traffic due to gas rationing.

## Marriages

JOSEPH A. FIORITO, New Haven, Conn., to Miss Edith Patricia Hawley of Montreal, Que., Canada, March 18.

EDWARD GORDON BILL, Jr., Bronxville, N. Y., to Miss Rose Elizabeth Hynes of New York, March 23.

OMAR GARFELD to Mrs. Martha Carr Moon, both of Chicago, in Carson City, Nev., recently.

REUBEN LEASS, Frammingham, Mass., to Miss Mae Kripke of Boston, March 21.

HARRY E. GRANT, Easton, Ill., to Miss Marietta Crosthwait of Chicago in March.

## Deaths

**Grant Charles Madill** © Ogdensburg, N Y, long a member of the House of Delegates of the American Medical Association, died, March 26 of myocarditis and cerebral hemorrhage aged 78. Dr Madill was born in Stockton, Calif, July 6 1864. His early education was received at the Ogdensburg Free Academy, Potsdam, N Y, and the state normal school. In 1886 he graduated at the Bellevue Hospital Medical College, New York. Following his internship at the Presbyterian Hospital and Sloane Hospital for Women, New York. Dr Madill joined the staff of the A Barton Hepburn Hospital, Ogdensburg, serving there as chief surgeon since 1888.

Dr Madill was a regent of the University of the State of New York, a fellow of the American College of Surgeons a member of the New York Academy of Medicine American Association for the Advancement of Science and the Alumni Association of New York University. In 1908 he received a doctor of laws degree from the St. Lawrence University, Canton N Y, and in 1932 one from New York University. He was president of the Medical Society of the State of New York in 1919, serving as trustee from 1926-1935. In 1925 he was president of the St. Lawrence County Medical Society. Dr Madill had been first vice president of the St. Lawrence County Savings Bank and director of the Ogdensburg Trust Company. He was a member of the House of Delegates of the American Medical Association from 1912 to 1913, from 1922 to 1935 and from 1937 to 1940. He served as captain in the medical reserve corps of the U S Army, 1917-1918.

**Clifton Meredith Miller** © Richmond, Va, Medical College of Virginia Richmond, 1892, associate professor of otolaryngology at his alma mater specialist certified by the American Board of Ophthalmology and the American Board of Otolaryngology, member of the House of Delegates of the American Medical Association in 1912 member of the American Laryngological Rhinological and Otolological Society Inc fellow of the American College of Surgeons past president of the Richmond Eye Ear Nose and Throat Society, Virginia Ophthalmological and Otolaryngological Society and the Richmond Academy of Medicine, served as a member and vice chairman of the city school board of Richmond local ophthalmologist, Seaboard Air Line Railway member of the board of directors, ophthalmologist and otolaryngologist on the staff of the Stuart Circle Hospital visiting surgeon, department of otolaryngology, Memorial Hospital, aged 69, died, February 26, of carcinoma of the prostate.

**Thomas Joseph O'Leary** © Superior, Wis, College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1906 past president of the State Medical Society of Wisconsin, the Douglas County Medical Society and the Interurban Academy of Medicine, councilor and past president of the Eleventh District of the State Medical Society, surgeon for the Great Northern and Soo Line railroads for many years, fellow of the American College of Surgeons, president of the Wisconsin State Bank and the Selective Service advisory board chief of staff of St. Joseph's Hospital on the staffs of St. Francis Hospital and St. Mary's Hospital where he died February 26, of coronary thrombosis, aged 61.

**Ralph Rust Wilson** © Kansas City, Mo Harvard Medical School, Boston 1921, specialist certified by the American Board of Obstetrics and Gynecology Inc, member of the Central Association of Obstetricians and Gynecologists, past president of the Kansas City Academy of Medicine and the Kansas City Obstetric and Gynecological Society for many years chairman of the committee on maternal welfare of the Missouri State Medical Association chief of the obstetric and gynecologic service at the Kansas City General Hospital, served on the staffs of the Menorah Hospital, Trinity Lutheran Hospital and St. Luke's Hospital, where he died, February 6 of coronary thrombosis, aged 46.

**Clarke Sullivan**, Dayton Ohio, Chicago Homeopathic Medical College 1904 member of the Ohio State Medical

Association, first chairman and first president of the Dayton Obstetrical Society, during World War I served as a captain in the medical corps of the U S Army and as assistant chief of staff at Base Hospital, Camp Sherman Chillicothe served on the courtesy staff of St. Elizabeth and Good Samaritan hospitals, member of the board of trustees, member of the consulting staff and for many years chief of the obstetrical staff of the Miami Valley Hospital, where he died suddenly, February 13, of acute dilatation of the heart, aged 65.

**Charles Walter Waddell** © Fairmont, W Va Harvard Medical School, Boston, 1907 specialist certified by the American Board of Internal Medicine, in 1938 president of the West Virginia State Medical Association, member of the State Advisory Board Department of Public Assistance and examiner for the State Compensation Commission member of the medical advisory board number 3, West Virginia Selective Service, fellow of the American College of Physicians director of the clinical laboratory and member of the staff of the Fairmont General Hospital, aged 65 died March 29.

**Elizabeth M Baer**, Roselle Park, N J, Hahnemann Medical College and Hospital Chicago, 1898, aged 81 died, January 25, in the Belle Mead Sanatorium and Farm Bellemead of coronary sclerosis.

**George Le Roy Brown**, Chicago, Chicago Homeopathic Medical College 1899 veteran of the Spanish-American War, aged 66, died February 28, in the Passavant Memorial Hospital of cardiac failure and hypertension.

**Julius J Buel**, Lakewood, Ohio, Universitat Bern Medizinische Fakultät Switzerland 1885, a charter member of the staff of Lutheran Hospital, Cleveland and for many years on the staff of St. John's Hospital, Cleveland, aged 82 died January 18 of cerebral hemorrhage.

**George Fletcher Bullard** © Elizabethtown N C, North Carolina Medical College, Charlotte, 1915 aged 55 died, January 17 in the Veterans Administration Facility Fayetteville, of carcinoma.

**Herbert G Cabbell**, Lawrence, Kan Jenner Medical College, Chicago, 1912 member of the Kansas Medical Society, aged 55 died, January 13, of valvular heart disease.

**Erasmus Taylor Camp**, Gadsden, Ala Medical College of Alabama, Mobile 1885 member of the Medical Association of the State of Alabama past president of the Etowah County Medical Society at one time county health officer formerly a physician in charge of the Camp and Ralls' Hospital aged 93 died February 9, of prostatic obstruction and uremia.

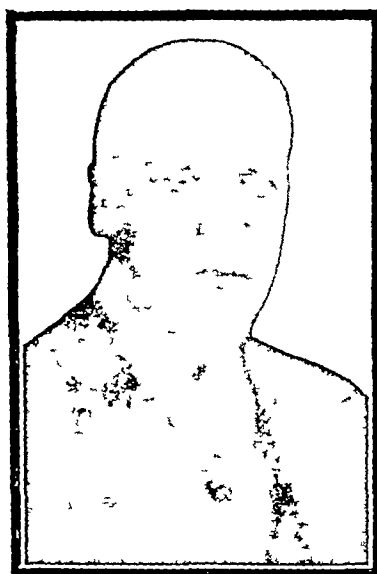
**Lawrence Cauffman**, Masonville, N J, Medico Chirurgical College of Philadelphia 1890, aged 73 died January 25 of cardiovascular renal disease.

**Guy Chappell**, Dawson, Ga, Atlanta Medical College, 1897 member of the Medical Association of Georgia chairman of the Selective Service Board and county physician past president of the Terrell County Medical Society, a captain in the medical corps of the U S Army during World War I, aged 67 died, January 15, of carcinoma of the prostate.

**Morton Clofine** © Philadelphia Long Island College of Medicine Brooklyn 1937 diplomate of the National Board of Medical Examiners member of the Philadelphia Obstetrics Society associate in gynecology at the University of Pennsylvania Graduate School of Medicine, on the staffs of the Mount Sinai St. Agnes and the Graduate Hospital of the University of Pennsylvania where he died February 18 of abdominal lymphosarcoma with metastases, aged 29.

**Solomon David Deren** © Syracuse, N Y University of St. Vladimir Faculty of Medicine, Kiev Russia, 1913 Syracuse University College of Medicine, 1924 served on the staff of the Syracuse State School, aged 61, died, January 5, of coronary occlusion arteriosclerosis and hypertension.

**John Vardeman Dillman**, Louisville, Ill, Missouri Medical College St. Louis, 1899 member of the Illinois State Medical Society, served during World War I in the medical corps of the U S Army for several years president of the Clay County State Bank of Louisville aged 73 died, February 11, of cardiorenal disease.



GRANT CHARLES MADILL, M D  
1864-1943

**John Otho Downey**, New York, University of Pennsylvania Department of Medicine, Philadelphia, 1906 at one time a surgeon, lieutenant commander, U S Navy served during World War I, aged 59, died, February 2, in St Luke's Hospital of coronary thrombosis

**Howard Paul Durbin** \* Kirkwood, Mo St Louis University School of Medicine, 1927, aged 46, died January 17, of coronary occlusion

**Thomas Burnham Enders** \* Mystic, Conn, College of Physicians and Surgeons, New York, 1891, aged 77 died, January 25, in the Lawrence and Memorial Associated Hospitals, New London of chronic nephritis, arteriosclerosis and duodenal ulcer

**Charles Schuyler Harper**, Berryville, Ark, Barnes Medical College, St Louis 1909, also a pharmacist received the doctor of public health degree from Tulane University New Orleans in 1916, aged 64, died, February 16, of heart disease

**Allen Fitch Higgins**, Tampa, Fla, Northwestern University Medical School Chicago, 1902, physician of Hillsborough County for many years served in the medical corps of the U S Navy during World War I, aged 67, died February 3 in the Veterans Administration Facility, Bay Pines of cerebral hemorrhage and arteriosclerosis

**Andrew Jackson Irwin**, Sandersville Ga University of Georgia Medical Department, Augusta 1884, aged 80 died January 25, of heart disease

**Homer Bates Jester** \* Corsicana Texas College of Physicians and Surgeons Baltimore, 1901 president of the Navarro County Medical Society, past president of the Central Texas District Medical Society, served as a major in the medical corps of the U S Army during World War I for many years a member of the Navarro Clinic a member of the board of directors of the State National Bank aged 67 died January 26 of coronary occlusion

**Rolfe Kingsley**, New York Columbia University College of Physicians and Surgeons New York 1906 associate in urology at his alma mater from 1924 to 1926 served as a genitourinary surgeon on the staff of the Presbyterian Hospital aged 61 died February 4, of cerebral hemorrhage

**John August Kussman**, Piqua Ohio Medical College of Ohio, Cincinnati, 1889 aged 76, died January 16

**Fannie Lanham**, Chicago Chicago College of Medicine and Surgery 1913 a founder, a member of the board of trustees and for many years on the staff of the Women's and Children's Hospital aged 71 died January 27 at the home of her niece in Peoria Ill of carcinoma

**Albert H Lanzer** \* Cleveland Heights Ohio University of Wooster Medical Department, Cleveland 1905 aged 65 died January 16, of carcinoma

**Charles Lester Large**, Portland Ore College of Physicians and Surgeons, Keokuk, Iowa, 1880 aged 87 died January 15, of cerebral hemorrhage

**Otto W Lewke**, Chicago, Chicago Medical College, 1889 member of the Illinois State Medical Society chief physician to the coroner of Cook County from 1902 to 1909 member of the board of directors of the Chicago Public Library and vice president from 1897 to 1901 on the staff of the Northwestern American Hospital, aged 76, died, March 7, of coronary thrombosis

**Washington E Linden**, Cleveland Western Reserve University Medical Department, Cleveland, 1883 formerly member of the county board of health, aged 84 died, January 8 of lobar pneumonia

**John Othello Logan** \* New York, Columbia University College of Physicians and Surgeons New York, 1898 served on the staff of the Lutheran Hospital, aged 68 died, January 30, of cardiac decompensation

**Thomas F Miller** \* Lamar, Mo, Missouri Medical College, St Louis, 1899, past president and secretary of the Barton County Medical Society, served on the staffs of St Luke's and General hospitals, Kansas City, aged 64, died, January 10, of coronary occlusion

**Joseph David Mitchell**, Fort Smith Ark, College of Physicians and Surgeons, Little Rock, 1909 for many years associated with the Great Lakes Agency of the Indian Service at Lac du Flambeau, Wis aged 61, died, February 2, in the Veterans Administration Facility, Fayetteville, of nephritis

**Willard Elizabeth Park**, Dallas Texas Rush Medical College, Chicago, 1909 aged 70 died, February 1, in a local hospital of burns received in a fire which destroyed an apartment house in which she was visiting

**J Lampton Price**, Frankfort, Ky Bellevue Hospital Medical College New York, 1877, formerly health officer aged 87 died January 29 of arteriosclerosis

**George I Reeves**, Fannin Neb Ensworth Medical College St Joseph, Mo, 1902 aged 82 died January 23, in Burlington Iowa, of hypostatic pneumonia

**George W Ringgold**, Gould Ark, Arkansas Industrial University Medical Department Little Rock, 1886 member of the Arkansas Medical Society, aged 77, died January 25, of coronary occlusion

**Edgar Allison Sears**, Decatur Neb Drake University Medical Department Des Moines Iowa, 1888 member of the Nebraska State Medical Association, for two years county superintendent of schools, associated with the Indian Service for many years aged 83 died January 29, of heart disease

**Solomon Thomas Shelly**, Mulvane, Kan, Missouri Medical College, St Louis 1883 member of the Kansas Medical Society, served on the staff of the Atchison Topock and Santa Fe Railway Hospital, aged 86, died January 17, of hypostatic pneumonia

**William E Waldrop**, Parma Idaho Lonsville (Ky) Medical College 1903 member of the Idaho State Medical Association at one time county physician veteran of the Spanish American War for many years a member of the board of trustees of the school board formerly superintendent of the Idaho State Soldiers Home Hospital Boise aged 69 died January 27 in Boise of pneumonia and heart disease

**Perry Trowbridge Walters**, La Crosse, Wis University of Michigan Medical School Ann Arbor, 1933 member of the State Medical Society of Wisconsin secretary treasurer of the La Crosse County Medical Society on the staffs of the La Crosse Lutheran Hospital and the Gundersen Clinic medical examiner for district board number 1 aged 38 died January 8 of carcinoma of the stomach with metastases

**Joseph M Welch** Sutton Neb Rush Medical College Chicago 1912 member of the Nebraska State Medical Association served as mayor of Sutton and on the school board on the staff of the Sutton Hospital aged 64 died January 26 of cardiovascular vascular disease

**Robert Minor Wiley**, Salem Va Medical College of Virginia Richmond 1895 member of the Medical Society of Virginia aged 72 died January 5 of paralysis agitans

**Philip L Wise** \* San Jose Calif University of Southern California College of Medicine Los Angeles, 1905 member of the Pacific Coast Oto Ophthalmological Society aged 62 died January 8 of heart disease

**Katharine Woltmann**, Delavan Ill Hahnemann Medical College and Hospital Chicago, 1904 aged 81, died January 12 of cerebral hemorrhage

**William Purnell Yerger**, Tallulah, La Memphis (Tenn) Hospital Medical College 1901 aged 65 died January 8

**Stanley John Zolnowski** \* Cleveland, St Louis University School of Medicine 1928 assistant in the department of pathology 1925 1926 and teaching fellow in the same department 1926 1927 at his alma mater aged 40 died January 6 of coronary thrombosis

#### DIED WHILE IN MILITARY SERVICE

**Claude Edwin Hale Jr**, Marshall Mich Vanderbilt University School of Medicine, Nashville Tenn 1917 member of the Michigan State Medical Society, served during World War I, captain in the medical corps Army of the United States, aged 46, died November 5 as the result of injuries received in a government vehicle in the Southwest Pacific area

**Eli Silberschein**, Brooklyn Regia Università degli Studi di Bologna Facoltà di Medicina e Chirurgia Italy 1940, was an intern at the Israel Zion Hospital first lieutenant in the medical corps of the Army of the United States called to active duty July 28 1942, aged 26, was shot and killed at Yuma, Ariz January 24

**Varnum Cochran Southworth**, Cambridge Md Detroit College of Medicine and Surgery, 1924, member of the Medical and Surgical Faculty of Maryland and the American Academy of Orthopaedic Surgeons was called to active duty as a lieutenant commander medical corps V (S) U S Naval Reserve aged 44 died February 9, in Hartford Conn of heart disease as the result of pneumonitis

## Correspondence

### HAZARD OF PARALDEHYDE ADMINISTRATION

To the Editor —In THE JOURNAL, March 6, page 783, appears a communication by Dr A H Miller in reference to my article on the "Hazard of Paraldehyde Administration," which appeared in the January 16 issue of THE JOURNAL.

I should like to repudiate all of Dr Miller's criticisms.

1 Dr Miller would propose a different caption for the paper, while he himself misquotes the original title.

2 Concerning the dosage for intravenous administration it is surprising to learn that an experienced anesthetist would employ a fixed, predetermined dose of 9 cc as the maximum intravenous dose. Any anesthetic agent administered intravenously should be injected at the proper rate until the desired effect is attained. Granted that 9 cc of paraldehyde intravenously is usually sufficient to produce anesthesia, there will be cases, as in the one described, in which this amount will be ineffective.

3 In his objection to the instillation by rectum of 35 cc of paraldehyde as excessive Dr Miller failed to mention that it was administered three times at six hour intervals. The amount actually given was 15 cc each time (a total of 45 cc and not 35 cc, as again misquoted).

4 The most objectionable criticism is the casual statement that paraldehyde is "an agent which, if not the safest of hypnotics, is certainly as safe as any." To repudiate this statement would require reiteration of the entire original paper, in which is given some of the history relative to fatalities following paraldehyde administration, as well as to reiterate the experimental evidence as reported in that article.

CHARLES BURSTEIN, Captain, M C, A U S

### TOXICITY OF HUMAN PLASMA

To the Editor —Our attention has been drawn to some inaccuracies in your editorial on Toxicity of Human Plasma (THE JOURNAL, Sept 19, 1942 p 206).

In the first place you refer to the A and B group specific substances as haptens. There is now considerable evidence to show that they are antigens and not haptens. In the second place the statement that 50 per cent of group A and 85 per cent of group B serums contain the corresponding agglutinin was qualified in our paper in the following way: "It should be mentioned here that the inhibition technic is not sufficiently sensitive to detect very small quantities of inhibiting substances" (*J Path & Bact* 54 92 [Jan] 1942). "It is evident that amounts of agglutinin too small to produce inhibition in vitro will yet produce a brisk response on injection. Although the inhibition test indicates that at least 50 per cent of group A and 85 per cent of group B persons have the corresponding agglutinin in their serum and plasma, it seems likely that the true percentages are higher" (*ibid* p 101). Thirdly, the terms serum agglutinin and isoagglutinin have been confused, it was isoagglutinin and not agglutinin titers which we estimated after pooling plasma from A and B donors. We made no estimation of residual agglutinin after pooling in view of the presence of free anti A and anti B isoagglutinins probably only small amounts of A and B agglutinin were present.

E F AUBERT,

S W London Blood Supply Depot,  
Benhill Avenue, Sutton Surrey

## Medical Examinations and Licensure

### COMING EXAMINATIONS AND MEETINGS

#### NATIONAL BOARD OF MEDICAL EXAMINERS EXAMINING BOARDS IN SPECIALTIES

Examinations of the National Board of Medical Examiners and Examining Boards in Specialties were published in THE JOURNAL, April 3, page 1170.

#### BOARDS OF MEDICAL EXAMINERS

ALABAMA Montgomery June 15 16 Sec Dr B F Austin, 519 Dexter Ave Montgomery

ARKANSAS \* Medical Little Rock June 3 4 Sec Dr D L Owens  
Harrison Eclectic Little Rock June 3 4 Sec Dr C H Young  
1415 Main St Little Rock

CALIFORNIA San Francisco June 28 July 1 Oral Los Angeles  
August 9 Sec Dr Frederick A Scatena 1020 N Street Sacramento

DELAWARE Dover April 13 15 Sec Medical Council of Delaware  
Dr Joseph S McDaniel 229 S State St Dover

DISTRICT OF COLUMBIA \* Washington May 10 11 Sec Commission  
on Licensure Dr George C Ruhland 6150 E Municipal Bldg Wash  
ington

FLORIDA \* Jacksonville June 21 22 Sec Dr William M Rowlette,  
Box 786 Tampa

HAWAII Honolulu June 12 15 Sec Dr J A Morgan 55 Young  
Building Honolulu

IDAHO Boise July 13 Director Bureau of Occupational Licenses  
Mrs Lela D Painter 355 State Capitol Building Boise

ILLINOIS Chicago June 22 24 Superintendent of Registration Depart  
ment of Registration and Education Mr Philip M Harman, Springfield

INDIANA Indianapolis Sept 14 16 Sec Board of Medical Registration  
& Examination Dr W C Moore 301 State House Indianapolis

KANSAS Kansas City May 19 20 Sec Board of Medical Registration  
and Examination Dr J F Hassig 905 N Seventh St Kansas City

LOUISIANA New Orleans, May 6 8 Sec Dr R B Harrison 1507  
Hibernia Bank Bldg New Orleans

MARYLAND Homeopathic Baltimore June 15 16 Sec Dr J A  
Evans, 612 W 40th St Baltimore

MICHIGAN \* Ann Arbor and Detroit June 11 13 Sec Board of  
Registration in Medicine Dr J Earl McIntire 100 W Allegan St  
Lansing

NEVADA Carson City May 3 Sec, Dr Richard A Petty 215  
North Carson St, Carson City

NEW JERSEY Trenton June 15 16 Sec Dr E S Hallinger 28 W  
State St Trenton

NEW MEXICO \* Santa Fe April 12 13 Sec Dr Le Grand Ward,  
135 Sena Plaza, Santa Fe

NORTH CAROLINA Raleigh June 14 18 Sec Dr W D James  
Hamlet

NORTH DAKOTA Grand Forks July 6 9 Sec Dr G M Williamson,  
4 1/2 S Third St Grand Forks

OKLAHOMA \* Oklahoma City May 10 Sec Dr J D Osborn Jr  
Frederick

OREGON \* Portland April 21 24 Sec Dr L S Besson 608 Failing  
Building Portland

SOUTH DAKOTA \* Pierre July 20 Dir Medical Licensure State  
Board of Health Dr J F D Cook Pierre

UTAH Salt Lake City June Dir Department of Registration Mr  
G V Billings 324 State Capitol Bldg Salt Lake City

WYOMING Cheyenne June 7-8 Sec Dr M C Keith Capitol Build  
ing Cheyenne

\* Basic Science Certificate required

#### BOARDS OF EXAMINERS IN THE BASIC SCIENCES

CONNECTICUT June 12 Sec State Board of Healing Arts Dr C M  
Bakewell 1945 Yale Station New Haven

DISTRICT OF COLUMBIA Washington April 19 20 Sec Commission  
on Licensure Dr George C Ruhland 6150 E Municipal Bldg Wash  
ington

FLORIDA DeLand June 9 Final date for filing application is May  
24 Sec, Dr J F Conn John B Stetson University Deland

IOWA Des Moines April 13 Dir Division of Licensure & Regi  
tration Mr H W Grefe Capitol Bldg Des Moines

NEBRASKA Omaha May 4 5 Dir Bureau of Examining Board  
Mrs J Crawford 1009 State Capitol Building Lincoln

NEW MEXICO June 14 Sec Miss P M Joerger State Capitol,  
Santa Fe

OREGON Corvallis July 10 Sec State Board of Higher Education  
Mr C D Byrne University of Oregon Eugene

RHODE ISLAND Providence May 19 Chief Division of Examiner  
Mr Thomas B Casey 366 State Office Building Providence

SOUTH DAKOTA Aberdeen June 4 5 Sec Dr C M ...

## Bureau of Legal Medicine and Legislation

### MEDICOLEGAL ABSTRACTS

**Insanity Criteria of Criminal Responsibility**—The defendant was convicted and sentenced to ten years' imprisonment for first degree robbery and appealed to the Supreme Court of Missouri. He admitted that the state's evidence was sufficient to support the conviction but on appeal contended that he was not capable of the intent required to be guilty of the offense in that he was mentally deficient and at certain periods, especially when he drank, he had not the capacity to distinguish right from wrong conduct.

There can be no doubt, said the Supreme Court of Missouri, but that legal mental capacity to commit a crime is an essential prerequisite to responsibility and a person cannot be legally punished for an act committed by him while insane, although the act would constitute a crime if done by a sane person. While the law recognizes the existence of many forms and degrees of insanity, mental incapacity excusing the commission of a crime must be such that the defendant is unable to distinguish right from wrong at the time of the commission of the offense, and the burden is on the defendant to prove the facts from which a jury may reasonably infer the fact of legal mental incapacity. Morosity, mere weakness of intellect or subnormal mental capacity, is not in and of itself such insanity or mental incapacity as constitutes an excuse or defense to a crime. The total effect of the defendant's evidence in this case the court pointed out, was not that he was insane but that he was a person of subnormal mental ability and capacity. This evidence does not prove insanity in the sense required by law. Broadly speaking voluntary intoxication, regardless of the person's intellect, is not a defense to a criminal charge and has no bearing on it except in certain instances not involved in the present case. The defendant's argument, the court continued, was merely of the commonly known phenomenon that liquor does affect one, at least to the extent that he does not act and conduct himself as he normally does and would if he were not drinking. The defendant's experiences and reactions in this respect, however, presented nothing new or unusual, certainly not insanity or even delirium tremens induced by intoxication.

The defendant did not claim to have been intoxicated to the extent that the liquor totally deprived him of his reason or that he was insane but argued that because he was a person of subnormal mentality and had been drinking, the combination of the two "laid a foundation" for the proof and defense of insanity of which he was deprived by the adverse ruling of the trial court on certain evidence offered. The trouble with this position, said the court, was that the only witness qualified to speak on the subject of the sanity of the defendant, a psychiatrist, stated that the defendant was sane when he examined him two years prior to the commission of the offense and that he had no opinion as to his mental condition after that time because he had not subsequently examined him. The evidence given by the lay witnesses to the effect that the defendant did not act or conduct himself as usual when he was drinking, that he kept his hands in his pockets and asked people for money when he was drinking were not such facts and circumstances from which they or any one else could draw the inference or express the opinion that he was insane or so lacking in mental capacity as to be excused from the charge of robbery if the jury believed him to be guilty under all the evidence.

The judgment of conviction was therefore affirmed.—*State v. Pinski, 163 S. W. (2d) 785 (Mo., 1942)*

## Society Proceedings

### COMING MEETINGS

- Alabama, Medical Association of the State of Birmingham April 20-22 Dr Douglas I. Cannon 519 Dexter Ave. Montgomery Secretary
- American Association of Industrial Physicians and Surgeons Rochester N. Y. May 25-27 Dr I. C. Holmlund 28 East Jackson Blvd. Chicago Managing Director
- American Association on Mental Deficiency New York May 12-15 Dr Neil A. Dayton Mansfield Training School Mansfield Depot Conn.
- American Gynecological Society Hershey Pa. May 31-June 2 Dr Howard C. Taylor Jr 842 East Ave. New York Secretary
- American Neurological Association New York May 6-7 Dr Henry A. Riley 117 East 72d St. New York Secretary
- American Ophthalmological Society Ho. Springs Ar. May 31-June 2 Dr Walter S. Wilson 129 Clinton St. Watertown N. Y. Secretary
- American Psychiatric Association Detroit May 10-13 Dr Winfred Overholser St. Elizabeth's Hospital Washington D. C. Secretary
- American Psychanalytic Association Detroit May 9-11 Dr Leo H. Bartemioff General Motors Bldg. Detroit Secretary
- American Society of Clinical Pathologists Chicago June 4-6 Dr Alfred S. Cordano 531 North Main St. South Bend Ind. Secretary
- American Surgical Association Cincinnati May 13-14 Dr Warfield M. Limer Johns Hopkins Hospital Baltimore Secretary
- Arizona State Medical Association Tucson April 30-May 1 Dr Frank J. Milloy 112 North Central Avenue Phoenix Secretary
- Arkansas Medical Society Little Rock April 19-20 Dr W. K. Brocksher 602 Garrison Ave. Fort Smith Secretary
- California Medical Association Los Angeles May 2-3 Dr George H. Kres 150 Sutter St. San Francisco Secretary
- Connecticut State Medical Society New Haven May 25-27 Dr Creighton Barker 258 Church Street New Haven Secretary
- Florida Medical Association Jacksonville April 15-16 Dr Shaler Richardson 111 West Adam St. Jacksonville Secretary
- Georgia Medical Association of Atlanta May 11-14 Dr Edgar D. Shanks 478 Peachtree St. N.E. Atlanta Secretary
- Illinois State Medical Society Chicago May 18-20 Dr Harold M. Camp 221 South Main St. Monmouth Secretary
- Iowa State Medical Society Des Moines April 29-30 Dr Robert L. Parker 3510 Sixth Avenue Des Moines Secretary
- Maryland Medical and Chirurgical Faculty of Baltimore April 27-28 Dr W. Houston Toulson 1211 Cathedral St. Baltimore Secretary
- Massachusetts Medical Society Boston May 24-26 Dr Michael A. Tighe 8 Lenoxway Boston Secretary
- Minnesota State Medical Association Minneapolis May 17-19 Dr B. B. Souster 493 Lowry Medical Arts Bldg. St. Paul Secretary
- Mississippi State Medical Association Jackson May 11-13 Dr T. M. Dye Clarksdale Secretary
- Missouri State Medical Association St. Louis April 18-20 Mr Raymond McIntyre, 634 North Grand Blvd. St. Louis Executive Secretary
- National Tuberculosis Association St. Louis May 5-6 Dr Charles J. Hartfield 7th and Lombard Sts. Philadelphia Secretary
- New Hampshire Medical Society, Manchester May 11 Dr Carleton R. Metcalf 5 South State St. Concord Secretary
- New Jersey Medical Society of Newark May 25-26 Dr Alfred Stahl 55 Lincoln Park Newark Secretary
- New York Medical Society of the State of Buffalo May 3-6 Dr Peter Irving 292 Madison Ave., New York Secretary
- North Carolina Medical Society of the State of Raleigh May 10-12 Dr Roscoe D. McMillan Red Springs Secretary
- North Dakota State Medical Association Bismarck May 10-11 Dr L. W. Larson 221 Fifth Street Bismarck Secretary
- Northern Tri-State Medical Association Ann Arbor, Mich., April 13 Dr F. R. Nicholas Carter 105 East Jefferson Blvd., South Bend Ind. Secretary
- Oklahoma State Medical Association Oklahoma City May 11-12 Dr Lewis J. Moorman 210 Plaza Court Bldg. Oklahoma City, Secretary
- Rhode Island Medical Society Providence June 2-3 Dr William P. Buffum 122 Waterman St. Providence Secretary
- Texas State Medical Association of Fort Worth May 3-6 Dr Holman Taylor 1404 West El Paso St. Fort Worth Secretary
- West Virginia Medical Association Charleston May 17-18 Mr Charles Ivelly 1031 Quarrier St. Charleston Executive Secretary

CENTRAL SOCIETY FOR CLINICAL  
RESEARCH*Fifteenth Annual Meeting held in Chicago Nov 6 and 7 1942*The President, DR ARLIE R BARNES, Mayo Clinic, Rochester,  
Minn., Presiding*(Continued from page 1176)***"Three to One" Modified Protamine Zinc Insulin**

DRS CYRIL M MACBRYDE and HAROLD K ROBERTS St Louis The protamine zinc insulin now in use is not ideal for maintenance of control in many diabetic patients. The need for a type of insulin effective for at least twenty-four hours, but with sufficient rapid activity to prevent postprandial hyperglycemia, is widely recognized. In the past two and one-half years among 154 well controlled diabetic patients whom we have followed, 35 per cent required combined therapy with protamine zinc insulin and a separate morning injection of regular insulin. Nearly all patients needing over 40 units daily required combined therapy for good control. The most widely useful ratio consists of three parts of protamine zinc insulin to one of regular insulin. The combined method of treatment is objectionable, however, because it is a compromise, partly nullifying the advantages of the slow acting protamine zinc insulin. Two injections are still required, and the patient is obliged to manipulate two very different forms of insulin, multiplying the possibilities of error.

Comparative twenty-four hour blood sugar curves on 18 diabetic patients under controlled conditions showed great similarity between those obtained with protamine zinc insulin as compared with histone zinc insulin. Diabetic control was better with protamine zinc insulin, while histone zinc insulin failed to exhibit the desired more prompt action. Comparative curves with clear (acid, or soluble) protamine zinc insulin on 11 patients revealed better control with the market turbid protamine zinc insulin, while the clear insulin failed to give evidence of more rapid initial activity. Studies with globin insulin and other insulin modifications have been disappointing.

The most promising field proved to be mixtures of protamine zinc insulin and regular insulin. When protamine zinc insulin and regular insulin are mixed in the proportions employed when separately injected in the combined method of therapy, all or practically all of the insulin is precipitated. By combining equal parts of protamine zinc insulin and regular insulin, and adjusting the  $pH$  to 7.2, however, it is possible to prepare a form of modified protamine zinc insulin which has the activity of three parts of protamine zinc insulin to one part of regular insulin, which is the proportion found most useful for the large majority of our patients. This special 3:1 modified protamine zinc insulin, when compared with protamine zinc insulin in 11 patients, gave better diabetic control with lower blood sugars during the day and equally good control of the night and fasting sugar levels. Comparison of 3:1 insulin with combined protamine zinc insulin and regular insulin therapy revealed somewhat better control with the 3:1 insulin than with the two separate injections. Six patients under controlled conditions showed comparatively little blood sugar fluctuations throughout the twenty-four hours, although in 4 cases the single dose administered was 70 units or over. Thus it would seem that a single injection of 3:1 modified protamine zinc insulin can take the place of market protamine zinc insulin in the regulation of mild diabetes when supplementary injections of regular insulin are not required and can also be substituted for the two separate injections required by most diabetic patients needing more than 40 units of insulin daily.

## DISCUSSION

DR R M WILDER, Rochester, Minn. What criteria were used for adjusting the dosage day by day of the mixed insulin? Is the morning urine tested and a lower dose given when the morning urine is sugar free, or is some other time of testing better for determining whether the dose is satisfactory or not? We have also been giving mixed insulins for some time, not

a fixed preparation such as Dr MacBryde is using but shifting the preparation, depending on the shifting daily requirements. Some people seem to do better with more protamine zinc insulin and less regular insulin, some, but not all, do well with preparations like those Dr MacBryde has found satisfactory. The patient tests the urine twice daily, and we use the result of the morning test as the criterion of whether or not the protamine component is as high as we want it to be. The afternoon test tells whether the regular component should be increased or decreased. I would like to know, using fixed proportions, how Dr MacBryde knows whether to increase or decrease the dose of the mixture. After he determines the dose in the hospital what criteria will the patient use at home?

DR CYRIL M MACBRYDE, St Louis. Most of our studies have been done in the hospital on carefully controlled patients, with diets accurately weighed, all urines collected for quantitative sugar determinations, and blood sugars frequently determined. We have some patients now controlled with 3:1 insulin who are coming to the clinic or are seen as office patients. Our criteria for control are the same as those we have used in treating patients with protamine zinc insulin alone or with the combined treatment, using separate injections each morning of protamine zinc insulin and regular insulin. If the fasting blood sugar is too low and there is no glycosuria during the night or if there are any indications of hypoglycemia during the night or in the early morning, the patient may be getting too much protamine zinc insulin effect. If the blood sugar is too high at night or glycosuria occurs, we know that the protamine zinc insulin effect is not sufficient. On the other hand, the blood sugar two hours after breakfast and the glycosuria during the morning tell us whether we are getting enough of the rapid insulin effect. With 3:1 insulin we are encouraged by the fact that the controls in these two periods tend to go together. We are obtaining relatively flat curves throughout the twenty-four hours. Previously the night period reflected chiefly the effect of protamine zinc insulin, while the period after breakfast showed the response to the separate injections of regular insulin. With the new 3:1 modified protamine zinc insulin, giving 75 per cent prolonged effect and 25 per cent rapid effect, we have accomplished in most of our cases much better control throughout the twenty-four hours. I am much opposed to the use of extemporaneous mixtures of protamine zinc insulin and regular insulin. In the first place the rapid insulin effect is not obtained to any perceptible degree unless an amount of regular insulin at least equal to the amount of protamine zinc insulin is used. If the  $pH$  is not readjusted to 7.2 the material injected is more acid than the tissue fluid and this introduces further variation in the rate of absorption. The great majority of patients should not and cannot be trusted to mix various forms of insulin for themselves. Most physicians are much too busy to worry with all the intricate details of numerous variable mixtures. The treatment of diabetes is complicated enough without making it more so. If the 3:1 insulin we have described can be substituted for the two separate injections previously needed for a large percentage of diabetic patients, it will simplify the problems both of patient and of physician.

**Mechanism of the Action of X-Ray Therapy  
on Infection**

DRS J DEWEY BRISGARD and HOWARD B HUNT Omaha. In a series of rabbits the peritoneal cavity was inoculated with a culture of hemolytic colon bacillus establishing a constant minimal lethal dose. Two slants of a forty-eight hour culture invariably caused death of the animals within eight hours after inoculation. Sulfanilamide and sulfathiazole given in large therapeutic doses either by stomach intravenously, subcutaneously or by implantation into the peritoneal cavity preceding or at the time of inoculation had no influence on the result of the inoculation. However, in a group of animals receiving 100 roentgens over the abdomen at periods varying from twenty-four to ninety-six hours before inoculation there were approximately 50 per cent survivals. Sixty per cent of the animals irradiated forty-eight hours before inoculation survived. From this survival peak there was a rapid decline so that there were

no survivals in those inoculated ninety-six hours after irradiation. All control animals inoculated at the same time died.

Because this culture produced such a rapidly fatal result it was decided to determine the effect of inoculating the peritoneal cavity with the killed culture. It was found that the killed culture was equally fatal and that preinoculation with irradiation gave the same results as previously enumerated. It appeared therefore that the animals were not dying from a fatal infection but rather from a fatal toxin and that irradiation caused the tissues to produce some factor capable of neutralizing the toxin.

In a third series blood was drawn from animals forty-eight hours after irradiation and the serum mixed with live cultures in one group and with killed cultures in another and these respectively were injected into the peritoneal cavities of stock rabbits. From 50 to 60 per cent of animals so treated survived. Thus it appears that the neutralizing effect of irradiation is not a local one but is the result of an antitoxic substance liberated into the blood stream. Irradiation gave about the same degree of protection to animals inoculated with a lethal dose of diphtheria toxin.

From these studies and from related ones which are still in progress it is our belief that the insult of irradiation to tissues causes them to liberate nonspecific antitoxic substances and that these substances are present in the blood stream and peritoneal fluid.

#### Comparative Study of Pathogenesis and Pathology of Pneumonitis in Infancy

DR JOHN M. ADAMS, Minneapolis. The pathogenesis and pathology of nine different forms of pneumonia in infancy have been considered separately and comparatively, and only the distinctive pathologic anatomic features have been related to the etiology and development of each entity. Three cases of sudden death due to pneumonitis have been presented. The study was conducted according to this outline:

- 1 Aspiration pneumonia (lipoid pneumonia)
- 2 Tuberculosis (first infection type of pneumonia)
- 3 Eosinophilic pneumonia (Loeffler's syndrome)
- 4 Interstitial pneumonia (whooping cough, measles and so on)
- 5 Primary virus pneumonitis
- 6 Secondary virus pneumonia (Goodpasture)
- 7 Primary pyogenic pneumonia
- 8 Secondary pyogenic pneumonia
- 9 Syphilitic pneumonia (pneumonitis alba)

Fat laden macrophages and foreign body giant cells set apart the pneumonias resulting from aspiration. In tuberculosis the epithelioid cell and enlarged mediastinal nodes characterize the entity. Widespread pulmonary infiltration of the eosinophilic cell, coinciding with the high blood eosinophilia, is assumed for Loeffler's pneumonia since there has been no opportunity to study autopsy specimens. The blood eosinophils are larger than normal, with unusually large granules, which are fewer in number.

The thickening of the various constituents of the pulmonary system seen in interstitial pneumonia is distinctive. The peribronchiolitis with small round cell infiltration adds to the picture. The features of primary virus pneumonitis are similar, with ulceration and proliferation of epithelial lining membranes plus the presence of cytoplasmic inclusion bodies in the epithelial cells. The secondary form has intranuclear inclusions in the epithelial structures as its specific differentiating feature.

The presence of leukocytes and specific bacteria with abscess formation and empyema distinguish the pyogenic pneumonias. Syphilitic pneumonia is characterized pathologically by the extreme hyperplasia of the fibrous elements and the presence of *Treponema pallidum*.

From an immunologic point of view the immature lung of infancy is a most vulnerable organ, being readily susceptible to nearly all forms of pneumonia. Primary agents such as the pyogenic bacteria and pneumotropic viruses may produce fulminating disease and even sudden death.

#### DISCUSSION

DR W. I. BROWN, Omaha. A few months ago inclusion body hemorrhage developed in a child who had been delivered by elective cesarean section, the amniotic membranes had not been ruptured. There was some curiosity as to this infection at birth in a child with no lung defect. The mother was apparently normal. An investigation was then begun of the vaginal epithelium of apparently normal women. To our surprise, various forms of inclusion body intracellular and extracellular organisms were present in 22 out of 25 normal women. We have raised the question at the University of Nebraska whether these inclusion bodies have anything to do with virus or are large toxic granules. In children we find these inclusion bodies in osteomyelitis and other infections in which virus is not usually encountered.

DR JOHN M. ADAMS, Minneapolis. In our babies in two epidemics we have had no conjunctivitis. Inclusion body hemorrhage begins from the fifth to the tenth day of life. The average age at onset of pneumonitis was 7 1/2 weeks. We have observed this disease in babies as old as 6 or 7 months, particularly prematurely born babies, after they have passed the period of immaturity; they still are apparently more susceptible to this disease. I cannot say how significant the finding of inclusions is in the sputum. We are at present studying the sputum of a good many patients with other diseases. We have not observed primary virus pneumonitis outside of small infants. Broadhurst in New York has found inclusion bodies in the sputum of adults nurses and doctors suffering from upper respiratory infection.

#### Treatment of Acute Bacillary Dysentery (Flexner) with Sulfaguanidine and Succinylsulfathiazole

DRS. CHARLES I. SMITH, SYLVESTER F. GOLD and MORRIS B. FINKELSTEIN, Florence, Mich. During an outbreak of acute diarrhea 86 patients were studied. From the stools of 25 *Shigella* paratyphenteric (variety Flexner) organisms were cultured. Thirteen patients were treated with sulfaguanidine and of these, 9 had positive stool cultures; 25 patients were treated with succinylsulfathiazole and 14 of these had positive stool cultures. With few exceptions the dosage of sulfaguanidine was 0.1 Gm. per kilogram of body weight initially, and a maintenance dose of one half of this was given every four hours. The dosage of succinylsulfathiazole was 0.25 Gm. per kilogram of body weight initially and 0.25 Gm. per kilogram daily divided into six equal portions given every four hours.

The results of this study indicate that the new sulfonamide compound succinylsulfathiazole has no definite advantage over sulfaguanidine in its effect on fever, diarrhea and time required for stool cultures to become consistently negative. Although both drugs were administered in the doses recommended by other investigators, a recurrence of positive stool cultures was observed once after each drug. Five fatalities occurred, three were of untreated patients. 1 was treated with sulfaguanidine and the other with succinylsulfathiazole.

Determinations of the blood concentrations revealed that sulfaguanidine was absorbed to a greater extent than succinylsulfathiazole. A concentration of 10.6 mg. of sulfaguanidine per hundred cubic centimeters following the administration of 27 Gm. of this drug in three days was observed in 1 case. In no instance did the blood concentration of free sulfathiazole exceed 1.39 mg. per hundred cubic centimeters or the total succinylsulfathiazole 1.45 mg. per hundred cubic centimeters. No significant changes were observed in hemoglobin and white blood cell counts following the use of either drug.

The effect of the administration of a second course of these drugs on twenty patients was investigated. 11 received sulfaguanidine and nine succinylsulfathiazole. Three of the patients given the second course of sulfaguanidine manifested definite signs of toxicity, but no reactions followed the readministration of succinylsulfathiazole.

We believe that the two drugs are equally effective in the treatment of these cases, but because succinylsulfathiazole is potentially less toxic it is the drug of choice. Repeated stool cultures to detect carrier states following sulfonamide therapy of acute bacillary dysentery (Flexner) are necessary.



## DISCUSSION

DR G F KEMPF, Indianapolis I should like to know what advantage either of these drugs has over sulfathiazole in this disease

DR M A BLANKENHORN, Cincinnati I think it is extremely difficult to demonstrate the value of a drug in a disease as variable as dysentery and, moreover, to compare two drugs and say which is better I would understand this epidemic better if Dr Smyth would say something of the circumstances of the outbreak, particularly the day of the disease on which the patient was put on treatment He was fortunate to have the epidemic in his institution, where he could get a good idea of its intensity, rather than in a general hospital, where only an occasional case is seen I have seen a rather generous sprinkling of cases and I am undecided about the value of either of these drugs in dysentery I think the mortality rates cited are rather high I think 2, 3 or 4 per cent is a fair estimate of the mortality rate Will he tell us more of the circumstances of the epidemic and state the day of the disease in which treatment was started?

DR H MARVIN POLLARD, Ann Arbor, Mich I should like to ask Dr Smyth if he found any organism other than Flexner's dysentery bacillus in the stool cultured, and if so whether succinylsulfathiazole had any effect on them During the past several months I have treated 12 cases of chronic ulcerative colitis with succinylsulfathiazole Four of these patients had a prompt drop in temperature and the others had a gradual fall of temperature In general the stools became less frequent, and blood disappeared from the stools completely in a period of one to three weeks One patient has received up to 1,200 Gm and none of these patients have had any type of reaction that could be directly attributed to the drug In general, I feel that it is a safe and valuable adjunct to the other forms of treatment necessary for these individuals

DR CHARLEY J SMYTH, Eloise, Mich We have had no experience with sulfathiazole in the treatment of dysentery Yannet and his associates in Connecticut reported more rapid clinical recoveries in cases with Sonne dysentery treated with sulfathiazole but pointed out that there was a significant prolongation of the time required before the rectal cultures became consistently negative as compared with a control group From our study of these relatively few cases we feel that, if succinylsulfathiazole is given in the amounts we have indicated, positive stool cultures can be controlled effectively and the course of the disease, as judged by fever and diarrhea, shortened The epidemic that we studied occurred in two wards of a mental and general hospital with a total population of 9,000 All patients suspected of having dysentery were segregated at once in an isolation ward There were many chronically ill and debilitated patients, and perhaps the high death rate may be due to that fact No other pathogenic organisms of any significance were recovered Although the final decision regarding the value of succinylsulfathiazole will be based on further clinical use, the results of this comparative study indicate that it provides a definite advance in the treatment of this important enteric disease

#### The Effect of Arsenic (Solution of Potassium Arsenite) on Erythropoiesis

DR LOUIS R LIMARZI, Chicago Following the oral administration of arsenic in relapsing cases of pernicious anemia the bone marrow shows severe toxic and destructive changes in the megaloblastic tissue consisting of various phases of caryorrhexis A reticulocytosis as high as 18 per cent is observed peripherally in some cases without improvement in the anemia The icteric index is not increased If liver extract is administered to such a patient there is a normoblastic stimulation with an improvement in the anemia The caryorrhetic fragments of the megaloblasts can still be observed for four or five days

The oral administration of arsenic to normal controls and to persons with sickle cell anemia erythroblastosis, hypochromic anemia, cirrhosis of the liver, carcinoma of the stomach and polycythemia vera in which the bone marrow consists of

moderate to severe erythroid hyperplasia and immaturity produces no significant degenerative changes in the normoblasts In spherocytic jaundice and in 1 case of refractory anemia with macrocytosis following the administration of arsenic, caryorrhexis in the polychromatic and orthochromatic normoblasts in the bone marrow is a conspicuous feature

In none of the bone marrows is the pronormoblast affected by arsenic

It is concluded that (1) the megaloblast in the bone marrow of relapsing cases of pernicious anemia is arsenic sensitive and the pronormoblast seen in normal marrow and in the bone marrow of most cases of anemia with an erythroid immaturity is arsenic resistant (2) the 'liver principle' can exert its physiologic effect on the bone marrow in pernicious anemia in the presence of a caryorrhetic megaloblastic tissue which presumably is in a poorly functional condition due to the toxic effect of arsenic and (3) the action of the hemopoietic principle is probably to effect the elimination (maturation) and suppression of the megaloblasts in the bone marrow It is still not clear as to how the liver extract effects a stimulation of the normoblastic tissue It is clear that arsenic has no such effect

#### Effect of Breathing 80 to 100 Per Cent Oxygen on the Erythrocyte Equilibrium in Patients with Sickle Cell Anemia

DR EDWARD H REINHARD, DR CARL V MOORE, R DUBACH, PH D, and DR LEO J WADE, St Louis The effect of prolonged administration of 80 to 100 per cent oxygen to patients with sickle cell anemia has been observed The study was undertaken to determine whether the oxygen tension of arterial blood could be raised sufficiently to decrease the intravascular sickling of red cells It was thought that this might accomplish (1) a reduction in the rate of hemolysis with consequent lessening of the degree of anemia and (2) relief of pain during sickle cell crises Observations have been made on 3 patients at six different times After control periods of four to eight days the subjects were fitted with a Boothby-Lovelace-Bulbulian mask and given pure oxygen without intermission for eight to twenty days Red cell counts, hemoglobin levels and reticulocytes were estimated daily Determinations of serum iron and of oxygen content and capacity of both arterial and venous blood were made every four days Excretion of urobilin in urine and stool was measured as an index of the rate of hemoglobin destruction (method of C J Watson) The percentage of sickled cells in arterial and venous blood was determined regularly (I J Sherman's method) Alveolar oxygen content was measured on several occasions

Administration of nearly 100 per cent oxygen to these patients when they were having abdominal or muscular pain did not regularly give them relief However, within a short time after the flow of oxygen was started the percentage of sickled cells in both venous and arterial blood decreased definitely, often from over 40 per cent to less than 20 per cent in the venous circulation This change persisted as long as pure oxygen was breathed The oxygen content of the arterial blood was increased so that it equaled or exceeded the oxygen capacity No consistent change occurred in urobilin excretion, however, to indicate that the rate of hemolysis had been materially altered The most dramatic results of prolonged oxygen administration were (1) a fall in reticulocytes which usually began on the fourth to sixth days and which lowered the level from the initial 20 to 30 per cent to as low as 1 per cent, and (2) a fall in the erythrocyte count, which usually began on the sixth to eighth days and was as great as 0.5 to 1.5 million cells After oxygen was discontinued, the reticulocytes began to increase and reached a peak of occasionally more than 50 per cent on the fifth to eighth days A shower of normoblasts appeared concomitant with the reticulocytosis At the same time the red cell levels began to increase and the rise continued until the preoxygen level had been attained These results are interpreted as indicating that the administration of nearly 100 per cent oxygen depresses erythropoiesis, an effect which might be the physiologic antithesis of the erythroid stimulation produced by low oxygen tensions It is suggested that this result has not been noted in previous studies when high concentrations

oxygen were given to normal persons and to individuals with polycythemia because the length of red cell life is so great that the decreased rate of erythrocytogenesis would not be evident for long periods. Patients with sickle cell anemia show the effect more quickly because their reticulocyte level is elevated and their rate of red cell destruction accelerated.

No distinct toxic manifestations of the oxygen administration were noted except for inflammation and congestion of the mucous membranes of the upper respiratory passages. After oxygen was discontinued 2 of the 3 patients became nauseated and had headaches for twenty-four to forty eight hours.

#### DISCUSSION

DR C. J. WATSON, Minneapolis: The alteration of the reticulocytes following the administration of oxygen is interesting. I think that the hypothesis offered is the only one that is tenable. It would be interesting to see what would happen to the reticulocyte count in hemolytic jaundice if oxygen should be given. I was most interested in the effect of oxygen and the way these patients tolerate oxygen. From the work Payne did with dogs I would not have expected patients to tolerate oxygen for so long. Payne found that in the dog several hours of 100 per cent oxygen often caused severe changes and after twenty-four hours death with contraction of the spleen commonly ensued. As the percentage of oxygen decreased the animals tolerated it better, 80 per cent oxygen could be tolerated for a long period without untoward effect.

DR EDWARD H. REINHARD, St. Louis: We have not studied the effect of high oxygen tensions on the blood of patients with hemolytic anemia. We did wonder if the inhalation of oxygen by patients with pernicious anemia might prevent the usual reticulocyte response to liver therapy. This was tried on 1 such patient with equivocal results. We are planning to repeat these investigations on patients with various types of anemia. As to the toleration of oxygen by our patients we have no completely satisfactory explanation as to why they developed no serious toxic manifestations. Our patients wore oronasal masks at night and nasal masks during the day. It has been shown that, when a person wearing a nasal mask talks or eats, the oxygen concentration of the inspired air decreases definitely. Undoubtedly this was a factor in preventing the development of oxygen intoxication.

#### The Response to Heparin: A Test of the Clotting Mechanism

DRS. GEZA DE TAKATS and N. C. GILBERT, Chicago: Following the intravenous injection of a 10 mg. dose of heparin, coagulation times have been determined at ten minute intervals. One hundred and fifty-four tests were made on 67 patients. A normal response was plotted from an average of fifty curves. A group of hyporeactors were found who showed varying amounts of resistance to heparin. They were patients in the early postoperative period, patients examined within a few days after an intravascular thrombosis and patients suffering from Buerger's disease. It was found that both digitals and epinephrine have a depressing effect on heparin response. Conversely, a group of hyperreactors were encountered who showed clinical signs and symptoms of sensitization together with an exaggerated response to heparin. They may or may not have received heparin previously.

Compounds containing sulfur seemed to augment the action of heparin. The action of heparin on the coagulation time is biphasic and the relationship of the curves to one another indicates that any drug which exaggerates the first curve will tend to depress the second.

Based on these observations, it is suggested that no patient be heparinized unless a heparin curve is previously determined. The best and simplest method of administration is the intermittent injection of 50 mg. of heparin every three to four hours, with an adequate check on coagulation times. The length of administration need not exceed three days, after which dicumarol can be started. While heparin is more expensive and needs intravenous injections, its dosage is easily controlled, whereas dicumarol is given orally but requires daily prothrombin levels, which are unobtainable except in large hospitals.

#### DISCUSSION

DR L. N. KATZ, Chicago: May I ask if observations on the heparin reaction in patients with Buerger's disease have been made to see whether the decreased sensitivity preceded or followed its onset?

DR OWEN O. MYERS, Madison, Wis.: Some people are hyporeactive to dicumarol and some are hypersensitive, but the hyperreactors are more numerous. I am not certain of the method employed in determining the coagulation time in this series. I presume, because of the short coagulation times reported, that it was done by the capillary method. The coagulation time of the so-called hyporeactive individuals was less than a minute shorter than that of the normal reactors. This difference would scarcely seem to be significant. If the capillary coagulation time is used, one must admit that it is relatively crude. I favor the determination of the coagulation time on venous blood. Although there are plenty of fallacies in the method of Lee and White it appears that they are less numerous than when capillary blood is used. The importance of determining the coagulation time frequently when using heparin is well recognized. It is my practice for at least the first day of heparin administration to determine the coagulation time every few hours. It is now the usual practice for a patient who has thrombosis already developed to administer heparin intravenously for the prompt effect because with dicumarol there is a latent period of about twenty-four hours, and this is true whether the preparation is administered intravenously or orally. At the time of the heparin administration we begin oral administration of dicumarol. We can tell when the latter substance becomes active because the prothrombin time which is unaffected by heparin will be prolonged. Then the heparin is omitted and dicumarol therapy alone is continued.

DR ARMAND QUICK, Milwaukee: This paper brings out the fact that heparin itself is not an anticoagulant but becomes so only when it reacts with something in the blood which presumably is albumin but which is probably best called albumin X. It is this albumin X which forms the true anticoagulant with heparin. It appears probable that the serum factor may vary, which accounts for the hyporeactivity and hyperactivity of heparin in various bloods. I agree with Dr. Myers' remarks on the coagulation time. A committee should be formed to standardize the determination of the coagulation time. The coagulation time determined according to the procedure of Lee and White yields much more satisfactory and uniform results if the temperature is kept constant (37° C). It has been observed that hemophilic blood which clots in two or three hours at 37° C may at room temperature require twenty-four hours for clotting.

DR FRANK H. BETHGIL, Ann Arbor, Mich.: I should like to ask Dr. de Takats if he has studied the prothrombin time in relation to reactions.

DR GEZA DE TAKATS, Chicago: If one produces a thrombosis in the lower extremity with a sclerosing solution there is usually a flattening of the heparin curve. A patient with deep femoral thrombosis presents a flattening of the heparin curve which disappears after ligation of the vein. It is quite probable that the flat curves are the result of the clot. On the other hand, it is also true that one can pick up patients with a flat postoperative curve, and this is particularly observed in the gynecologic service. We feel that if the patient has a flat heparin curve after the fourth postoperative day, thrombosis is likely. We had 5 such patients, 1 of whom developed embolism and 4 postoperative thrombosis. We now use dicumarol after two days of heparin. The action of the latter drug is prolonged. We are perfectly aware that Lee and White's method is the standard method for blood coagulation. We still believe, however, that the capillary coagulation time is useful. We were anxious to devise a method that could be run by nurses or interns in any hospital. We get errors with the capillary method, but the percentage of error is the same during the test. Dr. Quick mentioned that heparin itself is not an anticoagulant, that it is only an activator. Heparin does not seem to do anything to the prothrombin time. Our difficulty with the administration of dicumarol is that unless the prothrombin time is determined by skilled technicians dicumarol is dangerous. One dislikes to use dicumarol because of the difficulty of adequate control.

(To be continued)

## Current Medical Literature

### AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1932 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (\*) are abstracted below.

### American Journal of Psychiatry, New York

99 317-474 (Nov) 1942 Partial Index

- Musicians Point of View Toward Emotional Expression H. Hanson Rochester N. Y.—p. 317
- Irresponsibility of Juvenile Delinquents D. A. Thom Boston—p. 330
- Course in Military Neuropsychiatry R. D. Halloran and P. I. Yakovlev Waltham Mass.—p. 338
- Social Data in Psychiatric Casualties in the Armed Services A. Simon and Margaret Hagan Washington D. C.—p. 348
- Aircrew Selection H. D. Mitchell Trenton Ont. Canada—p. 354
- Wartime Tasks of Psychiatric Social Workers in Great Britain Mildred C. Scoville New York—p. 358
- Nonconvulsive Electric (Faradic) Shock Therapy of Psychoses Associated with Alcoholism Drug Intoxication and Syphilis Psychosomatic Approach in Treatment of Reaction in Delirium N. J. Berkwitz Minneapolis—p. 364
- Spinal Injuries in Shock and Epileptic Convulsions J. E. Barrett J. B. Funkhouser Marion Va. and W. A. Barker Roanoke Va.—p. 387
- Treatment of Psychoses with Long Protracted Insulin Coma J. Wortis M. Terris and I. M. Korr New York—p. 391
- Evaluation of Effects of Intravenous Insulin Technique in Treatment of Mental Diseases Follow Up Study of Group of Patients Treated with Intravenous Injection of Unmodified Insulin and Zinc Insulin Crystals P. Polatin and H. Spotnitz New York—p. 394
- Investigation of Effect of Inhalation of 9 per Cent Oxygen for Twenty Minutes in Nonpsychotic and Schizophrenic Male Subjects W. L. Holt Jr. Worcester Mass.—p. 406
- Prefrontal Lobotomy in Chronic Psychoses M. C. Petersen Wilmar Minn. and H. F. Buchstein Minneapolis—p. 426
- Role of Psychiatric Social Worker in Selection of Men for the Armed Forces Marian McBee and G. S. Stevenson New York—p. 431
- What Unemployment Does to People Study in Adjustment to Crisis S. W. Ginsburg New York—p. 439

### American Journal of Surgery, New York

59 1-158 (Jan) 1943 Partial Index

- Abdominal Cardectomy or Subtotal Gastric Resection for Cancer of Proximal Half of Stomach Case Report G. T. Pack and C. S. Cameron New York—p. 3
- Pilonidal Cyst Report of New Procedure for Operation and Treatment D. Brezin Fort Bragg N. C.—p. 18
- Comminuted Fractures and Fracture Dislocations of Body of Astragalus Operative Treatment H. C. Blair Portland Ore.—p. 37
- Levator Ani Coccygeus and Piriformis Muscles Agents in Causation of Coccygodynia Superior Gluteal Pain and Sciatic Syndrome T. Wilensky New York—p. 44
- Cesarean Section Evaluation of Types of Section and Their Indications E. A. Schumann Philadelphia—p. 50
- Additional Experiences with Spool Cotton as Suture Material P. Thorek R. Gradman and A. Glaess Chicago—p. 68
- \*New Type of Relaxing Incision—Dermatome Flap Method H. N. Harkins Detroit—p. 79
- Control of Somatic Pain W. Bates Philadelphia—p. 83
- Curative Treatment of Hemorrhoids E. Granet Guantanamo Bay Cuba—p. 87
- Differential Diagnosis Between Thymic Duct Fistulas and Branchial Cleft Fistulas Report of Case of Bilateral Aural Fistulas and Bilateral Thymic Duct Fistulas C. J. Baumgartner and S. Steindel Los Angeles—p. 99
- Human Red Cell Concentrate for Surgical Dressings J. J. Moorhead and L. J. Unger New York—p. 104

**New Type of Relaxing Incision**—A new relaxing incision which combines the advantages of primary closure by a cutaneous graft and eliminates the necessity of making a separate wound to obtain closure is described by Harkins. It consists of a dermatome graft which is left attached at one end and reflected back. The incision is then made in the donor area or bed of the graft and the flap is turned down again to cover the raw area made by the incision. This method is especially applicable to wounds of the extremities from which large superficial tumors or scars are excised.

### Annals of Surgery, Philadelphia

117 1-160 (Jan) 1943

- Cleft Palate G. M. Dorrance and J. W. Bransfield Philadelphia—p. 1
- Mechanism of Shock in Intestinal Strangulation Experimental Study E. I. Evans Boston—p. 28
- Fluid Protein and Electrolyte Alterations in Experimental Intestinal Obstruction W. E. Abbott R. C. Mellors and E. Muntwyler Cleveland—p. 39
- \*Study of Plasma Protein Variations in Surgical Patients D. Casten M. Bodenheimer and I. Barcham New York—p. 52
- Carcinoma of Gum G. S. Johnson and R. A. Daniel Jr. Nashville Tenn.—p. 74
- Rate of Epithelial Regeneration Clinical Method of Measurement and Effect of Various Agents Recommended in Treatment of Burns B. Cannon and O. Cope Boston—p. 85
- \*Intrathoracic Neuroblastoma Case Report W. E. Lee and J. A. Ritter Philadelphia—p. 93
- Empyema Complicated by Bronchoesophagopleural Fistula J. K. Berrian and C. E. Walters Indianapolis—p. 100
- Substitution of Urinary Bladder with Segment of Sigmoid Experimental Study J. D. Bisgard Omaha—p. 106
- So Called Retroperitoneal Lipoma Report of Seven Cases J. S. Regan S. Sanes and J. D. MacCallum Buffalo—p. 110
- Surgical Treatment of Congenital Malformations Implicating Distal Spinal Cord J. Browder Brooklyn—p. 118
- Treatment of Congenital Hemangiomas of Skin G. S. Johnson and R. A. Light Nashville Tenn.—p. 134
- Surgical Treatment of Intrinsic Knee Joint Lesions Further Analysis of Operative Cases J. J. Moorhead and D. Lyall New York—p. 140
- Light Compact Unit for Intravenous or Intraosseous Injection of Plasma in Emergencies Alison H. Price and L. M. Tocantins Philadelphia—p. 152

**Plasma Protein Variation in Surgical Patients**—In 215 consecutive surgical patients admitted to the Hospital for Joint Diseases Casten and his collaborators tried to determine the incidence of hypoproteinemia associated with operations and its relationship to various procedures, the factors which influence changes in plasma proteins, the relationship between hepatic disorders and hypoproteinemia and ways of preventing and treating hypoproteinemia. Following the operative procedure, plasma proteins and hematocrit were determined immediately and thereafter every twelve to twenty-four hours until the patient recovered. A significant decline in the plasma protein level was observed in 148 or 68.9 per cent of the patients. The decline was more common after operations on the stomach and intestine, the biliary tract, the spine and large joints and for toxic thyroid disorders. Among the many direct factors which influenced the extent and duration of the diminished protein concentration were blood loss, shock and anesthesia, while the indirect causes were the nutritional status of the patient, extent of the protein reserves and the adequacy of hepatic function. Depreciation because of blood loss and shock was usually of short duration and readily amenable to therapy, but when the protein reserves were exhausted or hepatic function was disturbed the depletion was prolonged and frequently response to treatment was irregular. As the hepatic function is known to be disturbed frequently in certain surgical conditions of an extrahepatic nature, the hepatic function of such patients should be tested routinely and the data should guide subsequent therapy. In the operations known to be almost constantly associated with much loss of protein, the estimated loss should be replaced during operation by blood or plasma transfusions. If protein reserves are thought to be exhausted, the operation should be postponed until the reserves are restored by dietary therapy high in amino acids or the feeding of amino acids if the dietary cannot be given. Plasma is a readily available and potent source of protein and often proves efficacious when dietary therapy fails.

**Intrathoracic Neuroblastoma**—Lee and Ritter report the case of a 5-month-old infant who had puzzling symptoms and was finally diagnosed as having intrathoracic neuroblastoma as the result of aspiration biopsy under fluoroscopic guidance. Though the infant's condition was fair at the close of operation, he died about three and a half hours later. At necropsy the cavity on the right side of the chest contained about 75 cc of dark red blood. The lung on the right side was fully collapsed and the one on the left was well aerated. The cause of death was probably hemothorax and associated shock. The diagnosis from a pathologic examination of the tumor was an atypical neurocytoma; there were hemorrhagic areas in the spleen, the lung on the right side was atelectatic and the one on the left

was normal, and the adrenals, kidneys and sternum were apparently normal. Early recognition of these tumors and prompt surgical and roentgen treatment will materially enhance the prognosis.

### Archives of Neurology and Psychiatry, Chicago

49 1-150 (Jan) 1943

- Regenerative Capacity of Ventral Roots After Avulsion from Spinal Cord Sarah S. Tower, Baltimore—p. 1
- Studies in Diseases of Muscle Progressive Muscular Atrophy Report of Case with Unusual Features Effect of Prostigmine and Physostigmine on Fasciculations, Metabolism of Ascorbic Acid A. T. Milhorat and T. P. Allen New York—p. 13
- Fascicular Muscle Twitchings in Amyotrophic Lateral Sclerosis Their Origin R. L. Swank and J. C. Price New York—p. 22
- Familial Type of Paralysis in Infants and Its Relationship to Other Heredofamilial Disorders Clinicopathologic Study A. J. Tulloh San Francisco O. Murburg New York and K. Tamaki San Francisco—p. 27
- Experimental Neuroses and Psychotherapy J. H. Masserman Chicago—p. 43
- Constitutional Differences Between Deteriorated and Nondeteriorated Patients with Epilepsy Capillaries of Fingerprint Fold H. A. Piskind and M. Brown Chicago—p. 49
- Intraocular Dermoid and Epidermoid Tumors J. Martin and I. Davis—p. 56
- Sibling Deaths in Anamneses of Schizophrenic Patients S. Roizenweiz and D. Bray Worcester Mass—p. 71
- Distribution of Iodine in Blood Serum and in Cerebrospinal Fluid I. I. Gildea and Evelyn B. Man New Haven Conn—p. 93
- Functional Repression in Oculomotor and Trochlear Nuclei M. B. Bender and E. A. Weinstein New York—p. 98
- Fatalities Following Electric Convulsive Therapy Report of Two Cases with Autopsy F. G. Ebaugh, C. H. Barnicle and K. T. Neuberger Denver—p. 107
- Acute Syphilitic Anterior Poliomyelopathic Syndrome Report of Case L. F. Barker Baltimore—p. 118
- \*Arterial Hypertension Following Metrazol Shock Therapy W. C. Menninger Topeka Kan—p. 120
- Apparatus to Be Used in Recording Tremors A. A. Morris Jr. Durham N. C.—p. 123

**Hypertension After Metrazol Shock Therapy**—Menninger reports an instance in which hypertension has persisted for four years since metrazol shock treatment. The mechanism of the cardiovascular dynamics is not clear. The author believes that the anxiety and the fear connected with such treatment were as important in producing the hypertension as was the drug or the convulsions. The psychiatric picture did not change at the time either as a result of therapy or with the onset of hypertension, but it did twelve months later after psychotherapy. The blood pressure has remained between 175 and 180 systolic and 115 and 125 diastolic as compared to the initial pressure before metrazol shock therapy was begun four years ago, of 110 systolic and 80 diastolic.

### Indiana State Medical Assn. Journal, Indianapolis

36 1-54 (Jan) 1943

- Skull Fractures and Brain Injuries H. E. Mock Chicago—p. 1
- War-time Industrial Surgery N. K. Forster Hammond—p. 11
- Emergency Medical Service of Civilian Defense W. S. Keller Cleveland—p. 16
- Medicine and Pharmacy—Shoulder to Shoulder S. Bradish Gary—p. 22
- Ocular Manifestations of Multiple Sclerosis B. J. Larkin Indianapolis—p. 26

### Journal of Experimental Medicine, New York

77 1-96 (Jan) 1943

- Studies on Hypoalbuminemia Produced by Protein Deficient Diets. III. Correction of Hypoalbuminemia in Dogs by Means of Large Plasma Transfusions R. Elman and Harriet Wolf Davey St. Louis—p. 1
- Synergistic Action of Hemophilus Influenzae Sus and Swine Influenza Virus on Chick Embryo F. B. Bang Princeton N. J.—p. 7
- Occurrence of Mucoid Polysaccharide in Hemolytic Streptococci of Human Origin C. V. Seastone Madison Wis.—p. 21
- Quantitative Studies of Sulfonamide Resistance W. M. M. Kirby and L. A. Rantz San Francisco—p. 29
- Virus of Infectious Feline Agranulocytosis I. Characters of the Virus Pathogenically J. T. Syverton J. S. Lawrence R. J. Ackart W. S. Adams D. M. Ervin A. L. Haskins Jr. R. H. Saunders Jr. M. B. Stringfellow and R. M. Wetrich Rochester N. Y.—p. 41
- Id. II Immunologic Relation to Other Viruses J. S. Lawrence J. T. Syverton R. J. Ackart W. S. Adams D. M. Ervin A. L. Haskins Jr. R. H. Saunders Jr. M. B. Stringfellow and R. M. Wetrich Rochester N. Y.—p. 57
- Studies Concerning Site of Renin Formation in Kidney IV. Renin Content of Mammalian Kidney Following Specific Necrosis of Proximal Convoluted Tubular Epithelium M. Friedman and A. Kaplan San Francisco—p. 65
- Epidemic Keratoconjunctivitis I. Isolation and Identification of Filamentous Virus M. Sanders and R. C. Alexander New York—p. 71

### FOREIGN

An asterisk (\*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

### British Journal of Radiology, London

16 1-30 (Jan) 1943

- Effects of Radiation on Workers R. Peterson—p. 3
- Accepted Standards in Radiologic Protection S. Russ—p. 6
- Radiologic Exploration of Sinus Fractures, Fistulas and Infected Cavities H. C. Croke and I. R. Williams—p. 8
- Method of Treatment for Carcinoma of Breast Including the Forequarter C. W. S. Jerrard and W. A. Tinsmead—p. 26
- Note on Amebic Hepatitis J. A. Koss—p. 30

### British Medical Journal, London

2 745-774 (Dec 26) 1942

- Science of Health J. A. Ryle—p. 745
- Treatment of Superficial Tuberculous Lesions by Local Application of Iodine W. H. Tytler and A. D. Lapp—p. 745
- Tuberculosis Deaths and the War I. Stocks—p. 740
- Artificial Respiration at Sea C. H. Gibbens—p. 751
- Communal Feeding Preliminary Report I. B. Cunliffe—p. 753

**Communal Feeding**—The communal feeding of some 10,000 Royal Ordnance Factory workers (mostly girls) resident at hostels adjacent to the factories according to Gunson, seems to improve notably the health of these residents. This improvement can be attributed in part at least to the manner and method of the feeding arrangements. In general the types of food necessary for health are well appreciated and these are supplied to the limit to which they are procurable. The catering management is in good hands, but more precise direction in the preparation of some particular foodstuffs is desirable and would be welcomed. The communal meal is a practical and economic arrangement so far as Royal Ordnance Factory workers living in hostels are concerned.

### Edinburgh Medical Journal

50 1-64 (Jan) 1943

- Outbreak of Diphtheria—Northern Palestine 1940-1941 J. D. S. Cameron—p. 1
- Acute Intraepithelial Breast Abscess: Clinical Observations on Its Etiology and Suggested Method of Treatment A. I. S. Macpherson—p. 25
- Medicine and History D. Guthrie—p. 31
- Studies on Stored Blood XI. Phagocytosis in Stored Citrated Blood and Osmotic Power of Stored Liquid Plasma J. W. Czekalski—p. 40

**Diphtheria in Northern Palestine**—An outbreak of diphtheria mainly confined to certain units with one unit showing a heavy infection but with cases being widespread throughout all troop units in the area is reported by Cameron. In the last war swabbing of contacts and isolation of carriers were sufficient to control most outbreaks. The outbreak occurred in the same theater of war as in 1914-1918. The frequent occurrence of acute cutaneous and nasal diphtheria alongside the faucial type was a further point demanding consideration. All suspected patients were hospitalized and nasal and faucial swabbing was enlisted in the search for carriers. In investigating the native population it was found that Jewish children (who at the time had crusted and discharging noses) are the usual sufferers from diphtheria and that the British troops were brought into closer association with the Jews than with the Arabs. The most probable origin would appear to be the children of the country. In both children and troops the nose was the commonest source of the organism. Preventive measures in the army must be directed toward immunization of troops. The clearance of carriers among the civil population is a local government problem. After six months of continuous cases of diphtheria the outbreak was successfully ended by immunizing all personnel of the unit. Since then, ten months no further cases have been reported although the unit has continued to stay in the area in which the infection was presumed to have arisen. In contrast, in another unit for which immunization was not instituted sporadic cases have continued. The same observation applies to several other units similarly treated. Isolation and swabbing alone appear not to answer the problem completely—a further justification for immunization of all personnel.

## Book Notices

**The 1942 Year Book of Industrial and Orthopedic Surgery** Edited by Charles F. Painter MD Orthopedic Surgeon to the Massachusetts Women's Hospital and Beth Israel Hospital Boston Cloth Price, \$3 Pp 424 with 302 Illustrations Chicago Year Book Publishers Incorporated 1942

This is the third review of this series, which is rapidly proving its worth. The compiler is well qualified for the task of selecting articles, authors and subjects. He has mature judgment. The subjects chosen are representative and well balanced. The authors are well recognized in their special fields. The general trend of the papers reviewed is toward traumatic, industrial, medicolegal and military subjects. The abstracts are well done, separating the wheat from the chaff and preserving the meat of the articles. The illustrations are reproduced satisfactorily. In this small volume one can obtain a bird's eye view of the progress and trend of orthopedic and traumatic surgery. The military application is emphasized. The intervertebral disk syndrome is discussed briefly. Some of the principal subjects covered are low back pain, the disk syndrome, arthritis, the Kenny treatment for infantile paralysis, the sulfonamides in orthopedic practice, osteomyelitis, burns, the scalenus syndrome, fractures of the hip, patella, humerus and elbow, wounds, amputations, soft tissue tumors, and tuberculosis of bones and joints. Operative procedures are described as well as advances in diagnosis. On the whole, the book is of the type eagerly awaited by the busy practitioner, who in this instance will not be disappointed.

**Human Embryology** By Joseph Krafka Jr MD PhD, Professor of Microscopic Anatomy University of Georgia School of Medicine Augusta Medical Students Series Cloth Price \$4.75 Pp 395 with 222 Illustrations New York & London Paul B Hoeber Inc, 1942

There is a widespread feeling in this country that the major ill of the medical curriculum is the failure of medical teachers to separate the important from the less important. In all the medical sciences—and arts—the rate of increase of new knowledge is ever increasing. This, with the addition of new sciences to the medical family, has made our present curriculum a monstrosity in which the student, armed with an array of encyclopedic textbooks, is required to learn much of the premedical and preclinical sciences and to spend an increasing period in postgraduate instruction. To remedy this condition various solutions are being considered by many of our leading medical schools. One of the results of this soul searching on the part of medical teachers is the appearance of a few smaller textbooks designed for students. Most, but not all, teachers feel that there is a great need for such textbooks but do not want quiz compends. The preparation of abbreviated books is difficult. The author or authors must possess a comprehensive knowledge of the field, including its controversies on unsettled questions. Perhaps the greatest danger in producing the shorter textbooks is the tendency to insert a short dogmatic sentence to cover a broad controversial subject.

With regard to this book, one cannot agree that an adequate consideration of experimental embryology is unnecessary. The discussion of heredity is much too brief for medical students. Some of the data usually presented in the laboratory work in embryology courses should be given in the textbook. The treatment of lymphatics is especially deficient. The illustrations could be improved, some are completely unacceptable.

A typical shortcoming of the book is shown in the following example of the insufficiency of a too brief—or unskilful—presentation. The student who wants to know is not helped by statements such as this on page 12 at the end of the chapter on historical development: "The last fifty years have seen the gradual development of an interaction theory, based on (1) definite localization of genes on the chromosomes (Morgan 1910), (2) the modification of the action of genes by specific extrinsic factors such as chemicals (Stockard, 1909), temperature (Krafka, 1920), x-ray (Job, 1935), endocrines (Young 1937), 'organizers' (Spemann, 1938), effective at 'critical moments' in development." If the purpose of providing smaller textbooks is to conserve the student's time, he is not being

helped by a discussion which consists essentially of references to the original literature. The function of the author is to abstract the literature for the student, to present the most important questions, controversies and conclusions and to give or withhold references to the original literature according to his pedagogic inclinations.

The strongest feature of the book as contrasted with its many deficiencies is its insistence on human material, with reliance on that of the primates where the former is lacking. The recently obtained early human "ova" of Hertig and Rock make unnecessary much of the comparative data usually given (Incidentally, why is a fertilized egg an ovum?) One may sympathize with the aims but be disappointed over achievements of this book.

**A Text Book of Fractures and Dislocations Covering Their Pathology, Diagnosis and Treatment** By Kellogg Speed SB MD FACS Professor of Surgery (Rush) of the University of Illinois Chicago Fourth edition Cloth Price \$12.50 Pp 1106 with 1140 Illustrations Philadelphia Lea & Febiger 1942

In this edition Speed presents the subject from the point of view of the principles involved and discusses treatment, as he states in his preface, on the basis of experience. To those seeking a quick reference work for a standard method of treating a fracture, the book may be somewhat disappointing. To students and practitioners, however, who want an understanding of the principles underlying the care of fractures it is highly satisfactory. The anatomic and physiologic facts relating to injuries in each region are briefly and clearly presented. Reproductions of roentgenograms, line drawings and photographs are used throughout the text and, with their terse descriptive titles, add much to the book. Each chapter is followed by a bibliography. The index of subjects which follows the text is complete. The first chapter which deals with emergency handling of fractures, general methods of reduction, roentgenology, anesthesia and the technic of splinting, contains many valuable practical points. The second chapter, on the general outline of treatment of fractures, discusses minor and major procedures used, as well as indications for and against open operations. In the discussion of individual fractures throughout the rest of the book, these points of treatment are elaborated. It is evident throughout that the author is not in favor of the present tendency to standardize the technic for each fracture but insists on adapting the treatment to the particular circumstances. Consequently he discusses principles at length and outlines several technics which have been tried and found useful. His emphasis on the common complications and difficulties in handling various fractures adds greatly to the value of the book. The volume is long for any one looking for quick and easy information on the treatment of fractures. For those however who want an adequate discussion of the principles of fracture treatment this book is one of the best references for students and practitioners.

**Divertículos idiopáticos del duodeno** Por Manuel S. Gultarte. Tesis de doctorado. Universidad nacional de Buenos Aires. Facultad de ciencias médicas. Escuela de medicina. Paper. Pp 110 with 65 Illustrations. Buenos Aires. Sebastián de Amorrortu e Hijos. El Ateneo. 1941.

The concept of intestinal diverticula purely as a postmortem finding belongs to the past. Although no sign can be considered as pathognomonic a careful analysis of the symptoms may anticipate in many cases what the radiologic examination will show more conclusively. This is the idea that the author develops in his thesis on the basis of the experience gained from a careful study of several patients. The prognosis and treatment of the condition are also considered, and the literature (two hundred and eighty-one references) is carefully reviewed.

**Contribución al estudio de la epilepsia experimental en el hombre** Por el Dr. Isaac Roimiser. Tesis de doctorado. Universidad nacional de Buenos Aires. Facultad de ciencias médicas. Paper. Pp 132 with Illustrations. Buenos Aires 1942.

Epileptic attacks of 38 patients as induced by pentamethylene were studied. This and analogous drugs have made possible an objective and controllable study of epilepsy comparable in every way to the spontaneous disease. Although the chief purpose of the author was the experimental study of the condition—and he does it quite thoroughly—the beneficial therapeutic effects observed are also recorded. The thesis is really a good monograph on the disease which the specialist would enjoy reading.

## Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS BUT THESE WILL BE OMITTED ON REQUEST.

### TRANSMISSION OF FILARIA

**To the Editor**—An article by Dr Earl S Taylor (The Journal Dec 20 1941 p 2123) states that syphilis malaria influenza measles allergy smallpox and diseases caused by the rickettsia organisms and in the Orient parasitic diseases such as filaria have been reported as transmitted by transfusion of whole blood. As far as I know, microfilariae must be sucked up by a mosquito in whose body they undergo a definite biologic cycle. When the cycle is completed they get into the proboscis and when the mosquito bites they break through the labium and actively penetrate the skin presumably at the point of puncture by the mosquito. Filaria worms for example *Wuchereria bancrofti* do not live in the blood but in lymph spaces. Microfilariae are liberated into the blood but when they are in the blood they are not infective as they are just embryos which can further develop only in the mosquito. Would you be kind enough to tell me whether or not Dr Taylor was right in his assumption that filarial diseases may be transmitted by the transfusion of whole blood and if so whether any such cases have been reported?

Rudolf W Kogan Minneapolis

**ANSWER**—Filaria infections cannot be transmitted directly by the transfusion of whole blood. The embryos (microfilariae) which circulate in peripheral blood need to be picked up by a susceptible blood sucking fly in its blood meal after which they migrate from the fly's stomach to its thoracic muscles, where they metamorphose through a series of larval stages and migrate down the fly's proboscis sheath to enter the skin the next time the fly bites a human being. It is true, however, that microfilariae may be transferred from an infected individual to a filaria free person and may survive up to six weeks or more.

### SENSITIVITY TO COCAINE AND IODINE BEFORE BRONCHOGRAPHY

**To the Editor**—A recent issue of the *Lancet* or the *British Medical Journal* contained a statement that before one performs transcrithyroid bronchography patients should be tested for sensitization to iodine and cocaine. Can you give me a description of standard or generally employed tests for this purpose?

M D Iowa

**ANSWER**—Search of the literature reveals little information regarding tests for sensitivity to cocaine and iodine. As regards cocaine or cocaine substitutes, caution is strongly advised. Emil Mayer (THE JOURNAL, March 15, 1924, p 876), heading a committee which investigated the toxic effects of local anesthetics, reported forty six deaths, of which twenty-six were due to cocaine alone or with procaine. Some of these patients also received epinephrine to reduce local bleeding but Mayer believes that the addition of epinephrine in amounts of 1 mg or more to a solution of cocaine often increases the toxicity of the cocaine. He suggests that it is unsafe to inject more than 10 minims of a 1:10,000 dilution of epinephrine when used with cocaine or more than 1 mg with procaine. Mayer also advises that in operative procedures in the larynx or bronchi cocaine be used in 10 per cent dilution, with two applications, totaling not over 15 minims, containing from 1 to 1½ grains (0.06 to 0.1 Gm). Procaine should not be stronger than 1 per cent.

Louis Pelnér, in a recent report on allergy to iodine (*J Lab & Clin Med* 27 1150 [June] 1942), found that all 5 of his patients gave positive patch tests to iodine. He merely applied a drop of tincture of iodine to the skin. Within twenty-four hours all the sensitive individuals developed definite redness and swelling at the point of application. Nonsensitive persons were also tested but gave negative reactions. Pelnér says "If this can be shown to be a general finding in other cases it can be used as a diagnostic test." The test is simple and should be tried before iodides are used or tincture of iodine is applied. In Pelnér's series redness and swelling of the eyes and face and a fine scarlatiniform rash occurred in each case. In one case symptoms occurred after a saline laxative was taken which contained a small amount of iodine, in another the cause was a throat lozenge containing calcium iodide. A third patient developed symptoms from an iodoform pack, and the other two were affected by painting with tincture of iodine (1 of these developed thrombopenic purpura).

### BUBBLE BATH PREPARATIONS

**To the Editor**—A white girl aged 3½ years gives a history of rash. For the past year she has been using Bubble Foam and Featherfoam in her bath and I am interested in finding out what ingredients these articles contain. A paste patch did not show local reaction but a symptomatic reaction was noticed on the following day.

John P Helmick M D, Fairmont W Va

**ANSWER**—The ingredients of bubble bath preparations are salts which produce carbon dioxide when they are dissolved in water. Irritation following such a bath is ordinarily due to the carbon dioxide, a fine erythema sharply limited above at the high water mark. This lasts but a short time and is accompanied by a tingling sensation. Directions given for management of the carbon dioxide bath for therapy specify that the patient should be dried by patting, not rubbing. No report has been found of a persistent dermatitis caused by the carbon dioxide bath.

Another possibility is sensitization to the essential oils used to perfume the bath powder. Patch tests should be made to correspond as closely as possible with the conditions of the bath, the solution of salts diluted as in the bath and the carbon dioxide allowed to pass off before the patch is applied. A negative patch test, however, would not prove that the material tested was wholly innocuous.

### OPERATIONS ON INFERIOR OBLIQUE MUSCLE

**To the Editor**—At the present time three operations are mentioned for correction for an overacting inferior oblique muscle. It seems that tenotomy is no longer in vogue. However myectomy of the muscles or recession of the muscles has to be championed. Will you kindly advise me as to whether the more difficult recession has any actual advantage over myectomy?

M D, Michigan

**ANSWER**—No operator is justified in limiting his surgical armamentarium to any one operation on a given tissue. An overaction of an oblique muscle requires a different surgical attack than does an underaction. In the same way an advancement of an oblique muscle must be varied according to the amount and character of the correction desired. Consequently myectomy, recession and advancement all have their place, and the competent ophthalmic surgeon must be familiar not only with the technique but even more with the indications of each. A short but reasonably adequate discussion of this subject is to be found in the second edition of 'Principles and Practice of Ophthalmic Surgery' by E B Speth (Philadelphia, Lea & Febiger, 1941, p 191).

### 'STARCH EATING' AND NUTRITIONAL DEFICIENCY

**To the Editor**—A colored woman has informed me that she eats large quantities of common gloss starch such as is used in washing clothes. She tells me that a great many people of her race in this locality eat as much as 2 cups a day. She appears to be in good general health. Is there any harm in this practice?

M D Ohio

**ANSWER**—"Starch eating" is a common dietary idiosyncrasy in certain localities and may lead to the development of deficiency diseases, particularly of vitamins of the B complex. Since starch supplies carbohydrate calories and is devoid of vitamins, protein and minerals deficiency diseases may develop when calories derived from starch replace calories derived from foods of high vitamin content. If the person merely adds the starch to a diet of optimal vitamin, protein and mineral content, probably no harm would be done.

### HYPNOTISM

**To the Editor**—In The Journal Jan 23, 1943 page 299 M D Puerto Rico is answered regarding the current status of hypnotism as a therapeutic procedure. On the whole the reply is fairly satisfactory, but I object to referring to such a book as "The Science of Hypnotism" by Alexander Cannon New York E P Dutton & Co 1937. Immediately on reading the reply I opened my copy of Cannon's book by chance, at page 87. It reads: "In disease the discomfort is produced by a deficiency in certain vibrations including visual and auditory vibrations, and this means that the tuning fork of the body the etheric double (which holds the astral to the physical body and should not be mistaken for the etheric body which is still finer than the astral body) is out of tune and needs adjustment. The correct colour is found which is required for the replenishing of the deficiency of the spectrum and the correct sound should also be dealt with by the use of gramophone records choosing the right type of music which corrects the deflected auditory vibrations. The etheric vibrations of the higher realms are still unaffected and can be adjusted by hypnosis or such state induced by colour vibrations alone auditory vibrations alone or better still the two combined. Perfumes all of which are small vibrations also affect the human vibrations for good or evil. This can be observed in daily life. The constant smell of animals has often cured certain forms of insanity. I have used the Irwin colour filters for producing sedative, recuperative and stimulative influences upon the mind of man. The Deighton Patmore psychic light (which consists of a red lamp surrounded by an orange bowl) brings out latent mediumship and hypnophilia. Unfortunately such is the type of reference in one instance suggested to some one seeking reliable information. I hope you will correct this."

Milton H Erickson, M D, Eloise, Mich



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## HYPERTENSION IN PEOPLE OVER FORTY

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H H MARKS AB

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AND

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In a previous communication we<sup>1</sup> intimated that the incidence of hypertension in the general population over 40 and 50 was higher than was generally appreciated. This has been confirmed in preliminary reports on the incidence of hypertension in workers over 40 and in general hospital patients. In this report we now summarize the blood pressure readings in nearly 15,000 men and women over the age of 40.

The problem of hypertension is a fundamental one. Together with coronary sclerosis it is the most common form of heart disease and probably is the largest single cause of death. This is doubly so if only those over 40 are considered. Furthermore, hypertension is important in respect to the role it plays in other diseases, e g arteriosclerosis of the cerebral, renal and coronary vessels.

The incidence of hypertension in persons over 40 has become increasingly important because there are now millions of people who survive this age.<sup>2</sup> One third of the present population is 40 years or over<sup>3</sup> and it has been estimated that in 1980 nearly one half will be.<sup>4</sup>

The literature on hypertension is voluminous. Yet reports on the incidence of hypertension in large series of people over 40 years of age have been few. In the few reports that discuss hypertension in older age groups the number of cases has been too small to be

reliable, often only 100 cases.<sup>5</sup> Furthermore, frequently only blood pressure averages for each age group are given, but these are not helpful in determining the incidence of hypertension.

The tremendous material presented by insurance statistics cannot be used, since they consist of a selected group. People with serious degrees of hypertension either do not present themselves to the insurance companies or are rejected and therefore not included in the published figures. Nevertheless, that the blood pressure increases with age is definite.<sup>6</sup>

### MATERIAL

We have collected blood pressure readings on 14,849 persons over 40 years of age (tables 1 and 2). There were 5,737 workers,<sup>8</sup> none in industries exposed to poisons, 2,610 residents of homes for aged,<sup>9</sup> rather than homes for aged and sick, and finally 6,502 patients in a general hospital (Mount Sinai New York City) in which only a small percentage were admitted for hypertension or its complications. There were 8,483 men and 6,366 women. The material was divided according to sex and ten year age groups. All the groups, except that comprising the ages 90 to 99, were of sufficient size to give statistically reliable results (tables 1 and 2).

### METHOD OF TAKING BLOOD PRESSURE

All the blood pressures were taken by the auscultatory method by physicians. In the industrial concerns the blood pressure readings of the women were nearly always taken by women doctors.

In nearly two thirds of the readings the diastolic pressure was taken at the fifth phase—the complete disappearance of sound rather than at the fourth phase—the definite diminution in intensity. The American

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From the Naval Medical School, National Naval Medical Center, Bethesda, Md; the Cardiographic Laboratory, Mount Sinai Hospital, New York; and the Statistical Bureau, the Metropolitan Life Insurance Company, New York.

This article has been released for publication by the Division of Publications of the Bureau of Medicine and Surgery of the U S Navy. The opinions and views set forth in this article are those of the writers and are not to be considered as reflecting the policies of the Navy Department.

1 Master A M, Dack Simon and Jaffe H L. Age, Sex and Hypertension in Myocardial Infarction Due to Coronary Artery Occlusion. *Arch Int Med* 64: 767 (Oct) 1939.

2 (a) Master A M and Dack Simon. Incidence of Hypertension in People of Forty Years of Age and Older. *J Mount Sinai Hosp* 8: 1232 (March-April) 1942. (b) Hypertension in Workers Over Forty Years of Age. *Indust Med* 11: 145 (April) 1942.

3 Steglitz E J. Aging as an Industrial Problem. *J A M A* 116: 1383 (March 29) 1941. Longevity Almost Doubled in Six Decades. *Statistical Bull Metropolitan Life Ins Company* New York 23: 1 1942.

4 Our Aging Population. *Quart Bull City of New York Department of Health* 9: 53 1941.

5 Osborn Frederick. Significance to Medicine of Present Population Trends. *Bull New York Acad Med* 15: 427 (July) 1939. Dublin L I. Statistical and Social Implications in the Problem of Our Aging Population. *paper in Medical Problems of Old Age (a Symposium)* Univ Pennsylvania Bicentennial Conference. Philadelphia: University of Pennsylvania Press 1941. Steglitz E.

6 Bowes L M. Blood Pressure in the Aged. *J Lab & Clin Med* 2: 256 (Jan) 1917. Thompson R J C and Todd A E. Old Age and Blood Pressure Problems. *Lancet* 2: 503 (Sept 2) 1922. Wildt<sup>25</sup> Richter<sup>26</sup>.

7 Woley H P. The Normal Variation of the Systolic Blood Pressure. *J A M A* 55: 121 (July 9) 1910. Norris W N, Brazett H C and McMillan T M. Blood Pressure: Its Clinical Applications. ed 4. Philadelphia: Lea & Febiger 1927. Williams T A. The Heart in Old Age. A Study of Seven Hundred Patients Seventy-Five Years of Age and Older. *Am J M Sc* 182: 1 (July) 1931. Fisher I, Symonds I, Hunter<sup>21</sup> Blood Pressure<sup>22</sup> Saller<sup>23</sup> Gager<sup>24</sup> Wetherby<sup>25</sup> Fishberg<sup>21</sup> Saunders<sup>27</sup> Miller<sup>18</sup> Master Dack and Jaffe<sup>1</sup> Wildt<sup>26</sup> Bowes<sup>6</sup> Thompson and Todd<sup>6</sup> Richter<sup>26</sup>.

8 The data on industrial workers were obtained from the New York Telephone Company, New York (Dr E McSweeney) from the General Motors at the Saginaw plant in Michigan (Drs Clarence Selby and R D Mudd) from the E I du Pont de Nemours Company, Wilmington, Del (Dr G H Gehrmann) from R H Macy & Co, New York (Dr Michael Lake) and from the B Altman Company, New York (Dr Louis Hausman).

9 The material was gathered from the City Home for Dependents, New York (Maxwell Lewis and Dr William A Buck), Brooklyn Hebrew Home and Hospital, New York (Dr Herbert Schreiber), Home for Aged and Infirm Hebrews, New York (Dr F D Zeman), Home for Old Men and Aged Couples (Christina Sutherland), Hebrew Home for the Aged of Harlem, New York (I Spira), Theodore Presser Foundations, New York (James Cooke and Dr W A Buck), Presbyterian Home, New York (Dr C F Collins), Peabody Home, New York (Dr T J Fisk), Sisters of St John the Baptist, New York, Seabury Memorial Home, New York (Mrs Mank), Samaritan Home, New York (Mary Lord), Braker Memorial Home, New York (W M Arnold), Mariners Family Asylum for Aged Women of the Sea, New York (Nellie Oxley) and St Teresa's Guest House, New York (Mother Mary Casen).



Heart Association<sup>10</sup> has recommended that the former be used. Most clinicians, however, still use the fourth. Since the blood pressure reading at that point averages at least 5 mm higher than the fifth,<sup>11</sup> it is readily seen

TABLE 1—Hypertension in Men 40 Years of Age or Over  
Percentage with specified degree of hypertension classified according to age groups and source of material

Degree of Hypertension * Mm	Source of Data	Percentage at Ages					
		40-49	50-59	60-69	70-79	80-89	90-99 ‡
140/90 or over	All groups	33.6	49.2	66.5	77.1	77.7	87.0
	Industry	37.1	44.9	62.4	81.1	†	†
	Homes for aged	50.0 †	73.4	78.2	86.1	84.4	87.0
	Hospitals	37.1	50.6	58.4	63.6	61.3	†
130/90 or over	All groups	25.9	40.6	56.3	65.5	66.1	78.3
	Industry	23.8	34.7	49.5	62.3	†	†
	Homes for aged	34.4 †	66.4	70.1	74.8	75.0	78.1
	Hospitals	31.7	43.6	47.6	52.6	44.0	†
120/90 or over	All groups	16.9	30.8	51.0	61.8	62.2	73.9
	Industry	16.1	29.0	41.7	58.1	†	†
	Homes for aged	34.4 †	57.5	65.1	71.2	71.7	73.9
	Hospitals	18.7	33.6	43.9	48.8	47.7	†
120/100 or over	All groups	15.4	31.7	50.4	61.2	61.2	73.9
	Industry	14.8	27.6	39.8	56.6	†	†
	Homes for aged	34.4 †	57.3	64.8	70.6	71.7	73.9
	Hospitals	16.4	32.8	42.9	48.8	47.7	†
Systolic 120 or over	All groups	16.6	29.7	48.8	58.4	61.2	73.9
	Industry	14.4	26.8	39.8	56.6	†	†
	Homes for aged	28.1 †	47.6	61.7	66.1	65.9	73.9
	Hospitals	13.9	30.5	42.1	47.7	47.7	†
Diastolic 90 or over	All groups	22.7	34.2	43.7	47.3	41.8	57.2
	Industry	20.6	28.1	33.9	35.8	†	†
	Homes for aged	28.1 †	60.8	57.8	58.9	47.8	57.2
	Hospitals	28.7	36.8	36.1	39.4	26.7	†
Diastolic 95 or over	All groups	10.3	20.5	26.6	32.6	27.0	21.7
	Industry	8.9	17.1	19.7	23.6	†	†
	Homes for aged	25.0 †	39.9	36.8	41.2	37.8	21.7
	Hospitals	14.0	21.5	21.0	20.2	13.2	†
Number of cases	All groups	3,886	2,966	1,667	895	256	99
	Industry	2,492	1,124	719	55	1	†
	Homes for aged	72	141	619	496	180	99
	Hospitals	862	989	729	346	75	†

\* Cases are included if either the systolic or the diastolic is within the specified limits.

† Ratio not reliable because of small number of cases.

‡ Only 1 case in study.

§ All 23 men in this age group were from homes for the aged. Ratios in this column are not reliable because of the small size of the sample.

that had the former method been consistently employed the percentages of hypertension in our series would be higher.

In our preliminary reports, we<sup>2</sup> have already presented in detail our reasons for concluding that our cases are representative of persons in middle and later life in the general population as a whole and therefore summarize them here only briefly. Among the industrial cases over 40, every type of worker was represented: clerk, telephone operator, longshoreman, linesman, chauffeur, laborer, executive and others. The data were obtained from companies possessing a complete medical service, where the individual is examined at application for employment and often regularly thereafter at six or twelve month periods, where voluntary examinations may be had at any time, where complete records are kept and where necessary precautions are taken to obtain correct blood pressures. Thus, these blood pressure readings are dependable. Although we were assured by the medical directors that only a very high blood pressure would bar an applicant from employment, it may be that in times when jobs are scarce hypertension may be used as an excuse not to hire an applicant. On the other

hand, workers were not discharged for uncomplicated hypertension. To a slight extent our figures are low, since they would not include hypertensives rejected on application for a job. As already indicated, records of employees were excluded if the workers were exposed to toxic chemicals, fumes and so on, which affect bodily health and blood pressure.

With regard to the hospital material obtained from the Mount Sinai Hospital, New York,<sup>2a</sup> the data were derived from all types of patients in a large institution of 1,000 beds, consisting of open wards and semiprivate and private patient pavilions. There is no unusual concentration on any specialty, and cases included are drawn from every department—medicine, surgery, neurology, gynecology, otolaryngology, ophthalmology and others. All classes of people, rich and poor, banker and laborer, are represented.

To be sure that the admissions to the hospital for hypertension, hypertensive heart disease or heart failure and cerebral apoplexy were not significantly high, three hundred charts of each decade except the ninth were sampled. If a patient was admitted for hypertension and another disease, e.g. diabetes, and there was any doubt as to the primary condition, we classified it as a hypertension admission. It is evident from table 3 that admissions for hypertensive disease or its direct com-

TABLE 2—Hypertension in Women 40 Years of Age or Over  
Percentage with specified degree of hypertension classified according to age groups and source of material

Degree of Hypertension * Mm	Source of Data	Percentage at Ages					
		40-49	50-59	60-69	70-79	80-89	90-99 ‡
140/90 or over	All groups	53.2	64.8	77.9	81.7	84.7	81.1
	Industry	57.0	64	84.2	†	†	†
	Homes for aged	48.9 †	81.1	89.0	88.3	89.5	81.1
	Hospitals	40.9	67.8	77.6	72.6	60.4	†
130/90 or over	All groups	37.0	63.4	67.7	73.3	70.6	73.0
	Industry	30.2	33.6	73.7	†	†	†
	Homes for aged	56.3 †	72.5	87.1	80.8	80.9	73.0
	Hospitals	31.6	51.2	61.1	67.7	†	†
120/90 or over	All groups	23.6	46.6	64.5	70.2	74.3	70.3
	Industry	20.1	41.1	69.7	†	†	†
	Homes for aged	41.8 †	63.8	78.9	78.5	78.0	70.3
	Hospitals	26.2	44.5	57.9	58.4	53.6	†
120/100 or over	All groups	22.7	45.5	61.0	69.5	74.3	70.3
	Industry	19.7	43.5	63.7	†	†	†
	Homes for aged	43.5 †	68.0	76.6	77.5	78.0	70.3
	Hospitals	25.2	43.8	57.3	55.1	59.6	†
Systolic 120 or over	All groups	29.8	44.4	63.4	62.0	72.8	70.3
	Industry	17.7	41.9	63.4	†	†	†
	Homes for aged	43.8 †	65.1	78.0	75.3	76.1	70.3
	Hospitals	23.4	43.0	56.7	57.4	50.6	†
Diastolic 90 or over	All groups	26.6	42.7	46.0	50.0	54.8	48.6
	Industry	25.1	41.7	51.3	†	†	†
	Homes for aged	50.0 †	62.4	62.1	61.5	57.4	48.6
	Hospitals	27.7	40.8	38.6	39.9	44.2	†
Diastolic 95 or over	All groups	13.3	24.0	29.2	34.3	35.6	24.3
	Industry	11.3	21.4	28.9	†	†	†
	Homes for aged	31.3 †	44.0	40.1	44.3	37.3	24.3
	Hospitals	15.0	22.8	24.4	27.1	28.8	†
Number of cases	All groups	2,656	1,460	1,940	712	261	37
	Industry	1,779	884	76	9	†	†
	Homes for aged	16	169	346	400	209	37
	Hospitals	1,761	967	818	303	52	†

\* Cases are included if either the systolic or the diastolic is within the specified limits.

† Ratio not reliable because of small number of cases.

‡ Only 9 cases in study.

§ All 37 women in this age group were from homes for the aged. Ratios in this column are not reliable because of the small size of the sample.

plications (20 to 85 per cent) constitute an unimportant and not undue proportion of the total admissions.

As regards the homes for the aged a definite attempt was made to obtain data from institutions where the basis of admission was age rather than infirmity, that is, institutions where the resident could spend the rest of his days in security, where he usually paid something

10 Standard Method for Taking and Recording Blood Pressure Readings. Joint Recommendations of the American Heart Association and the Cardiac Society of Great Britain and Ireland. J A M A 113:294 (July 22) 1930.

11 Hunter A. Blood Pressure: What Affects It? Proc A Life Insur Pres 17:64 1923. Blood Pressure Study, 1939. Actuarial Society of America and the Association of Life Insurance Medical Directors. New York 1940. Mackenzie and Shepherd.<sup>12</sup>

or contributed his entire savings for his future upkeep. Probably two thirds of the residents did this. Protestants, Catholics and Jews were represented, less than one fourth were Jews. Complete records of blood pres-

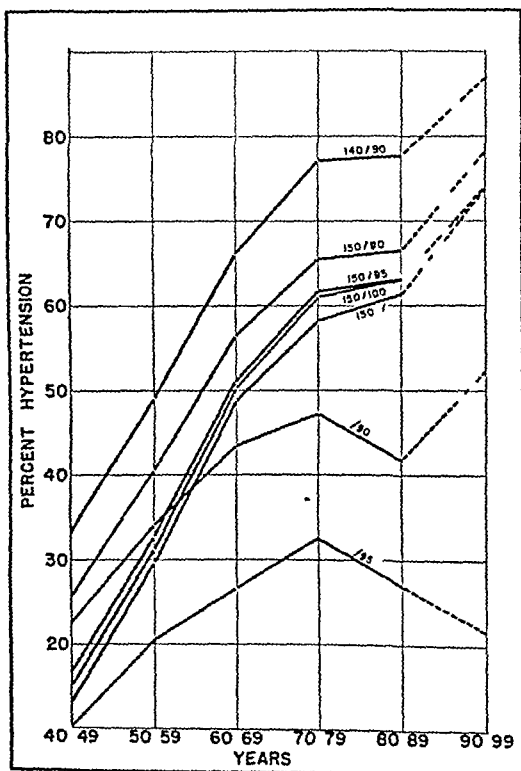


Chart 1—Hypertension in men aged 40-99

sure were kept in all instances and competent physicians made a physical examination once or twice a year regularly.

It is true that no one group, either workers, hospital patients or residents in the homes for the aged, is representative of the population as a whole. The incidence of hypertension was not identical for these three groups. However, since the aggregate is based on all classes of the population, it may be considered to be a fair cross section of it.

#### LIMITS OR DEFINITION OF HYPERTENSION

Clinicians and insurance investigators<sup>12</sup> have for years been interested in the limits to be used for hypertension. The definition of the latter is by no means specific. Various authors have used different lower limits of systolic and diastolic pressures, and in much of the earlier literature, and even some current literature, hypertension is defined merely in terms of the systolic. Some authors have related the lower limit to an arbitrary figure above the average for the age. In the past, a lower limit of 150/100 was in common use, but this was subjected some years ago to criticism as

being too liberal, chiefly on the basis of insurance mortality studies.<sup>13</sup> Some authorities now set the limit of beginning hypertension as low as at 140 mm systolic or 90 mm diastolic. In recognition of the arbitrary nature of the classification of hypertension we are reporting the facts on the basis of seven definitions, namely 140/90 or over, 150/90 or over, 150/95 or over, 150/100 or over (with either the systolic or diastolic pressure qualifying the case for the particular class), 150 mm systolic or over, 90 diastolic or over and 95 diastolic or over (tables 1 and 2).

#### RESULTS

Tables 1 and 2 give the combined results for the three broad classes of persons included in the study, subdivided according to age and sex, and these facts are presented graphically for men and for women in charts 1 and 2 respectively. Because of the relatively small number of cases over the age of 90, the changes between the ninth and tenth decades of age are indicated by broken lines.

On the basis of the customary limit of hypertension, 150 and/or 90 or over, a little over one fourth of the men have hypertension at ages 40-49, a little over two fifths in the next decade, considerably more than half in those 60-69, nearly two thirds in 70-79 and slightly more in the ninth decade. Among women the general contour of the age curve bears a general resemblance to that for males, but the proportions are much higher,

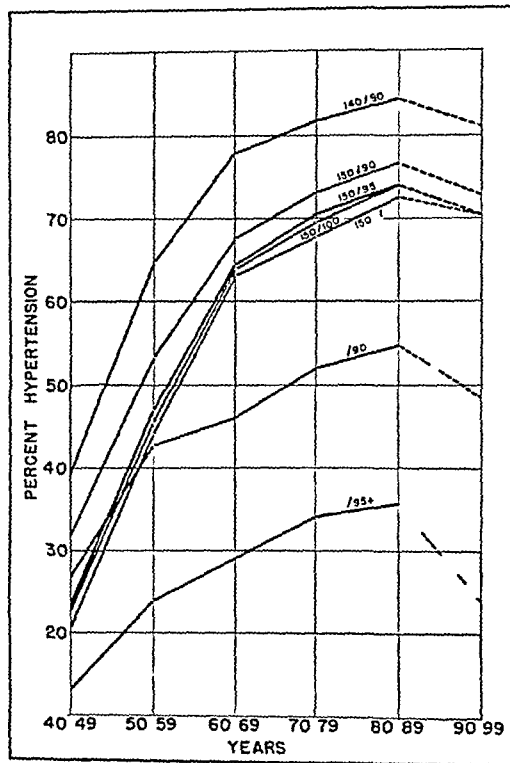


Chart 2—Hypertension in women aged 40-99

there being characteristic differences in the level and the steepness of the curves. In the first age group, 40-49, almost a third have hypertension, more than half

12 Fisher J W. The Diagnostic Value of the Sphygmomanometer in Examinations for Life Insurance. *J A M A* 63 1752 (Nov 14) 1914. Symonds Brandreth. The Blood Pressure of Healthy Men and Women. *ibid* 80 232 (Jan 27) 1923. Gager Leslie C. Hypertension. Baltimore: Williams and Wilkins Company 1930. Janeway T C. A Clinical Study of Hypertensive Cardiovascular Disease. *Arch Int Med* 12 755 (Dec) 1913. Edens E. Die Krankheiten des Herzens und Gefässe. Berlin: Julius Springer 1928. p 426. Hines E A Jr. Range of Normal Blood Pressure and Subsequent Development of Hypertension. A Follow Up of 1522 Patients. *J A M A* 115 271 (July 27) 1940. Basic Studies of the Aging Cardiovascular System. New York: Metropolitan Life Insurance Company 1940. Daley R M, Ungerleider H E and Gubner R S. Prognosis and Insurability of Hypertension with Particular Reference to the Electrocardiogram. *Proc A Life Insur M Dir America* 28 18 1942. Blood Pressure Study 1939.<sup>11</sup>

13 MacKenzie L F and Shepherd P. The Significance of Past Hypertension in Applicants Later Presenting Normal Average Blood Pressures. *Proc A Life Insur M Dir America* 24 157 1937. Blood Pressure Association of Life Insurance Medical Directors and the Actuarial Society of America. New York 1925. Blood Pressure Study 1939.<sup>11</sup>

in the next decade, more than two thirds in the seventh decade and about three fourths in the eighth and ninth decades

Turning to the lowest limit of hypertension namely 140 and/or 90 or over, it is found that about one third of the men between 40 and 49 years of age have hypertension, but this proportion increases rapidly for the next three decades, until it is over three fourths in the eighth. Among women the incidence of hypertension of this degree is approximately 40 per cent between the ages 40 and 49 rising rapidly and exceeding the three quarter mark between 60 and 69. The proportions continue to increase but more slowly, through the ninth decade when 85 per cent of the women have a blood pressure of 140/90 or over.

A study of the charts reveals that for all the seven limits of hypertension used, the incidence of hypertension rises with each decade until the age of 80. The curves containing systolic blood pressure limits rise, in fact until 90. The percentage is always higher in women.

When only diastolic blood pressure is considered there is found to be a definite lag in the upward slope of the curve of blood pressure with age beginning at the age of 60, and in men the proportion actually falls after age 80. This emphasizes the well known observation that the systolic rises more than the diastolic with age thus causing the pulse pressure to increase.

It is of interest to see how great the proportion of hypertensives is among persons in the general population who are past their fortieth birthday on the assumption that our findings are representative. Computations of this type, taking into account the increase in the proportion of cases with high blood pressure with advancing age have been made on the basis of the age distribution of the white population of the country at the census<sup>14</sup> of 1940. These computations have been done for several broad age groups viz 40 and over 50 and over 60 and over and 70 and over according to three of the definitions of hypertension (table 4).

By the most liberal definition of hypertension 140/90 or over, practically half the male population and 60 per cent of the female population 40 years of age and over are hypertensive. These proportions increase rapidly so that among persons 70 and over more than three fourths of the men and four fifths of the women have high blood pressure of this degree. Even by the much

population has a smaller proportion of persons at the ages past 60 than is true for the rest of the country.

The proportion of Negroes in our series is much lower than in the total population. If allowance should be made for this factor it would increase our figures somewhat, since hypertension has been reported to be appreciably more frequent in Negroes<sup>15</sup> than in white persons.

TABLE 4—Estimated Incidence of Hypertension of Various Degrees Among White Persons in the General Population Over Age 40

Based on the incidence in the survey and the age distribution of the population of the United States in 1940

Degree of Hypertension mm	Age Group Years	Percentage	
		Male	Female
140/90 or over	40 and over	41.8	53.8
	50 and over	59	72.5
	60 and over	70.5	79.6
	70 and over	77.2	82.2
140/90 or over	40 and over	40.9	50.7
	50 and over	58.2	62.2
	60 and over	70.8	70.2
	70 and over	65.8	71.0
150/100 or over	40 and over	31.5	41.6
	50 and over	42	56.5
	60 and over	51.7	60.5
	70 and over	61.4	70.4

Cases are included if either the systolic or the diastolic is within the specified limit.

Since most of the persons included in the study were residents of New York City which has a large Jewish population, it might be inferred that this was a major factor in the high incidence of hypertension reported. However only among hospital cases were Jews in the majority—about 60 to 65 per cent. As regards homes for the aged three fourths of the patients were non-Jewish. The proportions in the industrial cases are not known exactly but probably less than 10 per cent were Jewish. It is significant also that practically the same ratios of hypertension were observed in the different industrial concerns we have used in our study whether located in New York or elsewhere.<sup>16</sup>

#### COMMENT

It is surprising that there has not been an appreciation of the prevalence of hypertension in people over 40 or 50 years of age. However the indications of this high prevalence have been present if one searched for it. Since numerous papers<sup>17</sup> have shown that the average blood pressure goes up with age. Although the recording of average blood pressure in an age group is no help in respect to the incidence of hypertension, the paper of Britten and Thompson<sup>17</sup> and also the recent one of Miller<sup>18</sup> show a distinct trend of increase in hypertension with age. Thus, analysis of the data of Britten and Thompson shows in 2638 male workers an incidence of hypertension (150 mm) of 16.0 per cent in ages 40-49, 28.6 per cent in ages 50-59 and actually 51.2 per cent in the age of 60 years or over. These authors inferred that the high incidence of hypertension at the

TABLE 3—Hospital Admissions for Hypertension or Its Complications

Age Group	Male	Female
40-49	2.0%	2.5%
50-59	5.2%	7.7%
60-69	3.2%	1.3%
70-79	4.8%	8.5%

more conservative definition of 150/100 or over about one third of the male population and over two fifths of the female population at ages 40 and over have high blood pressure. This percentage also rises rapidly, so that it is present in more than a majority of men 60 and over and of women 50 and over.

In New York City, where most of the fundamental material was derived, the proportions would be slightly lower. The reason for this is that the New York City

<sup>14</sup> Age Composition of the Population for the United States Urban and Rural and for States 1940 (Sixteenth Census of the U. S. Series P 10, No. 6) U. S. Dept. of Commerce Bureau of Census Washington D. C. 1942

<sup>15</sup> Adams J. M. Some Racial Differences in Blood Pressures and Morbidity in a Group of White and Colored Workmen. *Am. J. M. Sc.* 184: 142 (Sept.) 1932. Hunter<sup>11</sup> Saunders and Bancroft<sup>10</sup>

<sup>16</sup> Fishberg A. M. Hypertension and Nephritis. ed 4 Philadelphia Lea & Febiger 1939. Lewis W. H. Jr. Changes with Age in the Blood Pressure in Adult Men. *Am. J. Physiol.* 122: 491 (May) 1938. Nossenthal H. O. Relation of the Kidney to Blood Pressure. New York State J. Med. 41: 953 (May 1) 1941. Woley<sup>7</sup> Fisher<sup>1</sup> Symonds<sup>12</sup> Hunter<sup>11</sup> Norris Bazett and McMillan<sup>1</sup> Saller<sup>13</sup> Gager<sup>12</sup> Wilbur<sup>1</sup> Wetherby<sup>14</sup> Saunders and Bancroft<sup>10</sup> Edens<sup>15</sup> Wildt<sup>16</sup> Bowes<sup>6</sup> Thompson and Todd<sup>8</sup> Richter<sup>10</sup>

<sup>17</sup> Britten R. H., and Thompson I. R. A Health Study of Ten Thousand Male Industrial Workers. *Pub. Health Bull.* 162 U. S. Public Health Service June 1926 p. 170.

<sup>18</sup> Miller Isidore. Blood Pressure Studies in the Aged. New York State J. Med. 41: 1631 (Aug 15) 1941.

older ages was common only to workers. As already stated, Saunders and Bancroft<sup>19</sup> found a 62.3 per cent incidence of hypertension (systolic 150 mm or more) in female Negroes of ages 50-59, 73.5 per cent of ages 60-69 and 73.1 per cent over 70. These investigators explained their findings away on the basis of poverty of the people and the frequency of avitaminosis among them.

Our survey of persons over 40 shows such high proportions with hypertension of slight and moderate degree that we believe it calls for some revision of our point of view as to what is normal for persons in middle and later life. It may well be that the definition of hypertension needs to be liberalized. For clinical medicine, certainly, if at least half the persons over 50 have a blood pressure of at least 150/90 it can hardly be said that such a degree of hypertension is abnormal. This point of view does not in any way conflict with the fact that pressures below this level are more favorable for longevity. We do not say, for example, that a man 60 years old with blood pressure 160/95 will live as long as one whose blood pressure is 120/80. That cannot be predicted for the individual. The chances are better for the man with the lower blood pressure because, when groups are considered, the mortality of those with higher blood pressure is appreciably in excess of those with low blood pressure. As far as longevity is concerned, insurance studies clearly show that the hypotensive have the best outlook. Richter<sup>20</sup> noted the frequency of very low blood pressures in very old persons. To the extent that the expected longevity is a rough index of physical and mental well-being, Robinson<sup>21</sup> may be correct in saying that hypotension is ideal, but we believe that he is wrong in intimating that the blood pressures beyond 140 or 150, let alone any blood pressure over 120, are 'pathologic.' It may well be that these higher pressures are a general and early indication of cardiovascular degeneration. But, of themselves, such pressures cannot be looked on as pathologic. Group longevity is not the sole criterion. Experience shows that in many persons hypertension is not incompatible with a high degree of mental and physical efficiency over long periods of time.

The data of this survey permit the construction of frequency distributions of blood pressures for persons over 40 and the computation of the normal range according to various statistical criteria. The preparation of this material is under way.

That the high percentage of hypertension in the population over 40 and particularly over 50, is no cause for alarm should be evident. Rather, it should be a means of reassurance since a slight, perhaps even a moderate, degree of hypertension can no longer be considered abnormal at these ages. Fahr<sup>22</sup> and Wiggers<sup>23</sup> feel that it is compensatory to the loss of elasticity that occurs in aging blood vessel walls. Since the aorta has lost its elasticity at each systole, the blood pressure is high. This physiologic reasoning also explains the

increase in pulse pressure with age,<sup>24</sup> for during diastole, as the blood flows off to the tissues of the body, the pressure falls rapidly since there is little elastic recall to the vessel wall. One might even hazard the opinion that the arteriosclerosis causes the hypertension and not vice versa.

We have mentioned the tendency of our curves to flatten after the age of 70, but the systolic hypertension certainly and even the diastolic (except in men from 80 to 89) rises until the age of 90. This is contrary to most series reported, which show a fall after the age of 65. Wildt<sup>26</sup> however, found in his small series a rise to 90. Saller's<sup>27</sup> data indicate a rise in blood pressure past 70 years of age. Wetherby<sup>28</sup> found increasing average blood pressure in older persons, but his data, based on the age group 70 and over, give no clue as to the situation in extreme old age. Undoubtedly the discrepancy is due to the fact that the number of cases in the age groups between 65 and 90 cited by previous investigators was very small, often consisting of 100 or 150 cases, including both men and women.

Concerning the absolute level of incidence of hypertension after the age of 90 we can say nothing, since the number of cases here is too small. We have used broken lines in the graphs to indicate this uncertainty.

#### SUMMARY

Since hypertension is most common in persons over 40 and because of the greatly increased number of people surviving this age, the incidence of hypertension at these ages is important.

The 15,000 persons in the survey (8,483 males and 6,366 females) represent a good cross section of the population in middle and later life. In each decade of life from the fifth to the ninth the size of the samples was sufficient to give statistically reliable results. The blood pressure readings were dependable.

The incidence of hypertension in each decade of life was determined according to seven limits namely 140/90 or over, 150/90 or over, 150/95 or over, 150/100 or over, 150 mm or over systolic, 90 or over diastolic and 95 or over diastolic.

In each decade of age a large proportion of persons were found to be hypertensive. This was true particularly of systolic hypertension. Among men a majority were hypertensive beginning with age 60 for most of the limits, and among women this occurred in some instances as early as age 50.

The percentages of hypertensive persons by decade were applied to the white population of the United States as constituted in 1940, and it was found that on this basis 41 per cent of the male population and 51 per cent of the female population 40 years of age and over would be expected to have blood pressures of 150/90 or over. At age 50 and over this ratio would be 50 per cent in males and 62 per cent in females; at age 60 and over, 60 per cent for males and 70 per cent for females; and at age 70 and over, 66 and 74 per cent respectively.

19 Saunders G M and Bancroft Huldah. Blood Pressure Studies on Negro and White Men and Women Living in the Virgin Islands of the United States. *Am Heart J* 23:410 (March) 1942.

20 Richter A. Ueber Blutdruck im höheren Lebensalter. *Deutsches Arch f klin Med* 148:111 1925.

21 Robinson S C and Brucier Marshall. Range of Normal Blood Pressure: A Statistical and Clinical Study of 11 383 Persons. *Arch Int Med* 64:409 (Sept) 1939.

22 Fahr George Davis Jay, Kerkhof Arthur, Hallock Philip and Giere Ellis. Hemodynamics of Arteriosclerosis. Influence of Change of Coefficient of Volume Elasticity on Circulation. *Am J Physiol* 101:376 (July) 1932.

23 Wiggers C J. Physical and Physiological Aspects of Arteriosclerosis and Hypertension. *Ann Int Med* 6:12 (July) 1932.

24 Fisher J W. Further Report of Diagnostic Value of the Systolic Blood Pressure Covering a Period from Aug 1 1907 to Aug 1 1915. *Proc A Life Insur M Dir America* 1917, p 203. Standard Method for Taking and Recording Blood Pressure Readings.<sup>10</sup> Adams J, Robinson and Brucier.<sup>21</sup>

25 Riseman J E F and Weiss Soma. The Age and Incidence of Arterial Hypertension. *Am Heart J* 5:172 1930. Bowes<sup>26</sup> Fisher.<sup>24</sup>

26 Wildt H. Ueber Blutdruck im Greisenalter. *Zentralbl f Hertz u Gefasser* f 41 1922.

27 Saller K. Ueber die Alters Veränderungen des Blutdrucks. *Ztschr f ges exper Med* 58:683 1928.

28 Wetherby Macnider. A Comparison of Blood Pressure in Men and Women: A Statistical Study of 5 340 Individuals in The Kidney in Health and Disease. edited by Hilding Berglund and Grace Medes. Philadelphia. Lea & Febiger 1935. p 370.

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Turning to the lowest limit of hypertension namely 140 and/or 90 or over it is found that about one third of the men between 40 and 49 years of age have hypertension, but this proportion increases rapidly for the next three decades, until it is over three fourths in the eighth. Among women the incidence of hypertension of this degree is approximately 40 per cent between the ages 40 and 49 rising rapidly and exceeding the three quarter mark between 60 and 69. The proportions continue to increase but more slowly through the ninth decade when 85 per cent of the women have a blood pressure of 140/90 or over.

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By the most liberal definition of hypertension, 140/90 or over practically half the male population and 60 per cent of the female population 40 years of age and over are hypertensive. These proportions increase rapidly so that among persons 70 and over more than three fourths of the men and four fifths of the women have high blood pressure of this degree. Even by the much

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	50 and over	50.0	65.0
	60 and over	69.0	70.0
	70 and over	68.8	71.0
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	60 and over	11.8	60.4
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<sup>15</sup> Adams J. M. Some Racial Differences in Blood Pressures and Morbidity in a Group of White and Colored Workmen. *Am J M Sc* 181: 342 (Sept.) 1932. Hunter<sup>16</sup> Saunders and Bancroft<sup>17</sup>.

<sup>16</sup> Fishberg A. M. Hypertension and Nephritis. ed. 4 Philadelphia Lea & Febiger 1939. Lewis W. H. Jr. Change with Age in the Blood Pressure in Adult Men. *Am J Physiol* 122: 401 (May) 1938. McEntal H. O. Relation of the Kidney to Blood Pressure. *New York State J Med* 11: 95 (May 1) 1941. Woley<sup>18</sup> Fisher<sup>19</sup> Symonds<sup>20</sup> Hunter<sup>21</sup> Norris Bazett and McMillan<sup>22</sup> Saller<sup>23</sup> Gager<sup>24</sup> Williams<sup>25</sup> Wetherby<sup>26</sup> Saunders and Bancroft<sup>27</sup> Edens<sup>28</sup> Wildt<sup>29</sup> Bowes<sup>30</sup> Thompson and Todd<sup>31</sup> Richter<sup>32</sup>.

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The percentages of hypertensive persons by decade were applied to the white population of the United States as constituted in 1940 and it was found that on this basis 41 per cent of the male population and 51 per cent of the female population 40 years of age and over would be expected to have blood pressures of 150/90 or over. At age 50 and over this ratio would be 50 per cent in males and 62 per cent in females, at age 60 and over, 60 per cent for males and 70 per cent for females, and at age 70 and over, 66 and 74 per cent respectively.

19 Saunders G M and Bancroft Huldah. Blood Pressure Studies on Negro and White Men and Women Living in the Virgin Islands of the United States. *Am Heart J* 23: 410 (March) 1942.

20 Richter A. Ueber Blutdruck im höheren Lebensalter. *Deutsches Arch f klin Med* 148: 111 1925.

21 Robinson S C and Brucer Marshall. Range of Normal Blood Pressure: A Statistical and Clinical Study of 11,383 Persons. *Arch Int Med* 64: 409 (Sept.) 1939.

22 Fahr, George Davis Jay Kerkhof Arthur Hallock Philip and Gere Ellis. Hemodynamics of Arteriosclerosis. Influence of Change of Coefficient of Volume Elasticity on Circulation. *Am J Physiol* 101: 376 (July) 1932.

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25 Riseman J E F and Weiss Soma. The Age and Incidence of Arterial Hypertension. *Am Heart J* 5: 172 1930. Bowes<sup>6</sup> Fisher<sup>1</sup>.

26 Wildt H. Ueber Blutdruck in Greisenalter. *Zentralbl f Hertz u Gefasser* 1: 41 1922.

27 Saller K. Ueber die Alters Veränderungen des Blutdrucks. *Ztschr f d ges exper Med* 58: 683 1928.

28 Wetherby, Macnider. A Comparison of Blood Pressure in Men and Women: A Statistical Study of 5,540 Individuals in The Kidney in Health and Disease edited by Hilding Berglund and Grace Medes. Philadelphia: Lea & Febiger 1935 p 370.

It was found that, regardless of the classification, the incidence of hypertension rose with each decade of age up through the eighth decade, and in the case of systolic hypertension up through the ninth decade. The incidence of hypertension was higher in women and rose precipitously between 40 and 60 years of age, faster than in men.

Systolic hypertension increased more rapidly than diastolic hypertension, resulting in an increase of pulse pressure with age.

The presence of hypertension at age 40 and over is so common that a mild degree and perhaps even a "moderate" degree can no longer be considered abnormal. Limits of normal blood pressure at these ages should therefore be raised. The material of the survey is being analyzed to develop such standards.

## THE RELATION OF VASCULAR DISEASE TO THE HYPERTENSIVE STATE

BASED ON A STUDY OF RENAL BIOPSIES FROM ONE HUNDRED HYPERTENSIVE PATIENTS

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The gross and microscopic appearance of the kidneys of hypertensive patients dying of renal failure or any other complication such as coronary disease, heart failure or cerebral hemorrhage has been fairly well established from postmortem studies. The almost constant finding of renal arteriolar disease in these cases has led many people to believe that increased peripheral resistance to blood flow offered by generalized arteriolar disease, especially of the kidneys, is the cause of hypertension. Moritz and Oldt's<sup>1</sup> comparative study of the arterioles of 100 hypertensive and 100 nonhypertensive persons showing that 97 per cent of the hypertensive and 12 per cent of the nonhypertensive persons had renal vascular disease seemed confirmatory evidence of this premise. The other school of thought is that the arteriolar disease is secondary to the hypertension, the cause of which is still unknown. The presence of severe arteriolar damage at the end stage of the disease, as seen in autopsy material, does not necessarily indicate primary arteriolar disease. Outside of experimental hypertension in animals, opportunities for study of the kidneys in the various stages of hypertension have been too few to warrant any definite conclusions.

The surgical treatment of hypertension by dorso-lumbar sympathectomy has afforded us the unique opportunity to examine the kidney grossly through this operative field and to take a biopsy. It was hoped that, if enough renal biopsies taken from hypertensive patients in all stages of the disease could be studied, light could be shed on the relation of the vascular disease to hypertension. During the past two years we have collected renal biopsies from more than a hundred hypertensive patients. This report will be based on a study of the first 100 cases.

## CLINICAL DATA

The 100 patients in this series ranged from 18 to 56 years of age, the average being 39. Table 1 shows their distribution by decades. There were 43 males and 57 females. Their symptoms, which included headache, fatigue and occasionally visual disturbances had been present from one month to fifteen years, the average being approximately six years. Most of them had systolic blood pressures over 200 mm. of mercury and diastolic pressures well over 100. The average systolic pressure was 210 and the average diastolic 130. Renal function determined by the phenolsulfonphthalein test showed that 60 per cent had normal function, that 20 per cent had a moderate reduction in excretion of the dye and that 20 per cent had a decided reduction. Renal clearance observations were performed on 20 of these patients, 15 of whom showed normal function by the phenolsulfonphthalein test. Of these 15, all but 3 showed diminished creatinine clearance and renal blood flow.

The eyeground changes were classified into four grades: grade 1 showed various degrees of arteriolar narrowing or constriction without nicking of venous crossings; grade 2, arteriovenous compression and narrowing, caliber changes, tortuosity or wide light reflexes in the arterioles; grade 3, retinal exudates or hemorrhages in addition to the other types of arteriolar changes; and grade 4, edema of the optic disks with measurable elevation usually with exudate and hemorrhage and any or all of the other changes mentioned. In this series of cases there were 32 per cent of grade 1, 28 of grade 2, 26 of grade 3 and 14 of grade 4. Five cases in which there was edema of the optic disks without measurable elevation were graded 1, 2 or 3 according to other changes. They may very well, however, have been in the earliest phase of malignant hypertension and might have been placed in grade 4. From these clinical data it is apparent that all stages of the hypertensive state are represented in this group of 100 hypertensive patients. Their renal biopsies, therefore, should provide fairly well balanced material to study the relation of the renal vascular disease to hypertension.

## TECHNIC

The selection of cases for sympathectomy will not be discussed here. Other significant clinical data concerning this group of cases and others as well will be reported in another communication. The operative procedure has previously been described by one of us.<sup>2</sup> In brief, it consists of a bilateral extensive splanchnic denervation, the great splanchnic nerves being removed from the semilunar ganglion to approximately the mid-thoracic level and the sympathetic trunk being resected from the ninth dorsal to the first or second lumbar ganglion inclusive. Occasionally the third lumbar ganglion is removed as well. The operation is performed in two stages, one side being done about ten days after the other. The exposure at this operation allows for accurate examination of the adrenals and kidneys which was done in all cases. No abnormalities of the renal artery or vein were noted other than congenital variations such as aberrant vessels to the upper pole or lower pole or both. Most kidneys were found to be

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<sup>1</sup> Moritz, A. R. and Oldt, M. R. Arteriolar Sclerosis in Hypertensive and Nonhypertensive Individuals. *Am. J. Path.* 13: 679-728 (Sept.) 1937.

<sup>2</sup> A more detailed account of the correlation of these findings with renal biopsies (Trillett, J. H., Castleman, Benjamin, Smithwick, R. H. and Melville, R. S., Renal Biopsy Studies Correlated with Renal Clearance Observations in Hypertensive Patients Treated with Radical Sympathectomy) is to be published in the *Journal of Clinical Investigation*.

<sup>3</sup> Smithwick, R. H. A Technique for Splanchnic Resection for Hypertension. *Surgery* 7: 18 (Jan.) 1940.



of normal size. In order to observe the cortical surface, the capsule was incised with a scalpel and by means of a groove director was gently reflected over an area approximately 3 cm in diameter. The large majority of kidneys had fairly smooth surfaces, a few were slightly granular and some had definite small scars. A wedge shaped specimen 6 to 7 mm wide and 5 mm deep was removed with a scalpel only forceps not being used to prevent any injury to the tissue. The specimen was immediately dropped into a bottle of Zenker's fixative. The biopsy wound was sutured with cotton or silk and covered with a small piece of adjacent fat. No complication occurred as a result of the biopsies. In 25 cases biopsies were taken from both kidneys and in every instance the microscopic appearance on the two sides was essentially the same.

#### MICROSCOPIC APPEARANCE OF THE RENAL BIOPSIES

Pathologists are so accustomed to the microscopic appearance of the hypertensive kidney from autopsy material with the usual postmortem changes that at the beginning of this study some of the findings due to the early fixation (a matter of seconds) seemed so conspicuous that they were at first believed to be pathologic. One of these is the strong accentuation of the basement membrane of the straight tubules, especially of the atrophic ones in the region of a small scar, best brought out by the van Gieson stain. The rapid fixation does not allow for the usual postmortem shrinkage of the epithelial cells in the convoluted tubules, so that these cells appear ballooned out and are filled with coarse granules, and almost all meet in the center, so that only a very small lumen, which is filled with granular material, is left. The glomerular capillaries in contrast seem more widely patent than in postmortem material.

The various types of renal vascular disease have been fully described in the past. One of the best papers on the subject is that by Moritz and Oldt,<sup>1</sup> and we have used their classification: intimal hyalinization, medial hypertrophy and degeneration and endothelial hyperplasia. Their comprehensive description and beautiful colored drawings of these various types of arteriolar sclerosis leave nothing to be added, and the reader is referred to this work for the detailed morphology. We arbitrarily divided the vessels studied into four groups: small arterioles, under 25 microns in external diameter, large arterioles, 25 to 50 microns in diameter, small arteries, 50 to 100 microns in diameter, and large arteries, over 100 microns. Since the biopsies were taken from the peripheral cortex, very few of the large arteries were available.

Most of the biopsies that showed vascular changes contained examples of all types. Except for endothelial hyperplasia, which was found only in the arteries and some of the large arterioles, the intimal and medial changes were observed in vessels of any size. Usually no one type of vascular change was found exclusively in a given biopsy. These findings are similar to those observed by Moritz and Oldt in their autopsy series. No necrotizing arteriolitis or change in the juxta-glomerular apparatus was observed.

We graded each biopsy according to the severity of its vascular disease without knowledge of any clinical data about the patient, and it was found that there were enough differences in the degree of vascular disease to classify the group into 5 grades: grades 0, 1, 2, 3 and 4. The biopsies showed that a very few patients, usually the older ones, had an occasional focal scar with

vascular disease in it. These scars are seen so often in nonhypertensive patients that it was felt that they should not influence the grading of the generalized vascular condition. This policy was also employed by Moritz and Oldt.

#### GRADE 0 RENAL VASCULAR DISEASE

There were 7 cases in which the biopsy showed no vascular disease. The absence of vascular disease in this group was confirmed by Drs. T. B. Mallory and A. R. Moritz. Two of these patients had biopsies taken from both kidneys and they were essentially the same. There were 4 women and 3 men, they averaged 37.7 years of age and had normal renal function. One interesting feature of this group is that 3 of the patients had adrenal tumors: two cortical adenomas and one pheochromocytoma.<sup>4</sup> The patient with the latter tumor had no symptoms of paroxysmal hypertension. A fourth patient in this group had symptoms suggestive of a hyperactive medullary tumor, but bilateral exploration and biopsy of the adrenals were negative.

#### GRADE 1 RENAL VASCULAR DISEASE

There were 21 patients, 11 men and 10 women with an average age of 40, in the group with grade 1 disease. The vascular disease in this group was so slight that at a cursory examination in many instances it might

TABLE 1—Age Distribution

Age	Patients
10-19	1
20-29	15
30-39	34
40-49	40
50-59	10
	<hr/> 100

well have been missed. The number of vessels involved was relatively small and much of the involvement was observed first in sections stained for elastic tissue by the van Gieson and Weigert method. All types of vascular disease were present, but it seemed that intimal hyalinization of the arterioles and arterial endothelial hyperplasia predominated. The amount and degree of vascular disease in this group was so slight that it is very unlikely that renal ischemia produced by vascular narrowing played any mechanical role in the production of the hypertension. One patient in this group had an adrenal cortical adenoma.

#### GRADE 2 RENAL VASCULAR DISEASE

There were 25 patients, 17 women and 8 men averaging 41.2 years of age, whose renal biopsies were classified as grade 2. Here the vascular disease was more advanced than the minimal changes seen in grade 1 but still not severe enough to be put with the large group 3 in which vascular disease was apparent even at a cursory glance with low magnification. In grade 2 an occasional hyalinized glomerulus was seen but by and large the vascular disease could be considered as mild. One patient in this group had an adrenal cortical adenoma.

#### GRADE 3 RENAL VASCULAR DISEASE

Grade 3 patients were those whose biopsies showed vascular disease usually severe in degree in every vessel. There were many more scars and hyalinized glomeruli

<sup>4</sup> A more detailed discussion of the incidence of adrenal tumors in this series of cases will be reported separately.

in a fair proportion of this group, but others showed apparently normal widely patent capillary tufts. Medial arteriolar hypertrophy seemed to predominate in this group. There were 33 patients in this group, 22 women and 11 men, their average age was 36.8 years. Two patients in this group had an adrenal tumor—1, a cortical

TABLE 2—Correlation of Renal Biopsies with Renal Function

Renal Vessels	Cases	Renal Function		
		Normal	Moderate Reduction	Sharp Reduction
Normal	7	7	0	0
Grade 1	21	17	3	1
Grade 2	2	16	6	
Grade 3	33	19	6	8
Grade 4	14	1	0	8
	100	60	29	11

adenoma and the other both a pheochromocytoma on the right side and a cortical adenoma on the left. The latter patient did not have paroxysmal hypertension.

#### GRADE 4 RENAL VASCULAR DISEASE

Fourteen patients, 10 men and 4 women with an average age of 42 years, had the most severe renal vascular disease. Every vessel was involved, many glomeruli were scarred and surrounding tubules were atrophic. Except for the absence of necrotizing arteriolitis, these biopsies suggested the so-called malignant nephrosclerosis and all but 1 patient did have decreased renal function. It might be argued that these patients should not have been subjected to sympathectomy because of their imminent uremia. Although this is probably true of some of this group, others have apparently been benefited, a few in a striking fashion.

#### THE QUESTION OF PYELONEPHRITIS

A few of the biopsies, more from grade 4 than from the other groups of patients, showed changes consistent with chronic or healed pyelonephritis according to the criteria of Weiss and Parker.<sup>5</sup> Not all of these patients gave a history of old or chronic urinary infection, while a few with a definite pyelonephritic history showed no evidence by biopsy. It was felt, however, that a definite diagnosis of pyelonephritis was not warranted from a small biopsy which did not include any medulla.

#### CORRELATION OF RENAL FUNCTION WITH RENAL VASCULAR CHANGES

Renal function as measured by the phenolsulfonphthalein test showed normal excretion in 60 per cent of all the cases. When divided into their biopsy grades, it is apparent from both table 2 and chart 1 that renal function is poorer the more severe the vascular disease. These results are obviously what is to be expected, however, and constitute confirmatory evidence of the accuracy of our microscopic gradings. For example, 81 per cent of patients with grade 1 renal vascular disease had normal excretion while 93 per cent of those with grade 4 disease showed impairment in renal function. There were, of course, exceptions such as 1 case of grade 1 in which there was very poor function and 1 case of grade 4 in which there was normal function. It should be emphasized that ordinary renal function tests may fail to detect early evidence of vascular disease and usually are normal or only slightly reduced when grade 3 vascular disease is present.

#### CORRELATION OF RETINAL VESSELS WITH RENAL VASCULAR CHANGES

The four grades of retinal change were described under clinical data. In many clinics quantitative estimation of the severity of a patient's hypertension is based wholly on the eye-ground changes, and for that reason it is interesting to correlate these changes with those in the kidney. Table 3 shows that there does seem to be some correlation between these two vascular systems in the normal grade 1 and grade 2 renal groups. 5 out of 7 of the normal renal biopsy group showed only grade 1 retinal changes, 81 per cent of the grade 1 renal showed grade 1 or 2 retinal changes. However, even in these groups there were many exceptions. With respect to the grade 3 renal group, all grades of retinal changes were about equally represented. In the grade 4 biopsy group 8 out of the 14 showed severe retinal changes.

#### THE QUESTION OF MALIGNANT VASCULAR NEPHRITIS AND MALIGNANT HYPERTENSION

In this series of 100 patients there were 14 who clinically fell into the class usually called malignant hypertension. All but 3 of these patients showed either grade 3 or grade 4 renal vascular disease. Nine had impaired renal function as measured by the phenolsulfonphthalein test but none had nonprotein nitrogen retention. All of them showed grade 4 retinal changes, i. e. measurable edema of the optic disks in addition to other retinal vascular disturbances. Microscopically the diagnosis of malignant vascular nephritis is usually associated with necrotizing arteriolitis. In none of these 14 cases of so-called malignant hypertension nor in any of the remaining cases in the series was there any arteriolar necrosis. Our data thus substantiate Goldblatt's<sup>6</sup> experimental evidence that both hypertension and severe renal insufficiency with uremia are necessary factors in producing necrotizing arteriolitis. He was able to produce these lesions in dogs by decreasing the blood supply of both kidneys below the level that was usually necessary to cause merely benign hypertension. These 14 patients were operated on before the onset of uremia and their kidneys, therefore, would not be likely to show any arteriolitis. Only

TABLE 3—Correlation of Renal Biopsies with Retinal Vessel Changes

Renal Vessels	Cases	Retinal Vessels			
		1	2	3	4
Normal	7	5	0	2	0
Grade 1	21	0	8	2	2
Grade 2		4	10	9	7
Grade 3		8	7	10	5
Grade 4	14	2	4	6	9
	100	28	29	31	14

1 died postoperatively. Although it is not within the scope of this paper to discuss the value of sympathectomy, it is interesting to note that the 2 patients in this group who have been followed for over a year after sympathectomy now have blood pressures of 120/90 and 140/100. Their respective blood pressures before operation were 175/135 and 230/160.

5 Weiss, Soma and Parker, Frederic, Jr. Pyelonephritis Its Relation to Vascular Lesions and to Arterial Hypertension. *Medicine* 18: 221 (Sept.) 1939.

6 Goldblatt, Harry. Studies on Experimental Hypertension. VII. The Production of the Malignant Phase of Hypertension. *J. Exper. Med.* 67: 809-826 (May) 1938.

## FOLLOW-UP

Obviously great care is being taken to follow these patients. Our follow-up data at the present time in the individual renal biopsy groups are inadequate for us to attempt to predict which cases will respond to sympathectomy. However, it is of interest to report

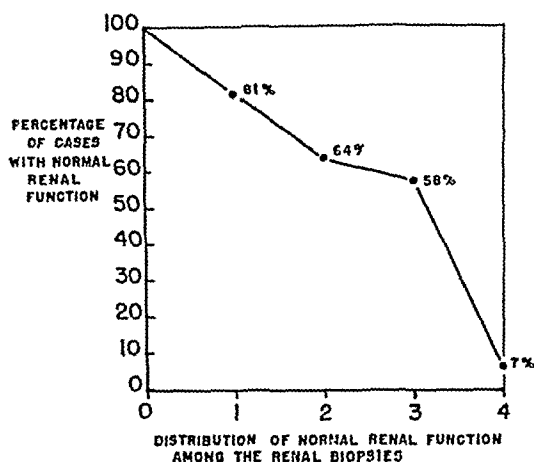


Chart 1—Distribution of normal renal function among the renal biopsies

that to date data are available on 21 patients who have been followed for at least a year. Most of these are in grades 2 and 3 renal vascular disease and have responded well. For example, the 7 patients in grade 2 that have been followed for a year have all had a fall in blood pressure averaging 45 mm of mercury systolic and 20 mm diastolic. Ten out of 11 patients in grade 3 had falls in pressure averaging 70 mm systolic and 35 mm diastolic. Only 1 patient with grade 4 renal disease has been followed for a year. He is back at work and his pressure which was 212/144 preoperatively is now 160/100. The blood pressures of 2 patients with grade 1 renal disease have not changed appreciably. We have just recently had the opportunity of studying a second biopsy taken one year after the first from a woman aged 27, and although her blood pressure, which was 235/145 before splanchnic resection is now 150/100, the renal disease, which was classified as grade 3, has not changed.

## COMMENT

The most striking result of this work is the finding of such a high percentage of renal biopsies in which there is no or only minimal vascular disease. Seven per cent were graded 0, 21 per cent grade 1 and 25 per cent grade 2, i. e., 28 per cent and possibly 53 per cent of the cases showed renal vascular systems so slightly damaged that it seems unlikely that the blood flow could have been embarrassed sufficiently to be the one factor responsible for the hypertension. A valid objection might be raised that a biopsy as small as the ones removed in this series is not an adequate sample of the whole kidney. We believe, however, that since great care was taken to select a representative region for biopsy and since similar morphologic findings were present in both kidneys in those 25 cases in which bilateral biopsies were taken each biopsy is a fair sample of the renal tissue in the respective case. When the preliminary report of this work was presented before the American Association of Pathologists and Bac-

teriologists in April 1941,<sup>7</sup> biopsies on only the first 16 cases were available. The statement was made then that all of the specimens showed definite and fairly severe vascular disease. In view of additional evidence it is apparent that this series was too small and included a high proportion of cases in which there was more severe hypertension. The biopsy grades of these 16 cases were 3 in grade 4, 11 in grade 3 and 2 in grade 2. It was our feeling at that time that since nearly all the biopsies showed moderate to severe vascular disease with relatively little if any renal impairment, perhaps the anatomic changes had probably antedated the hypertension. In the larger series of 100 patients, however, there were 53 who had normal kidneys or minimal renal vascular disease. Most of these patients, however, had had their hypertension for years and almost 30 per cent of them had hypertension which was clinically severe, some associated with cerebral hemorrhage or thrombosis.

The following is a case in point.

A housewife aged 38 developed mild hypertension 150/90 during the second trimester of her first pregnancy sixteen years before admission. Her blood pressure returned to normal following this pregnancy but rose again during her second pregnancy three years later. Ever since then she had had mild hypertension and during the past five years complained of fatigue, palpitation, dyspnea on exertion and occasional headaches. Examination four years before entry showed normal ocular fundi except for slight arterial constriction grade 1. The blood pressure was 170/110. There was no albuminuria. The heart was not enlarged. Two years later slight cardiac enlargement was demonstrable and there was a faint trace of albumin in the urine. Finally during the year before admission severe occipital headaches, increasing fatigue and nervousness developed. Her blood pressure was 260/150, the heart was large and the fundi showed 1 to 2 diopters of papilledema. The urea clearance was 92 per cent of normal.

Here, then, is a patient who had mild hypertension for many years and then suddenly so-called malignant

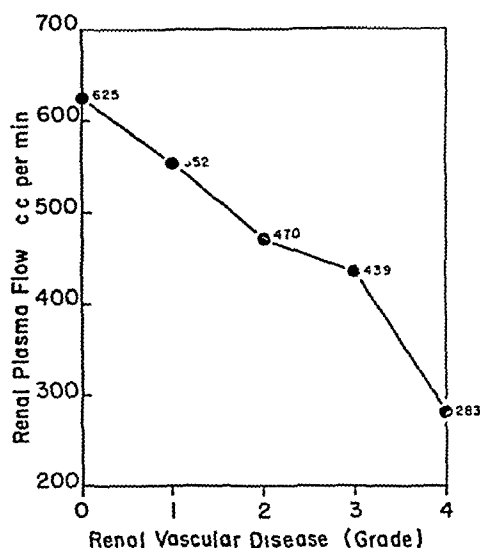


Chart 2—Average renal plasma flow values for each of the five grades of renal vascular disease

hypertension developed. Her renal biopsy showed only grade 1 changes—changes with luminal arteriolar narrowing so slight that under no circumstances could they alone be held responsible for the origin of the hyper-

7 Castleman Benjamin, Smithwick R. H. and Palmer R. S. Renal Biopsies from Hypertensive Patients. *abstr. from Scientific Proceedings of the 41st annual meeting of the American Association of Pathologists and Bacteriologists*. *Am J Path* 17: 617-619 (Dec.) 1943.

tension. It seems reasonable to infer therefore that her hypertension antedated her renal vascular disease. It is very probable that a renal biopsy performed a few years before would not have shown any vascular change.

This patient is one of the group of 21 (grade 1) having such minimal evidence of renal vascular disease that one is led to believe that the hypertensive state antedated the vascular disease. This possibility seems even more likely when one considers that 7 cases in this series, some with severe long-standing hypertension had no renal vascular disease at all (grade 0). It can further be stated that, in many of the 25 cases presenting grade 2 renal vascular disease in which the changes did not appear severe enough to have diminished the vascular bed to cause hypertension, the hypertension may also have antedated the vascular disease. This is in keeping with Cox and Dock's<sup>8</sup> recent perfusion experiments on kidneys post mortem in which they found that "most kidneys from patients with hypertension without uremia have vascular beds in the normal range." In another paper<sup>2</sup> based on 20 of the cases reported here it has been shown that a correlation appears to exist between renal vascular disease and renal plasma flow. Chart 2 shows the average renal plasma flow values for each of the five grades of renal vascular disease. It is interesting to note that in the grade 0 and grade 1 renal

TABLE 4—Distribution of Peripheral Vascular Disease Found in Renal Biopsies

Renal Vessels	Cases	Peripheral Vascular Disease	
		Present	Absent
Normal	3	0	3
Grade 1	14	1	1
Grade 2	12	6	6
Grade 3	11	6	5
Grade 4	6	4	2
	46	17	29

biopsy groups there was very little if any reduction in blood flow, in the grade 2 group there was a 25 per cent reduction, in the grade 3 group a 30 per cent reduction and in the grade 4 cases a 60 per cent reduction.

We are therefore led to the conclusion that a state of hypertension not infrequently exists in man in which evidence of renal vascular disease is either absent or is insufficient to explain the elevated blood pressure. The implication is that in many cases some other functional factor or factors exist which are primarily responsible for the hypertensive state and which precede the appearance of renal vascular disease. This point of view would appear to correspond to that of Homer Smith and his associates,<sup>9</sup> who found evidence from renal blood flow studies "that there exists a perturbation of vascular function which is primary in time and causality to the destruction of renal parenchyma." It is certainly very probable that the vascular disease, once established, aggravates the already present hypertension, which in turn accelerates the arteriosclerosis—a vicious circle. This is the stage in which the kidney is found post mortem and on which the theory of the primary vascular origin of essential hypertension is based. Our observations of the kidney biopsies in the earlier stages of hypertension have given us the missing link to help substantiate the theory that the hypertensive state precedes the renal vascular disease in many cases.

Because of the fact that renal vascular disease of consequence is known to exist in some normotensive patients dying of various causes (12 per cent in Moritz and Oldt's series) it seems probable that renal vascular disease could have been present before the onset of hypertension in some cases. In other cases renal vascular disease may result from lesions of one or both kidneys such as pyelonephritis. Even so the conclusion that renal vascular disease is the sole cause of hypertension under these circumstances is open to question. Granting that renal vascular disease may be present before the onset of hypertension, our data suggest that in many cases of so-called essential hypertension the elevation of blood pressure precedes the development of vascular disease in the kidney. It is not our purpose to minimize the importance of the kidney as a factor in the hypertensive state. We believe that it is probably the most important of all splanchnic viscera once it becomes involved by vascular disease or by some other mechanism resulting in a reduction or modification of the nature of its blood flow. We simply wish to indicate that the following sequence of events not infrequently exists: (a) hypertension and (b) renal vascular disease.

Just when peripheral vascular disease enters this sequence has not yet been established. There has been so much difference of opinion in the literature as to whether peripheral arterioles are or are not diseased in cases of hypertension that a study of the arterioles in biopsies of the sacrospinalis muscle in relation to the renal biopsies has been begun. At the present time we have examined only one section of muscle from 46 of the 100 cases in this series and without resorting to micrometer measurements noted that medial hypertrophy was present in only 40 per cent of the cases. Table 4 shows the distribution of these changes in the renal biopsy groups.

It is interesting to note the rare presence (7 per cent) of peripheral arteriolar sclerosis in grade 1 renal disease and the apparent increase of peripheral vascular disease in the higher renal groups (60 per cent in grades 3 and 4). Since each section contained relatively few vessels and since peripheral arteriolar sclerosis may be segmental (Moritz and Oldt<sup>11</sup>) it is quite possible that vascular disease may have been missed in some of the cases. Without serial sections of the blocks of tissue and perhaps micrometer measurements of the vessels no definite conclusions should be made from these findings. If these preliminary observations are confirmed it will be possible to conclude that the peripheral vascular disease develops after the renal disease.

#### SUMMARY AND CONCLUSIONS

1 Renal biopsies from 100 hypertensive patients in the course of splanchnic resections for hypertension were examined microscopically and the degree of their vascular disease divided into five grades as follows: grade 0, 7 per cent, grade 1, 21 per cent, grade 2, 25 per cent, grade 3, 33 per cent and grade 4, 14 per cent.

2 The patients averaged 39 years of age and were suffering from hypertension (average 210/130) for about six years. Sixty per cent had normal renal function as measured by the phenolsulfonphthalein test and all showed retinal vascular changes from mere arteriolar narrowing to edema with elevation of the optic disks.

3 In contrast to the almost invariable finding of well developed arteriolar disease in the kidneys of hypertensive patients observed post mortem, 28 per cent of the biopsies showed no or insignificant vascular disease and an additional 25 per cent only mild changes.

4 From these observations it is concluded that the morphologic evidence of renal vascular disease in more than half of the cases was inadequate to be the sole

<sup>8</sup> Cox, A. J. and Dock, William. The Capacity of the Renal Vascular Bed in Hypertension. *J. Exper. Med.* 74: 167-175 (Sept.) 1941.

<sup>9</sup> Smith, H. W. Physiology of the Kidney. Department of Journalism Press, University of Kansas, Lawrence, 1939.

factor in producing the hypertension and that in many of these and probably others the hypertensive state antedated the renal vascular lesion, which, once established, probably aggravated the hypertension. Furthermore, these observations are not in keeping with the concept that renal ischemia due to preexisting renal vascular disease is the cause of essential hypertension in man.

5 It is of interest to note that eight adrenal tumors were found in 7 patients. Six were cortical adenomas and two were pheochromocytomas. The latter had not provoked paroxysmal attacks of hypertension.

## THE ADMINISTRATION OF EGG WHITE AND AVIDIN CONCENTRATES TO PATIENTS WITH CANCER

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A rational basis for the treatment of cancer is to deprive the neoplastic tissue of the components required for its growth. This basis presumes that neoplastic cells either contain certain constituents lacked by their normal analogues or that the requirement for those constituents by the cancer tissue is greater than that of normal tissue.

Recently, several types of carcinoma were reported to contain abnormally high concentrations of biotin.<sup>1</sup> About the same time it was noted that the addition of biotin to diets which prevented in rats the development of hepatomas induced by the feeding of butter yellow broke down the protection those diets otherwise afforded.<sup>2</sup> These observations do not necessarily imply that biotin is required for the induction or growth of neoplastic tissue. They do suggest the possibility, however, that, if biotin should be withheld from patients bearing cancer, the growth of the neoplasm might be decreased to a greater extent than would that of the normal tissues.

The existence in egg white of a protein, avidin,<sup>3</sup> which forms a complex with biotin has been known for several years. The oral administration of large amounts of dried egg white to rats induces in them a deficiency syndrome presumably because the avidin prevents the absorption of dietary biotin from the gastrointestinal tract.<sup>4</sup> The production of a biotin deficiency in man also has been claimed. Clinical evidence of this deficiency was obtained within four to twelve weeks in normal individuals maintained on low biotin diets supplemented with about 1,000 units of avidin in the form of crude egg white. At the same time as clinical changes appeared, the urine of the subjects possessed abnormally small amounts of biotin activity.<sup>5</sup>

Obviously, the next step was to induce by the administration of egg white a biotin deficiency in patients with cancer and thereby to deprive the neoplastic tissue of a component possibly required in greater amounts by the tumor cells than by the normal cells. Accordingly, 2 patients with widespread cancer were given diets low in their content of biotin and supplemented with amounts of avidin several times greater than that necessary to bind *in vitro* the dietary biotin. The results obtained form the subject of the present communication.

### CLINICAL MATERIAL

The first of the 2 patients studied was L. W., a woman aged 58 with a mammary carcinoma of grade 2. A mass in her right breast first was noted ten years before admission to the hospital. The existence of the mass had been neglected and it had been allowed to grow until the whole breast was replaced by an ulcerating tumor. This extended through the chest wall on to the right pleura with metastases to the liver and to the right axillary and supraclavicular nodes. X-ray examination failed to reveal intrapulmonary or bone metastases but did demonstrate the existence of a moderate right pleural effusion. Accordingly the patient was considered to be unsuitable for surgery or radiation therapy.

The second patient, H. M., a man aged 48 with chronic lymphatic leukemia, for four months had noticed a gradual, progressive weakness, pallor, anorexia, generalized lymphadenopathy and abdominal distention. On admission he was found to have decidedly enlarged lymph nodes in all areas, the liver edge extended to the level of the umbilicus and to the midline, the spleen extended 2 inches below the umbilicus and also to the midline. There was a moderate degree of ascites, peripheral edema, dilated abdominal veins and bone tenderness. His red cell count was 2,033, hemoglobin 35 per cent and white cells 420,000, of which 98 per cent were adult lymphocytes. A sternal marrow aspiration confirmed the diagnosis of chronic lymphatic leukemia.

Throughout the present study, neither patient received any x-radiation therapy.

### METHODS

The method used for the assay of avidin<sup>3</sup> in the egg white and of biotin<sup>6</sup> in the diet and in the urine of the patients was essentially that of Snell and others.<sup>7</sup> The following modifications were employed:

(a) The Fleischmann foil yeast cake was used. Under the experimental conditions employed, the effects of biotin on the growth rate of this organism were the same as on the yeast used by Snell and his collaborators.

(b) To prepare a urine for its determination of biotin, a 5 cc sample was made acid with 12 normal sulfuric acid and autoclaved at 15 pounds pressure for one hour. The pH of the autoclaved urine was adjusted to 4.2 by the addition first of potassium hydroxide 1:1 and then of potassium hydroxide N/1. A glass electrode was employed for the titration. The urine specimen then was diluted with water to from 200 to 500 volumes and 0.25, 0.5, 1.0 and 2.0 volume samples used for assay.

(c) To assay the biotin content of the diet, amounts of all the foods equal to those ingested in the course of a day (other than egg white) were combined in a

6 Throughout this communication the term "biotin" is used to indicate the yeast growth effect in the assayed materials in terms of biotin equivalents.

7 Snell, E. E., Eakin, R. E. and Williams, R. J. A Quantitative Test for Biotin and Observations Regarding its Occurrence and Properties. *J. Am. Chem. Soc.* 62: 175-178 (Sept.) 1940.

Dr. Abels is Finney Howell fellow from the Memorial Hospital for the Treatment of Cancer and Allied Diseases.

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1 West, P. M. and Woglom, W. H. The Biotin Content of Tumors and Other Tissues. *Science* 93: 525-527 (May 30) 1941.

2 du Vigneaud, Vincent, Spangler, Juliet M., Burk, Dean, Kensler, C. J., Sugiyama, Kanematsu and Rhoads, C. P. The Pilocarpine Effect of Biotin in Butter Yellow Tumor Formation. *Science* 95: 174-176 (Feb. 13) 1942.

3 Eakin, R. E., Snell, E. E. and Williams, R. J. A Constituent of Egg White Capable of Inactivating Biotin *In Vitro*. *J. Biol. Chem.* 140: 535-543 (Aug.) 1941.

4 Gyorko, Paul, Rose, C. S., Eakin, R. E., Snell, E. E. and Williams, R. J. Egg White Injury as the Results of Nonabsorption or Inactivation of Biotin. *Science* 93: 477-478 (May 16) 1941.

5 Sydenstricker, V. P., Singal, S. A., Briggs, A. P., De Vaughn, N. M. and Isbell, H. S. Preliminary Observations on Egg White Injury in Men and Its Cure with a Biotin Concentrate. *Science* 95: 176-177 (Feb. 13) 1942.

5 liter jar. Water was added to make 1 liter, and the whole was thoroughly mixed for two hours by an electric stirrer. Three aliquots (5 cc) of this mixture then were removed for analysis. Each sample was acidified with 9 volumes of 6 normal hydrochloric acid and autoclaved at 15 pounds for one hour, the  $pH$  of the

excreted daily in the urine of patient 1 ranged from 6 to 132 micrograms and averaged 37 micrograms (chart 1). Thus it would appear that the addition of about sixteen times the amount of avidin to bind in vitro the biotin in the diet of this patient with mammary cancer did not decrease the urinary biotin excretion. The urine of patient 2, the man with leukemia, was not collected during this period.

The clinical condition of neither patient during the first twelve weeks of avidin ingestion was altered significantly from that expected. The ulcerated breast carcinoma of patient 1 had extended, she lost weight and bone metastases had occurred. The patient with leukemia became progressively anemic and required several transfusions. His white cell count fluctuated between 200,000 and 700,000 of which from 98 to 100 per cent were adult lymphocytes. No decrease in the size of his lymph nodes, liver or spleen were noted, but the ascites and peripheral edema did subside. However, this decrease of extravascular fluid probably was due to bed rest and a restricted fluid intake (1,500 cc a day). In neither patient did any of the signs and symptoms attributed to a biotin deficiency appear, namely desquamative macular dermatitis, shiny gray pallor, papillary atrophy of the tongue, mental changes, hyperesthesia, paresthesias, anorexia or nausea.

At the end of the twelfth week of egg white supplements the administration of avidin to both patients was increased by the addition of from 500 to 750 units of

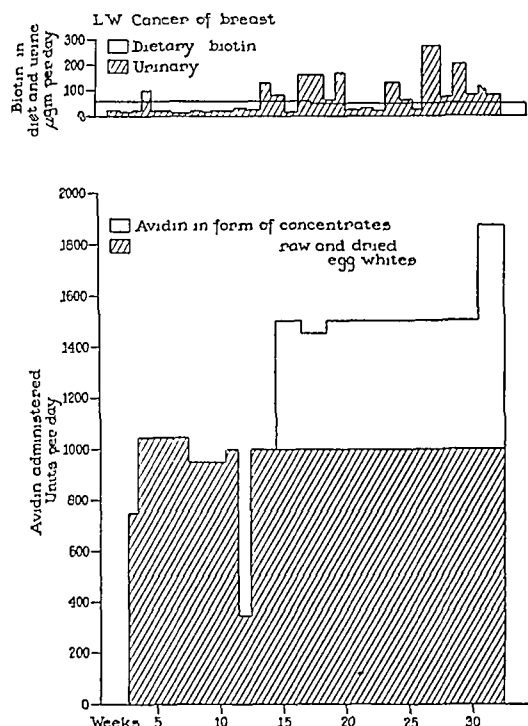


Chart 1—The ingestion of biotin and avidin and the urinary excretion of biotin active material by a patient with cancer of the breast

autoclaved mixture was adjusted to 4.2 as previously described and the specimen diluted to 500 cc. 0.25, 0.5, 1.0 and 2.0 cc samples were used for analysis.

Both of the patients were maintained on dietary regimens designed to induce, if possible, a biotin deficiency. When first admitted, each was given a diet which consisted each day of milk 1,150 cc, white bread 80 Gm, washed butter 30 Gm, farina 200 Gm, sucrose 50 Gm, saltine crackers 40 Gm and lean beef 60 Gm. By analysis this diet was found to contain 60 micrograms of biotin. Supplements of 5,000 units of vitamin A, 10 mg of thiamine, 200 mg of ascorbic acid, 500 units of vitamin D, 6.25 mg of calcium pantothenate, 6.25 mg of pyridoxine and 180 mg of ferrous sulfate were added. This diet was given to patient 1 for two weeks without the addition of avidin during which time her urinary biotin excretion ranged from 24 to 36 micrograms and averaged 27 micrograms a day.

After a two weeks basal period in case 1 and immediately in case 2, from 1,000 to 1,200 units of avidin was added daily to their diets. The avidin was supplied in the form of about 375 Gm of raw frozen egg white and 165 Gm of dried egg white. The avidin content of this raw material was found here to be 0.5 unit per gram, and that of the dried egg white from 4.0 to 5.0 units per gram. The egg white fractions either were mixed with milk or else whipped and spread on soda crackers.

#### RESULTS

The administration of the avidin supplements to both patients was continued for thirty weeks. In the first twelve weeks of that period the amounts of biotin

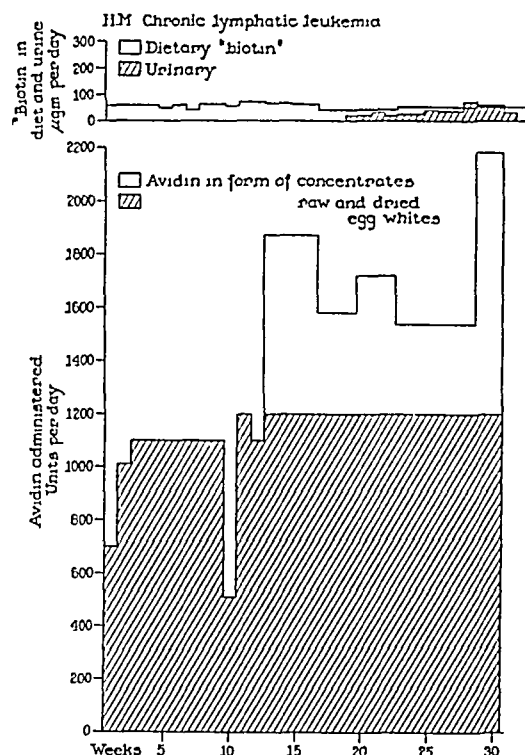


Chart 2—The ingestion of biotin and avidin and the urinary excretion of biotin active material by a patient with chronic lymphatic leukemia

concentrated material<sup>8</sup> during the next sixteen weeks and by 1,000 to 1,250 units for the last two weeks of the experiment.

At this time the original diet was replaced by more palatable foods. The composition of the revised diet

<sup>8</sup> Prepared and supplied through the courtesy of Dr. Vincent du Vigneaud and Mr. K. Dittmer, Cornell Medical College, New York City, who gave counsel and many helpful suggestions throughout the course of this investigation.

(described in the table) by analysis was found to contain 46 micrograms of biotin. The vitamin and non supplements were continued throughout the remaining eighteen weeks of the experiment. In that period neither patient manifested any evidence of biotin deficiency. Moreover in neither instance was a decreased urinary excretion of biotin noted. Patient 1 excreted from 15 to 270 micrograms a day (average 95 micrograms a day) during the last eighteen weeks of avidin administration (chart 1). Likewise patient 2 excreted from 21 to 70 micrograms (average 38 micrograms a day) during his last thirteen weeks of avidin intake (chart 2).

Thirty weeks after the avidin therapy was first instituted the experiment was discontinued. The patient with cancer of the breast had developed intrapulmonary metastases, considerable pleural effusion and increased hepatomegaly. She finally died four weeks after the experiment was completed. The patient with lymphatic leukemia still had pronounced hepatosplenomegaly, lymphadenopathy, anemia and leukocytosis. He was treated finally by x-radiation, which induced a considerable decrease in his white cell count and lymphadenopathy.

## COMMENT

The administration of from sixteen to forty times the amounts of avidin necessary to bind *in vitro* the biotin ingested by the 2 patients studied apparently had no effect on the course of their neoplastic disorders. Neither subject developed the clinical syndrome attributed to a lack of biotin or excreted less of that vitamin in the urine than before avidin was administered. Accordingly, these observations would suggest that the measures used were inadequate to induce the biotin deficiency syndrome described in animals and in normal human beings. Either the ratio of ingested avidin to biotin necessary to establish a clinical biotin deficiency or to decrease the urinary excretion of biotin is considerably greater than that used in the present investigation, or the avidin-biotin complex was broken down during the process of digestion so that a biotin deficiency could not be produced. In any event, to be satisfied that the administration of avidin had no effect in the growth of the cancer it would be necessary to establish in patients with malignant neoplasms clinical and experimental evidence for the existence of a biotin deficient state.

It is to be noted that patient 1 excreted more biotin in her urine than she received in her diet despite the simultaneous ingestion of large amounts of avidin. This anomalous situation likewise was observed by Oppel<sup>9</sup> in certain normal individuals who received amounts of egg white sufficient to bind their dietary biotin. On the other hand, the possibility exists that the biotin of the egg white and avidin concentrates administered in the present investigation were liberated by the enzymes of the foods in the diet or in the gastrointestinal tract.

In studies from this laboratory it was found that the growth of spontaneous mammary carcinoma in eight strains of mice was not affected when a typical biotin deficiency was induced in them. Also the growth of sarcoma 180 was not influenced by this dietary regimen.<sup>10</sup> Moreover, the inoculation of fragments of sarcoma 37 or sarcoma 180 into mice already in a biotin deficient state was followed by a tumor growth at the

expected rapid rate.<sup>11</sup> These observations accordingly indicate that, at least in mice, no relation could be established between the existence of biotin deficiency and tumor growth.

The failure to alter the course of the neoplastic disorders in the patients studied does not mean necessarily that the oral administration of egg white and avidin will prove to be valueless in the treatment of patients with cancer. The present investigation included only 2 persons each with a different neoplastic disorder. The effects of similar treatment of other patients with these or other forms of cancer are unknown. Moreover the long continued administration of large amounts of egg white and avidin concentrates to subjects on a constant diet apparently does not decrease their urinary excretion of biotin and evidently the mere feeding of large avidin supplements is not sufficient to produce clinical or experimental evidence of biotin deficiency in man.

*Diet Given to the Two Patients After the First Twelve Weeks of the Experiment*

	Gm
BREAKFAST	
Orange fruit sections	100
Farina	40
Milk	160
White bread	60
Washed butter	20
Sugar	15
Jelly	30
Coffee	200
DINNER	
Spinach	100
Kernel corn	50
Lean steak	110
White bread	60
Washed butter	20
Canned pears	100
Buttermilk	175
SUPPER	
String beans	100
Potato	150
Lettuce	10
Orange sections	150
Cottage cheese	25
White bread	60
Washed butter	20
Canned pineapple	150
Buttermilk	170

## CONCLUSIONS

1 One patient bearing mammary cancer and 1 with lymphatic leukemia were fed for thirty weeks from sixteen to forty times the amounts of avidin necessary to bind *in vitro* the limited amounts of biotin in their diets.

2 No clinical evidence of biotin deficiency was induced in these subjects nor were the amounts of biotin excreted in their urine abnormally low.

3 No effect was noted on the expected clinical course of these patients.

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<sup>11</sup> West P. M. and Woglom W. A. Abnormalities in the Distribution of Biotin in Certain Tumors and Embryo Tissue. *Cancer Research* 2: 324-331 (May) 1942.

**Potatoes and Potassium**—Among various foods the potato has the highest potassium content. 55 Gm of potassium in 2 pounds of potatoes. Potassium is a dangerous poison when injected directly into the blood and, considered objectively, potatoes are more poisonous than wine or coffee. If the potassium contained in an ordinary portion of potatoes was injected into the blood stream it could kill a man. But it never reaches the blood. A large part remains with the cellulose in the intestine and leaves the body in an indigested state. The assimilated potassium is stored in the liver and released into the blood only in the same minimal quantities in which it is excreted by the kidneys at the other end of the circulation.—Kahn, Fritz. *Man in Structure and Function* volume 2 translated from the German and edited by George Rosen M.D., New York Alfred A. Knopf, 1943.

<sup>9</sup> Oppel T. W. Studies of Biotin Metabolism in Man. *Am J M Sc* 204: 856-875 (Dec.) 1942.

<sup>10</sup> Kensler C. J., Rhoads C. P. and du Vigneaud Vincent. The Influence of Egg White and Avidin Feeding on Tumor Growth to be published.



## LEPROSY

THE CORRELATION OF ITS CLINICAL, PATHOLOGIC,  
IMMUNOLOGIC AND BACTERIOLOGIC ASPECTS

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Leprosy affects the skin, the peripheral nervous system and the mucous membrane of the nose by preference, but other tissues and organs are also affected, often early in the disease, such as the testicles, the mammary glands, the lymphatic glands, the larynx and the eyes. Late manifestations of the liver, spleen and other internal organs may occur.

Lesions of the muscles, bones, skin, hair, nails and mucous membranes may not be directly due to the presence of *Mycobacterium leprae* but to trophic disturbances caused by nerve involvement.

*The Correlation of the Pathology, Immunology and Bacteriology of Leprosy*

	Pathology		Immunology Lepromin test	Bacteriology	
Leprosy of the skin	Lepromatous		Negative	Numerous bacilli	
		Tuberculoid	Miliary	Positive	Rare bacilli
			Sarcoidal	Positive	Rare bacilli
	Lazarine		Positive	Abundant bacilli in necrotic areas rare in tissues	
	Nonspecific	Erythematous	Pos or Neg 50%	Few bacilli	
		Pigmented	Pos or Neg 50%	Few bacilli	
		Achromic	Pos or Neg 50%	Few bacilli	
Leprosy of the nerves	Lepromatous		Negative	Numerous bacilli	
	Tuberculoid	Miliary	Positive	Rare bacilli	
		Colligative			
	Nonspecific		Pos or Neg 50%	Few bacilli	
Leprosy of other tissues and organs	Lepromatous		Negative	Numerous bacilli	
	Tuberculoid	Miliary	Positive	Rare bacilli	
		Sarcoidal			
	Nonspecific ?		?	?	

The preference of leprosy for the skin and peripheral nerves led to the classic conception of "cutaneous," "neural" and "mixed" types of leprosy. However, it is evident that the great majority of patients with leprosy present symptoms and signs of cutaneous, neural and visceral involvement and therefore most cases of leprosy would fall under the heading of "mixed leprosy."

On the other hand, the fact that the clinical manifestations of leprosy affect the skin, the peripheral nervous system and many other tissues and organs does not offer a definite foundation for the classification of the types of leprosy, especially as to their prognosis, epidemiology, pathology and immunology. Cutaneous lesions may be severe and of bad prognosis or may be slight and of good prognosis. Nerve involvement may

be slight and chronic without much loss of function or may be severe, leading to rapid wasting and complete disability.

The leprosy congresses of Manila<sup>1</sup> in 1931 and of Cairo<sup>2</sup> in 1938 considered the classification of the clinical forms of leprosy, adhering to the old ideas and preserving the cutaneous, neural and mixed types. However, the South American dermatologists insist on the advisability of using a pathologic foundation for the classification of leprosy following the suggestion made as early as 1936 by Eduardo Rabello Jr.<sup>3</sup> of Rio de Janeiro. This classification has been adopted by the South American dermatologists, among whom the contributions of the Rabellos,<sup>1</sup> Schujman, N. V. Greco,<sup>6</sup> Souza Lima,<sup>7</sup> Moura Costa<sup>8</sup>, Aguiar Pupo<sup>9</sup> and Balñá and Bassombrio,<sup>10</sup> are prominent.

The pathologic changes found in leprosy are sufficiently definite and characteristic, corresponding with clearcut clinical aspects in the great majority of cases and with definite immunologic reactions and bacteriologic findings, making the correlation of these factors most important from the points of view of the prognosis and the sanitary control of the disease.

Whether leprosy affects the skin, the nervous system or the other tissues and organs, the pathologic changes may be grouped in three categories: lepromatous, tuberculoid and simple inflammatory, which we shall call nonspecific. To the trained eye these pathologic changes have clinical equivalents: the lepromatous, represented by the nodular infiltrative lesions; the tuberculoid, represented by flat infiltrated annular or ringlike small nodular lesions; and the nonspecific, represented by the irregular manifestations of the skin and the simple dystrophic neural manifestations.

The fact that lepromatous lesions are extremely rich in Hansen bacilli, while the tuberculoid and nonspecific are paucibacillary and that the immunologic lepromin tests are negative in lepromatous and positive in tuberculoid types adds strength to the practical importance of this classification.

The lepromatous and tuberculoid types are therefore definite clinical, pathologic, bacteriologic and immunologic forms of leprosy. The nonspecific types represent transitional stages and these cases may remain nonspecific for a long time or may develop into lepromatous cases or into tuberculoid cases. The tissues show only perivascular inflammation with lymphocytic infiltration. In some cases a few bacilli are scattered in the tissues or are demonstrable in the lymph and mucous membranes, while in others few or rare bacilli are found. In 40 to 60 per cent of these nonspecific types the lepromin test is positive while in the other 40 to 60 per cent the lepromin test is negative. Therefore the nonspecific types may progress to the severe lepromatous manifestations or slowly develop the more benign tuberculoid symptoms.

1 Report of the Leonard Wood Memorial Conference on Leprosy Internat. J. Leprosy 2: 329 (July-Sept.) 1934.

2 Resolutions and Reports of the International Congress of Leprosy Held in Cairo, Egypt, M. A. 21: 138 (March) 1938.

3 Rabello, Eduardo Jr. Una clasificación clínica epidemiológica das formas da lepra. Rev. brasil. de lepra 4: 375 (1936).

4 Rabello, Eduardo and Rabello, Eduardo Jr. Une classification clinico-épidémiologique des formes de la lepre. Rev. brasil. de lepra 6: 229 (Sept.) 1938.

5 Schujman, S. A proposito de una nueva clasificación de la lepra. Rev. brasil. de lepra 8: 111 (June) 1940.

6 Greco, Nicholas V. Clasificación de la lepra. Rev. brasil. de lepra 8: 301 (Sept.) 1940.

7 Souza Lima, L. Classificação das leprides. Rev. brasil. de lepra 6: 63 (1938).

8 Moura Costa, H. Letter to the editor. Rev. brasil. de lepra 8: 202 (June) 1940.

9 Aguiar Pupo, J. Das formas clinicas da lepra. Rev. brasil. de lepra 7: 357 (Dec.) 1939.

10 Balñá, P. L. and Bassombrio, G. Clasificación des formes cliniques de lepre. Rev. brasil. de lepra 6: 225 (Sept.) 1938.

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Read before the Section on Dermatology and Syphilology at the Ninety Third Annual Session of the American Medical Association, Atlantic City, N. J., June 10, 1942.

The accompanying table resumes the South American classification of leprosy modified by us, to make the clinical aspects more prominent and adding the lazarine type of tuberculoid leprosy

#### THE LEPROMATOUS TYPES

When *Mycobacterium leprae* invades the skin, mucous membranes, peripheral nerves and other tissues and organs, finding little or no defensive reaction, the histologic features are those of a chronic infiltrating granuloma affecting the totality of the tissue. The cells are large histiocytes with special characteristics, some are vacuolated and badly stained and some are huge cells filled with mucous degenerated protoplasm and innumerable accumulations of acid fast bacilli. The connective and elastic tissue disappear entirely and are supplanted by the cellular infiltrate. The glands and hair follicles are gradually choked and finally atrophy.

These infiltrations appear clinically as nodular formations more or less lobulated, usually dark red, well defined from the adjacent parts and varying in diameter from a few millimeters to several centimeters. Others are diffuse infiltrations without definite outline, more or less flat and geographic in outline. In the peripheral nerves the infiltrations may be total, thickening the nerves to three or more times their normal size, or may be moniliform, like the beads of a large rosary along the trunk of the nerve. In other tissues such as the testicle and mammary gland the lepromas affect the form of hard nodules, absolutely painless and without apparent signs of inflammation. In the larynx, nose and other mucous membranes the lesions ulcerate early, and deformities and mutilations are extreme. In advanced cases lesions of the liver and other internal organs present the same diffuse lepromatous infiltrations or localized nodular formations.

This is the easiest type to diagnose, and the cutaneous lesions may be recognized even by the layman in countries where leprosy is common.

Bacteriologically the lepromatous lesions are so full of acid fast bacilli that in the tissues they may be seen with the small dry objective in the form of bright red patches spread throughout the microscopic field. Two methods may be employed to examine tissues for bacteriologic diagnosis: one may remove a piece of a leproma by means of small curved scissors, imprinting the tissue juices on several cover slides, or make a small incision in the mass of the leproma, scraping off the soft tissues in the bottom of the wound with the scalpel and spreading the juice thus obtained on a cover slide. When proper staining is done by the Ziehl-Neelsen method, the number of acid fast bacilli in these preparations is enormous. It must be remarked that the specimens obtained from the mucous membranes of the nose should be taken by scraping the mucosa as deeply as possible without causing hemorrhage.

Immunologically lepromatous types show absolutely no reaction when tested with lepromin. Sometimes an early nonspecific reaction appears after the first or second day but disappears without leaving any trace. This absence of allergic response to lepromin means that the patient offers no defense to the infection. Therefore the prognosis of these cases is bad.

From a prophylactic point of view lepromatous cases are dangerous, being open and literally oozing *Mycobacterium leprae* of the highest virulence. These are the cases that must be isolated from the community.

#### THE TUBERCULOID TYPES

The tuberculoid types show three different histopathologic variations: the typical miliary type with giant cells, the sarcoidal type with circumscribed collections of histiocytes of the foamy type in the form of round, oval or sausage shaped nests and a third type with peculiar features ending in necrosis, which we have described as 'lazarine leprosy'.<sup>11</sup> In the peripheral nerves the histologic changes are similar and there is a particular type reported by Eduardo Rabello Jr.<sup>12</sup> as "nodular colliquative neuritis" in which necrosis and abscess formation are the main features together with typical tuberculoid follicular structure. This last mentioned type may possibly be the neural equivalent of the "lazarine leprosy" of the skin.

Eduardo Rabello Jr.<sup>13</sup> has described tuberculoid changes of the sarcoidal variety in the lymphatic glands and bones, a syndrome difficult to differentiate from lymphogranulomatosis benigna or Besnier-Boeck-Schaumann disease.

Clinically the tuberculoid lesions of the skin and peripheral nerves may be diagnosed by the expert. As a rule the lesions are few in number, sharply circumscribed, erythematous patches or flat infiltrations, often ring shaped or festooned, with macular center and elevated border, the latter being uniform or composed of small nodules arranged side by side.

Sometimes the lesions, which are first infiltrated and elevated patches of vivid red or purple, suffer a process of involution in the center and become atrophic with a ringlike border. The nerves more often affected are those of the upper extremities, particularly the ulnar, and also the superficial auricular branch of the cervical plexus. They appear as thick, pencil-like lineal infiltrations under the skin but show no discoloration. The ulnar nerve may be palpated in the ulnar canal at the inner part of the elbow as a thick or moniliform cord. In the type described by Eduardo Rabello Jr., of which we have seen only 1 case, the painless abscess forms in the mass of the ulnar nerve and progresses toward the skin, adhering to the latter and finally causing superficial necrosis and ulceration.

Bacteriologically the lesions of tuberculoid leprosy show very few acid fast bacilli. Often only one or two bacilli may be seen in a whole section of skin or nerve after painstaking search. Often no bacilli at all can be demonstrated, either in the sections or in the lymph tissue scrapings or mucous membrane secretions.

Immunologically the tuberculoid types of leprosy show the maximum possible allergy of the skin in the form of strongly positive lepromin tests, varying from the nodular to the necrotic. This is a constant feature which shows the excellent defenses of the body and proves once more the law of Jadassohn-Lewandowsky.

From a prophylactic point of view, persons with tuberculoid leprosy are not dangerous and in some countries where leprosy is endemic these patients are not isolated but are allowed to remain at home under sanitary supervision. Some leprologists contend that these patients should not be treated but allowed to develop their immune reactions spontaneously.

11. Pardo-Castello V. and Cebalero G. M. Lazarine Leprosy, A Peculiar Monosymptomatic Form of Leprosy. *Arch. Dermat. & Syph.* 23: 1 (Jan.) 1931.

12. Rabello Eduardo Jr. Etiologie generale et pathogenie de la lepre tuberculoide. *Rev. Brasil. de leprol.* 6: 291 (Sept.) 1938.

13. Rabello Eduardo Jr. Donnees nouvelles pour l'interpretation de l'affection de Besnier Boeck. role de la lepre. *Ann. de Dermat. et Syph.* 7: 571 (June) 1936.

In 'lazarine leprosy' the clinical lesions consist of plaques of cutaneous gangrene developing at the site of bullae, these necrotic manifestations are few in number but extremely destructive, causing deep, foul ulcers usually in the extremities which disorganize the muscles, tendons and joints. These ulcers are painless and as a rule heal leaving irregular scars in which there is absence of thermic and painful sensations. Recurrent crops of bullae may occur after healing. These are the only clinical manifestations there being no other cutaneous or neural lesions of tuberculoid type. The peculiar feature of this type of tuberculoid leprosy is that in spite of the tuberculoid structure of the affected tissue the gangrenous parts and the contents of the bullae are extremely rich in *Hansen bacilli* but not the tissue. The lepromin test is strongly positive, showing a high allergic reaction indicative of excellent defenses. In our opinion the 'lazarine' type of leprosy is the result of a massive infection with *Hansen bacilli* of patients with high immunologic defenses and the clinical symptoms represent the typical Koch phenomenon, with the throwing off of huge numbers of *Hansen bacilli* by the defensive mechanism of the body. Lazarine leprosy although highly destructive is of good prognosis and most patients recover spontaneously.

#### III NONSPECIFIC TYPES

Clinically the nonspecific types of leprosy are characterized by the presence of macular erythematous, ichnomic or pigmented skin lesions and by slight enlargement of the peripheral nerves with areas of apparently healthy skin in which the thermic and painful sensations are abolished. These types are at times exclusively neural and then the sole manifestations may be those due to trophic disturbances such as areas of anesthesia, muscular atrophies, retraction of the fingers and toes, paralysis of the muscles of the face, bone resorptions, mal perforans plantaris disturbances of the sweat and sebaceous secretions and filling of the hair. More often neural disturbances and cutaneous erythematous or dyschromic lesions are present together. Pathologically the tissues show only perivascular and perineural simple inflammatory changes consisting of cuffs of lymphocytes around the larger vessels of the upper cutis or the small trunks of the cutaneous nerves. In the cutaneous dyschromic or erythematous manifestations often called 'leprids' there is also pronounced vascular dilatation and passive congestion. The basal cells are often devoid of pigment, and chromatophores may be very abundant on the upper cutis in the pigmented lesions.

Bacteriologically these lesions, whether of the skin or of the nerves, are poor in acid bacilli. As a rule direct examinations of lymph result in negative findings.

The lepromin test is negative in some cases and positive in others, about 50 per cent of each although some investigators claim the numbers of positives much higher.

In reality cases of 'nonspecific' leprosy are transitional types, some of which progress toward the 'lepromatous' type and others toward the 'tuberculoid' types. At times the transition is quite rapid, and a patient who showed only macular lesions will suddenly develop crops of lepromas in an acute outbreak of 'lepra reaction'.

The prognosis of these transitional types may be foretold by the results of the lepromin test. Those who show positive tests will probably remain as non-

specific types or will develop tuberculoid lesions. Those showing a negative lepromin reaction will in all probability develop lepromatous lesions.

#### III MIXED TYPES

These transitions naturally result in types in which both lepromatous or tuberculoid and nonspecific 'leprids' coexist until the patient finally develops the definite type which the disease will follow in his particular case. Therefore in these cases the presence of leproma establishes the type as "lepromatous" in spite of the presence of numerous erythematous or dyschromic lesions. Likewise the presence of tuberculoid lesions establishes the type as "tuberculoid" in spite of the presence of erythematous or dyschromic manifestations. In many cases the clinical appraisal may be difficult and resort must be had to pathologic and bacteriologic examinations and even to the lepromin test in order to classify a case in the proper type.

The presence of lepromatous and tuberculoid lesions in the same patient has not been observed by us. The transformation of a lepromatous type into a tuberculoid type or vice versa has been reported by several investigators but we have not seen this phenomenon.

#### LEPRA REACTION

In sharp contrast with the usual slow and insidious evolution of leprosy there is sometimes observed an acute inflammatory phase which very frequently interrupts its chronic course or is the first clinical manifestation of the disease.

The major characteristic of the lepra reaction is its acuteness more or less accentuated in different cases. It is probably a manifestation of allergy or hypersensitivity of the body to the pathogenic agent. Sometimes the outbreak of the lepra reaction can be ascribed to a definite cause: complicating diseases, alimentary or alcoholic excesses, too intensive antileprotic treatment and so on. Frequently it is impossible to determine its cause. The clinical picture and evolution of lepra reaction differ in lepromatous and tuberculoid cases.

In lepromatous leprosy it generally begins suddenly with fever (39 to 40 C. or 102.2 to 104 F.), rigors, arthralgias, headache or prostration, followed in several hours by an eruption of erythema multiforme or erythema nodosum type and the exacerbation of pre-existing lesions. In some cases there are extracutaneous symptoms: adenitis, orchitis, splenic and hepatic enlargement, neuritis and keratitis. The fever, of remitting type, and the other symptoms persist during several days, ten to fifteen, rarely more, and then disappear in lysis. Relapses are frequent. The lepromin test is negative. The erythrocyte sedimentation index is greatly augmented. Short, acute reactions are of good prognostic significance.

Long or relapsing reactions aggravate the course of leprosy.

The first therapeutic measure is the cessation of all antileprotic treatment and the administration of a mild saline laxative and a bland diet.

Injections of antimony and potassium tartrate 1 per cent solution, calcium salts, vitamin B<sub>1</sub> and diphtheria toxoid are useful agents.

Exacerbations in tuberculoid leprosy are not accompanied by any general symptoms or fever. They are characterized by the resurgence of pre-existing lesions, the appearance of new wine red, infiltrated patches

mostly located on the face and extremities by a protracted course, never less than three months, and frequently more than a year in length. The lepromin test is positive. The erythro-sedimentation index is always low and prognosis is always good.

#### THE HISTAMINE TEST

The early manifestations of leprosy of the nonspecific or simple inflammatory type may be difficult to diagnose, although, if thermal and pain anesthesia are present, matters are simplified. However, many patients especially children, do not cooperate or they find it difficult to express their sensations, in which event the performance of the "histamine test" is very valuable.

When a drop of a 1:1,000 solution of a histamine salt is placed on the normal skin and a needle prick is made through the liquid a small wheal surrounded by an erythematous halo develops within a few seconds and persists for five minutes or more. When the sensitive nerve endings are paralyzed or destroyed the phenomenon occurs as far as whealing, but no erythematous halo develops around the wheal. The normal response to histamine is called the "positive test", the absence of erythematous reaction around the wheal characterizes the "negative test". Therefore in the cutaneous lesions of leprosy the histamine test is always negative. We have found occasion to do this test in numerous cases in which erythematous or dischromic lesions were suspected of being early manifestations of leprosy. The superficial, erythematonodular cutaneous syphilids have been the subject of differential diagnosis with early lesions of leprosy in several cases, and in these the "histamine test" has proved of definite help. The serologic reactions may be positive in the presence of leprosy, and the changes in cutaneous sensations may be difficult to appraise when patients are not cooperative.

#### THE LEPRONIN TEST (MITSUDA REACTION)

The lepromin test consists essentially in the intradermal injection of an antigen prepared from lepromatous tissues rich in Hansen bacilli.

Skin tests in leprosy were originally intended to find a diagnostic procedure similar to the tuberculin test in tuberculosis. No results were obtained in this direction, and investigations were given up until 1923, when Mitsuda<sup>14</sup> reported that, when an emulsion prepared with lepromatous skin was inoculated, healthy persons gave positive results, maculoanesthetic patients presented a late, nodular persistent inflammation and tuberous patients gave a negative local reaction. He deduced from his experiences that persons without leprosy and maculoanesthetic patients had a special immunity to the infection, while tuberous patients had no immunity. These findings and conclusions were later fully confirmed by many investigators.

All attempts to consider the test of any value in diagnosis are definitely abandoned. Its great importance in the classification of cases of leprosy and its immunitary and prognostic value are actually recognized by all.

Lepromin is prepared by boiling lepromatous tissues in isotonic solution of sodium chloride for one hour. The mass is then ground up in a mortar and 20 cc of isotonic solution of sodium chloride is added for each gram of ground up tissue. After thorough mixing and grinding again, the supernatant fluid is pipetted off,

filtered through gauze and stored in a sterile container, the remaining tissue being discarded.<sup>15</sup>

The liquid is autoclaved at 120°C for fifteen minutes, phenolized at 0.5 per cent and distributed in insulin type vials ready for use. It is a cloudy, milky emulsion containing numerous bacilli and globi plus all the tissue elements of the leproma. Kept in a dark cool place, it retains its activity for a long time. No easy standardization of lepromin is possible, being as it is such a complex suspension of bacilli and tissue material, but this does not interfere with the accuracy of results as wide variations in the concentration of the antigen do not give correspondingly different reactions. A nonreacting patient to the usual lepromin will not react to an antigen two or three times stronger. A reacting patient will do so to dilutions as high as 1:3,000 of lepromin, although with less intensity.

The presence of bacilli is essential to the activity of lepromin. Filtered antigens are inactive. Lepromins



Positive lepromin test twenty-eight days after inoculation with 0.1 cc of lepromin intradermally.

prepared with tuberculoid tissues (paucibacillary) produce attenuated reactions and then only in patients with strong reactions to the usual lepromin. Antigens prepared with normal skin are inactive.

The test is performed by injecting into the cutis 0.1 cc of lepromin. The most common sites used are the arms, the dorsum and the anterior surface of the thigh. At the end of twenty-four to forty-eight hours an erythematous halo may be observed with at times some infiltration, but these manifestations disappear quickly, usually after the fifth day, leaving a dark brown discoloration and some wrinkling of the skin. On the seventh to the tenth day a small papule begins to form in the positive cases, gradually increasing in size and reaching its acme about the third to the fourth week, when it may be a nodule of as much as 1 cm in diameter. Occasionally the center sloughs off and a small ulcer

14 Mitsuda K. *Troisième Conférence internationale de la lèpre*. Communications et Débats. Paris: J. P. Baillière et Fils, 1924. p. 219.

15 Rothberg A. Some Aspects of Immunity in Leprosy and Their Importance in Epidemiology, Pathogenesis and Classification of Form of the Disease. *Rev. brasil. de leprol.* 5: 45 (special number) 1937.

forms which requires several weeks to heal. In most cases the nodule regresses gradually after the fourth week, but in some cases of positive reaction some scarring is left. Rarely a positive reaction may not show until the third or fourth week and then follow the usual regressive course.

The erythematous reaction of the first few days is considered nonspecific. The reading of the test should be done about the thirtieth day after the intradermal injection. If there is no reaction or only a small (less than 5 mm) infiltration the test is negative. A well formed nodule more than 5 mm in diameter with or without a necrotic center characterizes the positive test.

Microscopic examination when the Mitsuda reaction is positive shows in specimens removed at its acme a collection of histiocytes, lymphocytes and at times giant cells, with an aspect very similar to that of tuberculoid leprosy. In specimens removed forty-eight hours after inoculation acute inflammatory phenomena may be observed without any specific changes, but in some of our specimens a decided perivascular histiocytic infiltration was present, resembling even at this early date the tissue changes of tuberculoid leprosy. However, we do not believe this is of diagnostic significance, as we have observed similar changes in lepromin tests of forty-eight hours' duration which later proved to be negative. The injected bacilli are not demonstrable in the lepromin reacting tissues. In negative tests, after the initial inflammatory reaction biopsies performed after eight, fifteen and twenty-eight days showed a return of the tissues to normal.

#### COMMENT

1. The classification of the types of leprosy on a histopathologic foundation into "lepromatous," "tuberculoid" and "nonspecific" is the result of studies made by dermatologists of Brazil and Argentina and accepted by Latin American dermatology. In this article an attempt is made to correlate these pathologic forms with the clinical, immunologic, bacteriologic and public health aspects of the disease.

The lepromin test is given an important place among the immunologic reactions of the skin and reports are made based on many tests performed by the authors, corroborating for the most part the findings of other investigators.

The histamine test is studied as a diagnostic procedure in early cases of leprosy with lesions of the "nonspecific" type.

Consulado 9

#### ABSTRACT OF DISCUSSION

DR. HOWARD FOX, New York. The authors have done well to call attention to three phases of leprosy which are apparently not well known to American dermatologists. Little is said about them in American textbooks on dermatology or even in books on tropical medicine. I refer to the South American classification, the lepromin reaction and the histamine test. The classification of leprosy adopted at the Memorial Conference in Manila in 1931 divided the types of the disease into cutaneous, neural and mixed. They used the symbols C and N, adding the numbers 1, 2 or 3 according to the severity of the individual case. This classification was not satisfactory as the cutaneous lesions are of two entirely different types. One of them long known as nodular, represents a severe and usually fatal type, whereas the maculoanesthetic and the tuberculoid lesions represent a relatively benign type and are invariably seen in neural leprosy. An improvement in classification was made at the International Congress of Leprosy in Cairo in 1938 by changing the term cutaneous to lepromatous and by including as subtypes of neural leprosy the pure anesthetic, the maculoanesthetic and the tuberculoid forms. The classification adopted by South

American leprologists, while not as simple as those aforementioned, has the advantage, as the authors say, of correlating the clinical appearance of the disease with the pathologic, bacteriologic and immunologic changes. The nonspecific group is convenient, as one is at times doubtful as to whether macules are forerunners of the lepromatous type or of the relatively benign neural type of the disease. In such cases it may be impossible to settle the question by either microscopic or bacteriologic examination, but this can be done by the lepromin test. Tuberculoid leprosy, first described by Jadassohn, is invariably associated with the neural type of the disease. It shows a tuberculoid structure histologically with few if any, bacilli and gives a positive lepromin reaction indicative of comparative immunity to the bacilli. This type may often be recognized from the clinical appearance alone, the lesions being sharply defined more or less asymmetrical and often bright red. Some of them appear as large coin to palm sized yellowish, slightly thickened patches often with a mammillated surface. Others appear as diffuse, slightly thickened areas with a raised border and a tendency to form circles or portions of circles. The so called hazine type of leprosy, which the authors have added to the South American classification is a rare manifestation, the only examples which I have seen being those which Dr. Pardo Castello demonstrated at the meeting of the American Dermatological Association in Havana in 1932. Curiously enough in spite of the destructive character of the lesions the lepromin reaction is always positive which indicates a good prognosis as to life.

DR. MARION B. STUEBEL, New York. Drs. Castello and Tiant give an insight into the immunologic biologic relationships in leprosy with a degree of clarity never previously offered to an American audience. The immunologic biologic factors in leprosy were studied first and most extensively by Josef Jadassohn while in Berne, Switzerland. There is an endemic focus of leprosy in Switzerland in several extremely isolated valleys of the canton of Valais. Few physicians from the outer world have penetrated into these valleys. At the time of Jadassohn's investigation leprosy had been in existence in these valleys for many generations. The peculiar thing is that leprosy has never disseminated from that focus to anywhere else in Switzerland. This brings out a well known factor, namely that climatic and environmental conditions have a great deal to do with the transmission of leprosy. A person with leprosy was discovered somewhere in the southern part of Germany. The German government did not know what to do with him. They put him in a freight car and shoved food and water within his reach. They then shunted this freight car from train to train and they got it across the Swiss border. Jadassohn was called to see this poor man whom he took to his hospital and even to his home and studied him intensively. Jadassohn thus established his concept of tuberculoid leprosy and came to the conclusion that not only was the lepromin test positive in this tuberculoid form of leprosy but also that it was impossible in this particular case to find the bacilli. These findings in leprosy were a further support of the Jadassohn-Lewandowsky law, which had been developed particularly in relation to tuberculosis, syphilis and fungous infections. This law states that wherever the immune mechanisms of the host are sufficiently active and adequate to produce a diminution of microorganisms or their virulence within the tissues of the host tuberculoid structures may appear. In this law there is an explanation of a great many facts known in tuberculosis and, more important still, it clarifies the morphologic and immunobiologic relationships not only in regard to tuberculosis but also in many other chronic granulomatous infections such as leprosy, syphilis and certain fungous infections. There are many differences between these diseases but their fundamental relationship lies in the fact that the way in which the host reacts is due to his immunologic biologic status at the time his tissues encounter the products of microorganisms to the specific local status and general status. These specific immunobiologic states determine (1) the histology of the lesion (tuberculoid structures or nontuberculoid structures), (2) the number of bacilli present (rare or numerous), (3) the course of the disease (its prognosis, good or bad), (4) the contagiousness of the disease (which is to some measure, at least a corol-

try to the bacillary findings) and (5) the type of treatment and sometimes the response to the treatment. All these five follow immunobiologic laws which are now clearly discernible not only in leprosy and tuberculosis but in innumerable other infectious diseases as well.

DR ALFRED HOLLANDER, Springfield, Mass. I should like to ask Dr. Castello what experience he has had with the following method. During the time of my association with Unna in Hamburg we always tried to find bacilli with the solidified carbon dioxide method especially in nonspecific cases, when we could not find them by any other method. We put solidified carbon dioxide on the skin and produced a blister, and often when in these nonspecific cases we were unable to find any bacilli by other methods we found them by this method. Dr. Sulzberger mentioned the work of Jadassohn. I should like to call attention to the fact that Dr. Paul G. Unna has worked on leprosy since 1875. He has done some quite important work, especially on the histopathologic part of leprosy. He went to his friend Hansen in 1876 and after that he treated leprosy in his clinic in Hamburg. We always had between 10 and 20 patients, mostly from South America, isolated in our leprosy department.

DR PAUL GROSS, New York. It is a privilege to express admiration for Dr. Castello's presentation of the problems of leprosy and for his contributions to dermatology in general. One only need recall his paper on venereal lymphogranuloma published in 1926 to appreciate the tribute due to him and to the medical profession of South America in general. The distribution of the positive lepromin test among the various types of leprosy, as shown by Dr. Castello, seems to correspond in certain respects to the luetin test of syphilis. A positive luetin reaction seemed to depend on the development of the allergic state of tertiaryism with its pronounced tissue reaction and absence of spirochetes in the tertiary lesions. Similarly, the lepromin test is specific for the tuberculoid types of leprosy, which are distinguished by their tissue reaction and an absence or scarcity of lepra bacilli. It would be interesting to hear from Dr. Castello whether the lepromin test can be used to differentiate between sarcoid leprosy and sarcoidosis of tuberculous origin.

DR GUY H. FAGET, Carville, La. As yet in the United States we have not adopted this classification, but I can see that at the next International Conference on Leprosy it may possibly be adopted. I can see many valuable points in this new classification originated by the South American leprologists. As I understand it, we might consider the maculoanesthetic leprosy, or what the South American leprologists call the non-specific type of leprosy, as the transitional form, or the intermediate form between the more severe lepromatous type and the more benign tuberculoid type of leprosy. In the lepromin test, therefore, we have a significant and valuable prognostic test for the differentiating of the types of the disease. With this new world war and our American boys going into tropical countries there is a grave possibility of a large increase in leprosy in the United States. At the national leprosarium at Carville we are ready to take care of such additional cases, as we have the facilities there for the hospitalization of 480 patients and can make room for more if necessary.

DR FRED D. WEIDMAN, Philadelphia. A large part of the merit of the South American classification lies in what Dr. Castello indicated namely that thereby one can tie in certain of the newer features of leprosy with what we have always thought we knew about the morbid anatomy (the dermatology) of the condition. But morbid anatomy is not everything. It is in the nature of medicine at large to develop especially along bacteriologic, immunologic and public health lines and with such newer developments in leprosy the older classification has become more or less obsolete. At least it has been necessary to contrive some sort of an additional classification not necessarily a new classification, but an auxiliary classification whereby these 'basic science' aspects of leprosy may be reconciled and tied in with the morbid anatomy. Dr. Castello did not have time to elaborate on a certain sentence in the printed paper which I think he may care to dwell on in his closing

discussion, in which he speaks of the worthlessness of the lepromin test. That would seem to be contrary to what we have heard this morning. It would appear on the face of it that in the lepromin test as Dr. Gross stated, we have at once a valuable method for distinguishing tubercular leprosy from puzzling cases of sarcoid. This is the aspect of leprosy which gives me the greatest difficulty in differential diagnosis. I should like to have Dr. Castello say something too about the frequency of lazarine leprosy. I am sorry that he did not show a lantern slide of that condition. It does not look like leprosy at all. Certainly it is rare in the United States. I should like to have Dr. Castello tell us whether it is likewise rare in Cuba. When I read the paper there was one place, where my mind stumbled and that was with respect to the use of the term 'follicular' as employed in connection with the histology. When one says 'follicular' to the general pathologist one thinks of such structures as the cortical follicles in the lymph nodes, and to the dermatologist the term follicular would conjure up thoughts of a hair follicle. The general pathologist prefers the term 'miliary'. In tuberculosis we speak of 'miliary tubercles' to indicate those which are sharply circumscribed. I take it, though that Dr. Castello's 'follicular' is a literal translation from the Spanish and Portuguese but perhaps it will conduce to clarity in North America if we might substitute the term 'miliary'.

DR V. PARDO-CASTELLO, Havana, Cuba. I want to thank you for this generous discussion. We have performed hundreds of lepromin tests on all types of patients and also on healthy men. We find in Cuba that all healthy men and women are lepromin positive. In other words, we live in a leprosy country, we have been in contact with leprosy persons for many years and we have developed immunity to leprosy, therefore our lepromin tests, my associates and mine are positive. We are trying to get hold of a number of Europeans who have not been in contact with leprosy and we are in contact with the immigration authorities in Cuba in order to perform lepromin tests on this type of men. Probably they will show negative, since they have not been in contact with leprosy. In reply to Dr. Hollander, we have tried, and so have all leprologists, to recover bacilli from the nonspecific types and the tuberculoid types by every method. Of course, some have been found but always in small quantities and in some cases it has been absolutely impossible to prove their existence. As far as sarcoid and tuberculosis are concerned I must recall to your minds that Dr. Balina of Buenos Aires and Dr. Rabello of Rio de Janeiro have reported cases of sarcoid caused by leprosy. Whether it is tuberculosis or a filtered virus we don't know, but sarcoid disease due to leprosy with the typical skin lesions clinically and pathologically and with lesions of the lymph nodes and lesions of the small bones of the extremities is indistinguishable from sarcoid of any other type. I do not believe that we can use the lepromin test to differentiate between these cases because as I said before, all Cubans are lepromin positive when they do not have leprosy of the lepromatous type, and therefore a case of sarcoid in Cuba or in any native of a country where the leprosy abound would be lepromin positive. I want to emphasize that lepromin is not a diagnostic test. All attempts to make a diagnostic test with lepromin have been abandoned. It is a prognostic test and in that light is a very useful test. Dr. Weidman is right about the word 'follicular'. In Spanish and in Portuguese we call 'follicular' that type of tuberculosis which you call here 'miliary'. It would perhaps be a good idea to change from 'follicular' to 'miliary'. I believe the lazarine type of leprosy is a special type of tuberculoid leprosy, that is these patients are lepromin positive and yet they have an enormous amount of bacilli in the necrotic part of the lesions, not in the tissues themselves. I interpret that as the Koch phenomenon in the case of leprosy the same as you would obtain in a case of tuberculosis with massive injection of tubercle bacilli when there already is a certain amount of immunity against tubercle bacilli. It is the massive infection somehow introduced into the system of the man who has high immunity and high defensive powers against leprosy and therefore the local lesions of the necrotic destructive type and the good prognosis with the positive lepromin test.

EVALUATION OF ANGIOCARDIOGRAPHY

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This report summarizes the examination of 100 persons by the Robb-Steinberg method.<sup>1</sup> The patient material comprises the groups included in the accompanying table. Many of the patients suffered from other ailments such as hemiplegia due to hypertensive cardiovascular disease, diabetes mellitus, nephritis and the like. However, this report is limited to the angiocardio-graphic study of the heart and major blood vessels.

TECHNIC

The angiocardio-graphic technic described by Robb and Steinberg was employed throughout the course of this study.

*Patient Material for Evaluation of Angiocardiography*

Type	Patients
Normal	18
Rheumatic heart disease	20
Arteriosclerotic heart disease	10
Hypertensive heart disease	20
Congenital anomalies	4
Aneurysms	11
Chronic intrapulmonary disease	10
Syphilitic heart disease	1
Pulmonary endarteritis	1
Leukemia	1
Tuberculosis	1
Total	100

Circulation time tests were determined by injection of solutions of ether, muresol,<sup>2</sup> dehydrocholic acid, sodium cyanide and saccharin. The results of these studies enabled us to calculate approximately the time at which the radiopaque substance would arrive at various locations.

A 70 per cent solution of diodrast (30 to 50 cc.) was injected intravenously and films were taken at predetermined intervals. Two such injections were found necessary for satisfactory visualization. In some patients three were required. Approximately fifteen minutes were allowed to elapse between injections. With each injection two exposures were made in the erect position at a distance of 6 feet. In several cases this entire procedure was repeated on one or two subsequent dates. For the average examination excluding the preliminary films four films were utilized: two in the posteroanterior position and two in an oblique position, thus obtaining roentgenograms of the right and the

left side of the heart in each position. In addition to these tests a few patients were examined in the supine position with the Bucky diaphragm at 36 inches.

All our observations are based on the technic described. At the present time we believe that this is sufficient for practical purposes. We believe, however, that much more information could be obtained through multiple serial exposures, as described by Sussman,<sup>3</sup> and from motion pictures of the fluoroscopic screen.

REACTIONS TO DIODRAST INJECTIONS

Reactions to the injections of diodrast which at no time were alarming were as follows. Immediately after the injection each patient experienced a flushing of the head and neck, in addition to a profound sense of warmth throughout the entire body. Most of the patients salivated profusely, some became nauseated and others had coughing spells. All these symptoms, however, disappeared quickly. Eucis was noted only in those patients who had eaten prior to the injection. In some cases there was an urgency to urinate or to defecate, but in no instance did incontinence occur. A sense of weakness invariably accompanied or followed the procedure. Immediately after the injection the blood pressure dropped. In some cases the systolic drop was as much as 80 mm. of mercury and the diastolic drop from 50 to 60 mm. The hypotension, however, was of a transitory nature with a return to the preinjection level within five minutes and at the same time a disappearance of the sense of weakness.

Itching and urticarial rashes appeared in a few cases, increasing in intensity after the second injection. All were relieved by subcutaneous injection of epinephrine. None of the persons had been previously tested for sensitivity. Of all the patients examined 21 were subsequently given cutaneous tests for sensitivity. Sensitivity was determined by injecting intradermally 0.2 cc. of a 70 per cent diodrast solution into the volar surface of the arm. The wheal raised by this injection was measured and the area observed at ten minute intervals for an hour. Of this group 6 showed positive reactions within fifteen minutes, the others showed no reaction for more than one hour. A reaction was considered positive when the wheal erythematous and pseudopodiums measured more than 2.5 cm. in diameter. Some of these reactions appeared almost immediately, others did not appear for fifteen minutes.

The development of sensitivity to the contrast substance is a possibility and should not be overlooked.<sup>4</sup> From the 21 patients tested there seems to be little or no correlation between the degree of sensitivity to an intradermal test with 0.2 cc. of 70 per cent diodrast and the reactions experienced at the time of the intravenous injection of 30 to 50 cc. of the 70 per cent diodrast. In 20 cases the injected vein became thrombosed within forty-eight hours but was subsequently recanalized.

ANATOMY—NORMAL HILARIS

Our examinations have shown variations from the recognized and accepted radiographic anatomy of the cardiac silhouette in the normal as well as in the abnor-

The Nopera Company supplied the muresol and the Winthrop Chemical Company the diodrast.

From the Roentgen Ray Department and Columbia Medical Division Coldwater Memorial Hospital.

Read before the Section on Radiology at the Ninety Third Annual Session of the American Medical Association Atlantic City, N. J. June 10, 1942.

1. Robb, G. P. and Steinberg, I. Visualization of the Chambers of the Heart: Pulmonary Circulation and Great Vessels in Man. Practical Method. *Am. J. Roentgenol.* 41: 117 (Jan.) 1939.

2. Muresol is a solution containing magnesium sulfate, calcium gluconate, sodium chloride and copper sulfate in distilled water. (Spier, L. C., Wright, I. S., and Saylor, Leslie. A New Method for Determining the Circulation Time Throughout the Vascular System. *Am. Heart J.* 12: 511-520 [Nov.] 1936).

3. Sussman, M. I., Steinberg, M. I., and Grishman, Arthur. A Multiple Exposure Technic in Contrast Visualization of Cardiac Chamber and Great Vessels. *Am. J. Roentgenol.* 46: 745-747 (Nov.) 1941.

4. Coldburgh, H. I., and Brer, Samuel. Death After the Intravenous Use of Diodrast. *J. A. M. A.* 118: 1051-1052 (March 29) 1942. Dolan, L. P. Allergic Death Due to Intravenous Use of Diodrast. *ibid.* 114: 138-139 (Jan. 13) 1940. Crane, J. J. Sudden Death Following the Intravenous Administration of Diodrast. *J. Urol.* 42: 745-748 (Nov.) 1939.



mal The present study indicates that existing concepts concerning the size, shape and position of the heart chambers and the thickness of its muscles are different from those observed in the adynamic viscus in the cadaver. Our concepts require modification in the light of observations made *in vivo* on the dynamic viscus.

**Posteroanterior Position** (fig 1A)—In this position, with contrast substance opacifying the superior vena cava, the right auricle, the right ventricle, the conus, the pulmonary aorta and the right and left pulmonary arteries, the entire right side of the heart appears to be a U shaped structure. The upper part of the right arm of the U is the superior vena cava and the lower part is the right auricle. When these two structures are combined they form the right border of the cardiac silhouette. In a number of instances we have observed a lack of filling with contrast substance in the right lower portion of the cardiac silhouette. This lack of filling when the right side of the heart is filled with contrast substance led to our excluding that portion as part of the right side of the heart. This region is therefore referred to as a silent area.

Pulsations with ventricular characteristics have been observed on kymographic examinations of this so-called silent area. Since we have also observed ventricular types of pulsations on that portion of the cardiac silhouette corresponding to the lower portion of the superior vena cava and the right auricle, we have concluded that the silent area is the site of the inferior vena cava and that the superior vena cava, the right auricle and the inferior vena cava are capable of transmitting ventricular pulsations.

The right ventricle is represented by the horizontal part and the lower portion of the left upright arm of the U. The left arm of the U is superimposed on the spine and seldom extends beyond the left lateral border thereof. The interventricular septum or the left lateral border of the opacified right side of the heart is vertical, with a tendency to convexity to the right. The apex of the right ventricle is usually represented as an acute angle far removed from the cardiac apex.

When the left pulmonary artery is outlined by contrast substance it is found to occupy only a small part of the left border of the cardiac silhouette, situated between the aortic knob and the superior portion of the left ventricle. The right ventricular conus does not participate in the formation of the left margin of the cardiac silhouette and only rarely does the pulmonary aorta reach that margin. Instead these two structures are visualized deep within the cardiac shadow. The left pulmonary artery is below the thoracic aorta. At times, however, as the left pulmonary artery ascends, its left lateral border forms the lower part of the middle cardiac segment. The pulmonary aorta may be convex toward the left and it may extend to, but not beyond the left cardiac border.

The lateral dimension of the right side of the heart, in the posteroanterior position, as demonstrated with the aid of contrast substance is considerably smaller than our previous conception of it. When enlarged it does not approach the left border and is appreciably removed from the left lateral border of the cardiac silhouette.

When the left side of the heart is opacified the two chambers assume the shape of a figure 8 obliquely sit-

uated at about a 30 degree angle from the horizontal. The auricular shadow is circular in outline, forms no part of either border of the heart shadow and is disposed more to the right than to the left. In only 1 instance was the contrary observed. The ventricular shadow is more often seen to be oval, occupying the major portion of the left half of the heart, including the apex.

Further observations of the left cardiac border demonstrated that the middle segment (i.e. the area between the aortic knob and the base of the ventricle) might be composed of a part of the pulmonary aorta. The remainder of the border is a continuation of the pulmonary aorta at its bifurcation, as the left pulmonary artery. When the middle segment was not so composed we found it to be made up in whole or in part, by the descending portion of the left pulmonary artery or of the descending thoracic aorta as it descends and divides the cardiac silhouette.

In many instances there was a lack of filling with contrast substance of the lower portion of the middle cardiac segment, namely that portion above the base of the left ventricle. This is another so-called silent area as it



Fig 1—Normal heart. A posteroanterior view showing entire right side of the heart opacified. No contrast substance is present in the lower right portion of the cardiac silhouette (silent area). Apex of the right ventricle is seen considerably to the right of the cardiac apex. B heart pervade only half of the cardiac shadow.

lacks contrast substance when the left side of the heart otherwise is filled. In only 1 instance did this area fill with contrast substance. The outline obtained led us to believe that this area is occupied by the left auricular appendage.

These examinations also revealed variations in the position of the ascending and the descending aorta. They have appeared superimposed adjacent to and widely separated from each other. The ascending aorta rarely forms part of the border of the right side of the heart except when it is tortuous, elongated or dilated.

An aortic knob not demonstrable by routine examination can be demonstrated it present by angiocardiology.

**Right Anterior Oblique Position** (fig 1B)—In this view, the position of the U shaped right heart is somewhat similar to that observed in the posteroanterior position. The only appreciable variation is a greater separation of the limbs of the U. The superior vena cava is visualized as it enters the right auricle. The right ventricle forms the horizontal and ascending portion of the U. In some cases a constriction in the contrast substance demarcates the site of the tricuspid ring.

The left pulmonary artery transversely crosses the clear space between the upper portion of the arms of the U. The opacified right ventricle does not occupy more than half of the ventral cardiac shadow in this position. Herebefore a larger portion of the silhouette was attributed to this structure. The left ventricular shadow on the



Fig. 2—A left anterior oblique view showing the superior vena cava and the right auricle. B left anterior oblique view showing the right side of the heart as a rectangular structure with anterior convexity occupying ventral half of the cardiac silhouette.

other hand, occupies considerably more space than was previously believed.

The left auricle and left ventricle form a figure 8 lying in an almost horizontal plane, with the auricular chamber at a slightly higher level than the ventricular chamber.

In this oblique position the ascending and descending aortic shadows are not only parallel but also very close to each other, often being superimposed. There is no arch.

**Left Anterior Oblique Position**—The U appearance of the right heart as observed in the posteroanterior and right anterior oblique positions now changes into an elongated rectangular structure as the two vertical arms of the U become superimposed (fig 2). The right heart occupies the ventral portion of the cardiac silhouette



Fig. 3—A left lateral view showing the right side of the heart opacified. B left lateral view showing the left side of the heart and aorta opacified.

and is convex anteriorly. The chambers are superimposed and cannot be differentiated. The posterior limit of the contrast substance, representing the interventricular septum, is convex to the right.

In this position, the left heart forms a kidney shaped structure with a deep ventral concavity from the depths of which arises the aorta.

**Lateral Position** (fig 3)—In this position, the outline of the right and left portions of the heart shows little variation from the contours found in the left anterior oblique position of a normal heart.

#### VARIATIONS FROM THE NORMAL

The facilities at our disposal permitted the obtaining of only two films for each injection with contrast substance. Under the circumstances we endeavored to obtain as much information as possible, arranging our examinations so as to get as much as possible of the cardiovascular portion of each side of the heart opacified with each exposure. Because of technical limitation it was not possible in all instances to differentiate one heart chamber from another. However, separate opacifications of each side of the heart were obtainable. In the remainder of our presentation we shall refer to the right and the left sides of the heart as separate units, each unit being considered a combined auricular and ventricular shadow. Whenever possible we shall refer to the individual chambers.

Anatomic changes were apparent. There were variations in size and shape of the cavities and increased



Fig. 4—A left anterior oblique view showing dilated right heart. B left anterior oblique view showing the left side of the heart with no demarcation between the left ventricle and aorta indicating insufficiency of the aortic valve.

thickness of the cardiac muscle wall. These abnormalities could be readily differentiated from the variations normally occurring during systole and diastole.

Enlargement of the right heart chamber was manifested in the posteroanterior position by a generalized increase in the size of the U shaped structure with an advance of the interventricular septum to the left. The shift in the apical region was less pronounced than that in the area of the conus. In the left anterior oblique view the right side of the heart when enlarged assumed the shape of an inverted mushroom. In our opinion this signified enlargement of the chamber. The greatest enlargement was observed in the lower and posterior portion of the right side of the heart. The interventricular septum, in the region of the apex, was to a variable extent, convex to the left. This type of change was not necessarily accompanied by an increase in muscular thickness or by cardiac enlargement. It represented (or was interpreted as) simply chamber enlargement or dilatation without appreciable muscular hypertrophy or cardiac enlargement. Enlargement of the right side of the heart in some instances was present without the inverted mushroom appearance. In one type we observed the upper opacified area in the right side of the heart to be enlarged, whereas the lowermost,

or dependent, portion did not participate in the enlargement. The convexity of the interventricular septum occurred in either direction.

Enlargement of the left heart chamber could be visualized in all positions. The size and shape of the shadow determined whether the enlargement was auricular or ventricular and, if ventricular, whether the heart was in systole or diastole at the time of the exposure.

The left anterior oblique position yielded a characteristic roentgenogram. Whereas normally the left ventricle appeared as a small opacified sphere, when enlarged it manifested itself in one of two ways. In the first, the junction between the ventricle and the aorta was lost (fig 4B). This area was widened, the chamber was elongated and the entire configuration took on a tongue-like appearance, with the interventricular septum convex to the right. In the second, there was no loss of demarcation between the ventricle and the aorta. The chamber enlarged anteriorly, but the septal deviation remained convex to the right. The former enlargement is associated with an insufficiency or regurgitant lesion of the aortic valve, the latter with hypertension or obstructions at the aortic ring.



Fig 5—A left anterior oblique view showing the right side of the heart opacified cardiac hypertrophy. Clinically, hypertension cardio-renal disease. B same as A showing hypertrophy of the left side of the heart.

The diagnosis of mediastinal lesions was considerably facilitated by the use of contrast substance. It was possible to differentiate between mediastinal tumors and vascular lesions in the mediastinum, conditions which are not always easily diagnosed by kymographic studies. Transmitted pulsations on a kymographic record may be interpreted as vascular pulsations. We have observed kymographic studies of aneurysms with no evidence of pulsations and conversely, pulsations in mediastinal tumors. By angiocardigraphic studies we were able to differentiate mediastinal lesions from aneurysms with only 2 exceptions. In 1 case we were able to recognize multiple aneurysms arising from the arch of the aorta and also locate a large mediastinal mass in the retrocardiac area. This mass displaced the esophagus anteriorly and to the right and eroded the spine. Not being able to demonstrate any contrast substance within this mass, we were led to diagnose it as a neurogenic tumor in addition to the multiple aneurysms. At autopsy the mass proved to be a large aneurysm containing a huge laminated clot with a small lumen for the passage of blood. This postmortem examination made it quite clear why kymography had shown no pulsations and why contrast substance had not been allowed to accumulate in sufficient concentration to cast a recognizable

shadow. In another instance failure to demonstrate the aneurysm proved to be due to dilution of the contrast substance within a huge, diffuse dilatation occurring throughout the entire length of the descending aorta. Kymographic examination had revealed typical aortic pulsations synchronized with the aortic pulsations.



Fig 6—A posteroanterior view showing definite retraction of the mediastinal structures to the right secondary to pleural and pulmonary fibrosis of the right lung, compensatory emphysema of the left lung. Right side of the heart opacified plow shaped appearance. B postero-anterior view showing definite retraction of the mediastinal structures to the left secondary to pleural fibrosis and bronchiectasis and compensatory emphysema of the right lung. Note enormous U shaped right heart.

The distribution of the patients with aneurysms on the basis of etiology was as follows: cardiovascular syphilis 9, arteriosclerosis 2. Among the 9 patients with cardiovascular syphilis there were several with multiple aneurysms, including 1 in the abdominal aorta (fig 7). One of the arteriosclerotic aneurysms was a dissecting aneurysm and the other was saccular. Both were situated in the descending aorta.

Chronic pulmonary emphysema was characterized by right ventricular enlargement without generalized cardiac enlargement. In half of these cases we found the septum convex to the left corroborating the findings of Sussman and his co-workers.<sup>6</sup> However in some cases

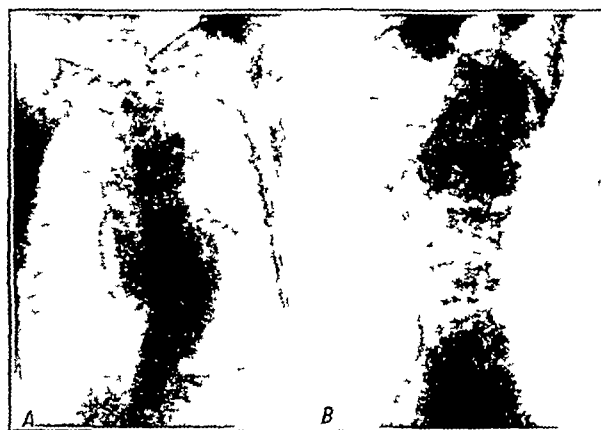


Fig 7—A slight obliquity with foreshortening of the left hemithorax showing multiple syphilitic aneurysms of the thoracic aorta. B same as A lateral view showing aneurysm of the abdominal aorta.

similar deviations were observed in which there was right sided chamber enlargement and no emphysema.

In 1 instance we found enlargement in the hilar regions, which we thought were due to multiple aortic

6 Sussman M L, Steinberg M F and Grishman Arthur. Contrast Visualization of the Heart and Great Vessels in Emphysema. *Am J Roentgenol* 47: 368-376 (March) 1942.

aneurysms (fig 10 *A*) Angiocardiography revealed large pulmonary arteries, the enlargements of which terminated quite abruptly

Obstructions to the large vessels leading to the right side of the heart were easily visualized as was the resulting secondary collateral circulation

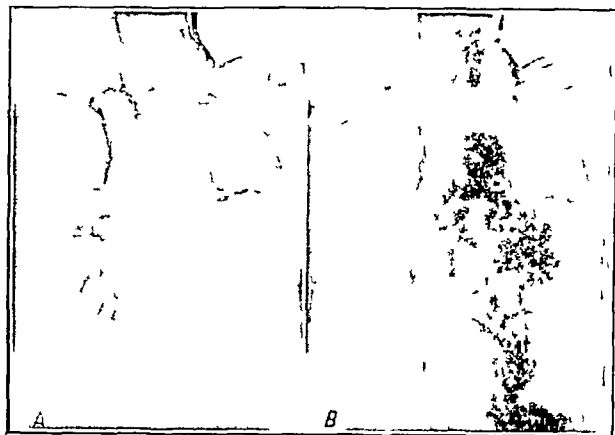


Fig. 8.—Arteriosclerotic aneurysm of the descending aorta of a white woman aged 95. *A* same as 4 posteroanterior view showing the entire right side of the heart opacified. *B* same as 4 posteroanterior view showing left side of the heart, aorta and aneurysm opacified.

In decided mediastinal deviations the size, shape and location of the heart and its chambers show significant variations from the normal. Intrinsic intrapulmonary obstructing factors existed which contributed to the changes observed. In 1 case in which the mediastinal structures were definitely deviated to the right (fig 6 *A*) secondary to a pleural and pulmonary fibrosis with bronchiectasis, the evidence of obstruction was quite profound. The pulmonary vessels were extremely dilated, a dilatation carried all the way back to the heart, the superior vena cava, the subclavian and the axillary veins. An extensive collateral circulation was also demonstrable. Angiocardiography showed enlargement of the right and left chambers. The interventricular septum presented an accentuated convexity to the right. In the posteroanterior position this septal convexity gave the right side of the heart a plow shaped appearance.

In a similar type case but with the decided deviation of the heart to the left (fig 6 *B*) the chambers assumed an entirely different shape. The right side of the heart was enlarged and the pulmonary vessels were extremely dilated. The U shaped structure appeared as a rectangle with the upright portions of the U dilated and widely separated.

One patient presented typical clinical manifestations of bronchiectasis which could not be verified by bronchography. He was studied in order to determine the morphologic appearance of the parenchymal pulmonary arteries, an obstructing lesion was suspected. Changes were observed which we interpreted as a pulmonary endarteritis, with an extensive intrapulmonary collateral circulation. The large vessels showed a sudden reduction in the size of the lumens.

There were 4 cases presenting congenital cardiovascular anomalies. In 1 we were able to establish the diagnosis by direct evidence. In 3 the diagnosis was confirmed by indirect evidence.

In a case of dextra aorta the position of the aorta was demonstrated beyond any doubt (fig 9).

In a case of coarctation definite on clinical evidence we were unable to demonstrate the constriction on three different occasions. On all examinations the arch and descending portion of the aorta down to the level of the sixth thoracic vertebra were visualized with contrast substance with no sharp demarcation between the upper and lower portions of the descending aorta. Examinations were made at ten, eleven, twelve, fourteen, fifteen and sixteen seconds following injections time factors which exceeded those determined by the circulation tests. Because of the constancy of the roentgen findings and despite the varying time factors we concluded that the area of coarctation was at the level of the sixth thoracic vertebra.

In another instance a diagnosis of patent ductus arteriosus had been made clinically in a 12 year old boy. The right side of the heart was visualized in two and one-half seconds and the left side of the heart in seven seconds. The left pulmonary artery formed a prominence in the middle cardiac segment and contained contrast substance during both examinations. Under normal circumstances the left pulmonary artery should have been free of contrast substance at the end of seven seconds and should not have been opacified along with the left side of the heart and aorta. The inference was that the contrast substance had arrived in the left pulmonary artery by way of the aorta.

In the fourth case a white man aged 35 had a clinical diagnosis of pulmonary stenosis. At the end of three seconds (fig 10 *B*) contrast substance was visualized simultaneously in the right and left ventricles, pulmonary aorta and pulmonary arteries. At the end of nine seconds contrast substance was present in the aorta and in the pulmonary arteries. The presence of contrast substance in both ventricles at three seconds could be accounted for only by an interventricular septal defect. Persistence of contrast substance in the large pulmonary vessels was further evidence of a septal defect.

The hypertensive type heart showed cardiac hypertrophy as was to be expected. In some instances the



Fig. 9.—*A* posteroanterior view showing the left side of the heart and aorta opacified and aorta to the right of the spine. *B* left anterior oblique view. The left side of the heart is opacified showing loss of normal aortic curve resembling that observed in the right anterior oblique view.

hypertrophy reached enormous proportions, not only of the left ventricular wall but of the right as well. In others there was an accompanying enlargement of the left ventricular chamber (fig 5).

The arteriosclerotic hearts showed no true cardiac enlargement or hypertrophy but showed enlargement of

the right heart chamber<sup>8</sup> More often, the inverted mushroom type of enlargement of the right side of the heart was found in these cases

As the right side of the heart enlarges, it appears, in the left anterior oblique position, as if the right ventricular apex were elevated and directed posteriorly, giving the impression that there might be a counter-clockwise or posterior rotation of the heart on a horizontal axis

The rheumatic hearts frequently showed evidence of cardiac enlargement This increase in size was due in some to enlargement of the chamber, in others to hypertrophy and in still others to a combination of the two conditions

Enlargement of the right side of the heart did not present the appearance of an inverted mushroom in the left anterior oblique position As the right side of the heart enlarges, the structures to the left of the base of the right ventricle may be displaced to the left and produce the convexity in the middle cardiac segment

At times the typical configuration ascribed to mitral hearts was noted Often there was an associated enlargement of the right heart chamber with little or no evidence of hypertrophy Some showed increase in the transverse diameter of the horizontal portion of the U between the right auricle and the right ventricle A loss of demarcation between the left ventricle and the aorta was attributed to valvular insufficiency

Those patients with clinical mitral stenosis showed large left auricles In the posteroanterior view the enlarged left auricle was disposed to the right and did not contribute to the formation of the left border of the cardiac silhouette However, when the left auricle is very large it forms part of the right border of the cardiac silhouette

We have been unable to demonstrate the left auricle on the left border, just as we have been unable to demonstrate the conus as forming the convexity of the middle cardiac segment We believe that as the left auricle enlarges and rotates posteriorly to appear on the right cardiac border structures lying to its left lateral border are pushed and form the convexity seen in mitral stenosis The structure called "conus" on the roentgenogram is not the anatomic conus The anatomic conus is an intracardiac and not contour forming structure We have found the convexity to be formed by the left pulmonary artery as it assumes an oblique intracardiac downward course instead of the usual horizontal

#### SUMMARY

1 A total of two hundred and fifteen injections were made with 70 per cent diodrast solution in a series of 100 persons, ranging in age from 12 to 93 years, in order to visualize the cardiac chambers and the large vessels Included in this group were persons with and without cardiovascular disease

<sup>8</sup> By arteriosclerotic hearts we mean hearts in persons with no antecedent history of essential hypertension or myocardial infarction whose blood pressure does not exceed 150 in the systolic level or 90 in the diastolic who have definite evidence of peripheral sclerosis and who are 45 years of age or over They may have an anginal syndrome and/or electrocardiographic evidence of myocardial damage

2 Reactions to the injections were observed in most persons, but no reaction was severe enough to warrant discontinuing the examination and no patient objected to a second injection The chief reaction was a sharp transient drop in the blood pressure

3 This study yielded information of an anatomic nature of the heart and blood vessels, information at variance with the ordinarily accepted concept of the normal heart In contrast to our past concept concerning the anatomic positions of the cardiac chambers and the great vessels the following points were determined

A There is a deep location of the ventricular conus

B Pulmonary aorta as it arises from the ventricle is situated deep in the cardiac silhouette and does not form a prominence on the left border of the heart

C That portion of the cardiac silhouette above the base of the left ventricle and below the left pulmonary artery is usually not opacified with contrast substance and must indicate an area that is not hollow but solid

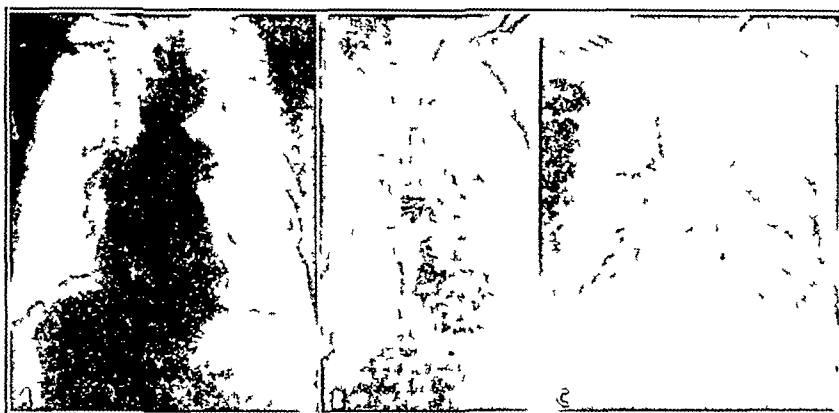


Fig. 10—A posteroanterior view showing very large pulmonary arteries without any clinical evidence of parenchymal obstruction B, right anterior oblique view showing the superior vena cava, right and left ventricle and pulmonary arteries opacified in three seconds C, posteroanterior view showing pulmonary endarteritis with extensive intrapulmonary collateral circulation

In our series, there was one exception and we thought it was the presence of a left auricular appendage

D The middle cardiac segment of the left border of the heart is formed by the pulmonary aorta and the left pulmonary artery

E The nonopacified portion of the lower right cardiac border is the inferior vena cava

F The right heart does not occupy the major portion of the cardiac silhouette in the posteroanterior projection The left ventricle occupies a considerable portion of the cardiac silhouette instead of, as previously supposed, only a small strip along the left cardiac silhouette

4 The following were demonstrated by angiocardiology

A Chamber enlargement

B Muscular hypertrophy

C Stenotic lesions

D Regurgitant lesions

E Congenital anomalies by both direct and indirect evidence

F Aneurysm of the thoracic and abdominal aorta (differentiation of mediastinal lesions from vascular lesions)

G Obstructive lesions of superior vena cava and outline of the collateral circulation

H Alterations in the pulmonary parenchymal circulation

## ABSTRACT OF DISCUSSION

DR M F STEINBERG, New York. The development of contrast roentgenography of the cardiovascular system has stimulated the clinician and the roentgenologist to a clearer understanding of fundamental cardiovascular problems. Angiocardiography and arteriography have opened diagnostic vistas hitherto unattainable, and these may prove as rich as those resulting from the development of cholecystography, urography and encephalography. The application of this technic allows the most intimate study of circulatory anatomy and dynamics. The position of the pulmonic conus and the supravalvular portion of the aorta has been demonstrated within the cardiac shadow. The interventricular septum has been delineated and its position ascertained directly. A word of caution must be given concerning the value of measurements of the myocardial walls and the size of the chamber cavities. In serial exposures these have been found to vary greatly during systole and diastole. For the present it would be wiser to refrain from such measurements until one can be assured of synchronous exposures either in systole or in diastole. The value of angiocardiography in the differential diagnosis of mediastinal masses is indisputable. At the Mount Sinai Hospital all circumscribed mediastinal masses in the region of the vascular pedicle are studied preoperatively by this method in order to differentiate, as far as possible, the aneurysms. We have encountered 2 instances of proved aneurysm which were not specified. Hence, in the differential diagnosis of mediastinal masses, angiocardiography is most significant when the findings are positive. Drs Taylor and McGovern have confirmed our observations on the change in the position of the interventricular septum in cases of chronic lung disease. Convexity of the septum to the left occurred in 43 per cent of our series of 28 cases of emphysema, asthma, pulmonary fibrosis and bronchiectasis. However, in most of the cases which did not show this change we found some factor causing left ventricular strain, either hypertension or coronary artery disease. The most practical application of the value of angiocardiography in congenital heart disease has been found in confirmation of the clinical diagnosis of patent ductus arteriosus. Dilatation of the pulmonary artery or its branches is not pathognomonic nor is it a constant feature. We place great diagnostic importance, however, on the finding of a peculiar dilatation in the descending aorta just beyond the origin of the subclavian artery. This has been seen in no other condition than patent ductus arteriosus and was found in 26 of 27 cases. We believe that it represents either the infundibulum of the ductus or a traction aneurysm of the descending aorta due to the "pulling" effect of the short ductus.

DR MERRILL C SOSMAN, Boston. I feel that we have gained considerable useful knowledge by the contrast cardiography, but this is still a highly specialized procedure and we must expect the men who are trained and equipped to do it to supply us with these new criteria so that we can interpret them or can use them in our interpretations of the films we get by ordinary means. I think probably the most valuable result of this work is the stimulation of a renewed interest in cardio-roentgenology.

DR HENRY K TAYLOR, New York. The questions propounded by Dr Sosman are very pertinent. Unusual procedures are attempted only after all other methods have been tried, the deciding factor is always: How much will the patient benefit by them from either the diagnostic or the therapeutic standpoint?

**The Heritage of Courage and Kindness**—The most effective teacher is not the colorless intellectual virtuoso who today deals out as a fact what tomorrow may prove to be only a fancy, or who pursues some petty experimental project, but he is the real doctor who transmits to his pupils the heritage of truth, courage, and kindness that will make his spiritual heirs worthy members of the medical profession—Irving, Frederick C. Safe Deliverance, Boston, Houghton Mifflin Company, 1942.

## THE FUNCTIONAL VALUE OF THE LIVER IN HEART DISEASE

AN EXPERIMENTAL STUDY

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AND

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One of the organs that suffers most in heart failure is undoubtedly the liver. Its enlargement is the general rule in right congestive heart failure as well as in total ventricular failure. But if it is easy to appreciate the anatomic alterations—enlargement, tenderness, hardness and the like—the functional attack often passes unnoticed or at least is clinically underestimated. It is only in the advanced stages when subicterus, or rarely icterus, appears or when digestive disturbances become important that the physician directs his attention toward the liver and admits the existence of hepatic insufficiency. Nevertheless, at much earlier stages of congestion laboratory procedures already show the functional attack of the gland.

TABLE 1—Classification of Cardiac Patients

	With Decom- pensation	Without Decom- pensation
Rheumatic heart disease	19	3
Syphilitic aortitis	3	2
Arteriosclerotic heart disease	5	0
Miscellaneous group (congenital, cor pulmonale and pharyngeal heart)	3	0
	0	

It is conceivable that this hepatic involvement should be practically inevitable in heart failure, even in its early stages, as a result of a combination of factors: first, the engorgement of the organ with its consequent effects on the nutrition of the hepatic cell, second, general anoxemia resulting from a defective pulmonary circulation, and, third, the possibility of an aggressive action of the cause of the heart disease itself—rheumatism, syphilis and like conditions.

In the face of scarcity of the usual clinical data, as well as the tardiness with which they appear, in view of the importance of a better knowledge of the functional capacity of the liver in our cardiac patients, and with the desire of learning whether or not the fourth factor mentioned, i. e. the aggressive action of the underlying cause of the heart disease, adds its part to the clinical picture of the congested liver, we have subjected a group of our cardiac patients to a certain number of experimental tests.

This particular chapter dealing with the functional exploration of the liver is one of the most debated in medicine. The literature on the subject is extensive without there being at present, complete agreement as to the value of the test proposed.

This lack of uniformity in criterion is explained by various reasons. 1. The liver has a multiplicity of

Because of lack of space this article has been abbreviated for publication in THE JOURNAL. The complete article appears in the authors' reprints.

Read before the Section on Experimental Medicine and Therapeutics at the Ninety Third Annual Session of the American Medical Association, Atlantic City, N. J., June 10, 1942.

functions some of which are so poorly understood that they cannot be correctly exploited. 2 Under pathologic conditions not all functions are affected at the same time or to the same degree—what has been called “functional asynergy” by Fiessinger and Walter. 3 The functional capacity of the organ varies constantly, the liver is a dynamic, not a static, gland, as Mann expresses it. 4 The liver has a great regenerative power and normally does not work at its full capacity. For the functional tests to give positive results an extensive attack of the gland carried to a more or less intensive degree is necessary.

These considerations of a physiologic nature, accurate as they are, do not invalidate the use of the tests, they only indicate certain conditions for their execution and fix certain limits as to the value of the results obtained. The following are the practical consequences that one may deduce from them: (a) It is necessary to perform several tests at the same time for the purpose of simultaneously exploring the greatest possible number of functions: it is the so-called “hepatic snapshot” of Fiessinger. (b) It is imperative to repeat the tests in order to obtain an idea of the evolution which the functions undergo in the course of time. (c) The results of the tests should always be confronted with clinical data.

Investigations that have filled these requirements and that have been carried out on cardiac patients are not very numerous as far as we have been able to determine. In 1930 Jolliffe<sup>1</sup> published a study on functional tests carried out on 16 patients with heart failure, in 1932 Robertson, Swalm and Konzelmann<sup>2</sup> reported the results obtained on 15 patients, most of whom were suffering from heart failure, in 1935 Routier, Cottet and Molinghen<sup>3</sup> explored the livers of 35 cardiac patients by means of several simultaneous tests. Later on we shall compare the conclusions of these authors with our own.

#### CASES STUDIED

In the present research 35 patients with heart disease from various causes were studied, 30 of whom had heart failure and 5 had no insufficiency. Six of those with heart failure were examined for the second time after a disappearance of, or at least an improvement in, their insufficiency, which raises the number of observations to 41. Finally, 4 patients with liver disease were studied as a control group in order to check the results of the tests.

One group of cardiac patients was divided as shown in table 1.

For the convenient appreciation of the results, we have diagrammatically classified the heart failure of our patients into four degrees: 1, slight, 2, medium, 3, accentuated, 4, extreme.

The heart failure of all our patients was congestive. The enlargement of the liver was estimated according to the number of centimeters which it measured below the costal arch at the mammary line.

The patients were subjected to a careful clinical study as well as to roentgen examination, an electrocardiographic study, a previous urinalysis, chemical analysis of the blood, blood counts, a Boidet Wassermann test, determination of the sedimentation rate, and like laboratory examinations.

#### TESTS EMPLOYED

The tests conducted by us were:

- 1 Investigation of bile pigments in the serum: van den Bergh's reaction.
- 2 Measurement of urobilinogen in a specimen of urine.
- 3 Rosenthal's test with bromsulphalein.
- 4 The Takata-Ara reaction.
- 5 The induced galactosuria test.

#### BILIRUBINEMIA

For serum bilirubin determination we have followed Jendrassik's technique and have used Summerson's photoelectric colorimeter. We conducted first the ring test.

TABLE 2—Bilirubin

First Group	Rheumatic Endomyocarditis—24 Cases	Bilirubin		
		Case	Grade	Indirect Mg / 100 Cc
Without cardiac failure (4 cases)		25	—	0.25
		8	—	0.48
		1	—	0.25
		12 bis	—	0.60
With cardiac failure (20 cases)		23 bis	1	0.40
		3	1	0.37
		30	1	0.75
		27 bis	2	0.40
		31	2	0.50
		14	2	0.55
		11	2	1.50
		2	2	0.85
		22	2	1.00
		29	3	1.50
		23	3	1.50
		21	3	1.40
		12	3	1.66
		16	3	0.50
		27	3	0.90
		5	3	2.02
		18	4	0.90
		28	4	1.90
		4	4	1.36
		39	4	4.98
Second Group	Syphilitic Aortitis—6 Cases			
		Case	Grade	Indirect Mg / 100 Cc
Without cardiac failure (2 cases)		9	—	0.25
		26	—	0.50
With cardiac failure (4 cases)		32 bis	1	0.25
		32	3	0.80
		33	3	0.60
		6	4	2.00
Third Group	Cardioangiosclerosis—6 Cases			
		Case	Grade	Indirect Mg / 100 Cc
All in cardiac failure		17	1	1.73
		15	2	1.07
		10	2	0.25
		13 bis*	2	1.65
		13	3	2.25
		19	3	1.50
Fourth Group	Miscellaneous—3 Cases			
		Case	Grade	Indirect Mg / 100 Cc
Congenital heart disease: septal communication cardiac failure		7	3	3.00
	Cor pulmonale (cardiac failure)	24	2	0.80
	Thyrototoxicosis (cardiac failure)	20	2	1.50

\* This patient had besides an alcoholic and syphilitic hepatitis.

of Lepehne to determine qualitatively whether or not direct bilirubin was present, either immediate or delayed in its appearance. If it was negative we proceeded with the quantitative determination of indirect bilirubin, following the method of Jendrassik and Czike. If it was positive and the ring of Lepehne revealed a weak reaction, we were satisfied with labeling it as such, without attempting the measurement, since the results obtained are always inexact if not misleading. In case of an intensively positive reaction, we proceeded to the separate determination of both bilirubins by the aforementioned method of Jendrassik and Czike.

We accept as normal for indirect bilirubin 0.1 to 0.5 mg per hundred cubic centimeters of blood. This figure, determined by Barron<sup>4</sup> using van den Bergh's reaction, is in accordance with our own experience.

1 Jolliffe Norman J Chin Investigation 8 419-433 (April) 1930  
2 Robertson W E Swalm W A and Konzelmann F W Functional Capacity of the Liver: Comparative Merits of the Most Popular Tests J A M A 99 2071-2077 (Dec 17) 1932  
3 Routier D Cottet J and Molinghen P Arch d mal de l'app digestif 25 801 (Oct) 1935



We have considered as abnormal the presence of bilirubin in the following conditions (a) when indirect bilirubin is greater than 0.5 mg per hundred cubic centimeters, (b) when direct bilirubin is present, whatever its amount, and (c), as is obvious, when total bilirubin is increased at the expense of its two fractions.

Of the 16 patients with heart failure studied by Jolliffe, 81 per cent showed an elevation of the blood bilirubin. On the other hand, in 14 cardiac patients, some with insufficiency and others without, studied by Robertson, Swalm and Konzelmann, not a single direct van den Bergh reaction was found, and as for the indirect they found it normal in the majority of cases, from which they concluded that this reaction is of little importance in the study of cardiac patients.

TABLE 3—Bromsulphalein

First Group Rheumatic Ludomyocarditis—94 Cases			
	Cases	Grade	Retention per Cent
Without cardiac failure (4 cases)	8		6
	12 bis		10
	20		12
With cardiac failure (90 cases)	2 bis	1	20
	20 bis	1	30
	30	1	18
	1	2	14
	14	2	2
	11	2	20
	2	2	40
	22	2	10
	27 bis	2	40
	20		61
	21		14
	12		4
	16		3
	16		14
	27		0
	18	4	40
	18	4	67
	4	4	14
	30	4	7
	5	3	67
Second Group Syphilitic Aortitis—6 Cases			
	Cases	Grade	Retention per Cent
Without cardiac failure (2 cases)	1		17
	6		17
With cardiac failure (4 cases)	1 bis	1	10
	3		30
	6	4	23
			36
Third Group Cardioangiosclerosis—6 Cases			
	Cases	Grade	Retention per Cent
All in cardiac failure	17	1	93
	10	2	4
	10	2	10
	10	3	48
	19		11
	10 bis †	2	61
Fourth Group Miscellaneous—2 Cases			
	Cases	Grade	Retention per Cent
Congenital heart disease septal communication cardiac failure	7	1	78
Hydrotoxicosis cardiac failure	20	2	34

1 This patient just recovered from cardiac failure.

† This patient had besides an alcoholic and syphilitic hepatitis.

Inversely, Routier, Cottet and Molinghen<sup>3</sup> affirm that in 31 patients with heart failure seen by them indirect bilirubin was always increased and the direct was positive in only 2 cases.

**Our Results**—In the present study, which includes 33 tests carried out on 30 cardiac patients with varying degrees of heart failure (1 to 4), bilirubin was abnormal in 28, or 85 per cent. On the other hand, of 6 cardiac patients who had no decompensation, all had normal bilirubin. It is worthy of note that patient 12 bis had previously had during his course of heart failure a positive direct bilirubin reaction and a total bilirubin of 1.86 per cent. Another patient, 23 bis, with normal reactions, had also shown a few days before, during a grade 3 insufficiency, direct positive bilirubin and a total bilirubin of 1.50 per cent.

In table 2 it can be observed that

1 In the group of patients with heart failure, even if the failure was not constant there existed a close relation between the degree of failure and the amount of bilirubin, in the group with slight failures (type 1), in which there were 4, only 1 had a positive direct reaction and that was a patient with long-standing syphilis with aortitis. In the other 3, indirect bilirubin remained normal or hardly superseded the normal limit. In the group with failures of class 2, which included 13 patients, all presented direct bilirubin, and the total bilirubin, with the exception of 3 in whom it remained normal, reached figures which ranged between 0.5 and 1.7 mg, in the group with advanced failures (type 3), which included 11 patients all with 1 exception had direct bilirubin and total figures which reached 2.25 and 3 mg, finally in the group with grade 4 failures, which included 5 patients all had direct bilirubin and total figures were high from 1.36 to 6.9 mg per hundred cubic centimeters.

2 In this table it can be appreciated that there is no striking significant relationship between the cause of cardiac disease and the degree of bilirubinemia, still the impression is gained that it is in the group of patients with rheumatic heart disease that the highest figures of bilirubin are to be found.

3 Finally, it was not possible to appreciate a fixed stable relation between the degree of liver enlargement and the amount of bilirubin. Generally speaking the livers with the greatest amount of enlargement are those with the most pigment, but the exceptions are numerous as in case 33 bis, in which the liver measured 3 cm beyond the costal arch, and in case 16 in which the liver measured 8 cm and the bilirubin was normal while in others in which there was less enlargement of the liver very high figures were obtained.

#### BROMSULPHALLIN TEST

Since the studies of Rosenthal and White,<sup>11</sup> bromsulphalein has been the dye of choice used for studying elimination by the liver. The dose of 5 mg per kilogram of body weight which we used is the one recommended by O'Leary, Greene and Rowntree.<sup>12</sup>

There are cases in which the test is not applicable, as in frank jaundice, on the other hand if the amount of bilirubin is moderate the test retains all its usefulness. Snell and Magath<sup>13</sup> after a survey of more than 10,000 tests of this kind performed in the Mayo Clinic, have concluded that bromsulphalein does permit one to judge the condition of the liver if bilirubin does not exceed 5 mg, and they even consider that it is perhaps the best functional test available at present.

In accordance with our experience we have considered as abnormal all retentions of the dye which are greater than 10 per cent thirty minutes after the injection. Retentions of this type were considered positive.

Jolliffe in the study already mentioned, using Rosenthal's original technique of an injection of 2 mg per kilogram of body weight found retentions ranging from 5 to 20 per cent in 75 per cent of his cases. Robertson, Swalm and Konzelmann with doses of 5 mg per kilogram, found in all of their 9 cases retentions greater than 6 per cent.

11 Rosenthal S. M. J. Pharmacol. & Exper. Therap. **19** 83, 91 (June) 1922. Rosenthal S. M. and White L. C. *Ibid.* **24** 265, 284 (Nov.) 1924. Clinical Application of Bromsulphalein Test for Hepatic Function J. A. M. A. **84** 1112, 1114 (April 11) 1925.  
12 O'Leary P. A., Greene C. H. and Rowntree J. G. Clinical Evaluation of Galactose Tolerance Test Arch. Int. Med. **14** 155, 193 (Aug.) 1929.  
13 Snell A. M. and Magath T. B. Use and Interpretation of Tests for Liver Function J. A. M. A. **110** 167, 174 (Jan. 15) 1938.

**Our Results**—We carried out 38 tests on our 35 patients, 6 tests on patients without heart failure and 32 on patients with varying degrees of decompensation including various factors. Among those cases without failure the reactions in only 3 were negative, in the other 3 moderate retention rates, from 10 to 12 per cent, were present.

In the 32 cases presenting heart failure which are classified in table 3 we obtained the following results:

Five patients with heart failure grade 1 all gave a positive reaction, with retentions ranging between 12 and 30 per cent and averaging 21 per cent.

Ten patients with heart failure grade 2 all gave a positive reaction, with retentions ranging between 14 and 40 per cent and averaging 28.8 per cent.

Twelve patients with heart failure grade 3 all gave a positive reaction, with retentions ranging from 14 to 78 per cent and averaging 43 per cent.

Five patients with heart failure grade 4 all gave a positive reaction, with retentions ranging between 14 to 72 per cent and averaging 44.4 per cent.

It is of interest to note in table 3 that among those patients studied twice, once during heart failure and again after they had improved or been relieved of it, the retention of the dye decreased or disappeared, as in case 12, in which on the first test there was a retention of 28 per cent and after relief it went down to 10 per cent, and in cases 23, 22 and 32 presenting retentions of 48, 40 and 30 per cent respectively, in which on improvement the rates were lowered to 20, 30 and 12 per cent respectively.

#### THE TAKATA-ARA TEST

The Takata-Ara reaction, which when applied to the functional study of the liver should in all justice be termed the Takata-Jezler reaction, has been studied by numerous investigators but to date there is no uniformity of opinion with regard to its diagnostic or its prognostic value or even as to its technique, much less as to the explanation of its mechanism. Magath<sup>14</sup> has recently made a revision of the subject, as has Naville in France.<sup>15</sup> It is accepted that at present this reaction is entirely empirical and that it is most probable that it stands in relation with the absolute and relative amounts of albumin and globulin in the serum since its greatest occurrence is in connection with alterations of the blood proteins. Nevertheless it seems that the liver takes a direct part in the formation and regulation of these plasma proteins. The experiments of Jurgens appear to bear this out. This investigator has been able to modify the production of the serum proteins in the dog and goose by ligating the portal vein and by means of Eck's fistula. In these cases the reaction of Takata-Ara becomes positive but again becomes negative if the liver of the animal under experimentation is removed.

Fully aware that it lacks specificity and that there are extrahepatic factors which influence the proportion of serum proteins, such as feeding, conditions of the kidney, thyroid activity and the like we have included the Takata-Ara-Jezler reaction in the present study, more in the hope of gathering information on the subject than because of any idea on our part that it is a true test of hepatic function.

The results of the test have been different and even contradictory in the hands of diverse authors. Girard

and Vincent<sup>16</sup> have found negative reactions in all their cases of cardiorenal disease complicated with heart failure. Crane<sup>17</sup> obtained the same negative results in 3 cases of cardiac hypertension. On the other hand, Horejsi<sup>18</sup> found a positive reaction of 37 per cent in 10 cardiac patients. Jezler, quoted by Wayburn and Cherry,<sup>19</sup> reports 28 positive reactions among 218 patients with decompensation or a rate of 13 per cent. Wayburn and Cherry, studying 122 cases of that type of disease, found only 9 positive reactions, or 7.4 per cent, and in a survey of the literature they collected 453 case reports published by eight different investigators.

TABLE 4—Takata-Ara Test

First Group Rheumatic Endomyocarditis—94 Cases			
	Case	Grade	Result
Without cardiac failure (4 cases)	95		—
	8		—
	1		—
	17 bis		++
With cardiac failure (90 cases)	93 bis	1	—
	3	1	—
	30	1	—
	27 bis	2	+++
	31	2	—
	14	2	++
	11	2	++
	2	2	++
	92	2	++
	99	3	+++
	23	3	+++
	21	3	+++
	12	3	+
	27	3	+++
	16	3	—
	5	3	+++
	18	4	++
	28	4	+++
	4	4	—
	39	4	+++
Second Group Syphilitic Aortitis—6 Cases			
Without cardiac failure (2 cases)	9		—
	20		—
With cardiac failure (4 cases)	32 bis	1	—
	32	3	—
	33	3	—
	6	4	++
Third Group Cardioangiostclerosis—6 Cases			
All in cardiac failure	17	1	+
	13	2	+
	10	2	++
	13 bis	2	—
	13	3	++
	19	3	++
Fourth Group Miscellaneous—3 Cases			
Septal communication (cardiac failure)			
	7	3	—
Cor pulmonale (cardiac failure)			
	24	2	—
Hydrotoxicosis (cardiac failure)			
	20	2	++

(themselves included). In this group there were 60 with a positive reaction or 13.3 per cent, a rate which might at present serve as a standard by which to judge the frequency of the reaction in the course of heart failure.

**Our Results**—In 30 cases of heart failure studied by us of different causes and of different degrees as specified in table 4, we found the Takata-Ara reaction positive in 19 or in 63.3 per cent. On the contrary, 7 cardiac patients without heart failure all had, with 1 exception, a negative reaction.

At a glance it can be appreciated that (1) the reaction is devoid of all specificity, for even though it is negative in all except 1 of the cases without heart failure it is also negative in all except 1 of the cases with slight heart failure and in several of those with

14 Magath T. B. J. Lab. & Clin. Med. 26: 156-173 (Oct.) 1940.  
15 Naville M. Ann. de med. 40: 28 (June) 1936.

16 Girard M. and Vincent D. Lyon med. 160: 672 (Dec.) 1937.  
17 Crane M. P. Am. J. M. Sc. 187: 703-710 (May) 1934.  
18 Horejsi J. Acta med. Scandinav. 96: 408-421 1938.  
19 Wayburn E. and Cherry, C. B. Am. J. Digest. Dis. 5: 231-238 (June) 1938.

advanced failure, and (2) the intensity of the reaction does not run parallel with the degree of heart failure or with the size of the liver, and it is not influenced by the underlying cause of heart disease.

*Comments*—The unsuspected frequency of 63.3 per cent at which we found it to be positive, and which

TABLE 5—Urobilinogen

First Group Rheumatic Endomyocarditis—11 Cases				
	Case	Grade	Urobilinogen Mg.	Van den Bergh Units
Without cardiac failure (3 cases)	8		0.00	0.10
	1		0.50	1.00
	12 bis		0.50	0.60
With cardiac failure (11 cases)	3	1	0.77	1.53
	27 bis	2	0.50	
	14	2	0.37	0.75
	11	2	2.00	4.00
	2	2	2.50	5.00
	29	3	2.00	4.00
	12	3	1.00	2.00
	27	3	0.60	1.20
	28	4	1.00	2.00
	4	4	3.88	7.75
	5	3	6.00	12.40
Second Group Syphilitic Aortitis—4 Cases				
Without cardiac failure (1 case)	9		0.17	0.33
With cardiac failure (3 cases)	20 bis	1	0.50	0.50
	23	3	0.75	1.50
	32	3	1.00	
Third Group Cardioangiosclerosis—3 Cases				
All in cardiac failure	15	2	0.70	1.40
	10	2	0.05	0.50
	13	3	1.00	2.50
Fourth Group Miscellaneous—1 Case				
Congenital heart disease septal communication cardiac failure	7	0	1.00	2.00

is a very much higher rate than the usual average of 13.3 per cent, does not fail to surprise us considerably. The only explanation that we can offer is that in the group of patients with advanced heart failure, subjected over long periods of time to dietary deficiencies, their hypoproteinemia is so advanced that it complicated a situation which is of itself highly chronic in undernourished persons with low protein intake, as frequently occurs among the poor people of our charity wards. Nevertheless it is well to note that we did not find any correlation whatever between the intensity of the Takata-Ara reaction and the degree of anemia or with the time of evolution of the disease or of the heart failure.

TABLE 6—Examples of Determination of Concentration of Galactose

	Urine Gc	Galactose Gm	Concentration per Thousand
Normal case			
Sample 1	250	1.2	4.8
Sample 2	200	0.2	1
Sample 3	600	0.0	
Sample 4	700	0.0	
Pathologic case			
Sample 1	100	2.0	20
Sample 2	250	3.5	14
Sample 3	400	1.5	3.75
Sample 4	500	1.0	2

## UROBILINOGEN

According to the technique proposed by Watson,<sup>23</sup> normal figures for urobilinogen in the twenty-four hours of the day vary between 0 and 4 mg., the most frequent being between 0.5 and 2 mg. a day. Notwithstanding that this procedure is extremely accurate we were not able to adopt it because of technical difficulties. It would

have been necessary to collect the urine of twenty-four hours, in addition to collecting the urine employed in the galactose test, also for twenty-four hours, all of which would have lengthened the process so much as to deprive it of its "snapshot" quality and at the same time would have postponed treatment of cardiac patients who were not in a condition to withstand a very long delay.

Consequently we selected Scott's technique, which also measures urobilinogen but requires only 1 specimen of freshly voided urine. It is true that the method can be criticized on the ground that urobilinogen is not uniformly eliminated in the twenty-four hours, but, since this varies within very short limits and Scott's method has the obvious advantages of simplicity and exactness, we adopted it as the method which seemed to suit our purposes exactly.

The normal amount of urobilinogen in fresh urine varies between 0.1 and 0.25 mg. per hundred cubic

TABLE 8—Induced Galactosuria

First Group Rheumatic Endomyocarditis—9 Cases				
	Case	Grade	Thiebaut	Bauer
Without cardiac failure (1 case)	20		Positive	Negative
With cardiac failure (7 cases)	23 bis	1	Positive	Negative
	27 bis	2	Negative	Negative
	31	2	Positive	Negative
	2	2	Positive	Positive
	29	3	Positive	Negative
	27	1	Positive	
	23	4	Positive	Negative
Second Group Syphilitic Aortitis—5 Cases				
Without cardiac failure (1 case)	9		Positive	Not done
	26		Positive	Negative
With cardiac failure (3 cases)	13 bis	1	Positive	Negative
		2	Positive	Negative
	1	3	Positive	Negative
Third Group Cardioangiosclerosis—2 Cases				
Both in cardiac failure	10	2	Negative	Not done
				Not done
Fourth Group Miscellaneous—2 Cases				
Cor pulmonale (cardiac failure)	4	2	Positive	Negative
Septal communication (cardiac failure)	7		Positive	Not done

This patient also showed renal insufficiency which account for the absence of galactose elimination.

centimeters, according to the figures given by Scott, but we call attention to the fact that in a considerable number of normal subjects it is not infrequent to find figures below the 0.1 mg. which we have just pointed out as a normal minimum.

Jolliffe<sup>1</sup> has found urobilinogen increased in more than half of his 16 cases (56 per cent). On the other hand, Robertson, Swalm and Konzelmann have found it normal in practically all their patients. Watson<sup>22</sup> finds the rates elevated in 9 of the 11 patients studied by him (81 per cent).

*Our Results*—In our study we carried out the measurement of urobilinogen in 18 cardiac patients with heart failure and in 3 without it, as is shown in table 5, in which it can be seen that

1 In the small group of cardiac patients without heart failure not 1 had an increase in urobilinogen.

2 In the group of 18 patients with heart failure, only 5 maintained normal rates, and all were only moderately decompensated, the remaining 13, or 75 per cent, had high rates, but there was no significant correlation between these rates and the degree of failure.

3 Nevertheless, it could be observed that in 2 of them (cases 12 and 27), on improvement of their condition, the urobilinogen rates returned to normal.

4 Even though the number of observations is too small to permit us to generalize, it seems that in equal stages of failure the group of rheumatic patients presents higher urobilinogen rates than the other groups

5 There is no constant relation between the size of the liver and the degree of reaction

#### THE INDUCED GALACTOSURIA TEST

The original technic of Bauei consists in the oral administration of 40 Gm of galactose apart from meals and measurement of the amount of sugar in the urine five hours later. An elimination greater than 3 Gm is considered pathologic

cent in the first specimen and of 1 per cent in the second. In the third and fourth samples there should be no galactose at all.

This was the method followed by us, and the details of its technic are set down in the beginning of this paper.

*Our Results*—For the purposes of our study we began the test in 27 cases but were able to complete it in only 17. The other 10 were not taken into account because of the impossibility of obtaining one or more samples of urine at the required time. This fact was due to the presence of great oliguria, and we were

TABLE 9—Comparative Results of Bromsulphalein Test, Blood Bilirubin and Urinary Urobilinogen

	Case	Grade	Liver, Cm Below Costal Margin at Mammary Line	Brom sulphalein Retention per Cent	Blood Bilirubin			Urobilinogen Mg /100 Cc
					Direct Mg /100 Cc	Indirect Mg /100 Cc	Total Mg /100 Cc	
Without cardiac failure	8		Normal size	Negative	—	0.48		0.20
	1		Normal size	6	—	0.25		0.55
	12 bis		Normal size	10	—	0.50		0.30
	25 bis		Normal size	12	—	0.25		
With cardiac failure	23 bis	3	1	20	—	0.40		
	30	1	2	18	—	0.75		
	27 bis	2	Normal size	40	+	0.45		0.75
	31	2	4	14	+		0.50	
	14	2	Normal size	22	+		0.55	0.37
	First Group Rheumatic Endomyocarditis							
	11	2	6	20	+		1.50	2.00
	2	2	3	40	+		0.85	2.50
	22	2	6	40	+		1.00	
	29	3	8	64	+		1.50	2.00
	23	3	6	48	+		1.50	
	21	3	9	42	+		1.40	
	12	3	8	28	+		1.80	1.00
	16	3	8	14	—	0.60		
	27	3	4	60	+	0.00		0.63
	18	4	6	40	+ 1.22	0.00	2.12	
	28	4	6	60	+ 5.00	1.00	6.00	1.00
	4	4	7	14	+		1.35	3.85
	39	4	Normal size	72	+		4.98	
	5	3	Normal size	62	+		2.02	6.70
	Second Group Syphilitic Aortitis							
Without cardiac failure	9			Negative	—	0.25		0.17
	26			12	—	0.50		
With cardiac failure	32 bis	1	Normal size	12	+		0.75	0.25
	32	3	4	30	+		0.80	
	33	3	4	28	+		0.60	0.75
	6	4	Normal size	36	+		2.00	
	Third Group Cardioangiosclerosis							
All in cardiac failure	17	1	5	28	+		1.73	
	15	2	2	34	+		1.07	1.00
	10	2	4	15	—	0.25		0.50
	13 bis	2	12	61	+		1.65	
	13	3	8	48	+		2.25	1.75
	19	3	4	34	+		1.50	
	Fourth Group Miscellaneous							
Congenital heart disease cardiac failure	7	3	4	78	+		3.00	
Thyrotoxicosis cardiac failure	20	2	5	74	+		1.50	

Fiessinger<sup>25</sup> and Thiebaut<sup>26</sup> consider that this method is not sufficiently sensitive and are of the opinion that better results are obtained if the fractional elimination is studied during the twenty-four hours rather than the total figure of galactose. In addition to the partial concentration of each specimen, these authors take into account the total concentration, according to the following formula:

$$\frac{\text{total quantity of galactose in 24 hours} \times 1000}{\text{volume of urine in 24 hours}}$$

Finally they express the results of the partial concentrations in grams per thousand and consider as normal a galactose elimination of not greater than 5 per

therefore unable to correct it, even the catheter was useless in cases in which the urinary bladder was empty. This circumstance, and the great frequency with which it repeated itself—in one third of the cases—constitute a serious inconvenience in the use of the test for cardiac patients.

The 17 completed cases, of which 15 showed decompensation and 2 did not, appear in table 8. It can be seen that 13 of the patients with heart failure had positive reactions and only 2 had normal reactions, 1 of them (27 bis) just as he showed improvement from his decompensation. A similar improvement reflected by the test was observed in 2 other patients who were cured of their heart failure, but these are not included in the table because study of these patients was not completed. Of the 2 compensated cardiac patients 1 had a positive and the other a negative reaction.

25 Fiessinger N. Les explorations fonctionnelles. Paris: Masson & Cie 1935, p. 146.  
26 Thiebaut F. Epreuves biologiques dans les ictères. Paris: Masson & Cie 1932.

In 10 of the cases studied we compared Baucer's and Thiebaut's methods, and in only 1 case were the results concordant. The other 9, positive according to Thiebaut's method, had normal elimination rates according to Baucer's technique. We have pointed out too many sources of error in both methods as regards the decompensated cardiac patient for us to place full confidence in one rather than in the other of the two procedures.

#### CENTRAL CONCLUSIONS

1 During heart failure the functions of the liver are profoundly disturbed. Blood bilirubin determinations and determinations of bromsulphalein and urobilinogen of the urine are positive as a rule, are perceptibly parallel to each other and usually keep a definite relationship with the degree of heart failure.

2 Tests which proved to be abnormal during heart failure turn back to normality when the latter disappears. When there is only an improvement of the circulatory condition, results follow in evolution which parallels such improvement.

3 In cases of heart failure functional hepatic disturbance does not usually keep a definite relationship with the cause of the heart condition itself. However, according to employed tests, the most accentuated hepatic disturbances are usually found in the group with rheumatic heart disease.

4 The Takata-Arai test is deprived of specific value and is of no use to evaluate the functional capacity of the liver.

5 The test of induced galactosuria is too influenced by circulatory disturbances, which renders it valueless as a hepatic test in heart failure.

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#### ABSTRACT OF DISCUSSION

DR GEORGE HERRMANN, Galveston, Texas. This work reflects the ability of the clinicians of Mexico to recognize problems that we have neglected. Our free use of sugar and milk with its high calcium content and of xanthines in the presence of congestive failure might be a protection to the liver cells. Do our patients possibly have greater hepatic reserve? Somolinos Artois stated recently in Mexico that the blood citric acid level was an index as to whether the functional disturbance of the liver was going to progress and the patient die or whether it was going to regress. His slides showed a tremendous destruction of the liver such as we rarely see in our cardiac patients. We would be prone to attribute such liver necrosis to some other cause. In the light of Professor Chavez and Dr. Sepulveda's work we must more carefully study our patients with congested livers. Another point of interest was the preponderant number of patients with rheumatic heart disease in this series that showed liver disturbance. Rheumatic carditis, as Professor Chavez has described it, in Mexico is active much longer and is more severe than the rheumatic fever that we see in the Southwest. I should therefore like to know what percentage of these patients had tricuspid stenosis. An increased frequency of the tricuspid lesions might be one of the reasons why there is greater disturbance of the liver function in this series than we see in heart failure in the Southwest. The results of the galactose tests are surprising and indicate some disturbance in the important hepatic carbohydrate metabolism as well as the other functions. I don't believe that in Mexico they use sugar, milk and xanthines as freely in heart patients as we do. We have considered disturbances in the blood serum proteins as evidence of hepatic dysfunction and have found that a large number of our patients had lowered levels and disturbed plasma protein relationships. In some of these patients concentrated human blood plasma administered intravenously produced a diuresis and general improvement. Our cardiac patients suffer

from protein undernutrition probably less than the Mexicans do, and I would venture to predict that a large number of them would show a decrease in the blood serum proteins in the presence of such severe hepatic disturbances along with congestive failure.

DR A. P. MUNSCH, St. Louis. It was a pleasure to listen to this extensive report on the experimental work done by Dr. Chavez and his collaborators. I am not aware that such a report exists and more than one thing has happened as a result of it. It gives us a standard to go by in comparison and it calls attention to an important condition. I believe that nearly all cardiologists and medical men have remained in the background in considering the importance of liver function clinically in cardiac failure. We are all aware of the importance of the liver function. We are aware that in cardiac failure there is a pathologic congestion to a greater extent. We are also aware that any organ that is congested cannot function normally. Therefore the normal function of the liver is impaired. Dr. Chavez has shown us through his commendable results from experimentation, a great deal about this damage. The realization of the points brought out by him will enable us to help at least to take the load off the damaged liver and in so doing lessen the embarrassment of the heart as well as that of the patient. He has given us an important thought and message to remember—that in cardiac failure it is important to consider the damaged liver function. It undoubtedly accounts for more deaths than we realize. As a result of his calling the attention of this audience to this subject all of us will go away with a greater realization of its importance and with a happy memory of the doctor who came to us from Mexico City to wake us up on this matter.

DR IGNACIO CHAVEZ, Mexico City. Dr. Herrmann has reason when he says that there may be more hepatic reserve here among patients in the United States than in Mexico. Our pathologists are accustomed to seeing lesions in the liver at autopsy which are more severe than those seen in the hospitals of other parts of the world. It seems as if the livers of our people are much more damaged. I don't know whether it is due to deficiencies in the diet, alcohol or some other factor but that is the fact. In heart failure we are accustomed to seeing the liver show not only greater congestion but greater destruction—necrosis and cirrhosis—than is normally seen in other countries. Dr. Herrmann also says that he is surprised at the great number of patients with rheumatic disease in comparison with the other forms of cardiopathy. That is true also. Among our poor rheumatism is so widespread that it is the greatest cause of heart disease in Mexico. In Cleveland at the meeting of the American Heart Association I pointed out that in Mexico City in the high altitude at our high plateau is where the highest figure of rheumatic heart disease has ever been shown. In my own statistics of 2,400 organic cardiac cases I have shown that 61 per cent of them in the charity hospitals are of rheumatic origin. It is 50 per cent more than in Boston, Washington, Paris or London. In no part of the world has there been shown so great an incidence of rheumatism in heart disease. As to the comments of Dr. Munsch I can only say that we think that the liver in the cardiac patients passes through two periods. In the first period when the heart failure begins, the liver trouble is reversible. It is only a functional attack. In the second period when the lesion has been established, the tests are more and more abnormal while the heart condition is more advanced. The lesions are tremendous and they are of irreversible nature. That is the reason why sometimes, when the heart condition improves the tests remain abnormal. A certain injury to the hepatic tissue remains. We do not employ any particular treatment for this liver condition while the heart failure is not anchored. We treat these patients as heart patients, and the only point that we have always in mind is not to give them digitals by mouth when the liver is greatly congested. Our routine procedure is to give them digitals by intramuscular or intravenous injection. When the heart failure disappears and the liver insufficiency persists, then it is necessary to use a certain treatment for this condition depending on the grade and the type.

## Clinical Notes, Suggestions and New Instruments

### A HIGH PROTEIN BEVERAGE

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WITH THE TECHNICAL ASSISTANCE OF  
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Low serum proteins are encountered in a number of conditions including diseases of the liver, kidney, stomach and intestine and during protracted convalescence from operations on the alimentary canal, e.g. after abdominal perineal resections of the rectum and in extensive and prolonged infections of burns. The ingestion of solid food by many of these patients is inadvisable or unacceptable, and the intravenous injection of proteins or amino acids over a prolonged period may not be entirely practicable or economical.

Therefore it seemed desirable to prepare a beverage that is rich in biologically important proteins. For this purpose we used a base of milk or evaporated milk to which egg white and powdered milk (Dryco) was added.

TABLE 1—Composition of the High Protein Mixture per Thousand Cubic Centimeters

Ingredient	Grams	Carbohydrate, Gm	Protein Gm	Fat Gm	Calcium Gm	Phosphorus C'm	Iron Mg	Vitamin A, Inter national Units	Thiamine Mg	Vitamin C	Riboflavin Mg	Vitamin D, Inter national Units
Milk	675	31	21	25	0.73	0.58	1.3	1,000	0.50	—	1.58	3.30
Dryco	150	69	48	18	1.50	1.12	3,150	0.54	—	—	—	495
Egg white	300	2	52	—	0.04	0.05	0.3	—	—	—	0.08	—
Total, 1,125 calories		102	101	43	2.27	1.85	1.6	4,150	0.84	—	1.66	300+
1 glass 200 cc 240 calories		20	20	9	0.45	0.37	0.3	830	0.17	—	0.41	100
Measures of food used												
Milk												
Egg white (frozen)												
Dryco												

TABLE 2—Recommended Daily Allowances for Specific Nutrients

Food and Nutrition Board of the National Research Council

	Calories	Protein Gm	Calcium Gm	Iron Mg	Vitamin A I U	Thiamine Mg	Riboflavin Mg	Nicotinic Acid Mg	Ascorbic Acid Mg
Man (70 kg.) moderately active	3,000	70	0.8	12	5,000	1.8	2.7	18	75
Woman (60 kg.) moderately active	2,500	60	0.8	12	5,000	1.5	2.2	15	70

The method of preparation is simple. It consists in mixing milk powder gradually with frozen egg white which has been beaten until foamy (but not dry) with an egg beater and then adding the milk while the mixing process is continued. Filtration through one thickness of gauze will remove the egg membrane.

Such a mixture can easily be prepared in a field hospital from canned or dry material and can be fortified with vitamin concentrates or cream if added calories are required. The day's supply is prepared in the morning and kept cool in the refrigerator. When served, each glass may be sweetened with sugar and flavored with vanilla chocolate, coffee, malt extract or molasses.

It is also a practical mixture in the medical treatment of duodenal ulcer. Most patients consume this mixture with relish, though occasionally a distaste for milk is encountered and considerable urging may be necessary.

In table 1 the composition of the mixture is given in detail. Table 2 shows the daily allowance for specific nutrients recommended by the Food and Nutrition Board of the National Research Council.

620 West 168th Street

From the Departments of Surgery and Nutrition, Columbia University

## Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT  
HOWARD A. CARTER, Secretary

### WESTERN ELECTRIC ORTHO-TRONIC AUDIPHONE ACCEPTABLE

Manufacturer: Western Electric Company, 300 Central Avenue, Kearny, N. J.

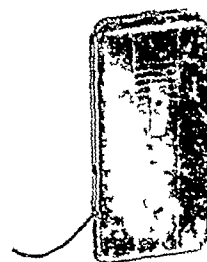
The Western Electric Ortho Tronic Audiphone is a vacuum tube hearing aid with microphone and amplifier housed in molded plastic case. A and B batteries are contained in separate leather case. The weights and overall dimensions of various parts are as follows: 125 A 3 amplifier, 5 1/4 inches by 2 1/4 inches by 1/4 inch weight 575 ounces.

Battery case, 5 1/4 inches by 2 1/2 inches by 1 inch weight 128 ounces.

714-A } Air receiver without molded earpiece 7/16 inch by 3/8 inch  
714-B } diameter weight 0.31 ounce  
714-C }  
715-A } Bone conduction receiver 1 3/8 inches by 3/4 inch by 1 inch  
weight 0.81 ounce

Batteries: The current supply is A battery, 1.5 volt, size D drawing 90 milliamperes at full volume. B battery, 45 volt No. 455, drawing 10 to 22 milliamperes under operating conditions.

Acoustical Gain: The microphone amplifier unit carries three controls, an on and off switch, volume control and tone discriminator, operated by knurled disks at the top of the instrument. The volume control serves the usual purpose of regulating the degree of amplification, and the tone discriminator changes the degree of amplification as between the high and low frequencies. Curves submitted show that the shift from full tone to "minimum tone position" suppresses frequencies below 1,000 cycles much more than frequencies above this value. Tests verify this claim, as shown later.



Western Electric Ortho-TRONIC Audiphone

The following amplifications for intensity slightly above normal ear threshold give the order of magnitude of the increase of sound intensity levels at the ear of the wearer over that at the microphone under normal use.

They do not give the maximum possible gain under ideal conditions nor the electrical amplifications as shown by measurements of electrical input and output.

		Frequency				
Receiver	Tone Setting	128	256	512	3,000	4,096
714 A	Minimum	Nil	2	15.35	14	13
714 A	Maximum	Nil	26	50.48	17	13
714 B	Minimum	Nil	15	25.44	19	13
714 B	Maximum	Nil	19	56.46	23	13
714 C	Minimum	Nil	2	22.34	16.5	16.5
714 C	Maximum	Nil	15	29.42	15.0	15.0

Acoustical Feedback: The foregoing values were shown with volume setting approximately two-thirds full on. As usually occurs in instruments showing high gain the maximum gain attainable in use is determined by the closeness of the fit of the earpiece in the ear. Tests made using a custom fitted earpiece showed that a volume setting of five-sixths of full volume was the maximum with receiver 714 A tone control setting at maximum and two-thirds full volume with tone control setting at minimum. With receiver 714 B five-sixths of full volume could be obtained without feedback for both maximum and minimum settings of tone control. Practically full volume could be obtained with 714 C receiver for both tone control settings.

Articulation: The usual syllable and sentence lists were used with a hard hearing subject at a distance of 5 feet in a quiet room with instrument set for comfortable hearing and using each of the three air conduction receivers and the bone receiver. These tests showed satisfactory performance for all combinations. The instrument is well made.

The Council voted to accept the Western Electric Ortho Tronic Audiphone for inclusion in its list of accepted devices.

# THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, APRIL 17, 1943

## B<sub>1</sub> VITAMIN HYPOIMMUNITY

As part of a long range program of study of the relation of diet to virus infections, Foster and her co-workers<sup>1</sup> of the University of Pennsylvania studied the relative susceptibility to poliomyelitis of mice maintained at different levels of vitamin B<sub>1</sub> (thiamine) intake. At the luxury level mice were given diets containing 100 micrograms of thiamine per hundred grams of food, which more than covered their full nutritional requirements (thiamine excretion not determined). Other groups of mice were maintained on a diet containing as little as 10 micrograms of thiamine per hundred grams. This usually led to signs of deficiency within fifteen days, with death of 40 per cent of the mice within thirty days. Still other groups were given thiamine at the minimum maintenance level, after partial depletion at the 10 microgram level, their thiamine intake being increased to 30 micrograms per hundred grams. The majority of these animals remained healthy and at stationary body weight for at least thirty days. After from fifteen to thirty-four days on these differential diets each animal was inoculated intracerebrally with 0.03 cc of a 0.5 per cent suspension of poliomyelitis infected mouse brain, control inoculation being made with uninfected brains.

In a typical experiment 36 mice were maintained for thirty-four days at the luxury thiamine level. On inoculation with the routine test dose 30 mice (83 per cent) developed typical paralysis, from which all died within thirty days, 3 additional mice (8 per cent) of the group dying without showing paralytic symptoms. A parallel group of 24 mice were maintained at the deficiency (10 microgram) thiamine level. On inoculation but 4 mice of this group (16 per cent) developed lethal paralysis, while 6 mice (25 per cent) died without showing paralytic symptoms, control tests suggesting that these additional deaths were due to thiamine deficiency.

In this experiment the incidence of lethal paralysis was increased fivefold as a result of the luxury vitamin B<sub>1</sub> intake (or decreased fivefold as a result of thiamine deficiency). Even more striking results were obtained in a second experiment, in which comparison was made with mice maintained at the 30 microgram level. Here there was a sevenfold increase in the number of lethal paralyses at the luxury vitamin B<sub>1</sub> level, when compared with the number at the minimum (30 microgram) maintenance level. If one should take the average of all groups, their data suggest a sixfold increase in poliomyelitis susceptibility as a result of a slight excess of vitamin B<sub>1</sub> (or a sixfold increase in resistance as a result of vitamin B<sub>1</sub> subnutrition). Thus viewed, urinary excretion of excess thiamine<sup>2</sup> becomes a purposeful defensive mechanism to prevent thiaminogenic viral hyp immunity.

Thus far the Pennsylvania pediatricians have avoided offering a theoretical explanation of this wholly unexpected phenomenon. In their opinion the length of survival of the virus and the nature of the histologic lesion in thiamine deficient mice must be determined before a definite theory can be formulated. It would be in line with the present tendency in immunologic research, however, to assume that thiamine is a necessary nutritional factor for the symbiotic multiplication of the polio virus, a relative abundance of thiamine leading to its increased proliferation, with thiamine subnutrition inhibiting proliferation. Such a theory would be essentially a renaissance of the original Pasteur exhaustion theory of acquired immunity, a discarded theory now being reconsidered by numerous investigators, particularly in its application to the phenomenon of virus antagonism.<sup>3</sup>

For some time a somewhat similar phenomenon has been under investigation by plant pathologists. Growers of narcissus bulbs, for example, have attempted to obtain superior flowers, increased bulb production and increased disease resistance by the use of numerous artificial plant hormones or synthetic growth stimulants. Stuart and McClellan<sup>4</sup> of the U. S. Department of Agriculture tested such possibilities. To their disappointment they found that, far from protecting bulbs from disease, such growth hormones stimulated the growth and apparently increased the pathogenicity of basal rot fungus (*Fusarium oxysporum f. narcissi*) and thus increased commercial loss from basal rot.

That thiamine has a somewhat similar stimulating effect on the poliomyelitis virus is the essential tentative suggestion from the results that have been reported by the Pennsylvania pediatricians. Whether or not vita-

<sup>2</sup> Thiamine Requirement of Man editorial J. A. M. A. 121 53 (Jan. 2) 1943.

<sup>3</sup> Poliomyelitis Inhibition editorial J. A. M. A. 121 194 (Jan. 16) 1943.

<sup>4</sup> Stuart N. W. and McClellan W. D. Severity of Narcissus Basal Rot Increased by the use of Synthetic Hormones and Nitrogen Bases Science 97 15 (Jan. 1) 1943.



min B<sub>1</sub> possesses a similar synergistic action with other vitamins, when it is tested in other animal species or by other methods of injection, however, has not yet been determined

The difference between the sevenfold and fivefold ratios drawn from Foster's data suggests the tentative conclusion that the maximum natural resistance to poliomyelitis virus is obtained from a minimum full maintenance level of vitamin B<sub>1</sub> intake and that intakes either above or below this level cause decreased resistance. If this should be confirmed by future tests, it would form a new rational basis for dietary hygiene and clinical therapy.

#### SUNLIGHT CARCINOMA AND OTHER TUMORS INDUCED BY ULTRA- VIOLET RADIATION

Tumors of the skin of exposed parts of the human body in most cases are epidermal carcinoma, mostly of the squamous variety. Clinical observations and statistical study support the view that the most important cause of this carcinoma is sunlight, specifically the ultraviolet rays of the spectrum. For instance, more carcinoma of the exposed skin of white men occurs in the southern than in the other parts of this country. Farmers, sailors and other outdoor workers are more frequently victims of such carcinoma than persons less exposed to sunlight. Experiments have shown, moreover, that cancer of the skin as well as of other tissues is easily induced in albino mice and other animals by ultraviolet radiation under well controlled conditions. It has been found by Blum and his co-workers<sup>1</sup> at the National Cancer Institute that in mice ultraviolet radiation penetrates the skin to some depth and thus can act on a variety of cells, inducing different kinds of tumors.

The most recent analysis of the results of extensive experiments by Blum and his associates<sup>2</sup> showed that spindle cell sarcoma predominated while squamous carcinoma formed a smaller group often combined with sarcoma. Also hemangioendothelioma, osteochondrosarcoma, sebaceous carcinoma and even tumors of the eye developed in mice exposed to ultraviolet radiation, indicating that ultraviolet rays can induce tumors in various tissues depending on their susceptibility to its action and limited by the penetration of the rays. It would seem, then, that ultraviolet radiation can induce tumors in any susceptible tissue it may reach.

Why do not other forms of tumor besides epidermal carcinoma develop frequently in men freely exposed to sunlight? The reason appears to be that in man the amount of radiation reaching the dermis at best is not

sufficient to induce the growth of tumors—sarcoma, and so on—of cellular elements in the dermal tissue. The workers at the National Cancer Institute found that the transmission of carcinogenic wavelengths by the human epidermis is much lower than by the mouse epidermis. In fact, in well tanned human skin almost no rays could reach the dermis. That white persons, especially blonds, seem more susceptible than Negroes to carcinoma of the exposed skin suggests that the pigment in the epidermis protects against the carcinogenic effect of ultraviolet rays.

#### VITAMIN E DEFICIENCY

Evans and Bishop<sup>1</sup> in 1923 concluded that certain natural foods, notably wheat germ and many plant leaves, contain a factor essential for normal reproduction in the rat. This substance, later called vitamin E, was shown to be essential for the successful completion of intrauterine growth as well as for the maintenance of testicular function in the male. The female mouse, like the rat, shows typical resorption of the fetuses when restricted to vitamin E deficient rations, whereas in the male mouse degenerative changes in the germinal tissues of the testes have not been demonstrated.<sup>2</sup> Again eggs from hens on a diet poor in vitamin E show early embryonic mortality and low hatchability. Vitamin E has been isolated, characterized chemically and synthesized, while the name alpha tocopherol has been given to an alcohol obtained from wheat germ oil, several other compounds possess similar biologic activity. Other functions have been demonstrated for the tocopherols during the past decade, but the part they play in promoting successful reproduction seems to have characterized these compounds from the functional point of view.

The striking gross feature of the reproductive failure in the female white rat restricted to diet deficient in vitamin E is the death and resorption of the fetuses when about two thirds of the gestation time has elapsed. In subsequent matings the same phenomena are seen unless vitamin E is administered, when normal reproduction again ensues. Adamstone<sup>3</sup> observed that in eggs from hens on feed poor in vitamin E the chick fails to hatch because of the development of a so-called lethal ring in the blastoderm, formed from cell proliferation in the mesoderm. This obstructs the blood vessels of the blastoderm and they disintegrate, the embryo dies from hemorrhage, ischemia and starvation. The mechanism of embryonic death in the mammal on diets deficient in tocopherol has recently been elucidated by Mason.<sup>4</sup> In a large number of observations on 16 day old rat embryos he observed widespread hemorrhages on the surface in the head, shoulder and trunk.

<sup>1</sup> Blum H F and Lippincott S W. Carcinogenic Effectiveness of Ultraviolet Radiation of Wavelength 2537A. *J Nat Cancer Inst* 3: 211 (Oct.) 1942. Kirby-Smith J S, Blum H F and Grady H G. Penetration of Ultraviolet Radiation into Skin as a Factor in Carcinogenesis. *ibid* 2: 403 (April) 1942.

<sup>2</sup> Grady H G, Blum H F and Kirby-Smith J S. Types of Tumor Induced by Ultraviolet Radiation and Factors Influencing Their Relative Incidence. *J Nat Cancer Inst* 3: 371 1943.

<sup>1</sup> Evans H M and Bishop K S. *Am J Physiol* 63: 396 1923.  
<sup>2</sup> Bryan W L and Mason K E. *Am J Physiol* 131: 263 (Nov.) 1940.

<sup>3</sup> Adamstone F B. *J Morphol & Physiol* 52: 47 (Sept. 5) 1931.  
<sup>4</sup> Mason K E. *J Nutrition* 23: 59 (Jan.) 1942. *Yale J Biol & Med* 14: 605 (July) 1942.

regions in plexiform patterns. The lesions were characterized by vasodilatation, congestion and vascular stasis of the superficial blood channels with subsequent bleeding into the various parts of the central nervous system. The general conclusion is reached that there develops in this specific nutritional deficiency a structural weakness of the vascular system leading to stasis and that death is due to the consequent progressive ischemia of the fetal tissues.

Elucidation of the biochemical defect induced by a deficiency in vitamin E is significant not only on its own account but also because it helps to temper the conception of functional specificity of the vitamins. Particularly important is recognition of the extent to which the tissues of the body are sensitive to slight chemical changes in the blood and lymph on which their metabolism depends.

## Current Comment

### RENAL VASCULAR DISEASE AND HYPERTENSION

The demonstration by Goldblatt<sup>1</sup> that chronic hypertension regularly follows partial clamping of the renal arteries of dogs and by Moritz and Oldt<sup>2</sup> that people with chronic hypertension usually show diffuse renal arteriolar sclerosis at necropsy, whereas normal persons rarely have such sclerosis, suggests that renal vascular disease in man may be the etiologic counterpart of the Goldblatt clamps in the dog. Although it has been recognized that degenerative vascular disease often follows the appearance of hypertension, the new evidence lends support to the view that renal vascular disease may often be primary and causal. A recent study of renal biopsies from 100 human subjects incident to the performance of splenectomy resections for hypertension afforded Castleman and Smithwick a unique opportunity to investigate an earlier stage of the disease than had been theretofore studied. Although all their patients had severe chronic hypertension, the renal vascular disease observed in 53 was so slight that it seemed unlikely in the opinion of the authors "that the blood flow could have been embarrassed sufficiently to be the one factor responsible for the hypertension." Thus it would appear that most if not all of the degenerative arteriolar lesions observed in persons dead of the effects of chronic hypertension should probably be regarded as secondary rather than primary. The observations of Castleman and Smithwick<sup>3</sup> provide some degree of morphologic confirmation of the conclusions of Homer Smith<sup>4</sup> and his associates, who found from renal blood flow studies that "there exists a perturbation of vascular function which is primary in time and causality to the destruction

of renal parenchyma." Whether the renal arteriolar lesions represent the late structural manifestation of a primary "perturbation of vascular function" or the mechanical effects of a prolonged elevation of intravascular pressure is not yet clear.

### BOTULISM

Meyer and his associates in California have gathered statistics on 367 outbreaks of botulism in the United States since 1899. Only 83 of the outbreaks have been due to commercially canned foodstuffs, with one possible exception, outbreaks have not occurred in nearly twenty years from this source. The other 284 outbreaks have been caused by foods canned in the home. The total cases of the disease for the forty-three years numbered 1052 with 687 deaths, a fatality rate of 65 per cent. How many other unrecognized cases have occurred is unknown. During the coming canning season many persons who never before attempted home canning will preserve garden produce. The danger from botulism is ever present unless proper precautions are taken. Faust<sup>5</sup> discussing methods of home canning, emphasizes the necessity of the pressure cooker with an accurate gage or thermometer for nonacid foods such as string beans and corn. Any such foods that have been processed in any other manner must be reheated for at least fifteen minutes before tasting or using. Any home canned food that shows the slightest evidence of spoilage should not even be tasted for the toxin of the *botulinus* bacillus is the most powerful poison known. The problem calls for concerted effort by agricultural advisers and public health personnel in warning against faulty methods of home canning and alertness of physicians in recognizing symptoms and administering antitoxin early and in adequate amounts.

### MARMOLA IS DANGEROUS TO HEALTH

Any drug which may expose the users to disease and pain when taken in the dosage and with the frequency recommended and suggested in its labeling is dangerous to health. Marmola is such a drug. Held the U. S. District Court for the Western District of Wisconsin in a recent case<sup>1</sup>. This proceeding was predicated on the contention that the article was dangerous to health when used in the dosage or with the frequency prescribed, recommended or suggested in its labeling and on the further ground that the labeling was false and misleading because it failed to reveal facts material with respect to the consequences which might result from the use of the article under the conditions of use prescribed thereon. In sustaining the government's contentions, the court pointed out that a substantial portion of the public, after reading the labeling used in connection with the product, would conclude that obesity is caused by the lack of some substance in the human body that Marmola supplies and that Marmola is a safe and efficient remedy for obesity, which is not a fact.

<sup>1</sup> Goldblatt, Harry. Experimental Hypertension Induced by Renal Ischemia. Harvey Lectures, Baltimore. Williams & Wilkins 33, 1937, 1938.

<sup>2</sup> Moritz, A. R. and Oldt, M. R. Arteriolar Sclerosis in Hypertensive and Nonhypertensive Individuals. Am. J. Path. 13, 679 (Sept.) 1937.

<sup>3</sup> Castleman, Benjamin and Smithwick, R. H. The Relation of Vascular Disease to the Hypertensive State Based on a Study of Renal Biopsies from 100 Hypertensive Patients. This issue, p. 1256.

<sup>4</sup> Smith, H. W. Physiology of the Kidneys. Dept. of Journalism Press, University of Kansas, Lawrence, 1939.

<sup>5</sup> Faust, Hilda. Nutrition Program During the War—Home Canning. University of California College of Agriculture, Berkeley.

<sup>1</sup> U. S. v. 62 Packages More or Less of Marmola Prescription Tablets, decided Feb. 23, 1943 by the District Court of the United States for the Western District of Wisconsin (No. 1-9 Admiralty).

The administration of thyroid in the dosage contained in Marmola, the court thought, constitutes a dangerous procedure which should not be undertaken without a thorough examination of the prospective user by a competent physician and then only under the supervision of the physician. While the federal act was not intended to prevent self medication, the court observed, it was enacted to make self medication safer and more effective. An imposing list of expert witnesses testified in this case for the government and for the intervenor, the Raladam Company. The decision of the court lists these witnesses without in most instances indicating the exact nature of the testimony they offered. Among those testifying for the Raladam Company were

Dr Abbott W Allen, New York, assistant clinical professor of medicine of Columbia University, Dr John A Killian, Englewood, N J, professor of biochemistry at the New York Post-Graduate School of Columbia University, Dr Phinn T Morse, Detroit, consulting pathologist, Dr William A Spitzley, general practitioner, Dr Benjamin H Schlomovitz, Milwaukee, professor of pharmacology and toxicology, Marquette University Medical School, and Dr Andrew I Rosenberger, Milwaukee, a specialist in diseases of the nervous system.

Among the witnesses who offered testimony in support of the government's contentions that the distribution of Marmola in interstate commerce was unlawful were

Dr James Short, New York, and Dr Frank Stites, Louisville, Ky, both specialists in internal medicine. Dr Elmer L Sevringhaus, Madison, Wis, professor in the Medical School of the University of Wisconsin and a specialist in metabolic and endocrine diseases, Dr Willard O Thompson, Chicago, professor in the Medical School of the University of Chicago and a specialist in endocrinology and metabolism, Dr Louis H Newburgh, Ann Arbor, Mich, professor in the Medical School of Michigan University and a specialist in endocrinology and metabolic diseases, Dr Israel Bran, Philadelphia, a specialist in thyroid diseases. Dr Russell M Wilder, Mayo Clinic, an instructor in the Medical School of the University of Minnesota and a specialist in the treatment of diabetes, Dr Samuel F Hames, Mayo Clinic, head of the section of the clinic pertaining to thyroid diseases and associate professor at the University of Minnesota, Dr William Oatway, Madison, Wis, a member of the faculty of the Medical School of the University of Wisconsin, Dr Chester M Kurtz, Milwaukee, a member of the faculty of the Medical School of the University of Wisconsin and a specialist in heart diseases, Dr Anton J Carlson, Chicago, who formerly held a professorship in the Department of Physiology at Rush Medical College and the University of Chicago from 1904 until recently, when he retired, and Dr Marian S Kimble, Madison, Wis, a chemist who, as an investigator, made tests as to the value of desiccated thyroid as a remedy for obesity.

One of the concluding paragraphs in the court's opinion merits a direct quotation:

The Court is thoroughly convinced, by a preponderance of the evidence, that Marmola when used as prescribed in the labeling thereof, is neither a safe, appropriate nor an efficient remedy for obesity, that it is dangerous to the health of the user when used in the dosage or with the frequency and duration prescribed, recommended or suggested in the labeling thereof, that the packages of Marmola in question, when seized in these proceedings, were misbranded within the meaning of the sections of the Federal Food, Drug and Cosmetic Act involved herein that the labeling on Marmola is false and misleading in its representations that it is a safe remedy for obesity, and in that it fails to reveal facts material with respect to consequences

which may result from the use of Marmola under the conditions prescribed in the labeling.

Thus unfolds another chapter in the existence of a preparation the dangers of which have been repeatedly pointed out in *THE JOURNAL* and which has received the attention of the federal government for over a decade. If this is not the final chapter, how long will it go on?

#### SWINE LUNGWORM AS RESERVOIR FOR SWINE INFLUENZA VIRUS

Shope's work on the swine lungworm as a reservoir and intermediate host for the virus of swine influenza adds a significant observation to research on viruses. In his most recent paper he<sup>1</sup> reports ninety-eight experiments with transmission, using 216 swine and involving a three year study of the lungworm as an intermediate host for the virus of swine influenza. Fifty of the experiments gave negative results. In the remaining forty-eight transmission of virus by way of the lungworm was demonstrated in 1 or more animals of each experiment. Irregularities in the results, Shope explains, would appear to be due not so much to lack of transmission of the masked virus by the lungworms as to failure to evoke its pathogenic capabilities. In several experiments pigs developed infections with the virus of swine influenza nine to seventeen days after infestation with infected lungworms, in the absence of any known provocative stress. An immune response of the swine to the lungworms themselves is suspected in these instances of having furnished the provocation. During the summer months May to August inclusive swine prepared by the injection of lungworms carrying virus were absolutely refractory to the provocation of influenza. They were also relatively refractory in September and October. Activation of the masked virus occurred most readily during the first four months of the year. In one experiment it was possible to demonstrate by direct means the presence of virus in the neighborhood of lungworms at the base of the lung at a time when the virus could not be demonstrated anywhere else in the respiratory tract. Masked virus of swine influenza was found to be present in lungworm ova obtained either from the respiratory tracts or from the feces of infected swine. In several instances masked virus persisted for over a year in lungworm larvae within the earthworm intermediate host, and in one of these its presence was demonstrated after thirty-two months. Finally it was found that lungworm ova obtained from convalescent swine which no longer carry swine influenza virus in infectious form in their respiratory tracts contain a masked virus. Such observations as these on the behavior of swine influenza virus are of doubtful immediate significance in relation to human influenza, though they clearly extend knowledge of the behavior of viruses. Furthermore swine influenza itself although not a highly fatal disease, has some intrinsic importance to the national economy and the veterinary profession.

1 Shope, Richard E. The Swine Lungworm as a Reservoir and Intermediate Host for Swine Influenza Virus. *J. Exper. Med.* 77: 111 (Feb.) 1943.

# MEDICINE AND THE WAR

*In this section of The Journal each week will appear official notices by the Committee on War Participation of the American Medical Association, announcements by the Surgeon Generals of the Army, Navy and Public Health Service, and other governmental agencies dealing with medicine and the war and such other information and announcements as will be useful to the medical profession*

## PROCUREMENT AND ASSIGNMENT SERVICE FOR PHYSICIANS, DENTISTS AND VETERINARIANS

### RESTRICTIONS ON USE OF INTERNS AND RESIDENTS

Because the number of interns and residents available for the year 1943-1944 will be very limited, the hospitals of the United States will have to reduce the number of such personnel to approximately 50 per cent of the number they maintained in 1940, it is announced by the Directing Board of Procurement and Assignment Service, acting on the advice of its Committees on Hospitals and the Allocation of Medical Personnel.

The following recommendations have been issued by the Directing Board of the Procurement and Assignment Service to its state chairmen:

For the efficient utilization of attending physicians, interns and residents, hospitals should avoid duplication of activities such as two or more medical, surgical or other surgical services, by consolidating such parallel services into one.

Hospitals should be requested also to arrange for the reabsorption of clinics in the subspecialties into a general clinic of the parent specialty and to maintain within the structure of the medical staff, in both inpatient and outpatient services, only such specialties as are recognized by the Advisory Board for Medical Specialties.

A hospital should not have more interns on July 15, 1943 than the number on duty on July 15, 1940 unless it can be shown that the institution's patient load has definitely increased or that other conditions exist that merit special consideration. Hospitals which have had a decrease in their patient load since July 15, 1940 should make a corresponding decrease in the number of interns.

In order to provide an adequate background for military medical service, at the completion of one year of internship, hospitals which do not now maintain rotating internships should, for the duration of the war, broaden and diversify the instruction and experience of their interns.

A physician who is eligible for military service should not be approved as an essential resident in a hospital unless the residency concerned is approved by the appropriate crediting body.

A physician who is eligible for military service should not be approved as an essential resident in a hospital for longer than a period of one year immediately following the completion of his internship. Physicians who by age, sex, physical defect or citizenship status are disqualified for military service may serve as residents in hospitals for periods varying from one to three years after internship. After this period of service such physicians, if they are to be approved by the Procurement and Assignment Service as essential, must have been appointed as full time members of the regular medical staff.

After July 1, 1943 the total number of residents permitted for the hospitals of the United States shall not exceed 50 per cent of the number on duty in the hospitals on July 15, 1940, this 50 per cent shall include those residents who are not eligible for military service, e.g. women physicians, physically disqualified male physicians, older physicians and alien physicians.

In view of the considerable number of physicians not qualified for military service who should be available for appointment as hospital residents, all hospitals should fill as nearly 100 per cent as possible of their allotted residencies with physicians not eligible for military service.

The total number of residents which a hospital may be permitted to retain shall be directly related to that hospital's teaching and service responsibilities with particular reference to the proportion of its ward service to total service. Consideration of an individual resident should be based primarily on his teaching responsibilities and patient service load and not on any specialized service which he may render to individual members of the staff or to a particular hospital service. A hospital shall not be permitted to retain a greater percentage of the number of its residents which it had on July 15, 1940 than the percentage of its ward patient days in relation to its total patient days, except that a hospital shall not retain more than two thirds the number of the residents it had on July 15, 1940.

Ward service is defined as service to patients who are not charged or paying a professional fee and patients who are used for teaching demonstration, if a teaching program is being conducted. In computing the service load the volume of outpatient visits shall be given due consideration.

Primarily teaching hospitals, i.e. hospitals carrying major responsibility for undergraduate medical teaching, shall be given consideration for that service in addition to that which they receive on the basis of ward service. A hospital which has made radical changes in bed capacity or in its intern and residency plans or has lost an excessive proportion of its visiting staff since July 15, 1940 may receive special consideration in the number of residents it is permitted to retain.

The Central Office of the Procurement and Assignment Service shall determine the total number of residents to be allotted to each state and shall suggest for the guidance of the respective state chairmen the number of residents recommended for each hospital after July 1, 1943.

Hospitals which find it necessary to request permission to retain, for a residency, an intern who holds a commission in military service shall submit such request to the state chairman for physicians of the Procurement and Assignment Service, who will add his recommendations and forward it to the Central Office of Procurement and Assignment Service for action by the directing board and for recommendation by the Army and Navy.

As far as possible, physicians who hold reserve military commissions for whom requests for further deferment have been made shall be assigned to residencies which will provide training of greatest usefulness in their subsequent military service, e.g. in surgery or medicine rather than in obstetrics and gynecology.

In order to accomplish these objectives, all residents must be selected from the following groups:

- 1 Women physicians
- 2 Male physicians who have been officially rejected for commissioned service with the Army or Navy
- 3 Male physicians who have been classified 4 F by Selective Service
- 4 Physicians who have applied for commission in the Medical Corps of the Army of the United States or the Naval Reserve and whose deferments are being requested for the ensuing year, as outlined.

Hospitals should be instructed not to communicate with the Army or the Navy regarding deferment of reserve officers for further hospital service. Such communications should always be addressed to the state chairmen of the Procurement and Assignment Service.

## PROCUREMENT OF SANITARY ENGINEERS

Paul V McNutt, chairman of the War Manpower Commission, has issued a directive placing the procurement and assignment of sanitary engineers for the armed forces and other governmental agencies under the War Manpower Commission's Procurement and Assignment Service for Physicians, Dentists and Veterinarians.

Plans are already under way to facilitate the recruitment of sanitary engineers by the armed forces without endangering public health by clearing all sanitary engineers through the Procurement and Assignment Service, as is done with physicians, dentists and veterinarians.

A critical shortage of trained sanitary engineers exists as a result of the need of the armed forces for the services of these engineers who are trained in disease prevention and health protection, particularly in those parts of the world where the armed forces are encountering disease hazards resulting from improper sanitation and in many instances from insects peculiar to a particular region.

To meet these needs of the armed forces, many of the state, county and local health organizations, as well as concerns employing sanitary engineers, have been heavily drawn on. To make the best use of the dwindling number of sanitary engineers for military, semimilitary and civilian purposes, it has been found necessary to establish a more uniform system of procurement and assignment of such professional personnel than has been applied up to this time. Accordingly, the War Manpower Commission has set up in the Procurement and Assignment Service for Physicians, Dentists and Veterinarians a Committee for Sanitary Engineers to be made up of the following members:

Abel Wolman, chairman, professor of sanitary engineering, the Johns Hopkins University, Baltimore.

Kenneth F. Macey, professor of epidemiology, School of Hygiene and Public Health, the Johns Hopkins University, Baltimore.

Harold E. Babbitt, professor of sanitary engineering, University of Illinois, Urbana, Ill.

F. C. Bishop, assistant chief, Bureau of Entomology and Plant Quarantine, U. S. Department of Agriculture, Washington, D. C.

V. M. Ehlers, chief engineer, Texas State Board of Health, Austin, Texas.

Gordon M. Fair, professor of sanitary engineering, Harvard University, Cambridge, Mass.

H. A. Whittaker, chief engineer, Division of Sanitation, State Department of Health, Minneapolis.

Mr. Paul Hansen, consulting engineer of Chicago, has been appointed as civilian consultant. C. W. Klassen of the Army Sanitary Corps and formerly chief sanitary engineer of the Illinois State Department of Health, is being assigned by the Army to the War Manpower Commission to handle sanitary engineering procurement under Dr. Max Lapham, executive officer of the Procurement and Assignment Service for Physicians, Dentists and Veterinarians.

For the purpose of administering this directive by the War Manpower Commission, the professional occupation designation "sanitary engineer" shall apply to a graduate of an approved scientific school who has fitted himself by suitable training or study and by experience to conceive, design, operate, direct or manage engineering works (a) developed as a whole or in part for the protection and promotion of the public health or (b) capable of injuring the public health through faulty conception, design, construction, operation or management. The basis for differentiation between individuals qualified as sanitary engineers and those qualified only as civil, mechanical, electrical, mining or chemical engineers shall be the ability to identify, evaluate and explain in terms of their sanitary or public health implications those factors connected with such engineering works as will prevent injury to health or will promote health in addition to the ability to conceive, design, operate, direct or manage such works.

All sanitary engineers coming within the scope of this occupational definition are urged to place their names on file with the War Manpower Commission and for this purpose and for any further information should communicate with the Procurement and Assignment Service, War Manpower Commission, 1006 U Street N.W., Washington, D. C.

The functions of the Procurement and Assignment Service in regard to sanitary engineers will be:

- 1 To determine the military and civilian needs for sanitary engineering personnel for this country and abroad.

- 2 To estimate the availability of sanitary engineering personnel of various ages and grades of experience.

- 3 To establish a plan for a well balanced allocation as far as practicable to meet the civilian and military needs.

## PHYSICIANS' PREFERENCE IN CHOICE OF MILITARY SERVICE

A recent memorandum from the Officer Procurement Service of the War Department states that physicians, dentists and veterinarians are afforded an opportunity on the reply cards sent to them by the Central Office of the Procurement and Assignment Service to indicate a preference for service with the Army, including the Medical Department of the Army, Air Forces, or the Navy. Preference so expressed by a candidate for service with the Medical Department of the Army, Air Forces will be plainly indicated on form 97 by the state Procurement and Assignment chairman when that form is transmitted to a district office.

Effective immediately, each district office, in forwarding to the Surgeon General the completed papers of any candidate who has expressed a preference for Army, Air Forces service, will include therewith a clear statement that the candidate has expressed a preference for service with the Medical Department, Army, Air Forces.

District offices will not attempt to influence a candidate one way or the other. If there is no information in regard to preference on a candidate's form 97, the interviewing officer will not request information as to his preference. If a candidate requests information relative to assignments, the interviewing officer will inform him of his right to state, if he so desires, a preference. The district office is responsible for recording and forwarding the facts as to a candidate's preference, if any, in accordance with the foregoing.

In discussing assignments with candidates interviewing officers will at all times make it clear that while every consideration will be given to a candidate's expressed preference, there can be no assurance that he will receive the assignment requested. Assignments are based on the candidate's qualifications and existing needs.

## THE QUOTA FOR DENTISTS

A wartime ratio of 1 dentist to each 2,500 civilian population has been established by the War Manpower Commission's Procurement and Assignment Service for Physicians, Dentists and Veterinarians in establishing state quotas for the 6,689 practicing dentists that will be required to meet the needs of the armed forces in 1943. The *Journal of the American Dental Association* reports: "The total needs of the armed forces for the current year will be 9,500 dentists. The Procurement and Assignment Service points out that 3,616 of these will be obtained from 1942 and 1943 dental graduates leaving 5,884 practicing dentists who will have to be obtained from the various states. In addition, 805 dentists still are to be inducted as of Nov. 30, 1942 to fill the quota for last year."

The Committee on Dentistry of the Procurement and Assignment Service reports that 1942 and 1943 dental school graduates who are commissioned in the armed forces are not to be credited against the quotas of the states in which they reside but against a central quota. The 5,884 dentists to be obtained among practicing dentists have been distributed in proportion to the dentists in each state. As of Nov. 30, 1942, thirty-two states had exceeded their first quotas by 1,283; however, Alabama, Arizona, Arkansas, Delaware, Florida, Georgia, Kentucky, Louisiana, Mississippi, New Mexico, North Carolina, Oklahoma, South Carolina, Tennessee, Texas and Virginia had contributed dentists in excess of the sum of their 1942 and 1943 quotas.

## ARMY

## THE BORDEN GENERAL HOSPITAL

The new U S Army Borden General Hospital at Chickasha, Okla., of 1,003 beds was completed on January 15. The buildings are of wood cantonment type construction with outside asbestos sheathing. The total number of buildings is 135, which includes the theater of operation type buildings and barracks for the numbered field hospital that will be attached. The hospital has been named in honor of the late Lieut. Col. William Cline Borden, distinguished officer of the Medical Corps.

The medical officers on duty at the hospital are as follows:

## COLONELS

Ernest R. Gentry, Commanding Officer  
William H. Gordon, Chief Medical Service

## MAJORS

Clarence E. Bird, Chief Surgical Service  
Edmond L. Faust, Assistant Chief Surgical Service  
John B. Hunter, Surgical Service Assistant  
Felix Jansev, Chief Orthopedic Section  
Kerwin M. Marks, Chief Plastic Surgery Section  
Leslie E. Morrisett, Chief E. E. N. T. Service  
Nathaniel Muskin, Chief Section General Medicine no. 1  
Leo V. Schneider, Chief Section General Medicine no. 2  
Silas H. Starr, Chief Officers and Women's Section  
Aloysius T. Waskowicz, Post Executive Officer

## CAPTAINS

James B. Berardi, Chief Section on Cardiovascular Renal Diseases  
Richard C. Cooke, Chief Neurology and Psychiatry Section  
Karl D. Dietrich, Chief Septic Surgery Section  
Leonard Freeman, Ward Surgeon  
Sidney Gelman, General Medicine no. 2, Allergy, Acute Exanthematous Diseases  
Samuel C. Gillespie, Officers and Women's Section  
Kenneth G. Jahnus, Chief Anesthesia Section  
James E. Kahler, Chief Laboratory Service  
Frank Kaminsky, General Medicine no. 1  
Miles I. Kelly, Mess Officer  
Daniel M. Kingsley, Ward Officer, Orthopedic Section  
Wilfrid J. Lewis, General Medicine no. 2, Dermatology, Syphilology, Acute Upper Respiratory Disease  
Hirsch R. Liebowitz, Chief Gastroenterology Section  
William J. MacFarland, Chief X-Ray Service  
Francis L. McPhail, Ward Officer, Orthopedic Section  
Arthur H. Milbert, Chief Urologic Section  
Dolbert A. Minder, Ward Officer, Surgical Service  
Ira S. Pidgeon, Ward Officer, Urologic Section  
Cleen S. Rost, Ward Officer, Surgical Service  
John W. Shadle, General Medicine no. 1, A. P. Section  
Sanders K. Stroud, E. E. N. T. Assistant  
Lee D. Van Antwerp, Registrar  
George K. Weyer, Cardiovascular Renal Diseases  
Harry T. Zankel, Chief Physical Therapy

## FIRST LIEUTENANTS

Eugene W. Black, Anesthesia Section  
Howard C. High Jr., E. E. N. T. Service  
Oscar B. Hunter Jr., Assistant Chief Laboratory Service  
Max E. Johnson, Neurology, Neuropsychiatric Section  
William P. Parrilli, Neuropsychiatric Section  
Allan E. Walker, Gastroenterology Section

The chief nurse is Capt. Helen A. Johnson of the Army Nurse Corps.

The medical officers on duty with the 49th General Field Hospital, attached are:

## COLONEL

John L. Kantor, Commanding Officer

## MAJOR

Isaiah A. Wiles, Executive Officer

## CAPTAINS

Samuel S. Caplin  
Frederick R. Mallott, Adjutant  
Milton H. Omstead, Assistant Executive Officer

## OFFICERS FROM THE RANKS

Companies C and D of the Medical Administrative Corps Officer Candidate School at the Medical Replacement Training Center, Camp Berkeley, Texas, graduated on March 24. Participating in the ceremony were Brig. Gen. Roy C. Heflebower, commandant, Col. George E. Armstrong, assistant commandant, Lieut. Col. Charles L. Driscoll, executive officer, and the band and color guard. Men selected from the ranks to attend officer

candidate school are chosen for their qualities of leadership, initiative and intelligence regardless of their educational background. On completion of an intensive twelve weeks training course these M. A. C. officers take over nonmedical functions formerly performed by medical and dental officers, thus releasing them for professional duties with field troops. On completion of a ten day leave, the newly commissioned second lieutenants will report to their first station assignments.

## GENERAL DAVIS VISITS HOSPITALS

Brig. Gen. Addison D. Davis, commandant of the Medical Field Service School, Carlisle Barracks, Pennsylvania, and Col. Albert S. Dabney, assistant commandant, returned on April 1 from a trip through the South and Midwest where they visited medical installations to observe the results of the courses of training for officers at the Medical Field Service School. At each station visited these officers sought out the Carlisle trained officers who, during the training, the commanding officers of the various posts praised highly. At the Medical Replacement Training Center at Camp Robinson, Arkansas, they observed 101 graduates of the Officer Candidate School at Carlisle Barracks. Brig. Gen. James E. Davis, commandant of the training center, said that the medical administrative corps officers exhibited training of a high order. General Davis and Colonel Dabney visited also six general hospitals, several station hospitals, a school for aviation medicine, a port or embarkation and a great medical supply depot. They observed that in many cases the station hospitals were larger than the general hospitals. The aim of the medical department to have all soldiers in the best possible health before going to theaters of operation, General Davis said, would keep to the lowest possible level the number who would eventually have to be treated in general hospitals. That view is corroborated in the present low disease rate not only in the homeland but in the actual theaters of operation.

## WALTER REED HOSPITAL'S CONVALESCENT CENTER

A convalescent center for Walter Reed General Hospital has been opened in the buildings which were formerly the National Park College, a school for girls at Forest Glen, Md. The convalescent unit provides an additional 1,150 beds, bringing the total capacity of Walter Reed Hospital to 3,325 beds. Careful planning has resulted in the fullest use of the facilities of the girls' school, located in beautiful park grounds which provide extensive recreational facilities: a swimming pool, bowling alley, amusement hall, gymnasium and walks and drives through shady groves. The excellent chapel contains a pipe organ and two libraries for patients. The clinic facilities for physical therapy, occupational therapy and dental work are extensive. The commanding officer at Walter Reed General Hospital is Brig. Gen. Shelly U. Marietta, Assistant Surgeon General, who is also in command of the Army Medical Center. General Marietta has had a distinguished administrative and professional career dating back to 1910 when he first entered the military service.

## MALARIA RECONNAISSANCE AND COMBAT UNITS

According to the *Army and Navy Journal*, the War Department reports that the medical department has established sixteen "reconnaissance" units and twenty-six "combat" units to control the spread of malaria. The "reconnaissance" units are engaged in survey activities, each unit consisting of a parasitologist, four technicians, four field collectors and three chauffeurs. Each "combat" unit has a malaria engineer, eight noncommissioned officers and privates and three chauffeurs. The forty-two malaria control units are or soon will be, in operation in areas where malaria is prevalent. The War Department reported that remarkably few fatalities have been attributed to malaria to date, owing largely to the antimalarial instructions, equipment and treatment available to troops.

## THE HAMMOND GENERAL HOSPITAL

The new U S Army Hammond General Hospital near Modesto, Calif., will eventually have a capacity of 2,000 beds. It is of the cantonment type and is equipped to give treatment in all types of cases admitted to a general hospital. Recently it was designated by the War Department as a hospital which will receive also patients requiring special chest surgery (THE JOURNAL, March 27 p 1095).

The hospital was named in honor of Brig Gen William H Hammond a pioneer in the development of medical field service and field hospitalization and a Surgeon General of the army during the Civil War.

The commanding officer of the Hammond General Hospital is Col Luther R Poust, M C, and the executive officer Lieut Col U R Merikangas, M C. The chiefs of service now on duty are:

**Medical Service** Major Carnett Cheney, associate professor of clinical medicine, Stanford University School of Medicine, Stanford University, Calif.

**Surgical Service** Major George S Reynolds on the staff of House of Mercy Hospital and St Luke's Hospital, Pittsfield, Mass.

**Neuro-psychiatric Service** Lieut Col Mark Ziefert, chief of psychiatric service, Brooklyn Hospital, Brooklyn.

**Eye, Ear, Nose and Throat Service** Major Alfred Wachsberger, adjunct professor of otolaryngology, New York Polyclinic, adjunct otolaryngologist, Beth Israel Hospital, New York.

**Outpatient Service** Major Ralph F Fry, on the staff of Monterey County Hospital, Salinas, Calif.

**X-ray Service** Major Marvin J Vapper, Staff, St John's, Burge and Springfield (Mo.) Baptist Hospital.

**Laboratory Service** Captain Russell Kerr, pathologist, Kansas City, Mo.

The other medical officers assigned to this hospital and their previous locations are:

Major William M Askew Jr, hospital inspector, Auburn, Ala. and Capt H F Nachman, registrar, resident, University of Pennsylvania Graduate School, Philadelphia.

**Medical Service** Major Benjamin Rubin, South River, N J; Capt Peter Callahan, Philadelphia; Capt Edward Denenholz, director of maternal and child welfare department of health, Chicago; Capt F R Maddison, Tacoma, Wash; Capt Richard L Saunders, dermatologist and syphilologist, Buffalo; Lieut Vincent Bellafiore, Brooklyn; Lieut C C Greene Jr, intern, Jefferson Medical College Hospital, Philadelphia; Lieut Sidney Margulis, resident, Edward J Mier Memorial Hospital, Buffalo; Lieut Murray May, dermatologist, matriculate at New York Hospital, New York; Lieut Morris McFarland, Lahey Clinic, Boston; and Lieut Aaron Spitzer, New York.

**Surgical Service** Major Dolan E Hodge, urologist, Billings, Mont; Major Eurfray Jones, Camp Hill, Pa; Major Manuel Pusitz, orthopedic surgeon, Kansas Crippled Children's Commission and Capper Foundation for Crippled Children, Topeka, Kan; Major Helen K Wallace, St Joseph, Mo; Capt Edward Jones, resident in urology, Grady Hospital, Atlanta, Ga; Capt Allen Lilienthal, Memphis, Tenn; Capt Arnold Niegeli, St Paul, Minn; Capt Carlton Price, obstetrician and gynecologist, Rochester, N Y; Lieut Eli Bernstein, surgeon, Flint, Mich; Lieut J T Bolkovatz, Fresno, Calif; Lieut E Davis, Vincentown, N J, on staff of Cooper Hospital, Camden, N J; Lieut Abraham Klein, New York; Lieut Frederick Luger, on staff of St Mary's Hospital, Saginaw, Mich; and Lieut Harold B Miles, resident in anesthesiology, Methodist Hospital, Indianapolis.

**Neuro-psychiatric Service** Capt H B Hargus, medical director, Twin Pines Sanatorium, Belmont, Calif; Psychiatrist San Mateo County Hospital, San Mateo, Calif; Capt W L Noe, Lanham, Pa, on staff of Abington (Pa.) Memorial Hospital; Lieut Roger Dixon, administrative psychiatrist, Elwyn (Pa.) Training School; and Lieut E R Miller, Mercy Hospital, San Diego, Calif.

**Eye, Ear, Nose and Throat Service** Capt N H Battles, on staff of Latter Day Saints Hospital and Idaho Falls Sacred Heart Hospital, Idaho Falls, Idaho; Capt Michael Lewin, plastic surgeon, on staff of Sydenham and Mount Sinai hospitals, N Y; and Capt James E Reeder, on staff of Lutheran Hospital, Sioux City, Iowa.

## NAVY

### MEDICAL SPECIALISTS UNIT NO 110

Naval Medical Specialists Unit No 110, organized at the Cleveland Clinic (Ohio), reported for duty at the Naval Medical Supply Depot in Brooklyn in March 1942 in connection with the establishment of Naval Mobile Hospital No 4 of several hundred beds which could be set up in a short time on arrival overseas. The material included seventy prefabricated metal buildings, equipment and supplies for the numerous departments of a hospital, even fire fighting apparatus, laundry power and light, refrigeration and water supply. The personnel was to comprise about 20 medical and dental officers and 180 enlisted men. The original complement of officers from Cleveland comprised Lieut Comdr J R Kennedy, ophthalmologist and otolaryngologist, Lieut Comdr J C Root, roentgenologist, Lieut Comdr A C Ernstene, internist, Lieut Comdr W James Gardner, neurologic surgeon, Lieut Comdr W J Engel, urologist, Lieut Comdr D H Nichols, dentist, Lieut George Crile Jr, surgeon, Lieut Guy H Williams Jr, psychiatrist, and Lieut (jg) E J Ryan, clinical pathologist. While waiting for the hospital to be assembled before embarkation the following additional medical officers, several of whom had taken post-graduate training in Cleveland, arrived: Lieut Hays R Yandell, Lieut Gordon Sinclair, Lieut Ray Andrews, Lieut Ralph Zupaneck, Lieut (jg) George Berry (DC), Lieut Charles Bingham, Lieut Comdr Dennis O Connor, Lieut (jg) Royston Miller, Lieut Burnell Eckart, Lieut Comdr Russell H Blood and Lieut (jg) Fred Sanborn.

The commanding officer, Capt John H Robbins, M C, U S Navy, and Lieut Comdr W James Gardner, M C, U S Navy Reserve, were detached from the unit and sent to New Zealand to make preliminary arrangements for the establishment of the hospital. Lieut Comdr Gardner describes the trip across the Pacific in the Bulletin of the Academy of Medicine of Cleveland and the environment in which the hospital was eventually established. The site selected was a hockey field of several acres about 3 miles from Wellington. The setting up of this hospital in a new country, he says, was a remarkable accomplishment, done largely by untrained hands, but in one month from the day work started the wards, operating rooms, mess halls and x-ray department were ready to function, and on that day 366 casualties were received from the landing operations in the Solomons. Within two months the hospital had

received more than 1,200 wounded of whom only 1 died. The hospital was then enlarged to 1,000 beds by adding wards built of New Zealand materials and by local labor. The complement of medical officers on the staff then was doubled. Lieutenant Commander Gardner in the fall returned to San Francisco with a large group of the wounded and later he says was transferred to inactive duty. When he left the outfit in Wellington all the men were in excellent health.

### EPIDEMIC CONTROL SPECIALISTS

Thirty-four officers and fifty-eight hospital corpsmen were graduated on April 3 as epidemiologists in a ceremony held at the National Naval Medical Center, Bethesda, Md. The graduates were addressed by Rear Admiral Luther Sheldon Jr, assistant chief of the Bureau of Medicine and Surgery. These doctors, technical specialists and enlisted men have been divided into epidemiologic teams for assignment to naval stations, marine amphibious forces and overseas bases where they will maintain sanitary conditions and guard against outbreaks of disease. Within the continental limits these teams will be composed of two officers and four hospital corpsmen; in overseas activities the composition will vary depending on local conditions and the character of the unit to which the team is attached. A new class will start training on April 19 at the Naval Medical School.

### EXAMINATION FOR APPOINTMENTS IN THE NAVAL MEDICAL CORPS

The next examination for appointments as acting assistant surgeons for intern training and for assistant surgeons, United States Navy, will be held at all of the major naval hospitals on May 3 to 7 inclusive. To date more than two hundred applications have been approved for these examinations.

### INSTRUCTION IN MALARIOLOGY

A class of six medical officers was convened at the Naval Medical Center, Bethesda, Md., on April 15 for a course of instruction in malariology. Seventy-two members of the Naval Hospital Corps and H-V(S) officers will also be convened for instruction in malariology and epidemiology on the same day.



## MISCELLANEOUS

## MEDICAL ATTENDANTS FOR MERCHANT SHIPS

A new school has been established at the Sheepshead Bay Training Station of the War Shipping Administration for the intensive training of medical attendants to serve on merchant ships. The 250 men enrolled as apprentice seamen of the Maritime Service who graduated from the school on March 12 will rate as petty officers responsible to the ship's master for the handling of health and sanitary problems. The school, which is under the supervision of the U. S. Public Health Service and under the immediate charge of Dr. S. S. Heilweil, has a staff of instructors and nurses, laboratories, lecture halls, sound film projection and other equipment necessary for the three months intensive course on sanitation, disease prevention, personal hygiene, first aid, transportation of the sick and injured, nursing and elementary pharmacy. This plan is said to be the first to provide every merchant ship, including cargo freighters, with a seaman trained and equipped to handle sanitary and health problems on board. The course is limited to men between 18 and 25 years of age with high school education.

## NYLON SURGICAL SUTURES

Nylon has proved to be a superior replacement for silk in surgical sutures according to du Pont de Nemours and Company, Inc., and millions of feet of nylon monofilament that formerly went into tennis racquet strings and other things will replace silk this year in surgical sutures for the army and navy and civilian use. Nylon will not dry out and rot like the natural fiber and it has greater tensile strength than silk. The monofilaments are solid strands in contrast to silk sutures, which are made by twisting together a number of threads. The nylon sutures are noncapillary, and bacteria cannot travel through them as they sometimes do in braided material, furthermore being smooth and solid, skin cannot grow into the interstices as it sometimes does in the interstices of silk sutures causing irritation and other complications when the sutures are removed. Nylon can be used internally as well as externally.

## PRIORITY FOR MATERIAL FOR PRODUCTION OF HEALTH SUPPLIES

Since adequate priorities assistance for materials for the manufacture of health supplies is now assigned by other means, preference rating order P-29, formerly used for this purpose, has been revoked by the War Production Board. The revocation includes all serially numbered copies of P-29 and is effective immediately.

P-29, issued in August 1941, was formerly used for priorities assistance to manufacture surgical and dental instruments, x-ray equipment, biologic products, medicinal chemicals and other commodities in the health supply field.

Application for priority assistance in obtaining controlled materials and other materials necessary to complete authorized production schedules under CMP should now be made on form CMP-4B. Application for chemicals, biologic products and other miscellaneous items should be filed on form PD-1A.

## ARMY-NAVY E AWARDS

The Army-Navy E Production Award was presented to the employees of the Baxter Laboratories, Inc., Glenview, Ill., at the public school auditorium in that community, March 11. The Baxter Laboratories are well known manufacturers of intravenous solutions and blood plasma and serum equipment.

James King & Sons, Inc., New York City, were awarded the Army-Navy E at ceremonies in the auditorium of the new Halloran General Hospital at Willowbrook, Staten Island, New York, which is said to be the largest army hospital in the United States. The ceremony was presided over by Supreme Court Justice John H. McCooey of Brooklyn and was attended by army and navy officers and hundreds of the employees of the company, who were praised for the speed and efficient manner in which the hospital was built. E pins also were presented to employees of the company.

## PUBLIC HEALTH UNDER HITLER

By a decree published in the Reichsgesetzblatt, the fuhrer has entrusted the German Red Cross (DRK) with the entire transport of the sick in the sphere of civilian health services. According to DNB of January 23, he has, moreover, ordered the reich health leader Dr. Conti, to issue the executive regulations in conjunction with the fuhrer's delegate for medical and health services Prof. Dr. Brandt. The new scheme, resulting from the fuhrer's decree and the reich health leader executive order, represents progress in the work of the health services. Numerous organizations have hitherto dealt with the transport of the sick, and their activities have not been sufficiently coordinated. This has often made a uniform control of the transport of sick persons difficult. In many places, especially in the country, this work has already been carried out exclusively by the DRK. Those organizations which are at present still engaged in the transport of the sick will now inform the DRK of their facilities for this work which they will on request transfer to the DRK for a corresponding compensation fixed in accordance with the Reich Compensation Law (Reichsleistungsgesetz). Likewise the personnel who have hitherto transported sick persons, while maintaining their present rights must, on request, be made available for incorporation into the DRK. The DRK will immediately start setting up the DRK Transport of the Sick and will announce locally when it is going to take over the entire transport. Until then the organizations at present engaged in the transport of the sick are to carry on. The DRK however may give them instructions. The new regulations do not affect the transport of the sick of the armed forces, the Waffen SS, those parts of the police which are subordinated to the armed forces, the Reich Labor Service and the Todt Organization.

The Leipzig *Volks-Anzeiger* of Nov. 29, 1942, reports that Saxony holds a leading place among all districts with regard to health services in factories. For instance, the number of industrial doctors has risen from 90 to 600 since the beginning of the war. It is now recognized as necessary to provide the factory health wardens with the necessary technical knowledge. In the Knapp health resort of Berggieschubel courses lasting a fortnight have been held. Men and women from the most important industrial concerns are here taking part in the training and at the same time are guests with full rights to use all facilities of the spa. They get their knowledge from practical experience on their own body. Early in the morning they get their ablutions and compresses according to a plan of treatment ordered by the doctor, and as their training proceeds they help one another with their treatment. Then follow lectures and practical demonstrations beginning with compresses for the chest and finally those for the whole body, ablutions, herb baths and other baths of all kinds. These factory health officials are not meant to give regular treatment but are rather expected to pass on their knowledge and above all, to set an example by their own natural way of living and to educate their fellow workers in it.

According to the *Krakauer Zeitung* of Nov. 19, 1942, the German Hospital, which has been extended and reconstructed, has now been handed over to Dr. Wiggers. It consists of five departments: the department for internal diseases, the surgical department, the department for skin and venereal diseases, the gynecologic department and maternity post, and an x-ray department. These departments, with the exception of the department for skin and venereal diseases, also treat outpatients. All departments are under the direction of specialists. The maternity post is to be transferred to the municipal maternity hospital, where a special department for German women is to be opened. The German Hospital of Lwow will be extended by a children's hospital. The admission to the German Hospital is subject to the regulations issued by the general government. Only the reich German and German speaking *volksdeutsche* are admitted.

Radio Paris of February 11 reported that hospital tram No. 528 arrived, February 10, at the Gare de Lyon, Paris, from Germany with 384 patients, who were sent to three different hospitals.

# ORGANIZATION SECTION

## OFFICIAL NOTES

### DOCTORS AT WAR

Radio broadcasts of Doctors at War by the American Medical Association in cooperation with the National Broadcasting Company and the Medical Department of the United States Army and the United States Navy are on the air each Saturday at 5 p m Eastern War Time (4 p m Central War Time, 3 p m Mountain War Time, 2 p m Pacific War Time). An exception is the Chicago area, where the broadcasts are heard by transcription at 10 30 p m Saturdays over Station WMAQ. Unless otherwise indicated, each program is summarized by Dr W W Bruer, Director, Bureau of Health Education.

The titles and guest speakers for the next four programs are as follows:

- April 24 Sharp Eyes  
Speaker: Lieut Col Harold C Lueth  
Liaison Officer, Surgeon General's Office and A M A United States Army
- May 1 Jungle Death  
Speaker: Brig Gen C C Hillman  
Chief of the Professional Services Office of the Surgeon General United States Army

- May 8 Drugs March to War  
Speaker: Dr Austin E Smith, Secretary  
Council on Pharmacy and Chemistry
- May 15 High Air

### BEFORE THE DOCTOR COMES

The American Medical Association program on Radio Station WLS (890 kilocycles) entitled "Before the Doctor Comes" will be on the air every Thursday morning at 9 45 up to and including May 27. Mrs June Merrill will interview Dr W W Bauer, Director, Bureau of Health Education, or Dr Austin E Smith, Secretary, Council on Pharmacy and Chemistry, on common home health problems. The titles for the next four programs are:

- April 22 What to Do About Bad Bumps  
(Bauer)
- April 29 What to Do About Bleeding  
(Bauer)
- May 6 What to Do About Foreign Bodies in the Nose  
Ears Throat or Eyes  
(Smith)
- May 13 Growing Pains  
(Bauer)

## MEDICAL LEGISLATION

### MEDICAL BILLS IN CONGRESS

*Change in Status*—H R 1857 has passed the House and Senate, providing for the appointment of female physicians and surgeons in the Medical Corps of the Army and Navy.

*Bills Introduced*—S 939, introduced by Senator Pepper, Florida, proposes a federal appropriation of \$11,580,000 for each fiscal year to enable each state to establish, extend and improve services for educating physically handicapped children. The sums to be made available will be used in making payments to those states which have submitted and had approved by the United States Commissioner of Education plans for the services indicated. S 983, introduced by Senator Bailey, North Carolina, would authorize such sums as may be necessary to provide for the training of nurses for the armed forces, governmental and civilian hospitals, health agencies and war industries, through grants to institutions providing such training. This bill is identical with H R 2326, introduced by Representative Bolton. Both bills were introduced at the suggestion of the Administrator of the Federal Security Agency. H Res 202, submitted by Representative Shafer, Michigan, will, if adopted, direct the House Committee on World War Veterans' Legislation to make a survey of existing veterans and military hospital facilities and a survey of the needs arising, and likely to arise, from the existing emergency for medical, tuberculosis and mental hospitals for veterans. The committee will be directed to submit to the House of Representatives a report covering a general program, with estimates of the cost, for the provision of hospital facilities likely to be needed. H R 2383, introduced by Representative Chapman, Kentucky, proposes to amend the Insecticide Act so as to provide that any white powder insecticide or fungicide containing arsenic in its elemental form or in any of its combinations, or fluorine in any of its combinations, shall, unless deemed unnecessary by the Secretary of Agriculture for the protection of the public health, be deemed to be adulterated unless it is distinctly colored in accordance with regulations promulgated by the Secretary of Agriculture. H R 2442, introduced by Representative Sparkman, Alabama, provides that during the present emergency and for six months

thereafter the Chief of the Dental Division, Surgeon General's Office, Army of the United States, shall have the rank, pay and allowances of major general. The bill provides too that there shall be officers of the Dental Corps promoted to the grade of brigadier general at the ratio of one for each six officers of the Medical Corps promoted to like grade.

### STATE MEDICAL LEGISLATION

#### California

*Bills Introduced*—A 686, to amend the Health and Safety Code, proposes, among other things, that the state director of health shall be a doctor of medicine eligible to license to practice in California, with at least one year's postgraduate training in public health and a minimum of five years' practical experience as an administrative officer in a well organized health department. A 1335 to amend the law relating to the use and sale of poisons, proposes, among other things, to add the following poisons to schedule C1: acetylurea, sulfonated methanes, paraldehyde, sulfanilamide except in tablets of 30 grains or more designed for stock purposes only and so labeled, sobisminol, amidopyrine, cinchophen, ergot, diethylstilbestrol provided that they may be sold only at retail on order or prescription of a physician, dentist, chiropodist or veterinary surgeon duly licensed to practice in the state of California and shall not be refilled without order of the prescriber to schedule C2: amphetamine, thyroid, phenylhydantoin or their compounds, provided they are sold only at retail on the written order or prescription of a physician and surgeon, dentist chiropodist or veterinary surgeon licensed to practice in the state of California but such prescription may be refilled for the person for whom originally written.

#### Colorado

*Bills Enacted*—H 199 was approved, March 31. To amend the chiropractic law, it requires chiropractors, at the time of the annual renewal of their licenses, to present proof that they have attended at least three days of a scientific clinic forum or educational study approved by the Colorado state board.

chiropractic examiners H 200 was approved, March 31. It authorizes the chiropractic board to adopt a schedule of minimum educational requirements for chiropractic schools to be not less than 3 600 sixty minute hours of classroom instruction with a maximum of thirty hours per week.

#### Connecticut

*Bills Introduced*—Sub for S 562 proposes to authorize a town board of education to appoint one or more legally qualified practitioners of medicine as school medical advisers and to provide such medical advisers with adequate facilities to provide for private health examinations of individual pupils. H 1194, to authorize a town health officer to detain and examine persons reasonably suspected of being infected with a venereal disease, has had an amendment to it introduced which would provide that nothing therein should be construed to interfere with the freedom of any adherent of the teachings of a well recognized religious sect, denomination or organization to depend exclusively on prayer for healing in accordance with the teachings of such sect, denomination or organization.

#### Georgia

*Bill Introduced*—S 213 proposes to require the secretary of state to issue licenses to practice naturopathy in Georgia to all persons who have been engaged in such practice in Georgia for the past three years and who have a license so to practice in the state of South Carolina. This proposal died in the Senate.

*Bills Enacted*—H 136 has become Governor's Act No. 346 of the Laws of 1943. It requires all licensed physicians attending a pregnant woman to take a sample of blood within thirty days of the first examination and to submit such sample to an approved laboratory for a serologic test for syphilis. The title to this bill indicates that the word "physician" wherever used in the act shall be construed to embrace and include those persons licensed to practice under the osteopathic laws of Georgia. H 552 has become Governor's Act No. 462 of the Laws of 1943. It abolishes the state boards of medical examiners, chiropractic examiners and osteopathic examiners and creates in their stead a State Commission of Medical Examiners, Georgia Commission of Chiropractic Examiners and State Commission of Osteopathic Examiners of Georgia. The powers, duties and qualifications of the new commissions are the same as those of the prior boards except that members thereof appointed by the governor must be approved by the secretary of state and confirmed by the senate.

#### Illinois

*Bills Introduced*—S 244 and H 393 propose to provide for the establishment and maintenance of county and multiple county public health departments. H 370 to amend the unemployment compensation act proposes that an employee will not be ineligible for benefits if he is unable to work because he is sick and has submitted proof of such sickness by means of a statement by a duly licensed physician. H 390 proposes to authorize the department of registration and education to issue licenses to practice physiotherapy defined as the method, art or science of treating the human body for hygienic or remedial purposes by the following methods: massage and manipulations with the hands or with any other physiotherapy modality, and the use of such adjuncts as light, heat, air, water, diet, gymnastics and electricity. H 395 proposes to authorize any town or two or more adjacent towns to be organized into a public health district.

#### Iowa

*Bills Introduced*—S 370, to amend the premarital examination law, proposes to permit a licensed physician who is a member of the armed forces of the United States, and authorized to make tests and examinations for syphilis to execute the required certificate for an applicant who is likewise in the armed forces. S 371, to amend S 82 concerning the income tax law which was approved by the governor March 11, 1943, proposes that a taxpayer may deduct expenses paid during the taxable year, not compensated for by insurance or otherwise, for medical care of himself, his spouse or any dependents. The term "medical care" is defined to include amounts paid for the

diagnosis, cure, mitigation, treatment or prevention of disease or for the purpose of affecting any structure or function of the body and also treatment or nursing as prescribed by a well recognized church or religious denomination in any hospital or at home or in a sanatorium conducted and operated by such church or denomination.

#### Maine

*Bill Passed*—H 1352 passed the senate, April 5. To amend the law relating to infectious and communicable diseases, it proposes that every physician shall within forty-eight hours of the time the fact comes to his knowledge, report in writing to the state bureau of health any person known by said physician to have any of the following infectious and communicable diseases: syphilis, gonorrhea, chancre, and lymphogranuloma venereum. The proposal would also authorize the state bureau of health to detain and examine any person believed to be infected with one of the aforementioned diseases and so conducting himself as to expose others to the dangers thereof.

*Bills Enacted*—S 457 became chapter 236 of the Laws of 1943. It amends the act relating to procuring or attempting to procure an abortion or miscarriage by exempting therefrom those instances in which the abortion or miscarriage is necessary for the preservation of the mother's life. H 325 has become chapter 273 of the Laws of 1943. It authorizes the state board of registration of medicine to issue temporary emergency certificates by general regulations or specific orders to such physicians licensed outside the state as it shall find qualified to practice in the state of Maine during the emergency period, for the time specified in the temporary license and in the order limited thereby. H 1202 has become chapter 195 of the Laws of 1943. It authorizes cities and towns to raise money for the purpose of subsidizing a physician to induce him or her to settle in said town.

#### Massachusetts

*Bills Introduced*—H 727 proposes to authorize a physician registered under the general laws to furnish contraceptives to a married woman in any case in which, after diagnosis, such physician is of opinion that her health or life would be endangered by pregnancy. H 1462, appendix H, to amend the narcotic drug law proposes to add methamphetamine to the list of drugs covered by the law.

#### Minnesota

*Bill Introduced*—H 1361 and S 1250 to amend the basic science law proposes that during the war and while accredited medical schools are accelerating their courses, the board of examiners may give examinations to applicants who are registered students in an accredited medical school and who are otherwise qualified even though such applicant is not 21 years of age.

*Bill Enacted*—S 825 has become chapter 314 of the Laws of 1943. To amend the law relating to coroners, it provides that any coroner or deputy coroner who is a duly licensed and registered physician and surgeon shall not be disqualified from rendering medical care or hospitalization to a recipient of public relief, from being appointed an examiner in minority or incompetency hearings or from being compensated therefor.

#### Missouri

*Bill Introduced*—H 85 proposing to define the words physician and surgeon so as to include osteopaths and to authorize such persons to practice in government supported hospitals was amended in the house so as to provide that the right to practice in such hospitals would devolve on and be enjoyed by only such practitioners as have acquired education, experience and training of a standard equivalent to that required by the board of trustees of the hospital.

#### Nebraska

*Bill Enacted*—Bill No. 149 was approved March 29. It exempts from the payment of the annual renewal license fee chiropractors, osteopaths and physicians while actively engaged in the military service of the United States as defined in the Soldiers' and Sailors Civil Relief Act.

### New Hampshire

*Bill Passed*—H 267, as amended by the house committee, passed the house March 30. It proposes the licensing of physiotherapists who have been engaged in the practice of physiotherapy for at least one year prior to the passage of the act.

### New Jersey

*Bills Passed*—S 68 and S 72 passed the senate March 30. Both proposals would exempt from a law requiring compulsory vaccination for smallpox and diphtheria those persons who present an affidavit that vaccination violates a tenet of the established religious society, institution, organization or sect of which he is a member. A 276 passed the house, April 1. To amend the medical practice act, it proposes to exempt from the provisions thereof chiropractors while operating under the specific direction of a regularly licensed physician or surgeon.

### New Mexico

*Bill Introduced*—Senate substitute for S 141 proposes that every physician who makes a diagnosis of or treats or prescribes for a case of venereal disease shall report such case immediately to the municipal or district health officer and authorizes state, district and municipal health officers to detain and examine persons reasonably suspected of being infected with a venereal disease and to require persons so infected to report for treatment to a reputable physician.

### New York

*Bills Enacted*—C C H S 16, adopted, March 20, enacts a resolution to the effect that a legislative committee be appointed to make a comprehensive and thorough study of legislation enacted in other states for the regulation, control and licensing of chiropractors, to determine proper educational standards and requirements, and to prepare and recommend legislation for the regulation and licensing of chiropractors in New York. A 335 has become chapter 294 of the Laws of 1943. It authorizes the state commissioner of health to employ necessary medical and health personnel for rendering services in areas designated by the governor as being emergency health and sanitation areas by virtue of an inadequacy of medical facilities or personnel therein. Compensation to such employed medical personnel may be paid by the state department of health. A 1125 has become chapter 193 of the Laws of 1943. It amends the medical practice act by postponing until July 1, 1944, the 1942 amendment exempting students, interns and resident physicians from the operation of such act.

### North Dakota

*Bills Enacted*—S 77 was approved, March 20. It provides for the establishment, maintenance and duties of a district board of health and provides that the district health officer appointed by such board shall be a physician and surgeon regularly licensed to practice medicine and surgery in the state of North Dakota. H 229 was approved, March 12. It provides for the organization and regulation of nonprofit hospital service plan corporations.

### Ohio

*Bills Introduced*—S 237 proposes to provide a comprehensive program for the physical rehabilitation of war veterans. H 345 proposes the creation of a state board of chiropractic examiners. Chiropractic is not defined by the proposal, but the bill would prohibit a chiropractor from practicing major surgery or obstetrics or administering general anesthetics until he shall have passed an examination in those subjects given by the state medical boards.

*Bill Passed*—Substitute for H 112 passed the house, March 30. It proposes to amend the law relating to osteopaths by providing for one osteopathic member of the medical examining board and requiring osteopaths to be examined by such board in the subjects of anatomy, physiology, pathology, chemistry, and diagnosis, surgery, obstetrics and such other subjects as the board requires and by the osteopathic member in the subjects of materia medica and therapeutics and the principles and practice of osteopathic medicine. Successful applicants would be entitled to practice osteopathy and surgery. Persons now licensed to practice osteopathy but who have not passed an

examination before the state medical board would be allowed to continue to practice osteopathy and minor and orthopedic surgery but not to practice major surgery.

### Oklahoma

*Bill Enacted*—H 222 was approved March 24. It amends the medical practice act by providing among other things, that the members of the board of examiners must be citizens.

### Oregon

*Bills Enacted*—S 284 was approved, March 29. It authorizes the payment of workmen's compensation to employees disabled by an occupational disease defined as (1) any disease or infection which is peculiar to the industrial process in which the employee is engaged and which arises out of and in the scope of the employment, and to which the employee is not ordinarily subjected or exposed other than during a period of regular actual employment, (2) silicosis—meaning a disease of the lungs caused by breathing silica dust (silicon dioxide) producing fibrous nodules distributed through the lungs and demonstrated by x-ray examination or by autopsy. H 229 has become chapter 402 of the Laws of 1943. It reenacts and extends the existing law providing for state reimbursement to hospitals for services rendered victims of motor vehicle accidents so as to cover nurses, doctors and owners and operators of ambulances as well. H 350 has become chapter 218 of the Laws of 1943. It authorizes commissioned medical officers of the army to execute the certificate necessary under the state premarital examination law.

### Pennsylvania

*Bills Introduced*—S 209, to amend the osteopathic law, proposes, among other things, to require the board of examiners by inspection or otherwise, to examine and fix the rating of all colleges and hospitals outside the state whose graduates or interns desire to obtain osteopathic licensure in Pennsylvania. S 460 proposes the creation of a state board of naturopathic education and licensure and defines naturopathy as a system of treatment and prevention of body ills without the use of drugs or surgery including in its armamentarium such natural elements as air, light, heat, electricity, water, phytotherapy, diet and/or physiologic and psychologic dysfunctions of the human body provided that nothing in the proposal would be held or construed to authorize any naturopathic physician licensed thereunder to use drugs or surgery. H Res 45 proposes a resolution to the effect that the department of health should initiate a campaign of education in order to bring home to the people the advisability and necessity of new immunization against disease and that the department through its county boards should make available sufficient serums and vaccines to properly guard the people against disease. H 669, to amend the law regulating and supervising nonprofit medical service corporations, proposes that subscribers earning more than a certain specified sum shall be liable to doctors of medicine registered with the corporation and rendering services to such persons for the full amount of the usual fees and charges for such services made by doctors of medicine and any payment made by the corporation to doctors for rendering such services shall be a payment on account and not necessarily in full. H 673, to amend the law relating to occupational diseases, proposes to include within the meaning of the term "occupational disease" infection or inflammation due to bacterial or parasitic agents in any occupation involving direct contact with or exposure to such agents. H 893 proposes the creation of a state board of chiropractic examiners and defines chiropractic as the science of treating human ailments by manipulation and adjustment of the spine of the human body and adjacent tissues thereof and the use of such mechanical, physiotherapeutic, dietetic, hygienic and sanitary measures except drugs and surgery, as are incident to the care of the human body, as taught and practiced in approved schools and colleges of chiropractic.

*Bill Enacted*—H 236 has become act No. 8 of the Acts of 1943. It provides that for the duration of the war a minimum of nine months rather than one year internship shall constitute the necessary training to qualify for admission to examination for a license to practice medicine.

## Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST SUCH AS RELATE TO SOCIETY ACTIVITIES NEW HOSPITALS EDUCATION AND PUBLIC HEALTH)

### CALIFORNIA

**Acting Health Officer of Los Angeles County**—Dr Hubert O Swartout, director of the bureau of preventable disease in the Los Angeles County Health Department, has been appointed acting health officer of the county. Dr Wilton L Halverson, Sacramento director of the department, was recently appointed in charge of the state department of health.

**The George Dock Lecture**—The annual George Dock Lecture of the Barlow Society for the History of Medicine was delivered by Dr George Blumer David P Smith clinical professor of medicine emeritus, Yale University School of Medicine, New Haven, April 2, at the Los Angeles County Medical Association. His subject was "Remarks on the Life and Accomplishments of William Heberden the Younger." The lecture marked the eighty-third birthday of Dr Dock.

**Lillian Jane Martin Dies**—Lillian Jane Martin Ph D, emeritus professor of psychology at Stanford University, died at her home in San Francisco, March 26, aged 91. Dr Martin was born in Olean N Y, July 7, 1851, receiving an honorary doctor of philosophy degree from the University of Bonn in 1913. She was a member of the department of psychology at Stanford from 1899 to 1916, when she became emeritus professor. Consulting psychologist in San Francisco and psychopathologist and chief of the mental hygiene clinic at the San Francisco Polyclinic and Mount Zion Hospital since 1916, Dr Martin was founder and director of the Old Age Center in San Francisco and president of the California Society of Mental Hygiene from 1917 to 1921. The New York Times credits Dr Martin with being the founder of the first child guidance clinic in the country. She was a member of many scientific societies and the author of extensive writings in her specialty.

**State Medical Meeting**—The seventy-second annual session of the California Medical Association will be held at the Biltmore Hotel, Los Angeles, May 2-3, under the presidency of Dr William R Molony Sr, Los Angeles. Among the out of state speakers will be

Dr John H Fitzgibbon, Portland, Ore, Wartime Community Health Problems in Oregon  
John R Mannix, Detroit, director Michigan Hospital Service Voluntary Nonprofit Health Plans  
Dr Tom D Spies, Cincinnati and Birmingham Ala, Detailed Methods of Diagnosis and Therapy in Acute Nutritive Failure  
Dr William A Sawyer, Rochester N Y, Some Medical Problems in Wartime Industry  
Philip Drinker, Chem E, Washington D C, Health Control in Welding Work  
Dr John H Hutton, Portland, Spinal Anesthetic Agents and Methods Usually Employed at the University of Oregon Medical School Hospitals  
Lieut H L Gartshore, M C, Army of the United States, Pendleton Ore, Psychiatry at an Air Base Station Hospital

The program also includes a wide range of subjects to be presented by military and civilian physicians.

### CONNECTICUT

**Premarital Blood Test Law Amended**—Out of state physicians and osteopaths are now eligible to sign marriage applications in Connecticut under a bill signed by the governor March 18. The act permits any physicians or osteopaths duly licensed in any state or territory of the United States or in the District of Columbia to sign a statement for marriage license application in Connecticut. According to the state department of health, the action is expected to relieve present difficulties, particularly on the part of men in the armed forces who are stationed in various sections of the country and desire to be married in Connecticut.

**The Yale Poliomyelitis Study Unit**—The National Foundation for Infantile Paralysis has made a five year grant totaling \$150,000 to Yale University School of Medicine New Haven to establish the Poliomyelitis Study Unit. The term of the grant will be June 30, 1948. In 1941 the Yale Poliomyelitis Study Unit was established by Drs James C D Trask (now deceased) and New Haven as a result of problems epidemic which swept New England. The unit's aim has been to develop a research program in which members investigating

transmitted. The school of medicine will reorganize its investigation of poliomyelitis problems. Henceforth studies will be conducted in the Poliomyelitis Study Unit under the direction of Dr Paul, professor of preventive medicine, who will have administrative direction of the unit. An advisory committee of the National Foundation will be appointed by Mr Basil O'Connor, New York, president, to consult with Dr Paul and his associates as the need arises. As far as facilities permit, the foundation may send to the unit individuals properly qualified in the opinion of the foundation's medical advisory committee, to pursue definite lines of investigation. To meet the immediate needs of the study unit space will be arranged by the Yale University School of Medicine. None of the funds granted by the National Foundation for Infantile Paralysis will be used for the construction of new buildings.

**Lectures on Non-War Psychiatry**—A series of lectures was given recently at the Graduate Club of the Neuro-Psychiatric Institute of the Hartford Retreat, Hartford. The series was devoted exclusively to non-war neurology and non-war psychiatry.

Dr Foster Kennedy, New York, (a) Neurological Examinations, (b) Gait, the Midbrain, Hysteria, (c) Myotonic Myasthenia and Other Neurological Conditions  
William T. Johnson, Hartford, Psychiatric Research in Electroencephalography  
Dr Abraham A Brill, New York, Various Schools of Psychotherapy  
Dr Abraham Myerson, Boston, The Philosophy of Psychotherapy  
Dr William Henry, Boston, Early Schizophrenia  
Douglas H Fryer, Ph D, New York, Research Observations in Pre-pertory Muscular Activity in Relation to Work  
Dr Clarence B Farrar, Toronto, An Editor Looks at the Psychiatric Literature  
Dr Edward A Strecker, Philadelphia, Alcoholism, Something on Therapy in Alcoholic Conditions  
Dr Charles Macfie Campbell, Boston, Common Sense in Psychiatry  
Dr Harold G Wolff, New York, Emotions and Disease  
Dr Donald J MacPherson, Boston, Relationship Between the Referring Man and the Mental Hospital

### FLORIDA

**Graduate Department of Medicine Organized**—A department of medicine has been established in the Graduate School of the University of Florida, Gainesville. The new unit will be located in Jacksonville and maintained in cooperation with the state medical association and the state board of health. Dr Turner Z Cason, Jacksonville, will be in general charge as director of the department. The new unit, which will conduct graduate courses and promote research in medicine and surgery, is the outgrowth of the annual graduate short course for doctors of medicine inaugurated about ten years ago. Continuation courses for practicing physicians with facilities for clinical instruction will be given from time to time.

### ILLINOIS

**Dr Brokaw Named Acting Director of Health District**—Dr Raymond V Brokaw, Springfield, chief of the division of cancer control, state department of public health, has been named acting director of the Champaign-Urbana Public Health District, effective March 16. He has succeeded Reuben F Reider, Champaign, passed assistant surgeon U S Public Health Service Reserve. According to the Illinois Department of Public Health this is an unprecedented action by the state to share with a local health office the services of a division chief.

### Chicago

**Billings Lecture**—The Institute of Medicine of Chicago announces that Carl Voegtlin, Ph D, chief of the National Cancer Institute, Bethesda Md, will deliver the fifth Frank Billings Lecture of the Thomas Lewis Gilmer Foundation at the Palmer House, May 28. His subject will be "Chemistry of Carcinogenesis and Tumor Growth."

**Mental Hygiene Meeting**—Dr Davis Slight, professor of psychiatry, University of Chicago, was reelected president of the Illinois Society for Mental Hygiene at its thirty-fourth annual meeting in Chicago March 15. William B Biele, lawyer, is secretary. Harold G Webster, Detroit, executive secretary of the Michigan Society for Mental Hygiene, addressed the meeting on "Strategy and Tactics in Mental Hygiene."

### INDIANA

**Hospital Ward Named for Physician**—A forty bed obstetric ward at the Indianapolis City Hospital was dedicated and named, March 23, in honor of Dr Henry F Beckman, Indianapolis, who has been in charge of the obstetric service at the hospital for more than thirty years. A bronze plaque was unveiled in the ward by Dr Charles W Myers, medical superintendent of the hospital, as a feature of the dedication to Dr Beckman. Another feature of the occasion was a talk by Sister Elizabeth Kenny.

## MARYLAND

**Annual Medical and Chirurgical Faculty Meeting**—The annual meeting of the Medical and Chirurgical Faculty of the State of Maryland will be held in Baltimore, April 27-28. Dr. Charles R. Austrian, Baltimore, president of the faculty, will deliver the presidential address on "Plans for Medical Care." Dr. Frank L. Horsfall Jr., New York, will present the Trumble Lecture on "Primary Atypical Pneumonia." Included on the program will be the following Baltimore physicians:

Dr. Marcus M. Rivitch, Preparation and Uses of Frozen and Dried Plasma  
Dr. Warfield M. Piror, Tetanus and Gas Infections  
Dr. Otto C. Brantigan, Compression Treatment of Burns  
Dr. James G. Arnold Jr., Management of Acute Head Injuries  
Dr. Charles A. Reifschneider, Intra Abdominal Injuries  
Dr. Warde B. Allen, Cardiac Problems in Aviation

One session will be devoted to "The Distribution and Redistribution of Physicians in the United States." Dr. Arthur M. Shipley, Baltimore, will be chairman of the discussion and speakers will be Dr. Harvey B. Stone, Baltimore, and Brig. Gen. George F. Lull, M. C., U. S. Army, Washington, D. C. Twenty-four subjects will be covered in the round table discussion at the Belvedere Hotel, April 28.

## MASSACHUSETTS

**The Cutter Lecture on Preventive Medicine**—Dr. Lowell T. Coggeshall, professor of epidemiology, University of Michigan School of Public Health, Ann Arbor, Mich., will deliver the Cutter Lecture on preventive medicine, April 27, at Harvard Medical School on "Importance of Tropical Diseases in the Current and Post War Period."

**Fiftieth Anniversary of Tufts Medical School**—September has been tentatively selected as the month to mark the fiftieth anniversary of Tufts College Medical School, Boston. The nature of the celebration will be appropriate to the wartime exigencies and preoccupations of those concerned when the time approaches. A committee has been appointed to develop plans and arrangements for the observance.

## MISSISSIPPI

**Student Loan Fund**—A gift of \$2,500, with a similar amount to be added in 1944, to the University of Mississippi School of Medicine, University, for the establishment of the G. D. Shands Memorial Loan Fund for medical students has been received from Paul Hill Saunders, Ph.D., and his wife of New Orleans and New York, newspapers reported March 14. The fund was presented in memory of the late Gov. Garvin D. Shands, Mrs. Saunders' father and for many years dean of the university school of law. It will be made available to worthy students who complete the two year course offered by the university and who need financial aid to finish their medical training at other schools.

## NEVADA

**Annual Registration Due May 1**—All persons holding licenses to practice medicine in Nevada are required by law to pay annually to the treasurer of the Board of Medical Examiners, on or before May 1, a tax of \$2. Failure to do so operates to forfeit a licensee's right to practice medicine, and his license to practice can be reinstated thereafter only on payment of a \$10 penalty.

## NEW YORK

**Outbreak of Sore Throat**—An outbreak of 56 cases of sore throat early in March in a village in Saratoga County has been traced to the consumption of raw milk. *Health News* reports that, although the epidemiologic investigation has not been completed, it is estimated that on the basis of the number of consumers of the suspected milk a total of 130 persons were affected. The illness was characterized by acute onset, severe sore throat with considerable purulent exudate, enlarged cervical glands and frequently, generalized symptoms including chills, fever and considerable prostration. The attack rate among persons drinking the incriminated milk was 36.4 per cent for those under 15 years of age and 44.1 per cent for those over 15 years. The health officer suspected an outbreak when 5 cases of sore throat, with onsets within a three day period, occurred in his practice. A house to house survey of a portion of the village showed that there were 31 cases among 79 consumers of milk from the implicated dairy and no cases among 55 consumers of milk from other dairies. Pasteurization of the suspected supply was instituted immediately, and no additional cases were reported with onsets occurring more than forty-eight hours after pasteurization was begun.

## New York City

**Symposium on the Premature Infant**—The Zeta chapter of Phi Delta Epsilon fraternity at Long Island College of Medicine, Brooklyn, announces a symposium with Dr. Sam Z. Levine, professor of pediatrics, Cornell University Medical College, New York, speaking on "The Handicaps of the Premature Infant." The discussion will be carried out by Drs. Charles A. Weymuller and Murray B. Gordon, professor of pediatrics and professor of clinical pediatrics, respectively, Long Island College of Medicine. The symposium will be presented at Hoagland Hall, Brooklyn, April 20.

## NORTH CAROLINA

**Tuberculosis Meeting Canceled**—At a recent meeting of the North Carolina Tuberculosis Association in Raleigh the executive committee voted to dispense with the usual annual meeting. Business matters will be settled at a meeting of the board of directors, the time to be announced later.

**Venereal Disease Education Institute**—Announcement is made of the recent establishment in Raleigh of the Venereal Disease Education Institute which is supervised by Mr. Capus M. Waymick, newspaper editor, High Point and by the state board of health, to disseminate educational material on venereal diseases. The institute is operated by the U. S. Public Health Service and the Zachary Smith Reynolds Foundation, which has been supporting public health work in North Carolina for many years.

## OHIO

**Use of Radio for Health Education**—The Institute for Education by Radio sponsored by Ohio State University will devote a section meeting to "The Use of Radio for Health Education" at the Deshler-Wallick Hotel, Columbus, May 1, under the chairmanship of David Resnick, director of public relations, National Society for the Prevention of Blindness, New York. Speakers will include:

Sterling W. Fisher, assistant public service counselor and director of the Inter American University of the Air, National Broadcasting Company, New York. The Role of the Broadcasting Industry in Health Education.

Dr. William W. Bauer, director, Bureau of Health Education, American Medical Association, Chicago. When Doctors Broadcast.

Daniel C. McCarthy, director of public relations, National Tuberculosis Association, New York. Selling Health by Radio.

Thomas C. Stowell, assistant director, division of public health education, New York State Department of Health, Albany. N. Y. Health on the Air Comes of Age in New York.

The Institute's annual conference will be held from April 30 to May 3.

**Vesalius Exhibit**—In commemoration of the quartercentenary of the foundation of modern anatomy by Andreas Vesalius, an exhibit has been arranged in the Cleveland Medical Library. The exhibit was prepared by the staff of the Cleveland Branch of the Army Medical Library and the books are largely from its collections. Two important items from the collection of the Cleveland Medical Library, however, include a copy of the second edition of the *Fabrica* (1555), presented to the association in 1893 by Dr. Howard A. Kelly, who died in January 1943, and a copy of the first edition of the compendium of Geminus plagiarized from Vesalius in 1945. All the works of Vesalius are represented in the exhibit, though not in every case by first editions. Included in the exhibit are two copies of the Geminus compendium, London 1545; the first edition of Fallopius' *Observations*, Venice, 1561; a copy of the attack on Vesalius by his former teacher Jacques Dubois (1551, represented by 1635 reprint) and a copy of the rare Murr reprint (1790) of the *Christianismi restitutio* of Servetus (1553), for which he was burned at the stake in Calvin's Geneva and which contains the earliest account of the pulmonary circulation perhaps arrived at when he was fellow prosector of Vesalius at Paris about 1536.

## TEXAS

**Exhibit of Rare Medical Books**—A special exhibit of rare medical books from the collections of Chauncey D. Leake, Ph.D., dean and vice president of the University of Texas Medical Branch, Galveston, and of the medical school library was held at the University of Texas Library, Austin. At the opening of the exhibit Dr. Leake spoke to premedical students and faculty members on "The Medical Books or Fine Printers' illustrating his remarks with particular emphasis on the *Fabrica* of Andreas Vesalius, first published in Basel four hundred years ago.



## GENERAL

**War-time Public Health Conference**—The American Public Health Association will sponsor a three day public health conference in New York, October 12-14. The seventy-second annual business meeting of the association will be held in connection with the conference, which will be devoted exclusively to war-time emergency problems as they affect public health and the public health profession. New York City was selected because more than 40 per cent of the association's membership is concentrated in and immediately around it.

**Report of Menninger Foundation**—The first annual report of the Menninger Foundation, Topeka, Kan. covering the period April 1941 to July 1942, has been received. Work was carried out during the first year of operation on education and treatment of neurotic children, hypnosis, occupational therapy and psychoanalytic training and psychologic testing. At the recent annual meeting all the officers of the foundation were reelected including Drs. Karl A. Menninger, president and William C. Menninger, secretary. An executive assistant, Jean Lyle Menninger, has been added to the staff to aid the secretary during his absence with the armed forces.

**Chemist Awarded Prize for Research in Milk**—Earle O. Whittier, Chem E. senior chemist of the bureau of dairy industry, U. S. Department of Agriculture, Washington, D. C. has been awarded the Borden Company Prize of \$1,000 for research in chemistry of milk. The prize, which was to be presented April 14 at a meeting of the society in Detroit, is given in recognition of researches in the chemistry of milk constituents. Dr. Whittier received his degree as a chemical engineer at the University of Maine, Orono in 1923. He had been a member of the teaching staff there from 1911 to 1915, when he went to Simmons College, Boston. From 1918 to 1921, when he joined the department of agriculture, he was research chemist at E. I. du Pont de Nemours and Company.

**Advisory Committee of Nutrition Foundation**—The Nutrition Foundation announces the following appointments to the food industries advisory committee: Franklin C. Bing, Ph.D., director, American Institute of Baking, Chicago; Edwin J. Cameron, Ph.D., director, Research Laboratories National Canners Association, Washington, D. C.; Lillian B. Storms, nutrition research, Gerber Products Company, Fremont, Mich.; Carl Nordgren, research chemist, Chr. Hensens Laboratories, Inc., Milwaukee; George C. Scott, M.S., director of research, Minnesota Valley Canning Company, Le Sueur, Louis; E. Dietrich, director of production and research, P. Duff & Sons, Inc., Pittsburgh; Roland A. Morck, research department, R. B. Davis Company, Hoboken, N. J.; Arthur Weber, process superintendent, National Sugar Refining Company, New York; and C. G. Harrel, director of research, Pillsbury Flour Mills Company, Minneapolis. The advisory committee serves as a liaison group between the foundation and the food industry.

**Conference to Consider Additions to Pharmacopeia**—A pharmacopoeial open conference, dealing with the forthcoming first U. S. P. XII bound supplement, will be held at the Hotel Pennsylvania, New York, April 23-24. The major subject for discussion Friday evening will be the U. S. P. XII requirement that multiple dose packages of parenteral solutions be limited in size to ten average doses. An all day program Saturday will cover about one hundred revisions and other alterations in monographs now official in the U. S. P. XII. Following the open conference and a consideration of suggestions and discussions the material will be printed as the first U. S. P. XII Bound Supplement. It was thought that this supplement would not be required for at least two years but demands by war interests and the increased revision tempo have required so many changes and additions that its immediate publication became necessary. It will be distributed without further charge to all purchasers of the U. S. P. XII who mail in the order coupon found inside the back cover of the U. S. P. XII.

**Medical Service Plans Meet in Chicago**—At a meeting of representatives of the various medical service plans, held in Chicago on February 14, it was agreed that an annual conference of representatives of such plans be held each year and that such a group form a council with president and secretary-treasurer. Dr. James C. McCann of Worcester, Mass., was elected president. Dr. Frank L. Feerabund of Kansas City, Mo., was elected secretary-treasurer. It was voted that a committee be appointed to act as a group to provide cooperation between the American Medical Association, the Canadian Medical Association and the new Medical Service Plans Council. The committee appointed consists of Drs. Chauncey L. Palmer

of Pittsburgh, chairman, Jason A. Hannah of Toronto and Robert L. Novy of Detroit. Mr. Jack Laux, Detroit, of the Michigan plan was appointed research director. It was also agreed that a meeting of this group be held at the time of the meeting of the House of Delegates of the American Medical Association in Chicago. Kansas City, Mo., was selected as the national headquarters for the council, and an annual contribution of \$25 was volunteered by each organization to pay the expenses of the function.

## HAWAII

**Island Health Activities**—William L. Zink, assistant surgeon, U. S. Public Health Service Reserve has been assigned to operate the new mobile x-ray unit of the Territory of Hawaii health board.—Dr. Alfred S. Hartwell, Honolulu, has recently been named medical director for Queen's Hospital. A new building has been constructed at the hospital to house the Honolulu Blood Bank. Funds were provided by the Office of Civilian Defense.—The Hawaii Territorial Society for Mental Hygiene was recently organized under the auspices of the Psychiatric Committee of the Hawaii Territorial Medical Association.—The name of Japanese Charity Hospital, Honolulu, has been changed to Kurekuni Hospital.—Major Charles L. Wilbur Jr., M. C. U. S. Army, has been appointed health officer of Maui County with headquarters in Wailuku.

## CANADA

**First Social Hygiene Day**—On February 3 the first Canadian Social Hygiene Day was observed under the auspices of the Health League of Canada according to the *Canadian Journal of Public Health*.

**Memorial to Physician at Queen's University**—Graduates of the Queen's University Faculty of Medicine, Kingston, Ont., have donated a number of old medical books to form the nucleus of a medical history collection to be used as a memorial to Dr. Thomas Gibson who at the time of his death was professor of the history of medicine at the university.

## LATIN AMERICA

**Pension Fund for Physicians**—President Batista of Cuba signed a bill on February 20 setting up a pension fund for physicians. The *New York Times* reported that the legislation creates a tax on all pharmaceutical products sold in Cuba and on the fees paid by members of cooperative health associations. Physicians will contribute 3 per cent of their earnings.

## FOREIGN

**Chadwick Lectures**—The series of Chadwick Public Lectures, arranged by the Chadwick Trust, Abbey House, Westminster, appears in the *British Medical Journal* as follows: M. Greenwood, February 23, on 'Social and Industrial Environment and Disease'; Dr. R. Crumckshank, March 16, 'Some Postwar Problems in the Control of Infectious Diseases'; Mr. T. Sharp, April 6, 'Town Planning and Public Health'; Dr. C. F. White, May 11, 'Health Problems in Rebuilt London'; and Mr. I. J. Chittenden, June 17, 'Plants Causing Irritation'.

## Government Services

## Results of Tuberculosis Surveys

Seventy-seven war industries in eleven different states were surveyed by the eight 35 mm. photofluorographic units operating in industry prior to February 1, according to the Office of Tuberculosis Control of the United States Public Health Service. A total of 194,896 individuals were x-rayed. Tabulations on results of the x-ray examination are available for 125,190 people. Of these, 1,631 or 1.3 per cent were found to have significant pulmonary tuberculosis. The distribution of the positive cases by stage of the disease was as follows: 874 or 53.6 per cent minimal, 707, or 43.3 per cent moderately advanced, and 50, or 3.1 per cent far advanced. In the District of Columbia 28,098 government workers have been x-rayed. Exactly 300 cases (1.1 per cent) of pulmonary tuberculosis have been discovered. Of these 182 (60.7 per cent) were minimal, 106 (35.3 per cent) moderately advanced and 12 (4.0 per cent) were far advanced. In addition 1,300 workers at the National Institute of Health have been x-rayed. Among these, 15 cases of tuberculosis were found, 9 minimal and 6 moderately advanced.



## Foreign Letters

### LONDON

(From Our Regular Correspondent)

Feb 27 1943

#### Reaction of Medical Association to the Beveridge Scheme

In a previous letter to *THE JOURNAL* (January 9 p 142) the Beveridge Report, which is a comprehensive scheme of social insurance with freedom from want as its goal was described. It is of profound importance to the medical profession for it proposes that the state should provide medical care, domiciliary as well as hospital for all. This might mean the extinction, or something near that, of private practice and conversion of the medical profession into state officials. Various committees of the British Medical Association have been studying the report and their recommendations have been brought before the council, which has framed a motion for transmission to the representative body of the association. This motion recommends that if Parliament accepts the report as a whole including a scheme for comprehensive health and rehabilitation services for the prevention and cure of disease and restoration of capacity to work available to all members of the community, the association would be willing to cooperate in the preparation of such a scheme, provided (1) that the character terms and conditions of the medical service are determined by negotiation and agreement with the medical profession, (2) that the members of the community who decide not to avail themselves in part or in whole of the benefits of the service open to them should not be precluded from obtaining the medical services they desire from doctors within the scheme paying for such services privately, with the necessary safeguards to prevent abuse. This recommendation will be considered by a special meeting of the representative body and of the panel conference and by a joint meeting of the two at the end of March. In the interval the divisions of the association will consider the council's recommendation.

The decision of the council is evidently due to two considerations. The medical profession could not refuse cooperation with the Beveridge scheme of social reform from which so much is hoped, if it is adopted by Parliament. The majority of the profession is opposed to the total abolition of private practice and the conversion of physicians into government officials. To prevent this, the second provision of the council's recommendation has been framed.

#### Scheme for the Prophylaxis of Tetanus

The prophylactic scheme against tetanus differs in the British and American armies. The American army, like the Canadian, relies entirely on active immunization while the British uses also passive immunization. The soldier gets a dose of toxoid on joining, a second dose about six weeks later and a further dose every twelve months. According to the *Army Medical Bulletin* (November 1942) this procedure sets up a 'shadow factory' for antitoxin and keeps it in commission but it does not maintain the circulating antitoxin at a constant high level. When tetanus organisms enter the body there may be a danger period of several days before the shadow factory begins to produce antitoxin in quantity and it is necessary to protect the patient during this danger period by giving him antitoxin at least 3000 units as soon as possible after he is wounded. This routine passive immunization has the advantage that it covers any men who may have refused or escaped active immunization. But such men will require two extra doses of 3000 units at weekly intervals to make them safe.

In the American army active immunization is compulsory and is carried further. Not only does the recruit receive three spaced injections of toxoid but on entering a theater of war he has a fourth dose and renewal doses every four months thereafter. The American authorities believe that these inoculations maintain so high a level of circulating antitoxin that passive immunization after wounding is unnecessary. Instead of antitoxin American soldiers are given a final 'boosting' dose of toxoid.

As in warfare American wounded may be brought to British hospitals and vice versa, the following arrangement has been made. The American authorities have asked that their soldiers should receive a boosting dose of toxoid instead of the British dose of antitoxin and the Canadian authorities have made the same request. This will be done whenever possible. On the other hand the American authorities have agreed that British wounded in American hospitals shall receive prophylactic antitoxin.

#### Medical Research in the Army

The medical corps of the British army has a long and distinguished record of medical research. To it is due much of our knowledge of disease in the British colonies. It now has medical research sections at home and abroad whose task is to bring to light urgent problems and advise on their solution. The *Army Medical Bulletin* for November 1942 points out that the health of a mechanized army is a matter of infinite detail and roving research cannot cover the whole ground. Often the person most likely to know what is needed is the junior medical officer who lives among the troops. He is in the best position to detect avoidable causes of sickness, disability and overstrain.

In industrial medicine the emphasis shifted a few years ago from the cure to the prevention of disease and is now shifting toward the maintenance of health in each particular occupation. The same is happening in the army. It is for the medical officer to notice the cramped position, the visual fatigue, the failure of vitality, the cold hands, the diarrhea or the incipient heat stroke. Medical officers who have noted specific problems of bodily or mental efficiency susceptible of solution by themselves or others are asked to forward them to the Director of Medical Research to the Army whose task is to coordinate investigations and initiate inquiries.

The role of the medical services as experts in all that concerns the human factor in warfare has been formally recognized by the military authorities. For some time the army council has had a scientific adviser. Sir Charles Darwin, FRS, but he and his staff are concerned only with weapons, equipment and ways of making war. A need was felt for a complementary adviser on the biologic side. The director of medical research, Brigadier F A E Crew, FRS, will henceforth fulfil this function on the same level as the scientific adviser. In doing so he will require all possible information on great matters and on small from the periphery and especially from the field.

#### Sir William Arbuthnot Lane

Sir William Arbuthnot Lane has died in his eighty-seventh year. He was trained at Guy's Hospital, passing the examination for fellowship of the Royal College of Surgeons when he was only 26. His first appointment was demonstrator of anatomy at Guy's, to be followed by surgeon to the Hospital for Sick Children, Great Ormond Street, and assistant surgeon to Guy's. He published a long series of papers on the most diverse subjects marked by daring originality. His first surgical innovation was excision of a piece of rib in treating an empyema. His next to operate for cleft palate early in life. He introduced the screwing or plating of fractures of long bones when accurate apposition could not otherwise be obtained. He published *The Operative Treatment of Fractures*. His skill in the operative

treatment of comminuted fractures of the femur was amazing. He was much interested in the disorders of the skeleton, which he traced to pressure changes induced by the patient's occupation. He pointed out that these changes revealed the work done during life. Thus the skeleton of the cobbler or the washerwoman was characteristic, and the effect of the corset on the abdominal viscera affected the mechanics of the foot. He saw in the skeleton the crystallization of lines of force. He boasted that he could tell in the dissecting room the occupation followed during life by a manual worker. At the beginning of the century he began to teach that much ill health was due to stagnation in the large intestine (intestinal stasis). He denounced the usual view that one daily evacuation was sufficient and said that if man reverted to the habit of three motions daily many diseases, including cancer, would disappear. He described a kink due to formation of thin tags of peritoneum which anchored the iliac colon. These he attributed to excessive straining caused by fecal accumulation in the colon. He treated some cases by excision of the colon. A great fighter, his failure to convince the profession only spurred him to increased polemics in the form of many papers, culminating in his book "The Operative Treatment of Chronic Constipation." He felt so strongly on the subject that he resorted to the lay press and ended by resigning his membership in the British Medical Association and founding the New Health Society to promote his hygienic gospel. Thus a great surgeon ended a long life as a medical crank.

## BUENOS AIRES

(From Our Regular Correspondent)

Jan. 12, 1943

### The Faculty of Medicine of Rosario

The Faculty of Medicine of Rosario, founded in 1920, is formed now by the schools of medicine, odontology, pharmacy, biochemistry, obstetrics, legal medicine and pediatrics and is one of the various faculties of the University of the Litoral. The number of students has grown from 173 in 1920 to 3,600 at present. Up to 1940 a total number of about 2,800 professionals, including more than 1,000 physicians, have graduated from the faculty. The development of scientific research work has been hindered to some extent because of the shortage of money and of research material. Only a group of teachers among those who work on a full time program are devoted to both teaching and research. Several medical societies of the various medical specialties have been founded by the members of the various departments of the faculty, scientific journals have been established and a large assembly hall founded. The hospital Nacional Centenario with 650 beds is the main focal point of the faculty. The number of hospitalized and ambulatory patients who have consultation and medical care annually is 10,000 and 100,000 patients respectively. There are also clinics of all the specialties, an institute of psychiatry, a hospital for the insane and a school for children with retarded mentality. There are also a central library of the faculty and a classic library of the chair of history of medicine.

### Public Health in Paraguay

General Don Higinio Morínigo M., the president of Paraguay, in his presidential message, recently delivered, spoke on the constant progress of the national organization of public health in the country. The problems of hygiene and public health are given proper attention all through the country, even in the remote villages and rural places. An antimalarial crusade was recently successfully completed notwithstanding the fact that malaria had rapidly flared up all through the country in violent form. New hospitals are in construction, and those which are

already functioning are modernized. Industrial hygiene is also improved. Laws have been given by which workers and their families have free medical care and drugs. The antituberculosis crusade is directed by a committee of specialized experts. New posts for free distribution of milk for infants and centers for therapy of venereal and syphilitic diseases have been opened to the public. The organization of a national department of nutrition and studies for establishment of obligatory social insurance are in progress.

### Malignant Lymphogranulomatosis

Dr. A. A. Ferraris recently reported clinical studies on 15 children who suffered from malignant lymphogranulomatosis in the Hospital of Niños of Córdoba. The patients between the ages of 5 and 12 years were all boys except 1. The disease began with a ganglionic tumor of slow development in the neck in 12 cases. In 3 cases the disease began with acute abdominal symptoms which suggested an emergency operation. There was splenomegaly in 70 per cent of the cases and moderate hepatomegaly in 60 per cent of the cases. The Mantoux intradermal test was carried on in all cases in concentrations of 1:10, positive results were observed in only 2 patients. The same proportion of positivity is obtained in normal children of the city. Two patients had pruritus. Twelve had moderate fever and 3 had no fever. There was a moderate leukocytosis with neutrophilia and without eosinophilia in all cases, notwithstanding that the ganglions showed a large number of polymorphonuclear eosinophils on microscopic study. There was leukopenia with figures varying between 4,000 and 2,000 leukocytes in 3 cases. There were also changes in the erythrocytes of the type of hypochromic anemias. In all cases the histopathologic study of the enlarged ganglions gave results for a proper diagnosis of the disease and the Sternberg cells were found in the specific granulation tissue. The Sternberg cells were scanty in some cases and abundant in some whereas the polymorphonuclear eosinophils were abundant in all cases. Giant cells similar to those of Langhans were observed in the blood of 2 patients with and without positive results of the Mantoux test respectively. The microscopic study of material obtained during a necropsy showed the ordinary involvement of the various organs by the disease. In the bone marrow of the sternum and of other bones the hemopoietic tissue was replaced by granulation tissue only partially (in foci) and late in course of the disease. In all cases death occurred within one to five years notwithstanding that roentgen therapy was administered.

### Erythroblastic Anemia

Dr. M. Acuña, president of the Society of the Instituto de Pediatría y Puericultura of the Hospital de Clínicas of Buenos Aires, in a recent lecture before this society said that erythroblastic anemia of Cooley's type in infants (also called erythroblastic anemia of either von Jaksch's or Luzet's type) should be differentiated by any of these names from any other forms of anemia in infants. The speaker reported two series, one of 4 and another of 7 cases. The clinical course consisted in early appearance of progressive anemia, hepatomegaly, splenomegaly, presence of erythroblasts in the blood, osteoporosis of the skeletal bones, congenital familial ethnic character and lack of any disease which could have been considered as cause of anemia. All the patients formerly lived in the Mediterranean area. There were several patients in the family of all patients but there were also normal children. Even in couples of twins one was ill and the other was normal. The disease appeared in the course of the first six months of life of the patients and was of the typical form when the infants reached 1 year of age. The cause was unknown in all cases. The 4 patients in the first series and 6 patients of the second series died. The patient in the second group who is still living is in a grave condition.

## Deaths

**Arnold Carl Klebs**, Nyon, Switzerland, medical humanist and student of the scientific and medical literature of the 15th century, died at his villa Les Terrasses, Nyon March 6 aged 72.

Dr Klebs was born in Berne, Switzerland, March 17, 1870. He was a son of Dr Edwin Klebs who, with Loeffler, had discovered the diphtheria bacillus. After his graduation in 1895 at the Universität Basel Medizinische Fakultät, Dr Klebs was for a time assistant in the polyclinic at the Basel University and pathologic instructor at the University of Zurich. In 1896 he came to the United States and devoted himself to the study of tuberculosis. For a time he was head of the tuberculosis sanatorium at Citronelle, Ala., later going to Chicago, where his father had been professor of pathology at Rush Medical College since 1896. In 1904 he became a citizen of the United States. During his years in Chicago he served as consulting physician to the Cook County Institutions and as director of the Chicago Tuberculosis Institute. Dr Klebs returned to Switzerland in 1909, from 1915 to 1918, Washington, D. C., and 1918 to 1919, New York, where he returned again for one year in 1926. Dr Klebs was vice president of the section on preventive diseases of the International Congress on Hygiene, Washington, in 1912. At one time he had held membership in the American Chemical and Climatological Association, the National Tuberculosis Association and numerous foreign and scientific societies. When Dr Klebs took up permanent residence in Switzerland he dropped his membership in the Illinois State Medical Society and fellowship in the American Medical Association.

Following the last war Dr Klebs came to the United States once each year until 1930, when poor health forced him to abandon his annual expeditions. His last trip was in April 1939, when he came secretly to surprise the late Dr Harvey Cushing on his seventieth birthday, which the Harvey Cushing Society was celebrating in New Haven, Conn.

Dr Klebs had written extensively on medical and historical subjects. In 1909 he was the editor of the American Treatise on Tuberculosis, History of Variolation, 1914, Leonardo da Vinci Studies, 1916, Tuberculosis and Military Organization, 1917, Bibliography of Medical Incunabula, 1917, 1918, Early Herbals (Lugano), 1925, and Incunabula Scientifica et Medica 1938. Dr Klebs was a close friend of Osler, Welch and Cushing and it was because of his long friendship with Cushing that he became affiliated with Yale and the Yale Medical Library.

**William Hoffman Gardner Logan** ♂ Chicago, Chicago College of Dental Surgery, 1896, American College of Medicine and Surgery, Medical Department of Valparaiso University, 1903, dean of the faculty and professor of plastic and oral surgery at the Chicago College of Dental Surgery Dental School of Loyola University, past president of the National Dental Association, Illinois State Dental Society, Chicago Dental Society, the seventh International Dental Congress and the American Association of Dental Schools, formerly vice president and president of the International Dental Federation, specialist certified by the American Board of Plastic Surgery, member of the American Association of Oral and Plastic Surgeons, fellow and a member of the board of governors of the American College of Surgeons, during World War I served as chief of the dental division of the Surgeon General's Office in Washington, D. C., member of the general medical board of the Council of National Defense, secretary from 1929 to 1933 and member of the board of governors from 1933 to 1941 of the Gorgas Memorial Institute of Tropical and Preventive Medicine, received the honorary degrees of doctor of laws from Loyola University in 1926 and the National University of Ireland, Dublin, in 1940, master of science from the University of Michigan, Ann Arbor, in 1930, was awarded the William Jarvie Fellowship Medal of the Dental Society of the State of New York, senior attending surgeon in oral surgery at the Michael Reese Hospital, on the staffs of the Cook County and St. Joseph's hospitals, aged 70, died, April 6, of coronary thrombosis.

**James Bassett McElroy** ♂ Memphis, Tenn., College of Physicians and Surgeons, Baltimore, 1893, professor of medicine, for many years chief of the division of medicine and at one time acting dean, member of the board of trustees and chairman of the faculty of the University of Tennessee College of Medicine, formerly professor of pathology at the Memphis Hospital Medical College, where in 1905 he served as chief of the dispensary and as lecturer in physical diagnosis, specialist

certified by the American Board of Internal Medicine, secretary of the Section on Practice of Medicine of the American Medical Association, 1902-1903, past president of the Tennessee State Medical Association and the Memphis and Shelby County Medical Society, member of the Southern Medical Association and the American Society of Tropical Medicine, fellow and ex-governor of the American College of Physicians, chief of staff and physician in chief of the medical division of the Memphis General Hospital now known as the John Gaston Hospital, on the staff of the Baptist Memorial Hospital, in 1934, at the commencement exercises of the University of Tennessee College of Medicine, his portrait was presented to the university by members of the faculty and the alumni, aged 76, died, March 24.

**William Birket Arnold**, St. Albans, Vt., Bellevue Hospital Medical College, New York, 1888, member of the Vermont State Medical Society, served as city health officer and city physician for many years, on the staff of St. Albans Hospital, aged 83, died, February 27, of heart disease.

**Walter Milo Barnum**, Kent, Conn., College of Physicians and Surgeons, New York, 1883, also a druggist, aged 83, died, February 19, of coronary occlusion.

**Robert Lee Beaumont**, Kansas City, Mo., Beaumont Hospital Medical College, St. Louis, 1889, aged 80, died, January 20, in the Armour Memorial Home of chronic myocarditis.

**Sylvester Robert Best**, Gary, Ind., Ohio Medical University, Columbus, 1898, member of the Indiana State Medical Association, aged 70, died, February 13, in St. Mary's Mercy Hospital of coronary occlusion.

**James Emmett Blagg**, Philadelphia, Eclectic Medical Institute, Cincinnati, 1905, member of the Medical Society of the State of Pennsylvania, aged 67, died recently in the Jewish Hospital of coronary thrombosis.

**John Willet Bruner** ♂ Bloomsburg, Pa., Jefferson Medical College of Philadelphia, 1890, fellow of the American College of Surgeons, aged 77, instrumental in the founding, surgeon in chief on the staff and member of the board of directors of the Bloomsburg Hospital, where he died, February 10, of uremia.

**Cornelius E. Cain**, Whitley City, Ky., Barnes Medical College, St. Louis, 1901, a director of the Bank of McCreary County, aged 70, died, February 6, in Washington, D. C., of brain tumor.

**Hanford Carvell**, Gloucester, Mass., Baltimore Medical College, 1910, member of the Massachusetts Medical Society, aged 67, member of the senior staff of the Addison Gilbert Hospital, where he died, February 15, of virus pneumonia and myocarditis.

**William Cogswell Clarke**, Cornwall Bridge, Conn., Columbia University College of Physicians and Surgeons, New York, 1899, member of the Connecticut State Medical Society, served as professor of experimental surgery at his alma mater and surgical pathologist to the Presbyterian Hospital, New York, member of the consulting staff of the Sharon (Conn.) Hospital, aged 71, died suddenly, February 14, of coronary occlusion.

**William Henry Conner**, Fort Wayne, Ind., Howard University College of Medicine, Washington, D. C., 1894, aged 81, died, February 19, of influenza and myocarditis.

**Augustus Ernest Cordes** ♂ Brooklyn, Albany (N. Y.) Medical College, 1899, served during World War I, aged 70, died, February 14, of coronary thrombosis.

**Edward F. W. Crawford**, La Porte, Ind., Detroit College of Medicine, 1894, member of the Indiana State Medical Association, aged 73, on the staff of the Holy Family Hospital, where he died, February 4, of myocarditis.

**Oren Louis Cuddy**, Lincoln, Mo., Barnes Medical College, St. Louis, 1903, member of the Missouri State Medical Association, past president of the Benton County Medical Society, for thirty years local and dispensing surgeon for the Missouri Pacific Railway Company, for ten years served as city physician, served on the advisory board and as a member of the medical reserve corps during World War I, aged 67, on the staff of the Bothwell Memorial Hospital, Sedalia, where he died, February 19, of pneumonia and coronary embolism.

**Charles Louis Davis**, Batavia, N. Y., University of Buffalo School of Medicine, 1907, member of the Medical Society of the State of New York, served on the staffs of the Batavia and St. Jerome hospitals, New York State School for the Blind and the Genesee County Home-Infirmiry, aged 60, died, February 19, of carcinoma of the rectum.

**Francis Asbury De Mand** \* Oklahoma City University of Oklahoma School of Medicine, Oklahoma City, 1917 served in France during World War I, associate in obstetrics at his alma mater, aged 50, on the staffs of St. Anthony Hospital and the University Hospital, where he died, February 11, of rheumatic heart disease

**Albert Edward Doe**, Chicago Chicago Medical School, 1921, a member of the medical department of the Chicago Rapid Transit Company, aged 61, died February 13, in the Albert Merritt Billings Hospital of pneumonia following an operation

**Joseph Alexander Driscoll**, Brooklyn Long Island College Hospital, Brooklyn, 1908, formerly physician to the District Attorney's office, served on the staffs of St. Catherine's and the Caledonian hospitals, aged 56, died, February 18, of cerebral hemorrhage and uremia

**Joseph Baylis Earle**, Greenville S. C. University of Virginia Department of Medicine Charlottesville 1886 member of the South Carolina Medical Association formerly medical director of the Pioneer Life Insurance Company and the Liberty Life Insurance Company, aged 80 died February 10 of heart disease

**Lewis H. Edwards**, Monroeville Ind. Fort Wayne College of Medicine 1883 aged 82, died February 12 in the Adams County Memorial Hospital, Decatur, of chronic myocarditis and pneumonia

**Adolf A. Eisenheimer**, Akron, Ohio Julius Maximilians Universitat Medizinische Fakultät, Würzburg Bavaria, Germany, 1912, aged 56, died, February 15 of coronary occlusion

**Jacob Nathaniel Feinberg** \* Long Island City, N. Y., University and Bellevue Hospital Medical College New York, 1914, on the staff of St. John's Long Island City Hospital vice president and on the staff of the Boulevard Hospital where he died, February 10, of coronary thrombosis, aged 53

**Attilio H. Giannini**, Los Angeles University of California Medical Department San Francisco 1896 for many years a banker and motion picture executive, aged 68 died February 7 of heart disease while attending a meeting of the board of trustees of Loyola University

**Earl P. Gray**, Wilkesburg, Pa. Western Pennsylvania Medical College, Pittsburgh 1897, aged 73, died, February 24 of chronic nephritis and cirrhosis of the liver

**Lesser Bernhardt Groeschel** \* Mount Vernon, N. Y., Columbia University College of Physicians and Surgeons, New York, 1906, specialist certified by the American Board of Radiology, Inc., member of the American Roentgen Ray Society and the American College of Radiology, roentgenologist at the Northern Westchester Hospital Mount Kisco St. Joseph's and the Professional hospitals Yonkers, and the Seton Hospital, New York, aged 56 died, February 23 in Scarsdale of coronary thrombosis

**Elmer Garrison Harris**, Los Angeles National University of Arts and Sciences Medical Department, St. Louis, 1918 served in the medical corps of the U. S. Army during World War I on the staff of the Presbyterian Hospital-Olmsted Memorial aged 50 died February 14, in the Veterans Administration Facility, West Los Angeles of spinal sclerosis

**George Frey Hermann Sr.**, Cincinnati Cincinnati College of Medicine and Surgery, 1896, aged 72, died, February 20 in the Bethesda Hospital of coronary disease

**Charles Clinton Hoagland**, Berkeley, Calif. Northwestern University Medical School Chicago, 1906 served on the staff of the Ernest V. Cowell Memorial Hospital, University of California aged 63, died, February 10 of coronary occlusion

**Alvah Alexander Howell**, New Lebanon Ohio Starling Ohio Medical College Columbus, 1911, aged 65, died February 15, in the Miami Valley Hospital, Dayton, of pulmonary tuberculosis

**John Preston Huff**, Cartersville Ill. St. Louis College of Physicians and Surgeons, 1909, aged 62 died, February 25, of cerebral hemorrhage

**Sergius M. Ingermar**, New York Universitat Bern Medizinische Fakultät Switzerland, 1889 member of the Medical Society of the State of New York and the American Academy of Ophthalmology and Otolaryngology, past president of the Russian Medical Society, aged 74, consultant in ophthalmology at the Beth David Hospital, where he died, February 18 of cerebral hemorrhage

**George Boerstler Kistler**, Newcomerstown, Ohio, Columbus Medical College, 1892, member of the Ohio State Medical Association, past president of the Tuscarawas County Medical Society, aged 76 was found dead in bed February 15

**Albert Joseph Lawler** \* Niagara Falls N. Y., Niagara University Medical Department, Buffalo, 1898 fellow of the American College of Surgeons on the staff of St. Mary's Hospital, aged 65, died, February 16 of burns received when his clothes ignited while he was smoking

**James M. Lemons**, Pine Bluff, Ark. Memphis (Tenn.) Hospital Medical College, 1893, member and past president of the Arkansas Medical Society and the Jefferson County Medical Society, aged 80, died, February 3, of arteriosclerosis and chronic nephritis

**Clarence M. Lentz**, Albemarle, N. C. North Carolina Medical College, Charlotte, 1909, past president and secretary of the Stanly County Medical Society, served as county coroner, on the staff of the Yicklin Hospital, aged 57, died, February 13, of coronary thrombosis

**Edgar Miller Long**, Hamilton, N. C. University of Maryland School of Medicine, Baltimore, 1909, aged 56, died February 24 in the Park View Hospital, Rocky Mount of adrenal insufficiency

**Emil Lustig**, St. Petersburg, Fla., University of the City of New York Medical Department, 1883, member of the Florida Medical Association, also a pharmacist, medical examiner for the Selective Service Board in Buffalo during World War I, served on the staff of the Mound Park Hospital, aged 86, died, February 23, of heart disease

**George Lyford**, Cincinnati University of Cincinnati College of Medicine, 1925, member of the Ohio State Medical Association, on the staffs of the Cincinnati General and the Christian R. Holmes hospitals, medical director of the Union Bethel Clinic, aged 44, died, February 15, in the Christ Hospital of pneumonia and myocarditis

**John Current McIntire**, St. Louis, University of Louisville (Ky.) Medical Department, 1898 member of the Missouri State Medical Association, aged 66 on the staff of the Christian Hospital, where he died, February 16, of myocarditis

**Sterling Price Martin**, Blytheville, Ark., Barnes Medical College, St. Louis, 1903, served as city health officer, aged 70 died, February 1, in the Walls Hospital of angina pectoris

**Americus Vespucius Menefee**, Covington Ky., Louisville (Ky.) Medical College, 1892, member of the Kentucky State Medical Association, served during World War I, aged 71, on the staff of St. Elizabeth Hospital, where he died February 17, of lobar pneumonia

**Henry Taylor Miller** \* Washington, D. C., University College of Medicine, Richmond, Va., 1905, aged 61, staff surgeon at the Episcopal Eye Ear and Throat Hospital and the Doctors Hospital, where he died, February 7, following an operation for prostatic hypertrophy, paralytic ileus and heart disease

**Alney Neal Minear**, Inglewood, Calif. Medico Chirurgical College of Kansas City, Mo., 1905, member of the Utah State Medical Association, for many years practiced in Salt Lake City, aged 74, died January 11, in a hospital at Los Angeles of nephritis

**Brutus Caesar Moore**, Albemarle, N. C., Jefferson Medical College of Philadelphia, 1886, aged 86 died, February 22, of coronary thrombosis

**Julia Mary Lombard Moriarty**, Newton, Mass. Boston University School of Medicine, 1895, aged 70, died, February 16 in the Massachusetts General Hospital, Baker Memorial Boston, of hemorrhage and duodenal ulcer

**Ralph Luther Morse** \* Norwalk, Ohio, University of Michigan Department of Medicine and Surgery, Ann Arbor 1902 on the staff of the Norwalk Memorial Hospital, aged 68 died February 21, of influenza and heart disease

**Charles Borromeo O'Rourke**, East Providence, R. I. Baltimore Medical College, 1907 member of the Rhode Island Medical Society, served during World War I, medical examiner for East Providence for many years, head of the medical examining board of the local draft board, on the staff of St. Joseph's Hospital formerly chairman of the East Providence branch of the Providence Chapter of the American Red Cross, aged 58 died February 13, in Providence of acute myocarditis

**Milton Jay Parke**, Lakewood Ohio, Western Reserve University Medical Department, Cleveland 1890 formerly on the staffs of St. Johns and St. Vincent Charity hospitals Cleveland, aged 79 died, February 9, of coronary sclerosis

**James Fred Pfahler**, Berwick, Pa. University of Pennsylvania Department of Medicine, Philadelphia, 1901 member of the Medical Society of the State of Pennsylvania served on the Berwick Hospital on the board of health and school board, aged 65, died suddenly, February 8 of coronary thrombosis

**Don Pierce**, Wyandotte, Mo., Barnes Medical College, St. Louis, 1901 member of the Missouri State Medical Association, aged 68, died recently of pneumonia and arthritis

**John Hunter Pope**, Tyler, Texas, Tulane University of Louisiana School of Medicine, New Orleans, 1918 served during World War I, member of the staff of the Mother Frances Hospital, aged 48, died, February 12, of a gunshot wound received while he was cleaning a pistol

**Katherine Porter**, Palo Alto, Calif., Johns Hopkins University School of Medicine, Baltimore, 1898, aged 72 died recently of cerebral hemorrhage

**George William Purefoy**, Asheville, N. C., Jefferson Medical College of Philadelphia, 1876, at one time a member of the county board of health, formerly on the staff of the Asheville-Biltmore Sanitarium, Biltmore, aged 92 died, February 23, of arteriosclerosis

**Paul Emil Rauschenbach**, Paterson, N. J., University of Virginia Department of Medicine, Charlottesville, 1904, member of the Medical Society of New Jersey, formerly served as city physician, aged 70, for many years served as director of the orthopedic clinic at the Paterson General Hospital, where he died, February 23, of embolism, heart disease and pneumonia

**James Denny Reed**, Covina, Calif., Bellevue Hospital Medical College, New York, 1883, formerly served on the school board, as president of the Chamber of Commerce and as bank president, aged 84 died January 29, in the Covina Hospital of pneumonia

**Francis Gurney Reese** \* Conduersport, Pa., University of Pennsylvania Department of Medicine, Philadelphia, 1895 served as president of the Potter County Medical Society and also as a member of its board of censors, formerly health officer, aged 72, died recently of carcinoma of the pancreas

**John Franklin Reynolds**, Mount Sterling, Ky., Hospital College of Medicine Louisville, 1890, died, February 10 of myocarditis, arteriosclerosis and gangrene of the right foot

**William Bernard Riley**, Lawrence, Mass., Harvard Medical School Boston 1911 served as city bacteriologist examiner for the Selective Service Board number 80 and examiner for the federal industrial accident board aged 58 died February 12, in the Lawrence General Hospital of cerebral hemorrhage

**Francis Emerson Rosenberger** \* Oklahoma City, Beaumont Hospital Medical College, St. Louis, 1901, member of the Oklahoma County Sanitary Board, served on the medical advisory board during World War I aged 68, died, February 8, in the Polyclinic Hospital of heart disease

**Jacob Coby Rosenblueth**, New York, College of Physicians and Surgeons, New York, 1892, member of the Medical Society of the State of New York, aged 71 died February 21, of carcinoma

**Abram S. Samuels** \* Baltimore, College of Physicians and Surgeons, Baltimore, 1898 also a pharmacist, clinical professor of gynecology at the University of Maryland School of Medicine and College of Physicians and Surgeons member of the Society of American Bacteriologists, fellow of the American College of Surgeons, served on the staffs of the Mercy and Sinai hospitals, aged 66 died, February 7, of coronary thrombosis

**Howard William Schaffer** \* Philadelphia, University of Pennsylvania School of Medicine Philadelphia, 1921, diplomate of the National Board of Medical Examiners, aged 46, on the staffs of the Memorial Hospital Germantown Hospital and the Philadelphia General Hospital, where he died, February 11 of carcinoma of the bladder

**Walter Jordan Sener**, Media, Pa., Temple University School of Medicine, Philadelphia, 1911 member of the Medical Society of the State of Pennsylvania and of the American Academy of Ophthalmology and Otolaryngology aged 66 died recently of coronary occlusion

**Harriet Belle Henry Short**, Riverside, Calif., Northwestern University Woman's Medical School, Chicago, 1899, aged 71, died, January 31, of myocarditis

**Percy Clinton Snowden**, Peekskill, N. Y., University of Vermont College of Medicine, Burlington, 1893, member of the Medical Society of the State of New York, formerly on the staff of the Peekskill Hospital aged 74 died, February 7, in the University Hospital, Coral Gables, Fla., of pneumonia

**George Omar Speirs** \* Spearville, Kan., Rush Medical College, Chicago, 1900, fellow of the American College of Surgeons, formerly secretary of the Ford County Medical Society, councilor of the Twelfth District of the State Medical

Society, formerly mayor of Ellinwood, served on the city council and as mayor of Spearville for several terms, recently an examiner for the Hodgeman County draft board on the staffs of St. Anthony's Hospital, Dodge City, and the Perkins Hospital, aged 67 died, January 28

**James Wesley Stack**, Crumpton, Md., University of Maryland School of Medicine, Baltimore 1893, past president of the Queen Annes County Medical Society served as magistrate at Crumpton for many years, judge of the Queen Annes County Orphans Court from 1934 to 1938, aged 75, died, January 31

**Joseph Francis Xavier Stack**, Hoboken, N. J., Bellevue Hospital Medical College New York, 1896, health commissioner of Hoboken for thirty-three years, aged 71, on the staff of St. Mary's Hospital where he died, February 17, of bronchopneumonia and cerebral hemorrhage

**Earl Minor Stewart**, Eagle, Neb., College of Physicians and Surgeons Baltimore 1900, at one time practiced in Imperial, where he had for sixteen years been a member of the Chase County High School Board a county coroner, vice president of the Farmers and Merchants Bank and chairman of the Chase County Red Cross, aged 71 died, February 14 in Lincoln of terminal hypostasis due to cerebral arteriosclerosis

**Edward von Toll**, Pasadena, Calif., St. Louis College of Physicians and Surgeons, 1905, aged 75, died recently of hypostatic pneumonia

**Otto Theodore Walser**, St. Louis, Marion-Sims Beaumont Medical College St. Louis 1902, aged 62, served on the staff of the Evangelical Deaconess Home and Hospital where he died, February 4 of heart disease

**Edward Spann Warlick**, Asheville, N. C., University of Nashville (Tenn.) Medical Department, 1888 also a druggist aged 76, died February 5, in the Aston Park Hospital of heart disease

**John Thomas Welch**, Chicago, Chicago Homeopathic Medical College, 1901, aged 77, died, February 6, of carcinoma of the colon

**Walter Balthasar Wellbrock**, Lindenhurst, N. Y., Long Island College Hospital, Brooklyn, 1901, at one time village trustee school physician and mayor of Lindenhurst, visiting physician to Dr. King's Hospital, Bay Shore, aged 67, died February 3, of coronary thrombosis

**William Willing Wilkinson** \* Phoenix, Ariz., Northwestern University Medical School, Chicago, 1901, member of the staff of St. Joseph's Hospital and the Good Samaritan Hospital aged 73, died, January 27 of injuries received when his automobile was struck by a train

**Samuel William Woodhouse Jr.**, Philadelphia, Jefferson Medical College of Philadelphia, 1895, formerly curator and acting director of the Philadelphia Museum of Art, medical director of the American Red Cross in southern France during World War I aged 69, died, February 1, of cerebral hemorrhage

#### DIED WHILE IN MILITARY SERVICE

**Thomas Henry Cheavens** \* Dallas, Texas, Baylor University College of Medicine Dallas 1928, since 1938 associate professor of clinical neuropsychiatry at his alma mater, where he was assistant in clinical neuropsychiatry from 1929 to 1931, instructor from 1931 to 1935 and assistant professor from 1935 to 1938 member of the American Psychiatric Association, specialist certified by the American Board of Psychiatry and Neurology, Inc., dispensary neuropsychiatrist and associate neuropsychiatrist Baylor and Parkland hospitals, on the staff of the Timberlawn Sanitarium, began active duty in April 1942 as a lieutenant commander in the medical corps of the U. S. Naval Reserve psychiatrist at the U. S. Naval Hospital San Diego, Calif. where he died, February 23, of hemorrhagic encephalitis, aged 39

**John Thompson Shaffer** \* Sellersville, Pa., University of Pennsylvania School of Medicine Philadelphia 1929, served as president of the Bucks County Medical Society, on the staff of the Grand View Hospital, an examining physician for the Bucks County Draft Board number 4 at Quakertown, extended active duty began in May 1942 as a captain in the medical corps, Army of the United States, attached to the 321st Air Base Squadron, Kellogg Field, Battle Creek, Mich. where he died, February 21 of coronary occlusion aged 38

## Correspondence

### PHYSICIANS MUST VOLUNTEER FROM LARGE CITIES

*To the Editor*—The editorial entitled "Physicians Must Volunteer from Large Cities" in the March 27 issue of THE JOURNAL states that "the responsibility" for the lagging in procurement of medical officers "rests unquestionably on the failure of young available physicians in the large cities of the country, particularly those of the eastern seaboard, to volunteer, and for a solution recommends 'the pressure of public opinion'."

But why are available physicians from the cities not volunteering? These men are no less patriotic than their country cousins and are just as eager to do their part. They resent, however, the fact that many physicians within the draft age are considered "essential" for hospital work, part time teaching, part time research or part time industrial work, an arrangement which permits these men to continue their private practice. The others feel that their obligations and family responsibilities are as great as those of the "essential" men in their own age group. They are particularly disturbed about single men in this deferred category. They know that there are enough qualified men over draft age in cities to take over all part time hospital and clinical work. They feel that whatever medical research is necessary to the war effort should be done on a full time basis, preferably under the direct supervision of the Army and Navy.

The removal of preferential ratings for part time clinical work or teaching would place all physicians within the draft age on an equal footing. They would then have neither reason nor excuse for not volunteering, and it might be unnecessary to call them "before the bar of public opinion" by publishing their names in medical journals.

EDITORIAL BOARD, *Norfolk Medical News*

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### OCHRONOSIS

*To the Editor*—In THE JOURNAL, March 6, page 784, a reference appearing in my abbreviated paper (Ochrosis of the Sclera and Cornea Complicating Alkaptonuria, THE JOURNAL, Dec. 19, 1942) is questioned concerning the first British case of ochronosis. Your correspondent infers incorrectly from Dr. F. M. Pope's article (A Case of Ochrosis with a Note on the Relationship of Alkaptonuria by A. E. Garrod, *Lancet* 1 24, 1906) that "the 11 previously reported (British) cases are mentioned and exact references are listed." The previously reported cases (10) were collected from other countries and can be found in my complete paper appearing in the 1942 Transactions of the Section on Ophthalmology of the American Medical Association. Dr. Pope states (p. 26) "This case is the eleventh reported of this disease and the first from the British Islands. I present in tabular form short abstracts of all the former cases." Only 9 more English cases of ochronosis could be found in my review of the literature. I still believe Cushing's finding that the first British case of ochronosis had been diagnosed as Addison's disease until examined by Osler is worth recording.

JAMES W. SMITH, M.D., New York

### PORTAL CIRRHOSIS

*To the Editor*—In the March 6 issue of THE JOURNAL, page 719, in an article by Carl H. Greene entitled "Physiologic Considerations in the Treatment of Portal Cirrhosis," the statement is made that "the patient with cirrhosis frequently shows a reduction in the prothrombin time of the blood which, if pronounced, will cause a tendency to hemorrhage."

It seems apparent that the author meant to express himself in terms of a reduction of the prothrombin level rather than in terms of a reduction of the prothrombin time. It is the reduction of the prothrombin level of the blood which will cause a tendency to hemorrhage. Such a condition, however, is associated with a prolongation of the prothrombin time and not with a reduction of the prothrombin time as mentioned in the author's paper.

Such terminology may seem confusing to the casual reader. For the sake of clarity it should be emphasized that a reduction of the prothrombin level of the blood (hypoprothrombinemia) is synonymous with a prolongation of the prothrombin time causing the well known tendency to hemorrhage. On the other hand, the increase in the prothrombin level of the blood (hyperprothrombinemia) is associated with a reduction of the prothrombin time, causing a tendency to clot formation.

WILLIAM SAIHIR, Captain M. C., U. S.

### DANGERS OF TALCUM IN THE PERITONEAL CAVITY

*To the Editor*—For the past decade or more, evidence has been accumulating of the occurrence of so called intraperitoneal granulomas following the accidental implantation of talcum during laparotomy. The talc is shed from the surface of rubber gloves or from collections of the talc powder, which so frequently settles in the tip of the glove fingers and spills therefrom through accidental rips and tears.

Talcum is predominantly a silicate of magnesium and sets up a vicious reaction, an adhesive peritonitis, provocative of post-operative intestinal obstruction. I never realized fully the tragic significance of this complication until I encountered it in the postoperative course of my own son.

No one has ever done more than to point out the dangers inherent in talc and to suggest careful depowdering of the surface of the gloves before operating. Consequently we set about to sidetrack the talc evil. After I had made numerous preliminary experiments, Dr. D. J. Verda and Dr. Frank H. Kidd Jr., respectively fellow in surgery and surgical resident in the Barnard Free Skin and Cancer Hospital, interested themselves in the work and have done all of the later experimentation.

This experimentation, although it is not completed in every detail, has now reached the point where we may state with assurance that ordinary cornstarch from every point of view serves as an ideal dusting powder for gloves, causes no undesirable after-effects and is sterilized by ordinary autoclaving.

We are anxious to publish this information in advance of the completion of all our work, so that the basic fact may be available to our armed forces at the earliest possible moment.

M. G. SEELIG, M.D., St. Louis

Director of Pathology, Barnard Free  
Skin and Cancer Hospital



## Bureau of Legal Medicine and Legislation

### MEDICOLEGAL ABSTRACTS

**Hospital Service Plans as Insurance**—The plaintiff, a nonprofit hospital service plan corporation organized and operated under the appropriate Ohio law relating to such organizations and licensed to do business by the superintendent of insurance of Ohio, sought to enjoin the state treasurer from collecting from it a franchise tax, which a state statute required the treasurer to collect from corporations engaged in the business of insurance. From a decree in favor of the hospital service plan corporation the treasurer appealed to the court of appeals of Ohio, Franklin County.

The plaintiff corporation agreed to act as the agent of eighteen charitable hospitals in Cleveland in the sale to the public of a contract which required the subscriber to pay a stated sum periodically to the plaintiff and entitled him in return to hospitalization for a stated period, if deemed necessary by the subscriber's attending physician, in any of the eighteen hospitals that the subscriber might choose. The plaintiff was to pay the hospital selected by the subscriber designated sums according to the type and length of service rendered to the subscriber. Any surplus remaining in the plaintiff's funds, after paying hospital bills and the cost of administration is held as a reserve for the benefit of the subscribers. This arrangement the treasurer argued, substantially amounted to insurance and in writing such a contract the hospital service plan corporation was writing a contract of insurance and hence was liable for the franchise tax in question. In support of this contention, the treasurer relied on the definition of "insurance company," set out in the insurance code of Ohio, reading, in part, as follows:

The term insurance company is used in this chapter includes every corporation association and society engaged in the business of insurance of any character whatsoever or engaged in the business of entering into contracts substantially amounting to insurance of any character or of indemnifying or guaranteeing against loss or damage or acting as surety on bonds or undertakings.

The treasurer also relied on *State ex rel. Duffy v. Western Auto Supply Company*, 134 Ohio St 163, 16 N E (2d) 256, an Ohio decision, the second paragraph of the syllabus of which reads as follows:

Insurance as related to property and liability is a contract by which one party promises upon a consideration to compensate or reimburse the other if he shall suffer loss from a specified cause or to guarantee or indemnify or secure him against loss from that cause.

The hospital service plan association argued that the contract it issued assures the subscriber service and not indemnity, that it is essential to a true insurance contract that it provide for payment of money to the insured in an amount, defined in the contract, designed to indemnify him for a loss he has suffered. In our judgment, said the appellate court, the contention of the plaintiff that a contract is not one substantially amounting to insurance unless it provides for the payment of money to the subscriber on the happening of a contingency cannot be adopted. Further, the fact that payment under the contract here in question is made to the hospital and not to the subscriber will not prevent the contract from being a contract of insurance. The advantage to the subscriber, if he invokes the benefits of his contract, requires payment in money which is definitely measured by the extent of service rendered to him by the hospital to which he elects to go. It is payable on a contingency, namely, that it is certified by his attending physician that the subscriber requires hospitalization. The minimum payment is not fixed but the maximum payment that may be exacted from the hospital service plan corporation is set forth in the contract. The contract, in probability, is not to indemnify the subscriber because the hospital which he selects does not extend credit to him and, therefore, there is no primary liability on his part which would be essential to make the hospital service plan corporation an indemnifier. The amount which is paid by the subscriber is a charge based on an actuarial determination of the probable risk

incurred in issuing the contract. Although that which is provided the subscriber on the happening of a contingency is, so far as he is concerned, service, yet it is measured by a money consideration payable to the hospital because of the rendering of that service to the subscriber on behalf of the hospital service plan corporation. The language of the section of the insurance code quoted above, in effect, defining a company issuing contract substantially amounting to insurance of any character as an insurance company, is so broad as to require this court to hold that the hospital service plan corporation is an insurance company. The contract in this case in so many particulars amounts substantially to insurance to the subscriber as to require that it be construed to be an insurance contract.

The hospital service plan corporation contended that, even if it was assumed that it was engaged in an insurance business, nevertheless, it was exempt from the payment of the franchise tax imposed on corporations engaged in an insurance business because of a section in the hospital service plan corporation act of Ohio that provides:

Every corporation subject to the provisions of this act is hereby declared to be a charitable and benevolent institution and its funds and property shall be exempt from taxation.

Obviously, said the court the purposes of the plaintiff and the conduct of its business bring it clearly not only within the letter of the act but also within the spirit. In every sense of the term it is a charitable and benevolent institution. The treasurer argued however, that the franchise tax he sought to collect is not levied on the funds or the property of a corporation but is a tax on the right to carry on the nonprofit hospital service plan and that the exemption accorded the plaintiff corporation from all other provisions of the insurance laws, which is granted by the hospital service plan corporation law of the state, does not preclude liability on the part of the hospital service plan corporation for the franchise tax. Charitable hospitals, answered the appellate court, are exempted from all forms of taxation. The hospital service plan corporation here involved acts as an agent for charitable hospitals. The purpose of the subscription contract the plaintiff corporation offers is twofold: first, to make possible necessary hospitalization for a large part of the public at a low cost, and second, to assure in the aggregate the payment of the hospitals of a larger sum for these services than would otherwise be received and thus to enable the hospitals to render a better and more extended general service. The hospital service plan corporation act exacts the payment from each such corporation licensed to do business in the state of a fee of \$250 on the filing of an application for certificate of authority and an annual license fee equal to one tenth of one cent for each contract issued by such corporations and then outstanding. The \$250 payment, in itself, is a form of franchise tax and is a prerequisite to the issuance of a certificate which authorizes the hospital service plan corporation to carry on its business. While it is true that it is generally held that a franchise tax is not a tax on property, it should be noted that the language exempting hospital service plan corporations from taxation includes not only property but its funds as well. In view of all of the germane acts, namely, the insurance laws, the taxation statutes and the act relating to hospital service plan corporations, it would seem that it was the legislative intent in enacting the hospital service plan corporation law to exempt such corporations from any liability for taxes of any kind or character or the payment of any sum for the privilege of operating. The legislature as a basis for the granting of certain rights and privileges accorded to nonprofit hospital service plan corporations classified them as benevolent and charitable institutions and set up a comprehensive act under which they were authorized to conduct their business and provided a fee which it deemed adequate in view of the fact that it further provided expressly that the funds and property of such corporation shall be exempt from taxation. This exemption, the court concluded, was intended to be all inclusive.

For the reasons stated, the decree restraining the state treasurer from collecting a franchise tax on the hospital service plan corporation was affirmed.—*Cleveland Hospital Service Association v. Ebright, Treasurer of State*, 45 N E (2d) 157 (C 1942).



**Society Proceedings****COMING MEETINGS**

HOUSE OF DELEGATES OF THE AMERICAN MEDICAL ASSOCIATION CHICAGO BEGINNING JUNE 7 DR Olin WEST 535 NORTH DEARBORN ST CHICAGO SECRETARY

Alabama Medical Association of the State of Birmingham April 20 22 Dr Douglas L Cannon 519 Dexter Ave Montgomery Secretary

American Association of Genito Urinary Surgeons Stockbridge Mass June 10 12 Dr Charles C Higgins 2020 East 93d St Cleveland Secretary

American Association of Industrial Physicians and Surgeons Rochester N Y May 25 27 Dr E C Holmblad 28 East Jackson Blvd Chicago Managing Director

American Association on Mental Deficiency New York May 12 15 Dr Neil A Dayton Mansfield Training School Mansfield Depot Conn

American College of Radiology Chicago June 6 Dr Mac T Cahal 540 North Michigan Blvd Chicago Executive Secretary

American Gynecological Society Hershey Pa May 31 June 2 Dr Howard C Taylor Jr 842 Park Ave New York Secretary

American Neurological Association New York May 6 7 Dr Henry A Riley 117 East 72d St New York Secretary

American Ophthalmological Society Hot Springs Va May 31 June 2 Dr Walter S Atkinson 129 Clinton St Watertown N Y Secretary

American Psychiatric Association Detroit May 10 13 Dr Winfred Overholser St Elizabeths Hospital Washington D C Secretary

American Psychoanalytic Association Detroit May 9 11 Dr Leo H Bartemeier General Motors Bldg Detroit Secretary

American Society of Clinical Pathologists Chicago June 4 6 Dr Alfred S Ciordano 531 North Main St South Bend Ind Secretary

American Surgical Association Cincinnati May 13 14 Dr Warfield M Piror Johns Hopkins Hospital Baltimore Secretary

Arizona State Medical Association Tucson April 30 May 1 Dr Frank I Milloy 112 North Central Avenue Phoenix Secretary

Arkansas Medical Society Little Rock April 19 20 Dr W R Brooks 602 Garrison Ave Fort Smith Secretary

California Medical Association Los Angeles May 23 Dr George H Kress 450 Sutter St San Francisco Secretary

Connecticut State Medical Society New Haven May 25 27 Dr Creighton Barker 258 Church Street New Haven Secretary

Georgia Medical Association of Atlanta May 11 14 Dr Edgar D Shanks 478 Peachtree St NE Atlanta Secretary

Illinois State Medical Society Chicago May 18 20 Dr Harold M Camp 224 South Main St Monmouth Secretary

Iowa State Medical Society Des Moines April 29 30 Dr Robert L Parker 3510 Sixth Avenue Des Moines Secretary

Maryland Medical and Surgical Faculty of Baltimore April 27 28 Dr W Houston Toulson 1211 Cathedral St Baltimore Secretary

Massachusetts Medical Society Boston May 24 26 Dr Michael A Tighe 8 Fenway Boston Secretary

Minnesota State Medical Association Minneapolis May 17 19 Dr B B Souster 493 Lowry Medical Arts Bldg St Paul Secretary

Mississippi State Medical Association Jackson May 11 13 Dr T M Dye Clarksdale Secretary

Missouri State Medical Association St Louis April 18 20 Mr Raymond McIntire 634 North Grand Blvd St Louis Executive Secretary

National Tuberculosis Association St Louis May 5 6 Dr Charles J Hatfield, 7th and Lombard Sts Philadelphia Secretary

New Hampshire Medical Society Manchester May 11 Dr Carleton R Metcalf 5 South State St Concord Secretary

New Jersey Medical Society of Newark May 25 26 Dr Alfred Stahl 55 Lincoln Park Newark Secretary

New York Medical Society of the State of Buffalo May 3 6 Dr Peter Irving 292 Madison Ave New York Secretary

North Carolina Medical Society of the State of Raleigh May 10 12 Dr Roscoe D McMillan Red Springs Secretary

North Dakota State Medical Association Bismarck May 10 11 Dr L W Larson 221 Fifth Street Bismarck Secretary

Oklahoma State Medical Association Oklahoma City May 11 12 Dr Lewis J Moorman 210 Plaza Court Bldg Oklahoma City Secretary

Rhode Island Medical Society Providence June 23 Dr William P Buffum 122 Waterman St, Providence Secretary

Texas State Medical Association of Fort Worth May 3 6 Dr Holman Taylor 1404 West El Paso St Fort Worth Secretary

West Virginia Medical Association Charleston May 17 18 Mr Charles Jively 1031 Quarrier St Charleston Executive Secretary

**CENTRAL SOCIETY FOR CLINICAL RESEARCH**

Fifteenth Annual Meeting held in Chicago Nov 6 and 7, 1942

The President, DR ARTHUR R BARRETS, Mayo Clinic, Rochester Minn., Presiding

(Continued from page 1246)

**Effect of Pectin on the Coagulation of Blood in Thrombocytopenic Conditions**

DR RAPHAEL ISAACS, Chicago Citius pectin in the form of powder taken by mouth (in capsules) in doses of 1 Gm three times a day one half to one hour before meals, has been used in 8 cases of thrombocytopenic purpura over periods of from three months to one year. Two cases were of the idiopathic thrombocytopenic type 2 were secondary to sulfanilamide and sulfathiazole poisoning, 2 of leukemia and 2 others of aplastic anemia. In all these cases there was a cessation of bleeding from the mucous membranes (nose, mouth, uterus) in from twelve to twenty four hours. The coagulation time of the capillary blood was reduced to less than one minute and the bleeding time lowered to normal. There was rapid but only incomplete clot retraction. There was no change in the number of platelets that could be attributed to the medication. In certain nonthrombocytopenic patients with a tendency to bleed (following extraction of the teeth, menorrhagia) there was a prompt clinical response. No toxic symptoms were noted from much larger doses than those given routinely. While remissions are common in purpuric conditions in these cases cessation of clinical bleeding was noted even though the platelet number was below 30,000 per cubic millimeter.

**DISCUSSION**

DR S C WERCH, Chicago My associates and I have been able to investigate the effect of pectin on coagulation. Pectin in a 2 per cent solution was injected intravenously in the *in vivo* experiments and was added to serum and the like in the Quick system in the *in vitro* experiments. No effect was ascertained. Since for all practical purposes pectin is completely destroyed in the alimentary tract and since we have not been able to show any effect on coagulation Dr Isaac's observations do not appear valid to us at this time. If he had given pectin intravenously his results might be explained by the size of the pectin molecule and blocking of the capillary walls. However since pectin was given orally the results can be explained only by an unknown substance which may be present in the crude preparation employed.

DR C J WATSON, Minneapolis The available evidence indicates that in thrombocytopenic purpura the main fault is in the platelet capillary relationship the clotting mechanism is not concerned in the production of petechiae. In a study of this sort it would be valuable to know more about capillary resistance. In other words was the capillary resistance improved. Did the cuff test become negative after the administration of pectin? The same questions might also apply to conditions associated with hypoprothrombinemia as for example in some cases of jaundice and frequently in sprue. There is usually a positive cuff test in cases exhibiting a hemorrhagic tendency. It would be helpful to have objective data with respect to capillary resistance in a study of this sort.

DR RAPHAEL ISAACS, Chicago In our cases the capillary blood clotted quickly and there were clinical remissions. As I understand it Dr Werch's observations were on the prothrombin time of dogs and normal men while our observations were on the capillary blood coagulation time of patients with thrombocytopenic purpura. It has been reported that the injection of pectin solutions into dogs prolongs their coagulation time. In animals the prolonged coagulation time produced by heparin injections can be neutralized by injection of pectin. Pectin does not hasten the coagulation of blood *in vitro*. In 3 of the patients with pronounced capillary fragility the number of petechiae appearing after the tourniquet test was greatly reduced after pectin therapy.

### "Demerol" Clinical Observations

DRS HANS HICHT, PAUL H. NOTH and F. F. YONKMAN, Detroit. One hundred and eleven patients suffering severe pain were treated with "Demerol" (the ethyl ester of 1-methyl-4-phenyl piperidine-4-carboxylic acid). About 75 per cent received an average of 1 Gm. over an average period of six days. The remainder received larger total amounts over longer periods up to two hundred and eleven consecutive days. The patients were suffering from a variety of acute and chronic diseases such as arthritis, pleurisy, far advanced carcinoma, hypothalamic lesions (with so called intractable pain), peptic ulcer and angina pectoris. Twelve patients had been receiving morphine or its derivatives from thirty to one hundred and seven days prior to administration of Demerol. The drug was administered orally or intramuscularly in doses of 0.05 to 0.10 Gm. from one to eight times daily. One patient received nine hundred and seventy-six injections. The drug was considerably more effective when given intramuscularly. Approximately 80 per cent of the patients obtained satisfactory relief of pain. The degree and duration of the analgesic effect exceeded that of 0.07 to 0.10 Gm. of codeine sulfate but was usually less than that of 0.01 Gm. of morphine sulfate.

Dizziness, nausea, vomiting, a choking sensation, momentary excitation, euphoria, dryness of the mouth and urticaria were occasionally noted immediately following administration, but in only 5 per cent of all cases were these reactions severe enough to necessitate withdrawal of the drug. Regular urinalysis, blood counts, electrocardiograms and liver function tests showed no alterations which were not explained by the disease from which the patient suffered. A firm, nontender induration of the subcutaneous tissues around the site of injection was frequently observed when the drug was given six to eight times a day over a long period of time.

After prolonged intramuscular administration (0.1 Gm. six to eight times daily for periods exceeding one month) sudden withdrawal occasionally resulted in nausea, violent vomiting, profuse perspiration, itching of the skin, irritability, depression and apprehension. These symptoms began a few hours after the drug had been withdrawn and generally lasted for one or two days. During these periods of withdrawal the patients were kept free from pain by various opiates. These reactions could easily be overcome by the use of barbiturates and scopolamine. Symptoms of this kind were never observed following prolonged oral medication.

Demerol, a synthetic substance, is apparently capable of replacing morphine and its derivatives to a certain extent, thus helping to relieve a possible future shortage of opiates. Demerol is not toxic even when given in large doses over a prolonged period. Occasional side effects are observed, and long continued use may be followed by undesirable symptoms on withdrawal.

#### DISCUSSION

DR FREDRICK F. YONKMAN, Detroit. The authors have emphasized the chemical relation between atropine, morphine and Demerol. The new analgesic can be synthesized readily and, if future results substantiate present experiences with Demerol, this agent represents a distinct contribution to the field of analgesic therapy. Our attention has been directed to the spasmolytic action of Demerol and our results reveal interesting effects of the drug on certain smooth muscle. Pharmacologic studies indicate that relaxed smooth muscle may frequently be stimulated by Demerol, whereas spastic or activated visceral muscle is usually relaxed by this agent. Should the former condition occur, the analgesic action might be of sufficient degree to obviate complaint of discomfort whereas early and rather complete relief might be anticipated if visceral relaxation with analgesia prevailed.

DR JOHN W. SCOTT, Lexington, Ky. It seems that a more accurate measure of relief from pain should be used in making a comparative study such as this, such a method as the Wolff-Hardy apparatus would supply.

DR PAUL H. NOTH, Detroit. No objective method of measuring the analgesic effect was used. The Wolff-Hardy technic provides a standard pain stimulus and is useful in

measuring time of onset, degree and duration of analgesic action. Such studies have been made comparing Demerol with other analgesic drugs. In our study a variable clinical painful stimulus was already present, making the Wolff-Hardy test inapplicable. Therefore the subjective response of the patient was the best measure, under these circumstances, of the effectiveness of the drug.

### Treatment of Migraine With Potassium Thiocyanate

DRS E. A. HINES JR. and L. M. EATON, Rochester, Minn. In treating a group of patients who had hypertension with potassium thiocyanate, it was noted that many were relieved of their migraine.

Following the observation of the effect of potassium thiocyanate in relieving migraine associated with hypertension, it seemed logical to try the effect of this drug in treating a group of patients who had severe and frequent migraine attacks but who did not have hypertension. To date 27 patients have been treated for periods of three months or longer. In 2 cases it was impossible to obtain a concentration in the blood greater than 2 mg. of potassium thiocyanate per hundred cubic centimeters even though as much as 20 grains (1.3 Gm.) daily was given. After one month's trial the attempt was discontinued. Neither of these patients noted any change in the frequency or severity of the headaches. Of the group of 27 patients in whom satisfactory blood thiocyanate levels (6 to 12 mg.) could be maintained all received some definite relief. In the majority the frequency of the headaches was reduced by 75 per cent. In 7 cases the blood cyanate level was allowed to fall to less than 1 mg. per hundred cubic centimeters without the patient's knowledge and there was a definite increase in the frequency of the attacks with subsequent relief when the blood cyanates again reached a satisfactory therapeutic level (6 to 12 mg.).

In none of our patients were there any serious toxic manifestations from the drug. It is recognized that potassium thiocyanate is a potentially dangerous drug and in our opinion it should not be used unless the dosage is controlled carefully by frequent determinations of the blood cyanate content.

#### DISCUSSION

DR EDWARD MASSIE, St. Louis. I should like to ask about the intravenous injections of the drug to patients during the stages of nausea and vomiting.

DR E. A. HINES JR., Rochester, Minn. We have not given potassium thiocyanate intravenously, so we do not know the effect. I have thought of this as a possibility in aborting an attack when the patient has severe nausea and vomiting. I should like to know if any one has given it intravenously to human beings. I know it has been given to animals.

### Organic Heart Disease and Electroconvulsive Shock Therapy

DR VERNON L. EVANS, Aurora, Ill. Since the use of electroconvulsive shock therapy was started at Mercyville Sanitarium, no patient has been refused the benefit of this treatment when it was thought to be indicated from a psychiatric standpoint. In many cases the risks taken appeared to be very great but in a series of 302 consecutive cases there have been no deaths from the treatment. No attempt has been made to modify the severity of the convulsions by curare or other drugs.

In the group were 8 patients with presumptive to positive evidence of previous coronary occlusions. The ages of these patients ranged between 52 and 74. In 5 cases there were positive histories of previous coronary occlusions. Seven of the electrocardiograms showed definite inversion of the T waves in leads 1, 2 or 4. The eighth patient was a woman aged 74 who had a complete left bundle branch block. Although there was no history of heart disease this was taken as presumptive evidence of a previous coronary occlusion.

Three patients with auricular fibrillation were treated during the presence of this irregularity. Two of these patients had rheumatic heart disease with histories of previous attacks of decompensation. The other was a woman aged 75 with no his-

tory of heart disease or vascular hypertension. However, she did have generalized arteriosclerosis and moderate enlargement of the heart.

Two patients had hypertensive heart disease as shown by elevated blood pressures (210-180 systolic and 100-90 diastolic) and pronounced left axis deviation on the electrocardiogram. Two patients had probable coronary artery disease because in 1 the PR interval was 0.23 second and in the other there was flattening of the T waves in all four leads. (There was no evidence of myxedema, and the basal metabolic rate was normal.)

With one exception no complications whatever were encountered in the treatment of these patients. The exception was a woman aged 40 who had rheumatic heart disease and a history of one previous episode of decompensation. This patient developed decompensation under treatment and the course of treatment had to be stopped after the tenth convulsion. However, the ascites and edema cleared up with the administration of diuretics and she was given no further shock treatment, as she recovered from her psychosis.

#### DISCUSSION

DR A. E. BENNETT, Omaha: Most of the depressions in which we get the best results from shock therapy occur in the upper age group. Here the question of cardiovascular complications frequently arises. Dr Evans has shown us that this treatment can be given in the presence of severe heart disease. I have treated many patients in the presence of extreme hypertension and with severe myocardial disease. However, I think a word of caution should be left with respect to this paper because it does carry the implication that the treatment is not serious. Most of the deaths that have occurred with electrotherapy have been coronary deaths. I had one such death occur two hours after an electroshock treatment. I am sure Dr Evans would want us to explain to the relatives of the people to be treated that there is increased risk. Even though we are successful in a large percentage of depressions complicated with organic heart disease, I am sure it increases the hazard.

DR L. N. KATZ, Chicago: This report is important because it seems to indicate that we have been too conservative in our views. A number of patients at the Michael Reese Hospital have been referred from the psychiatric department for electrocardiograms before shock therapy. A number of cases with ST depressions in the limb leads were noted for which no organic cause could be ascribed. It is possible that in psychiatric patients the ST depression sometimes may be on the same basis as the ST depression in normal people associated with fear. Thus there may be abnormalities in the electrocardiogram which are purely functional and not related to organic heart disease.

DR CARROLL W. OSGOOD, Wauwatosa, Wis.: At the Milwaukee Sanitarium we have treated in the neighborhood of 250 cases by electric shock therapy and we feel that the treatment is relatively safe. We have treated a number of patients with electrocardiograms which are suggestive of some coronary disease. We treated one man, aged 67, who had a definite history of a coronary attack several months before. He had severe pain and had been in bed for six weeks. At the time we saw him his electrocardiogram was relatively normal. We saw no ill effects whatever from the treatment. His depression cleared up. He later had a recurrence. Altogether he had three courses of electroshock treatments, about eighteen shocks altogether. We have also treated a number of people with essential hypertension who had pressures of over 200 systolic and 100 diastolic, with no ill effects. We had one death in our series, the patient being an elderly man with some arteriosclerosis. He died suddenly immediately after the shock. An autopsy was held and no abnormality was found on examination of the heart or brain. However, there was a considerable amount of semifluid contents in the stomach, and material having the same appearance in the bronchial tubes. This emphasizes the danger of aspiration.

DR VERNON L. EVANS, Aurora, Ill.: I did not want to imply that this treatment should be given promiscuously. I think that if we continue to give the treatment to patients who are in poor physical condition we shall have deaths. However, as yet we have had none, and it appears that the rate will be small and should not deter us from our efforts to cure people who are seriously ill.

#### Blood Pyruvic Acid Following Exercise in the Trained and Untrained Individual and in Patients With Heart Disease and Hypertension

DR ZALF A. YANOF, Chicago: It is now firmly established that pyruvic acid and not lactic acid, is the center core of tissue carbohydrate metabolism. This displacement of lactate by pyruvate stimulated this work.

A light standard exercise of fifty ascents in fifty seconds over a two-step contrivance with blood pyruvates at rest and at ten and sixty minutes after the exercise was performed on 11 collegiate wrestlers and track men, 10 sedentary individuals, 10 patients with heart disease of class II-III with enlargement of the heart and 9 class I hypertensive patients without enlargement of the heart but with blood pressures exceeding 200.

Ten minutes after the exercise the mean pyruvate change in the trained group was -5.82 per cent of that of the resting levels, the heart patients +45.75 per cent, the untrained +53.38 per cent, and the hypertensive +63.38 per cent. This difference in the utilization of carbohydrates in the 'trained individual' as opposed to that of the individual whose heart only is working overtime, suggests a clue to the complex chemical changes of 'training' and 'compensation' and may furnish an index of physical fitness.

The sixty minute mean pyruvate change of the trained group was -15.11 per cent of the resting level, that of the untrained group -5.82 per cent, the hypertensive 0 and the heart patients +16.66 per cent. The order of progression from negative to positive sixty minute changes is more or less in keeping with the cardiac function of these groups. This test could presumably be used to follow the course of a patient with heart disease. This is further supported by the fact that the class III heart patients with the poorest cardiac function had the highest positive sixty minute changes.

Lactate increases only after strenuous exercise whereas in this work pyruvate changed after only light exercise as much as 100 per cent. In addition pyruvate sixty minute changes are more pronounced and circumscribed than lactate sixty minute changes. Pyruvate estimations would appear to be of value in the study of exercise physiology of both trained and untrained individuals and of patients who are not capable of undertaking the strenuous exercise that lactate requires.

#### DISCUSSION

DR SAMUEL SOSKIN, Chicago: The author expresses all his results in terms of percentage changes. There should be some mention of the absolute values of pyruvic acid with which he was dealing. I should like to ask that these values be given, because I believe that they amount to only a few milligrams per hundred cubic centimeters. In view of this and the inherent errors in sampling and in chemical methods, it is not surprising that the author's data for trained and untrained subjects and for normal and pathologic individuals overlap to a considerable extent. I believe the author also ignores a known physiologic fact when he assumes that the level of pyruvate in the blood is an index of the deficiency of oxygen in the heart and skeletal muscles. It is true that when oxygen is deficient the muscles liberate excessive amounts of pyruvate and lactate into the blood, but it is also true that the normal liver rapidly removes these substances from the blood. The blood level is therefore merely the resultant of these two opposite processes. The slightly higher level of pyruvate and lactate in the blood of patients with heart disease is just as likely to result from some passive congestion of the liver as from any abnormal process in the muscles.

DR ZALF A. YANOF, Chicago: There is some truth in all of the things Dr Soskin said. All I attempted to do was to show what I actually found.

(To be continued)

## Current Medical Literature.

### AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1932 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (\*) are abstracted below.

### Alabama State Medical Assn Journal, Montgomery 12 193-220 (Jan) 1943

- Low Spinal Anesthesia J E Cameron Alexander City —p 193  
Dilantin Sodium Therapy in Deteriorated Epileptics Refractory to Other Treatment S A Peoples and A L Fatum University —p 197  
Benign Ovarian Tumor with Bilateral Hydrothorax and Ascites Report of Case W N Jones Birmingham —p 199  
Management of Third Stage of Labor R C Benson Birmingham —p 203

### American Journal of Medical Sciences, Philadelphia 205 1-156 (Jan) 1943

- Administration of Sulfonamide Microcrystals by Inhalation T A Harris Harriet E Sommer and C C Chapple Philadelphia —p 1  
Medication by Chewing Sulfadiazine and Other Drugs Incorporated in Paraffin Base Preliminary Report J H Arnett Philadelphia —p 6  
\*Effect of Iron on Hemoglobin Regeneration in Blood Donors Adelaide P Barer and W M Fowler Iowa City —p 9  
Clotting Action of Fer-de-Lance Venom C L Kruer R M Bird and P Reznikoff New York —p 16  
Critical Study of Action of 3,3 Methylene Bis (4 Hydroxycoumarin) (Dicoumarin) C S Davidson and Harriet MacDonald Boston —p 24  
Six Autopsied Cases of Disseminated Lupus Erythematosus Connie M Guion and Elisabeth C Adams New York —p 33  
\*Rheumatoid Arthritis and Rheumatic Heart Disease in Autopsied Cases T B Bayles Boston —p 42  
Pole of Heart Disease in Psychoses of the Senium S R Rosen Greenwich Conn and K L Smith Cambridge N Y —p 48  
Extreme Tachycardia Report of Nonfatal Paroxysms Following Myocardial Infarction J Edeiken Philadelphia —p 52  
Family History in Arterial Hypertension Study of 4376 Insurance Examinations R H Feldt and D E W Wenstrand, Milwaukee —p 61  
Effect of Antipressor Kidney Extract Angiotonin Methylguanidine and Tyramine on Cardiac Output as Measured by Ballistocardiograph in Hypertensive and Normal Persons R D Taylor and I H Page Indianapolis —p 66  
Effect of High Fat Test Meal on Blood Cholesterol in Normal and Obese Individuals E Oppenheim and M Bruger, with assistance of S Member New York —p 77  
Leukocytosis Induced by Methyl Acetamide with P Chloroxylenol Chemotactic Effect on Bone Marrow B Zondek and Y M Bromberg, Jerusalem Palestine —p 82  
Liver Function in Therapeutic Malaria I Kopp and H C Solomon Boston —p 90  
Clinical Experience with Water Soluble Vitamin K like Substance (Tetrasodium 2 Methyl 1,4 Naphthohydroquinone Diphosphoric Acid Ester) J G Allen Chicago —p 97  
Water and Electrolyte Distribution in Diabetes Mellitus Dehydration in Diabetes F W Sunderman Philadelphia —p 102  
Familial Cretinism Two Brothers Exhibiting Thyroid Deficiency and Epiphyseal Dysgenesis I P Bronstein L E Bower and J Murphy Chicago —p 114  
Postoperative Achylia Pancreatica Fat and Protein Absorption With and Without Replacement Therapy Report of Case M Lake N W Cornell and H E Harrison New York —p 118  
Note on Evaluation of Privity Hydrochloric Acid as Nasal Vasoconstrictor N D Fabricant and O E Van Alyea Chicago —p 122  
Use of Hevencol in Burns of Limited Areas B Levine Cleveland —p 125

**Effect of Iron on Hemoglobin Regeneration in Blood Donors**—To determine the average time required for the hemoglobin to return to its original level in blood donors Barer and Fowler gave an iron salt to 89 donors after their second blood donation. The rate of hemoglobin regeneration was increased by 49 per cent so that the average daily hemoglobin increase per hundred cubic centimeters of blood was 0.0772 Gm

and the recovery period was shortened to thirty-five and two-tenths days in comparison to forty-nine and six-tenths days after the first donation without therapy. Under these conditions, 93.5 per cent of the subjects regained their normal hemoglobin level within eight weeks. Iron therapy was administered continuously and some of the subjects gave as many as five donations, subsequent donations were given as soon as the hemoglobin level reached normal. In spite of the continuous iron therapy there was a gradual decline in the rate of hemoglobin formation after each donation until it was being formed at a rate which was no more rapid than it had been without iron therapy. Therefore it seemed as if iron had progressively less effect with continuous administration. There was no evidence of bone marrow exhaustion after repeated donations.

**Rheumatoid Arthritis and Heart Disease in Necropsies**—At a postmortem study of the joints of 23 patients with definite rheumatoid arthritis changes Bayles observed that in 6 there were changes in the heart valve leaflets and myocardium similar to those of rheumatic fever. The microscopic lesions of 1 could be considered active and of 5 inactive. Excluding the 1 patient because of definite rheumatic fever and rheumatic heart disease in childhood 22 per cent had rheumatic cardiac lesions. A coincidence, a relationship of rheumatic fever and rheumatoid arthritis or the possibility that the heart disease is related to rheumatoid arthritis might be inferred from the data. Since patients with rheumatoid arthritis die of some cause other than this disease it would be safer and probably wiser to delay a final conclusion until further studies indicate which of the three foregoing situations obtains. In the clinical treatment of the patients the author regarded the cardiac changes as a coincidence of rheumatic heart disease and rheumatoid arthritis.

### Archives of Otolaryngology, Chicago

37 1-148 (Jan) 1943

- Allergic Aspect of Vasomotor Rhinitis H H Gelfand New York —p 1  
Certain Aliphatic Compounds as Nasal Vasoconstrictors A W Proetz St Louis —p 15  
Tension Pneumothorax and Mediastinal Emphysema After Tracheotomy General Study with Analysis of Seventeen Cases in Series of One Hundred and Twenty Six Tracheotomies for Acute Obstructive Infections of Larynx Trachea and Bronchi During Past Decade A H Neffson —p 23  
\*Diagnosis and Treatment of Meniere's Syndrome A Atkinson New York —p 40  
Bilateral Paralysis of Abductor Muscles of Larynx Report on Seven Patients Treated by Method Outlined by Dr Brien T King L F Morrison San Francisco —p 54  
\*Neurinoma of Facial Nerve in Middle Ear and Mastoid Report of Case G J Roberts Pomona Calif —p 62  
Functional Examination of Hearing A Lewis and N Leshin Chicago —p 82

**Meniere's Syndrome**—Atkinson suggests two important reasons for the failure of any particular treatment to achieve its hoped for results. Inactivity of diagnosis and the tendency to regard Meniere's syndrome (recurring vertigo deafness and tinnitus) as a disease *in generis*. Cases of the syndrome can be divided into groups according to causation and each group demands its appropriate treatment. An accurate diagnosis demands a careful neurologic examination, Baring tests, appraisal of the relative patency of the eustachian tubes a thorough general examination to determine the presence of any associated condition, and, when the diagnosis is still not made idiopathic Meniere's disease is thought of instead of looking for two or more syndromes. This large remaining group of cases can be divided into at least two divisions each with a different cause. Some may have an allergic basis and the others about four fifths of the total, may be insensitive to histamine that is in these the mechanism is primarily vasoconstrictor in contrast to vasodilator of those with an allergic basis. Classification according to the etiologic basis, which is tentative and expresses present knowledge is as follows. A Lesions interfering with the function of the eighth cranial nerve because of (1) lesions of the cerebellopontine angle and (2) degenerative vascular disease. B Lesions interfering with the function of the labyrinth because of (1) alteration in intralabyrinthine pressure (a) from without stricture of eustachian tube and (b) from within

increased production of endolymph (primary vasodilatation, allergy, sensitivity to histamine), (2) vascular disease (a) angiospasm, primary vasoconstriction and (b) arteriosclerosis, and (3) "toxic labyrinthitis," that is focal infection

**Neurinoma of Facial Nerve in Middle Ear and Mastoid**—The thirteenth case of neurinoma of the facial nerve, a rare but clinical entity, is reported by Roberts. Such neurinomas are benign tumors and produce symptoms by extension and pressure. The first symptom is facial paralysis, followed after a period of years by deafness, chronic purulent otitis media and invasion of the mastoid. The tumor is microscopically characteristic of neurinomas or neurofibromas in general and presents a definite pathologic picture.

### Journal of Pediatrics, St. Louis

21 705-842 (Dec.) 1942

- Presidential Address: Function of Academy and Its Members During War and Peace. E. C. Mitchell. Memphis, Tenn.—p. 705.  
Note on Penetration of Poliomyelitis Virus from Gastrointestinal Tract in Chimpanzee. H. A. Howe and D. Bodin. Baltimore.—p. 713.  
Study of Premature Mortality. L. Flax, E. L. Levert and R. A. Strong. New Orleans.—p. 717.  
Enzymic Therapy in Infant Feeding. W. C. Davison. Durham, N. C.—p. 727.  
\*Treatment of Ichthyosis with Vitamin A. H. C. Rapaport, H. Herman and E. Lehman. New York.—p. 733.  
Match Test. H. Vollmer with cooperation of H. W. Hyslop and H. V. Lomant. New York.—p. 747.  
Modified or Reverse Schultz-Charlton Technique in Diagnosis of Scarlet Fever. J. D. Goldberg and J. De Hoff. Jamaica, N. Y.—p. 757.  
Role of Honey in Prevention and Cure of Nutritional Anemia in Rats. M. H. Haydak, L. S. Palmer and M. C. Tanquary. St. Paul.—p. 763.  
Influence of Diet on Physiologic Anemia of Infants. Katherine F. Brokaw, Margaret S. Sedam and Anne Marie Cassirer. New York.—p. 769.  
\*Thrombophlebitis Migrans. V. J. Birnberg and Arild E. Hansen. Minneapolis.—p. 775.  
Study of Birth Weights and Ponderal Growth of Children of Tuberculous Mothers. C. A. Urquijo and M. Weissmann. Buenos Aires, Argentina.—p. 787.  
Laurence Moon-Biedl Syndrome: Report of Two Cases with Unusual Combinations of Heredofamilial Deviations. L. A. Iurie and S. Levy. Cincinnati.—p. 793.

**Treatment of Ichthyosis with Vitamin A**—Because of impaired dark adaptation in their 6 patients with ichthyosis and because of the similarities between the accepted cutaneous manifestation of vitamin A deficiency and ichthyosis, Rapaport and his associates submitted them to daily oral doses of 60,000 to 200,000 international units of vitamin A for several months as a therapeutic test for cutaneous improvement. Vitamin A is injectable, containing 100,000 international units of vitamin A and practically no vitamin D in 1 cc. of vegetable oil was administered intramuscularly two or three times a week for several months. The use of this preparation excluded the possibility that vitamin D might have been a factor in the effects obtained. The results were favorable and all patients obtained an amelioration which they deemed worth while. After several months of therapy the texture of the thickened skin became more normal. Cracks and fissures disappeared entirely. Pruritus was also considerably diminished. The scales became thin, superficial and more widely separated. Improvement was noticeable at the end of a month of therapy and was progressive for several months while the treatment was continued, but whenever the vitamin A was withdrawn for an appreciable time the condition of the skin became worse. Dark adaptation also improved with the therapy. The basis of ichthyosis may be some hereditary disorder of vitamin A metabolism. In all but 1 of the 6 patients heredity played a conspicuous role.

**Thrombophlebitis Migrans**—Birnberg and Hansen present the case of a boy of 14 whose death was definitely due to thrombophlebitis migrans. This, they believe, is the first time the condition has been described in a child. Heparinization was not successful in preventing further venous thrombus formation. Mesenteric thrombosis, the cause of death, was revealed at necropsy. Bacteriologic studies gave no clue to the underlying etiology. However, microscopic study of the eosinophilic inflammation and swelling of the intima of an involved vein suggested that some allergic phenomenon may have been associated with the clinical picture.

### Kentucky Medical Journal, Bowling Green

41 1-32 (Jan.) 1943

- \*Virus Pneumonia Treatment with Convalescent Blood. M. Flexner and M. L. Garon. Louisville.—p. 5.  
Report of Case of Ruptured Intervertebral Disk Following Chiropractic Manipulation. E. D. Fisher. Murray.—p. 14.  
Rural Hygiene in Hospital. H. H. Caffee. Oneida.—p. 15.  
Management of Rabies Contracts. G. I. Brockman. Greenville.—p. 21.

**Convalescent Blood for Virus Pneumonia**—Flexner and Garon believe that their use of whole blood or plasma from convalescent donors for the treatment of 7 patients with atypical (virus) pneumonia definitely reversed the trend of the disease and shortened the convalescence. The response seemed to be specific. They reserved its use only for the seriously ill. They believe that small injections of convalescent serum or plasma might act prophylactically as does measles convalescent serum or whole blood injection in poliomyelitis. In the absence of specific donors blood transfusion from adults may prove beneficial.

### Maine Medical Association Journal, Portland

34 1-24 (Jan.) 1943

- Treatment of Burns. H. Brinkman. Farmington.—p. 1.  
Freudian Theories. Section 11. Historical. I. Newman. Augusta.—p. 4.

### Medical Annals of District of Columbia, Washington

12 1-42 (Jan.) 1943

- Medicine in the Nation's Capital—1817-1942. A. C. Christie. Washington.—p. 1.  
Brief Outline of Present Day Concepts of Rheumatic Fever. B. J. Walsh. Washington.—p. 9.  
Some Wartime Obstetric Problems. H. I. Kane and C. K. Frazer. Washington.—p. 12.  
Treatment of Puerperal Infection. R. Brown. Washington.—p. 15.  
Gynecitics in Wartime. F. J. Stieglitz. Bethesda, Md.—p. 19.

### Michigan State Medical Society Journal, Lansing

42 1-80 (Jan.) 1943

- Preventive Aspects of Maternal Mortality. P. F. Williams. Philadelphia.—p. 25.  
\*Pregnancy Complicated by Acute Anterior Poliomyelitis. J. W. Peelen. Kalamazoo.—p. 30.  
Achlorhydria and Gastrointestinal Disturbances: Value of Substitution Therapy. I. D. Fagin. Detroit.—p. 36.  
Blindness in Michigan. Survey. J. O. Wetzel. Lansing.—p. 39.  
Ideal Obstetrics. J. H. Beaton. Grand Rapids.—p. 48.  
Transplantation of Preserved Tissue in Ophthalmic Surgery. M. Wiener. St. Louis.—p. 53.

**Pregnancy Complicated by Poliomyelitis**—Peelen suggests that pregnancy and acute anterior poliomyelitis probably occur more frequently than a review of the literature indicates. The 29 cases reported in some detail are reviewed and 2 new ones are added. In addition 28 cases have been reported incompletely. The important conclusions are that the usual course of pregnancy does not change the type of paralysis and complications determine whether interference with the pregnancy is necessary and it has not been proved that intrauterine poliomyelitis occurs. There are only 3 cases which suggest the possibility of intrauterine poliomyelitis. Miller believes that a bilateral clubfoot in 1 was not the result of intrauterine poliomyelitis but rather a congenital deformity and in the other 2 the data available are insufficient to confirm or refute the possibility of intrauterine infection.

### New England Journal of Medicine, Boston

228 39-80 (Jan. 14) 1943

- History and Discovery and Isolation of Myle Hormone. G. J. Newerla. Albany, N. Y.—p. 39.  
Military Discharge for Inadequacy: Report of 182 Cases. D. J. Flicker and O. H. Coleman. Camp Blinding, Fla.—p. 48.  
Gynecology: Neoplasms of Ovary. J. V. Meigs. Boston.—p. 52.

### New Jersey Medical Society Journal, Trenton

40 1-40 (Jan.) 1943

- Treatment of Compound Fractures in Wartime. I. E. Deibert. Camden.—p. 12.  
Syphilis of Larynx. E. L. Wood. Newark.—p. 15.  
Historical Sketch of Tuberculosis. B. L. Gordon. Atlantic City.—p. 17.

## FOREIGN

An asterisk (\*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

## Clinical Science, London

4 341-448 (Dec 15) 1942

- Idioma Following Ischemia in Rabbit's Ear F I Pochun—p 341  
\*Swelling of Human Limbs in Response to Immersion in Cold Water T Lewis—p 349  
Trousseau's Phenomenon in Tetany T Lewis—p 361  
Observations on Vascular Axon Reflex in Human Skin as Exhibited by Case of Urticaria with Remarks on Nociceptor Nerve Hypothesis T Lewis—p 365  
Measurement of Duction Movements of Eye I I Rundle and C W Wilson—p 385  
Assay of Renin in Rabbits with Experimental Renal Hypertension C W Pickering, M Prinzmetal and A R Kelsall—p 401  
\*Experimental Trinitrotoluene Poisoning: Effect of Diet H P Himsworth and I L Glynn—p 421

**Edema Produced by Cold**—The routine cooling of human hands (and feet) by their immersion in water at 41 F Lewis observed causes the extremities to swell. This increase in their volume occurs in both the cutaneous and subcutaneous tissue and may amount within three hours to as much as 15 per cent of the original volume. The swelling is due mainly to an edema of the tissues judged to be inflammatory from its relatively rapid outpouring and from its relatively high content of protein. The contribution in the form of imbibed water is slight. From this and correlated evidence it seems that cold directly injures the cutaneous and subcutaneous tissue. This effect begins at about 59 to 64 F and increases as the temperature of water descends. The edema that results from long continued immersion of the limbs in cold water should be taken into account as should protein loss, when the effects of exposure to cold on the whole circulation are estimated.

**Diet and Trinitrotoluene Poisoning**—In an effort to modify the seriousness of the illness that follows exposure to trinitrotoluene Himsworth and Glynn fed white Wistar rats different diets. They observed that typical necrosis of the liver and a profound though not aplastic, anemia occurred in rats exposed to trinitrotoluene when they were on a diet rich in fat while in animals on a high carbohydrate or a high protein diet the ill effects were slight or absent. Chronic trinitrotoluene poisoning in rats was characterized by loss of weight, increased appetite, urinary excretion of high concentrations of trinitrotoluene derivatives, a great decrease in hemoglobin, normoblasts, reticulocytes and polychromatic erythrocytes in the peripheral blood, erythroblastic hyperplasia of the bone marrow, siderosis of the spleen, fatty hepatic infiltration to acute necrosis of the parenchymal cells and loss of hair. The evidence suggests that the effect of the high fat diet is to impede the metabolic ability of the animal to dispose of the trinitrotoluene within its tissues. The resemblance between the effects of trinitrotoluene poisoning in the rat and of that in man is close.

## Lancet, London

1 1-34 (Jan 2) 1943

- Surgery in the Middle East E G Muir—p 1  
\*Cross Desensitization in Allergic Diseases Kate Maunsell—p 3  
Recovery from Heart Failure After Cardiac Massage H K Vernon—p 6  
\*Accidental Head Injuries: Prognosis in Service Patients C P Symonds and W R Russell—p 7  
Postconcussional Headache E Guttmann—p 10  
Method of Controlling Bronchial Secretion in Thoracic Surgery J Halton—p 12  
\*Perurethral Methods in Benign Prostatic Hypertrophy T L Chapman—p 14

**Cross Desensitization in Allergic Diseases**—Maunsell deals with desensitization to the class of allergens called idio-toxins or atopens which cause bronchial asthma, eczema, conjunctivitis and rhinitis. The allergic properties are exerted by food proteins, pollen and other constituents of plants, animal feathers, hair and wool, dust, bacteria and mold. Her investigation is designed to examine the specificity of the anti-allergic mechanism, for which a method of local desensitization of the skin has been studied. The technic was applied to obtain evidence whether in multisensitive patients one allergen can desensitize the skin so that it will no longer react to the others.

This is termed "cross desensitization" as opposed to the "direct desensitization," in which the same allergen is used for desensitizing and retesting. If the desensitization is carried out with two allergens of the same cutaneous activity a reciprocal cross desensitization occurs. If one allergen is stronger than the other the desensitization is unilateral. The occurrence of either reciprocal or unilateral desensitization is independent of the biologic group of the allergens. The desensitization is only a quantitative change and not a qualitative return to a normal response. Observations on the histamine reaction in desensitized areas showed that the decrease in the allergic reaction is not a mere general refractoriness of the tissues but the result of an anti-allergic mechanism. The wide range of cross desensitization suggests that a patient with a multiple sensitiveness does not require a mixed extract but that treatment with a single allergen is sufficient. If various allergens give equally positive reactions, the extract that is obtainable in the strongest concentration should be chosen, so that during treatment the initial dose can be increased ten thousand times or more. An improvement in desensitization must not be expected from finding still more skin reacting allergens but from the production of highly effective extracts and by carrying the desensitization as far as possible.

**Accidental Head Injuries**—In the course of their work at a military hospital for head injuries Symonds and Russell dealt with a variety of head injuries due to accidents of a kind that also occur in civil life. Their series of 242 acute consecutive cases is not entirely representative of accidental injuries because it does not include those cases in which the severity of the head injury or associated injuries of other parts forbade transfer within three weeks. This explains the low mortality, there were five deaths, and 22 (9 per cent) of the survivors were invalided out of the service. The others, 215, or 89 per cent, were returned to duty. A follow-up showed that a further 11 per cent were invalided later. A long post-traumatic amnesia carried a relatively bad prognosis for return to duty. Analysis of those returned to duty and followed up shows that in 90 per cent treatment (including rehabilitation) was less than three months, there was no difference in the length of treatment between those who had a relapse and those who remained well. The return to duty of 718 patients with chronic head injury, largely selected for admission to a special hospital because of unsatisfactory progress, was more than twice as bad as for the acute cases. There was a correlation between this bad prognosis and a higher incidence in this group of predisposition to mental disorders. The prognosis for return to duty among 111 personnel of the Royal Air Force with acute and chronic head injuries was four times as good as in the total series. The main reason for this relatively good prognosis in flying personnel probably was due to the fact that they were a highly selected group in respect to the absence of a predisposition to mental disorders.

## Perurethral Methods in Benign Prostatic Hypertrophy

—Chapman has employed perurethral prostatic resection with the Thompson resectoscope since 1938. His results in 100 consecutive cases have been far short of those obtained at the Mayo Clinic. It is chiefly in the benign group that the choice between suprapubic and perurethral methods arises. Six of the 100 men died, in 93 of the 94 survivors urethral micturition was achieved, the 1 patient in which this failed was mentally deteriorated. Micturition was sluggish in 10, and 4 of these were advised to continue with suprapubic drainage. In 3 there was evidence of recurrence of obstruction and in 2 others this was suspected. Function was maintained in the rest. The follow-up period extended up to four years. One instance that was clinically benign at operation later became malignant. Suprapubic prostatectomy offers little or no advantage over a perurethral prostatectomy in the removal of early foci of a malignant condition. Incontinence rarely occurred and then it responded to treatment.

## Tubercle, London

23 215-238 (Oct) 1942

- Some Observations on Effects of Experimental Diets on Pulmonary Tuberculosis G Day—p 215  
Aspiratory Metastasis E Fraenkel—p 227

**Gastroenterologia, Basel****66 121-248, 1941-1942 Partial Index**

- Alimentary Idiosyncrasy E. Hanhart—p. 121  
 Abdominal Meteorism R. M. Teoz—p. 130  
 Meteorism Its Roentgenologic Aspects and Their Diagnostic Value in Some Intestinal Diseases O. Walther—p. 162  
 Osteomalacia and Hypochromic Anemia After Gastric Resection Charlotte Sarasin—p. 182  
 \*Anemia in Kyphoscoliosis F. Reimann—p. 197

**Anemia in Kyphoscoliosis, Hemorrhagic Gastritis**—Reimann reports 4 cases of severe kyphoscoliosis associated with hypochromic anemia caused by profuse gastrointestinal hemorrhages. Examination of the stomach of 1 patient following resection revealed extensive erosions of the mucosa as the anatomic basis of the gastropathy. The gastric disorder has a causal relationship to the kyphoscoliosis in that the latter produces abnormal spatial conditions. There is a compression of the stomach and duodenum delayed emptying of the stomach a tendency to frequent vomiting, compression of the large abdominal vessels at the root of the mesentery and interference with circulation in the gastric vessels. Delayed emptying and stasis in the gastric vessels cause gastric symptoms and severe hemorrhages. These symptoms disappear in the reclining position and recur when the patient gets up, they have a distinct orthostatic character. The symptoms kyphoscoliosis, hypochromic anemia and erosive hemorrhagic gastropathy are a pathogenic triad which can be designated as anemia in kyphoscoliosis. Knowledge of this syndrome is important in the evaluation of gastric disorders in patients with kyphoscoliosis.

**Schweizerische medizinische Wochenschrift, Basel****72 909-932 (Aug. 22) 1942 Partial Index**

- Therapeutic Results in Cervical Cancer J. H. Müller—p. 909  
 \*So-Called Interstitial Plasma Cell Pneumonia in Early Infancy F. and W. Stürmman—p. 910  
 Cecal Invagination in Regional Enteritis (Terminal Ileitis) G. Rieben—p. 914  
 Experiences with Insulin in Schizophrenia A. Friedemann—p. 916  
 \*Serodiagnosis of Undulant Fever Advantages of Complement Fixation V. Badoux—p. 920  
 Allergic Myocarditis and Nephritis in Case of Tuberculous Hilar Adenitis J. Flagg and M. Froehner—p. 922

**Interstitial Plasma Cell Pneumonia in Infancy**—The Stürmman report observations on cases of interstitial plasma cell pneumonia. An alarming increase became apparent in the fall of 1941. Five infants developed the disorder in short succession and 4 of them died while of the earlier cases about half had recovered. It was surprising that all children who developed this form of pneumonia had been in the same room. Moreover, 1 infant who had been nursed in this room developed interstitial plasma cell pneumonia six weeks after discharge from the hospital. Necropsy of the 4 children who died last verified the diagnosis of interstitial plasma cell pneumonia. The authors observed in all 14 typical cases and a few atypical cases. The cases observed by them differed from others reported in that all the infants with one exception were normal, well developed and not prematurely born. The authors advance the following hypothesis regarding the still obscure pathogenesis. A neurotropic virus damages the respiratory regulation in the diencephalon so that the tonus of the inspiratory muscles, with the exception of the diaphragm, is intensified and the respiratory air is decreased. The extreme inspiratory position of the ribs dilates the pulmonary tissue, which is easily torn at this age. Thus alveolar ruptures or spontaneous pneumothorax is likely. The forced expiration together with the glottis closure increases the intrapulmonary pressure in thrusts. The tears in the alveoli lead to interstitial emphysema, which in turn leads to mediastinal and paratracheal emphysema. Not only air but also detritus is driven into these clefts and in this way the picture of interstitial plasmocytic pneumonia results. Where the detritus originates, whether in the infection or in the torn tissue will require further investigations. The description of the disease still has gaps and it still presents unsolved problems which require further observations.

**Serodiagnosis of Undulant Fever**—Defining the role which the laboratory should play in the serodiagnosis of undulant fever, Badoux says that the physician will demand (1) a hemoculture (2) an agglutination test and (3) the fixation of

the complement. Hemoculture will be most successful in the recent and febrile cases. Unfortunately the positive results are rare, particularly in case of *Brucella abortus bovis* (Bang) infection which is most frequent in Switzerland. There remain agglutination and fixation of the complement. He made comparative studies with these two tests on 527 patients who were suspected to have brucellosis. The superiority of the fixation of the complement was demonstrated by the fact that it produced 6.45 per cent more positive reactions than did the agglutination test. In conclusion the author calls attention to the high incidence of human brucellosis particularly *Brucella abortus* infection in the French speaking part of Switzerland. He maintains that the serologic methods are often the only procedures which permit a definite diagnosis and that serodiagnosis will be carried out with maximum success by (1) fixation of the complement, (2) the agglutination of Wright and (3) hemoculture.

**Semana Medica, Buenos Aires****49 941-1003 (Oct. 22) 1942 Partial Index**

- Therapy of Cancer J. Zavala Muniz—p. 943  
 \*Pericarditis in Infants R. Kreutzer, B. Izar and I. Diaz Bohillo—p. 953  
 Syphilis and Asthma May Syphilis Play Any Role in Development of Asthma J. A. Cruciani and O. F. Izard—p. 963  
 Diabetes and Postoperative Hypothyroidism L. C. Fong—p. 981

**Pericarditis in Infants**—Kreutzer and his collaborators report 8 cases of pericarditis with effusion in infants (2 girls and 6 boys). A clinical and roentgen diagnosis was made in all cases. Electrocardiograms were taken in 4 cases. The disease was purulent in 6 cases and serous and serohemorrhagic in 1 case each. It was secondary to suppurative bronchopulmonary or pleuropulmonary disease in 4 cases to suppurated cervical adenitis in 2 cases and to osteomyelitis of the clavicle in 1 case. Pain and fever were early symptoms. The constant moaning of the patients was interpreted as complaint of pain. Fever was moderate in 1 case acute and of the septic type in the cases of purulent pericarditis and did not appear in the only case of idiopathic pericarditis. Dyspnea, cough and cyanosis appeared late in the course of the disease. The authors found that the diagnosis is made by the aforementioned symptoms and by certain physical signs and electrocardiographic changes. The cardiac sounds as heard in the four foci of auscultation may be either weak or normal. The enlargement of the area of cardiac dullness at percussion and the signs of compression of the left lower lobe of the lung by the enlarged pericardium are of pathognomonic value. The enlargement of the x-ray shadow of the heart is also of diagnostic value. The size of the shadow depends on the amount of pericardial fluid. Its form varies with the postural changes of the patient as the liquid is displaced according to the laws of gravity. Radioscopy is also of value. Pulsation of the heart may be diminished, but the so-called quiet heart is exceptionally rare. The increase of venous pressure and the consequent engorgement of the jugular veins, enlargement of the liver and development of ascites and edema depend on the more or less rapid accumulation of pericardial fluid. As a rule they follow a slow course except in cases of serohemorrhagic pericarditis, in which the pericardial liquid is rapidly collected. The changes of the electrocardiogram consist in elevation of the ST segment especially in the second lead, and of inversion of the T wave in the four leads. The diagnosis is verified by the results of pericardial puncture. Pneumococci, streptococci and staphylococci are in order of frequency the bacteria found in suppurated pericarditis. The pericardial fluid does not contain bacteria in cases of idiopathic serous pericarditis. The prognosis is good in idiopathic pericarditis, moderate in the serohemorrhagic form of the disease and fatal in suppurative pericarditis. The prognosis of suppurative pericarditis can be improved by early therapy consisting of pericardiectomy and administration of sulfanilamide. The patients with serous (idiopathic) and serohemorrhagic pericarditis were reported by the author cured. Four patients died from suppurative pericarditis. Two patients died from renal abscess complicating suppurative pericarditis.



## Book Notices

**Recent Advances in Anesthesia and Analgesia (Including Oxygen Therapy)** By C. Langton Hewer M.B. B.S. D.A. Senior Anesthetist St. Bartholomew's Hospital London. Fourth edition. Cloth. Price \$5.00. Pp. 311 with 135 illustrations. Philadelphia: Blakiston Company, 1943.

The author, who is a well known British anesthetist has gathered from the literature (largely British) much relatively recent material. For the most part he indicates his agreement or disagreement with opinions expressed in the literature. The fields considered are theoretical aspects of inhalation anesthesia, premedication, nitrous oxide and the hydrocarbon gases, carbon dioxide and helium, modern apparatus for the administration of the gas anesthetics, recent work on the ethers, the halogen containing anesthetics, recent developments in endotracheal anesthesia, the explosion risk in anesthesia, intravenous anesthesia, general aspects of local analgesia, drugs used in local analgesia, recent advances in the technique of local analgesia, the present position of spinal analgesia, collapse and resuscitation, anesthesia for cranial and dental surgery, anesthesia for endoscopy and nasal and oral surgery, and use of suction, anesthesia and analgesia for thyroid, thoracic and abdominal surgery and in obstetrics with comments on resuscitation of the newborn, anesthetic sequelae, psychological aspects of anesthesia and analgesia and oxygen therapy. The book is especially interesting to the experienced anesthetist. It reflects the rapid advancement in anesthesiology. It is also valuable to the inexperienced anesthetist in that it serves as a guide to his reading. This small book is similar to the annual reports published in certain fields in order to record recent progress. It includes many practical points that may be applied clinically. However many who read it will feel that they would gladly trade much of the material in the book, which has been gathered from the literature for more information from the author on how he anesthetizes patients.

**The Antigonadotropic Factor with Consideration of the Antihormone Problem.** By Bernhard Zondek and Felix Sulman. Hebrew University, Jerusalem. Cloth. Price \$3. Pp. 185. Baltimore: Williams & Wilkins Company, 1942.

The authors have chosen to discuss a controversial subject. The review is thorough and gives much data pro and con based on experimental evidence both animal and human. Historically, Long and Evans in 1921-1922 found that protracted treatment of female infantile rats with anterior pituitary extracts induced the formation of atretic corpora lutea, atrophy of the ovaries and failure of estrus. Zondek in 1930 reported that female animals subjected to prolonged treatment with gonadotropic extract showed definite involution of the genital organs. In 1929 Lee, Teel and Gagnon reported failure of continued stimulation following prolonged treatment with thyrotropic factor. In 1934 Collip and Anderson postulated the presence of an antithyrotropic hormone. Since then antihormonal reactions have been reported for almost all the known hormones, especially those having a protein structure, such as the pituitary, the parathyroid, the adrenal and the pancreatic.

Zondek and Sulman state that "one of the main difficulties of antihormone research is that hormone preparations are not available 100 per cent pure. These contain the hormone together with protein contaminants which compete with the hormone in serological ability to form antibodies. They conclude "We feel that the arguments presented suffice to establish the view that antiprolan formation is an immune reaction. Up to the present, only protein containing hormones, especially the anterior pituitary (and cortin) have been found to evoke the formation of antihormones. It seems to have been proved that antihormone formation does not occur from protracted treatment with the steroid hormones, or with insulin, adrenalin, thyroid hormone (thyroxin), pitressin or pitocin. The theory is here advanced, therefore, that the antigonadotropic factor represents a new type of blood substance which, though closely related to the immune bodies, does not give the in vitro reactions which generally characterize an antibody. It seems likely,

furthermore, that also antifactors other than the antigonadotropic factor are immune bodies, the antigonadotropic substances in any case are not 'hormones with reverse properties', they are immune bodies which lack a visible in vitro reaction. Their general behavior in vivo and in vitro leads to their classification as a group of immune bodies of a character hitherto unknown in serology."

While this book indicates a comprehensive knowledge of the subject 'antihormones' and contains valuable information for investigators who are doing animal research, it is too complicated for the clinician. The subject is furthermore too theoretical to have practical clinical value now.

**The Relation of Certain Anomalies of Vision and Lateral Dominance to Reading Disability.** By Phillip W. Johnston Ph.D. Research Consultant, Mass. Dept. of Public Health, Boston. Monographs of the Society for Research in Child Development, Volume VII, No. 2 (Serial No. 32). Paper. Price \$1.50. Pp. 154 with 31 illustrations. Washington, D.C.: National Research Council, 1942.

The investigation was designed to determine the importance of various visual functions as factors in reading disability. The factors considered were visual acuity, muscle balance and anomalies of ocular dominance. A group of school children in Reading, Mass. were submitted to tests for these functions, and the results were compared with their record of reading accomplishment. The use of the various tests is accurately described. The Massachusetts vision test was used in estimating visual acuity with certain modifications, including a method of using the Landolt broken ring test in a way which seems more practical than any yet described. Variations in this test were minimized when standardized methods were employed and when one particularly well qualified member of the school staff was employed to do all the testing. Results indicated a probable association between latent hyperopia and low reading achievement. No such relationship was found between reading disability and heterophoria as found in this group.

Ocular dominance was determined by a battery of ten tests performed on each child, and right or left handedness was determined by a similar series of tests. The results are treated in an elaborate statistical manner with profuse use of algebraic formulas and graphs which are confusing to the reader with an ordinary medical education. Out of it all, however, comes the sober conclusion that no correlation between incongruities of ocular dominance and handedness and cases of reading disability could be found. The series in which the latter series of tests was made was not a large one, but the conclusion if corroborated will be of importance, since many educators, with out much evidence, have placed great stress on such a probable relationship and this is perhaps the most accurately controlled series of observations which has been made on the subject.

**The Biological Action of the Vitamins. A Symposium.** Edited by E. A. Evans Jr. Associate Professor of Biochemistry, the University of Chicago. Cloth. Price \$3. Pp. 227 with 30 illustrations. Chicago: University of Chicago Press, 1942.

Under present conditions it probably will be a long time before such another symposium is held as the one on respiratory enzymes at the University of Wisconsin, and its sequel on the biologic action of the vitamins at the University of Chicago late in 1942. The present volume is a companion piece to the volume on respiratory enzymes published under the editorship of Prof. Perry Wilson of the University of Wisconsin. It consists of fourteen essays on the vitamins, each one being an important presentation by a distinguished investigator. The general tone of the papers is brought out in the initial paper on "The Biological Action of the Vitamins" by C. A. Elvehjem, in which he has called attention to the change in direction of research on the vitamins. Whereas much of the earlier work on vitamins involved a study of growth in animals, the present direction is toward a study of the action in tissues. Here the work has been made possible by advances in the field of enzyme chemistry and thus these two phases of biochemistry have been brought together, at least with regard to some of the members of the vitamin B complex. Thus thiamine, riboflavin and nicotinic acid in combination with other substances have been demonstrated to be essential components of enzyme systems concerned with the oxidation of foodstuffs. Ochoa has written

on cocarboxylase, Norman Jolliffe on the clinical aspects of vitamin B<sub>1</sub>, Paul Gyorgy on riboflavin deficiency in the human being, and David T. Smith on nicotinic acid and pellagra. S. Lepkovsky has contributed a brief discussion of pyridoxine, R. J. Williams has written on pantothenic acid, Edgar S. Gordon on pantothenic acid in human nutrition and Vicent du Vigneaud on biotin. Wendell H. Griffith, now on foreign service with the Army, has given an excellent presentation of the facts about choline. Franklin C. McLean has presented new points of view about the economy of phosphorus in the animal organism and D. W. MacCorquodale and H. P. Smith and E. D. Warner have written about vitamin K. Persons interested in any one of these phases of vitamins will find this book exceedingly useful and stimulating.

**Climate Makes the Man.** By Clarence A. Mills, M.D., Ph.D., Professor of Experimental Medicine, University of Cincinnati. Cloth. Price \$3. Pp. 320. New York & London: Harper & Brothers, 1942.

The title of this well written book aptly characterizes the content. Designed for the nonprofessional reader, it presents a survey of the many interrelated fields in which climate assumes a role—a role much greater than the modern medical man and more particularly the modern medical scientist has cared to consider. For this very reason this popular survey, while purely nonscientific from the point of view of omitting all references to the literature, can be most useful to the physician who may still have sufficient time and detachment to think of the causes of disease as multiple rather than single.

Physicians of an earlier generation were more than conscious of this. In von Leyden's biography a chance remark on the health conditions of Bucharest is pertinent. "For despite its beautiful situation Bucharest is by no means among the healthier cities, the climate is not favorable, in winter temperatures fall to -24 C and during the heat of summer reach 48 C among the patients who consulted me were many with heart disease (nonrheumatic in character) which leads me to conclude that the cause must be associated with the climatic conditions." Coming from the north of Europe, the more brusque and taxing changes in the weather of the Balkans and Russia impressed the medical visitor. Page Hitler for confirmation!

"Climate Makes the Man," finding favor with the reading public, will indirectly awaken the interest of the physician. Patients are living organisms that are conditioned by the weather and the climate. Their diseases reflect these changing conditions, and the physician who evaluates the sum total of the environmental factors becomes a better physician. But this is not yet taught in the medical schools.

**The Vertebrate Eye and Its Adaptive Radiation.** By Gordon Lynn Walls, Research Associate in Ophthalmology, Wayne University College of Medicine, Detroit. Bulletin No. 19, Cranbrook Institute of Science. Cloth. Price \$6.50. Pp. 785 with 198 illustrations. Bloomfield Hills, Michigan: Cranbrook Institute of Science, 1942.

This book is the nineteenth bulletin of the Cranbrook Institute of Science, a massive tome with illustrations galore. The material deals with the various phases of the vertebrate eye. The first part is labeled "basic." It treats of light and its properties with especial reference to perception by an eye. The eye itself, the human eye is then discussed and dissected from all points, starting with embryology, passing through the gross and microscopic anatomy, and finishing with the physiology of vision. This part is well written in plain language. The second part is the ecologic, in this are discussed the necessary adaptations that the visual apparatus has undergone and is still undergoing so that the parent organism may survive under various conditions. To the clinical ophthalmologist, much of this section will be entirely new and he will be surprised how much of this applies to his daily routine. The third section is labeled "synoptic," which Webster defines as "affording a general view of a whole or of its principal parts." In this are described the eyes and their why and wherefore of birds, beasts, reptiles and fishes. Here too the clinician will find much of interest. While this book is essentially for reference, the average thinking physician can read it with pleasure and profit. The bookmaking is good, as are the illustrations, which are largely diagrammatic and hence easily understandable.

**Pesquisas sobre a febre amarela.** Por el Dr. Hermínio Linhares, biólogo do Instituto Oswaldo Cruz. Tese. Paper. Pp. 78. Rio de Janeiro: Imprensa Nacional, 1941.

This is a thesis written for the degree of doctor of medicine from the University of Brazil to be considered by the faculty of that institution in the manner of and modeled after French schools of medicine. During 1939, 1940 and for a few months of 1941 the author worked in the yellow fever service of the Ministry of Education and Health of Brazil and through that organization in cooperation with the International Health Division of the Rockefeller Foundation. It seems to be a careful study of the yellow fever virus. The experimental animals used in the study were chicks, mice and cats, the primary purpose was to study passages of the virus from animal to animal routes by which these animals are susceptible organs within the body of the animals in which the virus may be found after specific periods of time, the effect on the virus of avitaminosis B and the periods of time following inoculation in which immune bodies appear, correlated with age and route of introduction. It is pointed out that following intradermal inoculation of the virus it is not impossible that infected mosquitoes may be responsible for the spread of the virus among chicks and perhaps other very young birds which suggests a possible reservoir. The volume is bound in durable paper, written in the Portuguese language and well printed on permanent glossy paper. Comprehensive English summaries are appended to each of four sections. Included in the book are numerous well designed and informative tables and several graphs setting forth in detail the results of the experiments.

**Laboratory Handbook for Dietetics.** Compiled by Goodwin Thompson, Head Dietitian, Municipal Hospitals, Winnipeg, Canada, under the direction of Margaret A. Ohlson, Associate Professor, Foods and Nutrition, Iowa State College, Ames, Iowa. Paper. Price \$1.25. Pp. 73. Minneapolis: Burgess Publishing Company, 1942.

This is an 8 by 11 spiral book, prepared to furnish students with convenient tables for use in evaluating diets. The table of dietary allowances contains the figures of the Committee on Foods and Nutrition of the National Research Council, May 1941. The sources from which the data quoted in the table of proximate composition of some American foods were obtained are all listed and are known to be reliable. The table is ample for ordinary use. The last fifty pages of the book are recipes in tabular form to be evaluated by the student. Its purpose is to require the student to analyze food combinations and recognize the wide difference in the proximate composition of the final product. These tables omit space for fat and carbohydrate. Moreover, an equal number of blanks for the student's own recipes would give the book broader use. Tables giving the chief food sources of each of the specific nutrients or space where the student might record these would also be of great value.

**La toracoplastia ántero lateral elástica de Monaldi.** Por Jacinto Foglio, Tesis de doctorado, Universidad Nacional de Buenos Aires, Facultad de Ciencias Médicas, Escuela de Medicina. Paper. Pp. 98 with 39 illustrations. Buenos Aires: Establecimiento tipográfico de A. Cuidi Buffarini, 1942.

This gives an excellent account of the indications, operative methods and results of Monaldi's operation. The views of the Italian school—Forlunio Morelli and Monaldi—are clearly summarized. The conclusions of the author are supported by numerous clinical histories and reproductions of x-ray plates, and the literature on the subject is thoroughly quoted.

**Páginas clínicas.** Por el Doctor Lázaro Mendoza, profesor de clínica médica (seminología y diagnóstico), Universidad de El Salvador. San Salvador. Paper. Pp. 166. San Salvador: Imprenta Nacional, 1942.

The author, professor of medicine in the University of Salvador, has selected 36 interesting and varied cases which range from malaria to cancer of the pancreas. A devout admirer of French medicine, he deals with his problems in a light, picturesque and yet penetrating manner. The most interesting chapters are the fourteenth, fifteenth and sixteenth, in which he comments on the first cases of typhus fever, murine type, ever described in his country.

## Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

### COLOR BLINDNESS OF PHYSICIAN AND MILITARY SERVICE

**To the Editor**—One of our boys in medical school is color blind. As I understand the military requirement, that would bar him from military service. What effect will that have on him in general practice of medicine and surgery?

Robert H Kerr MD Alma Neb

**ANSWER**—Color blindness is not a bar from army service in the medical corps. Those who are color blind are not acceptable for general military service but can qualify for limited military duty. It is believed to be barred in the Navy Medical Corps as it is in aviation services. It does offer certain handicaps in medical work, chiefly in certain laboratory procedures, but there are a number of physicians who are red green blind (the common anomaly) who have done excellent work and claim to have noticed little, if any, inconvenience from this defect.

### PHARMACOLOGIC EFFECTS OF YOHIMBINE

**To the Editor**—I have noted in some literature from a manufacturing pharmaceutical concern relative to the use of yohimbine that vertigo, nervous excitation, palpitation, insomnia and headache indicate a reduction or discontinuance of the remedy. With 1 patient I have noted most of the symptoms mentioned quite definite with even a small dose. Have you any data concerning the physiologic action of yohimbine on the circulatory, respiratory, nervous or other body systems which might explain the symptoms noted?

M D New Mexico

**ANSWER**—The undesirable symptoms and reactions reported after yohimbine are correctly emphasized as those indicating toxicity and are apparently directly associated with a fall in blood pressure. It has been shown by Hamet (*Compt rend Acad d sc* 93 1274 [Nov 27] 1925) in Europe and by Young, Yonkman and their co-workers in this country that the alkaloid and some of its derivatives produce an abrupt and pronounced fall in blood pressure, respiratory changes and occasional skeletal tremors when injected intravenously into anesthetized cats and dogs. In cats a dose of 3 to 7 mg per kilogram produces a paralysis of salivation controlled by the cervical sympathetic nerve as demonstrated by failure of secretion when the nerve is electrically stimulated after yohimbine (Yonkman, F G, and Young, A G. The Antisymphatheticomimetic Effect of Ethyl Yohimbine on Salivation and Mydriasis, *J Pharmacol & Exper Therap* 63 40 [May] 1938). This sympatholytic action, together with the well known epinephrine reversal effect elicited by the drug (Young, A G, and Yonkman, F G. Further Studies of the Chemotherapy of Yohimbine Compounds, *ibid* 57 150 [June] 1936), suggested the use of yohimbine in experimental hypertension of the type produced in dogs by Page's technique of kidney envelopment. The alkaloid, when intravenously administered, is capable of acutely lowering tension and is still able to reverse the effect of epinephrine in the hypertensive state (Chase, H S, Yonkman, F G, and Lehman, A J. The Effect of Ethyl Yohimbine in Experimental Hypertension, *ibid* 72 6 [May] 1941).

After oral treatment of hypertensive dogs with yohimbine it was found (Jacobs, J, and Yonkman, F G. The Effect of Yohimbine Hydrochloride in Trained Unanesthetized Dogs with Experimental [Page Type] Hypertension to be published) that an initial dose of 10 mg per kilogram produced after five to fifteen minutes profound salivation, panting, increased pulse rate, fall in blood pressure, generalized tremors and weakness to the point of collapse. The animals were evidently in real distress. However, beginning with smaller daily doses of 1 to 3 mg per kilogram the undesirable symptoms and reactions were diminished or obviated, apparently an early tolerance seems to be developed to some extent, but pressure decline persisted as long as treatment continued for twelve months or more.

Clinically, 1 to 2 mg per kilogram can be tolerated orally by most patients. The described side reactions should be carefully avoided if possible and one must always anticipate the hyperreactive patient such as the one described. The early treatment of essential hypertension on a sympatholytic basis seems promising, but acceptance of this procedure awaits further clinical study.

### INJECTION OF HEMORRHOIDS AND OBTURATOR NERVE PARALYSIS

**To the Editor**—Are there recorded instances of bilateral obturator nerve paralysis following hemorrhoidal injections? I should appreciate knowing the best procedure or treatment used in such cases. M D Nebraska

**ANSWER**—The obturator nerve arises from the lumbar plexus by a fusion of the three anterior divisions of the plexus which are derived from the second, third and fourth lumbar nerves. Emerging from the medial border of the psoas near the brim of the pelvis it passes on the lateral side of the hypogastric vessels and ureter and descends through the obturator foramen to the medial side of the thigh. The symptoms of isolated paralysis of this nerve which is rare are impairment of external rotation and adduction of the thigh, difficulty in crossing the legs and a small insignificant sensory loss.

Injection of hemorrhoids occasionally causes an ascending thrombosis of the superior hemorrhoidal vein. For several days the patient feels pressure and fullness in the pelvis, and to digital palpation a sensitive leathery thickening may be felt extending 2 or 3 inches upward from the site of injection. Rarely an embolus into the portal system, notably into the liver may occur. The inferior and middle hemorrhoidal veins drain into the internal pudic and from here into the hypogastric vein. No case of obturator paralysis has been recognized from a thrombosis of the hypogastric vein, although in a septic ascending thrombosis with abscess formation one can observe radiation of pain into gluteal or sciatic territory. In order to explain a bilateral paralysis either the obturator nerve must be involved through a bilateral hypogastric thrombosis or the block must occur in the vertebral canal into which the anterior vertebral veins may drain blood from the hemorrhoidal venous plexus.

These data are given as a basis for a possible anatomic connection between the injection of hemorrhoids and the paralysis of the obturator nerves. Whether such a connection can really be assumed would depend on data which the correspondent does not submit, namely type of rectal lesion, treated symptoms following injection and interval between the injection and the paralysis. Other causes of paralysis, namely pressure on the pelvic brim, intrapelvic abscesses and position of the patient on the operating table, should be considered. Finally, a neurologic lesion associated with involvement of other nerves, mostly the femoral, must be thought of. Treatment cannot be suggested unless the cause of the lesion can be more closely defined.

### REFRACTORY PARATYPHOID A INFECTION OF LIVER AND BILE TRACT

**To the Editor**—A man aged 29 has had an infection with paratyphoid A organisms for eighteen weeks. He has a septic type of fever below normal in the morning and up to 104 F every night. Every possible focus of infection except the liver and the gallbladder has been eliminated where on laparotomy small abscesses were found throughout the liver. The gallbladder itself contained bile which had numerous pus cells and paratyphoid A organisms. Have there been any reports of liver abscess complicating paratyphoid A infection or any in which drainage of the common bile duct has afforded cure? The gallbladder has already been drained, the bile flowing freely for three weeks without appreciable effect on the fever. The tube has since fallen out and drainage has ceased. While the gallbladder was draining the patient's fever was lower but since it has stopped draining his chills have returned and his temperature has resumed its high level. Sulfathiazole, sulfadiazine and azosulfamide have been tried without much effect. Sulfapyridine reduced the temperature for two days but had to be discontinued since the patient could not tolerate it. The main question now is whether the common bile duct should be drained again and the entire bile flow redirected outside the body.

H D Cheifetz MD, Montreal Que

**ANSWER**—The occurrence of multiple abscesses of the liver has been observed in the typhoid infections. It is not common but is more common than solitary abscess of the liver. The multiple abscesses usually follow a suppurative cholangitis or a pyelophlebitis following appendical involvement. It seems likely in this case that the primary difficulty lies in the liver and that the gallbladder is secondarily infected. In such a situation drainage of the gallbladder would afford some relief but would not adequately drain the foci in the liver. All of this could easily account for the septic type of fever although other foci should be sought. Thrombophlebitis elsewhere and pyelitis may cause a similar course.

It seems unlikely that further drainage of the gallbladder would effect a cure. At least other methods would seem indicated first. In such a case as this it is necessary to grasp at straws. While sulfaguanidine therapy has not yet received sufficient support to warrant its widespread adoption it would certainly be worth a trial. Convalescent serum has had some support in the past and would certainly be harmless. Immuno-transfusion, that is, transfusion of whole blood from an immune donor, is worth consideration. If all these measures fail surgical drainage of the biliary tract may be reconsidered.

on cocarboxylase, Norman Jolliffe on the clinical aspects of vitamin B<sub>12</sub>, Paul Gyorgy on riboflavin deficiency in the human being, and David T. Smith on nicotinic acid and pellagra. S. Lepkovsky has contributed a brief discussion of pyridoxine, R. J. Williams has written on pantothenic acid, Edgar S. Gordon on pantothenic acid in human nutrition and Vicent du Vigneaud on biotin. Wendell H. Griffith, now on foreign service with the Army, has given an excellent presentation of the facts about choline. Franklin C. McLean has presented new points of view about the economy of phosphorus in the animal organism, and D. W. MacCorquodale and H. P. Smith and E. D. Warner have written about vitamin K. Persons interested in any one of these phases of vitamins will find this book exceedingly useful and stimulating.

**Climate Makes the Man.** By Clarence A. Mills, M.D., Ph.D., Professor of Experimental Medicine, University of Cincinnati. Cloth. Price \$3. Pp. 320. New York & London: Harper & Brothers, 1942.

The title of this well-written book aptly characterizes the content. Designed for the nonprofessional reader, it presents a survey of the many interrelated fields in which climate assumes a role—a role much greater than the modern medical man and more particularly the modern medical scientist has cared to consider. For this very reason this popular survey, while purely nonscientific from the point of view of omitting all references to the literature, can be most useful to the physician who may still have sufficient time and detachment to think of the causes of disease as multiple rather than single.

Physicians of an earlier generation were more than conscious of this. In von Leyden's biography a chance remark on the health conditions of Bucharest is pertinent: "For despite its beautiful situation Bucharest is by no means among the healthier cities, the climate is not favorable, in winter temperatures fall to -24° C and during the heat of summer reach 48° C among the patients who consulted me were many with heart disease (nonrheumatic in character) which leads me to conclude that the cause must be associated with the climatic conditions." Coming from the north of Europe, the more brusque and taxing changes in the weather of the Balkans and Russia impressed the medical visitor. Page Hitler for confirmation!

"Climate Makes the Man," finding favor with the reading public, will indirectly awaken the interest of the physician. Patients are living organisms that are conditioned by the weather and the climate. Their diseases reflect these changing conditions, and the physician who evaluates the sum total of the environmental factors becomes a better physician. But this is not yet taught in the medical schools.

**The Vertebrate Eye and Its Adaptive Radiation.** By Gordon Lynn Walls. Research Associate in Ophthalmology, Wayne University College of Medicine, Detroit. Bulletin No. 19, Cranbrook Institute of Science. Cloth. Price \$6.50. Pp. 78, with 198 illustrations. Bloomfield Hills, Michigan: Cranbrook Institute of Science, 1942.

This book is the nineteenth bulletin of the Cranbrook Institute of Science, a massive tome with illustrations galore. The material deals with the various phases of the vertebrate eye. The first part is labeled "basic." It treats of light and its properties with especial reference to perception by an eye. The eye itself, the human eye, is then discussed and dissected from all points, starting with embryology, passing through the gross and microscopic anatomy, and finishing with the physiology of vision. This part is well written in plain language. The second part is the ecologic in this are discussed the necessary adaptations that the visual apparatus has undergone and is still undergoing so that the parent organism may survive under various conditions. To the clinical ophthalmologist, much of this section will be entirely new and he will be surprised how much of this applies to his daily routine. The third section is labeled "synoptic," which Webster defines as "affording a general view of a whole or of its principal parts." In this are described the eyes and their why and wherefore of birds, beasts, reptiles and fishes. Here too the clinician will find much of interest. While this book is essentially for reference, the average thinking physician can read it with pleasure and profit. The bookmaking is good, as are the illustrations, which are largely diagrammatic and hence easily understandable.

**Pesquisas sobre a febre amarela.** 11. biólogo Interino do Instituto Oswaldo. Rio de Janeiro: Imprensa Nacional, 1941.

This is a thesis written for the degree of Doctor of Science from the University of Brazil to be received from that institution in the manner of the schools of medicine. During 1939-1940 and of 1941 the author worked in the well-known Ministry of Education and Health of Brazil, an organization in cooperation with the International Commission of the Rockefeller Foundation. It was a study of the yellow fever virus. The animals used in the study were chicks, mice and guinea pigs. The purpose was to study passages of the virus from one animal to another by which these animals are susceptible. The body of the animals in which the virus is present in specific periods of time, the effect on the animals, the periods of time following inoculation, the bodies appear, correlated with age and route of infection. It is pointed out that following intradermal infection with the virus it is not impossible that infected monkeys are responsible for the spread of the virus among other very young birds, which suggest a possible route of infection. The volume is bound in durable paper, written in Portuguese and well printed on permanent glossy paper. Comprehensive English summaries are appended to each of the chapters. Included in the book are numerous well designed illustrative tables and several graphs setting forth in detail the results of the experiments.

**Laboratory Handbook for Dietetics.** Compiled by Gordon A. Head, Dietitian, Municipal Hospitals, Winnipeg, Canada, and Margaret A. Olson, Associate Professor, Foods and Nutrition, Iowa State College, Ames, Iowa. Paper. Price \$1.25. Pp. 117. Ames, Iowa: Burgess Publishing Company, 1942.

This is an 8 by 11 spiral book prepared to furnish students with convenient tables for use in evaluating diets. The tables of dietary allowances contain the figures of the Committee on Foods and Nutrition of the National Research Council, 1941. The sources from which the data quoted in the tables were obtained are listed and are known to be reliable. The tables are ample for ordinary use. The last fifty pages of the book are recipes in tabular form to be evaluated by the student. Its purpose is to require the student to analyze food combinations and recognize the wide difference in the proximate composition of the final product. These tables omit space for fat and carbohydrate. Moreover, an equal number of blanks for the student's own recipes would give the book broader use. Tables giving the chief food sources of each of the specific nutrients or space where the student might record these would also be of great value.

**La toracoplastia Antero lateral elástica de Monaldi.** Por Jacinto Foglio. Tesis de doctorado. Universidad Nacional de Buenos Aires. Facultad de Ciencias Médicas. Escuela de Medicina. Paper. 1 p. 56 with 39 illustrations. Buenos Aires: Establecimiento tipográfico de A. Cudli Buffarini, 1942.

This gives an excellent account of the indications, operative methods and results of Monaldi's operation. The views of the Italian school—Forlanini, Morelli and Monaldi—are clearly summarized. The conclusions of the author are supported by numerous clinical histories and reproductions of x-ray plates, and the literature on the subject is thoroughly quoted.

**Páginas clínicas.** Por el Doctor Lázaro Mendoza, profesor de clínica médica (seminología y diagnóstico). Universidad de El Salvador. San Salvador. Paper. Pp. 166. San Salvador: Imprenta Nacional, 1942.

The author, professor of medicine in the University of Salvador, has selected 36 interesting and varied cases which range from malaria to cancer of the pancreas. A devout admirer of French medicine, he deals with his problems in a light, picturesque and yet penetrating manner. The most interesting chapters are the fourteenth, fifteenth and sixteenth, in which he comments on the first cases of typhus fever, murine type, ever described in his country.

## Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

### COLOR BLINDNESS OF PHYSICIAN AND MILITARY SERVICE

**To the Editor**—One of our boys in medical school is color blind. As I understand the military requirement that would bar him from military service. What effect will that have on him in general practice of medicine and surgery?  
Robert H. Kerr, M.D., Alma, Neb.

**ANSWER**—Color blindness is not a bar from army service in the medical corps. Those who are color blind are not acceptable for general military service but can qualify for limited military duty. It is believed to be barred in the Navy Medical Corps as it is in aviation services. It does offer certain handicaps in medical work chiefly in certain laboratory procedures but there are a number of physicians who are red-green blind (the common anomaly) who have done excellent work and claim to have noticed little if any inconvenience from this defect.

### PHARMACOLOGIC EFFECTS OF YOHIMBINE

**To the Editor**—I have noted in some literature from a manufacturing pharmaceutical concern relative to the use of yohimbine that vertigo, nervous excitation, palpitation, insomnia and headache indicate a reduction or discontinuance of the remedy. With 1 patient I have noted most of the symptoms mentioned quite definite with even a small dose. Have you any data concerning the physiologic action of yohimbine on the circulatory, respiratory, nervous or other body systems which might explain the symptoms noted?  
M.D. New Mexico

**ANSWER**—The undesirable symptoms and reactions reported after yohimbine are correctly emphasized as those indicating toxicity and are apparently directly associated with a fall in blood pressure. It has been shown by Hamet (*Compt rend Acad sci* 93 1274 [Nov. 27] 1925) in Europe and by Young, Yonkman and their co-workers in this country that the alkaloid and some of its derivatives produce an abrupt and pronounced fall in blood pressure, respiratory changes and occasional skeletal tremors when injected intravenously into anesthetized cats and dogs. In cats a dose of 3 to 7 mg per kilogram produces a paralysis of salivation controlled by the cervical sympathetic nerve as demonstrated by failure of secretion when the nerve is electrically stimulated after yohimbine (Yonkman, F. I., and Young, A. G. The Antisymphatheticomimetic Effect of Ethyl Yohimbine on Salivation and Mydriasis, *J Pharmacol & Exper Therap* 63 40 [May] 1938). This sympatholytic action, together with the well known "epinephrine reversal" effect elicited by the drug (Young, A. G., and Yonkman, F. F. Further Studies of the Chemotherapy of Yohimbine Compounds, *ibid* 57 150 [June] 1936), suggested the use of yohimbine in experimental hypertension of the type produced in dogs by Pages' technique of kidney envelopment. The alkaloid when intravenously administered, is capable of acutely lowering tension and is still able to reverse the effect of epinephrine in the hypertensive state (Chase, H. S., Yonkman, F. I., and Lehman, A. J. The Effect of Ethyl Yohimbine in Experimental Hypertension, *ibid* 72 6 [May] 1941).

After oral treatment of hypertensive dogs with yohimbine it was found (Jacobs, J., and Yonkman, F. F. The Effect of Yohimbine Hydrochloride in Trained Unanesthetized Dogs with Experimental [Page Type] Hypertension to be published) that an initial dose of 10 mg per kilogram produced after five to fifteen minutes profound salivation, panting, increased pulse rate, fall in blood pressure, generalized tremors and weakness to the point of collapse. The animals were evidently in real distress. However, beginning with smaller daily doses of 1 to 3 mg per kilogram the undesirable symptoms and reactions were diminished or obviated, apparently an early tolerance seems to be developed to some extent, but pressure decline persisted as long as treatment continued for twelve months or more.

Clinically, 1 to 2 mg per kilogram can be tolerated orally by most patients. The described side reactions should be carefully avoided if possible and one must always anticipate the hyperreactive patient such as the one described. The early treatment of essential hypertension on a sympatholytic basis seems promising, but acceptance of this procedure awaits further clinical study.

### INJECTION OF HEMORRHOIDS AND OBTURATOR NERVE PARALYSIS

**To the Editor**—Are there recorded instances of bilateral obturator nerve paralysis following hemorrhoidal injections? I should appreciate knowing the best procedure or treatment used in such cases. M.D. Nebraska

**ANSWER**—The obturator nerve arises from the lumbar plexus by a fusion of the three anterior divisions of the plexus which are derived from the second, third and fourth lumbar nerves. Emerging from the medial border of the psoas near the brim of the pelvis, it passes on the lateral side of the hypogastric vessels and ureter and descends through the obturator foramen to the medial side of the thigh. The symptoms of isolated paralysis of this nerve which is rare are impairment of external rotation and adduction of the thigh, difficulty in crossing the legs and a small insignificant sensory loss.

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### REFRACTORY PARATYPHOID A INFECTION OF LIVER AND BILE TRACT

**To the Editor**—A man aged 29 has had an infection with paratyphoid A organisms for eighteen weeks. He has a septic type of fever below normal in the morning and up to 104 F every night. Every possible focus of infection except the liver and the gallbladder has been eliminated where on laparotomy small abscesses were found throughout the liver. The gallbladder itself contained bile which had numerous pus cells and paratyphoid A organisms. Have there been any reports of liver abscess complicating paratyphoid A infection or any in which drainage of the common bile duct has afforded cure? The gallbladder has already been drained, the bile flowing freely for three weeks without appreciable effect on the fever. The tube has since fallen out and drainage has ceased. While the gallbladder was draining the patient's fever was lower but since it has stopped draining his chills have returned and his temperature has resumed its high level. Sulfathiazole, sulfadiazine and azosulfamide have been tried without much effect. Sulfapyridine reduced the temperature for two days but had to be discontinued since the patient could not tolerate it. The main question now is whether the common bile duct should be drained again and the entire bile flow redirected outside the body.  
H. D. Cherfetz, M.D., Montreal, Que.

**ANSWER**—The occurrence of multiple abscesses of the liver has been observed in the typhoid infections. It is not common but is more common than solitary abscess of the liver. The multiple abscesses usually follow a suppurative cholangitis or a pylophlebitis following appendical involvement. It seems likely in this case that the primary difficulty lies in the liver and that the gallbladder is secondarily infected. In such a situation drainage of the gallbladder would afford some relief but would not adequately drain the foci in the liver. All of this could easily account for the septic type of fever, although other foci should be sought. Thrombophlebitis elsewhere and pyelitis may cause a similar course.

It seems unlikely that further drainage of the gallbladder would effect a cure. At least other methods would seem indicated first. In such a case as this it is necessary to grasp at straws. While sulfaguanidine therapy has not yet received sufficient support to warrant its widespread adoption, it would certainly be worth a trial. Convalescent serum has had some support in the past and would certainly be harmless. Immuno-transfusion, that is, transfusion of whole blood from an immune donor, is worth consideration. If all these measures fail, surgical drainage of the biliary tract may be reconsidered.

# RECURRENT ULCERS AND NEUROLOGIC DISTURBANCE OF LEG

To the Editor—A woman gives a history of being well until two years ago at which time she thought she hurt her left foot at the ankle and an ulcer developed soon afterward. This ulcer did not heal for several months and soon after it did heal another developed. These ulcers have been coming and going ever since always being somewhere on the lower part of the left leg near the ankle. At present she has a large craterlike ulcer on the inner aspect of the ankle which has been present since July and which will not heal in spite of therapy used. She has a number of large scars on her arms which she says developed from sores following mosquito bites last year. Also soon after her first ulcer the left leg became numb and began to swell. When first seen by me in the summer her left leg was cold with no sensation to pain or touch up to the knee. She is unable to move any part of the leg below the knee. The knee reflex (patellar) is normal. The trophic ulcer now is constantly increasing in size. In the early part of September she developed severe stomatitis with patchy reddened areas covered with a grayish exudate. Smears were negative for Vincent's organism. The gums also became involved and are much swollen and bleed easily. The condition has remained the same since with but little improvement. A spinal tap done in September revealed a normal cell count no increase in pressure normal globulin and sugar normal colloidal gold and no xanthochromia. The red blood cells number 3,470,000 hemoglobin 65 per cent white blood cells 13,800 polymorphonuclear cells 82 per cent, lymphocytes 16 per cent metamyelocytes 2 per cent. She has headaches in the back of the head three or four times a day. The x-ray examinations of the chest and the bones of the leg are negative except for density due to disuse. Pulsation above the ankle is not felt the foot being swollen. No external pain sensation is present although there is some deep sensation when exploring the ulcer crater. There is no sensation to hot or cold water. The patient suffers from constipation. The menstrual periods vary from six weeks to six months apart are scanty, and usually last only one to two days. The blood pressure is 132/80 the urine normal the Wassermann reaction negative agglutinations for typhoid undulant fever and tularemia are negative. Possible syringomyelia or vitamin deficiency are considered. The patient has been given vitamin B complex nicotinamide ascorbic acid liver extract ferrated liver and the like at one time or another contrast baths and other treatments, but so far none have done any good.

Carl Baumgartner M.D. Bismarck N.D.

ANSWER—Any attempt to explain this condition on the basis of the facts set forth encounters obstacles somewhere. First a central nervous system lesion such as syringomyelia is not often found in the lower extremities alone and almost never is so sharply defined. In addition the tactile sense is usually retained. The correspondent does not tell of the neurologic findings elsewhere, so it is assumed that they are normal except for the left leg. A spinal cord tumor or a myelitis would produce changes on both sides.

Secondly, although no pulse may be made out in the lower left leg, it is unlikely that the condition is primarily one of arterial disease. Primary arterial disease is usually associated with pain. Early, before the onset of gangrene pain is the principal symptom and may be severe. Edema is not a part of arterial disease.

There is obviously a circulatory disturbance. The history of onset with trauma would suggest the occurrence of a thrombophlebitis at the point of injury. It must then be assumed that the process is slowly ascending in the veins of the left leg. At the time the condition was described it must be assumed that the circulation was severely impaired in most of the leg below the knee.

The objection to this hypothesis is that it does not explain the anesthesia in the leg, and it totally disregards the aphthae and the bleeding gums. It is extremely difficult to connect the mouth condition with the disturbance in the leg in the presence of all the other negative findings. It seems unlikely that the situation represents an avitaminosis in view of the lack of response to vigorous vitamin therapy.

To obtain further information it would be well to have a thoroughgoing neurologic examination if this has not already been done. A microscopic examination of a bit of muscle might reveal the presence of some systemic vascular disease. The adequacy of the circulation in the left leg should be investigated with the histamine flare or by careful observation of the skin temperature. Meanwhile the leg should be treated for thrombophlebitis with rest, elevation and perhaps compression. The use of heparin dicumarol or both should be seriously considered.

## PHENYTOIN SODIUM FOR ASTHMA

To the Editor—Will you please comment on the value of phenytoin sodium in the treatment of bronchial asthma?

M.D. Massachusetts

ANSWER—Phenytoin sodium (sodium diphenyl hydantoinate commercially known as Dilantin Sodium) was described in 1937 and 1938 by Merritt and Putnam as a new anticonvulsant. They reported that the drug gave excellent results in the treatment of epilepsy. When large doses were used, toxic effects occurred: nausea and vomiting, nervousness, tremor of the hands, drowsiness, headache, ataxia, hypertrophy of the gums and toxic der-

matitis varying from an erythema to a severe morbilliform rash. Patients who received 0.3 Gm or less daily showed few or no toxic symptoms.

Shulman has reported excellent results in the treatment of 7 asthmatic children. All had severe refractive asthma, with positive cutaneous tests but with indifferent therapeutic results despite the fact that they had been under treatment for at least a year. Phenytoin sodium was given for periods varying from five to twelve months and all other medication was stopped. The initial dosage was  $\frac{1}{2}$  grain (0.032 Gm) twice daily. If symptoms persisted the dosage was increased to  $\frac{1}{2}$  grain three times daily and some patients received as much as 3 grains (0.2 Gm) a day. Six of the 7 patients were rendered symptom free, although 2 of the children had mild abortive attacks. One patient developed toxic symptoms which cleared rapidly on withdrawal of the drug; this patient was able to resume the treatment with a slightly smaller dose. In 2 cases seasonal nasal and ocular symptoms could not be controlled by the drug. Relief of a concomitant eczema occurred in 2 cases. Shulman notes that, as in epilepsy, the use of phenytoin sodium leads to an improvement in the personalities of some of the children, and he suggests that the drug might be best suited for patients with chronic asthma in whom a psychogenic factor exists. Further studies in this field are necessary but the results are encouraging.

## References

- Putnam T. J. and Merritt H. H. Experimental Determination of the Anticonvulsant Properties of Some Phenyl Derivatives. *Science* 55: 525 (May 28) 1937.
- Merritt H. H. and Putnam T. J. A New Series of Anticonvulsant Drugs Tested by Experiments on Animal. *Arch. Neurol. & Psychiat.* 30: 1003 (May) 1938.
- Sodium Diphenyl Hydantoinate in the Treatment of Convulsive Disorders. *The Journal* Sept. 17, 1935 p. 1054.
- Sodium Diphenyl Hydantoinate in the Treatment of Convulsive Seizures. Toxic Symptoms and Their Prevention. *Arch. Neurol. & Psychiat.* 12: 1051 (Dec.) 1939.
- Shulman M. H. The Use of Dilantin Sodium in Bronchial Asthma. A Preliminary Report. *Acad. England J. Med.* 2: 660 (Feb. 12) 1942.

## ADMINISTRATION OF MORPHINE

To the Editor—In the Dec. 19, 1942 issue page 1349 you published your answer to Major M. Abrams on morphine administration. The remarks on sublingual administration deserve serious reconsideration as they are based on impressions in the older literature that have not been established. In 1928 this question was studied by actually determining quantitatively the morphine unabsorbed from the sublingual space. It was concluded that little if any was absorbed (Davis David and Ayman David. *Sublingual Absorption of Drugs*. *Morphine Arch. Int. Med.* 41: 231 [Feb.] 1928). It is my impression that the effects of sublingual administration of morphine are those of absorption from the gastrointestinal tract after the drug is swallowed. On the other hand I fully agree that morphine is quickly and completely absorbed from the gastrointestinal tract. In my experience when properly administered by mouth the effects may be as rapid as those following subcutaneous administration. For many years now I have recommended the use of a hypodermic tablet completely dissolved in an ounce of water to be followed immediately by a glass or two of water. When the stomach is empty the effects are often experienced within two or three minutes. When given on a full stomach and followed by sufficient water the effects are rapid also. Your statement that the sublingual route protects the morphine from the action of gastric ferments and that morphine is excreted into the stomach are misleading and without foundation (Hatcher R. A. and Davis David. *The Excretion of Morphine into the Stomach*. *J. Pharmacol. & Exper. Therap.* 26: 49 [Aug.] 1925). It is important to inform members of the Medical Corps that morphine is not appreciably absorbed from the mucous membrane of the mouth as this procedure will undoubtedly delay its action. It is also important to emphasize that morphine may be quickly absorbed from the gastrointestinal tract if taken in complete solution. The method suggested is a hypodermic tablet completely dissolved in water and then followed by water, to wash it into the circulation.

David Davis M.D. Boston

## EXPRESSIONS OF VISUAL ACUITY

To the Editor—Ophthalmologists are accustomed to designate their findings on visual acuity by referring to a standard distance (for instance 20/50, 20/80). On the other hand it seems that in all tests given by the services a standard size letter is used and the examinee has to approach this letter until he is able to read it. Therefore the official designations of visual acuity for the services read 12/20, 15/20 and so on. Examiners may have difficulty in comparing these two different kinds of designations. There is a simple way of conversion by dividing the figure one wants to convert into 400. For instance 20/25 of the ophthalmologist's designation equals 16/20 since 400 divided by 25 equals 16. 12/20 of the services' designation equals 20/33 since 400 divided by 12 equals 33.

I hope these remarks will be helpful.

Arthur Linksz M.D. Hanover N.H.



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## PERSONALITY CHANGES FOLLOWING SUBSTITUTION THERAPY IN PRE- ADOLESCENT EUNUCHOIDISM

JACOB KASANIN, MD

SAN FRANCISCO

A D

LIEUTENANT COLONEL GERSON R BISKIND  
MEDICAL CORPS, ARMY OF THE UNITED STATES

The dramatic physical changes resulting from the administration of testosterone and its derivatives to males with hypogonadism have been the subject of many reports since the introduction of this specific therapeutic agent<sup>1</sup>. The anatomic and physiologic changes have received special attention, but the descriptions of the physiologic changes have with few exceptions been meager, in general, these factors have been overlooked<sup>2</sup>. It is our purpose in this communication to present in greater detail the changes of personality that occurred following specific treatment in 7 cases of eunuchoidism.

The cases under observation represent moderate to severe types of hypogonadism that have been treated by the subcutaneous implantation of pellets of testosterone or its derivatives. In 3 cases previous therapy in the form of injections of testosterone propionate in oil had been given. Two types of pellets were used. Small pellets of methyl testosterone were prepared by compressing the crystalline material<sup>3</sup> in a mold<sup>4</sup>. Approximately 15 pellets representing 150 mg were implanted every ten weeks. Four large pellets, each weighing approximately 200 mg and generally composed of testosterone propionate, were implanted once a year. The effectiveness of therapy was determined by the physical changes, particularly the enlargement of the penis and prostate, the appearance of pubic and axillary hair, the deepening of the voice and enlargement of the neck and the alteration in body contour

with the development of the muscles of the shoulders, arms and thorax. Associated with these changes were a development and increase in libido expressed by masturbation, an interest in women and, whenever possible, by intercourse. The concomitant feeling of well-being and of optimism and the change of attitude to the environment which are expressions of personality modifications that resulted from treatment will be described in greater detail.

The patients themselves have been very helpful in describing minutely the changes in personality following treatment. All had had much ineffective nonspecific treatment of various types before they came to us. They had learned to be quite skeptical and expected very little from any treatment. Thus the element of suggestion is fairly well eliminated. All the patients had become quite introspective since adolescence when at the age of 14 or 15 they discovered that they were different from other boys, and then in time they became convinced that there was very little possibility of any improvement in their condition. The patients were very reticent concerning their pretreatment existence until they saw that the rapid physical response to therapy was of a permanent nature, at which time they gave data previously withheld.

One must visualize the reaction of a young boy when he realizes that he has undescended testicles or that his testicles are atrophic. These boys in their early childhood were active, healthy, husky children able to compete with or even excel other boys, at adolescence they suddenly discover that they are different from other boys, who make fun of them. Whereas previously their rate of growth was on a par with the normal boys, at adolescence our patients ceased to develop sexually and to mature. The normal boys begin to excel them in sports and social activities and are gradually transformed into young men. Our patients remain adolescent, take on an abnormal body contour, retain a high pitched voice and show no growth of genitals. They doubt then that they are real men. This leads invariably to a great deal of resentment mixed with the feeling of rage and frustration, which is usually repressed, and the only thing evident on the surface is a feeling of bitterness and hostility to the world at large. The most important change effected by successful treatment is a better relationship to the world. All these patients describe in one way or another that they become warm, more affectionate, less hostile, less jealous and not so bitter and that they do not shrink from people any more. They meet men and women on an equal basis, and they are not afraid to compete. Together with this there comes a feeling of growth and security, and the patients state that they "are less jumpy, more firm, more definite, not so irritable". All this will be elaborated in greater detail in the review of the cases.

From the Departments of Psychiatry and Pathology Mount Zion Hospital.

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Released for publication by the War Department Manuscript Board which assumes no responsibility, other than censorship for the contents of this article.

1 Vest S A, and Howard J E. Clinical Experiments with Use of Male Sex Hormones. Use of Testosterone Propionate in Hypogonadism. *J Urol* 40 154 (July) 1938. Moore C R in Allen Edgar Danforth C H and Dorsey E A. Sex and Internal Secretions ed 2 Baltimore Williams & Wilkins Company 1939 chap 7. Koch F C ibid chap 12. Biskind Escamilla and Lisser<sup>4</sup>.

2 Carmichael H T and Kenyon H T. Eunuchoidism A Psychiatric and Endocrine Study of Six Cases. *Arch Neurol & Psychiat* 40 717 (Oct) 1938. Rennie T A C Vest S A and Howard J E. Use of Testosterone Propionate in Impotence. Clinical Studies with Male Sex Hormones. *South M J* 32 1005 (Oct) 1939. Carmichael H T. A Psychoanalytic Study of a Case of Eunuchoidism. *Psychoanal Quart* 10 243 (April) 1941.

3 The Ciba Pharmaceutical Company Inc Summit N J supplied the powdered crystalline methyl testosterone and the testosterone propionate pellets.

4 Biskind G R Escamilla R F and Lisser H. Implantation of Testosterone Compounds in Cases of Male Eunuchoidism. *J Clin Endocrinol* 1 38 (Jan) 1941.



These patients spend a great amount of energy in solution of the neurotic conflict created by the hypogonadism. Even though the conflict has factual rather than fanciful causes, the influence on the psychic life is the same. An emotional conflict in which the patient is not sure of his sex (and this occurs in many other conditions, including neuroses and schizophrenia) gives rise to a tremendous amount of speculation, indecision and a feeling of hopelessness. As with any other patient whose neurosis is resolved by psychotherapy or analysis, there is a newly gained feeling of freedom after successful treatment. There is a feeling that one can carry out one's own decisions without constant inner struggle and a feeling that one has become a different person. The energy which was previously spent in the solution of the neurotic conflict is now released, and the patient is able to do a good day's work without constant anxiety. This is indicated by the fact that all our patients said that their work takes them much less time and that in the same space of time they do more and better work. This combined with a certain amount of self assurance and even aggressiveness results in their giving up inferior positions and looking for, and finding, more remunerative employment. Several patients were able to go off to relief and obtain independent positions. Other patients were advanced from subordinate to executive positions. All this is described by the patients themselves as "becoming more ambitious." There is less strain, less fatigue, more firmness, less suspiciousness and a growing feeling of security. Together with such changes there comes a feeling of "belonging," of being in unison with the world and a general feeling of well-being. The changes brought about by the treatment are described by the patients in various ways, depending on the educational and intellectual background.

#### REPORT OF CASES

CASE 1—A. B., aged 29, a tall, lanky, asthenic looking man appeared very lethargic, dull and apathetic. He had been a poor scholar and had to repeat the sixth and seventh grades. He was brought up in a broken home, was placed in an orphanage and ran away from school several times. He was involved in minor delinquencies and finally was committed to a school for delinquent boys at the age of 17. However, his behavior was very good after he left the institution. He was able to work as a janitor without returning to a life of crime. The patient stated that he noticed as a boy that his genitals were small, but he always hoped that they would grow. At the age of 15 he became aware that something was radically wrong with him, and that worried him a great deal. The patient began to masturbate at the age of 12. This habit has continued until the present time. His criminal activities coincided with the height of his anxiety about his sex organs. The only way he could prove his masculinity to the other boys was by stealing, hoping that this would be used as evidence of sexual potency. There was no history of homosexual relations. The patient was attracted to girls but never dared to approach them on account of the small size of his genitals. The impression he gave was that of a lethargic, withdrawn, introverted boy with a strong sense of inferiority, to which he reacted at first by criminal behavior and afterward by complete resignation and withdrawal.

Before treatment the following measurements were recorded. His height was 183.7 cm., span 192.5 cm., lower measurement 100 cm. His weight was 66.8 Kg. The penis was 3.5 cm. long and 5.5 cm. in circumference, the right testicle was 2 cm. in diameter and the left testicle was absent. The scrotum was small. The body hair was scant, with a feminine distribution and no beard could be distinguished. The voice was high pitched. The bone age was between 16 and 18 years.

November 4, 1940 a subcutaneous implantation of 4 pellets of testosterone propionate totaling 800 Gm. was made.

One year after treatment the pellets were still palpable and effective. The penis measured 6.5 cm. in length and 7 cm. in circumference. The measurements of the body and the bone age did not change. The voice deepened. Body hair retained a female distribution but became more abundant. The facial hair required shaving every two weeks. The right testicle measured 3 cm. in diameter, but the enlargement was mainly in the epididymis.

When the patient returned a year later for examination we were surprised to see a tall, husky, rawboned, rangy looking man, self-assured and confident. The first thing he did was to remark that he had quit his job and that he was looking for another position. He was better in every way. He liked more people. He was not so tired and felt much stronger. The patient stated that the work of a janitor was not interesting and he was now going to work in the shipyards as a welder. The following changes in his personality were evident. He felt and acted more alert, ambitious and imaginative. He had initiative and was more aggressive and even rebellious. The patient stated that he was more outspoken but he himself is easier to get along with because he has become more firm and honest and does not try to court every one's favor, he is not as cranky and irritable as he used to be. In reference to his sex life the patient stated that he had frequent erections and was going with a girl.

CASE 2—C. D., aged 20 was tall and thin, had a very broad chest and large buttocks, had no facial hair, spoke in a high pitched whisper and was shy and retarded. He stated that he came to California only four years before from a farm in the Middle West. He did all kinds of work and was on a National Youth Administration job in the city. For the past six weeks he had been working as an attendant in a hospital. The patient stated that he had known nothing about sex until he was 15. He hoped that his penis would grow but it didn't. At the same time he noticed that instead of a chest he had a bosom and that his hips were becoming very large. He tried intercourse several times but had difficulty getting an erection and had premature ejaculations. Being aware of the small size of his penis he was very shy and kept away from girls. He also avoided boys. He was depressed, very quiet and discouraged.

Before treatment the following measurements were recorded. His height was 178.2 cm., span 175.6 cm., lower measurement 94.8 cm. His weight was 87.3 Kg. The penis was 4 cm. long and 8 cm. in circumference. Each testicle was 3 cm. in diameter and held close to the pubic bone. The scrotum was small. The body hair was scant but the pubic hair extended slightly to the umbilicus. The voice was moderately high pitched. There was no beard.

Subcutaneous implantation of 2 pellets of testosterone propionate totaling 400 mg. was made. One pellet sloughed out three months later.

Examination ten months later showed no change in the size of the testicles. The penis was 5.6 cm. long. The voice had deepened slightly, the facial hair was fuzzy and required shaving once or twice a month. An acneiform eruption was present on the face. There had been a gain in weight to 100 Kg.

When the patient came six months later he stated that he felt much better, and one could notice a decided difference in his appearance. There was greater poise, self-assurance and optimism. The patient stated that he had been working all this time in a hospital but now he was leaving it to work in an airport. He had broadened out physically and had gained weight. He was going out with girls. He was quite active sexually, had good erections and was able to have satisfactory intercourse. It bothered him, however, that his penis shrank after intercourse. The patient planned to get married as soon as his job at the airport materialized. He was quite articulate but tried to convey the impression that "he was more sociable, not so bashful and more self-confident."

CASE 3—E. G., aged 33, was an undertaker and presented a sober, funereal appearance. At the age of 8 years a bilateral orchiopexy had been done, but the testicles failed to grow. For many years various types of glandular therapy had been tried without success, and the typical habitus of preadolescent eunuchoidism developed. After three years of high school

education he worked at odd jobs. For the past thirteen years he had been an undertaker. He had had occasional erections but no seminal discharge. He went with his wife for six years before he married her. They were both very much in love with each other and finally the patient explained his condition to her and stated that he was not able to have intercourse. The girl understood and consented to marry him. They had been married for six months and the wife was still a virgin. Their sexual life consisted largely in mutual masturbation. The patient stated that up to the age of 18 or 20 he was frequently approached by homosexuals. He reacted violently to such attempts, as he had been warned by a physician that such approaches would be made to him.

Before treatment the following measurements were recorded: height 170.6 cm, span 170 cm, lower measurement 90 cm and weight 63.6 Kg. The penis was 2.5 cm long and 5 cm in circumference. The scrotum was very small and appeared bifid with a small mass in each side. The body hair was extremely scant, with a feminine distribution, and facial hair was almost invisible. Bone age studies showed complete fusion of all epiphyses. The basal metabolic rate was minus 26 per cent. The voice was high pitched.

Treatment consisted of the following implantations:

Dec. 23, 1940, 18 pellets of methyl testosterone, total 169.5 mg

Feb. 26, 1941, 4 pellets of testosterone propionate, total 800 mg

March 30, 1942, 2 pellets of testosterone propionate, total 400 mg

Fifteen months after the first implantation the penis measured 5.5 cm. in length and 7.5 cm in diameter. The voice became deep. There was moderate proliferation of body hair and a scant fuzz appeared on the face. His height and weight remained stationary but his shoulders became heavier and his hips thinner.

When the patient came in April 24, 1942 there was a decided change in his appearance. He was alert, eager, snappy and peppy, his eyes were shining and he was grinning from ear to ear. His funereal appearance was gone and he was wearing bright sport clothes. The patient stated that he felt "swell", his work was going along very satisfactorily and he was getting a promotion. He stressed the fact that he had changed physically a great deal. Ten days after the implantation he began to have emissions of seminal fluid. He had definitely penetrated his wife and both he and she enjoy intercourse. She now has definite orgasms. His wife is more cheerful and the treatment has brought them together. The patient stated that he is a different person, small things do not bother him, he is not so jumpy, he is less irritable, he thinks differently, he is more secure and he is able to make definite plans and carry them out. The patient discussed his plans of enlarging his business which seemed to be quite realistic and which he has been able to follow through since the interview.

CASE 4—G. H., aged 40, an alert, eager, active business man, was extremely ingratiating and almost too eager to cooperate. He stated that he had had undescended testicles and that at the age of 13 an orchiopexy was unsuccessful; no testicular tissue was demonstrable. Six years later he had an unsuccessful transplantation of testicles from a convict. He was always aware of the small size of his penis and the atrophic testicles, and he reacted to it by being very active, aggressive and positive. He worked in all sorts of occupations, including that of ship fitter and sailor, and was very active in various sports. He was very intelligent and graduated from high school in three and one-half years. He graduated from a business school of one of the local universities and immediately after this was given a position, first as a salesman, then rapidly promoted to a responsible executive position. At the age of 30 he began to go out with a girl and married her when he was 33. Before he was married he had explained to his future wife his difficulty, but she loved him so much that it did not matter. They had occasional intercourse with no seminal discharge.

Before treatment the following measurements were recorded: height 181 cm, span 186 cm, lower measurement 106 cm, and weight 94.7 Kg. The hair on the face was scant and downy, body hair was almost absent and the sparse pubic hair had

a feminine distribution. The voice was high pitched. The skin of the face was soft and finely wrinkled. The penis was 4 cm long and 6 cm in circumference. In the erect state it was 7 cm long. The scrotum was very shrunken and appeared bifid, and no tissue was palpable in it. On rectal examination the prostate and seminal vesicles were not palpable. The basal metabolic rate was determined twice and was minus 23 per cent and minus 19 per cent.

Five separate implants of methyl testosterone pellets were given between March 1940 and May 1941, making a total of 740.5 mg. An average of 17 pellets were implanted each time. Four large pellets of testosterone propionate totaling 800 mg were given in May 1941. They were effective until June 1942, when 3 additional pellets were implanted.

After two years of treatment the penis measured 7 cm in length and 7.2 cm in diameter. The prostate was palpable. The pubic hair became heavier but remained feminine in distribution. The sallow, fawn color of the skin of the face disappeared and the characteristic facial periorbital wrinkles became much less evident. The hips became smaller and the shoulders enlarged. The voice was deep and well modulated.

When the patient came in following treatment he described the changes as follows. His drive for success has been more intense and he has had more financial success than ever before in his business. He has less fatigue and more energy. He has much more sex drive. He was very proud of the fact that hair had begun to grow all over his body and that he had emissions of seminal fluid. Intercourse was complete and pleasurable. The patient stated that he was more affectionate, that he did not try to please people as much as he had before and that he liked people more. He was less jittery and not so insecure, as he expressed in a jubilant exclamation, "I am part of the world, I am normal."

CASE 5—I. J., aged 27, was tall, asthenic, pale and beardless and looked like a boy of 18. The patient stated that he had come from a large family, had gone to high school and had studied for two years in a midwestern university. At the age of 20 he came to San Francisco and began to work in a drugstore. He had had mumps in childhood but did not remember whether that illness had been complicated by orchitis. He had had occasional erections but there had been no emissions. He was treated with testosterone propionate for eunuchoidism by a physician until referred for implantation therapy. The patient stated that the treatment produced the following changes. He had had a high pitched voice which now was normal. His attitude in conversation was more free. He showed a greater sense of humor. He was more aggressive and recently he was promoted to the job of an executive. Before treatment he could not take charge of people. His orders were not carried out. He was afraid to give orders for fear people would laugh at his high pitched voice. Now his voice was more resonant. He could assume a definite tone of authority and he talked more slowly and was more deliberate. His associates took orders from him because he was more consistent and less arbitrary. Before this he was always in difficulties and disputes with the other employees, and for these reasons he was not promoted. He could meet girls now and they did not frighten him. Recently he was in a girl's home and was told by the family that whereas a year ago he would read a book when he came to see the girl at present he was really interested in her and wanted to be with her alone. He had regular erections and occasional emissions. Prior to the change in his voice he had to be very careful in choosing his friends for fear they would try to make homosexual approaches to him, now he was not afraid of that. Since he had been under treatment he felt confident that he could become a real man.

Before treatment the patient was tall, thin, long legged and beardless and had a high pitched voice. The complexion was sallow. Pubic hair was slight in amount and axillary hair was negligible. The penis was small, the left testicle was extremely atrophied and the right testicle was much smaller than normal. The prostate and seminal vesicles were not palpable. His weight was 56.8 Kg, the height was 179 cm, the lower measurement 96 cm and the span 182 cm. He received a total of fifty-nine injections of 25 mg of testosterone propionate in oil, three injections a week up to March 1940.

Implants of methyl testosterone pellets were started in April 1940, a total of 511 mg, distributed in four implantations, was given until December 1940.

The large pellets of testosterone propionate were implanted in December 1940, but the original 4 sloughed out and 3 additional pellets were implanted in March 1941. These also were extruded from the wound and an additional 4 large pellets totaling 800 mg were implanted in July 1941. These proved entirely satisfactory and effective through May 1942.

A recent examination showed that there had been no change in major body measurements but an increase in weight had occurred. The penis more than doubled in size and measured 9 cm in length and 8.5 cm in circumference. His voice was deep. His neck and shoulders had increased in size. The pubic hair was heavier and was growing toward the umbilicus.

CASE 6—K. L., aged 19, a tall blond boy, spoke intelligently and freely. He stated that he had one undeveloped descended testicle and one undescended testicle. Two attempts at orchiopexy had failed to place the undescended testicle in the scrotum. He was brought for treatment by his father, who stated that the patient had failed to mature in that his play activities were with children five and six years his junior, his mannerisms were of the fussy feminine type, and his beard and genitals were not developed. The patient had no sexual desire, he had had occasional erections but no seminal emissions. He was very bashful and afraid of girls. He was always somewhat nervous, jittery and restless. When he was small, things used to "bother" him at home, apparently there was a great deal of discord in the family. Since adolescence he had been in a constant state of anxiety. The boys used to tease him and talked about the fact that he had no testicles and laughed at him because he had a small penis. Before implantation therapy was started he had had sixteen injections of testosterone propionate, 10 mg in oil, given by the referring physician.

The patient was immature and boyish, appearing younger than the stated age. His height was 168 cm, the span 171 cm and the lower measurement 87.5 cm. His weight was 68 Kg. The voice was high pitched and the body hair scant. The penis was 6 cm long. The scrotum was small, shriveled and limited to the right side and contained a pea sized bit of tissue. The prostate was barely palpable. His bone age was placed at 13 years. The basal metabolic rate was minus 16 per cent.

Implants of methyl testosterone pellets were started in November 1939, and up to December 1940 he had had five implantations averaging 18 pellets each. The total amount of methyl testosterone used was 643.8 mg.

Four large pellets, each 200 mg, were implanted in December 1940, but several sloughed out so that an additional 4 similar pellets were implanted in September 1941. These have been effective for almost one year.

The physical changes resulting from treatment were an increase in body and facial hair, a deepening of the voice and development of an acneiform eruption on the face and shoulders. The penis measured 10 cm in length and 9.5 cm in diameter. The scrotum enlarged. He grew 7 cm in height.

Following treatment the patient noticed that there had been a decided change in his libido. He started to go out with girls. He developed sexual desire, which he has desired to control until marriage. He began to go to dances and enjoyed going with girls. He was more eager now to succeed. He was not satisfied with his job in a gas company and intends to go into the army. He had occasional nocturnal emissions and frequently dreamed of girls, occasionally he had to resort to masturbation. His anxiety was greatly diminished. He was more calm and more definite and self assured.

CASE 7—M. N., aged 21, a student in one of the local universities, was referred to the clinic for implantation therapy for typical preadolescent eunuchoidism. The patient was a tall, good looking, attractive, blond boy with a pleasant engaging smile, he was very intelligent and obviously well brought up. As a little boy he could "lick" other boys in school, but after the age of 12 he began to lose out, and instead of being the leader in his class the other boys began to pass him up. They became huskier and taller and better athletes than he was, whereas previously the patient was much stronger than they were. The family did not worry about it, since both

his father and mother were quite late in maturing. Prior to the specific androgenic treatment the patient had had no erections and no emissions. The patient stated that on several occasions he had been approached by homosexuals but repulsed their advances. He knew about homosexuality from other boys in his fraternity.

Physical examination in September 1941 revealed the following measurements: height 178 cm, span 178 cm, lower measurement 92.5 cm and weight 62 Kg. The penis was 10 cm long and 9.7 cm in circumference. The scrotum was fairly loose and wrinkled and contained a mass 2 cm in diameter on the right side, nothing was palpable on the left side. The pubic hair was fairly abundant but of feminine distribution. Axillary hair was scant and facial and body hair was absent. The bone age was less than 14 years. The basal metabolic rate was plus 10 per cent.

In the year before the examination described he had received two or three injections a week of testosterone propionate, 23 mg in oil, for approximately eight months, terminating four months before the examination.

Three large pellets of testosterone propionate were implanted subcutaneously in September 1941.

Examination in February 1942 showed no essential change in the foregoing measurements. The voice was slightly deeper and better modulated. The erections and nocturnal emissions occurred as frequently as they had during the testosterone propionate injections.

The patient stated that following the specific therapy he was much better and quite different. He developed an interest in girls, his libido increased and he was masturbated occasionally. He left the university and obtained a position in one of the shipyards. He was more mature and stable, had greater interest in his work and was planning to enter aviation. He was going steadily with a girl whom he planned to marry within a short time. The patient stated that he was more mature and better balanced, was able to save money and was less of a kid.

#### COMMENT

In reviewing these cases, one finds that there are two ways in which these patients reacted to their sexual inferiority. The more simple, less complex persons with limited background and intelligence reacted to their eunuchoidism by submissiveness and withdrawal. They became misanthropic, detached themselves from people, shying from the company of women as well as avoiding association with men. In some instances there was a defensive attempt at pronounced aggressivity, with efforts to prove to the other boys that they were regular fellows. They became leaders in their neighborhood gangs, one followed a criminal career. These attempts at compensation were usually quite sporadic and lasted only a short time. They carried on more or less routine jobs with inferior salaries, not daring to ask for a raise in pay. They did not go out with girls for fear that their inferiority would be discovered.

The second group, with more intelligence and better backgrounds reacted to their feeling of inferiority resulting from the hypogonadism by overcompensation. Thus our executive (case 4) from the very beginning became a very active, extroverted person, a leader in activities and sports. Nonetheless he was in constant dread that his condition might be discovered. At the same time there were definite evidences of psychosexual maturity with capacity to care for another person of the opposite sex. Thus two of our patients had married not for the sake of appearances but of genuine love for their wives. This latter point is important to bear in mind in connection with the question of homosexuality, which will be discussed later.

In general then the reactions of these patients were either of extreme submissiveness or of aggressivity and arrogance. Frequently these were intermingled

with feelings of jealousy and hostility. These patients were constantly on guard, vigilant and never at ease.

Following successful treatment there was a decided change in the aforementioned attitude with a feeling of poise and security. The patients were no longer on guard lest some one take advantage of them, lest they be made completely feminine. In regard to the married patients, as the treatment gave them the capacity to carry out normal sexual relations there was a noticeable increase in the sense of security and feeling of fulfillment, felt both by the patients and by their wives.

It is significant that in spite of the hypogonadism and attendant feminine build of these patients none of them became homosexual. As stated in the histories homosexual approaches and attempts at seduction were made, but the patients reacted with repugnance and disgust, and none of them recalled having had any sexual experience with men after adolescence—none beyond the usual experimental sex play in childhood when our patients were normal, husky children. As previously mentioned, 2 of the 7 patients married and 1 had definite plans of marrying, and though the element of keeping up appearances was dominant they appeared to be genuinely in love.

Thus, in this group of patients at least, there was no evidence that hypogonadism was in any way associated with homosexuality. Comparing this group with a similar group of 15 homosexuals who came to us in connection with the selective service, we have come to the following conclusions. All the homosexual boys had large, well developed sexual organs with well developed testicles. Nearly all of these homosexual men had strong sex drives, as evidenced by frequent erections, nocturnal emissions and fantasies—all, however, misdirected to their own sex. None of them had any desire for women, but all of them had very strong sexual drives with libido directed to other men either passively or actively. Comparing these two groups, one cannot avoid a conclusion that there must be psychologic rather than physiologic factors which tend to direct men into homosexuality.

#### SUMMARY AND CONCLUSIONS

1 Psychologic changes took place in 7 patients with preadolescent eunuchoidism treated by implantations of testosterone derivatives.

2 Anatomic and physiologic changes that resulted from specific androgenic therapy did not differ from those described in the literature.

3 The eunuchoid patients had reacted to their defect either by strong passivity and submission, with sporadic attempts at overcompensation as expressed in delinquent behavior, or else by overcompensation in becoming very aggressive, domineering and overactive.

4 The psychologic changes following successful therapy consisted in gaining a feeling of security, greater emotional stability and a feeling of belonging, with the disappearance of a constant state of vigilance, suspiciousness, pettiness, fussiness, jitteriness and a more or less constant state of anxiety. The improvement can be compared to a successful therapeutic result in a typical neurotic state.

5 In our series eunuchoidism did not preclude a normal feeling of affection and love for members of the opposite sex.

6 A comparison with a control group of 15 homosexual men indicates that psychologic rather than physiologic factors are responsible for the development of homosexuality.

Corner Post and Scott streets

## TREATMENT OF EDEMA OF RENAL ORIGIN

### REPORT OF TWELVE CASES

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The patient who suffers from nephrosis or from the nephrotic state of chronic glomerulonephritis has as his predominant symptom edema, which is characteristic of this clinical entity. Not only is it the main symptom, but it is the outstanding feature of his illness, which keeps him an invalid and prevents his maintaining a normal or nearly normal economic and social existence. When the nephrotic features of glomerulonephritis predominate, hypertension, with its accompanying symptoms due to vascular changes in brain, heart and kidneys, is rarely present. Renal function is usually good and there usually is no retention of nitrogenous matter in the blood. There is little or no anemia. In other words, except for the generalized edema and the symptoms secondary to it the patient usually feels well, and if the edema was absent he could live a fairly unrestricted life. To attain such an end and to rehabilitate patients who have been so incapacitated we are presenting an outline of therapy which has proved satisfactory.

Without going into detail, the edema of nephrosis is the result of retention of water and the accumulation of an excess of sodium chloride in the tissues. These changes are brought about by loss of protein in the urine or lack of protein in the patient's diet or, occasionally, both. This results in a decrease in the concentration of serum protein, a subsequent decrease in colloidal osmotic pressure of the serum and a tendency to edema formation and the retention of salt in the tissues of the body.

The following significant laboratory findings are present: albuminuria, a decrease in the concentration of plasma protein and an increase in the amount of sodium chloride in the plasma and tissues. The colloidal osmotic pressure of the plasma (normal, 21.4 mm of mercury or 360 mm of water) is decreased. Anemia, definite hematuria and pronounced retention of nitrogenous waste products usually are absent. Hypercholesterolemia is present and the basal metabolic rate usually is low. Vascular changes are rare and occur only in cases in which there is extensive glomerular involvement. There is a decrease in plasma volume.<sup>1</sup>

Since the renal lesion cannot be attacked directly, some means of eliminating the sodium chloride and water from the body through the urinary tract must be employed. The serum protein must be augmented. The intake of water and salt must be restricted. Although modified for each case, an outline of treatment based on the clinicochemical factors just mentioned has been found to be most efficacious. It consists of dietetic and diuretic measures which restore the physico-electrolytic balance in the body.

From the Division of Medicine Mayo Clinic  
1. Harris A. W. and Gibson J. G. Clinical Studies of the Blood Volume. VII. Changes in Blood Volume in Bright's Disease With or Without Edema, Renal Insufficiency or Congestive Heart Failure and in Hypertension, *J. Clin. Investigation* 18: 527-536 (Sept.) 1939.

DIET

The patient is instructed to use a diet containing 100 to 125 Gm of protein daily. It is salt free except for the natural salt contained in the food and contains between 1,000 and 1,500 cc of fluid. If his edema free weight is normal, the diet furnishes approximately 2,000 calories. It may be supplemented by any reliable vitamin concentrate. An adequate, healthful diet is as essential in the treatment of this disease as in that of any chronic illness.

DIURETICS

The diuretic agents can be divided into two groups: (1) those which have a direct action on the kidneys,

as diuretic agents. The manner of their use will be described in detail in the ensuing reports of cases. Their advantage is in their low toxicity, desired diuretic action and ease of administration. Mercurial diuretics, although usually efficacious, are generally not needed when the diuretic program is established.

The use of acacia in the treatment of nephrotic edema is still considered by some to be a rather heroic measure, to be employed only under strenuous circumstances. Goudsmit and Binger<sup>4</sup> recently reported that it was a reliable and reasonably safe procedure.

The clinical and laboratory observations pertinent to 10 of the patients so treated maintain a certain uniform-

TABLE 1—Significant Laboratory Findings in Twelve Cases of Edema of Renal Origin

Case	Urine					Blood					Basal Metabolic Rate per Cent
	Albuminuria Grade	Erythrocyturia Grade	Leukocyturia Grade	Cylindruria Grade	Urea Clearance Cc per Minute	Urea Mg. per 100 Cc	Plasma Cholesterol Mg. per 100 Cc	Serum Protein Gm. per 100 Cc	Hemoglobin Gm. per 100 Cc	Albumin Globulin Ratio	
1	4	2	2	2	28.8	18	218	5.4	10	4.2:1	
2	4	2	1	1	26.5	28	219	5.1	8.8	1.0:1	
3	4	2	1	1	72.1	23	219	5.7	11	1.1:1	-1
4	4	2	1	2	44.4	11	707	4.0	11.0	1.1:1	-1
5	4				72.0	50	500	2.9	11	1.1:1	
6	4				65.0	10	650	4.0	10.5	1.1:1	-11
7	4			1	53.2	48	757	3.0	15.0	1.1:1	
8	3				77.6	12		4.5	17.7	1.1:1	
9	4	*	†		26.4	12	410	5.7	11.9	1.1:1	-4
10	4			1	45.1	36	757	4.7	11.9		
11	4		1	1	50.1	14	500	5.0	1.6	3.5:1	+10
12	4		1	1	15.6	62	1,100	3.6	17.7	1.1:1	-7

\* An occasional erythrocyte    † An occasional leukocyte

TABLE 2—Significant Clinical Findings in Ten Cases of Edema of Renal Origin

Case	Age Years	Sex	Duration of Nephrosis	Degree of Edema	Days in Hospital	Inject. of Acacia Number	Loss in Weight Pounds	Relief of Edema	Subsequent Course
1	57	♀	4 months	3	11	4	10	Complete	Excellent
2	34	♀	3 years	0	5	3	0	Complete	Excellent
3	19	♀	3 months	3	6	4	1	Complete	Excellent
4	32	♀	10 months	4	8	4	20	Complete	Excellent
5	29	♀	7 months	2	10	4	10	Complete	Excellent
6	40	♀	3 years	5	7	4	0	Complete	Excellent
7	28	♀	8 years	0	5	3	0	Complete	Excellent
8	20	♀	5 months	4	15	8	11.5	Complete	Excellent
9	35	♀	5 months	2	10	6	40.4	Complete	Excellent
10	25	♀	3 months	1	7	3	7	Complete	Excellent

\* Prophylactic treatment with acacia    † Required second series of treatment with acacia

TABLE 3—Significant Laboratory Findings at Various Intervals in Case 12

Date	Weight Pounds	Albuminuria Grade	Blood Urea Mg. per 100 Cc	Serum Protein Gm. per 100 Cc	Albumin Globulin Ratio	Plasma Cholesterol Mg. per 100 Cc	Hemoglobin Gm. per 100 Cc of Blood
On admission to hospital (1/19/40)	200	4	62	3.6	1.1:1	91	10.7
On dismissal (3/23/40)	146	4	80	3.6	1.4:1	511	
On return for check up (9/22/41)	151	4	56	6.0		600	13.8

such as mercurial preparations, potassium and ammonium salts, caffeine derivatives, concentrated solutions of dextrose and (2) those which act by affecting the colloidal osmotic pressure of the blood such as whole blood or plasma, which should be administered by transfusion, and acacia, which should be administered intravenously. The latter produce diuresis by increasing plasma volume and by promoting a saline diuresis as well as by raising the colloidal osmotic pressure.<sup>2</sup> In previous communications Keith and Binger<sup>3</sup> described the advantages of potassium salts (potassium nitrate)

and are therefore recorded in tables 1 and 2. In all cases the diet yielded 2,000 calories a day and contained from 100 to 125 Gm of protein and from 800 to 1,200 cc of fluid. No salt was added to the food in preparation. Each patient received 9 Gm of potassium nitrate daily and was given iron and vitamin concentrates as needed.

Vascular changes appeared only in case 7, as evidenced by the blood pressure, which varied over twenty-four hours between 180 and 132 mm systolic and 120 and 70 mm diastolic, together with minimal narrowing of the retinal arterioles.

<sup>2</sup> Kerkhof A. C. Plasma Colloid Osmotic Pressure as a Factor in Edema Formation and Edema Absorption. *Ann. Int. Med.* **11**: 867-880 (Dec.) 1937. Lepore M. J. Acacia Therapy in Nephrotic Edema. *Ann. Int. Med.* **11**: 285-296 (Aug.) 1937.  
<sup>3</sup> Keith N. M. and Binger M. W. Diuretic Action of Potassium Salts. *J. A. M. A.* **105**: 1584-1590 (Nov. 16) 1935.

<sup>4</sup> Goudsmit Arnoldus Jr. and Binger M. W. Treatment of Nephrotic Edema. *J. A. M. A.* **114**: 2515-2517 (June 29) 1940. Acacia in the Treatment of the Nephrotic Syndrome. *Arch. Int. Med.* **65**: 1252-1281 (Dec.) 1940.

Each patient received a minimum of three intravenous injections of 500 cc of a 6 per cent solution of pure acacia in a 0.06 per cent solution of sodium chloride at intervals of from one to two days. In some cases more acacia was required to obtain the desired effect. The concentration of acacia in the serum was determined one day after the last injection. If the concentration of acacia was 2 Gm or more per hundred cubic centimeters of serum, further treatment with acacia was not employed. Otherwise the administration of acacia was continued not only until the patient was free from edema but until the concentration of acacia in the serum reached a satisfactory level. A few patients suffered slight reactions, consisting of mild headache, backache or feeling of constriction in the thorax. All were relieved by slowing the rate of flow of acacia into the vein or by administration of small doses of ephedrine or epinephrine.

Careful examination was carried out in all cases for active foci of infection. Several patients had infected teeth extracted or underwent tonsillectomy during their hospitalization. While this report is not directly concerned with the bacteriologic aspect of nephritis, it is known that streptococcal infections can be serious etiologic factors in acute glomerulonephritis and can precipitate acute exacerbations of chronic glomerulonephritis. Focal infection should be eradicated in these cases.

When ready for dismissal from the hospital each patient was instructed about a proper diet and was advised to follow this diet and to take potassium nitrate until advised otherwise by the physician in his home locality. The diets of those whose nutritional state was poor were augmented by vitamin concentrates and iron.

Patients 2 and 7 did not have edema at the time of treatment. These patients were given "prophylactic" treatment with acacia in view of a long history of recurrent edema. Patient 2 had had edema for three years and patient 7 for eight years. It was deemed advisable to administer acacia in the hope that it would increase the colloidal osmotic pressure of the serum and help prevent subsequent edema. At the time of this writing such recurrence has not been reported in either case. One patient (6) who had received acacia two years earlier still had minute traces of it in the blood.

Those patients whose subsequent course has been recorded as "fair" required a second series of injections of acacia after dismissal from the hospital. For example, patient 4 required acacia four months later, patient 6 six months later and patient 8 eleven days later.

Cases 11 and 12, because of the therapeutic problems they presented, are reported in detail.

#### REPORT OF CASE

**CASE 11**—An electric foreman aged 39 registered at the clinic complaining of peripheral edema of six months' duration. It had followed a sore throat which had been present for a few days. Previous to this illness he had been quite well and had passed an insurance examination one month before its onset. With the discovery of albuminuria, hypertension and erythrocyturia, he had been placed in bed on a diet low in salt and protein, and a diuretic regimen had been instituted. Nevertheless, orthopnea had developed, he had become more and more dyspneic and the edema of the lower extremities had progressed to massive proportions.

The patient, who was pallid, was well developed. Moist rales were present at the bases of both lungs. The transverse cardiac diameter was 12.0 cm. The aortic second sound was accentuated. The systolic blood pressure was 200 mm of mercury and the diastolic pressure was 118 mm. There was

definite pitting edema of ankles and legs but no ascites. Examination of the ocular fundi revealed sclerosis, grade 1, of the chronic hypertensive type and widespread retinitis with cotton-wool patches and retinal hemorrhages. The significant laboratory findings are listed in table 1.

A diagnosis of chronic glomerulonephritis with nephrotic features and superimposed diffuse arteriolar disease with hypertension, grade 3, and myocardial failure was made. The patient was given a salt free diet that furnished 2,000 calories. The daily diet contained 100 Gm of protein. Potassium nitrate was administered three times a day in doses of 45 grains (3 Gm). Sodium bicarbonate was administered four times a day in doses of 10 grains (0.65 Gm). Phenobarbital was administered three times a day in doses of  $\frac{1}{2}$  grain (0.032 Gm) in addition,  $1\frac{1}{2}$  grains (0.1 Gm) of this drug was administered at bedtime. A total dose of 12 cat units of digitalis was administered in four days and 1 cat unit of the drug was administered daily thereafter. Acacia was administered on alternate days.

In the intervening days the patient was given 2 cc of valyrgan for a total of four doses. During that time he lost 28½ pounds (13 Kg) of fluid (fig 1) and became free from

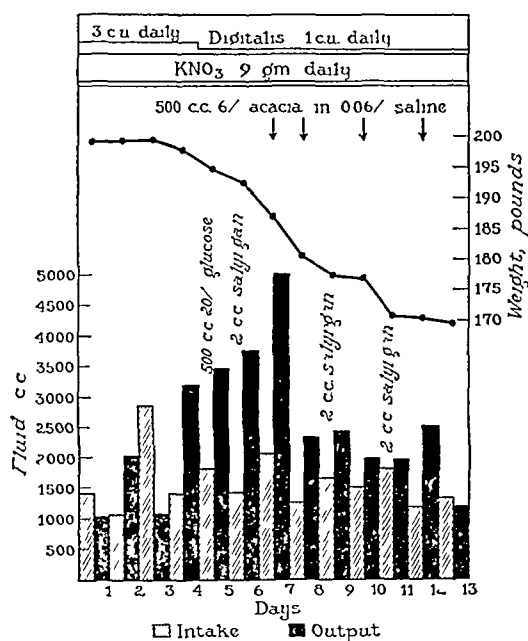


Fig 1—Response to the diuretic measures. Acacia played a role supplemental to digitalis salyrgan and potassium nitrate; its usefulness is indicated by the massive urinary output of the seventh and twelfth days.

edema, orthopnea and dyspnea, and his general condition improved materially. He was dismissed from the hospital two weeks after admission with instructions to continue the diet and maintenance doses of digitalis and potassium nitrate. His blood pressure did not change as a result of this treatment.

This case differs from the first 10 presented in that nephrosis was complicated by vascular disease and cardiac insufficiency. The treatment of the two components of the illness was compatible, as evidenced by the successful termination after treatment in the hospital. The patient's prognosis is much more guarded than one of uncomplicated nephrosis. We present this problem as one in which treatment with acacia played a supplemental, yet important and effective, role in combating edema, the cause of which was cardiac as well as renal. However, we would not advocate treatment with acacia unless the concentration of protein in the serum is lowered and is considered an adequate cause of the edema.

**CASE 12**—A man aged 33, who registered at the clinic in January 1940 had been well until September 1939, except for an occasional attack of sore throat. Four months prior to his registration at the clinic, edema of the legs had developed. His physician had made a diagnosis of nephritis and had placed him on a diet low in salt, protein and fluid. Nevertheless the

patient's vision had become blurred, the edema had increased and the systolic blood pressure had increased to more than 160 mm of mercury

When the patient was examined at the clinic, bilateral hydrothorax, ascites and massive edema of the sacrum, scrotum and lower extremities were present. He was orthopneic and vomited frequently. The blood pressure was 150 mm systolic and 116 mm diastolic. Examination of the ocular fundi gave negative results. The patient weighed 200 pounds (91 Kg) and his height was 73 inches (185 cm). The significant laboratory findings are included in table 1.

The patient was placed on a diet which yielded 2,000 calories, the diet contained 100 Gm of protein, was free of salt and included 800 cc of fluid daily. Nine Gm of potassium nitrate was administered daily. He received three infusions of a 6 per cent solution of acacia in a 0.06 per cent solution of sodium chloride on three successive days. During the next fifteen days he was given intravenous injections of 500 cc of a 20 per cent solution of dextrose in distilled water daily. In this interval he lost 20 pounds (9 Kg). He then received four more daily infusions of acacia, and six doses of 10 cc of salyrgan.

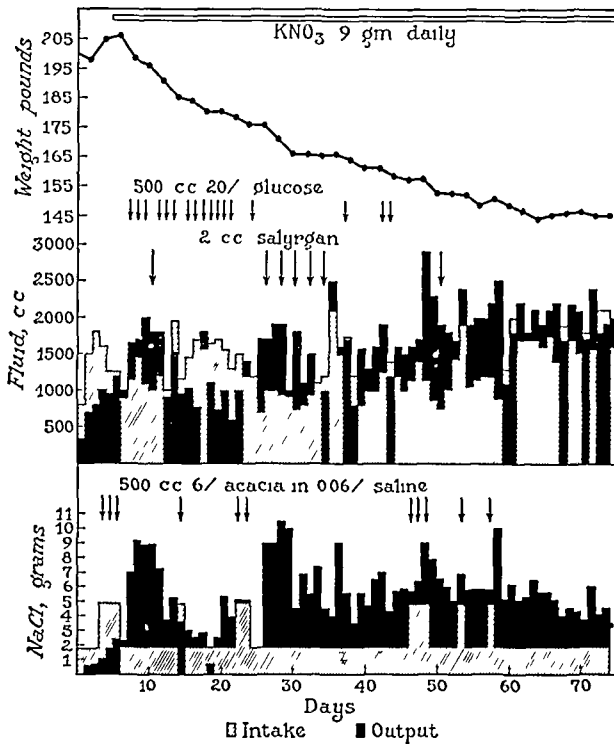


Fig. 2—Effect of acacia on excretion of salt and urinary output of the nephrotic patient. Definite saline diuresis after each injection or series of injections of acacia may be noted. There is a concomitant increase in urinary output.

and high in protein. The concentration of urea in the blood has remained at about 80 mg per hundred cubic centimeters. On fairly limited activity he has felt extremely well.

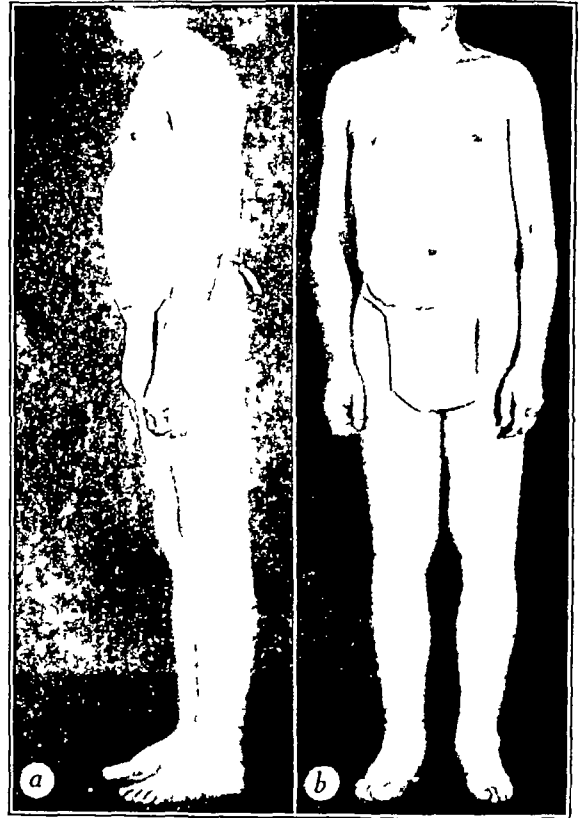


Fig. 3—Body contour before treatment. a profile view b front view

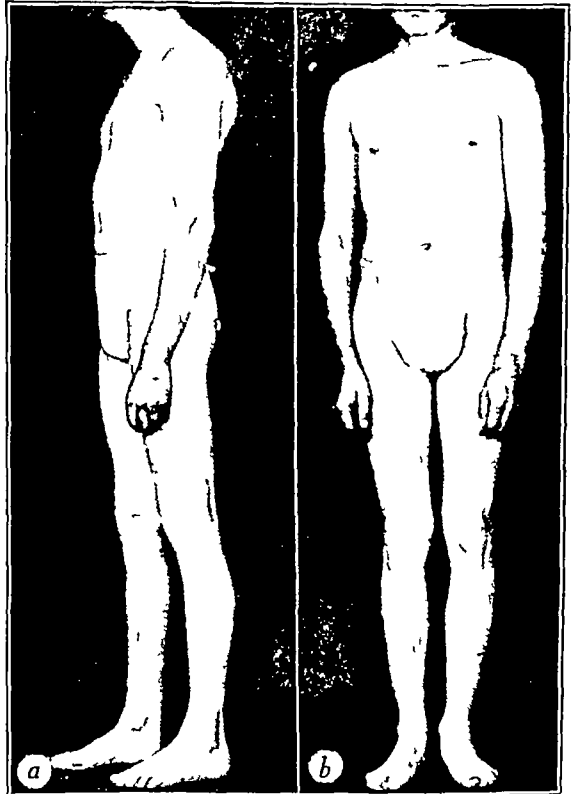


Fig. 4—Body contour after treatment and lapse of twenty months. a profile view b front view

were administered intravenously in twelve days. On this regimen he lost 12 pounds (5.4 Kg). By this time he had recovered his appetite and the dyspnea had decreased. He was comfortable except for an attack of acute otitis media, which lasted one week but responded well to chemotherapy. Because of a low basal metabolic rate he was given 1 grain (0.065 Gm) of desiccated thyroid daily. Before his dismissal from the hospital the basal metabolic rate had risen to -5. After fifty-eight days in the hospital he had lost 53 pounds (24 Kg). He left the hospital after seventy-four days, at which time he weighed 145 pounds (66 Kg), or 55 pounds (25 Kg) less than on admission. Edema was absent. During the course of treatment he was given a total of 330 Gm of acacia in eleven infusions of 500 cc of a 6 per cent solution in a 0.06 per cent solution of sodium chloride with no ill results whatever. He is the first patient at the Mayo Clinic to receive such a large quantity of acacia.

Since the patient's dismissal from the hospital in March 1940 he has remained free from edema on a regimen of 6 Gm of potassium nitrate daily and a diet low in fluids, free of salt



The so called salt free diet contained 18 Gm of salt per day. From this and from the ringer solution the patient received a total of 1662 Gm of sodium chloride. Daily analyses of the urine for total excretion of salt were made and the output of sodium chloride during his hospitalization was 3895 Gm. This large negative balance of sodium chloride is striking evidence that the retention of salt is a powerful factor in the production of nephrotic edema. The effect of ringer on the excretion of salt may be seen in figure 2. Following each administration of ringer there was a pronounced increase of sodium chloride in the urine.

Thus, ringer combats edema by its twofold action, namely mobilization of sodium chloride and reinforcement of the serum protein in maintaining the colloidal osmotic pressure. At the beginning of treatment the colloidal osmotic pressure was 117 mm as compared to normal of 360. Unfortunately the osmotic pressure was not determined at the conclusion of treatment. This case is described to emphasize the importance of retention of salt as well as a low serum protein in the production of edema and to demonstrate the effect of racia in combating these two factors. The value of administration of potassium salts, hypertonic solution of dextrose and salyrgan also is demonstrated. The concentration of proteins in the plasma decreased temporarily following treatment with acacia, this is probably a dilution phenomenon. The albumin globulin ratio changed from 1:12 before treatment to the normal ratio of 1:4.1 after treatment.

The patient returned to the clinic on Sept. 22, 1941 for further examination. By comparison of figure 3 with figure 4 it may be seen how well the edema was controlled. Except for infected tonsils and blood pressure of 136 mm systolic and 96 mm diastolic, abnormal physical findings were absent. The significant laboratory findings at various intervals are listed in table 3. Of particular interest is the normal level to which the serum protein had risen in spite of persistent albuminuria. The patient weighed 151 pounds (68.5 Kg) as compared to 146 pounds (66.2 Kg) at the time of his dismissal from the clinic twenty months earlier. The concentration of hemoglobin had risen from 127 Gm to 138 Gm per hundred cubic centimeters of blood.

The patient underwent an uneventful tonsillectomy and returned home. He was advised to continue the regimen of potassium nitrate, iron, diet and minimal activity.

#### COMMENT

These cases are not reported as a series the volume of which is evidence for efficacy of the form of treatment we have described but as a description of the type of case for which acacia is beneficial and the rationale for its use.

**Pirogoff**—The Crimean War produced another of the really great army surgeons of history, Nicolai Ivanovitch Pirogoff (1810-1881), who was in charge of the treatment of Russian troops in the siege of Sevastopol, which lasted for fourteen months. The conditions under which he had to work were appalling, and the number of men who died as a result of erysipelas, pyemia, hospital gangrene and purulent edema was so high that Pirogoff defined war as "a traumatic epidemic." Almost unaided he toiled at his great task, striving to improve conditions and making many sound recommendations to combat the prevailing sepsis. Through the influence of the Grand Duchess Helena Pavlovna he was able to introduce female nursing for the Russian soldiers at the time when Florence Nightingale was providing a similar organization for the British army. Pirogoff was a firm believer in the importance of early surgical treatment and was one of the first to adopt all the more recent advances of surgery, as is shown by his use of ether anesthesia in 1847 only a few months after this was first advocated by Bigelow, and of plaster of paris bandages in 1854, two years after Mathijssen's first description of this technique—Trueta, Joseph. *The Principles and Practice of War Surgery*, St. Louis, C. V. Mosby Company, 1943.

## ACUTE BACILLARY DYSENTERY (FLEXNER)

### TREATMENT WITH SULFAGUANIDINE AND SUCCINYL SULFATHIAZOLE

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The control of acute bacillary dysentery is becoming increasingly important because of the presence of troops in tropical regions where this disease is common and also because of the poor housing and sanitary conditions which inevitably result from the mass shifting of civilian populations. During the past year numerous reports of the high incidence of this disease have come from the nations long at war, namely, China, Russia, Japan, Germany and Italy.

Uniformly favorable clinical results concerning the value of sulfaguanidine in the treatment of bacillary dysentery have been reported.<sup>1</sup> There are, however, few published reports of the use of the newer sulfonamide compound succinylsulfathiazole in the treatment of this disease. This drug was first synthesized in 1939 by Miller, Rock and Moore<sup>2</sup> and has been reported by Poth and Knotts and others<sup>3</sup> to have striking bacteriostatic action against the usual intestinal flora of man and also to be effective against strains of Shiga, Sonne and Flexner dysentery bacilli. Experience with the use of succinylsulfathiazole in the management of acute outbreaks of dysentery has been limited to a few cases occurring in widely separated parts of this country.<sup>4</sup> Our purpose in this communication is to report the effects of these two drugs in an epidemic of bacillary dysentery (Flexner) which occurred in Eloise Hospital and Infirmary during the summer of 1942.

#### EPIDEMIOLOGY

Starting late in July 1942 an increase in the incidence of diarrhea was noted at this hospital and within a short time five deaths had occurred among 32 patients with diarrhea. It was recognized that an epidemic of dysentery was occurring and that the organism was sufficiently virulent to produce a high case fatality rate. Therefore the Michigan State Department of Health was requested to give aid in its control.

From the William J. Seymour Hospital, Eloise, Mich., and the Bureau of Epidemiology, Michigan Department of Health, Lansing, Mich.

1. Marshall E. K., Jr., Bratton A. C., Edwards Lydia B. and Walker Ethel. Sulfanilylguanidine in the Treatment of Acute Bacillary Dysentery in Children. *Bull. Johns Hopkins Hosp.* 68: 94 (Jan.) 1941.  
Lyon G. M. Chemotherapy in Acute Bacillary Dysentery, *West Virginia M. J.* 37: 54 (Feb.) 1941.  
Rantz Lowell A. and Kirby William M. M. The Use of Sulfaguanidine in the Treatment of Dysentery Carriers. *J. A. M. A.* 118: 1268 (April 11) 1942.

2. Miller Ellis Rock H. J. and Moore M. L. Substituted Sulfanilamides. *N<sup>4</sup>-Acyl Derivatives*. *J. Am. Chem. Soc.* 61: 1198 1939.

3. Poth E. J. and Knotts F. L. A New Bacteriostatic Agent Locally Active in the Gastrointestinal Tract. *Proc. Soc. Exper. Biol. & Med.* 48: 129 (Oct.) 1941.  
Poth E. J., Knotts F. L., Lee J. T. and Inn Frank. Bacteriostatic Properties of Sulfanilamide and Some of Its Derivatives. I. Succinylsulfathiazole, a New Chemotherapeutic Agent Locally Active in the Gastrointestinal Tract. *Arch. Surg.* 44: 187 (Feb.) 1942.  
Welch A. D., Matis P. A. and Latven A. R. A Toxicological Study of Succinylsulfathiazole. *J. Pharmacol. & Exper. Therap.* 75: 231 (July) 1942.

4. Poth E. J., Chenoweth B. M. and Knotts F. L. A Preliminary Report on the Treatment of Bacillary Dysentery with Succinylsulfathiazole. *J. Lab. & Clin. Med.* 28: 162 (Nov.) 1942.

In the three divisions of the institution, psychopathic hospital, general hospital and infirmary, there were at the time of the outbreak 8,000 inmates and 1,800 employees. The patients are housed in fourteen buildings, each having a separate kitchen but a common supply of food, milk and water.

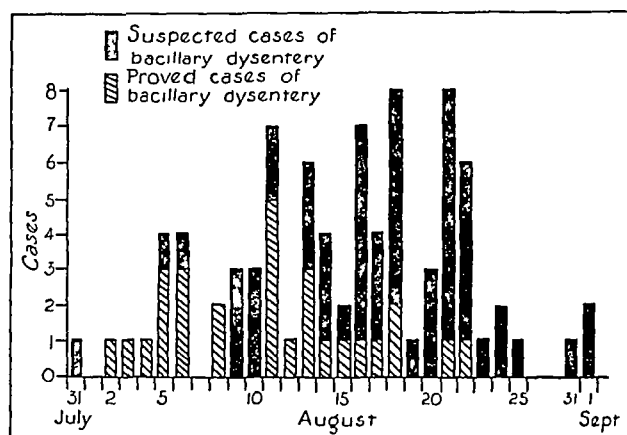


Chart 1—The distribution of cases by date of onset indicating occurrence of suspected and proved cases.

It was found that the outbreak began in two wards for chronically ill patients in one of the buildings which at the time had a patient census of 2,200. The first few patients in whom the diagnosis of bacillary dysentery (Flexner) was established were transferred to the acute general hospital building. Three patients in the general hospital developed the disease and in each case the infection could be readily explained by contact with these proved cases. In order to prevent additional secondary cases an isolation ward was established in a building which was closed at the time, and all patients at the institution who developed diarrhea were immediately moved to this building. Complete isolation was effected and no further secondary cases occurred. With the exception of two attendants, both of whom cared for patients ill with the disease, no cases were found among the hospital personnel. The distribution of cases by dates of onset is shown graphically in chart 1.

The fact that most of the cases occurred in one building and that the outbreak did not have the explosive character of milk or water borne outbreaks indicated quite definitely that food was the source of the infection. This evidence, coupled with the fact that cases developed in widely separated wards of the same building, and that hospital personnel who ate in a separate kitchen were not affected, indicated that the infection had its origin in the main kitchen, where food was prepared only for patients in this building.

To break the chain of infection and stop the epidemic, general control measures were immediately established and a search was made for a carrier or carriers among the food handlers employed in that building. This necessitated taking cultures of the stools from 328 individuals and of these, two inmates who served food in the patients' kitchen were found to have *Bacterium flexneri* organisms in their stools. That these men were the source of the original infection was never proved. Although neither was treated many subsequent stool specimens, including swabs taken directly from the rectal mucosa on three occasions, were negative. One of these men was admitted to the institution two weeks prior to the outbreak and gave a history of chronic vague abdominal pain.

For the purpose of completeness a survey was made to determine whether or not the water supply was safe. Investigation showed that the plumbing was protected by vacuum breakers, there were no submerged outlets and no cross connections were discovered. The milk supply was also investigated as a possible source of infection and found to be satisfactory.

#### METHOD OF STUDY

On admission to the isolation ward a complete blood count and urinalysis was done in each patient. Cultures of stools were taken daily by means of accepted bacteriologic and serologic methods. A total of 86 patients were isolated for observation during the epidemic and in 26 cases the diagnosis was proved by stool cultures. In 2 additional cases there were negative stool cultures but these were considered "probable cases." One patient had bloody diarrhea and a high temperature and died early in the epidemic in a ward where several positive cases later developed. The other had the characteristic symptoms of the disease and subsequently developed a high serum agglutination titer against the organisms known to have caused the outbreak. Repeated stool cultures were obtained from all positive cases for from six to eight weeks after release from isolation. When the diagnosis was suspected but the organisms could not be demonstrated in the stools, serum agglutination tests were done against *Bacterium flexneri* organisms isolated from the stools of other patients of this epidemic.

Treatment consisted in routine administration of camphorated tincture of opium and bismuth subcarbonate, and when indicated dehydration was controlled by parenteral fluids. One group of 12 patients was given sulfaguanidine, another group of 24 patients was given succinylsulfathiazole. In most cases these drugs were started on the first or second day of the disease, but occasionally not until the third day of illness. With

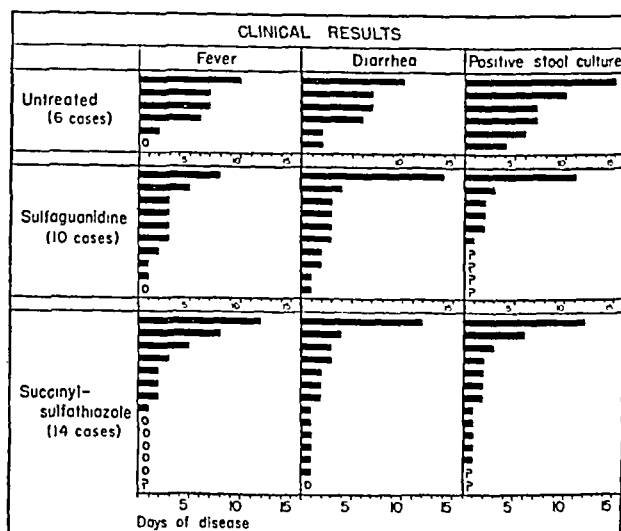


Chart 2—A comparison of the clinical results in untreated, sulfaguanidine treated and succinylsulfathiazole treated cases. The symbol 0 indicates no fever or diarrhea. The question mark indicates inadequate data.

few exceptions the dosage of sulfaguanidine was 0.1 Gm per kilogram of body weight initially and 0.3 Gm per kilogram daily divided into six equal parts. The

5 Succinylsulfathiazole is marketed under the trade name of sulfasuxidine and is manufactured by Sharpe and Dohme Incorporated Philadelphia who supplied the drug used in this study.

dosage of succinylsulfathiazole was 0.25 Gm per kilogram of body weight initially and 0.25 Gm per kilogram daily divided into six equal parts given every four hours. The duration of sulfonamide therapy varied from two to fourteen days, most patients were treated for six days.

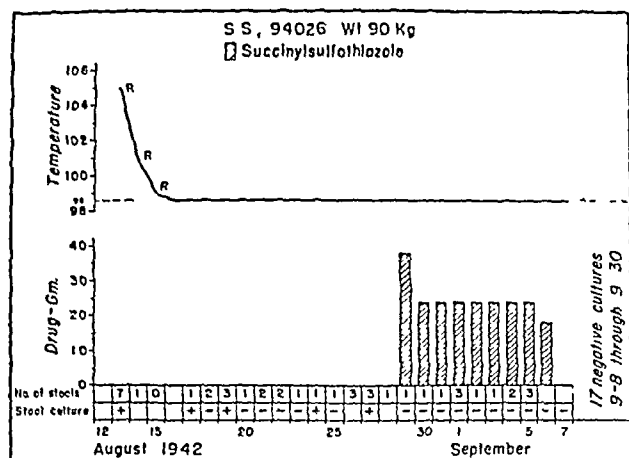


Chart 3—The development of a carrier state in a patient untreated for sixteen days later cured with succinylsulfathiazole.

On alternate days during sulfonamide therapy complete urinalyses, determinations of hemoglobin, white blood cell counts and sulfonamide blood concentrations by means of the method of Bratton and Marshall<sup>6</sup> were obtained. Values for succinylsulfathiazole were expressed as "free" sulfathiazole and as total sulfonamide.

#### CLINICAL RESULTS

In this analysis of the clinical results of treatment discussion will be limited to the 26 proved and the 2 probable cases of acute bacillary dysentery. These cases are divided into three groups: the first group, 6 patients, received no sulfonamide therapy; the second group, 10 patients, were treated with sulfaguanidine; the third group, 14 patients, were treated with succinylsulfathiazole.<sup>7</sup>

Except for the first few patients the day of onset of symptoms could be established with considerable accuracy because all patients were under constant observation by trained hospital personnel who had been instructed to report the occurrence of diarrhea in any inmate. This permitted the isolation and institution of chemotherapy early in the course of the disease. The clinical results are summarized in chart 2.

**Group 1 (untreated)** There were 6 patients who received no sulfonamide drug and of these 5 were proven cases, whereas 1 was considered a probable case. There were four deaths in this group and autopsies were performed in 2 of these. In both cases throughout the descending colon and rectum there was severe hyperemia, multiple petechial hemorrhages and shallow 1-2 mm ulcerations. *Bacterium flexneri* organisms were cultured from the ulcers in both cases.

Of the 2 patients who recovered, 1 remained febrile for six days and had a nonbloody diarrhea for three days. The stool cultures remained positive through the fourth day of the disease and then became persistently negative during a period of four weeks. The

other patient (S S, chart 3) was a white man aged 50 with a fractured humerus but otherwise in good physical condition. On the day of onset of dysentery his temperature rose to 104.8 F (rectal) and he had seven watery stools. The following day the diarrhea subsided and by the third day his temperature was normal. However, during a period of sixteen days *Bacterium flexneri* organisms were recovered from his stools on five different occasions. He was then treated with succinylsulfathiazole and all subsequent cultures, twenty-seven in thirty-one days, were negative. (This patient is also included in group 3.)

**Group 2 (treated with sulfaguanidine)** Ten of the 12 patients who were treated with sulfaguanidine are included in this group, 9 were positive cases and one a probable case. In 7 of 10 patients the temperature returned to normal after three days of therapy, another patient remained febrile for eight days. There was one death in this group, a man who was first given treatment on the sixth day of dysentery. He seemed to be responding favorably, but on the fourth day of treatment his temperature rose to 103 F (rectal) and the following day he died. At autopsy the mucosa of the colon was hyperemic and presented shallow ulcers, cultures of these lesions were negative.

Diarrhea was controlled in 8 of the 10 cases after three days of therapy and in the fatal case after four days of treatment. The other patient (G R) continued to have diarrhea for fourteen days while receiving sulfaguanidine and was therefore treated with succinylsulfathiazole. (This case is included in both groups 2 and 3.)

Stool cultures became negative in 5 cases after three days of sulfaguanidine therapy. In 4 cases cultures of the stools were not taken at frequent enough intervals to determine the exact date on which the feces were rendered free from pathogenic organisms. In the patient who was later treated with succinylsulfathiazole

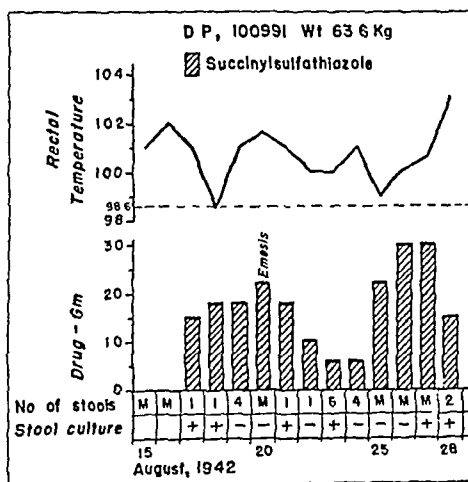


Chart 4—Fatal termination in a case treated with succinylsulfathiazole for twelve days.

(G R) stool cultures were positive on the eleventh day of sulfaguanidine therapy.

**Group 3 (treated with succinylsulfathiazole)** Fourteen of the 24 cases treated with succinylsulfathiazole are included in this group, one of these cases (S S, chart 3) was previously discussed among the untreated cases and another (G R) was included among those treated with sulfaguanidine. The duration of fever in this group was comparable to that observed in group 2.

6 Bratton A. C. and Marshall E. K. Jr. A New Coupling Component for Sulfanilamide Determination. *J. Biol. Chem.* 128: 537 (May) 1939.

7 In group 1 is included a patient who later was given succinylsulfathiazole and is therefore also included in group 3. In group 2 is 1 patient treated first with sulfaguanidine and later with succinylsulfathiazole and this case is also included in group 3.

In the 1 fatal case in this group the temperature continued elevated for fifteen days, in 1 case it remained elevated for eight days and in another for five days. Five other patients became afebrile after three days of treatment. In the remaining patients in this group the temperature was normal at the time succinylsulfathiazole

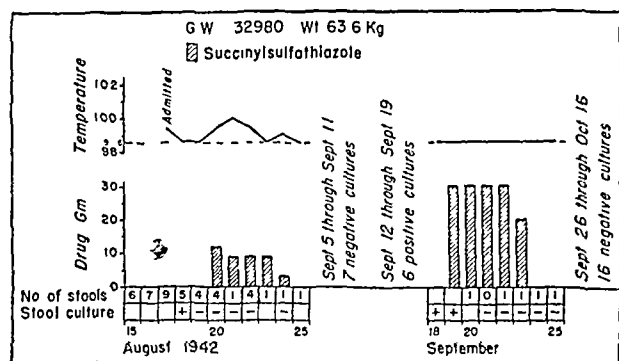


Chart 5—The development of a carrier state in a case treated with small doses of succinylsulfathiazole, later cured with larger doses

zole was started and remained normal throughout the period of treatment.

Diarrhea was controlled in 11 of the 14 cases after three days of therapy. Of the 3 remaining patients in this group 1 had no diarrhea when therapy was begun, 1 had diarrhea for six days and the last patient (D P, chart 4) represented the 1 fatal case in this group. This man was 81 years old and had been hospitalized for more than one year because of atherosclerotic heart disease. Treatment was started on the third day of the disease, but in spite of the fact that the dose was increased to approximately 0.5 Gm per kilogram of body weight daily he had bloody stools almost constantly and died on the fifteenth day of the illness.

Cultures of the stools from 12 of the 14 patients of this group were taken daily, thus the exact day on which stools became negative could be determined. In 10 of these 12 cases the stool cultures were negative after three days of treatment, of the other 2 cases stool cultures remained positive for six days in 1 and twelve days in the other (D P, chart 4).

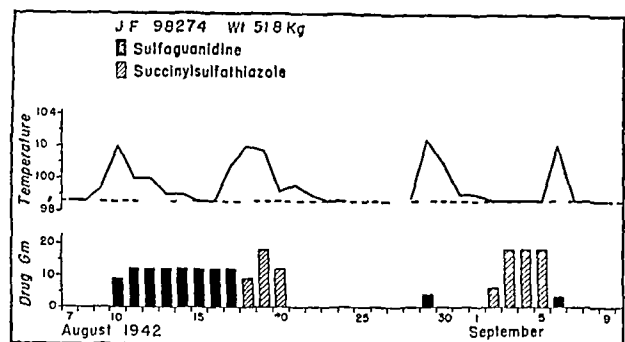


Chart 6—Drug fever occurring with the administration of sulfaguanidine and later produced by the readministration of the same drug. No fever following the readministration of succinylsulfathiazole.

One of the patients in this group (G W, chart 5) received 0.15 Gm of succinylsulfathiazole per kilogram of body weight initially and 0.15 Gm per kilogram daily for approximately four days. Throughout the period of treatment and for the next sixteen days eleven stool cultures were negative. Then on six consecutive days the stool cultures were positive. A second course

of succinylsulfathiazole was given, using 0.5 Gm per kilogram as the initial dose and the same amount daily in six divided doses for four days. The stool cultures became negative after one day on this dose and remained so throughout an observation period of twenty-three days.

#### BLOOD CONCENTRATIONS OF THE DRUGS

The blood sulfonamide concentrations and the corresponding total dosage of drug administered at the time of the determination in the sulfonamide treated patients are summarized in table 1. Although the values obtained for blood concentrations of sulfaguanidine in this series of cases are comparable, for the most part, with the values reported in other investigations, we observed 2 patients in whom unusually high concentrations occurred. In 1 case a blood concentration of 10 mg per hundred cubic centimeters was observed following the administration of 81 Gm of sulfaguanidine in eight days. In the other case a blood concentration of 16.6 mg per hundred cubic centimeters followed the administration of 27.5 Gm of sulfaguanidine in three days.

TABLE 1—Total Dosage and Corresponding Blood Concentrations of Sulfaguanidine in Twelve Cases

Patient	Weight kg	Total Dose in Grams to Date	Blood Concentration of Drug Mg. per 100 Cc
T F	81.8	48.5 78.5	1.0 2.2
J S	60.9	15.0 81.0 108.0	3.2 10.0 7.2
C K	71.4	28.0	7.7
G R	48	22.0 51.0 63.0 108.5	4.2 5.6 6.2 8.3
J I	51.8	48.0 72.0	0.9 1.5
M A	60	70.0	2.1
W S	81.8	51.0	5.0
F K	51.1	45.0	7.2
R G	56.4	27.5 57.5	16.6 4.6
T T	43.2	41.0	4.3
J P	68	25.0 85.0	4.5 5.3
R H	75.5	71.0 190.0	2.6 14.4

The blood sulfaguanidine value in the latter case is higher than any values previously reported, the highest reported value with which we are familiar is 10 mg per hundred cubic centimeters<sup>8</sup>. The values for blood concentration of succinylsulfathiazole in this series were consistently low and are comparable with the values reported by others<sup>3</sup>. In no instance did the free sulfathiazole exceed 1.39 mg per hundred cubic centimeters or the total succinylsulfathiazole 1.45 mg per hundred cubic centimeters.

**Toxicity**—Slight vomiting occurred in 1 case with each drug. No nausea, rash or hematuria was observed. Sulfonamide crystals were found in 6 of the 10 patients who received sulfaguanidine and in 10 of the 14 who received succinylsulfathiazole. These urine specimens were examined four to six hours after voiding. Because the presence of crystalluria had not been previously reported in patients who had received succinylsulfathiazole, we administered this drug to 10 patients hospitalized for other conditions and who were in a normal

<sup>8</sup> Kirsner J B, Rodaniche Enid C and Palmer W L. Use of Sulfaguanidine in Nonspecific Ulcerative Colitis and Other Infections of Bowel. Am J Digest Dis 9: 229 (July) 1942.

state of hydration. Urine specimens were collected after four days of administration of this drug and were examined within one hour after voiding. There were no sulfonamide crystals in any of these cases.

One patient (I F, chart 6) who received sulfaguandine developed a drug fever. At the time this drug was started his temperature was 102 F and after four days of therapy it had returned to normal. Sulfaguandine was continued for four more days, at which time his temperature again rose to 102 F. This second

TABLE 2—Total Dosage and Corresponding Blood Concentrations of Succinylsulfathiazole in Twenty-Four Cases

Patient	Weight, Kg	Total Dose in Grams to Date	Blood Concentration of Drug, Mg per 100 Cc	
			Free	Total
M S	50.8	31.0	0.87	0.89
		68.0	0.35	0.41
		78.0	0.25	0.5
J B	60.0	61.0	0.77	1.12
		100.0	0.41	0.51
		177.0	0.23	0.25
I F	51.8	15.0	0.92	1.0
A S	48.7	101.0	0.73	1.07
		141.0	0.65	0.81
		168.0	0.57	0.77
J P B	56.8	70.0	0.61	0.82
		80.0	1.0	1.08
		101.0	0.19	0.5
F A	51.1	57.5	0.97	0.99
		145.0	0.3	0.5
P L	67.3	27.5	1.79	1.45
		57.5	0.33	0.46
D P	63.6	57.0	0.40	0.4
		130.0	0.30	1.10
		219.0	1.0	1.39
G W	61.4	16.5	0.19	0.19
		41.5	0.3	0.46
M S	67.5	81.0	0.38	0.40
W H	50	37.0	0.71	0.37
G G	77.7	2.0	0.29	0.41
S D	60.9	18.0	0.1	0.17
		30.0	0.49	0.54
		48.0	0.69	0.27
		60.0	0.50	0.48
S S	92.1	70.5	0.70	0.18
		118.5	0.70	0.68
		166.5	0.70	0.46
			0.28	0.25
J A	56.8	24.0	0.39	0.41
		48.0	0.42	0.45
		68.0	0.46	0.91
W B	59.5	112.0	0.82	0.86
J A	67.3	39.0	0.31	0.32
P McM	67.3	42.5	0.32	0.34
R N	73.0	63.0	0.25	0.27
A G	45	41.0	0.64	0.65
H S	60.5	49.0	0.08	0.11
		75.0	0.38	0.41
A T	75.9	40.0	0.2	0.31
		76.0	0.6	0.74
J R	73	98.0	0.4	0.6
E S	52.3	48	0.87	0.63
		84	0.58	0.57

elevation in temperature was at first thought to be a result of continued gastrointestinal infection and because sulfaguandine was apparently not effective it was discontinued and succinylsulfathiazole substituted. After three days of treatment with the latter drug the temperature returned to normal. A later analysis of the case revealed that during the second febrile period there was no diarrhea and the stool cultures were negative. This suggested that this fever was due to drug sensitivity rather than to continued bacillary infection. Therefore, twelve days after sulfaguandine was discontinued the patient was again given 4 Gm of this drug in one dose. Three hours later he became dyspneic and cyanotic and his temperature rose to 102 F but returned to normal within forty-eight hours. No simi-

lar toxic reaction followed the readministration of succinylsulfathiazole. However, when sulfaguandine was given for a third time the temperature rose to 101.6 F.

This observation led us to investigate further the readministration of each of these drugs. Eight other patients who had previously received sulfaguandine

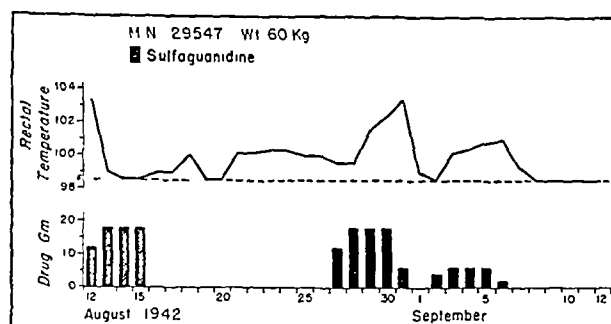


Chart 7—The occurrence of fever during the readministration of sulfaguandine

were given a second course of the drug, and 2 of these exhibited febrile reactions. That these patients were sensitive to this drug was further demonstrated by the production of similar reactions during a third course of the drug. These cases are illustrated in charts 7 and 8.

Twelve patients who had previously been treated with succinylsulfathiazole were given a second course of this drug and in no case did a febrile reaction occur.

The occurrence of febrile reactions following the readministration of sulfathiazole was first reported from this hospital by Lyons and Balberor.<sup>9</sup> The present study indicates a similar hypersensitivity to the readministration of sulfaguandine.

#### CONCLUSIONS

It is evident from this study of 28 cases that both sulfaguandine and succinylsulfathiazole are of distinct value in the treatment of acute bacillary dysentery (Flexner). It must be emphasized, however, that failures have occurred following the use of each of these drugs. Because succinylsulfathiazole is equally effective, and because it is without the potential toxic effects of sulfaguandine, we believe that it is the drug of choice in the treatment of acute bacillary dysentery (Flexner).

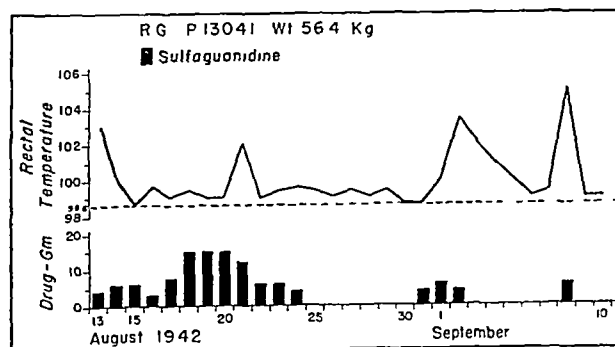


Chart 8—The occurrence of fever during the readministration of sulfaguandine

We consider that succinylsulfathiazole given in doses of 0.25 Gm per kilogram initially and 0.25 Gm per kilogram daily for at least six consecutive days was adequate to effect a cure in 12 of 14, or 85 per cent, of our cases. We observed that doses of twice this

amount may be administered without untoward reactions and it is suggested that if fever and diarrhea are not controlled after three days of therapy with the smaller doses twice the amount of the original dose be given.

We wish to stress the importance of repeated stool cultures for at least three weeks after therapy has been discontinued. Although the final decision regarding the value of succinylsulfathiazole will require further clinical use, the results of this comparative study indicate that it is a definite advance in the treatment of this important enteric disease and may prove to be of great value in the treatment of other types of bacillary dysentery.

## THE PREVENTION OF EAR DISABILITY IN INDUSTRY

REPORT ON THE USE OF A PLASTIC MOLD

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The innocuously progressive loss of hearing as encountered in industrial work associated with continuous exposure to noise has been a refractory disability problem. This is so not only by reason of the lack of an adequate treatment but also because essential precautions are imperfect and rarely instituted. Perhaps this is largely due to the fact that there has been no remedy which is both efficient in its function and acceptable to the worker.

### TYPES OF EAR DAMAGE

The significance of "boilermaker's ear" is well known among workers. In otologic practice it represents the clinical entity due to acoustic trauma. The deafness is relative to prolonged and repeated exposure to loud noises and particularly loud sounds of the high frequency range. In present day industry there are two factors which have accentuated the possibility of this disability. There is a demand for an unparalleled speed of production requiring an added number of men in limited areas in which there was already sufficient noise to be hazardous. An example of this is the work on the airplane assembly line and specifically in the shipyards, where work in confined areas such as in the double bottoms of transports is required. In the latter instance men with pneumatic chipping hammers must follow the welding bead along the side of the ship, and the resultant noise is sufficient to cause even a passerby on the outside of the hull to experience discomfort.

For a point of reference the threshold of immediately painful sound varies between 112 and 129 decibels, depending on the frequency. The higher the frequency the lower the threshold of painful sound. An airplane propeller has an intensity level of approximately 120 decibels. A rivet hammer or a chipping hammer may be estimated at 115 to 140 decibels, depending on the distance from the hammer at which the noise level is taken. A stream of air under high compression (150 pounds) passing out the customary  $\frac{5}{8}$  inch diameter outlet varies from 105 to 130 decibels when 2 feet to 6 inches from the opening. In comparison, conversational speech at 10 to 20 feet varies from 68 to 30 decibels. It should be remembered that the effect of the noise on the ear is also directly related to the duration of exposure as well as to the distance from the source.

A type of ear damage not seen frequently before is now confronting the industrial physician. With the advent of the intensive use of welding and the resultant necessity for the chipping of the weld metal, direct damage to the ear canal drum and middle ear is becoming common. The small flying balls of hot slag to which the worker is exposed as he works in various positions ricochet through the ear canal, leaving damage both from burning and from trauma. In this type of work there is a continuous dispersion in all directions of these metallic particles requiring the worker to be outfitted in stiff thick leather to protect his body.

### PREVIOUS METHODS

The use of cotton in the ear is an old standby and, though not effective in reducing the noise, does serve to keep out foreign material. Rubber ear stoppers have been used but, owing to the molding required of the plug to accommodate its presence in the canal, points of pressure develop which prevent their use over too long a period of time without symptomatic reaction. As a result of this they are usually kept in the pocket or thrown away. The use of material such as paper and rags is unsanitary and hazardous but a common practice.

By audiometric reading cotton lowers sound 10 to 15 decibels, depending on the efficiency with which it is packed in the canal. Rubber ear defenders lower sound 20 to 25 decibels. The plastic ear mold lowers sound 25 to 30 decibels in the speech range and 30 to 40 decibels in the high frequency range.

### THE PLASTIC EAR MOLD<sup>1</sup>

The problem has been to have an ear stopper which not only eliminates the hazards of intensive noise and stops the entrance of foreign material but also is so acceptable to the worker that he will permit its use for long and repeated periods. In order to fulfill these

requirements the ear canal was plugged just below the beginning of the bony portion with two small wads of cotton. Wet plaster was then put into the remaining outside portion of the canal and the immediately related portion of the concha. This is easily removed when hardened, carrying with it the uppermost piece of cotton. The other piece of cotton is removed and the plaster cast is



Fig. 1—General shape of ear mold.

transformed through a mold into an exact reproduction in transparent plastic lucite. This procedure has been used for years to produce the perforated ear unit for hearing aids. Thus each ear has its individual plastic mold stopper, which carries the obvious advantages of having no pressure points, of eliminating

completely the danger from foreign material and of definitely reducing the intensity of the noise

In addition it may be said that the plastic withstands heavy blows, is nonflammable, will not shatter and cut the wearer, and has a relatively low coefficient of expansion. It is nonresistant to alcohol. Also the mold causes no inconvenience to the wearer, for once in place the upper portion of the mold and the lower portion to a lesser degree lock behind the overlapping roll of the concha, preventing its coming out without actual manual removal.



FIG. 2—How ear mold fits into ear

#### EFFICIENCY OF THE PLASTIC EAR MOLD

Audiometric examination reveals that loud noises are reduced approximately 30 to 40 decibels, yet the ordinary conversational tone is distinguished without trouble.

In the California Shipbuilding Corporation thirty workers who were exposed to noise in various occupations were fitted with ear molds. These workers included welders, chippers, burners and buffers. After a period of ten days' use these workers were subjected to questioning with the following results:

#### QUESTIONS AND ANSWERS

1 Q—How did the sharp clattering noises and sounds in your work affect you? A (representative)—Chipper: "I had to quit and get away from it every ten minutes or so to get relief. I was trying to get a transfer into the open. At the end of the day my head always ached and my ears rang." Burner: "In tight places noise hurts. When the day is over you can't hardly hear. The wife claimed I was irritable and the ringing bothered my sleep."

2 Q—How effective are the ear molds in reducing these noises? A—All stated that the intense noise was eliminated.

3 (a) Q—Have you had trouble with foreign matter in your ears? A—Most complained of dust and rust scale, particularly the scalers and buffers. Five had had slag burns of the ear. Two of these had had ear drums ruptured from flying hot metal, a permanent disability was evident in one of the two.

3 (b) Q—While wearing the ear molds were you bothered by foreign matter? A—In no case did the molds fail to keep out the foreign material.

4 Q—How do the ear molds fit your ears? Is there any irritation? Are they comfortable? Are they easy to manipulate? A—The ear molds caused no irritation. The men wore them constantly without removing them during their working hours. All stated that they were comfortable and easy to manipulate in and out.

5 Q—Do you find that the ear molds help you in your work in any way? A (represented most clearly by actual quotation)—"That noise was a big distraction but these molds took that away. I believe I do more work in a day now." "These are aces high. My ears are not under pressure any more." "I can hear the fellows talk but the noise is gone."

6 Q—Does wearing the ear molds during working hours affect your leisure hours? (This question was asked because a large percentage of the men entering the field hospital

complained of ringing in the ears, partial deafness, nervous irritability and occasionally trouble in sleeping. Most of these cases of temporary partial deafness and ringing in the ears were relieved automatically by morning, but there was some complaint of continued trouble.) A—Relief in all cases of irritative symptoms after working hours was experienced.

7 Q—How do these ear molds compare with other ear stoppers you have tried? A—The ear molds were given preference. The objections to other types were those outlined earlier.

Knowing the obvious disadvantages of accepting this type of evidence as accurate, it nevertheless serves to establish the point that the molds are acceptable to the worker. In support of this is the fact that approximately five hundred workers have voluntarily bought these molds without any advertising by the ear mold company.

#### SUMMARY AND CONCLUSIONS

A new type of ear stopper, a plastic ear mold, offers as its advantages:

- 1 It is relatively indestructible
- 2 It is efficient in diminishing intense and high frequency noises, yet permits conversation
- 3 It is a sure block for foreign material
- 4 It is light, transparent and easily cleaned

The finished product is a die cast reproduction of a plaster model. Each ear being different, a new plaster cast is made for each and every stopper. Thus the exactness of fit is obtained to eliminate sound leaks and to prevent irritating points of pressure.

A trial of 30 cases was made by pertinent questions following two weeks' usage.<sup>2</sup> The following conclusions therefore seem justified:

- 1 The hazard of loud noise can be eliminated by these plastic ear molds
- 2 Slag burns and foreign bodies involving the ears can be prevented
- 3 Elimination of prolonged and repeated exposure to noise is obtained with the resultant eradication of irritative symptoms which should allow greater concentration on the job and increase of production
- 4 A solution is thus offered for certain industrial ear problems

175 Berkeley Street

<sup>2</sup> Trials made at California Shipbuilding Corporation. David A. McCoy, M.D., chief of eye, ear, nose and throat department.

**The Changes in an Apple**—The manufacturer of foodstuffs is the plant. It takes carbon dioxide from the air and water from the soil and builds up complex compounds by means of the energy furnished by the sun's rays. The simplest compounds formed from carbon dioxide and water are formaldehyde and simpler acids related to formaldehyde. Acids appear first in the process of synthesizing food substances. Because of this fact, unripe fruit is sour. A boy who steals an apple in September makes a "sour" face. But the plant is industrious. It repeats the process, combining 2, 4, 6 molecules of formaldehyde, giving rise to sugar. In October the acids in the apple have been transformed into grape sugar, and the apple is sweet. Now man reaps the crop, but the plant continues to manufacture. It combines 2 molecules of grape sugar to form malt sugar, malt sugar molecules combine to form dextrin, and by uniting dextrin molecules the plant makes starch. In November the apple loses its sugar and becomes mealy. Then the plant combines starch molecules to form cellulose. In December the apple is no longer sour, sweet or mealy but as tough as wood.—Kahn, Fritz. *Man in Structure and Function*, volume 1 translated from the German and edited by George Rosen, M.D., New York, Alfred A. Knopf 1943.



# JAUNDICE OCCURRING ONE TO FOUR MONTHS AFTER TRANSFUSION OF BLOOD OR PLASMA

REPORT OF SEVEN CASES

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The purpose of this communication is to report 7 cases of jaundice which occurred one to four months after transfusions of whole blood or plasma and to suggest that these illnesses were probably caused by the transfusions.

There are on record a number of instances in which inoculation of groups of people with human plasma, serum or lymph has resulted in outbreaks of an illness resembling catarrhal jaundice. A distinctive feature of these cases has been a long incubation period, varying between four and thirty weeks, the majority being between eight and eighteen weeks. The first large outbreak occurred in 1883-1884 among workers in a Bremen shipyard, who were vaccinated with human lymph derived from cases of vaccinia. From one to seven months later 191 of 1,289 persons became jaundiced, while 500 other workers in the same shipyard, vaccinated with a different lot of lymph, remained free of the disease.<sup>1</sup> In England in 1937-1938, 41 cases of jaundice occurred among a group of 109 children who had been inoculated with a preparation of human convalescent plasma for passive protection against measles. Yellow fever vaccination, using vaccines containing human serum, has been the cause of several outbreaks of hepatitis. These occurred in England,<sup>2</sup> in Brazil<sup>3</sup> and recently in American soldiers.<sup>4</sup> Evidence has pointed to the human serum in the vaccines as the source of jaundice in each of these outbreaks, as a consequence, the vaccines now being used are made without human serum.

A memorandum has recently been issued by the British Ministry of Health on the subject of "Homologous Serum Jaundice."<sup>5</sup> This document supplies details of the hepatitis referred to previously which followed measles convalescent plasma. In addition, an outbreak of jaundice is described involving 86 members of a group of 266 soldiers who had been inoculated with convalescent plasma from mumps patients. Finally it is stated that 12 cases of jaundice have been reported, from several sources, in persons who had previously been given transfusions of plasma or of whole blood. The memorandum contains useful data on the clinical manifestations of this form of hepatitis.

The clinical features of these illnesses have resembled to some extent those of common infective hepatitis or catarrhal jaundice. Certain manifestations, however,

have been noted in the "homologous serum" cases which may assist in clinical differentiation. Urticaria and various types of erythema are described. For example, skin rashes were noted in 41.7 per cent of the "mumps plasma" cases. Also a transient generalized arthritis has been an early manifestation in some instances. In most cases the symptoms were mild, but some of the affected persons were severely ill, and deaths occurred. In the cases among American soldiers which followed yellow fever vaccination the fatality rate was stated to be about 0.2 per cent, but in the English children who received measles convalescent plasma the disease was apparently much more severe, there being eight fatalities among 41 cases.

Comparable with the foregoing experiences in human beings are some observations which have been made in horses. Jaundice has been noted in horses from one to six months after they have received injections of horse blood or serum given for the purpose of immunization against such diseases as African horse sickness,<sup>6</sup> equine encephalomyelitis,<sup>7</sup> anthrax<sup>8</sup> and grass sickness.<sup>9</sup>

The cause of these diseases has not been established, although a number of theories have been suggested.<sup>10</sup> The explanation which has generally been favored is that the jaundice is caused by a virus which happened to be present in the body fluids of the donors and which, after a long incubation period, produced a hepatitis in the recipient. Another suggestion is that this disease is the result of an immune mechanism in which, following inoculation with homologous blood or plasma, an individual develops antibodies which cause injury to his own tissues.

The connection between the preceding inoculation and the subsequent jaundice has been recognized in previous instances because of the simultaneous occurrence of a considerable number of cases among persons who had all been inoculated with a single material. It is reasonable to suppose that this sequence of events may have occurred on other occasions, involving smaller numbers of persons, and that the relationship may have been overlooked because of the long interval which elapsed between the inoculation and the subsequent jaundice. Recently 2 patients (1 and 2) have been treated in Grady Hospital in each of whom jaundice had occurred several weeks after transfusion of blood or plasma. In addition, examination of the hospital records for the years 1940, 1941 and 1942 revealed 4 more examples (cases 3, 4, 5 and 6). These were among a group of 79 cases in which a diagnosis of "acute catarrhal jaundice" or "toxic hepatitis" had been made. Thus in one hospital, among a total of 81 persons ill with "catarrhal jaundice" or "toxic hepatitis" there were 6 who had recently received transfusions. The seventh case which I am reporting was noted by Dr. Charles Harris in a relative of his who underwent a subtotal gastrectomy at Emory University Hospital, Atlanta. The patient received several transfusions at the time of his operation. On recovery from the operation he returned to his home in Texas, and there, approximately three months after the transfusions, he developed jaundice. He was not admitted to a hospital, but sufficient information has been obtained to show

From the Medical Service of Grady Hospital and the Department of Medicine, Emory University School of Medicine.

1 Hirsch's Handbook of Geographical and Historical Pathology, translated from the German Edition by C. Creighton. London: New Sydenham Society, 1886, vol. 3, pp. 420 and 424.

2 Probert S. A. Hepatitis After Prophylactic Serum. Brit. M. J. 2: 677 (Sept. 24) 1938. McNulty A. S. Annual Report of the Chief Medical Officer, Ministry of Health for the Year 1937, London: H. M. Stationery Office, 1938, p. 38. Homologous Serum Jaundice.

3 Findlay G. M. and MacCallum T. O. Hepatitis and Jaundice Associated with Immunization Against Certain Virus Diseases. Proc. Roy. Soc. Med. 31: 799 (May) 1938.

4 Fox J. P., Manso Caio, Penna H. A. and Para Madureira. Observations on the Occurrence of Icterus in Brazil Following Vaccination Against Yellow Fever. Am. J. Hyg. 36: 68 (July) 1942.

5 Jaundice Following Yellow Fever Vaccination. editorial J. A. M. A. 119: 1110 (Aug. 1) 1942. The Outbreak of Jaundice in the Army. Circular Letter No. 95 S. G. O. J. A. M. A. 120: 51 (Sept. 5) 1942.

6 Homologous Serum Jaundice. Memorandum Prepared by Medical Officers of the Ministry of Health. Lancet 1: 83 (Jan. 16) 1943.

7 Theiler A. Acute Liver Atrophy and Parenchymatous Hepatitis in Horses. 5th and 6th Reports of the Director of Veterinary Research, Union of South Africa. Dept. of Agriculture, 1918, p. 7.

8 Cox H. R., Philip C. B., Marsh Hadleigh and Kilpatrick J. W. Observations Incident to an Outbreak of Equine Encephalomyelitis in the Bitterroot Valley of Western Montana. J. Am. Vet. M. A. 93: 225 (Oct.) 1938.

9 Slagsvold L. Ikterus hos hester behandlet med miltbrandserum. Norsk vet. tidskr. 50: 69 1938.

10 Findlay and MacCallum.<sup>3</sup> Fox, Manso, Penna and Paré.<sup>4</sup>

that his illness was similar clinically to those of the other patients in this series. A diagnosis of "catarrhal jaundice" was made by his attending physician.

The principal data of the 7 cases are presented in the accompanying tables. The clinical diagnosis which had been made in 6 of them was "acute catarrhal jaundice," while a diagnosis of "toxic hepatitis" had been made in 1 case (6). None of the patients were severely ill.

A point of interest is the fact that a skin eruption and joint pains were the initial symptoms in case 3 and that in case 6 the initial symptom was a generalized urticaria. As noted previously, skin eruptions and arthritis have occurred frequently in "homologous serum jaundice."

Four of these 7 patients received four or more transfusions, involving relatively large volumes of blood or

TABLE 1—Data on Relationship of Transfusions to Occurrence of Jaundice Seven Cases

Case	Age	Sex	Color	Condition for Which Transfusions Were Given	Transfusions of Pooled Plasma		Transfusions of Citrated Blood		Date of Onset of Symptoms	Interval Between Last Transfusion and Onset of Symptoms Days	Interval Between First Transfusion and Onset of Symptoms Days
					Date	Amount Cc	Date	Amount Cc			
1	53	♂	W	Burns of body and limbs	8/24/42 8/25/42 8/27/42 8/30/42 9/16/42	1000 1600 500 600 250	9/17/42 9/20/42	650 500	10/16/42	33	65
2	46	♀	N	Hysterectomy, salpingo oophorectomy and appendectomy	None		10/6/42 10/9/42 10/10/42 10/13/42	500 500 500 500	2/2/43	111	110
3	45	♀	W	Perineorrhaphy and hysterectomy	None		1/6/41	500	4/21/41	106	106
4	70	♂	N	Mid thigh amputation following injury	None		1/6/41	650	3/15/41	69	69
5	24	♀	W	Salpingo oophorectomy for ruptured ectopic pregnancy	4/24/42 4/26/42 4/26/42	1000 500 750	4/26/42 4/27/42 4/30/42 5/2/42 5/5/42	550 500 200 550 600	6/12/42	38	49
6	30	♀	N	Hysterectomy, salpingo oophorectomy and appendectomy	None		3/31/42	700	6/12/42	73	73
7	60	♂	W	Subtotal gastrectomy for peptic ulcer	8/27/42	50	8/29/42 8/31/42 9/2/42 9/5/42 9/10/42	500 500 500 500 500	11/28/42	79	93

TABLE 2—Clinical Features of Seven Cases of Jaundice Following Transfusions

Case	Symptoms	Physical Examination	Course of Illness	Laboratory Findings
1	None except jaundice	Moderate jaundice of scleras and skin. Liver edge just palpable. Not tender. Spleen not felt.	Admitted on 3d day of illness. Remained 40 days. No fever. Always felt well. Jaundice increased first 3 weeks then began to fade. Still a faint trace 105 days after onset.	No anemia. Leukocytes 10,800. 78% polys. Urine fell to 6,200. 64% polys. Urine contained bile on admission. Not on discharge. Feces contained no bile first 10 days. Icterus index 40 on admission rose to 80 fell to 12.
2	Anorexia, headache, epigastric pain, vomiting, cream colored stools, constipation, dark urine.	Jaundice of scleras and buccal mucosa. Moderate tenderness in right upper quadrant. Liver and spleen not felt.	Admitted on 2d day of illness. Remained 28 days. No fever. Symptoms subsided after 3d day in hospital.	No anemia. Leukocytes 6,500. 72% polys. Urine gave 4+ test for bile on admission. Trace 7 days later. Feces always positive for bile. Icterus index 44 on admission. 18 5th day. 19 12th day.
3	Onset with headache, swelling and tenderness of knees, elbows, fingers and toes. Second day numerous red bumps on feet and ankles. Third day nausea, vomiting, anorexia. Felt feverish. Severe palpitation.	Paroxysmal auricular tachycardia (this occurred also during previous hospital admission). Tenderness and swelling of all joints. Jaundice of scleras and skin noted on second hospital day. No abdominal tenderness. Liver and spleen not felt.	Admitted on 9th day of illness. Remained 12 days. Daily temperature elevation 99-100 first 6 days. Normal thereafter. Pain in left side of epigastrium first 2 days. Comfortable thereafter. Tachycardia controlled by quinidine. Jaundice diminished on discharge and not noted at follow up 2 weeks later.	No anemia. Leukocytes 6,850. 64% polys. Urine never gave positive test for bile. Feces not examined for bile. Icterus index 29 on admission. 44 on 8th day.
4	Crampy epigastric pain, vomiting, anorexia, no change in color of urine or stools.	Jaundice of scleras and skin. Slight tenderness in right upper quadrant. Liver not felt. Thought to be small. Spleen not felt.	Admitted on 5th day of illness. Remained 25 days. Symptoms subsided after few days. Jaundice diminished while in hospital.	No anemia. Leukocytes 6,200. 77% polys. Urine positive for bile on admission and also 7 days later. Negative 7 days after that. Feces always contained bile. Icterus index 133 on admission, fell steadily to 28 on discharge.
5	Nausea, vomiting, epigastric fullness.	Jaundice of scleras and skin. Dehydration. Liver and spleen not felt. No tenderness.	Admitted on 4th day of illness. Remained 14 days. Comfortable after 4th day. Jaundice fading on 10th day and no longer evident 5 weeks after onset.	No anemia. Leukocytes 6,450. 72% polys. Urine positive for bile on 2d day. Negative on 14th day. Feces always contained bile. Icterus index 36 on 2d day. 20 on 9th day.
6	Onset with urticaria all over body. 3 days later headache, anorexia, epigastric pain, nausea and vomiting, chilliness noted. Jaundice on tenth day.	Jaundice of scleras. No tenderness. Liver and spleen not felt.	Admitted on 15th day of illness. Remained 44 days. Little change in icterus. No further gastro-intestinal symptoms.	No anemia. Leukocytes 6,500. 72% polys. Urine gave 4+ test for bile on admission. Only a trace 7 days later. Feces always contained bile. Icterus index 25 on admission. 57 on 9th day. 33 at time of discharge.
7	Nausea, anorexia, vomiting, fever, light colored stools, dark colored urine. Jaundice noted on sixth day.	No record.	Stools remained light in color for 12 days. Urine was dark for 20 days. Jaundice evident for 34 days. Lost 15 pounds in weight then rapidly regained it. Attending physician made diagnosis of catarrhal jaundice.	No record.

plasma This is probably significant only to the extent that the risk of receiving a jaundice producing substance in a transfusion may be increased in proportion to the number of donors from whom blood or plasma is received The volume alone does not seem to be an important factor, since the volume of human serum or plasma which caused the postvaccination cases was comparatively small It has not been possible to trace the donors of the blood or plasma given to these patients<sup>11</sup> However, in some previous outbreaks of this disease the donors have been traced and have not presented any evidence of illness subsequent to the time at which they gave blood

Three coincidences in dates appear in this series of cases Patients 3 and 4 were given transfusions on the same day, Jan 5, 1941 However, since 1 was white and 1 a Negro, and since flasks of blood are never pooled, there is almost no possibility that they received any of the same material Patients 1 and 7 received multiple transfusions between Aug 24 and Sept 10, 1942 They were in different Atlanta hospitals In cases 5 and 6 the onset of symptoms occurred on the same day, June 12, 1942, although patient 6 had received her transfusion more than three weeks earlier than patient 5 The significance of these coincidences cannot be decided at present

The present large scale use of blood and plasma transfusion may lead to the occurrence of a considerable number of such cases of hepatitis It seems highly probable that they may be occurring not infrequently but are not being recognized If one were not aware of the fact that jaundice may follow inoculation with homologous serum or plasma after a long latent period, one would be unlikely to attach any significance to a history of transfusion three months previous to the onset of a patient's illness The real frequency of this complication of transfusion will be known only when there has been a concerted effort by physicians to recognize such cases

Two practical measures are indicated for the investigation of this problem First, a careful record should be kept of the source of blood or plasma administered to each patient Second a small portion of blood or plasma should be set aside at the time a transfusion is given, so that in the event of subsequent cases of hepatitis, some of the causative material will be available for study

#### SUMMARY

Seven persons who had received transfusions of blood or plasma at the time of injuries or surgical operations became ill one to four months afterward, with symptoms resembling those of catarrhal jaundice It is suggested that these illnesses were probably caused by the transfusions

Basis for the suggestion is a number of reported instances in which immunizations against different diseases, using homologous serum, plasma or lymph, have resulted in the occurrence of jaundice in significant numbers of the recipients A distinctive feature in these outbreaks has been a long incubation period, varying from one to seven months

Isolated cases, such as those reported here, may be occurring more frequently than is appreciated

11 The blood and plasma used in Grady Hospital are prepared as follows Blood is drawn into a liter flask containing sodium citrate The flask is sealed immediately and stored in a refrigerator at 5 C until needed It is never mixed with any other blood If a flask is not used within seven days the plasma is siphoned from the cells and pooled with plasma from three or four other flasks Whole blood therefore is derived from only one donor while plasma may be derived from four or five different donors

## SIXTY CASES OF PNEUMOCOCCIC MENINGITIS TREATED WITH SULFONAMIDES

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In 1939 one of us<sup>1</sup> reported 17 cases of pneumococcal meningitis treated with sulapyridine at Sydenham Hospital between October 1938 and May 1939 with recovery of 8 patients (47 per cent) We have since then had occasion to treat 43 more patients at Sydenham Hospital and at the Harriet Lane Home or the Johns Hopkins Hospital Since there is considerable variation in the mortality figures reported in case series from other hospitals it seemed to us worth while to report our own cases and analyze our experience

Prior to the introduction of sulfonamide therapy the mortality in pneumococcal meningitis was nearly 99 per cent The Goldsteins<sup>2</sup> reviewed the literature in 1927 and were able to collect 150 authentic reports of recovery from this disease Between 1930 and 1936 no specific therapy was used at Sydenham Hospital and all 29 patients died From December 1936 to October 1938 17 patients were treated with sulfanilamide at Sydenham and only 1 recovered At the Harriet Lane Home of 8 patients who received sulfanilamide 1 recovered but had severe residual damage to the spinal cord

In October 1938 sulapyridine came into use both at Harriet Lane and at Sydenham, since then sulapyridine, sulfathiazole, sulfadiazine or sulfapyrazine has been used in each case Our ideas concerning the details of treatment have changed gradually in the last three years, and we prefer not to establish a set routine of treatment However, we shall attempt to describe the general principles which we follow

#### METHOD OF TREATMENT

*Sulfonamide Therapy*—As soon as the diagnosis of meningitis is established by the presence of cloudy spinal fluid, a blood culture and nasopharyngeal cultures are obtained and the patient is then given the sodium salt of one of the sulfonamides intravenously Children are given 0.025 to 0.050 Gm of the sodium salt per kilogram of body weight, freshly made up in a 5 per cent solution with distilled water At the same time the patient receives 0.1 to 0.2 Gm per kilogram of body weight of the sulfonamide by mouth or, if unconscious, by stomach tube From then on approximately 0.2 Gm per kilogram of body weight is given every twenty-four hours, divided into six or eight doses Adults usually receive 3 Gm intravenously and 2 to 4 Gm by mouth as an initial dose, and 1.5 Gm every four hours

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1 Hodes H. L. Gumbel H. S. and Burnett C. W. Treatment of Pneumococcal Meningitis with Sulapyridine and the Sodium Salt of Sulapyridine J. A. M. A. 113: 1614 (Oct. 28) 1939

2 Steele C. W. and Gottlieb Julius Treatment of Pneumococcal Meningitis with Sulfanilamide and Sulapyridine A Statistical Study of All Reported Cases in Which Chemotherapy Was Used With or Without Specific Antipneumococcus Serum Arch. Int. Med. 68: 211 (Aug.) 1941  
Rhoades P. S. Hoyne A. L. Levin Benjamin Horswell R. G. Reels W. H. and Fox W. W. Treatment of Pneumococcal Meningitis J. A. M. A. 115: 917 (Sept. 14) 1940  
Dowling H. F. Dauer C. C. Feldman H. A. and Hartman C. R. Pneumococcal Meningitis Study of 72 Cases New England J. Med. 226: 1015 (June) 1942  
Neal Applebaum and Jackson Dingle and Finland<sup>3</sup>

3 Goldstein H. Z. and Goldstein H. I. Review of Literature on Pneumococcus Meningitis Internat. Clin. 3: 1007 (Dec.) 1940

thereafter. During the early period of treatment the blood level of the sulfonamide is determined daily. In our first group of patients we attempted to maintain very high drug levels, but we find that our results are equally good with concentrations of 8 to 12 mg per hundred cubic centimeters and we rarely find it necessary to give the drug intravenously after the initial dose. The sulfonamide is usually continued for two weeks after the temperature has dropped to normal. It is not withdrawn unless the spinal fluid is sterile and has a normal sugar content and the patient appears well. Some of our patients showed definite clinical improvement within twenty-four hours of admission, but others who eventually recovered remained ill for as long as ten days.

Eleven of our 60 patients have shown some toxic effect of the sulfonamides. Of these 6 developed gross or microscopic hematuria. When this occurred early in the course of the disease the patient's fluid intake was increased and the hematuria cleared. When blood appeared in the urine at a time when the patient was clinically well, drug therapy was discontinued. Two of our patients developed "drug fever," 1 a drug rash and 2 showed leukopenia. All of the latter manifestations of sensitivity to the drug occurred during convalescence and not one was fatal.

**Serum Therapy**—In our first series of 17 cases previously reported<sup>1</sup> type specific antipneumococcus rabbit serum was not used. In our subsequent cases we have used serum for most of our patients under 2 years of age and for those older patients who seemed severely ill, especially when pneumonia was present. At first we gave the serum intravenously as soon as it could be obtained, usually within a very few hours after admission. We gave it in large amounts, with 80,000 to 100,000 units as an initial dose, so that several patients received 300,000 to 400,000 units in all and one as many as 750,000 units. If the patient did not respond rapidly to treatment he was given serum intrathecally. However, a number of the infants seemed to grow rapidly worse following these massive doses of serum. Accordingly we have modified our method of treatment as follows. On admission the spinal fluid is examined for pneumococci which if present, are immediately typed by the Neufeld-Sabin method. A culture of the spinal fluid is taken and its sugar content is esti-

**Lumbar Punctures**—A lumbar puncture is performed on admission for diagnostic purposes. It is repeated only if the patient fails to improve or if he develops a drug reaction and the condition of the spinal fluid must be checked before the sulfonamide is discontinued.

**Fluids**—These are given freely by mouth. We do not limit the fluid intake in order to maintain a higher drug level. In fact fluids are forced, especially when

TABLE 2—Results With and Without Serum Therapy

Under Over	With Serum			Without Serum		
	Died	Recover- ed	Total	Died	Recover- ed	Total
	12 4	6 7	18 11	13 6	1 11	14 18
Total	16	13	29	19	12	31

sultidiazine is employed since a reduction in the fluid intake seems to contribute to the hematuria which is frequently encountered with this drug.

**Sedation**—Many of our patients are restless or wildly delirious. We feel that the safest drug in these cases is paraldehyde, administered intramuscularly or by stomach tube. We do not use morphine or codeine since these drugs even in small doses seem to cause respiratory depression in the presence of purulent meningitis.

**Surgical Drainage of Foci of Infection**—Mastoidectomy or surgical drainage of infected sinuses was originally thought to be of the utmost importance.<sup>4</sup> We prefer to treat the patient conservatively, deferring operation until his general condition is greatly improved, i.e. usually for two or three weeks at least. We believe that this delay of surgical intervention has contributed to recovery in a number of our cases.

## RESULTS OF THERAPY

With the method of treatment outlined, 22 per cent of the patients under 2 years of age and 64 per cent of those over 2 recovered, that is, 42 per cent of our 60 patients recovered. All of these received sulfonamide therapy. Twenty-nine of the patients received serum in addition. It is noteworthy that only 1 child under the age of 2 recovered without serum, whereas 13 died. Almost all of these, however, were critically ill on admission and died within twenty-four hours. We do not feel justified therefore in concluding definitely that the patients treated with serum have a more favorable outlook than those who receive sulfonamide therapy alone.

## COMMENT

Pneumococci were cultured from the spinal fluid in all cases. The type isolated did not seem to alter the prognosis so far as we could determine from this relatively small group of cases.

In 1 case the pneumococcus obtained from the spinal fluid gave a positive Neufeld-Sabin reaction with both type VII and type XXIV rabbit serum. It is interesting to note in retrospect that although we treated the patient with both type specific serums, we were probably dealing with a single organism, namely type VII c Kauffman, Morch and Schmith<sup>5</sup> have shown that this organism and type XXIV share a common capsular antigen.

4 Neal Josephine B. Applebaum Emanuel and Jackson H. W. Sulfapyridine and Its Sodium Salt in the Treatment of Meningitis Due to the Pneumococcus and Hemophilus Influenzae. J. A. M. A. 115: 2055 (Dec. 14) 1940.  
5 Kauffman F. Morch E. and Schmith K. On Serology of Pneumococcus Group. J. Immunol. 39: 397 (Nov.) 1940.

TABLE 1—Distribution of Cases of Pneumococcic Meningitis

	Number of Cases	Recovered	Percentage Recovered
Sydenham first series (previously reported)	17	8	47
Sydenham second series	17	10	57
Harriet Lane Home	26	7	27
Total	60	25	42

mated. If the patient is under 2 years of age, has pneumonia or seems severely ill, type specific rabbit serum is usually given intravenously, about twelve hours after sulfonamide therapy has been instituted. It seems to us that serum administered in this way causes fewer severe reactions. From 20,000 to 40,000 units is given as the initial dose. Subsequently from 20,000 to 40,000 units of serum is administered each day until it can be demonstrated that the patient's serum diluted 1:5 with isotonic solution of sodium chloride produces definite capsular swelling of a culture of the patient's own pneumococci. We no longer give intrathecal serum.

Two of our patients are interesting in that they had previously recovered from meningitis caused by another organism. R. B., a 4 month old Negro baby, was treated in the Harriet Lane Home for meningitis due to *Hemophilus influenzae*. He received concentrated anti-influenza rabbit serum, also sulfapyridine and sulfadiazine, a bilateral mastoidectomy was performed and the patient made a complete recovery. Two months later he returned and was found to have meningitis due to

TABLE 3—Types of *Pneumococcus* Isolated from Spinal Fluid

Type	No of Cases	Died	Recovered	Type	No of Cases	Died	Recovered
1	3	1	2	14	4	2	2
2	2	2		16	2	2	
3	4	1	3	18	1		1
4	4	3	1	18a	1	1	
5	4	2	2	19	4	2	2
6	6	4	2	21	1	1	
7	1	1	1	22	2	1	1
7c	1		1	23	6	4	2
8	1	1		25	1	1	
9	2		2	27	1	1	
10	1	1		29	1	1	
11	1	1		31	1	1	
12	4	2	2	33	1	1	

the type VI pneumococcus. With type specific antiserum and sulfathiazole the patient again recovered completely and has remained well.<sup>6</sup> G. C., an 8 month old Negro baby, was admitted to the Harriet Lane Home with septicemia and meningitis due to a group I meningococcus. He recovered slowly, but at the end of the second week in the hospital his temperature rose and a spinal puncture revealed the presence of type XIX pneumococci. These were still present three days later. The patient recovered under sulfapyridine therapy.

Linell and Robinson<sup>7</sup> investigated 7 cases of pneumococcic meningitis which came to autopsy and emphasized that in such cases there is frequently evidence of previous trauma to the head. Injury in 3 of their cases had occurred as long as fourteen, five and two and a half years prior to the onset of meningitis. In only 1 of our cases could we elicit a history of previous head injury, and even here there was no evidence of skull fracture.

The blood culture from 33 of our 60 patients yielded a pneumococcus; of these, 13 (39 per cent) recovered. Of 24 patients the initial blood culture was sterile; of these, 10 (42 per cent) recovered. One patient who died was found to have hemolytic *Staphylococcus aureus* in the blood stream. In 2 cases no blood culture was taken. It seems that the presence or absence of organisms in the blood had little to do with the course of the disease.

It is well known that a primary focus of infection can frequently, though by no means always, be found in pneumococcic meningitis. In many of our patients otitis media of varying degrees of severity was present. One child was completely deaf on admission and had purulent otitis media for three days. Under sulfonamide therapy, without operative intervention, he recovered completely. A mastoidectomy was performed on 4 patients. Two patients showed purulent discharge from the sinuses, and it was necessary in 1 of these to drain the sinuses. Pneumonia preceded the onset of meningitis in 9 of the patients who died but only in 4 of those who survived.

All our patients have remained well since discharge and, with 1 exception, have no apparent sequelae. One infant, D. M., a 10 month old Negro boy, was treated with sulfathiazole and 500,000 units of antiscrum. His spinal fluid cultures remained positive for at least two months, and the baby was discharged from the hospital with symptoms of chronic meningitis, hydrocephalus and weakness of the right arm. At present he is 2 years old and appears to be of normal mental development. There is some residual weakness of the right hand but no indication of hydrocephalus.

Our series is too small to allow comparison of the relative efficacy of the different sulfonamides in pneumococcic meningitis. Suffice it to say that 19 of the 25 patients who recovered received sulfapyridine either alone or in combination with another sulfonamide. Three received both sulfadiazine and sulfathiazole, 1 received sulfadiazine and sulfapyridine, 1 received sulfadiazine alone and 1 sulfathiazole alone. It is our impression that all these drugs are probably equally effective in the treatment of this disease.

FACTORS INFLUENCING PROGNOSIS

*Age*—In reviewing our cases we have been struck by the difference in the recovery rate depending on the age of the patient. Only 22 per cent of our patients under 2 years of age recovered, in contrast to 64 per cent of those over the age of 2. One factor which contributes to the high mortality in infants is the delay in instituting treatment. The family does not recognize the serious nature of the illness in an infant as readily as in an adult, and the signs of meningitis may not be clear to the attending physician. Of our 32 patients under 2 years of age 10 died within twenty-four hours of admission. The high fatality rate among infants explains why only 27 per cent of the Harriet Lane Home patients recovered, whereas Sidsenham Hospital, where most of the patients with this disease are adults, had a recovery rate of 53 per cent.

*Presence of Other Disease*—Patients with congenital anomalies, chronic infections or some other acute infection in addition to meningitis have a poor outlook. Three of our patients who died had congenital syphilis, in 2 congenital malformations of the heart were discovered at autopsy, another was suffering from generalized peritonitis.

TABLE 4—Recoveries by Age

	Number of Cases	Recovered	Percentage Recovered
Under 2 years	32	7	22
Over 2 years	28	18	64
Total	60	25	42

*Presence of Pneumonia*—Patients who develop pneumococcic meningitis following pneumonia have, in general, a poor prognosis. This fact is noted by Dingle and Finland<sup>8</sup> and is also borne out by our experience.

CONCLUSION

In our experience the mortality rate in pneumococcic meningitis is not so high as some authors have suggested. The sulfonamides and serum administered in adequate but not massive doses bring about an encour-

6 Zepp H. D. and Hodes H. L. Proc. Soc. Exper. Biol. & Med., to be published.

7 Linell A. E. and Robinson W. L. Head Injuries and Meningitis. J. Neurol. & Psychiat. 4: 23 (Jan.) 1941.

8 Dingle J. H. and Finland M. J. Diagnosis, Treatment and Prevention of Meningococcus Meningitis with a Resume of the Practical Aspects of Treatment of Other Acute Bacterial Meningitides. War Med. 2: 1 (Jan.) 1942.

aging proportion of cures, except in the patients under 2 years of age. Moreover, however ill the patient may seem when first seen, one should not give up hope though it is true, by and large, that a patient admitted in coma has a grave prognosis. Several of our patients have recovered completely after appearing moribund on arrival.

## SUMMARY

1 Sixty patients with pneumococcal meningitis were treated with sulfonamides.

2 Of these 60, 25 (42 per cent) recovered. Thirty-two of the patients were under 2 years of age, of these 7 (22 per cent) recovered. Twenty-eight of the patients were over 2 years of age, of these 18 (64 per cent) recovered.

3 While our experience with sulphyridine has been greater, the results obtained with the newer sulfonamides have been satisfactory.

Harford Road at Herring Run

## THE RELATIVE VALUE OF PECTIN SOLUTION IN SHOCK

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Von Ziemssen in 1892, on the basis of clinical observations, was perhaps the first to note that in shock and hemorrhage "salt infusion was of benefit only for a short time as compared with blood transfusion." Blacklock<sup>1</sup> sums up the present day view based on both clinical and experimental observations: "There is no doubt but that the intravascular volume can be temporarily increased by the direct introduction of salt solutions into the vascular system. Prompt temporary response of most patients with depleted blood volume to such treatment is well known. It is equally well known that this favorable response is often disappointingly transient, and the blood stream again becomes dehydrated and the circulatory impairment progresses in spite of the continued introduction of fluid. The introduction of aqueous solutions dilutes the plasma colloids in the blood stream. Tissue edema develops while the blood stream remains dehydrated. If there is extensive capillary damage so that protein escapes with fluid, the continuous administration of fluid by vein washes out more protein and as a result may actually reduce rather than increase the volume of circulating blood. What has been said applies to all crystalloid solutions, according to Amberson,<sup>2</sup> "no matter how ingeniously contrived."

Since the crystalloid solutions do not restore and maintain blood volume or blood pressure they obviously are not to be used in the progressive oligemic anoxia of shock. By the same token, solutions for the treatment of shock must contain colloidal constituents whose physical properties are such that they will remain in the circulation for extended periods, maintaining blood volume and blood pressure.

Blood plasma and blood serum have become thoroughly established as replacement fluids in shock, even when accompanied by hemorrhage, and are increasingly available in both military and civilian practice, so that they must now be considered standards for the evaluation of other colloidal solutions used for this purpose. Their dependability in restoring and maintaining blood volume and blood pressure needs no further elaboration.

TABLE 1—Chemical Analysis of Pectin

	Per Cent
Moisture	5 to 10
Ash	0.5 to 1
pH of 1% aqueous solution	3 to 4
Galacturonic acid	70 to 80
Pentoses and pentosans	0 to 10
Methoxyl group	8 to 11.0

or discussion, but the physicochemical mechanism by which this is accomplished unfortunately still is controversial. This is unfortunate because if settled the criteria would be better for the selection of colloidal fluids which are not derived from the blood or body fluids of either man or animals.

The intravenous use of pectin solutions for the prevention and treatment of shock was proposed earlier, and this communication is submitted as an evaluation and progress report.

## SOURCE OF PECTIN

Braconnot in 1825 demonstrated the existence of pectin in fruits and vegetables. About the same time Fremy showed that pectin played an important role in the firmness of fruit during maturation. In citrus fruits pectin occurs largely in the white peel portion (albedo) just beneath the outer ring (flavedo). It is present with cellulose in a cold water insoluble form known as "propectin." Propectin is converted to pectin by slightly acid solutions. Hot acid solutions are used for extraction from fruit. After clarification and concentration pectin may be precipitated with alcohol, washed and dried. Only sound fruit is used for the production of pectin, as the enzymes from unsound fruit would greatly reduce the yield. Citric acid is produced from unsound fruit. Acid extraction and alcohol precipitation produce a pure protein free product—"pectinum" N F VII.

TABLE 2—Effect of Autoclaving at Fifteen Pounds (250 F) on Average Molecular Weight of Pectin Precipitated from 1 per Cent Solutions

Time of Autoclaving at 250 F. Hours	Pectin A		Pectin B
	Natural pH 3.3	Adjusted to pH 4.9	Natural pH 3.4
0	240,000	226,000	106,000
1/4	121,000	75,000	104,000
1/2	69,000	40,000	60,000
1	50,000	31,000	41,000
2	19,000	16,000	18,000

## DESCRIPTION AND PHYSICAL PROPERTIES (JOSEPH)

Pectin is a coarse or fine powder, almost odorless and with a mucilaginous taste. It dissolves in cold or hot water, forming viscous opalescent colloidal solutions up to 5 per cent concentration. Hydrolysis produces pectic acid or pectates.

## CHEMICAL CONSTITUTION

Pectin consists principally of partially methoxylated polygalacturonic acids and the formula, according to Schneider, is given in table 1.

From the Department of Laboratories and the Department of Surgery, Henry Ford Hospital.

Read before the Section on Pathology and Physiology at the Ninety-Third Annual Session of the American Medical Association, Atlantic City, N. J., June 11, 1942.

1 Blacklock, Alfred. Principles of Surgical Care, St. Louis, C. V. Mosby Company, 1940.  
2 Amberson, W. R. Blood Substitutes. Biol. Rev. 12: 48, 1937.

The pectin molecule is thought to be composed of chains of partially methoxylated galacturonic anhydride units. This molecule contains no protein or sulfur. The molecular weight is in the order of 150,000 to 300,000.

#### VISCOSITY AND MOLECULAR WEIGHT DEPENDING ON PREPARATION

In an earlier publication<sup>3</sup> it was noted that unheated solutions of pectin were not well tolerated by animals. The unheated material tended to accumulate in the liver. Hueper<sup>4</sup> has recently demonstrated that unheated pectin, like other macromolecular substances, is taken up by the reticuloendothelial system throughout the body. Heated or sterilized solutions, especially if the  $p_{\text{H}}$  was adjusted to 5 before sterilization, were found to be well tolerated in three different laboratory animals, and the

Ten Gm of dry pectin powder (pectinum) is dissolved in 1,000 cc of cold double distilled water with constant stirring. The resulting solution is turbid and is immediately filtered through coarse filter paper. Heating of the solution is then started in the Arnold sterilizer at temperatures of from 200 to 212 C. Heating is continuous for from fifteen to eighteen hours except for filtration through No. 50 filter paper three times, at intervals of four to five hours. At the end of the heating period and the four filtrations the solution is passed through bacteriologic Seitz filters with pressure into sterile bottles containing enough sodium chloride to make a 0.9 per cent concentration.

With this procedure the solutions obtained should be almost water clear and free of yellow color. The  $p_{\text{H}}$

TABLE 3—Experiments in Which Bleeding Was Followed by the Injection of 0.75 per Cent Solution of Pectin

Dog	Date	Body Weight Kg	Calculated Blood Volume Cc	Quantity of Blood Lost Cc	Percentage of Blood Volume	Pectin 0.75% Solution Cc	Result
1	10/5/41	10.9	87.0	500	57	600	Recovery
2	10/14/41	10.4	83.0	500	60	400	Recovery
3	10/14/41	10.0	80.0	600	75	600	Recovery
4	10/14/41	10.4	83.2	550	66	600	Died 4 weeks later Intussusception
5	10/24/41	21.6	179.8	1,000	60	1,000	Recovery
6	10/24/41	20.9	166.2	975	58	1,000	Died 4 days later ruptured artery

TABLE 4—Control Experiments in Which Blood Was Withdrawn and Saline Solution Was Injected After the Bleeding

Dog	Date	Body Weight, Kg	Calculated Blood Volume Cc	Quantity of Blood Lost Cc	Percentage of Blood Volume	Salt Solution Cc	Duration of Bleeding Minutes	Result
7	10/25/41	9.5	76.0	550	72	700	15	Died
8	10/25/41	9.5	76.0	400	53	500	15	Recovery
9	10/25/41	9.5	76.0	450	60	1,000	15	Died
10	10/25/41	9.5	76.0	450	60	1,000	15	Died
11	10/25/41	9.5	76.0	500	66	1,000	15	Recovery

TABLE 5—Experiments in Which Red Blood Cells in Saline Solution Were Injected During the Bleeding and 0.75 per Cent Pectin After the Bleeding

Dog	Date 1941	Body Weight Kg	Calculated Blood Volume Cc	Quantity of Blood Lost Cc	Percentage of Blood Volume	Pectin 0.75% Solution Cc	Salt Solution Cc	Red Blood Cell Suspension Cc	Plasma Protein after Bleeding Gm	Result
12	10/28	15.0	1,200	1,300	100+	700	800	700	2.3	Recovery
13	10/29	15.0	1,200	2,300	190+	500	100	1,000	0.18	Recovery
14	10/30	16.2	1,296	1,650	100+	00	1,300	700	1.57	Died 4 days later distemper
15	11/1	16.0	1,280	1,650	100+	100	1,000	700	0.64	Died hemorrhage

accumulation in the liver and other tissues proved slight and of short duration. This empiric finding has been adhered to in producing all subsequent solutions. The explanation lies in the partial hydrolysis with reduction in the viscosity and molecular weight, as illustrated by Joseph and Bryant in table 2.

It is noted in table 2 that autoclaving pectin A when the  $p_{\text{H}}$  was adjusted to 4.9 for fifteen minutes at 15 pounds reduced the molecular weight to 75,000 or to within the range of blood plasma.

#### METHOD OF PREPARATION

The usefulness of the pectin solution depends for the most part on the method of preparation and sterilization, hence the label should indicate the physical characteristics of the solution and also by what procedures these were obtained.

<sup>3</sup> Hartman F. W., Schelling, Victor, Harkins H. N. and Brush Brock. Pectin Solution as a Blood Substitute, *Ann. Surg.* **114**: 212 (Aug.) 1941.

<sup>4</sup> Hueper W. C. Macromolecular Substances as Pathogenic Agents. *Arch. Path.* **33**: 267 (Feb.) 1942.

is about 3.5 and a buffer must be added before use. The buffer preferred is prepared by dissolving 285 Gm of sodium biphosphate ( $\text{NaH}_2\text{PO}_4 \cdot \text{H}_2\text{O}$ ) in 1,000 cc of water and adjusting to  $p_{\text{H}}$  7 with 10 per cent sodium hydroxide solution.

Before salting and buffering, a pectin solution prepared as described should have a viscosity at 38 C of 3, osmotic pressure 55 mm of mercury and molecular weight of 60,000 to 75,000.

Pectin solutions of 0.75 per cent, 1.5 per cent, and so on may be prepared in the same manner. Obviously the physical properties will be different from those of the 1 per cent solution described. For example, the 0.75 per cent solution prepared in a similar manner will have a viscosity at 38 C of 2 and an osmotic pressure of 45 mm of mercury, while the 1.5 per cent solution with the same preparation will have a viscosity of 4 at a temperature of 38 C and an osmotic pressure of 70 mm of mercury.



Pectin solutions of the various concentrations prepared according to the method described have more recently been reprecipitated with alcohol and desiccated to form a fine light powder which may be readily redissolved in sterile water, isotonic solution of sodium chloride or dextrose to make salted buffered solutions ready for immediate intravenous use. A report on the use of this latest solution will be given in a subsequent communication.

#### PHYSICAL EFFECT OF PECTIN ON THE BLOOD

In vitro pectin increases the sedimentation of the red cells in citrated blood and greater acceleration is seen in saline suspensions of red blood cells. The tendency to rapid sedimentation is reduced when the sterilized buffered solutions described are used. When pectin is given intravenously the sedimentation rate of blood removed is also increased. The rapid sedimentation does not apparently occur in the circulation, as no untoward symptoms were noted by patients and no evidence of this was found in animals coming to autopsy.

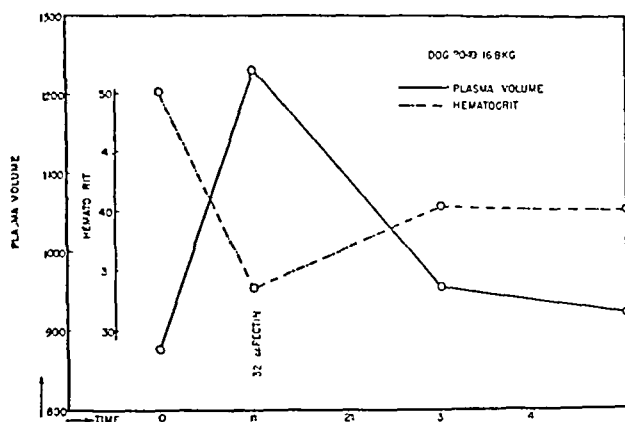


Chart 1—Plasma volume (Evans blue method) and hematocrit readings after intravenous injection of sterile 0.75 per cent pectin solution.

Coagulation time of the blood remained at normal levels and intravenous clotting has never been observed following the use of the solution described. Bleeding time was shortened corresponding to some degree to the numerous reports from 1925 to the present on the use of pectin as a hemostatic agent with local, oral, intramuscular and intravenous administration.<sup>5</sup>

#### INTRAVENOUS USE IN ANIMALS

The autoclaved 0.75 per cent solutions of pectin are well tolerated by the larger experimental animals in amounts of 40 to 60 cc per kilogram, provided it is given at rates of from 3 to 5 cc a minute. Very large doses and rapid administration result in vomiting and diarrhea.

These untoward symptoms may readily be explained on the basis of the large increases in blood volume demonstrated by the Evans blue dye method (chart 1). Apparently the material is retained in the circulation for three to four hours and may in addition draw some fluid from the tissues, hence with 40 cc per kilogram the

blood volume would be increased 50 per cent and with 60 cc per kilogram it would be increased 75 per cent. This is in contrast to electrolyte solutions, which leave the circulation almost as rapidly as they are injected if administered at 3 to 5 cc a minute. Another factor that contraindicates too large and too rapid infusion

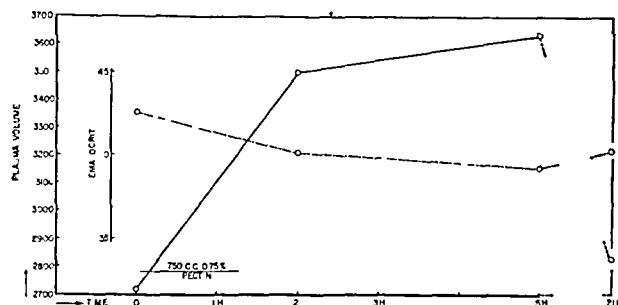


Chart 2 (patient J.P.)—Plasma volume (Evans blue method) and hematocrit readings after the intravenous injection of sterile 0.75 per cent pectin solution. Solid line plasma volume broken line hematocrit. Smyth and Jacobson.

is the viscosity of 4, which is about the same as whole blood.

In experimental shock produced by hemorrhage in which 52 to 75 per cent of the blood volume was removed and replaced with pectin there was 100 per cent recovery (table 3). In contrast when 52 to 75 per cent of the animal's blood was removed and replaced with isotonic solution of sodium chloride, 3 out of 5 animals died (table 4). Kymographic records show that the blood pressure is readily restored and maintained by employing pectin solutions as replacement fluids.

Bile peritonitis employed by Harkins for the production of experimental shock invariably results in extreme hemoconcentration and death because of the large amount of exudation into the peritoneal cavity. However, pectin has proved quite effective in combating both the hemoconcentration and the fall in pulse and blood pressure. It appears to be as effective in prolonging life as any other measure, including blood and plasma transfusion.

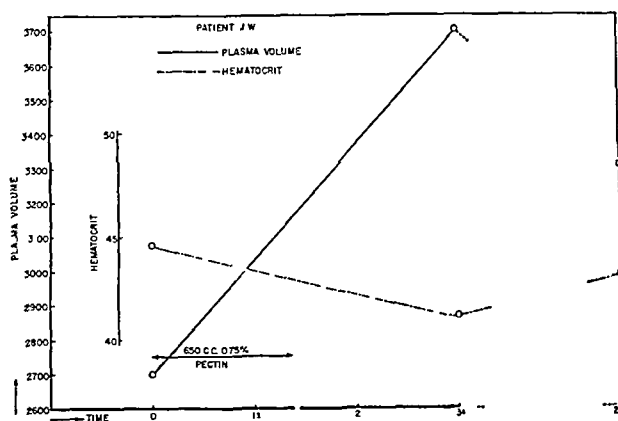


Chart 3 (patient J.W.)—Plasma volume (Evans blue method) and hematocrit readings after intravenous injection of sterile 0.75 per cent pectin solution. Smyth and Jacobson.

Experimentally produced traumatic shock, such as bile peritonitis, is so measured as to be a lethal procedure, but here too pectin solutions are as effective in prolonging life as other measures.

Plasmapheresis is a difficult procedure, always accompanied by a high mortality when the plasma proteins

5. Violle H. and de Saint Rat, L. Pectin and Its Hemostatic Effects. Bull Acad de med Paris 92 1097 1924. Ziegelmayer W. The Chemical Physical Basis of the Pectin Phenomenon of the Blood. Kolloid Ztschr 71 214 1935. Dietrich S. and Oettel H. Treatment of Hemorrhagic Diseases with Pectin. Deutsche med Wchnschr 65 1690 (Nov 5) 1937. Ragni Guglielmo. Blood Coagulation I. Comparative Effects of Various Substances Which Accelerate Blood Coagulation. Boll d Soc ital di biol sper 13 23 (Jan) 1938.

are reduced below 1 per cent, but it has been readily accomplished by Whipple<sup>6</sup> using saline solution with washed red cells, by Amberson<sup>2</sup> using gum-saline and washed red cells, as well as by many others. With pectin solutions there has been about 50 per cent mortality in our series, and 0.64 Gm per hundred cubic

Jacobson and Smyth,<sup>7</sup> who used the Evans blue dye method. These authors show not only that the pectin solution infused is retained in the circulation for from four to five hours but that an additional amount equivalent to 7 to 10 per cent of the original plasma volume may be drawn in from the tissues. After twenty-four hours 3 of 7 individuals still showed plasma volumes above the original of 13 per cent, 21 per cent and 27 per cent (charts 2 and 3). In contrast, saline infusions showed rapid loss of the saline from the circulation with plasma volume levels reaching near normal. This occurred despite the fact that the amounts of saline infused averaged 40 per cent higher than the amounts of pectin solution (chart 4).

Clinically more than 125 surgical patients have received pectin solutions. The distribution of these is represented in table 6. The need for infusion is suggested by the type of cases and the length of the

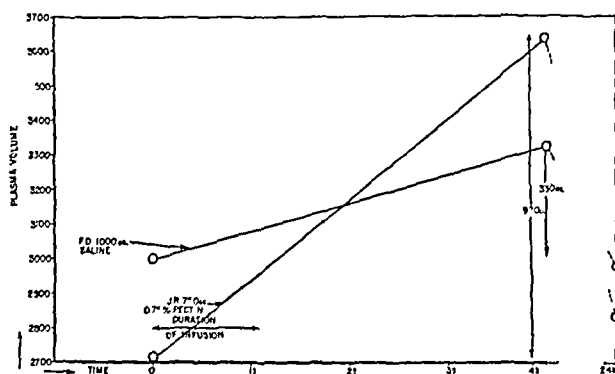


Chart 4—Comparison of plasma volume changes following injection of pectin and saline solutions

TABLE 6—Summary of One Hundred Clinical Cases

Type of Case	
Gastrectomy—Total	2
Partial	2
Colon resection	0
Radical mastectomy	11
Traumatic shock	6
Neuro-vascular procedures	4
Myocardial infarction	0

TABLE 7—Summary of One Hundred Clinical Cases

Length of Operation	
1 to 1½ hours	140
1½ to 2 hours	243
2 to 2½ hours	0
2½ to 3 hours	11
3+ hours	50
600 to 1000 cc. of pectin solution used	

TABLE 8—Evaluation of Results in One Hundred Clinical Cases

Good	65
Fair	27
Poor	8
No reactions or complications	

operative procedures (table 7). The response is shown in chart 5 and table 8. In some of the cases blood or plasma was given either before or after the pectin, and no signs of incompatibility were observed. The results indicated as good refer to a satisfactory response in blood pressure and general condition. A fair result indicates stabilization of blood pressure or a moderate increase, while the poor results obtained in 5 per cent indicate no increase or slight decrease in blood pressure, so that other measures were made necessary.

Very few patients in postoperative shock were seen, but those treated showed satisfactory improvement (chart 6).

Traumatic shock is unusual in our institution but the results in the limited number of patients treated with pectin are encouraging.

#### SUMMARY AND CONCLUSIONS

1. Pectin furnishes a readily available source for colloidal solutions which may be prepared economically.

7. Jacobson S. D. and Smyth C. J. Plasma Volume Changes Following the Intravenous Injection of Pectin and Physiological Saline in Man. *Proc. Soc. Exper. Biol. & Med.* 50: 218 (June) 1942.

centimeters was the lowest plasma protein level obtained (dog 15). Even this animal died on the third day from hemorrhage in its wound.

#### INTRAVENOUS USE IN MAN

The 0.75 per cent pectin solution has been used exclusively in the prevention and treatment of shock, traumatic or surgical. In other words, it has been used strictly as a replacement fluid when blood or plasma transfusions would otherwise have been indicated.

For patients the size and speed of the infusions must be given careful consideration, and experience has shown that 5 to 10 cc a minute can be maintained in the average patient without subjective symptoms. As with cold bank blood pectin solution may be given faster if the situation demands it, 1,600 cc is the largest amount given continuously.

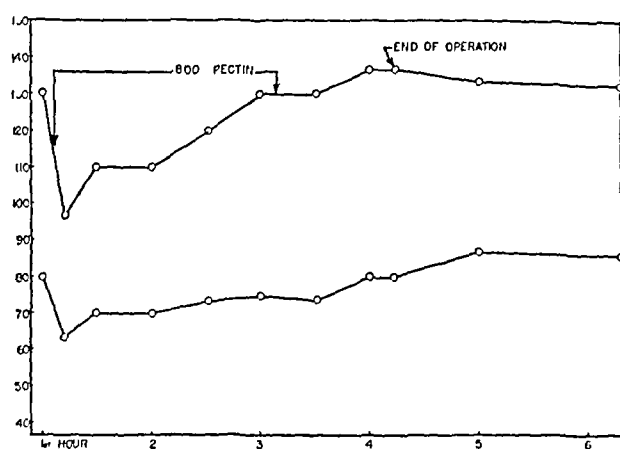


Chart 5 (patient B. B., aged 32)—Diagnosis marginal jejunal ulcer, operation, release gastroenterostomy, partial gastrectomy, postoperative course uneventful

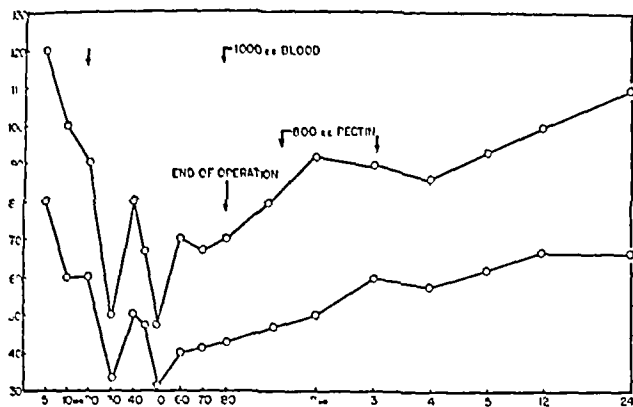
If given slowly to normal individuals, the blood pressure, both systolic and diastolic, tends to increase. Plasma volumes in normal individuals are reported by

6. Whipple G. H., Smith H. P., and Belt A. E. Shock as a Manifestation of Tissue Injury Following Rapid Plasma Protein Depletion. The Stabilizing Value of Plasma Proteins, *Am. J. Physiol.* 52: 72 (May) 1920.

2 The pectin molecule contains no protein and the solutions give few if any reactions if the method of preparation is correct

3 Solutions prepared by multiple filtration and heating for fifteen to eighteen hours are preferred

4 Good solutions should be water clear. They should have a viscosity of from 2 to 4 at 38°C and osmotic

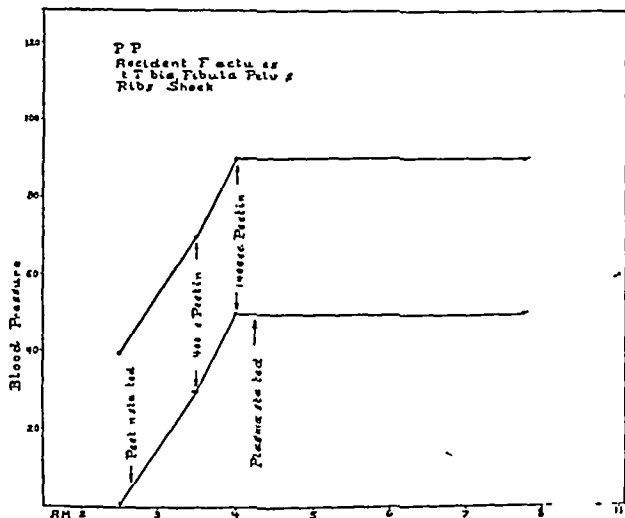


pressure from 45 to 70 mm of mercury, depending on the percentage of pectin 0.75 to 1.5. The molecular weight may vary from 60,000 to 75,000.

5 In animals the solutions as described are well tolerated and are more efficient in replacing blood loss than electrolyte solutions.

6 In human patients intravenous injection tends to increase both the systolic and diastolic blood pressure.

7 Blood volume is increased and well maintained by pectin solutions administered intravenously.



8 These solutions have been used in 125 clinical cases as a substitute for electrolyte solutions, blood and blood plasma in the prevention and treatment of shock with satisfactory results.

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## ABSTRACT OF DISCUSSION

DR VIRGIL H. MOON, Philadelphia: I have been following with interest the work of Dr. Hartman and his associates on pectin as a possible blood substitute in the treatment of shock. It has been stated by eminent physiologists that the usefulness of a fluid in the treatment of shock depends more on its physical than on its biologic properties. Therefore if one could find a fluid which has a viscosity approaching that of the blood plasma, a molecular weight not too far from that of plasma and particularly a colloidal osmotic pressure which is somewhere near that of the blood plasma and if that substance is not antigenic and produces no obvious effects, it would be an ideal substance for use as a blood substitute. It appears that pectin as prepared and used by the authors conforms to those specifications very closely. The fact that they have used it not only in experimental animals but in human beings in numerous instances with satisfactory results indicates that it may be a useful substitute for plasma or serum when the latter substances are not obtainable. Obviously, if plasma or serum is at hand, I think that even the authors would prefer to use it, because it replenishes the plasma proteins with the same type of protein which was lost. This property, of course, is lacking in a vegetable product such as pectin. Few of those who have written concerning shock realize that one major item in its dynamics is a disturbance of fluid balance. This results from injury or damage to the endothelial membrane. Many forces are concerned with the passage of fluid from the blood to the tissues and vice versa, but the operation of those forces is absolutely conditioned on the presence of a normal semipermeable endothelium between those two areas. Anything that damages endothelium renders it more permeable and interferes seriously with osmosis, which is a major factor governing the movement of fluid between the blood and the tissues. In shock there is a sharp disturbance of fluid balance, and an abnormal shift of fluid from the blood to the tissues occurs. In some of the cases reported by the authors there was a sustained increase in the blood volume. This indicated that fluid balance had been reestablished, at least in part. If this occurs regularly or frequently it would indicate that pectin solution may be useful in more than one way. Not only does it restore the fluid loss but it may tend also to restore fluid balance.

DR HARRY J. CORPER, Denver: Some years ago we worked in our laboratories with pectin and were able to obtain a dry pectin preparation on the market, but it proved unsatisfactory. Dr. Hartman did not mention the type of pectin referred to or whether dry pectin would prove suitable for preparing desirable solutions.

DR F. W. HARTMAN, Detroit: We have repeated the blood volume studies using Evans blue dye in dogs and have found evidence of definite differences in the reaction of the dog when Evans blue dye is used or when pectin is used in the presence of the Evans blue dye. We do not know why that is, however, it does seem that there is the possibility of a combination between this azo dye and the colloid of pectin. I think we had better sound a warning against the combination of pectin with a lot of other things, particularly with dyes and metals which may form a combination. We have used this material in 135 clinical cases alone and we have never seen any such manifestations and we have never seen any untoward reactions. I have been asked many times whether one could give this or that with pectin, and my answer has been that I do not know, but the three instances, that is, the combination with the azo, the combination with bismuth and the combination with arsenic, would indicate that if it is to be used it should be used alone and not in combination with these other substances. We are using the purest material which is recognized by the National Formulary and which is known technically by the name of pectin. The specifications are very carefully worked out. In Dr. Moon's comments, I think his interpretation of the presentation was entirely correct. In none of these patients was there volume loss at the end of four hours. In fact, the average was 23 per cent above the beginning dose, the amount administered initially. If we should find that this material is somewhat more effective in supporting the blood volume and the blood pressure

than biologic products such as plasma or blood, I do not believe we would hesitate to use this in preference, because there is no incompatibility between this material and the blood or the plasma. In other words, one could give blood before or after administration without any evidence of reaction or incompatibility. In our institution we are using pectin routinely in all major surgical cases, the same way as we previously used blood or plasma during the operative period. As to the food value, this material is exerted as such, so there is no food value in it but we have found that a biologic product, that is, a solution of amino acids, can be combined with this material safely and that the combination is well tolerated and that in animals, at least, it does rapidly build up the plasma protein, so that such a combination may be considered and, if proved satisfactory in human use, it may do practically everything that blood plasma will do.

## Clinical Notes, Suggestions and New Instruments

### A CASE OF CORONARY OCCLUSION FOLLOWED BY PREGNANCY WITH SUCCESSFUL TERMINATION

OSWALD HORWITZ, MD LOUIS B. LALPHE, MD, NORMA P. SHAWWAY, MD AND WILLIAM D. STROUD, MD  
PHILADELPHIA

It has been thought and expounded in recent years not only that coronary occlusion occurs in younger people<sup>1</sup> but also that the prognosis which at one time was regarded as invariably extremely grave by Heberden and his followers, may now be considered somewhat better. Cases have been reported recently of coronary disease occurring in younger people such as the

apparently in complete recovery, the patient now leading a more or less unrestricted life.

Master, Dick and Jaffe<sup>2</sup> report that 202 patients who had acute coronary disease proved by electrocardiographic evidence all recovered one third being able to live a life with either slight restrictions or none at all. Jentel<sup>3</sup> also reports that patients who had their acute attacks as far back as 1925 have led useful lives with more or less unrestricted activity. However in these reports we have been unable to find an instance in which such a patient was able to go through a normal pregnancy. It is for this reason that we are reporting this case.



Fig. 2—Appearance of chest about Aug 10, 1942.

#### REPORT OF CASE

M. B., a white woman aged 35 entered the office of one of us (N. P. S.) in September 1940 complaining of pain in both ankles and swelling of the left leg. She stated that she had been suffering from sinusitis since 1937 and had had slight dyspnea on exertion. She had never been pregnant. In 1938 she had her appendix and right salivary removed. The operation was complicated by phlebitis of the left leg.

The patient was thin, nervous and moderately well nourished but of rather poor musculature. The hands and feet were quite cold with mottling of the skin. There was slight tenderness over both axillary sinuses. The tonsils had been removed. The heart was not enlarged and the sounds were normal. There was a soft apical systolic murmur which was thought to be of no pathologic significance. The blood pressure was 130 mm of mercury systolic, 78 diastolic. There was slight edema of the left leg but no evidence of arthritis. The impression at that time was that the patient was probably suffering from vasomotor instability and psychasthenia.

On Dec. 29, 1940 the patient was seen at 11 p. m. during an attack of severe substernal pain which required morphine for relief. The pain continued for about thirty six hours and then moderated in intensity. An electrocardiogram was taken two days later and is seen in figure 1. She was kept in bed for approximately two months and then allowed progressive increased activity, which was finally almost unrestricted. Serial electrocardiograms were taken which suggested healing of the myocardial infarction.

On Sept. 6, 1941 she was seen by Dr. Louis Lalphee, who found no convincing evidence of heart disease and assured the patient that her heart was then organically sound.

In December 1941 she consulted Dr. Robert A. Kimbrough who found that she was two months pregnant. It was decided at this time that she should go through with the pregnancy, and it was felt that the outcome would be satisfactory. Orthodiagrams and electrocardiograms taken during her pregnancy were well within normal limits and were featured only by some degree of left axis deviation. On July 25, 1942 she was delivered by cesarean section of a healthy 6½ pound (3,060 Gm.) boy by Dr. Kimbrough, two weeks after which another electrocardiogram and a teleroentgenogram were taken. The latter was completely negative as may be seen in figure 2 and the electrocardiogram showed slight left axis deviation but was otherwise entirely within normal limits.

In some ways this case is similar to the case report by Barnes and Burchell<sup>4</sup> of acute pericarditis which simulates coronary disease from the point of view both of symptoms

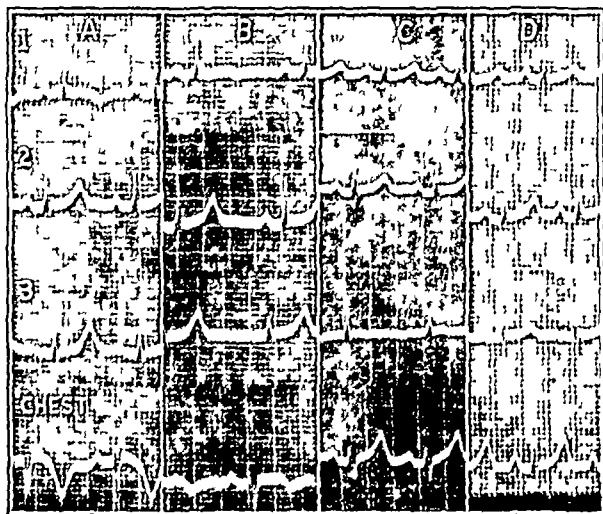


Fig. 1—A tracings taken Dec 31, 1940. Rhythm normal. Rate 86. P-R interval 0.17 second. No axis deviation.  $I_1$  inverted. Chest lead  $F$  wave deeply inverted. ST segment elevated slightly. QRS notched. In view of the history this was considered typical of a recent anterior myocardial infarction. B tracings of Jan 15, 1941. Rhythm normal. Rate 75. P-R interval 0.17 second. No axis deviation.  $I_1$  diphasic. Chest lead  $T$  wave diphasic. It was believed that there was considerable improvement since tracings of Dec 31, 1940. C tracings of Sept 5, 1941. Rhythm normal. Rate 88. P-R interval 0.18 second. Slight left axis deviation.  $I_1$  low amplitude. Chest lead normal. This shows remarkable improvement of the record of Dec 31, 1940. D tracings of Aug 5, 1942. Aside from the tachycardia of 108 and the mild degree of left axis deviation these tracings are within the limits of normal.

case reported by Ravdin and Wood,<sup>5</sup> in which the coronary thrombosis was complicated by an embolus to the bifurcation of the aorta and which necessitated an embolectomy and resulted

1 Ferguson A. S., and Lockwood J. R. New York State J. Med. 70: 1618-1621 (Aug. 15) 1939. Goodson, W. H. Jr. and Williams, I. A. Coronary Thrombosis Among Persons Less Than Forty. Minnesota Med. 22: 291-293 (May) 1939.

2 Ravdin I. S. and Wood F. C. Ann. Surg. 111: 834-839 (Nov.) 1941.

3 Master A. M., Dick Simon and Jaffe H. J. New York State J. Med. 12: 413-420 (March 1) 1942. Cardiac Efficiency and Prognosis Following Recovery from Acute Coronary Occlusion. J. A. M. A. 120: 1271-1278 (Dec. 19) 1942.

4 Jentel Drew. Illinois M. J. 81: 52-56 (Jan.) 1942.

5 Barnes A. R., and Burchell H. B. Am. Heart J. 23: 247-264 (Feb.) 1942.

and of the electrocardiogram. However, the changes in the chest lead of the tracings taken on Dec. 31, 1940 would tend to make the diagnosis of pericarditis unlikely.

## SUMMARY

A 35 year old white woman was delivered of a normal child by cesarean section twenty months after having what was apparently an acute anterior myocardial infarction.

1011 Clinton Street

## SCIATIC NERVE INJURY DUE TO THE INTRA-MUSCULAR INJECTION OF PARALDEHYDE

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Assistant in Neurology, Harvard Medical School and Resident in Neurology, Boston City Hospital

Direct injury to peripheral nerve trunks by deep intramuscular injection of drugs has been reported by many observers. Oppenheim<sup>1</sup> in his Textbook of Nervous Diseases states that paralysis of the sciatic has been produced by the subcutaneous injections of ether, sublimate and antipyrine, and by the alcohol injections which were once used in the treatment of sciatica. Biggam<sup>2</sup> and Seshachalam<sup>3</sup> have found nerve damage due to quinine injection, and Gammel<sup>4</sup> reported a case of peroneal nerve palsy after bismuth injection in the treatment of syphilis. Recently Elkington<sup>5</sup> reported 2 cases of sciatic and one of radial nerve paralysis developing within a few days after deep injection of sodium sulfapyridine.

To my knowledge there has not been any reported case of injury to the sciatic nerve by paraldehyde. It is my purpose in this report to record 3 cases occurring within a brief period of time in which damage to this nerve followed the intragluteal injection of paraldehyde.

Cervello is reported by Goodman and Gilman<sup>6</sup> to have first used paraldehyde in 1882. It soon became recognized as a drug of low toxicity permitting a wide range of safety. The intravenous route of administration was initiated in 1912 by Noel and Souttar.<sup>7</sup> In 1934 Johnson<sup>8</sup> reported 20 cases in which the intramuscular route was used with impunity. During recent years the latter method has been widely adopted, although occasional tissue necrosis may develop.

## REPORT OF CASES

The following 3 cases were referred to the Neurological Service of the Boston City Hospital on account of symptoms referable to the sciatic nerve.

CASE 1—M. T., a man aged 34, a factory inspector, had an acute illness characterized by sore throat, headache, chills, malaise, vomiting, delirium and, finally, coma. On examination the patient was comatose. The neck was rigid, Kernig and Brudzinski signs were present. The deep tendon reflexes were hyperactive and the plantar responses were of the extensor type. There was a maculopapular rash over the trunk and extremities, and a few moist rales were heard in the right lung base.

There was a leukocytosis of 22,100 cells, with 88 per cent polymorphonuclear leukocytes. Urinalysis was normal except for the presence of occasional pus cells. The spinal fluid was turbid, was under a pressure of 340 mm of water, and contained 30,000 leukocytes (100 per cent polymorphonuclear) and

gram-negative diplococci. Chemical examination revealed protein 366 mg, sugar 7 mg and chloride 629 mg. The blood and spinal fluid Hinton reactions were negative.

A diagnosis of meningococcic meningitis was made and treatment with sulfathiazole and sulfadiazine, orally, was instituted. A total of 5 Gm of sulfathiazole and 90 Gm of sulfadiazine was received by the patient during the ensuing fourteen days. After four days the patient became conscious but was excited and behaved in an irrational manner. During the next few days several injections of paraldehyde were administered intragluteally, practically all into the right buttock. On the eighth day after commencement of treatment the patient was allowed up in a chair and at that time he complained of weakness of the right leg and intense pain in the posterior aspect of the right thigh.

He was referred to the Neurological Service on the fifteenth day. On examination at that time there was considerable weakness and atrophy of the right thigh and leg. All movements of the thigh, leg and foot were weak, although no single movement was completely lost. A partial foot drop was present. The right achilles reflex was diminished. The patellar reflexes were equal and the plantar responses were flexor. Straight leg raising and pressure along the course of the right sciatic nerve produced severe pain. Sensation of numbness was felt along the lateral surface of the foot and little toe. Appreciation of touch, pain and temperature was decreased on the posterior aspect of the calf and ankle. A small oval area of anesthesia and analgesia was found on the upper part of the calf and another such area on the buttock. The posterior surface of the thigh was decidedly hyperesthetic and hyperalgesic, the highest touch causing intense pain. Position and vibratory sensations were not affected.

The spinal fluid which was examined on the nineteenth day was under a pressure of 90 mm of water and contained 11 cells and 20 mg of protein.

Treatment of the affected limb with rest, diathermy and the heat cradle was instituted. The hyperesthetic area slowly decreased in size but did not entirely disappear. The right achilles reflex was eventually lost. The patient became more comfortable but on the day of discharge, forty-eight days after symptoms referable to the leg developed, there remained pronounced wasting and weakness of the leg and only slight return of sensation.

CASE 2—F. J., a man aged 42, a mail carrier, developed hematemesis following prolonged ingestion of alcohol. On admission to the hospital the patient was intoxicated, with apprehensive facies and gross tremors of the extremities. There was a patch of old choroiditis in the right optic fundus. The tongue was smooth and red and the teeth were carious. The heart and lungs were normal and slight tenderness was present in the epigastrium. Blood and urine studies were normal and the blood Hinton reaction was negative.

Owing to his extreme restlessness the patient was given paraldehyde rectally. When this proved ineffectual, he was given 20 cc of the drug into the lower half of the left buttock. Immediately a sharp pain shot down the posterolateral aspect of the left leg to the dorsum of the foot. Within two minutes the dorsum of the foot became blue and swollen and numbness enveloped the thigh and leg. Sleep occurred shortly afterward.

On the following morning the patient was referred to the Neurological Service. At that time he complained of throbbing in the great toe and numbness from the mid thigh to the foot. The left foot was discolored, edematous and tender on the dorsal surface. The site of needle puncture was evident in the lower half of the left buttock near the midline. All movements of the left foot were impaired, and foot drop was nearly complete. Movements at the hip and knee were not weakened. The patellar reflexes were equal, but the left achilles reflex was absent. The plantar responses were flexor. On palpation the left foot felt warmer than the right and the left calf was tender to compression and the muscles were lacking in tone. Pain, temperature and tactile appreciation were lost in a well defined area covering most of the dorsum of the foot and the posterolateral surface of the leg. The border of this area and part of the dorsum of the foot were hyperalgesic. A

From the Department of Neurology, Harvard Medical School and the Neurological Unit, Boston City Hospital.

1 Oppenheim, Hermann. Textbook of Nervous Diseases for Physicians and Students, authorized translation by Alexander Bruce, ed. 5, Edinburgh: Otto Schulze & Co., 1911, vol. 1, p. 462.

2 Biggam, A. G. Damage to the Sciatic Nerve from Intramuscular Administration of Quinine. *Brit. M. J.* 1: 1171 (June 28) 1930.

3 Seshachalam, T. Musculospiral Nerve Paralysis Following Intramuscular Injection of Quinine, *Indian M. Gaz.* 64: 86 (Feb.) 1929.

4 Gammel, J. A. Local Accidents Following Intramuscular Administration of Salts of Heavy Metals. Report of Two Cases of Embolia Cutis Medicamentosa. *Arch. Dermat. & Syph.* 18: 210 (Aug.) 1928.

5 Elkington, J. St. C. Peripheral Nerve Palsies Following Intramuscular Injections of Sulfonamides. *Lancet* 2: 425 (Oct. 10) 1942.

6 Goodman, Louis and Gilman, Alfred. The Pharmacological Basis of Therapeutics. New York: Macmillan Company, 1941, p. 178.

7 Noel, H. L. C. and Souttar, H. S. The Intravenous Injection of Paraldehyde. *Lancet* 2: 818 1912.

8 Johnson, A. S. The Parenteral Use of Paraldehyde for Control of Pain and Convulsive States. *New England J. Med.* 210: 1065 (May 17) 1934.

less definite area of hyperalgesia extended up over the popliteal space and posterior surface of the thigh. Position sense was lost in the left foot, and vibration sense was diminished below the knee. Stimulation with the faradic current produced no response in the extensors of the foot and a weak response in the extensors of the toes. A sweat test brought no response on the dorsum of the foot. Permission to examine the cerebrospinal fluid was refused.

During his stay in the hospital the patient complained of sharp stabbing pains in the calf, foot and toes, often without stimulus. The swelling of the foot eventually subsided. Treatment of the involved extremity consisted of physical therapy and the application of a foot brace. On discharge from the hospital on the thirty-first day, the patient was more comfortable but there was little or no improvement in muscular strength or in the sensory defect.

CASE 3—P. P., a man aged 42, a seaman, was treated for intoxication resulting from excessive alcohol ingestion of three weeks' duration. On examination, in addition to the signs of intoxication there were gross tremors of the tongue and extremities and a chronic purulent otitis media on the left side. The heart, lungs and abdomen were normal. Reflexes were normally active. Laboratory studies of the blood and urine were normal.

On account of restlessness the patient was given 12 cc of paraldehyde into the upper outer quadrant of the right buttock. No immediate symptoms were experienced. On the following morning he complained of numbness of the entire right leg from the buttock and groin to the sole of the foot, the sensation being most pronounced along the posterior aspect. No pain was felt in the leg. The patient stated that the foot and ankle were weak.

When he was referred to the Neurological Service on the third day there was weakness of all movements of the right foot, especially dorsiflexion, and slight weakness in flexion of the leg at the knee. The right achilles reflex was absent. Patellar reflexes were equal and the plantar responses were flexor. A large oval area of anesthesia and analgesia was found over the posterior aspect of the right thigh and lower part of the buttock. A similar area of sensory loss, less sharply defined, was present over the heel, toes and medial surface of the foot. Position and vibratory sensations were preserved. The point of the needle entry was not visible. The spinal fluid was entirely normal.

The patient left the hospital on the fifth day. He declared that the sensation and strength were improved in the affected limb, but no change was evident on objective examination.

#### COMMENT

In case 2 the immediate development of symptoms suggests that the drug was injected directly into the nerve sheath. It was apparent that the injection was made too near the gluteal fold and that an unusually large quantity of paraldehyde was introduced. In case 1 it was impossible to determine whether one or several injections led to the nerve palsy, since multiple injections were given, all into the same general region. In the third case 12 cc of the drug was supposedly given into the upper outer quadrant of the buttock, the accepted site for intramuscular injections. It is assumed that the course of the needle was misdirected after the skin was pierced or that the paraldehyde was later displaced toward the sciatic nerve.

In 2 of the cases pain and weakness were the outstanding symptoms and in 1 numbness and weakness occurred. In all 3 cases there was little evidence of recovery after varying periods of time.

The question may naturally arise as to whether the symptoms should be attributed to some other factor than paraldehyde. In case 1 the possibility that the nerve injury was a complication of meningitis or due to the toxic influence of the sulfonamide drugs has to be considered. In the other 2 cases hospitalization was due to chronic alcoholism, a condition often associated with peripheral nerve involvement. However, the isolated nature of the paralysis and its development in each case within a brief interval after injection of paraldehyde into the region of the sciatic nerve trunk indicate a direct causal relationship.

#### SUMMARY AND CONCLUSIONS

Injury to peripheral nerves has followed the intramuscular injection of various substances into or near the nerve trunks. Among the irritants previously reported are bismuth, ether, alcohol, quinine, antipyrine and sodium sulfapyridine. To this group are added 3 cases of sciatic nerve injury following the intragluteal injection of paraldehyde.

Paraldehyde is an irritant, and its parenteral use may cause injury to nerves with which it comes into contact. The increasing use of this method of administration may be expected to lead to additional mishaps such as those herein reported unless particular care is taken. The oral or rectal route should be used in preference to the intramuscular. When the latter method becomes necessary the drug should be injected at a safe distance from important nerve trunks, and not more than 5 cc should be given in one injection.

#### ACNE CONGLOBATA AND PERIANAL PYODERMA (HIDRADENITIS SUPPURATIVA)

PROMPT RESPONSE TO LOW FAT DIET AND THYROXIN THERAPY

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Acne conglobata is a chronic inflammatory disease of the skin which is characterized<sup>1</sup> by the presence of the constituents of acne vulgaris, such as comedones, papules and pustules, and in addition large elevated, fluctuating plaques which are dusky blue and frequently form cutaneous or subcutaneous abscesses and oil cysts, which may perforate and form discharging sinuses, healing very slowly and often leaving keloidal or so called bridge scars (brückenarben) of Lang. The lesions closely resemble tuberculoderms of the colliquative type (scrof-

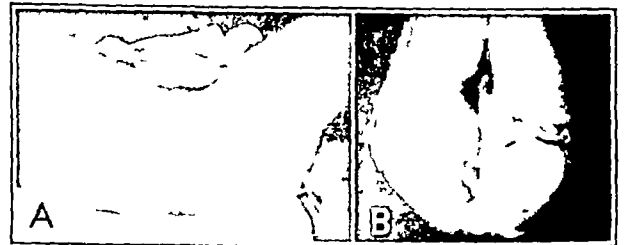


FIG. 1—A, buttocks and perianal region before operation. B, showing sluggish wounds one week after operation.

uloderma). Ormsby<sup>2</sup> credited Reitman with the first description of the disease, in 1908, occurring in 4 men who had "innumerable comedones, many double comedones and comedo scars together with follicular and perifollicular inflammatory infiltrations, often confluent, some of which had softened and were open."

Pautrier described a case in which torpid abscesses, keloid fibrous bridges and other hyperplastic fibrous formations occurred in the early stages in the usual acne areas. Later indolent abscesses developed on the hips and buttocks and these were followed with lesions resembling bromoderma or blastomycosis on the arms, forearms and thighs.

The chronicity of this rare form of severe acne and its rebelliousness to treatment are well known to dermatologists.

Proctologists see cases such as those described by Highman<sup>3</sup> in which the perineum and buttocks are riddled with abscesses. One of us (M. M. M.) has in the past seven years undertaken to manage the disease severely affecting the buttocks of 10 Negro women aged 25 to 50. Each suffered from hypoglandular defects as evidenced by obesity and scabbiness as well as ordinary acne affecting other parts of the body. Their "perianal pyoderma" was treated with surgery, heliotherapy and vaccines without success. Postoperative healing was exceedingly slow and ended with keloidal scars. Smith<sup>3a</sup> described 6 cases of perianal pyoderma of the type here considered. Relationship of

1. Michelson, H. E. and Allen, P. K. Acne Conglobata. Arch. Dermat. & Syph. 23: 49-64 (Jan.) 1931.

2. Ormsby, O. S. Diseases of the Skin, ed. 5. Philadelphia: Lea & Febiger, 1937, p. 1184.

3. Highman, W. J., in discussion on Michelson and Allen.<sup>1</sup>  
3a. Smith, N. D. Pyoderma Simulating Extensive Anal Fistula, Tr. Am. Proctol. Soc. 36: 163-176 (June) 1938.

this to hidradenitis suppurativa,<sup>3b</sup> a disease which affects mainly the axilla as a rule was recognized by Jackson.<sup>3c</sup> The venous nature of one type of hidradenitis, the type not due simply to staphylococcal parasitism of axillary sweat glands, was postulated by one of us (R I S Jr).<sup>3d</sup> The groin location of lesions of hidradenitis suppurativa was depicted by Brunsting<sup>3e</sup> in a case which we would class with the venous type and which resembled the case we report. We believe such cases not to be of pyogenic bacterial etiology. We consider them and perianal proctoderma and acne conglobata, all to be variants of acne.

Pain in the sitting position was the complaint of our patient, whose acne conglobata had existed for thirteen years. On July 6, 1942 he underwent an operation for the drainage of sinus tracts about the anus. The resulting wounds were painful, sluggish and unresponsive to treatment. A few days later his cutaneous lesions were recognized as acne conglobata and he was put on the treatment one of us<sup>4</sup> devised and routinely uses in the management of acne vulgaris, a treatment based on the hypothesis that the lesions of acne are inflammatory

within a few weeks until they themselves have tried this method of treatment in cases in which they have not been able to afford much relief over a period of years. We hope too that proctologists may be enabled to manage successfully cases which have puzzled and disappointed them in the past.

## REPORT OF CASE

G W, a white man aged 32, an electrician, complained of pain in the sitting position, perianal abscesses, sores on the skin and weariness. Since 1929 his acneiform troubles had been severe and marked by the development, healing and recrudescence of symmetrically located plaques of boggy, painful, sinus riddled dermatitis from which oozed thin malodorous pus and which in healing left keloid-like, irregular, rough cribriform and atrophic scars. Lesions were located on the back of the neck over the scapulas, over the sternum, about the buttocks and perianal region, in the groins and on the forearms. While the patient was seldom completely incapacitated, he was continually in pain, forced to wear dressings and often obliged

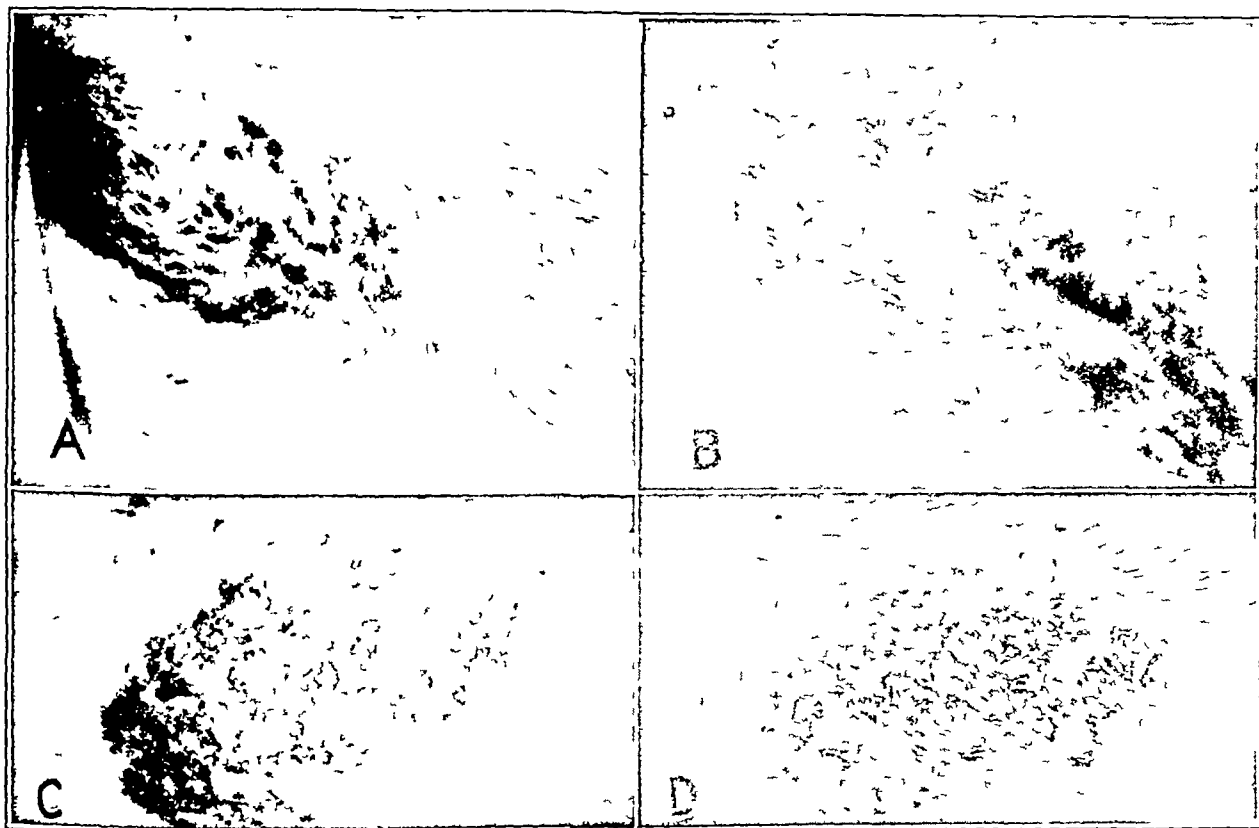


Fig 2—A left inguinal lesion before treatment showing edema and comedones B left inguinal lesion after seven weeks of treatment with low fat diet and thyroid showing healthy scars and absence of edema and comedones C, left forearm lesion before treatment showing edema and comedones D left forearm lesion after seven weeks of treatment showing healthy scars and absence of edema and comedones

foreign body reactions to lipid. On a low fat diet and thyroid medication the wounds began promptly to heal, losing their painfulness. By August 31, only seven weeks later, he was completely relieved of all symptoms in all parts of the body, only scars remained. He stated that he "did not know it was possible to feel so good."

We report our case in the expectation that dermatologists will be skeptical of our claim to have cured acne conglobata

3b Brunsting H A. Hidradenitis Suppurativa. Abscess of the Apocrine Sweat Glands: a Study of the Clinical and Pathologic Features with a Report of 22 Cases and a Review of the Literature. *Arch Dermat & Syph* 39: 108-120 (Jan) 1939.

3c Jackson R J. Hidradenitis Suppurativa. Diagnosis and Treatment of Its Perianal Manifestations. *Am J Digest Dis* 9: 220-222 (July) 1942.

3d Sutton R L and Sutton R I Jr. Diseases of the Skin, ed 10. St. Louis: C V Mosby Company, 1939. Hidradenitis Suppurativa.

3e Brunsting L A. Pyogenic Infections of the Skin. Especially Hidradenitis Suppurativa. *J Michigan M Soc* 42: 185-190 (March) 1943, fig 3.

4 Sutton R L Jr. Acne Vulgaris and Pustular Lipoidosis. Successful Treatment Based on Control of Lipid Metabolism by Low Fat Diet and Thyroid Extract. *South M J* 34: 1071-1082 (Oct) 1941.

to undergo procedures of incision and drainage, the wounds from which granulated tediously and generally broke down after apparent healing. He had despaired of ever feeling better.

The patient had previously sought medical care in a number of cities. In particular from 1938 to 1941 he regularly attended a clinic in New Orleans, where investigations were intensively pursued during six weeks of hospitalization in 1941. Such local, vaccinal and roentgen therapeutic efforts as were tried failed. Tuberculosis was not demonstrated.

The feature of weariness was noteworthy throughout the past nine years. No amount of sleep provided a sense of satiety with rest. The patient for many years drank 3 quarts or more of milk a day, hoping thereby to improve his condition. Much of the time he had a low grade fever, probably because of secondary infection and absorption of purulent material.

When we saw him, both buttocks were scarred. The skin and subcutaneous tissues of that region supported linear indurations, thick, bluish and pierced in many places by openings from which rancid pus and caseous matter could be expressed



(fig 1A) There was no fistulous connection with the anal canal. At operation on July 6, 1942 the sinus riddled inflammatory tissue about the anus was excised or widely opened. Pain and reluctance to heal featured the first postoperative week (fig 1B).

We directed him on July 11 to follow a low fat diet, without limit as to caloric content, and to take thyroid U S P in a dose of one 1 grain (0.065 Gm) tablet twice a day with breakfast and supper. He was instructed to record daily his basal temperature, the temperature in the morning before arising from bed. This is a guide on which we have learned to rely after having tested it, in comparison with basal metabolic rate determinations as a criterion of thyroid function, at the suggestion of Dr Broda Barnes. On July 14, after taking 2 grains (0.13 Gm) of thyroid U S P a day for three days, his basal temperature was 97.8 F, the weight was 148 pounds (67 Kg) and little change was as yet observable in his condition. Photographs (fig 2A and C) were taken which show the edematous state of the boggy lesions and many comedones in the irregular interstices of their corded surfaces. On July 17 he felt brighter, more vigorous and less tired by his day's work. The lesions, including the operative wounds, were drying, healing and less painful, the basal temperature remained at 97.8 F and the weight was 149 pounds (67.6 Kg). He was instructed to take 3 grains (0.2 Gm) of thyroid each day. On July 20 he weighed 150 pounds (68 Kg), the basal temperature was 98 F, and he had mild irritable symptoms of thyroid overdosage. He was ordered to omit the next two 1 grain doses and then to continue on 2 grains a day. The lesions showed continuation of their tendency to heal and their soreness was leaving. The patient made an unexpected trip out of town and forgot to carry his thyroid tablets with him. After a week without thyroid medication he felt so bad and the lesions were so apparently getting worse that he prevailed on a village druggist to give him thyroid tablets without a prescription for them. He then took 2 grains a day until his return to Kansas City on August 10. The operative wounds were now completely healed. He weighed 150 pounds and his cutaneous lesions were almost free from discharge, but the basal temperature had dropped to 96.8 F. He was ordered to take 3 grains a day, although three weeks previously this had been an overdose. Now, however, he tolerated 3 grains a day and, in fact, was by this time so familiar with the effects of thyroid and with our intention of raising his temperature to normal that he increased the dose of his own accord. On August 22 he telephoned the report that his basal temperature stayed at 98 F on a dosage of  $3\frac{1}{2}$  grains (0.22 Gm) a day. On August 31 his weight was 152 pounds (69 Kg), and there after on 4 grains (0.26 Gm) a day his temperature remained normal at 98 F. By August 31 every lesion was dry, firm, painless and free from edematous inflammation and comedones had dropped away, as seen in photographs (fig 2B and D) taken on that date. He was working fourteen hours a day, sleeping soundly and awaking refreshed. There was no symptom of thyroid overdosage. Objective evidence of his declared sense of well-being was apparent. He had gained 4 pounds (1.81 Gm) in seven weeks while taking thyroid. When last seen in February 1943 his condition had remained excellent and his thyroid dose continued to be 3 grains (0.2 Gm) a day.

## COMMENT

To dermatologists, the only physicians who as a class are familiar with acne conglobata, such a case record of definitive response to apparently specific therapy is astonishing. To proctologists, familiar with perianal pyoderma, the same is true. In fifty days a man with an illness of ten years' duration was relieved of all manifestations saving scars and felt a sense of well-being such as he had never known. Improvement was observable within two weeks of the start of his regimen. If he had not been away from control for three weeks, we believe that the fifty days would have been reduced to perhaps thirty-five.

We believe that such results can be repeated in every case of acne conglobata. The necessary conditions are, we think, the maintenance of (1) a truly low fat diet<sup>5</sup> which does not

entail curtailment of any nutritional necessity<sup>7</sup> and (2) a dose of thyroid which is the maximum amount tolerated without any symptom of overdosage. The basal temperature<sup>8</sup> was a valuable criterion of the proper dosage in this case, as we find it also in the treatment of acne vulgaris.

As to the patient's intolerance of 3 grains of thyroid a day nine days after treatment was started, followed by tolerance of 4 grains a day five weeks later, we think that early in his course he was febrile from absorption of exudate which was then still profuse, whereas later the basal temperature fell below 97 F because the lesions had almost healed, so that no absorption occurred. Then the larger dose of thyroid was tolerated and necessary.

Looking briefly at the literature on acne conglobata, one finds Wise<sup>9</sup> saying "The actual etiologic factor is unknown; however, the fact remains that the condition occurs in a person with a seborrheic skin, which in this instance constitutes a soil particularly susceptible to the formation of abscesses and scars." Fraser<sup>1</sup> spoke of the "special predisposition." Crutchfield<sup>10</sup> observed that even in large abscesses one finds no organisms and that tuberculosis cannot be demonstrated. Michelson and Allen<sup>1</sup> helped their patient with cleanliness, sulfur baths and a vaccine given intravenously. Highman<sup>2</sup> helped his with a blood transfusion and liver extract. Belote<sup>11</sup> concluded that "tuberculosis is a specific etiologic factor can be excluded."

The condition apparently is not caused by a specific organism. The etiologic factor of importance apparently is the patient himself and involves a constitutional predisposition. In experiments on 2 patients with acne conglobata, Belote inoculated 1 with pus from the other and so provoked a fairly typical lesion. We interpret this as a successful transference of oily matter which acted as a foreign body<sup>12</sup> in the second patient, just as it did in the first. Pautrier<sup>13</sup> believes the etiology must be sought in a study of the terrain. Gent<sup>13</sup> thought that "no results can be expected from auto-vaccines, stimulation or fever therapy, but immediate cessation of nodule formation and of suppuration is observed after internal use of Fowler's solution, after the usual method combined with prolonged sulfur baths and external application of liquor caleni sulfurati, which must be rubbed into the skin with a handbrush." We should not have tried the handbrush on our patient without a general anesthetic.

We believe that the peculiarity of the terrain lies in conditions conducive to hypothyroidism and improper lipid metabolism. Our patient was managed with striking success.

<sup>7</sup> Low fat diet instructions. The living body requires a certain number of calories. If the food eaten does not contain the requirement, then the remainder is obtained by using up the body store of fat and the individual loses weight by burning oil. Therefore, when one loses weight one is not on a low fat diet. So if one faces the alternative of either eating fatty food or else going hungry one should eat. In general, foods of plant origin are low in oil content and foods of animal origin are high in oil content. There is no limit on quantity of food eaten.

## Avoid These Fatty Foods

Milk—none to drink  
Cream  
Butter  
Ice cream—none  
Cheese (cottage cheese is all right)  
Pork, ham, bacon, sausage  
Wiener  
Gravy  
Fried foods  
Nuts, peanut butter  
Chocolate, cocoa  
Vegetable oils (crisco, corn oil, olive oil, margarine)

## Eat These Nonfatty Foods

Cereals (hot or cold), wheat bread  
Fruits (apple, pear, banana and others)  
Vegetables (potato, rice, tapioca, corn, hominy, all kinds of beans, peas, cauliflower, cabbage, turnip, lettuce, celery, onion, cucumber, pickle and others)  
Sugar, jam, jelly, honey, syrup  
Sugar candy (stick candy, gum drops, jelly beans, caramel, taffy, dynamite)  
Lean meats (beef, veal, chicken) all sea foods, all game fishes, frog's legs, gelatin, white of egg, visceral organs such as liver, kidney, sweetbread  
Salt, pepper, spices  
Beverages except milk, chocolate, alcohol, tomato juice, grape juice

Avoid also certain rich sources of the lipid, provitamin A like substances: tomato juice, catsup, chili, cod liver oil and vitamin concentrates: spinach, carrot, sweet potato and yolk of egg.

<sup>8</sup> Wise, Fred, in discussion on Michelson and Allen.<sup>1</sup>

<sup>9</sup> Fraser, J. I., in discussion on Michelson and Allen.<sup>1</sup>

<sup>10</sup> Crutchfield, E. D., in discussion on Michelson and Allen.<sup>1</sup>

<sup>11</sup> Belote, G. H., Acne Conglobata: An Experimental Study. Arch. Derm. & Syph. 27: 302-309 (Feb.) 1933.

<sup>12</sup> Pautrier, J. M., Ann. de dermat. et syph. 5: 233 (March) 1934. Also in Wise, Fred and Sulzberger, M. B., Year Book of Dermatology and Syphilology, Chicago Year Book Publishers, 1934, p. 192.

<sup>13</sup> Gent, W., Dermat. Wehnschr. 111: 963 (Nov.) 1940. Also in Wise, Fred and Sulzberger, M. B., Year Book of Dermatology and Syphilology, Chicago Year Book Publishers, 1941, p. 211.

<sup>5</sup> Barnes, Broda, Basal Temperature versus Basal Metabolism. J. A. M. A. 119: 1072-1074 (Aug. 1) 1942.

<sup>6</sup> Sutton, R. L., and Sutton, R. L., Jr., Diseases of the Skin, ed. 10, St. Louis, C. V. Mosby Company, 1939, reprinted 1942, p. 448.

without regard to cleanliness or local applications. His major dietary change by our order was the elimination of milk, 50 to 60 per cent of the caloric value of which comes from fat.

#### SUMMARY

A patient with acne conglobata and perianal pyoderma of many years' duration responded, with strikingly prompt and satisfactory results to treatment with a low fat diet and thyroid given to tolerance. Acne conglobata, perianal pyoderma and hidradenitis suppurativa of the acneic type comprise various manifestations of one disease, acne, which is fundamentally a disease of lipid metabolism.

31 First Sixth Second Street

### Special Article

## THE STANDARDIZATION OF ELECTROCARDIOGRAPHIC NOMENCLATURE

REPORT OF COMMITTEE OF THE AMERICAN  
HEART ASSOCIATION

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It is nearly half a century since Einthoven first employed the letters P, Q, R, S and T to designate the component deflections of the curves which he obtained by computing and eliminating the distortion present in records of the normal heart beat taken with the capillary electrometer. After he had invented the string galvanometer and was able to record the human electrocardiogram in undistorted form he continued to use these symbols and eventually added to their number by assigning the letter U to the low voltage deflection often present in early diastole and by accepting the designation  $T_a$ , previously employed by Hering for the inconspicuous final component of the ventricular complex.

This system of nomenclature has been in practically universal use since the very beginning, and it is permanently embedded in a vast and important literature, which all serious students of electrocardiography must frequently consult. In spite of the tremendous growth of this science in the recent past, it has continued to serve its purpose more than reasonably well. Some have found it unsatisfactory in certain respects and have tried to replace it with an entirely different terminology, but such efforts have met with no success and are now of interest chiefly from the historical standpoint. Under these circumstances it seems essential that, in attempting to standardize electrocardiographic nomenclature, we respect usages that are long standing and generally accepted and make only such recommendations as may be required to meet urgent needs of the present and immediate future. It is desired that all concerned clearly understand the causes of dissatisfaction which have led to a demand for some action of this sort.

Much of this dissatisfaction is clearly dependent on the circumstance that electrocardiographic nomenclature, like any other language, is continuously changing. It must grow and expand with the science which it serves and can be stabilized only temporarily. With the advance of knowledge the terms and symbols introduced by our predecessors have been utilized to meet new needs and have acquired meanings which they did not originally possess and which are not exactly the same for all workers. We propose to redefine those terms that are in general use, so that misunderstanding

may be avoided. The introduction or recommendation of new terms which have not been widely adopted in response to an imperative need would be more confusing than helpful.

It was primarily to facilitate the description and discussion of the form of the electrocardiogram that Einthoven first assigned letters to its individual components. It is important that this function of our nomenclature should be kept in mind. The deflections to which he gave names differed one from another in various ways—in size, in direction, in shape, in duration, in sequential position and in their relations to other events in the cardiac cycle. All the components originally named were no doubt regarded as fundamentally different in origin. It should be emphasized that neither the observed differences nor the differences in origin inferred can be considered all of the same sort or all equally significant.

It is clearly desirable that deflections alike in origin always be given the same name and that deflections unlike in origin bear different names. Both Einthoven and Lewis after him recognized the validity and importance of this principle. The former went considerably further than the latter in his efforts to avoid violating it and his writings suggest that it was chiefly for this reason that he never solved to his own complete satisfaction the problem of adapting his nomenclature to electrocardiograms of unusual or abnormal outline. The difficulty seems to have been that he did not fully realize that the symbols he was using differed greatly in value; that the phenomena which they represented were by no means equal in rank.

When dealing with initial ventricular deflections conspicuously different from those to which the letters Q, R and S were first assigned, he usually did not attempt to name them individually but made use of the symbol QRS to designate this group of deflections as a whole. This solution of the problem surrendered the advantages which he had gained originally by naming the components of the QRS complex.

In the case of bundle branch block of the common type he went further still and often labeled the first large deflection of the essentially diphasic ventricular complex *A* and the large final deflection *B*. For a similar reason Lewis assigned the symbols  $Q'$ ,  $R'$ ,  $S'$  and  $T'$  to the components of electrocardiograms of this kind. Few authors have followed Einthoven and Lewis in giving distinctive names to the ventricular deflections of branch block curves. According to our present conceptions the final ventricular deflection always represents the same physiochemical process. By always calling it the T wave we emphasize this important truth. By giving it one name when normal and a variety of others when abnormal we should obscure a likeness which is fundamental for the sake of making distinctions which are, by comparison, trivial. These remarks apply with equal force to the problem presented by normal and abnormal QRS complexes.

In cases of pronounced axis deviation, Einthoven used the letter R to designate the chief QRS deflection regardless of whether it was upward or downward. Lewis, on the other hand, called this deflection R when it was upward and S when it was downward and the vast majority of recent writers have done likewise. From time to time, however, attempts have been made to revive Einthoven's point of view.

In the last few years differences of opinion have arisen as to what constitutes a Q deflection and what an S deflection. When the QRS complex consists of

a single downward deflection, some writers call this deflection S on the ground that a downward deflection should not be labeled Q unless it is followed by an upward deflection. Others call it Q on the ground that this name should be given to every downward deflection not preceded by an upward deflection.

By far the greater part of the dissatisfaction with our electrocardiographic nomenclature has clearly been due to a lack of agreement as to what principles should govern the assignment of the letters Q, R and S to the components of the QRS complex. The symbols P, T<sub>a</sub>, QRS, T and U have long been used in the same way by every one and present no difficulties. The electrocardiographic components which they represent may be regarded as at least approximately equal in rank. Each has a characteristic contour and a distinctive relation to other events of the cardiac cycle. According to our present conceptions each has a distinctive origin. The first (P) is held to represent all those electrical forces produced by depolarization (activation) of the auricular muscle, the second (T<sub>a</sub>), all those electrical forces produced by repolarization of the auricular muscle. The third (QRS) and fourth (T) are held to represent all the electrical forces generated when these same physiochemical changes take place in the ventricular myocardium. The last (U) is less well understood, it apparently depends on some sort of readjustment of the polarization of the ventricular muscle. Since these physiochemical changes are closely related to the mechanical activities of the heart and necessarily occur whenever the heart beats, their electrical representatives can never be actually absent in any lead. Some may, however, be isoelectric or of such low voltage that they are imperceptible, and it often happens that a small deflection is difficult or impossible to detect because it is superimposed on a much larger one. Whatever the standpoint adopted, each of these components of the electrocardiogram is clearly entitled to a distinctive name. It is obvious that there is little danger of mistaking one of them for any of the others.

The individual components of the QRS complex are not entities of the same sort. They vary in number from subject to subject and from lead to lead. They have not been related to different events of the cardiac cycle, nor have they been shown to depend on the activities of distinct subdivisions of the ventricular muscle. No one of them has a distinctive contour. They differ one from another chiefly in direction and in sequential position and cannot be easily defined except in terms of these differences. All these deflections are alike in origin in the sense that all are produced by electrical forces generated by the spread of the excitatory process over the ventricular muscle. They can differ in origin only as regards the particular fraction of these forces which each represents. The individual fibers which contribute the elementary forces responsible for a given component in a given lead do not all lie in the same part of the ventricular myocardium. No one of the QRS components in any lead has a simple anatomic basis of this kind which would make its origin distinctive in the anatomic sense. The origin ascribed to any component is, mainly for this reason, dependent to a large extent on the point of view adopted, and no one particular point of view has gained such wide acceptance as to make it preeminent.

It has been suggested that the QRS interval should be subdivided in one way or another and that names should be assigned to parts of the QRS complex solely

on the basis of the particular subdivision of this interval within which they fall, rather than to the separate deflections of which it is composed. This suggestion is derived from the view that any part of the QRS complex written during a given interval of time in one lead is identical in origin with those parts of the QRS complex written during the same interval in other leads in the sense that it is produced by the same electrical forces. It is assumed that all the elementary electrical forces present at a given instant are equally effective, in proportion to their magnitude, in all the leads under consideration or that as far as these leads are concerned they are equivalent to a unique resultant electromotive force which may be substituted for them. Lintoven's equilateral triangle defines a resultant electromotive force the cardiac vector which may be substituted for the actual electromotive forces when dealing with limb leads, if the assumptions on which this triangle is based may be regarded as representing the true situation with sufficient accuracy for the purposes in mind. Now that it is customary to take precordial leads to which it is not applicable as well as limb leads, it is not desirable to enthrone this point of view in our nomenclature and disregard others which are equally legitimate.

For this reason and because it greatly complicates the assignment of the letters Q, R and S to the initial group of ventricular deflections and the description of the form of the QRS complex, we believe that a downward deflection should never be labeled R on the ground that it occupies the same interval and represents the same resultant forces as an upward deflection in another lead to which this letter has been appropriately assigned. It is equally disadvantageous to label an upward deflection Q or S because it corresponds in time to a downward deflection in another lead to which the same letter has previously been allotted.

The considerations mentioned and the multiplicity of leads now in use fully justify the labeling of the QRS components of one lead without reference to the number or character of the QRS components in any other lead. The allocation of the symbols employed should be determined solely by the direction and sequence of these deflections in the lead under consideration.

#### RECOMMENDATIONS

1 The symbols P, T<sub>a</sub>, QRS, T and U should be used to represent those deflections or groups of deflections to which they were originally assigned both when the electrocardiogram is normal and when it is abnormal.

2 In the majority of cases the QRS complex is superimposed on the T<sub>a</sub> deflection. For this reason the level of reference from which the voltage of the QRS deflections is measured should be the level at which the first of these deflections begins. The voltage of an upward QRS deflection should be measured by estimating the vertical distance between the upper edge of the trace at the beginning of the QRS interval and the upper edge of the trace at the point where the deflection reaches its maximal elevation. The voltage of a downward deflection should be determined by estimating the vertical distance between the lower edge of the trace at the beginning of the QRS interval and the lower edge of the trace at that point of the deflection which is farthest from the reference level.

3 In order to indicate how the QRS complex should be subdivided for the purpose of assigning symbols to the deflections which it displays, we may describe a

QRS complex which has three components in the following terms. The first deflection begins at the onset of the QRS interval when the trace first leaves the reference level. From this point the trace rises or falls to a turning point where the direction of its motion is reversed. It may pass through a second or third turning point before crossing to the opposite side of the reference level.<sup>1</sup> At this crossing the first deflection ends and the second begins. The second deflection, necessarily opposite in direction to the first, must display one turning point and may display many; it does not end until the trace crosses the reference level for the second time. The third deflection begins at the second crossing and ends at the RS-T junction. No part of the QRS complex which does not display at least one turning point should be considered a separate deflection. If the RS-T junction is displaced and this junction and the last turning point lie on opposite sides of the reference level, that portion of the trace which lies between the last crossing and the RS-T junction should be considered part of the deflection to which the last turning point belongs.

The earliest QRS deflection which lies above the reference level should be labeled R. Any downward deflection which precedes R, so defined, should be labeled Q. The first of any downward deflections which may follow R should be labeled S. The first of any upward deflections which may follow S should be labeled R', and the first of any downward deflections which may follow R' should be labeled S'. If it is necessary to label still later deflections of the QRS group, the symbols R'', S'' and so on should be used in accordance with the same principles. When R is absent, so that the QRS complex consists of a single downward deflection, this deflection should be labeled QS. In statistical studies QS, Q and S deflections should be considered separately.

A deflection is "notched" when it displays more than one turning point on the same side of the reference level. A deflection is "slurred" when it displays a distinct and local "thickening" on either limb or at its apex, owing to a sudden and pronounced change in the slope of the curve, or, in other words, in the rate at which the trace is rising or falling.

When the form of the QRS complex varies from moment to moment because of the effect of the respiratory movements on the position of the heart or for some similar reason, the classification of this complex should be determined by the variety of complex which is most abundant or, if no type is numerically predominant, by the outline of the complexes which are of intermediate form. Very small QRS complexes (largest deflection less than 5 mm) which display more than three components or multiple slurring and notching should be classed as "small and bizarre" or "vibratory."

4 The term RS-T junction should be used to indicate the point or shoulder which marks the end of the QRS complex, the point where the steep slopes of the QRS deflections are more or less abruptly replaced by the more gradual slopes which precede or comprise the first limb of the T wave. In many electrocardiograms the RS-T junction is followed by a nearly horizontal or gently sloping segment which lies on, above or below the reference level and ends with the onset of a much

steeper slope that rises or falls to the apex of T. It is agreed that the term RS-T segment is a useful name for this part of the ventricular complex when it exists, even though it is proper to regard it as the earliest part of the T deflection. When there is no point between the RS-T junction and the apex of T at which a sharp change in the slope of the trace occurs, this part of the ventricular complex should be called the first limb of the T wave. When the term RS-T segment is used without reference to some particular electrocardiogram or to some particular class of electrocardiograms, it should be understood to refer merely to that part of the ventricular complex which immediately follows the RS-T junction. The reference level for the measurement of the displacement of the RS-T junction should be the same as the level of reference for the measurement of the QRS deflections. The level of reference for the measurement of the RS-T segment, the T wave and the U wave should be the isoelectric level when this can be determined, otherwise it should be the level of the trace at the beginning of the QRS interval. The isoelectric level is the level of the trace at the beginning of the P wave when the P wave occurs in its normal relation to the QRS deflections and is not superimposed on T or U.

5 The term "diphasic T waves" should be applied to those final ventricular deflections which present two distinct turning points, one on each side of the level of reference. If the earlier turning point lies below this level and the latter above it, the diphasic T wave may be said to be of the minus-plus ( $\mp$ ) type. If the reverse is the case it may be said to be of the plus-minus ( $\pm$ ) type. When the term diphasic is used with reference to other deflections, to the QRS complex or to the ventricular complex as a whole, it should be used in the same sense.

6 When applied to the QRS complex to the T deflection, to any other electrocardiographic component or to RS-T displacement, the term "concordant" should signify that the largest deflection or displacement is in the same direction in lead 3 as in lead 1. Under the same circumstances the term "discordant" should signify that the largest deflection or displacement in lead 3 is opposite in direction to that in lead 1.

## SECOND SUPPLEMENTARY REPORT BY THE COMMITTEE OF THE AMERICAN HEART ASSOCIATION FOR THE STANDARDI- ZATION OF PRECORDIAL LEADS<sup>2</sup>

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Early in 1938 the Committee of the American Heart Association for the Standardization of Precordial Leads and a similar committee representing the Cardiac Society of Great Britain and Ireland made joint recommendations with reference to a single precordial lead for

<sup>2</sup> It has been pointed out to us that the meaning of the last sentence of the third paragraph of our previous supplementary report is not clear. The correct interpretation of this sentence is as follows:

When the letters and subscripts specified are employed it shall be understood that in the case of the sternal leads the precordial electrode has been placed in the fourth intercostal space and that in the case of the other leads it has been placed on a line drawn from the left sternal margin in the fourth intercostal space to the outer border of the apex beat and continued around the left side of the chest at the level of the apex beat. When the apex beat cannot be satisfactorily located this line should be drawn from the left sternal margin in the fourth intercostal space to the point where the left midclavicular line crosses the center of the fifth intercostal space and should be continued around the left side of the chest at the level of this point.

<sup>1</sup> When the trace is descending it crosses the reference level at the instant when its lower margin reaches a position below that which it occupied at the beginning of the QRS interval. When the trace is ascending it crosses the reference level at the instant when its upper margin reaches a position above that which it occupied at the beginning of the QRS interval.

routine use. In a supplementary report published in the same year, the American committee recommended that when multiple precordial leads were taken the precordial electrode be paired either with an electrode on the left leg or with a central terminal connected through equal resistances of 5 000 or more ohms to three electrodes—one on the right arm, one on the left arm and one on the left leg. Six precordial points were recommended as suitable locations for the precordial electrodes, and these may be referred to as the  $C_1$ ,  $C_2$ ,  $C_3$ ,  $C_4$ ,  $C_5$ , and  $C_6$  positions. In the last few years the number of electrocardiographers who have abandoned single in favor of multiple precordial leads has rapidly increased, but there has been no uniformity as regards the number of leads taken, the location of the remote electrode paired with the precordial electrode or the locations of the precordial points regularly explored.

There has been a persistent demand that some further action be taken with reference to the standardization of precordial leads. We have therefore consulted and have attempted to reach an agreement with reference to the more important questions that have arisen in connection with this problem. It is agreed that many of these questions must be left unanswered until our knowledge of the precordial electrocardiogram is far more complete than at present. A great deal of methodical painstaking work is urgently needed with reference to the best location for the remote electrode, the desirability of taking precordial leads routinely and the best combination of locations for the precordial electrode. The present situation is not, however, due solely to inadequate information but also to a lack of complete agreement as to exactly what is meant by "best combination" and similar terms when used with reference to precordial leads, and as to whether the questions at issue are to be decided on empirical grounds alone or, if not, as to what basic principles should be given important consideration. The recommendations which follow must, for these reasons, be considered merely tentative.

The committee is agreed that a single precordial lead from the region of the cardiac apex, or from any other part of the precordium, is inadequate. When multiple precordial leads are taken, it is found that in the vast majority of cases the extreme right side of the precordium and the extreme left side of the precordium yield QRS complexes of more or less opposite form. Leads from a usually small region lying between those from which complexes of opposite types are obtained customarily yield complexes of intermediate or transitional form, which are often difficult to interpret when curves from points farther to the right and from points farther to the left are not available for comparison. The location and size of the region from which transitional complexes are obtained vary greatly from case to case and are not entirely constant in one and the same subject. When single precordial leads are taken from the outer border of the apex beat, the exploring electrode is, in actual practice, sometimes placed to the right of the region of transition mentioned and sometimes to the left of it, or within it. In serial observations on the same subject inaccuracy in placing this electrode or an alteration in the size or location of the region in question may be responsible for striking changes in the form of the curve obtained by what is technically the same lead.

This is only one of the causes for dissatisfaction with routine apical leads. When all cases are considered, regardless of whether the standard leads are normal or abnormal, it is perhaps true that a lead from the region

of the apex or from the left anterior axillary line at the level of the apex will display abnormalities of the ventricular complex more often than any other single precordial lead. When, however, only those cases in which the limb leads are normal are considered, this is certainly not the case. It is now clear that, when the standard limb leads are normal, the precordial leads most likely to yield significantly abnormal curves are those from points lying between the left sternal border and the midclavicular line. Consequently single apical leads most often fail completely in those cases in which multiple precordial leads have most to offer.

The committee believes that three is the least number of precordial leads that can be regarded as satisfactory for general purposes. It suggests that those who wish to reduce the number of such leads to a minimum take leads from the  $C_1$ ,  $C_4$ , and  $C_6$  positions. All are urged to take additional leads whenever possible. A lead from the  $C_2$  or a lead from the  $C_4$  position may show diagnostic abnormalities when equally significant changes fail to occur in other leads. Those who follow our recommendations must remember that inversion of the T deflections in leads from the  $C_4$  position is frequently encountered in normal adult subjects. It is believed that those who have had little experience with multiple precordial leads would gain much worthwhile information by taking a full set of six precordial leads on a few normal subjects and on a series of patients with known cardiac abnormalities of the commoner types.

It is agreed that the information available does not permit a definite decision on empirical grounds as to the best location for the remote electrode with which the exploring or precordial electrode is paired. It is recommended that the precordial electrode be paired with an electrode on the right arm with an electrode on the left leg or with a central terminal connected through equal resistances of 5 000 or more ohms to three electrodes—one on the right arm, one on the left arm and one on the left leg. Some but not all members of the committee who formerly placed the remote electrode on the left leg now prefer to place it on the right arm. It has been observed that, when the precordial electrocardiogram is judged by the normal standards at present available, a lead from a given point on the precordium may yield an abnormal curve if the exploring electrode is paired with a left leg electrode (CF lead) even though the curve obtained from the same point by using the right arm electrode as the reference point (CR lead) is within normal limits. The opposite situation may also arise. It has also been observed that in certain cases of cardiac infarction in which diagnostic changes are present in the standard limb leads, CF leads display the most striking and CL leads (leads from the precordium to a left arm electrode) the least striking changes. These observations cannot, however, be interpreted as indicating that CF leads are always more reliable in the diagnosis of infarction than precordial leads of other kinds. There will be less confusion with reference to the effect of the remote electrode if it is clearly understood that each CR lead is equal to the corresponding CF lead plus standard lead 2, that each CL lead is equal to the corresponding CF lead plus lead 3 and that each central terminal lead is equal to the corresponding CF lead plus one-third the sum of

3. Recent observations indicate that in the vast majority of cases if not in all, the omission of these resistances has no appreciable effect on the form of the precordial curves obtained. Consequently it may be satisfactory to connect the central terminal directly to the three extremity electrodes without the use of intervening resistances of any kind. Further studies should be made before this method is generally adopted.

leads 2 and 3 and is the algebraic mean of the CR, CL and CI leads from the same precordial point

The committee does not desire at this time to make any recommendation bearing on the question as to whether precordial leads should be taken routinely or in selected cases only. It believes that precordial leads are most likely to yield information of diagnostic importance under the following circumstances: (1) whenever myocardial infarction is suspected or must be considered a possibility, (2) whenever myocardial disease is suspected or must be considered a possibility and other methods of examination yield no unequivocal evidence of cardiac disease, (3) whenever it is important to distinguish between right and left ventricular hypertrophy or between right and left bundle branch block and this cannot be satisfactorily done by other means, (4) whenever for any reason a complete cardiac study is indicated

## Council on Pharmacy and Chemistry

### REPORTS OF THE COUNCIL

THE COUNCIL HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT  
ALGER I. SMITH, M.D., Secretary

#### ORGANOGRAPHY WITH DIODRAST CONCENTRATED SOLUTION 70 PER CENT

Winthrop Chemical Company, Inc. presented for Council consideration Diodrast Concentrated Solution 70 Per Cent. The preparation is proposed for use in a special diagnostic procedure for visualization of the heart, the ascending and descending aorta and branches, the superior vena cava, the pulmonary artery and branches, the coronary arteries and other structures of the heart and mediastinum. It has also been used for cholangiography by injection of the material into the common bile duct. For cholangiography the amount of Diodrast Concentrated Solution 70 Per Cent varies within wide limits, as little as 15 cc and as much as 100 cc has been required by direct injection into the common bile duct. For cardiopulmonary visualization 40 to 45 cc is injected in the average patient. The amount varies, however, according to the diameter of the chest, the size of the heart and certain pulmonary congestion. The manufacturer states that where visualization of the pulmonary circulation is desired 30 to 35 cc is sufficient.

The technic in using Diodrast Concentrated Solution 70 Per Cent for such a study is relatively complicated and requires accurate timing and teamwork between the physician, the patient and the roentgenologist. The method consists in injecting the substance into the blood and taking roentgenograms simultaneously with the concentration of the opaque material in the cardiopulmonary system. In addition a preliminary examination of the chest with the x-rays is necessary in order to obtain data for roentgenography. At times it is necessary to determine the circulation rate of the blood for accuracy. There has also been developed a multiple exposure method in which eight x-ray exposures are taken within ten seconds.

The contraindications include hepatic disease, nephritis and hyperthyroidism. Premedication with a barbiturate is advisable, epinephrine is administered when there is a possibility of an allergic reaction or low blood pressure. The results of this method have been reported chiefly by Robb, Steinberg and their associates.<sup>1</sup> They have reported no serious consequences following 238 injections in 127 patients of whom 42 were normal, 47 had pulmonary disease and the remainder heart disease.

Results, according to this group of workers, have been of considerable aid in the detailed visualization of the cardiovascular system of the chest. They consider it safe, practical and of great value in the differential diagnoses of chest conditions. Von Baeyer and Liebow also consider the procedure an excellent one in the conditions mentioned. Stewart, Breimer and Muei<sup>2</sup> have reported in detail 4 cases in which cardiography was studied with Diodrast. A number of other investigators have also reported satisfactory results with the use of this substance with the conclusion that under the proper conditions there is a minimum of danger of harmful reactions with its use. In addition to the reports of these workers, the Council was referred to a number of reports submitted directly to the Winthrop Chemical Company totaling 849 cases in which 1399 injections were given. The manufacturer has also submitted photographs of x-ray plates showing typical findings from this technic.

The Winthrop Chemical Company has submitted laboratory data on the tolerance of Diodrast Concentrated Solution 35 Per Cent and of the Concentrated Solution 70 Per Cent. It is admitted that subcutaneous or intramuscular injections resulted in induration which subsides within seventy-two to one hundred and forty-four hours. After ten days no local effect can be demonstrated following subcutaneous injection and after six days following intramuscular injection. Microscopic examination shows that the inflammatory tissue response gradually diminishes after twenty-four hours. Following intravenous injection in rats there were no symptoms when 35 Gm per kilogram was administered. With administration of 40 Gm per kilogram slightly convulsive movements were observed, but the animals recovered within one-half to one hour, 45 to 50 Gm per kilogram was fatal. Intravenous injection of 25 Gm per kilogram resulted in mild hepatitis. Winthrop Chemical Company considers that in mice, dogs and man there was little tissue damage probably because the compound is excreted more rapidly than in the rat. Thus dogs injected with 40 Gm per kilogram over a period of three days showed no ill effects. There is a transient fall in blood pressure together with an acceleration of respiration following as little as 0.75 Gm per kilogram. Excretion of Diodrast is performed almost entirely by the kidneys; the substance is unchanged and there is little delay in excretion in dogs having kidney damage. With a dosage of 100 cc into a human being weighing 75 Kg the dose would approximate 1 Gm per kilogram, which is considerably below the toxic dosages for the dog, the rat and other animals.

While use of radiopaque substances in the visualization of cardiac and pulmonary blood vessels seems to be highly promising, the technic of using a substance such as Diodrast Concentrated Solution for this purpose is relatively complicated when compared with the use of Diodrast 35 Per Cent of similar substances for visualization of other organs. It is entirely possible that the inherent nature of cardiography requires a skilled and meticulous technic. Most of the experimental work on the use of Diodrast 70 Per Cent for cholangiography was performed by Robb, Steinberg and their associates. Several other groups of workers, however, have obtained satisfactory results using the technic described by these investigators. It appears that this technic can be mastered by experienced workers who have the proper facilities, although it would be dangerous in the hands of persons who are inexperienced or who use the technic in a casual manner. Under the proper conditions the use of Diodrast 70 Per Cent for cholangiography appears to be a relatively safe procedure, since few untoward results have been encountered. This is, perhaps, because of the precautions taken by skilled workers.

As this diagnostic procedure appears to be of some value for the visualization of thoracic organs as well as the biliary tract and possibly other organs, the Council voted to accept Diodrast Concentrated Solution 70 Per Cent (Winthrop Chemical Company, Inc.) for inclusion in New and Nonofficial Remedies, to be used, however, only by specialists or others who have the proper facilities and experience necessary for the relatively complicated technic.

<sup>1</sup> Steinberg, Israel and Robb, G. P. *Am Rev Tuberc* 38: 557 (Nov.) 1938. Robb, G. P. and Steinberg, Israel. *J Clin Investigation* 17: July 1938. *Am J Roentgenol* 41: 1 (Jan.) 1939. Robb, G. P. and Weiss, Soma. *Am Heart J* 8: 650-670, 1933. Robb, G. P. and Steinberg, Israel. *Am J Roentgenol* 42: 14 (July) 1939. Steinberg, Israel and Robb, G. P. *Radiology* 33: 291 (Sept.) 1939. Steinberg, I. F., Grishman, A. and Sussman, M. L. *Angiocardiography in Congenital Heart Disease*. I. Dextrocardia to be published.

<sup>2</sup> Stewart, W. H., Breimer, C. W. and Maier, H. C. *Am J Roentgenol* 46: 636 (Nov.) 1941.



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SATURDAY, APRIL 24, 1943

## ENVIRONMENTAL TEMPERATURE AND MORTALITY IN BURNS

The use of heat versus cold as local therapy for injured or infected tissue continues to arouse debate. Enthusiasms for and diatribes against hot or cold applications date back to the time of Hippocrates. Although exact physiologic studies have shown the relative reactions which follow the heating or chilling of tissue, most physicians are still undecided when confronted with the necessity of making a decision as to whether to advise a hot water bottle or an ice cap.

The problem of heat versus cold reaches a higher plane of clinical importance in the treatment of surgical shock. For decades the shocked patient was surrounded with hot water bottles or even actually heated with various appliances. In a recent editorial<sup>1</sup> in *THE JOURNAL* the subject of cooling in shock was discussed at some length and the deleterious effects of warming the shocked patient were evaluated. The discussion was based not only on well established physiologic considerations but also on the recent important experimental studies of Blalock.

The influence of cold and heat on the human being's environmental temperatures has received but scant attention by investigators. Undoubtedly the availability of air conditioning equipment in recent years will stimulate such studies. Right now, during the present global war, the fact that our soldiers, sailors and marines must fight in such wide extremes of temperature emphasizes urgently the importance of knowledge concerning the influence of environmental temperature on various injuries sustained by our fighting men. A provocative experimental study on the influence of environmental temperatures on the mortality in extensive burns has

just been published by Elman, Cox, Lischer and Mueller.<sup>2</sup> This study suggests that these considerations are really of paramount importance. These workers, combining the research facilities of a university and a commercial institution, have observed striking effects at environmental temperatures of 32, 55, 75 and 99 F. Rats under deep anesthesia were subjected to uniform severe thermal injuries involving 75 per cent of the skin surface. When they were stored at a temperature of 75 F, mortality was 25 to 32 per cent. However, when the animals were placed in colder rooms set at 32 or at 55 F the mortality rose to 100 per cent. When placed in a heated environment of 99 F the mortality also increased to 100 per cent. These differences are so pronounced as to suggest a profound influence of environmental temperature on the vital reparative processes which tend to compensate for the deleterious effects of severe burns. Indeed, they tend to show that 75 F is somewhere near the optimal environmental temperature, a fact which is not surprising as this is usually considered the most comfortable level. Quite similar findings were reported by Sanford Rosenthal<sup>3</sup> in a paper appearing at about the same time. The observations were made on mice during the course of experiments on the chemotherapy of burns in the laboratories of the U. S. Public Health Service.

The practical inferences which flow from these simple but clearcut observations are significant. First they add evidence to that already mentioned in surgical shock<sup>1</sup> that the common practice of covering the burned patient with a heated cradle may be definitely deleterious. Such a view has found expression during the past decade in several clinical reports on the treatment of burns. These bedside objections to the use of heat in burns find ample justification in the experiments just cited. These studies, however, also suggest that even in temperate climates when the summer temperature rises to 100 F or in tropical climates where this level may even be exceeded, air conditioned rooms may well prove an important method of reducing the hazard of a fatal outcome due to severe burns. It also suggests that further investigations as to the influence of environmental temperature in other conditions will probably also reveal important influences from which therapeutic inferences may be drawn.

<sup>2</sup> Elman, Robert, Cox, W. M., Jr., Lischer, Carl and Mueller, A. J. *Proc. Soc. Exper. Biol. & Med.* 51: 350 (Dec.) 1942.

<sup>3</sup> Rosenthal, S. M. *Pub. Health Rep.* 57: 1923 (Dec. 18) 1942.

<sup>1</sup> Cooling in Shock editorial *J. A. M. A.* 121: 432 (Feb. 6) 1943.



EXAMPLES OF RECENT PROGRESS  
IN VIRUS RESEARCH

A new virus papilloma is described by Parsons and Kidd,<sup>1</sup> a noncancerous papillomatosis of the oral lining of domestic rabbits. The growths are situated mainly on the under side of the tongue. Parsons and Kidd have extracted a filtrable virus from these growths which reproduces the disease in the oral mucosa of rabbits. As yet there has been no effect in other rabbit tissues or in the oral mucosa of other animals. This form of virus papilloma, of which there now is a considerable number, does not show any tendency to become cancerous. Its natural transmission appears to be "by a direct handing along in the family."

Further studies of feline agranulocytosis by Syvertson and Lawrence and their associates<sup>2</sup> show that the specific virus of this disease is not related to various other pathogenic viruses, human and animal, and that it produces a specific immunity. The disease is characterized by profound leukopenia, proliferation of reticuloendothelial cells and intranuclear inclusion bodies.

Chambers and his associates<sup>3</sup> report that studies by ultracentrifugation indicate that influenza A virus is one of the smallest specific agents so far isolated, also that this virus is one of the least complex, as it appears to be composed principally of nucleoprotein.

By means of differential ultracentrifugation of infected human, monkey and chimpanzee stools, Melnick<sup>4</sup> obtained the virus of epidemic poliomyelitis in purified and concentrated form. The virus so isolated caused poliomyelitis in monkeys, hence it appears that a sensitive method for detecting the virus has been found.

Sanders and Alexander<sup>5</sup> report the isolation and identification of a filtrable virus from conjunctival scrapings from 2 patients suffering with epidemic keratoconjunctivitis. This virus proved to be pathogenic for mice and it produced a mild but characteristic keratoconjunctivitis in a human volunteer, whose serum contained specific antibodies for the virus one month after the infection. Antibodies were also demonstrated in the serum of patients who had passed through attacks of the disease.

These examples of recent research on viruses are not intended as an exhaustive review, they are more or less random selections which show that the study

of pathogenic filtrable viruses continues to give results of scientific and practical value. The opportunities for research in the field of the viruses grow daily more numerous, the results promise vast benefit to mankind.

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*Current Comment*

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## SULFAGUANIDINE AND SUCCINYLSULFATHIAZOLE FOR BACILLARY DYSENTERY

During the past year there have been numerous reports on sulfaguanidine and a smaller number on succinylsulfathiazole in the treatment of bacillary dysentery, both in the active state and in carriers. Lyon,<sup>1</sup> who reported more than 300 cases, found sulfaguanidine effective in acute bacillary dysentery but less potent after the first five to ten days, in recurrent attacks and in the chronic forms. It was effective in acute bacillary dysentery in adults and also in infants and children. He discussed the results with succinylsulfathiazole in 14 cases of severe or moderately severe bacillary dysentery. This agent appeared to have all the virtues of sulfaguanidine as to therapeutic efficacy and freedom from untoward effects. Among the most recent reports on this subject is that of Bulmer and Priest,<sup>2</sup> who during 1941 treated 554 soldiers in a military hospital in the Middle East for bacillary dysentery. Seventy-six of these were given sulfaguanidine. These cases were not consecutive but were selected because of (1) the acuteness of the diarrhea, (2) the severity of the toxemia, (3) the persistence of the diarrhea or (4) the military importance of an early recovery among a few "key" persons. In this small series the drug failed to have any effect on 3 persons, although all eventually recovered. There were only two deaths. In the remaining cases the response to the drug was prompt and often dramatic. The drug was lacking in toxic effects. They believe, as do several of the others<sup>3</sup> who have reported on the subject, that sulfaguanidine is a specific drug for bacillary dysentery. From the evidence, so far as it is as yet available, succinylsulfathiazole<sup>4</sup> appears to be practically as effective and nontoxic as sulfaguanidine and, if further investigation bears out preliminary observations, may be proved somewhat superior.

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1 Lyon G M. The Chemotherapy of Bacillary Dysentery. *U S Nav M Bull* 40: 601 (July) 1942.

2 Bulmer, Ernest and Priest W M. Sulfaguanidine in Treatment of Bacillary Dysentery. *J Roy Army M Corps* 79: 277 (Dec) 1942.

3 Eblen J G. Sulfanilylguanidine in the Treatment of Enteric Infections. *South M J* 35: 302 (March) 1942. Edwards Lydia B. Sulfaguanidine in the Treatment of Bacillary Dysentery. *ibid* 35: 48 (Jan) 1942. Jones, A F. The Present Role of Sulfaguanidine in Medicine and Surgery, *Nebraska M J* 27: 251 (July) 1942. Hawking Frank. Sulfonamide Compounds in Feces. *Lancet* 1: 290 (March) 1942. Hall L C. The Use of Sulfaguanidine in Enteric Infections. *J Pediat* 20: 328 (March) 1942. Hardy A V. Watt James Peter son Jerome and Schlosser Elise. Studies of the Acute Diarrheal Diseases. *Pub Health Rep* 57: 529 (April 10) 1942. Rantz L A, and Kirby W M. The Use of Sulfaguanidine in the Treatment of Dysentery Carriers. *J A M A* 118: 1268 (April 11) 1942. Oppen Lincoln and Hale Virginia. Sulfaguanidine in Treatment of Dysentery (Bacterium Flexneri) Carriers. *ibid* 119: 1489 (Aug 29) 1942.

4 Poth, E J, Chenoweth B M, Jr, and Knotts, F L. Treatment of Bacillary Dysentery with Succinylsulfathiazole. *J Lab & Clin Med* 28: 162 (Nov) 1942. Kirby W M M, and Rantz L A. The Treatment of Typhoid and Dysentery Carriers with Succinylsulfathiazole. *J A M A* 119: 615 (June 20) 1942. Smyth, C J, Finkelstein M B, Gould S E, Koppa T M and Leeder, F S. Acute Bacillary Dysentery (Flexner) this issue, p 1325. Lyon<sup>1</sup>.

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1 Parsons R J and Kidd J G. Oral Papillomatosis of Rabbits. *A Virus Disease J Exper Med* 77: 233 (March) 1943.

2 Syvertson, J T and Lawrence J S. Ackart R J, Adams W S, Ervin, D M, Haskins, A L Jr, Saunders, R H Jr, Stringfellow, M B and Wetrich R M. The Virus of Infectious Feline Agranulocytosis. I. Characters of the Virus. *Pathogenicity J Exper Med* 77: 41 (Jan) 1943. Lawrence J S, Syvertson J T and others. II. Immunological Relation to the Other Viruses. *ibid* p 57.

3 Chambers L A, and Henle Werner. Studies on the Nature of the Virus of Influenza. I. The Dispersion of the Virus of Influenza A in Tissue Emulsion and in Extraembryonic Fluids of the Chick. *J Exper Med* 77: 251 (March) 1943. Chambers, L A, Henle Werner, Lauffer M A and Anderson T F. II. The Size of the Infectious Unit in Influenza A, *ibid*, p 265.

4 Melnick J L. The Ultracentrifuge as an Aid in the Detection of Poliomyelitis Virus. *J Exper Med* 77: 195 (March) 1943.

5 Sanders Murray, and Alexander, R C. Epidemic Keratoconjunctivitis. *J Exper Med* 77: 71 (Jan) 1943.

**"LOST PLASMA" IN HEMORRHAGIC SHOCK**

There is a theory known as the "lost plasma" theory, that death results in hemorrhagic shock from reduction in the blood volume by passage of plasma through the capillaries into the tissues. The evidence cannot be said to be absolutely conclusive. An experimental study of the problem has been made on dogs by Fine and Seligman,<sup>1</sup> using a radiobromoprotein. The preparation of which they describe in detail, for the identification of plasma proteins. By injecting this radioprotein into the circulation and tracing its subsequent course, they could follow the movement of plasma proteins from the blood into the tissues in the normal dog as well as in dogs in hemorrhagic shock. The radioactivity of the circulating plasma and of the tissues was the same in the shock dogs as in normal controls. The evidence does not indicate that death from hemorrhagic shock in dogs is caused by a progressive decline in the blood volume due to the passage of plasma into the tissues. The conclusion drawn by Fine and Seligman from their experiments that in hemorrhagic shock of dogs plasma loss by passage into the tissues is not a crucial factor seems warranted.

#### CHARACTERISTICS OF INSTITUTIONAL INMATES IN 1940

On April 1, 1940 according to an analysis of statistics recently issued by Capt. of the Bureau of the Census, there were 591,365 patients 14 years old and over in mental institutions.<sup>1</sup> In addition, persons in homes for the aged, infirm or needy numbered 245,026. Inmates of prisons and reformatories totaled 217,919 and inmates of local jails and workhouses 99,249. Officials and attendants in institutions were excluded from the statistics of the institutional population, as were all persons in tuberculosis sanatoriums. Of all inmates 70 per cent were native whites, 16 per cent were foreign born whites and 14 per cent were nonwhites. Males constituted 93 per cent for prisons and reformatories, 91 per cent for local jails and workhouses, 59 per cent for homes for the aged, infirm or needy and 54 per cent for mental institutions. The percentage of all persons 14 and over inhabiting institutions was 1.16 for the United States as a whole, the District of Columbia had the highest percentage with 1.72, followed by Delaware, Virginia, Maryland and New York. Strangely Columbus, Ohio, led all other large cities with 3.59 per cent of all persons 14 and over in an institution, Memphis, with a corresponding figure of 0.28 per cent, seems to belie its reputation for criminality. The figure of 0.56 per cent for New York City contrasts with 1.78 per cent for one of its constituent boroughs—Richmond.<sup>1</sup> The sometimes curious sidelight effects of these figures remains largely unexplained. However, the over-all picture is clear: one out of every hundred persons 14 years and over in the United States is an inmate of an institution.

<sup>1</sup> Fine Jacob and Seligman Arnold M. Traumatic Shock. IV. A Study of the Problem of the Lost Plasma in Hemorrhagic Shock by the Use of Radioactive Plasma Protein. J. Clin. Investigation 22: 285 (March) 1943.

<sup>1</sup> U. S. Department of Commerce Bureau of the Census. Washington. Characteristics of the Institutional Population 1940. Series P-3. No. 32.

**A COUNTY PROGRAM FOR THE  
PREVENTION OF DEAFNESS**

Washington County, Md., is inaugurating a program for the prevention of deafness to be conducted as a function of Services for Crippled Children. The need of such a program may be gleaned from a previous survey which has shown that some 25 per cent of school children in the county have impaired hearing. The program will augment the limited facilities for otolaryngology in the community and will provide for radon therapy for adenoid tissue. The following immediate steps are projected: 1. Education of parents in the necessity for proper medical care for children with acute otitis media. This is to be accomplished through Parent-Teacher Association meetings, distribution of pamphlets, newspapers, preschool and school medical conferences and home nursing visits, especially for school children with earaches. 2. Testing of hearing in public and parochial schools. Each child will be tested approximately three times during his school life. The screening test will be performed by a trained technician from the Frederick School for the Deaf. 3. Establishment of an ear, nose and throat clinic to be conducted by a trained specialist. Provisions will be made by arrangement with the local hospital and the local ear, nose and throat profession for special treatment such as tonsil and adenoid operations and mastoid operations. Dr. C. H. Halliday, director of Services for Crippled Children of the State of Maryland Department of Health, emphasizes that the program is to be carried out under the supervision of the county health officer with the approval of the county medical society. It is to be a cooperative study by the health agencies, medical societies and state board of education. The private physician is to be brought into active participation.

**THE RESPIRATORY PATTERNS AT BIRTH**

The physiologist Sir Joseph Barcroft could not find any detailed description of the exact ways in which children born normally begin to breathe. In a small series of observations of normal births by mothers "to whom not more than an occasional whiff of general anesthetic was given" he recognized three obvious patterns of initial breathing: the rhythmic, the single prolonged inspiration and the gasp. The rhythmic type begins on emergence of the unconquered head and is associated with only slight jaundice. In the other two types there is considerable or even deep cyanosis. The gasp is dependent on the lower part of the medulla, the higher parts of the brain being functionless on account of asphyxia, of which cyanosis is the external sign. In rhythmic respiration, parts higher in the brain are functioning. In the initially protracted inspiration the respiratory effort seems to consist of a number of single inspirations without corresponding expiration. Owing Barcroft<sup>1</sup> suggests, to failure of the inhibitory stimuli associated with normal respiration. In all probability the study of a larger number of cases than Barcroft's may furnish more data on the initial respiratory pattern and its relation to sensitivity to asphyxia and other influences of the brain at birth.

<sup>1</sup> Barcroft Joseph. Respiratory Patterns at Birth. Cambridge University Medical Society Magazine 20: 6 (Michaelmas Term) 1942.

# MEDICINE AND THE WAR

*In this section of The Journal each week will appear official notices by the Committee on War Participation of the American Medical Association, announcements by the Surgeon Generals of the Army, Navy and Public Health Service, and other governmental agencies dealing with medicine and the war and such other information and announcements as will be useful to the medical profession*

## ARMY

### AUSTRALIA PROVIDES YANKS WITH HOSPITAL

The government of Australia, under its program of reciprocal lend lease has provided the United States with a new ten story hospital "somewhere in Australia" to be used by American soldiers, sailors and marines recuperating from illness and wounds suffered in the Pacific. The transfer does not involve payment of any sort. The building, construction of which was undertaken as a civic enterprise at a cost of \$3,000,000 was taken over and adapted for the American forces to accommodate several times its original capacity. It is complete with laboratories, operating rooms, nurses quarters and administrative offices. All ten stories are now being used. The main buildings are well arranged. Verandas for convalescents are supplemented by broad spaces on the roof, where servicemen gather to rest in glass enclosed rooms or in the open air. Recreational equipment is available. The new hospital is one of many Australian contributions to the United States forces in the Pacific as reciprocal lend lease. Australia provides most of the food for our troops on the mainland and has recently undertaken to supply food as well to American troops in New Guinea, the Solomons and other islands in the South and Southwest Pacific theaters.

standing were Brigadier General Remartz, Commandant, Brig Gen W E Carter G S C, Chief of Staff, Army Air Forces, Gulf Coast Training Center, Col W C White, A C, Commanding General Instructors School, Col Walter C Jensen, M C Acting the Air Surgeon, Col Fabian Pratt, M C, Surgeon Fourth Air Force, Drs Eugene R Lewis and Isaac H Jones of Los Angeles, members of the original Medical Research Board, Lieut Comdr Robert J Hunter (MC), USNR, the first flight surgeon to report for duty as such, and Dr A C Bachmeyer, Associate Dean, Department of Biological Science University of Chicago, a pioneer in Aviation Medicine. Lieut Col W Harvey Kernan, M A C, executive officer of the school, and Major Harold F Pierce, M C Randolph Field, members of the first group reporting to Hazelhurst field for duty at the original Medical Research Laboratory were also present. The anniversary dinner was attended by members of the staff of the school and their wives, officers of the Air Forces past commandants of the school and out of town guests. Saturday was devoted to scientific meetings.

### MOBILE X-RAY UNITS FOR RUSSIA

Thirteen mobile trailer units, each fitted with portable x-ray equipment that can be set up during battle or air raids in twenty minutes, have been purchased in this country by English donors for the Russian army. Spanish refugees in England donated two of the units and various English organizations the others. Two units will be shipped first to England for acceptance ceremonies featuring Mrs Ivan Maisky, wife of the Russian ambassador to England. The trailers are equipped with x-ray units manufactured by the Westinghouse X-Ray Division, Baltimore. Each trailer carries complete facilities also for fluoroscopy. The x-ray equipment can be quickly removed from the trailer and set up in a shack or tent by two members of the medical crews assigned to each unit. Complete darkroom equipment is provided for making permanent records of injuries on regular size x-ray films. The trailers are constructed of sheet metal with hinged sides and ends to permit speedy loading. To prevent damage the x-ray apparatus is packed in padded boxes, which are arranged to receive each component part of the equipment in its proper order. Power to operate the equipment is supplied by a generator mounted in the trailer and driven by a gasoline engine. An ample length of supply cord enables the generator to be stationed up to 150 feet from the x-ray unit if necessary.

### COLONEL DIBBLE AND MAJOR GLEASON REPORTED MISSING

An airplane accident which occurred in the Southern Pacific area was recently reported in the newspapers and among those missing were Col John Dibble and Major James J Gleason, both of the Medical Corps. Colonel Dibble was commissioned a first lieutenant in the medical corps in January 1917, in which year he graduated from the Army Medical School following his graduation in medicine at the University of Pennsylvania in 1915. He was an honor graduate of the School for Flight Surgeons in 1919 and graduated from the Medical Field Service School advanced course in 1934. He was appointed from New Jersey. Major Gleason, whose home address was Long Island City, N Y, was born in 1897 and graduated from Loyola University School of Medicine, Chicago, in 1928. Major Gleason entered the military service about Aug 1, 1942.

### SIXTEEN NURSES MADE LIEUTENANT COLONELS

The War Department, acting under the authority of the nurse promotion act of Dec 22, 1942, has advanced sixteen captains of the Army Nurse Corps to the grade of lieutenant colonel and has promoted an additional fifteen captains to the grade of major. The promotions involve no transfers, although a few occurred recently incident to the changes in the nursing division of the Office of the Surgeon General, which changes the *Army and Navy Journal* says, were the natural accompaniment of a change in the superintendent of nurses. The fifteen majors are eventually to be increased to a total of thirty-nine by subsequent promotions. A number of additional promotions to the grade of captain will be made soon, not only to fill the vacancies created by these promotions, but also to increase the number of captains in the Army Nurse Corps to one hundred and eighty-one.

### TWENTY-FIFTH ANNIVERSARY OF SCHOOL OF AVIATION MEDICINE

The twenty-fifth anniversary of the School of Aviation Medicine was celebrated, April 1-3, at Randolph Field, Texas. Several of the original group who assembled at Hazelhurst Field, Mineola, Long Island, N Y, on Jan 19 1918 to establish formally research and training in aviation medicine were present for the exercises. The program consisted in the dedication of a memorial window in the Post Chapel (THE JOURNAL, March 13, p 846). This window, bearing the wings of the flight surgeon, the seal of the school and depicting St Christopher, the patron saint of aviators and all travelers, was presented to the chapel by Class 42-F Aviation Medical Examiners, which was under instruction at this station from Sept 21 to Dec 17, 1942. Following the dedication of the window the new research laboratory building was dedicated by Brig Gen Eugen G Remartz, commandant of the school.

A review of the classes in aviation medicine, aviation physiology, enlisted flight surgeons' assistants and the Detachment Medical Department was held on April 2. In the reviewing

### PRESBYTERIAN HOSPITAL (CHICAGO) UNIT ACTIVATED

On March 19, twenty-four doctors and thirty-two nurses of the Thirteenth U S Army General Hospital (sponsored by the Presbyterian Hospital, Chicago) left for Camp Robinson, Arkansas, to joint seven other medical officers and some three hundred and sixty-five enlisted men who had reported at Camp Robinson at an earlier date (THE JOURNAL, March 13, p 846), thus reactivating Base Hospital No 13, which was sponsored by the Presbyterian Hospital in service in the first world war. The commanding officer of the Thirteenth General Hospital will be Col Lyle S Powell, who served in the first world war in France and recently was a member of the staff of the Army Field Service School, Carlisle Barracks, Pennsylvania. Colonel Powell formerly was a member of the faculty of the University of Kansas. The other medical and dental officers on duty with the unit are as follows:

#### MEDICAL SERVICE

Lieut Col Homer K Nicoll	Capt John Tysell
Major O Earle Gray	Capt Bertram O Nelson
Major George W Stupp	Capt Donald A Morrison
Major George C Turner	Capt Herbert C Breuhaus
Major C Jack Harrison	Capt Ralph E Talbott
Capt Joseph Bennett	Lieut Richard P Morris
Capt James Webster	Lieut W L Riker

#### SURGICAL SERVICE

Lieut Col Edwin M Miller	Capt Clayton E Brock
Major Linden J Wallner	Capt Charles S Textor
Major Cyril V Crane	Capt Cecil Draa
Major Francis H Straus	Capt Frank B Papiernik
Major Richard K Gilchrist	Capt Hugo C Brum
Major Stanley Lawton	Lieut Fred Max Marquis
Major Egbert H Fell	Lieut William C Cameron
Major Arthur Diggs	Lieut Isaac Michael
Major John Olwin	Lieut Frederic A DePeyster
Capt Stanton A Friedberg	

#### LABORATORY SERVICE

Major Evan Barton	Lieut Ralph L High
Capt Franklin Moore	

#### X-RAY SERVICE

Capt George L Pelkey	Lieut Edward S Murphy
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#### DENTAL SERVICE

Capt Arthur R Hanson	Lieut A Leo Klein
Capt John M Spence	Lieut Roger K Stockton
Lieut Richard Holie	

The chief nurse will be 1st Lieut Nelle Crout and the other nurses, when recalled to the unit, will bring the number of nurses to about a hundred. Among the enlisted men in the present unit are several whose fathers served with the original Base Hospital No 13 at Limoges, France, from May 1918 until after the armistice was signed.

### CAPTAIN WOLFE AWARDED SOLDIER'S MEDAL

The War Department announced on March 1 the award of the Soldier's Medal to Capt Russell S Wolfe of the Medical Corps for heroism on Aug 8 1942 in the vicinity of Requin Bay in the Solomon Islands. Captain Wolfe and two infantry soldiers manned a small skiff and in a heavy and dangerous surf rescued the survivors after an army plane had been forced to land at sea. Captain Wolfe's home address is Houston, Texas.

### NEW SUPERINTENDENT OF ARMY NURSE CORPS

Miss Florence A Blanchfield, Lieutenant Colonel, Army Nurse Corps, has been appointed superintendent of that corps, effective June 1, to succeed Mrs Julia O Fikke, who will retire on May 31. Miss Blanchfield was assigned to the Surgeon General's Office in 1935 and was appointed assistant superintendent of the Army Nurse Corps in 1939.

### AVIATION MEDICAL EXAMINERS

Another class in aviation medicine for aviation medical examiners graduated recently. The didactic portion of the course was conducted at the School of Aviation Medicine in Texas and the practical portion at three army air forces classification centers. Graduation exercises were held at each of the three centers. The list of graduates follows:

<b>ALABAMA</b> William Thomas Daniel 1st Lieut Birmingham George E Johnson Captain Urrah Madison Reeves Popt Captain Palladega	<b>GEORGIA</b> Bertram Price Aver Jr, 1st Lieut, Augusta Samuel Young Brown 1st Lieut, Atlanta Fred Jessup Coleman 1st Lieut, Augusta Hyden Hackney Donahue, 1st Lieut, Augusta John P Jones 1st Lieut, Macon Maurice Rich, 1st Lieut, Atlanta
<b>ARIZONA</b> Erroll Payne Palmer Jr 1st Lieut Phoenix Russell O Raymond 1st Lieut, Flagstaff	<b>IDAHO</b> Lewis Baty Hunter, 1st Lieut, Wallace Albert Milton Peterson 1st Lieut, Wallace David Warren Springer 1st Lieut, Boise
<b>ARIZONA</b> Orville B McCoy 1st Lieut Har- rison John W Smith 1st Lieut Little Rock	<b>ILLINOIS</b> George Jaeger Best, 1st Lieut, Teoria Walter August Bock 1st Lieut, Chicago Edward F Cannon 1st Lieut, Chicago John Sheldon Clark Jr, 1st Lieut, Chicago Wenck Rayburn Freeman 1st Lieut, Chicago Robert Heuner Captain Chicago Cletus Timothy Kearney 1st Lieut, Chicago Milton Harold Partridge 1st Lieut, Chicago Voris Ralph Payne 1st Lieut, Wayne City William P Phillips 1st Lieut, Chicago Robert Bruce Rutherford Captain, Chicago William Bernard Sermon 1st Lieut, Chicago Henry Fred Otto Steinbock 1st Lieut, Villa Park Kent Lincoln Wattleworth 1st Lieut, Newton
<b>CALIFORNIA</b> Deane Taylor Adams 1st Lieut, San Jose August Alexander Antipa 1st Lieut, San Francisco Robert Lynwood Blackmun 1st Lieut, Los Angeles Frank Herbert Bowles Jr, 1st Lieut, San Francisco Burton Kent Brock 1st Lieut, Bakersfield Herschel S Burns Captain, Arcadia Harold Galeener Carter 1st Lieut, San Diego Maxwell Peterson Fonda 1st Lieut, Los Angeles Kirk Durand Carrington 1st Lieut, San Francisco Henrik Sofas Crasner Major, Woodland Alfred John Heldfond 1st Lieut, Los Angeles William Cloyce Huff 1st Lieut, Ventura William Travis Kelley 1st Lieut, Oxnard Jack Albert Lighthill 1st Lieut, Santa Monica Edward Gerald Miel 1st Lieut, Beverly Hills (Los Angeles) Clement Joseph Molony Captain, Los Angeles Irvine Cora Newman 1st Lieut, Beverly Hills Frederick Powers Herald 1st Lieut, El Centro Joseph Bonora Reis 1st Lieut, San Leandro Paul Curtis Roberts 1st Lieut, Indio James Roberts Savage 1st Lieut, San Bernardino Ernest Tim Smith 1st Lieut, Claremont Harold Dumer Smith Captain, Pomona Malcolm James Timney Captain, Placerville Carl Elmer Willers 1st Lieut, Chowchilla Julius Zellman 1st Lieut, San Bernardino	<b>INDIANA</b> Harold C Adkins Captain, Indianapolis John B Berchule 1st Lieut, Peru John Perring Birdzell 1st Lieut, Crown Point Koderick Lee Boling 1st Lieut, Indianapolis Charles Eugene Cook 1st Lieut, North Manchester Hugh Wilson Eikenberry 1st Lieut, Peru Lester Lathrop Hardy 1st Lieut, Indianapolis Voris Francis McFall 1st Lieut, Anderson Vernon Ray Pancost 1st Lieut, Elkhart Frederic Luther Perry 1st Lieut, Plymouth Robert Maurice Salassa 1st Lieut, Indianapolis Byron John Smith 1st Lieut, Kingman Donald F Vixian 1st Lieut, Indianapolis Robert Hadley Wisheart 1st Lieut, Lebanon
<b>ARIZONA</b> Earle George Haldrup Captain, Stonington Nicholas Salvador Peters 1st Lieut, Bridgeport	<b>KANSAS</b> Letter George Howard Lewis 1st Lieut, McPherson Doyle Alexander Shrader 1st Lieut, Kansas City George Lawrence Thorpe Captain, Valley Center
<b>DELAWARE</b> George Augustus Connolly 1st Lieut, Wilmington	<b>KENTUCKY</b> Rankin Clay Blount Captain, Louisville Joseph Charles Denniston 1st Lieut, Russellville John A Dorger 1st Lieut, Covington Martin James Harris Captain, Louisville Louis Otto Mitzloff 1st Lieut, Louisville
<b>DISTRICT OF COLUMBIA</b> Raymond Arnold Lown Major, Washington Kenneth Eugene Fletcher Captain, Washington Carey Addison Stone Jr 1st Lieut, Washington	<b>FLORIDA</b> Henry Samuel Blank Captain, Lake City Albert Harvey Gleason, 1st Lieut, Umatilla Joseph Jacob Lowenthal 1st Lieut, Jacksonville Alexander Robbins 1st Lieut, Miami Beach

Thomas Lowery Phillips Jr, 1st  
Lieut Louisville  
Francis Glover Plunkett 1st Lieut,  
Louisville  
John Norman Rich Captain, Phila-  
delphia (Myfield)  
Livingston Augustus White 1st  
Lieut Henderson

## LOUISIANA

William Pierce Addison Jr, 1st  
Lieut Shreveport  
Griff Walford Bilbro 1st Lieut,  
New Orleans  
Ernest George Debrakey, 1st Lieut,  
New Orleans  
Reed Anthony Fontenot 1st Lieut  
Vill Platte  
Marshall Morris Scarle 1st Lieut,  
Amite  
Jack Murff Sheppard 1st Lieut  
Pineville  
Seals Samuel Speer, 1st Lieut  
Ringgold  
Ephraim Lionel Wagner 1st Lieut  
New Orleans  
Joseph Edwin Warren 1st Lieut  
New Orleans  
Hugh Murphy Yearwood 1st  
Lieut Shreveport

## MAINE

Napoleon Joseph Gingers 1st Lieut  
Augusta

## MARYLAND

Bruce Johnston Franz 1st Lieut  
Baltimore  
Elmer Walter Haertig 1st Lieut  
Touson  
Arthur Joseph Katberg 1st Lieut  
Baltimore  
Clarence Watson Ledoux 1st Lieut  
Baltimore  
James Joseph Nolan 1st Lieut  
Cantonville  
Alexander Irskine Sproul 1st  
Lieut Baltimore

## MASSACHUSETTS

Milton F Brougham 1st Lieut  
Boston  
William Francis Crocker Captain  
Milton  
Edward Francis Higgins 1st Lieut  
Worcester  
James Stephen Kavanagh Captain  
Methuen  
Francis James Kells 1st Lieut  
Worcester  
Henry Long Kirkendall Captain  
Worcester  
James Philip Mallowney 1st Lieut  
Worcester  
John Milne Murray Major Boston  
Melvin Thomas Pennell 1st Lieut  
Boston

## MICHIGAN

James Barron 1st Lieut Detroit  
Daniel Junior Carothers 1st Lieut  
Charlotte  
Bernard Jacob Goldman Captain  
Detroit  
Roderic Bristol Howell Captain  
Ann Arbor  
William Albert Joerin 1st Lieut  
Coldwater  
Thomas D Johnson 1st Lieut  
Augusta  
Ward Rayfield Johnson 1st Lieut  
Channing  
William Davis Knapp 1st Lieut  
Detroit  
Robert Kuhn 1st Lieut Highland  
Park  
Roy land Lionel Mindlin Captain  
Detroit  
Eugene Henry Quigley Captain  
Eloise  
Benton Adam Schiff 1st Lieut  
Flint  
Leopold J Snyder 1st Lieut  
Eloise  
Aaron Carl Stander 1st Lieut  
Saginaw  
Robert Benjamin Sweet 1st Lieut  
Ann Arbor

## MINNESOTA

Lauri Edwin Koskela 1st Lieut  
Sebeka  
John Edward Thue Haavik, 1st  
Lieut St Paul  
Benedict Trach 1st Lieut Minne-  
apolis  
Maurice Nhill Walsh Major  
Rochester  
Frederic Phillip Army 1st Lieut  
Preston  
Milton Monroe Balcome 1st Lieut,  
St Paul  
Robert George Hankerson 1st  
Lieut Minnesota Lake  
Bernard Leo Kreilkamp 1st Lieut  
Rochester  
John C Lillie 1st Lieut Rochester

Irven Izura Purnala 1st Lieut  
Minneapolis  
Robert Thomas Rowland 1st Lieut,  
Houston

## MISSISSIPPI

Hugh Kimbriel Curry 1st Lieut,  
Lupora

## MISSOURI

William Max Aldredge 1st Lieut  
St Louis  
Kenneth Clayton Coffelt 1st Lieut,  
Springfield  
Billard Marion Lubank Captain  
Raytown  
Joseph Louis Glaser 1st Lieut  
St Louis  
William Robertson Oakes 1st  
Lieut St Louis  
James Hartford Robertson 1st  
Lieut St Louis  
Vergil Nelson Slee 1st Lieut  
St Louis  
Jerome Norman Tolier 1st Lieut  
St Louis  
Robert Benjamin Wilson 1st Lieut  
Lake City

## MONTANA

Maurice Sanford Wessell Major  
Hamilton

## NEBRASKA

Loren Otis Bohinen 1st Lieut  
Omaha  
John W Kelley 1st Lieut Omaha

## FLORIDA

John Riley McDaniel Jr, Captain  
Las Vegas

## NEW JERSEY

Charles Francis Baldini Jr 1st  
Lieut, Jersey City  
Richard Ollendorff Bauman 1st  
Lieut Newark  
Lucene Hubert Bekampis 1st  
Lieut Camden  
Matthew J Bowen 1st Lieut  
Jersey City  
Edward Walter Chudzik 1st Lieut  
Lindhurst  
Jack Edward Cox 1st Lieut  
Camden  
Charles Richard D Amato 1st Lieut  
Last Rutherford  
Henry Dantzig 1st Lieut Tren-  
ton  
William Nickles Lames 1st Lieut  
Trenton  
Norman Wallace Gordon 1st Lieut  
Elizabeth  
Bruce MacLean Hogg Major 1st  
Orange  
Thomas W Howell Major 1st  
Orange  
Dabney Von K Moon Captain  
Humboldt  
John Kline Nexus Jr 1st Lieut  
Humboldt  
James John Noble 1st Lieut  
Hoboken  
Bertram Jacob Lyons Sauerbrunn  
1st Lieut Elizabeth  
Leland Munyan Stetser 1st Lieut  
Collingswood  
Albert Wilon Van Sickle 1st  
Lieut Chester

## NEW MEXICO

Ulysses Steve Marshall 1st Lieut  
Roswell

## NEW YORK

Francis Tolson Baker 1st Lieut  
Rochester  
Scott Livermore Bennett 1st Lieut  
Brooklyn  
Robert Meredith Berry 1st Lieut  
New York  
Hugh Edward Conly 1st Lieut  
Brooklyn  
William Hynes Conway 1st Lieut  
Larchmont  
Timothy Leonard Curran 1st  
Lieut, Brooklyn  
Joseph A D Errico Jr Major  
North Tonawanda  
William Fredk Doney 1st Lieut  
Rochester  
Philip Walter Dorsey 1st Lieut  
Binghamton  
William Joseph Eisenmenger 1st  
Lieut New York  
Joseph Wm Finn 1st Lieut  
Brooklyn  
James Stuart Fleming 1st Lieut  
Salamanca  
Raymond Harold Gehl 1st Lieut  
Brooklyn  
Thomas Joseph Gilligan Jr 1st  
Lieut New York  
John Tetard Goodner 1st Lieut  
New York  
Edwin Harry Heller 1st Lieut,  
East Hampton  
Joseph William Hewett 1st Lieut,  
Buffalo

Patrick Henry Hoey Captain  
Scarsdale  
Francis Paul Keefe 1st Lieut  
Olean  
Alfred Lachterman 1st Lieut  
Brooklyn  
Sanford Levine 1st Lieut Brook-  
lyn  
Benedetto A Lohalbo 1st Lieut  
Staten Island  
William Benedict MacGuire Jr  
1st Lieut Brooklyn  
Morris Louis Miller 1st Lieut  
Brooklyn  
Charles Howard Mortimer 1st  
Lieut New York  
Leo John Murphy 1st Lieut  
Olean  
Elliot Arthur Ornstein 1st Lieut  
New York  
William Clarke Quinn 1st Lieut  
New York  
Arland DeMont Ryan 1st Lieut  
Sodus  
Samuel David Spratt 1st Lieut  
Brooklyn  
William Allan Stewart 1st Lieut  
Watervliet  
Norbert Paul Sullivan Major  
Jackson Heights  
Henry John Vomacka 1st Lieut  
New York  
Roland John Walker Captain  
Auburn

Russell K Ameter 1st Lieut  
Bryan

Alfred K Bard 1st Lieut Cleve-  
land

Robert Addison Bruce 1st Lieut  
Dayton

Clayton Wayne Chrl 1st Lieut  
Cleveland

Sidney Weiss Durschlag 1st Lieut  
Cleveland

John Mackay Hamilton Captain  
Cleveland

A Morton Karlan Captain Spring-  
field

Flmer Edward Ellsworth McClie-  
land Captain Bellare

Robert Douglas Mansfield Major  
Canton

John Edward Martin 1st Lieut  
Columbus

Louis George Ralston 1st Lieut  
Youngstown

Edward William Sanders 1st  
Lieut Bellevue

Paul A Stoodt Major Mansfield

Kenneth Lynne Stratton 1st Lieut  
Portsmouth

Edwin Rathven Westbrook 1st  
Lieut Warren

Joseph F Hattenbach 1st Lieut  
Cleveland

Samuel J Klatman 1st Lieut  
Youngstown

James Winston Beattie 1st Lieut  
Oklahoma City

Francis John Daugherty 1st Lieut  
Oklahoma City

Louis J Feves 1st Lieut Pendle-  
ton

Frank LeCocq Jr 1st Lieut  
Portland

William Robert A Boben Captain  
Wilkes Barre

Ralph Cantafio 1st Lieut Phila-  
delphia

Joseph Chervinko Captain Farrell  
Edwardsville

Cilbert N Clime 1st Lieut Lan-  
caster

William Richard Crosby 1st Lieut  
Philadelphina

Hugh Meyers Crumay 1st Lieut  
Mercer

John Wood Cordon Jr Captain  
Belle Vernon

Warren Elmer Hartman 1st Lieut  
Bradford

James Daniel Heller 1st Lieut  
Coplay

John David High 1st Lieut  
Williamsport

Henry John Kehrli 1st Lieut,  
Scranton

Willis Barr McClelland 1st Lieut,  
Franklin

Charles Christian Montgomery 1st  
Lieut Wilkes Barre

Walter Edward Naugler 1st Lieut  
Philadelphina

Joseph Louis Nocentini Captain  
Philadelphina

William S Piper 1st Lieut Clear-  
field

Luke Kinsel Remley 1st Lieut,  
York  
William F Sheeley 1st Lieut  
Pittsburgh  
Ralph Chadwick Worrell 1st Lieut  
Springtown  
Ralph Maynard Wymer 1st Lieut,  
Pittsburgh

William Spinks Bethea 1st Lieut  
Latta

Richard B Josey 1st Lieut  
Columbia

Edwin Roy McCoy 1st Lieut  
Charleston

Lane E Mays 1st Lieut Green-  
ville

William Gordon Morehouse 1st  
Lieut Columbia

William Ross Casey 1st Lieut,  
Memphis

Thomas Bentley Stone 1st Lieut  
Nashville

Daniel D Altgelt Captain San-  
Antonio

John Hodge Arrington Jr Cap-  
tain Wichita Falls

Mathew DeVore Burnett Jr 1st  
Lieut Houston

Jesse Lantham Coleman 1st Lieut  
Houston

Robert Francis Gossett 1st Lieut  
San Antonio

Theodore R Hannon Major  
Houston

DeWitt H Hotchkiss Jr Major  
Houston

Paul Katrabe 1st Lieut Houston

Edward P Leeper Major Dallas

Philip Magrish Captain San An-  
tonio

Harl D Mansur Jr Captain San-  
Antonio

Wayne Reeser 1st Lieut Lub-  
bock

John B Stewart 1st Lieut  
Dallas

John Howard Strickland 1st Lieut  
Alice

Samuel Tenney 1st Lieut Mar-  
shall

Robert W Wells 1st Lieut  
Edna

Edward Albert Wilkerson Major  
Houston

Geoffrey Paul Wiedeman 1st  
Lieut Burlington

Harry Yeringer Twiss 1st Lieut  
Montpelier

Burnett Sheldon Rawson 1st  
Lieut North Willi ton

James Francis Higgins 1st Lieut  
Barre

Milton Hamlin Bland 1st Lieut  
Norfolk

James Thomas Gianoulis 1st Lieut  
Richmond

Ieshe Mac Lisle Jr 1st Lieut  
Alexandria

Don Preston Peters Jr 1st Lieut  
Lynchburg

Richard Chute Potter Jr Captain  
Warren

Dennis Hardesty Robinson 1st  
Lieut Bedford

James Tribue Rountree Captain  
Harrisonburg

Clarry Clyde Trice 1st Lieut  
Richmond

Harold Brown Webb Captain  
Waynesboro

LeRoy Judson Ayers Captain  
Seattle

Jack Lynn Boyd 1st Lieut  
Seattle

Kenneth Richard Drewelow 1st  
Lieut Kirkland

Lowell Ladd Eddy 1st Lieut  
Seattle

Arthur Lee Foley 1st Lieut  
Seattle

George Kenneth Moore 1st Lieut  
Everett

Claude Lacy Houck 1st Lieut  
Carbon

James S Feurig 1st Lieut Sey-  
mour

Adrian William Frankow 1st  
Lieut West Bend

Urguhart Louis Meeter Captain  
Medford

Harry Lloyd Schwartz 1st Lieut  
Kenosha

John Carlin Haley 1st Lieut  
Montreal

## NAVY

VENEREAL DISEASE DROPS TO  
NEW LOW

Venereal disease rates in the Navy have dropped to new all time lows a special subcommittee of the National Advisory Police Committee on Social Protection was told on April 2 by Comdr T J Carter, who is in charge of preventive medicine in the Bureau of Medicine and Surgery. Sick list admissions last year in the entire Navy, ashore and afloat due to syphilis, gonorrhea and the lesser venereal infections totaled 36 per thousand men, a decrease of 29 per cent from 1941 and of 55 per cent since 1940. "During 1942, only 28 per cent of the Navy's venereal disease problem came from foreign ports," Commander Carter revealed. While this proportion and the total number of cases, may increase in the near future, the fact remains that the bulk of the problem will remain in the United States for some time. It is particularly important he said from the point of view of civilian control that communities in or around which there are naval activities appreciate the degree to which they are involved in the total Navy problem.

## AWARDS TO NAVAL MEDICAL OFFICERS

The Bureau of Medicine and Surgery U S Navy, Washington, D C, announced in its March 1 weekly news the award on February 22 of the Purple Heart to Comdr B W Hogan (M C) of the aircraft carrier *Hasp* and to Lieut G H McAttee (M C) of the aircraft carrier *Hornet*. The bureau announced also in its February 15 issue of the weekly news the award of the Navy Cross on February 11 to Lieut Edward P McLarney of the Medical Corps for bravery in action in the Solomon Islands. Lieutenant McLarney is a native of Washington, D C, where he practiced medicine after graduating from Georgetown University until he entered the Navy in 1937. The citation was as follows: "During the night action of December 13-14, when prepared to move his first aid station after the enemy advance made it unsafe, many wounded arrived for treatment. He coolly disregarded hostile fire from front and flank and, assisted by a greatly reduced number of hospital corpsmen, rendered aid to approximately 200 casualties during the engagement."

DENTAL OFFICERS PROMOTED TO  
NAVY CAPTAINS

Comdr C Raymond Wells, chief dental officer of the Selective Service System, Washington, D C, and president elect of the American Dental Association and Comdr Frederick F Molt of the Great Lakes Naval Training Station in Illinois have been promoted to the rank of captain in the Navy. According to the *Naval Surgeon*, both officers have served with distinction in many positions in military and in professional life. This is the first time, it is said, that two members of the dental corps reserve have been promoted to the rank of captain in the U S Navy.

## REST HOME FOR TORPEDOED SEAMEN

A rest home for torpedoed seamen was opened on a beautiful site at Camp Kittiwake, Pass Christian, Miss., January 11. Participating in the ceremony were George H Terriberry, chairman of the New Orleans Port Area Committee, United Seamen's Service and Capt Roger J O'Sullivan, regional representative Recruitment and Manning Organization War Shipping Administration. The speaker was Mr Marshall E Dimock, director of Recruitment and Manning Organization. The home is for the purpose of giving torpedoed seamen an opportunity of recovering from the psychic trauma resulting from experiences following the torpedoing of their ship at sea and is intended to provide them with a period of complete rest and relaxation.

SHIPS NAMED AFTER FAMOUS  
MEDICAL MEN

In recent months the merchant marine has honored the small group of medical men who in its earlier years made Johns Hopkins University famous throughout the world by naming new Liberty ships the *William Osler*, the *William Welch*, the *William S Halsted*, the *Howard A Kelly*, the *John J Abel* and the *Franklin P Mall*. The Maritime Commission has a committee whose duty it is to name the new ships and that committee is free to honor thus any Americans it deems worthy of recognition for services to their country and to humanity.

## FOOD RESEARCH SECTION

The Bureau of Supplies and Accounts of the Navy has established a Food Research Section in its Subsistence Division in order to accentuate the efforts of the Navy to improve the nutritional value and quality of the navy ration. Food chemists and technologists both commissioned and civilian, who are experts in food research, will comprise the staff of the new section. The officer in charge will be Lieut Comdr Arthur J Harrington, SC USNR, formerly chief of the Import Section Office of Civilian Supply War Production Board.

## INSTRUCTION IN THE SPECIALTIES

Fifteen regular and reserve naval medical officers were assigned recently to duty under instruction in roentgenology and radiology at major naval hospitals. Ten medical officers are under instruction in anesthesia at the Mayo Clinic Rochester, Minn. and six officers at the Lakes Clinic, Boston. On completion of these courses these officers will be assigned to continental and mobile hospitals.

## NAVY PERSONALS

Several West Virginia physicians now in the Navy are members of the staff of the U S Naval Hospital at Quantico, Va. Comdr W M Sheppe, formerly of Wheeling, who has been serving as chief of medicine at the Naval Medical Specialists Unit No 40, has been promoted to the rank of captain. USNR. Captain Sheppe is an associate editor of the *West Virginia Medical Journal*. Lieut Comdr H G Little of Wheeling, who is in charge of the laboratories, has been promoted to the rank of commander. Lieut Comdr Russell Kevel of Charleston is chief of surgery. Lieut Comdr James K Stewart of Wheeling is director of the eye, ear, nose and throat department and Lieut A L Osterman of Wheeling is neuro-psychiatrist. Capt John Brewster of Weston, who has been in the naval medical corps for some years, is executive officer.

## LIEUTENANT BATES MISSING

Lieut John H Bates, MC USNR Reserve, formerly of New Preston, Conn., has been reported missing in action since a destroyer on which he was serving was lost February 1. Dr Bates graduated at Yale University School of Medicine, New Haven, in 1941 and was commissioned lieutenant in the U S Naval Reserve. He reported for active duty about July 15, 1942.

## WOMEN PHYSICIANS

Six lieutenants (jg) W-V(S), USNR, who are physicians will graduate from the basic course of instruction at the Naval Medical Center, Bethesda, Md., on April 27 and will be assigned to duty at the Naval Training School, Women's Reserve, the Bronx, New York.

## CIVILIAN DEFENSE

### GUARDING MILITARY INFORMATION

The United States government is engaged in an intensive campaign to impress on the public the importance of guarding information of a military nature. Beginning in April booklets containing personal messages from Admiral King, General Marshall and J. Edgar Hoover on this subject will be distributed through the facilities of the Office of Civilian Defense to the immediate families of men in the armed services. It is vital that every one observe the rule of not talking about any information of a confidential nature which one may possess.

vided by the Office of Defense Transportation on request of the commander of the local citizens' defense corps. Among such outside transport service is that for evacuation of civilians, for reinforcement of distant communities, for transfer of injured persons to emergency base hospitals in other cities or areas and for transportation of emergency civilian supplies between communities.

### PASADENA REORGANIZES EMERGENCY MEDICAL SERVICE

The civilian defense councils cooperating with the Red Cross have reorganized the emergency medical services in Pasadena and Altadena, Calif. The revised plan fits into the county setup. Instead of having seventeen casualty stations as dispatching centers for medical teams, now there are only six in the combined area. These teams comprise a physician, a nurse, several corps men, an ambulance and a squad car, to be dispatched from six base hospitals in Pasadena and one in Altadena. Dr. Leroy B. Sherry, chief medical officer of Pasadena, Dr. Paul Kinney, chief physician inspector of the Pasadena schools, Dr. H. W. Benjamin of the Altadena Defense Council and others cooperated in the revision of the emergency medical service plans.

### EMERGENCY MOBILIZATION OF MOTOR VEHICLES

The Office of Civilian Defense, Washington, D. C., issued on March 3 Operations Letter No. 114, defining the functions of regional, state and local transport officers and clarifying the relations of transport officers recommended in Operations Letter No. 86 with the Office of Defense Transportation and the American Red Cross under plans made for the mobilization of commercial motor vehicles to serve local citizens' defense corps. This letter states that the Office of Defense Transportation has the right of jurisdiction over all domestic transportation including commercial motor vehicle equipment and in the war effort may allocate its use in the most effectual manner.

By joint action of the Office of Defense Transportation and the Office of Civilian Defense, concurred in by the War and Navy departments, a plan for the mobilization of commercial vehicles to serve the War and Navy departments and local citizens' defense corps has been consummated, under which all local commercial motor vehicles except organized motor transport companies, are now available immediately to the transport officer of each citizens' defense corps for local service in case of war emergency without application to the Office of Defense Transportation. Also, under this plan, all transport facilities required for civilian service outside the local area will be pro-

### LIST OF PUBLICATIONS

The Office of Civilian Defense, Washington, D. C., announced on March 17 the first revision of its official list of Office of Civilian Defense publications and posters for the use of leaders in local defense councils. There is no charge for this list when it is used for this purpose; however, individuals not engaged in civilian defense who wish to secure these publications may purchase them from the Superintendent of Documents, Washington, D. C., which is the only agency authorized to sell federal publications.

## MISCELLANEOUS

### RUSSIAN WAR RELIEF, INC.

This relief agency, with headquarters at 11 East 35th Street, New York City, telephone Murray Hill 6-3203, has issued an appeal pointing out that the Russian medical profession is in dire need of medical supplies and surgical instruments to care for the wounded and the refugees. The appeal is made to the American people for contributions in kind rather than primarily in cash. Russian War Relief, Inc., has issued a lengthy official Russian list of medicines, laboratory and hospital supplies, drugs and surgical instruments which are particularly needed. Among the items are various kinds of surgical forceps, needle holders, scissors, knives, retractors, saws, elevators, autoclaves, trial lens sets, transfusion needles, spinal needles, rubber sheeting, surgeon's gloves, tourniquets, ice bags, sulfanilamide, caffeine, procaine and digitalis.

### PREFERENCE RATINGS TO REPAIR REFRIGERATION SYSTEMS

The War Production Board has amended preference rating order P-126 for the purpose of facilitating the acquisition of material for the emergency repair servicing of industrial and commercial refrigerating or air conditioning systems. Preference ratings are assigned to deliveries of such material on the terms and conditions set forth in the amendment to the order. Among other things under class I for the assignment of preference ratings are the processing, transportation or storage of food and dairy products for the Army or Navy of the United States, the United States Maritime Commission or the War Shipping Administration, and under class II the order relates to deliveries of material for emergency repair service for any system on which depends, among other things, (1) the continued operations of a plant engaged in industrial or commercial processing of food or food products (not including the processing of dairy products on a farm) and (2) the preser-

vation of blood plasma, pharmaceuticals or foods in a hospital and the transportation or storage of food and dairy products except in establishments selling or serving food at retail, and except for domestic storage.

### FUNDS FOR PURCHASE OF FOREIGN BODY LOCATORS

The junior members of the National Society Daughters of the American Revolution have presented a check for \$1,400 to the Bureau of Medicine and Surgery of the Navy for the purchase of instruments to aid in the location of foreign bodies known as the Berman Locator which had previously proved its usefulness in locating embedded foreign bodies and detecting their subsurface depth. The instrument is sensitive, according to the Navy Department, not only to iron and steel but also to silver, copper, aluminum and other metals. The check was presented by Mrs. Hansel D. Wilson of Grosse Pointe Mich., and Mrs. George D. Schermerhorn of Detroit to Rear Admiral Ross T. McIntire, Surgeon General of the Navy, who expressed appreciation of the organization's efforts in sponsoring the project.

### AMBULANCES PRESENTED TO THE GOVERNMENT

The Pythian Sisters, Grand Temple of Maryland, conducted a campaign for funds with which five field ambulances were purchased and presented to the United States government in a ceremony at Baltimore on February 13. The Grand Chief of the Maryland branch of this society, Mrs. Pearl C. Klem, who was the leader in the campaign for funds, turned the keys of the ambulances over to Col. Frank P. Strome of the Army Medical Corps, representing the Third Service Command. Major Howard W. Jackson made the speech of presentation.



## PUBLIC HEALTH UNDER HITLER

According to the *Kaizer Zeitung* of Nov. 16, 1942, speculation and illegal trading in medicines had assumed large proportions in Vilna. A number of medicines, including oils of ether, morphine and anesthetics, especially those used for wounded soldiers, have become scarce. The district commissioner reviewed the situation and anticipated in the near future a large collection of medicaments for Germany. The local herb market was widely known and had formerly supplied Germany to a great extent with medicinal herbs. The peasants should cultivate gardens in order to increase production of these plants.

*Aftonbladen*, Stockholm, of Nov. 17, 1942 reports from Oslo that 600,000 liters of cod liver oil was sent from Norway to Germany during September and October. It is estimated that more than 14,000 tons of cod liver oil has been exported to Germany since April 1941. During the whole period of occupation cod liver oil has been a valuable help to the civilian population, but stocks are now so reduced that only expectant mothers and children can get 1 teaspoon daily.

As stated in the *Klinsche Zeitung* of Nov. 25, 1942, at a meeting of the Cologne Society for Anthropology, Dozent Dr. Bauermeister of the University of Cologne spoke on genetic-biologic tests to determine parentage. Last year in the Cologne Institute alone about 3,000 people were examined. Here the foundations for a race biology of the Rhineland were laid. An examination of similarities between parents and child the decisive factor in the determination of parentage, is made by comparing three to four thousand hereditary characteristics which are recorded either by photography or by drawing. As a rule the mother-child relationship does not need any examination, it is rather the search for the father which is the object of all investigations. The less similarity a child has to its mother the more certain will be the verdict as to the father. In 1,200 cases examined in Cologne the proportion of cases in which science was not able to pronounce a verdict was 4 per cent, the number of absolutely certain cases against which even an oath could be disregarded was 5 per cent, the number of probable cases was 15 per cent, the number of very probable ones was 55 per cent and the number of most probable cases was 21 per cent. The speaker pointed out that the damage which would result if this question of parentage was to be left undecided would be much greater than the harm done in a case in which a wrong decision is made. Such cases are rare. At a time like the present, when millions of foreigners are working in the reich, genetic-biologic control is of an importance which could not be overrated.

A review of what has been done for young and expectant mothers is given in *Le Pays Reel* of Nov. 28, 1942. It states: "From the fourth until the sixth month of pregnancy, expectant mothers can get an extra ration of 14 bread coupons and 24 milk coupons per rationing period. Later until the birth they get an extra 14 bread coupons, 14 meat coupons and 30 milk coupons for each rationing period. The same rations can be had by young mothers for a period of two months after the birth of a child. After that they are entitled to only 30 milk coupons. From the fourth until the sixth month after the birth they can get 12 milk coupons per rationing period. The young and expectant mother will also get an egg card. This card will be valid six months before and six months after the birth. One egg a week is to be had on this card. The baby itself gets—apart from the normal rations—26 milk coupons per rationing period.

"Special regulations have also been issued for textile articles for both mothers and babies. Some people have doubted the value of these coupons because they said that one could not purchase the articles. We have learned, however, that all the articles can be bought without difficulty. There were some difficulties only with diapers, but this condition has improved since special shops have been appointed for the sale of these.

"Young mothers get an extra textile card containing 150 points and coupons for special articles such as bed covers, provided the birth of the child takes place at least three years after the previous child."

According to *Stefani* of Dec. 19, 1942 the cabinet has decreed the civil mobilization of doctors and pharmacists and, in general, of all persons carrying out health services.

DNB of Dec. 18, 1942 reports that following an agreement between the reich leader of the DAF, Ley, and the reich health leader, Conti, the health office of the DAF and the Association of German Panel Doctors have arranged for the district doctors to hold consulting hours in armament factories, supplementing the medical service provided by the works themselves. Thus armament workers will be able to undergo medical treatment in the works without having to waste time by going to the doctor and waiting there. Loss of working hours and output will thus be avoided. As a rule the works doctor will act for the district doctor, and the worker who has been certified as unfit for work will continue to be treated by his panel doctor.

*Klinsche Wochenschrift*, Berlin, Dec. 5, 1942, reports from the *Deutsche Militärarzt*, 1942, that German soldiers who have been sent to hygienically backward countries where the incidence of syphilis is high sometimes acquire extragenital syphilitic infections through the use of dirty and contaminated eating and drinking utensils.

According to *his Ujsdag* of Dec. 20, 1942 the minister of education has, in agreement with the university authorities, reduced the period of study for medical students by one year. This has been done in order to remedy the shortage of doctors.

The worst scarlet fever epidemic ever known is at present afflicting West Prussia, according to *Politiken* of Dec. 20, 1942. Entire families are being infected, and Marien hospitals are overcrowded. The cases are often followed by complications for instance kidney trouble and inflammation of the middle ear.

A recent edition of the *Petit Parisien* states that the services of the secretariat of state for health have been worried lately by a recrudescence of cases of venereal disease. To put a stop to this measures will soon be taken by Dr. Grasset. Antivenereal disease clinics are to be modernized and their mechanism improved in coming months. Antepartum consultations and the examination of nursing infants will be supervised by specialists in order to prevent the development of hereditary syphilis. A decree is about to be signed by the marshal which will make it obligatory for any persons having contracted a venereal disease to undergo treatment in a clinic of their own choice or under their usual doctor. This obligation will imply a further measure, namely the declaration by the doctor of each new case of venereal disease observed by him. If the diseased person agrees to be treated normally, this declaration will remain anonymous. On the other hand, if the diseased person should either neglect or refuse to undergo treatment the doctor will be obliged to declare the name of the diseased to the sanitary authorities.

According to *Transocean* of Dec. 30, 1942 the sterilization of persons whose children are bound to be weak in body and mind has now been rendered possible in Norway by law, it was announced in Oslo on December 30. The law further provides for the sterilization of criminals if it is considered likely that they will repeat the same criminal actions. In all cases the decision lies with the director of public health.

Rome Radio of January 12 stated that in application of the laws on the control of citizens in time of war, the national labor service center has ordered the federal labor service centers to take a census of all doctors and to call up for checking purposes all male doctors born in 1914, 1915 and 1916. The doctors will present themselves, if resident in the capital of the province, at the federal labor service center and, if resident in other communes at the respective labor service recruiting centers which are set up in each fascio. They must be provided with identity papers and make a written declaration containing all particulars asked. Those who fail without reasonable cause to present themselves at the labor service centers will be reported to the judicial authorities.

According to *Dagens Nyheter*, Stockholm, of February 5, the recent extremely difficult food situation has brought protective vaccination against tuberculosis into the limelight. A definite increase has not so far been observed in the number of cases, but from various parts of Norway more serious individual cases are reported, therefore preparations have been made for voluntary mass vaccination throughout Norway. The Norwegian National Union Against Tuberculosis voted a large amount for the purpose, and local unions are to supervise the campaign. Sufficient vaccine is available.

# ORGANIZATION SECTION

## REPORTS OF OFFICERS

**NOTE**—At the 1925 session of the Association, the House of Delegates suggested that all reports of officers, committees, etc. and resolutions to be brought before the House, if available, be published in advance of the session so as to permit careful consideration and discussion—Ed

### REPORT OF THE SECRETARY

To the Members of the House of Delegates of the American Medical Association

The following annual report of the Secretary is respectfully submitted

#### MEMBERSHIP

As of April 1, 1943 the official membership list of the American Medical Association carried 122,741 names. This number represents an increase of 2,040 over the number of members enrolled on the same date in 1941. The continuous growth of the Association's membership would seem to constitute a rather definite refutation of the charge sometimes made during the last few years to the effect that the Association has lost the support of a large part of the medical profession and that it does not officially represent the views and desires of the physicians of the nation. Such charges have emanated in most instances from sources entirely outside the profession itself. It is true that there are those within its own membership who are not wholly in accord with all its policies and who do not altogether approve some administrative methods, but that is a wholesome sign. Constructive criticism is helpful in any democratic organization, and it is a matter for congratulation and for thankfulness that the principle of free speech and independence of thought and individual conviction is still alive in the hearts and minds of our people, including the members of this Association.

It may be highly significant that within the last ten years the Association's membership has grown from 97,111 on April 1, 1933 to 122,741 on April 1, 1943 and in five years from 109,435 to the present number. The increase in membership is believed to be larger in proportion than the increase in the number of physicians resident in the United States.

In accordance with long established precedent, there appears as a part of this report a table designed to indicate the number of constituent associations and component societies, the number of physicians in each state and territory, the number of members in each major jurisdiction and other statistical data.

#### FELLOWSHIP

The number of names enrolled on the Fellowship roster as of April 1, 1943 was 72,851. The decrease of 896 from the enrollment on April 1, 1942 is explained by the fact that many Fellows called to active duty with the armed forces have resigned or have permitted their Fellowship to lapse because of uncertainties created by the war. However, a very considerable number of members have qualified as Fellows for the first time, and many of those who are now serving as medical officers have maintained Fellowship.

#### CANCELLATION OF ANNUAL SESSION

Because of conditions growing out of emergencies created by the war, the Board of Trustees, after thorough consideration of the many factors involved and by unanimous vote, decided that it would be advisable to cancel the annual session of the Association scheduled to be held in San Francisco in 1943. Announcement of this action was made several months ago and the decision apparently has met with general approval.

### Organization of Constituent State and Territorial Medical Associations, April 1, 1943

	Number of Counties in State	Number of Component Societies in State	No of Counties in State Not Organized	No of Physicians in State 17th Ed A M Directory	No of Members of State Associations	Number of Fellows in State
			1942	1943	1942	1943
Alabama	67	67		2 123	1 564	1 595
Arizona	14	13	1	615	383	390
Arkansas	75	68	11	1 806	1 085	1 070
California	58	40	8	12 365	9 987	7 314
Colorado	65	27	1	1 886	1 179	1 161
Connecticut	5	8		2 720	1 843	1 937
Delaware	3	3		360	248	245
Dist. Columb. a				4 040	898	924
Florida	67	3	17	2 391	1 397	1 429
Georgia	150	95	37	2 814	1 651	2 005
Idaho	44	9		446	321	320
Illinois	102	92	6	12 548	8 252	8 087
Indiana	92	83	1	4 165	3 262	3 344
Iowa	99	97		3 102	2 462	2 446
Kansas	105	70	17	2 042	1 080	1 060
Kentucky	120	113	3	2 717	1 557	1 8 6
Louisiana	64	42	15	2 691	1 547	1 551
Maine	16	15		1 011	756	751
Maryland	22	23		3 085	1 596	1 517
Massachusetts	14	18		8 085	5 416	5 412
Michigan	5	54		6 509	4 371	4 415
Minnesota	87	34	1	3 614	2 934	2 945
Mississippi	82	20	3	1 525	9 6	973
Missouri	114	77	8	5 183	3 279	3 214
Montana	56	17	21	556	442	476
Nebraska	95	50	16	1 637	1 150	1 147
Nevada	7	5	12	174	125	124
New Hampshire	10	10		687	539	540
New Jersey	21	21		6 038	4 211	4 178
New Mexico	21	14	17	447	281	272
New York	62	61	1	27 928	15 255	15 624
North Carolina	100	67	24	2 871	1 554	1 912
North Dakota	58	13	11	590	401	408
Ohio	85	87	1	9 466	6 668	6 783
Oklahoma	7	61	7	6	1 440	1 501
Oregon	36	25	2	1 493	806	912
Pennsylvania	65	60	6	13 505	9 769	9 922
Rhode Island	5	6	1	958	583	613
South Carolina	40	37	4	1 427	897	922
South Dakota	60	12	1	493	323	339
Tennessee	95	57	24	2 961	1 748	1 756
Texas	254	126		6 952	4 459	4 798
Utah	29	9	4	585	487	481
Vermont	14	10	3	561	399	387
Virginia	100	49	8	2 920	1 425	1 562
Washington	39	24	13	2 234	1 591	1 645
West Virginia	55	30	5	1 534	1 291	1 337
Wisconsin	71	52		3 551	2 569	2 587
Wyoming	24	11	11	265	192	195
Alaska				79	40	38
Hawaii	5	4	1	395	320	341
Isthmian Canal Zone				181	123	126
P. I. (Provinces)	56	25	30	4 209	1,2 0	1 947
Puerto Rico	7	7		526	402	450
Foreign				17		159
Total	3 139	2 040	352	155 903	120 701	122 741
Commissioned Medical Officers						69 011
						2 560
						72 851

#### INSTALLATION OF THE PRESIDENT

While there will be no meetings of the Scientific Assembly in 1943 a general meeting will be held in the Ball Room of the Palmer House on the evening of Tuesday, June 8 at which the President-Elect, Dr. James E. Paullin will be installed as President of the American Medical Association.

## REAPPORTIONMENT OF DELEGATES

Section 3 of chapter I of the By-Laws of the Association, which provides for a reapportionment of delegates every third year, reads as follows:

**SEC. 3. APPORTIONMENT OF DELEGATES.**—At the annual session of 1925 and every third year thereafter the House of Delegates shall appoint a committee of five on reapportionment of which the Speaker and the Secretary shall be members. The committee shall apportion the delegates among the constituent associations in accordance with article 5 section 3 of the Constitution and in proportion to the membership of each constituent association as recorded in the office of the Secretary of the American Medical Association on April 1 of the year in which the apportionment is made. This apportionment shall take effect at the next succeeding annual session and shall prevail until the next triennial apportionment whether the membership of the constituent association shall increase or decrease. (As amended 1925)

The last apportionment was made at the annual session held in New York in 1940. A new apportionment is due to be made at this session of the House of Delegates.

The Judicial Council, complying with instructions of the House of Delegates and after careful study of the provisions of the Constitution pertaining to the organization of the House of Delegates and of the provisions of the By-Laws pertaining to the apportionment of delegates, submitted in official report to the House at the 1942 annual session. In this report the Council stated its conclusions and offered the recommendation

(1) that the Constitution article 5 section 2 be amended to make delegates elected by the sections of the Scientific Assembly *ex officio* delegates without the right to vote or (2) because of the number of members of the Association now in government service and therefore unlikely to wield influence on their representation in this House of Delegates that all action be postponed and the reapportionment in 1943 be made under the present constitutional provisions.

The part of the report of the Judicial Council pertaining to apportionment of delegates was referred to the Reference Committee on Sections and Section Work. In its report to the House the Reference Committee proposed an amendment to the Constitution which is reproduced in the next section of this report of the Secretary. The Reference Committee also offered the following recommendation:

Since it is necessary for this amendment to lie over until the next annual session your reference committee also recommends the adoption of the second or alternative recommendation of the Judicial Council that because of the number of members of the Association now in government service and therefore unlikely to wield influence on their representatives in this House of Delegates the reapportionment in 1943 be made under the present constitutional provisions.

The recommendation of the Reference Committee on Sections and Section Work was adopted by the House of Delegates.

## PROPOSED AMENDMENT TO THE CONSTITUTION

The Reference Committee on Sections and Section Work submitted the following proposed amendment to the Constitution, article 5, section 2, to the House of Delegates at the annual session of the House held in 1942:

Amend article 5 section 2 of the Constitution by adding after the word Councils the words and the delegates elected by these sections of the Scientific Assembly so that the section reads as follows:

**SEC. 2.—COMPOSITION.**—The House of Delegates is composed of delegates elected by the constituent associations and by the sections of the Scientific Assembly and of delegates from the Medical Departments of the Army and the Navy and the Public Health Service appointed by the Surgeon General of the respective departments. The Trustees the *ex Presidents* of the Association the members of the several Councils and the delegates elected by these sections of the Scientific Assembly shall be *ex officio* members of the House of Delegates without the right to vote provided that members of the Councils who are also elected delegates may exercise all the rights of elected delegates.

In accordance with the provisions of the Constitution, this proposed amendment is respectfully presented.

## CORRECTION OF THE MINUTES

On page 68 of the printed Proceedings of the House of Delegates the minutes of the 1942 session of the House are made to show that Dr. Arthur J. Bedell had signed the report of the Reference Committee on Sections and Section Work. The Secretary has been informed that Dr. Bedell did not attach his name to the report of the reference committee and wishes to have the minutes corrected accordingly.

ANNUAL CONFERENCE OF SECRETARIES AND EDITORS OF  
CONSTITUENT STATE MEDICAL ASSOCIATIONS

The Annual Conference of Secretaries and Editors of Constituent State Medical Associations was held in Chicago in November 1942. These conferences have been held annually for many years except when some emergency has arisen to prevent. On most occasions nearly all state secretaries and editors of state medical journals have attended, and a constantly increasing number of other officials of state and county medical societies have been present at each of the conferences in the last several years. Members of the Board of Trustees and of the Association's administrative personnel also attend.

The programs of the conferences held in 1941 and 1942 were largely given over to discussion of matters pertaining to war service in which the Surgeon Generals of the Army, the Navy and the Public Health Service, the Director of the Selective Service System and the Federal Security Administrator, or their official representatives, have served as leaders. The Secretary is very sure that he expresses the sentiment of all members of the conferences in extending thanks to those officials who have so graciously and generously given of their time and effort to bring authentic and helpful information to the members of the conferences. Thanks are due also to others who have contributed to the conference programs and are herewith offered.

## MEMORIALS AND RESOLUTIONS

Up to the time when this report is being prepared, no memorials or resolutions have been submitted to the Secretary for inclusion.

## AND AGAIN

Even though it may be done in the same old words the Secretary offers in expression of his heartfelt thanks and grateful appreciation for the many kindnesses extended to him by the members of the House of Delegates by the officers and members of official bodies of the Association and of state and county medical societies and by those with whom he is associated in the Association's offices.

Respectfully submitted

OWEN WIST, Secretary

## REPORT OF THE BOARD OF TRUSTEES

*To the Members of the House of Delegates of the American Medical Association*

The following annual report of the Board of Trustees to the House of Delegates is respectfully submitted:

## Participation in the War Effort

For more than two years the official and administrative personnel of the American Medical Association and of its councils, bureaus and departments have been actively engaged in efforts designed to contribute to the success of the nation's war program. Members of all the Councils, the members of the Board of Trustees and the administrative personnel in practically every department have served in various capacities on committees or commissions of official standing in Washington or in other ways have been directly concerned with one or another phase of the war effort and in some instances have devoted a large part of their time to such service. Official representatives of the Association have on numerous occasions been called on to participate in official conferences held in Washington and have attempted in that connection and in many other ways to be as helpful as possible to the federal government.

It has been necessary to make certain phases of the work of some departments secondary in order that the greatest possible contribution might be made toward the successful prosecution of the war. The number of male employees of the Association fully eligible for war service has been comparatively small. At the time of the preparation of this report thirty-five employees of the Association including members of its professional staff as well as workers in other capacities have been assigned to active duty with the military forces. Five young women of the Association's personnel have been assigned to duty with the Women's Army Auxiliary Corps, and others are contemplating entering on a similar service.

A suboffice of the Procurement and Assignment Service for Physicians, Dentists and Veterinarians was established some months ago in the headquarters of the Association and is now operating intensively under the direction of Lieut Col H C Lueth of the Medical Corps of the Army of the United States. Practically all persons engaged in this particular work are Civil Service employees. This suboffice is engaged in compiling material for the use of the Procurement and Assignment Service and for the use of the Army, Navy, Public Health Service and other government agencies that may wish to utilize such data and is otherwise pursuing activities designed to be helpful to the government, to the civilian population and to the medical profession as a whole in its relations to the war program.

Many official releases from various federal offices have been published in *THE JOURNAL*, and several large mailings of informational material have been made from the offices of the Association at the request of responsible officials of government departments.

Thousands of individual communications from physicians and laymen pertaining to medical service with the military forces or to conditions created by the world war have poured in to the Association's offices and whenever possible and permissible, these communications have received careful attention and replies intended to be helpful to those concerned.

In order that the members of the House of Delegates may be informed as to the specific nature of some of the services that have been performed by officers, members of official bodies and the administrative personnel of the Association in connection with the war program of the federal government, the following information is offered.

The President of the American Medical Association, Brig Gen Fred W Rankin, Medical Corps, Army of the United States, has been on active duty assigned to the Office of the Surgeon General in Washington for more than a year. The President-Elect, Dr James E Paullin is a member of the Directing Board of the Procurement and Assignment Service for Physicians, Dentists and Veterinarians and is also a member of one or more committees of the Division of Medical Sciences of the National Research Council. Dr Harvey B Stone a member of the Council on Medical Education and Hospitals, is a member of the Directing Board of the Procurement and Assignment Service. Members of the Council on Pharmacy and Chemistry, the Council on Physical Therapy, the Council on Foods and Nutrition and the Council on Industrial Health are members of important scientific committees working under government auspices in Washington, and some of them are serving in other capacities.

The executive officers of all the Councils and the Directors of all the Bureaus of the Association have attempted whenever opportunity has offered to be helpful to government departments and bureaus in various matters pertaining to war service. Dr Paul C Barton, Director of the Bureau of Investigation and assistant to the Secretary, has been on duty in Washington for about four months. In compliance with requests received from several official agencies of the government the facilities of the Association have been used for the purpose of distributing rather large quantities of informative material.

Under the direction of the Editor of *THE JOURNAL*, a scientific news letter is prepared every two weeks which is sent under the auspices of the Committee on Information of the Division of Medical Sciences of the National Research Council to medical officers of the Army, Navy and Public Health Service. For the Navy, this material is incorporated in a fortnightly letter issued under the title 'Bumed,' and this letter, in accordance with a special request, is being sent also to the air force of the Canadian army and is issued to the medical officers of that force. The Editor of *THE JOURNAL* also serves as consultant to various offices and committees in Washington and is a member of a committee on drugs and medical supplies of the Division of Medical Sciences of the National Research Council and vice chairman of the Medical Committee of Civilian Defense for the City of Chicago.

The Library of the Association, with the cooperation of the Editorial Department, has assembled material relating to health conditions in various parts of the world for a division of the medical department of the U S Army. Through the Cur-

rent Medical Literature Department bibliographies and abstracts concerned especially with problems of military medicine have been prepared and submitted to federal agencies. From these abstracts collective reports and reviews are prepared which are published subsequently in *WAR MEDICINE*. A member of the editorial staff has directed the preparation of abstracts issued fortnightly covering progress in medical science for an important government office, and these abstracts are circulated in mimeographed form by that office in a manner that makes the material available in many parts of the world. Some of this material has been republished in periodicals in several countries. The director of the Department of Press Relations is serving as a member of committees or subcommittees of official government agencies in Washington and in somewhat similar capacity for the Emergency Medical Services of the Office of Civilian Defense in Chicago.

The Association has attempted to make the greatest possible contribution toward the winning of the war, and the Board of Trustees has authorized the active participation of the Association's administrative personnel in efforts designed to accomplish that end. In extending such cooperation to the government the Association has received most valuable aid from government officials and desires to express its grateful appreciation of many courtesies graciously extended and for valuable assistance and cordial cooperation offered by those officials.

### Income and Expenditures

It was expected that during the period covered by this report the income of the Association would be adversely affected by conditions growing out of the prosecution of the war, but such expectations were not realized. In accordance with long established precedent the Report of the Treasurer and the Report of the Auditor for the year ended Dec 31 1942 are submitted as a part of this report of the Board of Trustees.

Gross income from all sources for the fiscal year covered by this report amounted to \$1,975,236.30, an increase of \$36,108.91 over the amount of gross income as reported for the year ended Dec 31 1941. Total expenditures for the year ended Dec 31 1942 amounted to \$1,644,820.96, a decrease of \$70,958.79 from the total expenditures in the preceding year.

Income received from Fellowship dues and subscriptions amounted to \$804,319.66, which exceeds the income received from the same source in 1941 by \$8,859.18. It was stated in the report of the Board of Trustees submitted to the House of Delegates at the last annual session that income from Fellowship dues and subscriptions would in all probability be materially reduced in 1942, and it is gratifying indeed to be able to report to the House of Delegates that such receipts actually increased over comparable receipts for the preceding year.

Receipts from the sale of advertising space in *THE JOURNAL* amounted to \$1,036,571.59, representing an increase of \$26,717.63 over similar income for the year 1941.

The interest received on investments in 1942 amounted to \$74,482.58 as compared with receipts from a similar source in 1941 of \$77,424.09. There has been a continuous decrease in the amount of interest realized on the Association's investments during the past several years, explainable by the fact that interest rates and especially those applicable to many of the most dependable securities have been rather radically scaled downward and by the further fact that because of somewhat revolutionary changes in the issuance and distribution of such securities the difficulties involved in making satisfactory investments have been greatly intensified.

The net income for the year as shown in the Report of the Auditor which appears as an appendix to this report, was \$330,415.34, of which sum \$74,482.58 represented interest on the Association's investments.

The cost of paper used in the publication of *THE JOURNAL* in 1942 was \$262,682.14, representing an increase of \$2,491.15 over a similar expenditure for the year 1941. The price of practically all the paper used by the Association has been considerably increased, but the full effect of such increase is not shown in this item of expense for 1942, partly because stock in hand at the end of the preceding year was used during the year covered by this report. Restrictions placed on the pro-

duction of paper and on the use of this material by publishers has made it necessary to reduce the size of some of the Association's publications and to resort to other procedures in order that the allotment made under the rulings of the War Production Board shall not be exceeded. Lighter weight paper stock will be used in *THE JOURNAL* and in *HYGEIA* wherever possible, and the amount of printed material on each page of the special journals will be increased by cutting down the page margins. It is possible that if the war continues over any considerable period of time and if certain conditions incident to the war are deepened rather than improved, additional restrictions may be placed on the production and distribution of paper used by publishers. There is also a possibility that the cost of paper will increase rather than diminish.

Expenditures for wages and salaries reported in *THE JOURNAL* account in the Report of the Auditor for the year ended Dec 31, 1942 amounted to \$548,302.57 as compared with similar expenditures in 1941 of \$540,800.30. Because of higher living costs, it has been necessary to adjust the salary and wage scale, and further adjustments will have to be made. The total amount expended for wages and salaries in 1942 would have been somewhat larger except for the difficulties involved in maintaining adequate working personnel.

Expenditures incident to the operation of the various councils, bureaus and departments of the Association, including salaries and wages, amounted to \$467,974.57 in 1942, an increase of \$7,460.99 over similar expenditures in the preceding year.

Expenses under the heading Legal and Investigation Expense for 1942 amounted to \$64,449.71 as compared with \$119,183.19 in 1941. By far the larger part of expense incurred in this connection in 1941 was incident to the costs involved in the trial of the case of the United States of America versus the American Medical Association and the Medical Society of the District of Columbia et al and in expenses involved in appeals to higher courts from the decision rendered by the trial court.

The Association's buildings and equipment have been well cared for, and special care has been taken to maintain in good working order all machinery used in the publication of periodicals or required for the maintenance of buildings. During the year the inside walls of the main building were repainted or otherwise refurbished.

The number of employees of the Association at the time of the preparation of this report was 561.

#### Summary

Gross income from all sources for the year 1942 amounted to \$1,975,236.30, an increase of \$36,108.91 over the preceding year. Total expenditures for the year were \$1,644,820.96, which was less than the total expenditures during 1941 by the sum of \$70,958.79. Income received from Fellowship dues and subscriptions amounted to \$804,319.66, exceeding income from the same source in 1941 by \$8,859.18. Receipts from the sale of advertising space in *The Journal* were \$1,036,571.59, representing an increase of \$26,717.63. Interest received on investments in 1942 amounted to \$74,482.58 as compared with similar income in the preceding year of \$77,424.09. There has been a continuous decrease during the past several years in the amount of interest realized from the Association's investments. Net income for 1942 was \$330,415.34. The cost of paper used in the publication of *The Journal* amounted to \$262,682.14 during the past year, an increase of \$2,491.15 over similar expenditure in 1941. Expenditures for wages and salaries as reported in *The Journal* account for the year ended Dec 31, 1942 were \$548,302.57 as compared with expenditures on the same account in the preceding year of \$540,800.30, and expenditures incident to the operation of the various councils, bureaus and departments of the Association, including salaries and wages, amounted to \$467,974.57, an increase of \$7,460.99 over similar expenditures in 1941. Legal and investigation expense for 1942 was \$64,449.71 as compared with \$119,183.19 in the preceding year. At the time of preparation of this report there were 561 persons in the employ of the Association.

#### The Journal of the American Medical Association

The impact of the war, including enrolment in the armed forces of more than 45,000 physicians, has been recognized by special consideration given in *THE JOURNAL* to problems of military medicine and to official announcements related to the war effort. The department of *THE JOURNAL* devoted to "Medicine and the War" has regularly published for the benefit of the medical profession the official announcements of the U S Army Medical Department, the Bureau of Medicine and Surgery of the Navy, the Office of Civilian Defense, the United States Public Health Service, the Office of War Information, and those sections of the government concerned with the control of foods, drugs and medical supplies. Each of these government agencies has acknowledged in written communications the service rendered by *THE JOURNAL*, as the voice of American medicine in the coordination of the medical profession for the war effort.

In its editorials *THE JOURNAL* has aided the war effort by participation in the recruitment of physicians for the innumerable activities which they are called on to perform at this time.

The content of *THE JOURNAL* has been somewhat modified by the cancellation of many scientific medical meetings which used to be a source of scientific contributions. Nevertheless the prestige and the circulation of *THE JOURNAL* have served to make it first choice for submission of voluntary manuscripts, so that there is not a dearth of papers.

An arrangement has been made with the Council on Scientific Assembly and the officers of the scientific sections to prepare scientific programs just as if the annual session of 1943 were to be held. These manuscripts will then be submitted to a selected group of authorities who will present written discussions, these in turn being submitted to the original authors for closing discussions. It is believed that this method of development of material will serve a most useful purpose in keeping readers of *THE JOURNAL* abreast of scientific advances during the war period.

The war continues to interfere seriously with the receipt of correspondence and medical periodicals from foreign countries. The arrangements that have been made to cooperate with the Latin American nations are gradually being perfected so that correspondence is being received more frequently from our South American neighbors. Through arrangement with the government archives, microfilms of scientific periodicals published abroad will be received for abstracting in the periodicals of the Association and for indexing in the *QUARTERLY CUMULATIVE INDEX MEDICUS*.

The Organization Section of *THE JOURNAL* has served fully to inform the members and Fellows of the Association concerning the activities of various councils and official agencies of the Association and the work of the Board of Trustees and similar groups. Through this section also the reports of the Bureau of Legal Medicine and Legislation and of the Bureau of Medical Economics are given wide circulation.

Significant among the special articles published during 1942-1943 is the series on nutrition, developed under the auspices of the Council on Foods and Nutrition and planned ultimately for circulation as a book to be called "The Handbook of Nutrition."

*THE JOURNAL* is attempting to cooperate with the War Production Board in reducing the total amount of paper used during the year by 10 per cent. Conceivably the demands made on *THE JOURNAL* for the services it may render in the war effort may make it difficult to continue to comply with this demand. The situation has been placed before the representatives of the War Production Board.

There was a slight decrease, due entirely to war conditions, in the number of subscribers to *THE JOURNAL* during the year. On Dec 31, 1942 there were 103,692 names on the mailing list of *THE JOURNAL* as compared with 104,003 names on the same date in the preceding year, a difference of 311. It is extremely interesting to note in this connection the loss in 1942 of 261 subscribers from the Philippines as well as a decided reduction in the total number of foreign subscribers.

The accompanying table 1 indicates the number of Fellows and subscribers on THE JOURNAL mailing list in each state and territory on Jan 1, 1943 and also shows the number of Fellows and subscribers in other countries, the number of copies sent to advertisers and subscription agents and the number sent as

TABLE 1—Approximate Count of Fellows and Subscribers on The Journal Mailing List Jan 1, 1943 Showing Gain or Loss

State	Fellows	Subscribers	Totals	Gain	Loss
Alabama	610	303	913	111	
Arizona	218	171	389	41	
Arkansas	410	211	621	106	
California	4,430	3,110	7,540	1,011	
Colorado	776	35	1,031	6	
Connecticut	1,099	615	1,674		38
Delaware	113	78	191		16
District of Columbia	721	61	1,164	199	
Florida	916	538	1,454	193	
Georgia	890	593	1,483	173	
Idaho	164	97	261	11	
Illinois	4,083	2,990	7,073		114
Indiana	1,569	674	2,243		87
Iowa	1,104	156	1,260		101
Kansas	780	338	1,118		14
Kentucky	769	402	1,171	46	
Louisiana	819	517	1,336	87	
Maine	349	160	509		17
Maryland	985	734	1,719	30	
Massachusetts	2,797	1,004	4,401		107
Michigan	2,707	1,176	3,883		15
Minnesota	1,775	672	2,447		106
Mississippi	413	274	687	110	
Missouri	1,724	978	2,702	27	
Montana	198	89	287		16
Nebraska	586	249	835		4
Nevada	67	34	101		
New Hampshire	270	109	379		14
New Jersey	2,480	1,999	4,479		260
New Mexico	136	109	245	31	
New York	9,364	5,967	15,331	710	
North Carolina	910	631	1,541	76	
North Dakota	191	80	271	21	
Ohio	3,477	1,561	5,038	106	
Oklahoma	657	313	970	14	
Oregon	501	371	872	93	
Pennsylvania	8,480	2,602	11,082		194
Rhode Island	769	197	966	12	
South Carolina	303	707	1,010	107	
South Dakota	178	104	282	6	
Tennessee	763	497	1,260	13	
Texas	2,257	1,748	4,005	303	
Utah	209	113	322	79	
Vermont	178	69	247		12
Virginia	1,167	619	1,786	157	
Washington	931	76	1,007	93	
West Virginia	687	963	1,650	54	
Wisconsin	1,173	642	1,815	19	
Wyoming	110	48	158		4
U S Army		564	564	197	
U S Navy		700	700	90	
U S Public Health Service		104	104	5	
Alaska	90	34	124		21
Canada	18	606	624	95	
Cuba	7	243	250	33	
Hawaii	131	104	235		12
Mexico	8	201	209	39	
Panama	39	64	103	12	
Philippine Islands					961
Puerto Rico	64	89	153		15
Virgin Islands	1	5	6	2	
Foreign	62	1,850	1,912		921
Advertisers and agents			388		99
Exchanges			171		73
Complimentaries			107		13
Total on mailing list			103,692	3,409	3,763

exchange or complimentary copies. The number of physicians in each state, based on the Seventeenth Edition of the American Medical Directory, the number of physicians in each state who receive THE JOURNAL and the approximate percentage of such physicians are shown in table 2.

The net paid weekly average circulation in 1942 was 101,993 as compared with 100,027 in 1941. The total number of copies of THE JOURNAL printed in 1942 was 5,417,360.

#### Summary

Throughout the year 1942 special consideration has been given in the columns of The Journal to problems of military medicine and to official announcements related to the war effort. Acknowledgment of the service rendered by The Journal has been received from many government agencies.

Although the content of The Journal has been somewhat modified because of the cancellation of scientific

medical meetings which used to be a source of scientific contributions, The Journal apparently continues to be the first choice for submission of voluntary manuscripts.

A plan has been worked out with the cooperation of the Council on Scientific Assembly and the officers of the scientific sections whereby papers and discussions of them will be available for publication in The Journal during the coming year even though the regular annual session of the Association is not held.

The war continues to interfere seriously with the receipt of correspondence and medical periodicals from foreign countries, but cooperative arrangements are gradually being perfected with the Latin American countries, so that correspondence is being received more frequently from that source.

The Organization Section of The Journal continues to serve fully to inform the members and Fellows of the Association concerning Association activities.

It is conceivable that the demands made on The Journal for the services it may render in the prosecution of the war effort may make it difficult to continue to comply with the restrictions placed on the use of paper by the War Production Board, although up to this time there has been complete cooperation in this connection. The situation has been placed before representatives of the War Production Board.

TABLE 2—Percentage of Physicians Receiving The Journal\*

State	Number Receiving Journal	Physicians in A M A Directory	Approximate Percentage Receiving Journal
Alabama	993	2,123	47
Arizona	410	615	68
Arkansas	671	1,806	37
California	7,540	19,630	61
Colorado	1,031	1,886	55
Connecticut	1,674	2,790	62
Delaware	201	760	26
District of Columbia	1,364	4,540	30
Florida	1,404	2,391	63
Georgia	1,492	2,814	53
Idaho	261	446	58
Illinois	7,073	12,548	56
Indiana	2,243	4,160	54
Iowa	1,260	3,102	48
Kansas	1,118	2,047	55
Kentucky	1,171	2,717	45
Louisiana	1,336	2,601	52
Maine	509	1,011	50
Maryland	1,709	3,080	55
Massachusetts	4,401	8,080	64
Michigan	3,883	6,509	59
Minnesota	1,897	3,614	52
Mississippi	687	1,520	45
Missouri	2,702	5,163	51
Montana	287	566	51
Nebraska	835	1,637	51
Nevada	101	174	58
New Hampshire	379	687	55
New Jersey	4,479	6,008	63
New Mexico	245	447	59
New York	15,331	27,970	55
North Carolina	1,541	2,871	53
North Dakota	271	570	53
Ohio	5,041	9,460	54
Oklahoma	970	2,084	47
Oregon	872	1,493	58
Pennsylvania	11,082	13,503	60
Rhode Island	966	1,908	51
South Carolina	1,010	1,477	68
South Dakota	282	493	57
Tennessee	1,260	2,961	43
Texas	4,005	6,907	58
Utah	322	550	67
Vermont	247	501	49
Virginia	1,786	2,990	60
Washington	1,007	2,234	45
West Virginia	1,650	1,834	90
Wisconsin	1,815	3,001	60
Wyoming	158	263	60

\* This table gives the number of physicians (based on the Seventeenth Edition of the American Medical Directory) in the United States the number receiving THE JOURNAL and the approximate percentage in each state. Copies to physicians in the United States Army, Navy and Public Health Service are not included.

There was a slight decrease, due entirely to war conditions, in the number of subscribers to The Journal in 1942. The net paid weekly average circulation during the year was 101,993, and the total number of copies of The Journal printed was 5,417,360.

### Special Journals

Nine periodicals are included in the group of scientific publications of the Association generally referred to as the "special journals." They are the ARCHIVES OF INTERNAL MEDICINE, the ARCHIVES OF SURGERY, the AMERICAN JOURNAL OF DISEASES OF CHILDREN, the ARCHIVES OF OPHTHALMOLOGY, the ARCHIVES OF PATHOLOGY, the ARCHIVES OF NEUROLOGY AND PSYCHIATRY, the ARCHIVES OF OTOLARYNGOLOGY, the ARCHIVES OF DERMATOLOGY AND SYPHILOLOGY and WAR MEDICINE. Each of these journals deals with the special field of medicine indicated by its title, and each has its own editorial board elected by the Board of Trustees. The members of these boards devote a large amount of time and effort to their editorial duties, and the Association can well be proud of the products of their fine service. The contributions to the columns of these periodicals are of high quality, and each of the special journals has won recognition from specialists in many parts of the world.

The newest member of the group WAR MEDICINE has steadily gained favor. Its circulation in its second year increased over that of the preceding year by more than 33 per cent.

Certain special features of some of these journals notably symposiums and reviews in the ARCHIVES OF SURGERY and reviews in the ARCHIVES OF INTERNAL MEDICINE have attracted wide interest. The "Opie Number" of the ARCHIVES OF PATHOLOGY, published in July 1942 received high commendation.

Because of restrictions imposed by the federal government on paper supplies, it became necessary to reduce the number of pages in each of the special journals but this deficiency was minimized to some extent by reducing the width of page margins and widening printed columns.

Five of the special journals were published at a loss of \$16,027.96. Four produced income larger than the cost of publication by the sum of \$11,182.63, these four being the AMERICAN JOURNAL OF DISEASES OF CHILDREN, the ARCHIVES OF OTOLARYNGOLOGY, the ARCHIVES OF OPHTHALMOLOGY and WAR MEDICINE.

Total circulation of the nine special journals in 1942 was 28,880 as compared with a circulation of 28,576 in 1941. However, four showed decreases, varying from 45 for the ARCHIVES OF OTOLARYNGOLOGY to 320 for the ARCHIVES OF INTERNAL MEDICINE. Gains in circulation were recorded for WAR MEDICINE, the ARCHIVES OF OPHTHALMOLOGY, the ARCHIVES OF DERMATOLOGY AND SYPHILOLOGY, the ARCHIVES OF NEUROLOGY AND PSYCHIATRY and the ARCHIVES OF PATHOLOGY.

### Hygeia

The increasing success of HYGEIA is reflected in its circulation and its importance as a medium for the advertising of materials related to health. In some areas HYGEIA is relied on for providing collateral reading in courses of science in schools. Its feature articles and its editorials have had large circulation through repetition in the press. Outstanding as a part of its service in the war effort have been the special articles related to foods and nutrition, to industrial health and, particularly, to the health problems of women in industry. HYGEIA has served, moreover, to inform the public regarding the health aspects of military service.

The average net paid circulation of HYGEIA for the twelve months of the fiscal year was 111,021. In December 1942 the number of physicians on the subscription list was 15,017.

From a financial standpoint, 1942 was HYGEIA's best year. Substantial gains were recorded for both subscription and advertising income with the result that there was a net gain of \$40,376.34 from the year's operations.

The Woman's Auxiliary to the American Medical Association has continued its interest in HYGEIA and has been very helpful in maintaining its circulation. A past president of the Auxiliary was instrumental in securing the renewal of more than 800 subscriptions to HYGEIA for use in junior and senior high schools in Pennsylvania.

### Library

The Library of the American Medical Association distributed 2,466 library packages in 1942, approximately 20 per cent of which were sent to governmental agencies, including army and marine hospitals and naval training stations. Requests for library packages were received and filled from every state in the Union. While it has proved impractical to extend the package service outside the continental United States requests were received from Hawaii, Mexico and the Canal Zone and owing to the urgency of the requests, service was extended to those points. Requests for subjects dealing with war and military medicine including air raids and gas warfare led all other requests for 1942. Other subjects popular in 1942 were aviation medicine, sulfonamide, industrial medicine, heart disease, blood transfusion, treatment of burns and virus pneumonia.

During the year 12,267 periodicals were sent out through the Library's periodical lending service and approximately five thousand requests for references were received and filled.

Indexes for the three volumes of THE JOURNAL were prepared as usual in the Library.

Members of the Library staff assisted the Abstracting Department in the preparation of abstracts for members of committees of the National Research Council. The principal subjects covered were bacteriology of burns and wounds, blood substitutes, cardiovascular diseases, head injuries, healing of fractures, experimental malaria, malaria therapy, military psychiatry, peripheral nerve injuries, shock and thrombophlebitis.

Continuing the policy of maintaining only a ten year collection of periodicals, periodicals covering the year 1930 were distributed during the year to fifty-five libraries through the Medical Library Exchange.

The Employees Library, which makes books and magazines available to employees of the Association for an annual fee of 50 cents, circulated 4,107 books in 1942.

### Quarterly Cumulative Index Medicus

Because of conditions created by the global war comparatively few publications from foreign countries have been available for indexing during the past two years. Only 13,424 articles from such publications were indexed in 1942, a large percentage of which were from Spanish and Portuguese journals, whereas in 1940 there were 26,614 such articles. It is expected that arrangements may be made in 1943 for indexing 1942 material in much larger amount.

The cost of publication of the INDEX MEDICUS for 1942 because of the dearth of material available for indexing was greatly reduced and the loss sustained from its publication was considerably less than in previous years. Expenditures exceeded income from subscriptions and sales by the sum of \$27,337.94 for the year 1942.

### American Medical Directory

The preparation and publication of the Seventeenth Edition of the American Medical Directory was greatly delayed because thousands of physicians were assigned to duty with the military forces after the preliminary work was far advanced. It was necessary to make a great many changes in listings. Much time was lost also because of the difficulty encountered in maintaining adequate personnel. Because of the acute shortage of competent clerical help and of supplies as well as because so many physicians are serving as medical officers it is doubtful that it will be possible to publish another edition of the American Medical Directory at the regularly scheduled time in 1944.

The style of the Seventeenth Edition is practically the same as that of the previous edition. Symbols have been used to designate physicians serving with the military forces. The new Directory contains 201,272 names, as compared with 195,104 names in the Sixteenth Edition, and is larger by 122 pages.

The net loss for the Seventeenth Edition as of Dec. 31, 1942 amounted to \$12,338.66, a sum in excess of the loss on the previous edition by \$3,399.40.

In common with practically every department of the Association the Directory Department has cooperated to the full, to possible extent with the Procurement and Assignment Service.



and has been of material aid to that service and to other branches of the federal government in supplying and checking information concerning many thousands of physicians.

### Mailing and Order Department

The total number of pieces of outgoing first and third class mail handled through the Mailing Department in 1942 was 2,446,130, as compared with 2,582,248 in the previous year. For transmitting this mail 4,177,739 envelopes of all kinds were used. A large amount of first class mail was sent from the Association's offices during the year that was not handled through this department.

The Order Department handled 73,415 orders in 1942 involving the distribution of 355,309 items, an increase over the previous year of more than 1,400 orders.

The records of the Mailing and Order Department show that 5,946 mail bags containing 181.4 tons in average weekly weight of  $3\frac{1}{2}$  tons of second third and fourth class mail were used. This tonnage does not include the mailing of current weekly and monthly issues of the Association's publications which in 1942 amounted to approximately 3,160 tons, or a weekly average of 60.7 tons involving the use of 125,182 mail bags during the year.

### Cooperative Medical Advertising Bureau

The Cooperative Medical Advertising Bureau continued in 1942 to serve thirty-five of the official publications of constituent state medical associations.

Commissions earned by the Bureau during the year ended Dec. 31, 1942 amounted to \$42,681.71 which represents the Bureau's most successful year. The expense incident to the operation of the Bureau was \$14,751.55. Cash discounts allowed in excess of cash discounts received were \$1,930.16 and commissions remitted to state journals at the end of the year in proportion to the total amount of advertising secured for each cooperating journal amounted to \$26,000.

### Press Relations

The increasing recognition resulting from the nation's war effort of the importance of health is reflected in the press relations activities of the Association which are carried on under the supervision of the Editor of *THE JOURNAL*. Particularly important in the operations of this department during the past year was the extension of its information service through the medium of the *AMERICAN MEDICAL ASSOCIATION NEWS* to a large and constantly increasing number of house organs of industrial firms throughout the United States and Canada. The number of mediums through which the Association is reaching the farmers of the nation also was increased extensively during the year.

Typical of the comments being made about the public relations activities of the Association is the following statement which appeared in an editorial in a recent issue of the *Michigan Legal Record*: "It isn't exactly illegal to besmirch the general character of the medical profession. But it just isn't done because facts are continually placed before the public concerning the activities carried on by physicians to better the public health. This barrage of information is supplied by the national organization of the profession and all down the line through the state and county society."

Although news space in the newspapers of the country is being drastically reduced because of the paper shortage due to the nation's war activities the number of stories based on articles appearing in *THE JOURNAL* and *HYGEIA* during 1942 totaled more than eighty-three thousand, an increase of almost two thousand over the number in 1941. In addition an increasing number of feature stories and editorials based on information furnished by the Association appeared in the daily press and in popular magazines. The use by radio stations of information furnished by the Association also continued to increase during the year.

The mailing list of the *AMERICAN MEDICAL ASSOCIATION NEWS* includes three hundred and nineteen daily newspapers,

six papers on the mailing list having been suspended during the year, eighty-three news services, radio stations and miscellaneous publications, thirty-seven local and state health departments, fifty health and tuberculosis associations, seventy-nine county and local medical societies, fifty-three state and territorial medical societies, eighty-five national medical organizations, fifty-eight pharmaceutical companies and associations, sixty-four industrial organizations, nineteen educational institutions, twenty-four science writers and eighty miscellaneous publications and organizations. Fifty-five copies of the *AMERICAN MEDICAL ASSOCIATION NEWS* are sent weekly to various constituent state and territorial medical associations for distribution to small newspapers in their areas.

Indicative of the importance of the Association as a source of information was the fact that all the press associations and several of the nation's leading newspapers sent their science editors and reporters to cover the Atlantic City session. In some instances the papers sent more than one staff member to cover the session. A large number of stories pertaining to the Atlantic City session appeared prior to and during the meeting in the newspapers of Central and South America. These papers also are using throughout the year an increasing number of stories based on releases prepared by the Association.

The number of inquiries regarding various phases of medicine received in the Press Relations Department from newspapers, radio stations and other mediums of public information continued to increase in 1942. During the year these totaled more than three thousand eight hundred as compared with approximately three thousand one hundred in 1941 and two thousand in 1940. Inquiries pertaining to various medical phases of the war were responsible for a portion of this increase.

During 1942 the facilities of the Department of Press Relations were being used increasingly by various governmental agencies and other organizations particularly in connection with the nation's war effort. This was particularly true in regard to matters pertaining to industrial health, to the procurement and assignment of physicians for the armed forces and to the nation's civilian medical needs. State and county medical societies continued to call on this department for assistance in their press relations programs. The medical news page appearing in *HYGEIA* each month is furnished by the Press Relations Department.

### Council on Pharmacy and Chemistry

The Council on Pharmacy and Chemistry has completed thirty-eight years of service to the medical profession and to the public. During this time the Council has assumed ever increasing importance in the field of medicine until now it is truly considered one of the leading authorities on rational therapeutics. Its rules were adopted originally with the idea of protecting the medical profession and the public against fraud, undesirable secrecy and objectionable advertising in connection with proprietary medicinal articles. As time progressed the function of the Council was broadened, so that it now advises the medical profession concerning the status of medicinal articles, the profession is importuned to use, publishes reports on claimed advances in the use of drugs and with the aid of the Chemical Laboratory, elaborates standards for the control and identity of drugs that are introduced into materia medica. During 1942 the Council's observance of these principles and its leadership in medicine rose to a new peak.

### CONTRIBUTION TO THE WAR EFFORT

The Council has contributed directly and indirectly to the prosecution of the war effort. It has provided information for physicians in private practice in industry and in the armed forces; it has been of service to research centers, educational bodies and purchasing agencies and it has cooperated with governmental agencies, regulatory and advisory. The Council has supplied criteria for evaluating drugs to be used in industry and on the battle fields and information on therapeutic procedures, pharmacology, toxicology and the actions and uses of drugs and drug substitutes. Among the bodies with which the Council has maintained cooperative relationship are the Army, Navy, Public Health Service, War Production Board, Office of Emergency Management, Office of Price Administration.

National Research Council, National Safety Council, Office of Civilian Defense and American Red Cross

Four members of the headquarters office personnel are on active service with the armed forces. One Council member is on active service abroad, and another has spent some months in an allied country conducting a special survey. Most of the Council members are on one or more special committees in active or advisory capacities, of the central bodies which are directing the war effort.

#### GOOD WILL RELATIONS

During the year the Council on Pharmacy and Chemistry representing the American Medical Association, and the American Pharmaceutical Association sponsored a meeting for discussion of subjects of common interest. The meeting was so well attended and successful that both bodies hope to participate in another conference at an appropriate time.

Cooperative relationships have been established, or furthered with representatives of a number of foreign countries including Canada, England, China, Mexico, Brazil, Ecuador, Peru, Venezuela and Russia.

#### PUBLICATIONS

During the year, revision of New and Nonofficial Remedies 1942, Useful Drugs and Epitome of the U. S. Pharmacopeia and National Formulary was completed, and the new editions will be available early in 1943. Fifteen thousand copies of the Council's publications, including New and Nonofficial Remedies Useful Drugs, Epitome of the U. S. P. and N. F. Annual Reprint of the Reports of the Council and Glandular Physiology and Therapy were distributed. The figures for 1942 bring up to 380,000 the number of publications of the Council on Pharmacy and Chemistry which have been distributed over the last twenty year period. Included in this figure are 165,000 copies of New and Nonofficial Remedies, of which 75,000 have been complimentary paper bound copies issued to students in approved medical schools. Publications for which the Council is not solely responsible, such as the A. M. A. Intern's Manual and The Vitamins, are not included in these figures.

#### RESEARCH

A complete report of the Council's Committee on Therapeutic Research is included in the Addenda to the Report of the Board of Trustees. In brief, twenty-seven new grants were issued during 1942, making a total of sixty-seven grants which were still open at the end of the year. The number of grants that have been issued since the formation of this committee in 1911 is four hundred and ninety-three.

The Council is sponsoring status reports on preparations intended for the prevention and treatment of fungous infections and the treatment of Trichomonas vaginalis infections and of burns, on the antibacterial and anti-infective properties of soaps and commonly included ingredients, on the value of gas gangrene antitoxin and tetanus gas gangrene antitoxin, on metrizol, on tissue stimulants for wound healing and on xanthine derivatives, digitals and immunization against whooping cough. Some of these investigations have been completed and will be published soon.

#### EDUCATIONAL ACTIVITY AND OTHER WORK

During 1942 the Council adopted for publication forty-four reports consisting, in part, of statements of a general nature concerning the use of bulk ether in anesthesia, the status of sodium cacodylate, aminoacetic acid and the higher types of antipneumococcus serums, criteria for the evaluation of antibacterial agents and the proper use of vitamins in mixtures, and, in part, the status of compounds such as zinc peroxide, zephiran hydrochloride, bismuth ethyl camphorate, nikethamide, diethylstilbestrol and mecholyl bromide. It also adopted for publication twenty monographs on new drugs and accepted for inclusion in New and Nonofficial Remedies approximately two hundred and fifty drugs, involving over five hundred dosage forms and two thousand five hundred dosages. The Council also gave partial consideration to several hundred other therapeutic agents but did not complete action at the request of the manufacturer pending further investigation or because of insufficient data or submission of the products late in the year.

Although it is impossible to accept all requests for speaking engagements, the Secretary of the Council appeared on several occasions before audiences composed of physicians, chemists, pharmacists, students and others. The Secretary also appeared on several radio programs as a representative of the Council. Tentative plans have been made for a series of exhibits sponsored by the Council on Pharmacy and Chemistry which can be used before medical and lay groups.

#### ANNUAL MEETING OF THE COUNCIL

During the early part of October the Council held its annual two day meeting to discuss problems which had arisen during the year. The topics discussed included agents used in the prevention and treatment of athlete's foot, the promotion of mixed vitamin preparations to the public, labeling of vitamins used in therapeutic doses, contraceptives, artificial mineral waters, the use of the metric system in Council publications, the scope of New and Nonofficial Remedies, censorship of descriptions of new drugs published in THE JOURNAL and medical pharmaceutical relations. The censorship of Council descriptions of new drugs deserves special mention as the subject arose following discussion with the Office of Censorship and the Board of Economic Warfare. For the duration of the war, statements of description or methods of preparation of new drugs on their original publication in THE JOURNAL will be subject to censorship in the interests of national defense.

#### MEMBERSHIP

Dr. Austin F. Smith, who has been a member of the Council's staff at the headquarters office for several years, was appointed Acting Secretary of the Council on Pharmacy and Chemistry by the Board of Trustees following the resignation of Dr. Theodore G. Klumpp in December 1941. Dr. Smith now serves as Secretary of the Council.

The tragic death of Dr. Somer Weiss deprived the Council of a prominent member. As a new member Dr. Weiss had served with the Council only a short time, but during that period his abilities as a stimulating teacher, resourceful clinician and brilliant investigator made him one to whom all freely turned for advice and help. During the war Dr. Robert A. Hatcher retired from active membership and, by special action of the Board of Trustees, was made an Honorary Life Member. Dr. Hatcher was one of the two remaining charter members of the Council. His contributions to science and education as well as his attributes as a scholar and scientist are known to all. Dr. Chester S. Keefer of Boston University School of Medicine and Dr. Robert P. Herwick of the United States Food and Drug Administration were appointed to fill these vacancies.

#### Summary

The Council on Pharmacy and Chemistry has completed thirty-eight years of service to the medical profession. During 1942 the Council increased its contributions to the welfare of the physician and his patient, was of material aid to many agencies of the federal government in the prosecution of the war effort and established and furthered good will relations with representatives of a number of foreign countries. Several members of the Council and of its office staff are on active service with the armed forces, and others are members of special advisory committees which are aiding in directing the health of the civilian population and of the fighting troops.

Revision of several of the Council's publications was completed during the year, and the popularity of these publications appears to be increasing.

By issuing twenty-seven new research grants through the Committee on Therapeutic Research in 1942, the number of grants issued since 1911, when this committee was established, was brought up to four hundred and ninety-three. The Council initiated several status reports on a number of agents and therapeutic procedures which are of vital importance in medical practice.

The Council adopted for publication forty-four reports on the status of certain classes of drugs, twenty monographs on new drugs and accepted for inclusion in

New and Nonofficial Remedies approximately two hundred and fifty drugs including over five hundred dosage forms and two thousand five hundred dosages. Consideration of several hundred other drugs was not completed for one or more reasons.

During the year the Secretary appeared on several radio programs as a representative of the Council and also filled a number of speaking engagements.

At the annual meeting of the Council, topics discussed included prevention and treatment of fungous infections, promotion of mixed vitamins, labeling of vitamin preparations, mineral waters, contraceptives, use of the metric system, scope of New and Nonofficial Remedies, censorship of published descriptions of new drugs in *The Journal* and medical pharmaceutical relations.

Dr Austin E. Smith, who was appointed Acting Secretary following the resignation in December 1941 of Dr Theodore G. Klumpp, was later made Secretary of the Council on Pharmacy and Chemistry. The Council was deprived of two valuable members through the death of Dr Soma Weiss and the retirement of Dr Robert A. Hatcher. Drs Chester S. Keefer and Robert P. Herwick, authorities in their respective fields, have been appointed as new members.

### The Chemical Laboratory

The Chemical Laboratory has served the medical profession for over thirty six years. In 1942, as in former years, the primary function of the Laboratory has been the chemical consideration of medicinal products for the Council on Pharmacy and Chemistry. Information concerning the identity, purity and strength of new chemotherapeutic agents is made available to the profession generally through reports of the Council and of the Laboratory published in *THE JOURNAL*.

An important contribution of the Chemical Laboratory in the field of drug analysis during 1942 has been the chemical and physical characterization of the vitamin K active substance menadione bisulfite (2-methyl-1,4-naphthoquinone-sodium bisulfite addition product) and the development of techniques for its isolation, identification and detection in mixtures. Although this information has been accepted for publication in the chemical literature it has not yet been published because of wartime censorship. Another important contribution has been the publication of a method for the detection and quantitative determination of 4-amino-2-methyl-1-naphthol, another synthetic vitamin K.

The Laboratory is equipped with many of the newer types of apparatus which aid in the examination of chemical substances. The space and equipment for macroanalysis and the excellent facilities for microchemical analysis and spectrophotographic examination of materials have been augmented by the installation of a Beckman photoelectric spectrophotometer suitable for the determination of light absorption in both the ultraviolet and the visible portions of the spectrum and of a Coleman photoelectric fluorophotometer useful in the study of certain vitamin mixtures and other fluorescent substances.

### WORK FOR THE COUNCIL ON PHARMACY AND CHEMISTRY AND OTHER DEPARTMENTS OF THE ASSOCIATION

Each year the Laboratory is called on by the Council on Pharmacy and Chemistry to examine many of the newer substances being introduced into therapy and to assist in the development of suitable tests and standards by means of which uniformity in composition and action may be assured. In addition to the examination of many other products submitted to the Council in 1942, the Laboratory gave consideration to tests and standards for such substances as vitamin K<sub>1</sub>, sulfadiazine, pyridoxine hydrochloride, sulfaguanidine, sulfadiazine sodium, diethylstilbestrol, menadione bisulfite, calcium levulinate, phenarsine hydrochloride, hydroxymercurifuran, phemerol hydrochloride, bismuth ethylcamphorate, aluminum hydroxide gel, aluminum phosphate gel, delvalin sodium, diodrast compound solution, syrup of ammonium mandelate, zinc insulin crystals and succinylsulfathiazole. The Laboratory also served the Council in connection with revision of New and Nonofficial Remedies

1942 and devoted a considerable amount of time to the provision of chemical information in reply to correspondence and to problems of nomenclature.

The Laboratory has continued its cooperation with the Bureau of Investigation in the examination of a number of products sold to the public. The Laboratory staff in the classification of substances under correct chemical designations and has been of assistance to the advertising committee by means of technical advice and a number of laboratory studies.

The Chemical Laboratory continues to enjoy cooperation with the laboratories of the American Dental Association, the U. S. Food and Drug Administration and many manufacturers in the consideration of chemical problems concerning standards for the identity, purity and strength of various drugs.

### Summary

The Chemical Laboratory of the American Medical Association has made important contributions, arising from its work for the Council on Pharmacy and Chemistry, in the field of drug analysis. The addition of new equipment maintains its position in the vanguard of well equipped laboratories. The Laboratory has cooperated wholeheartedly with all departments of the Association and with a number of other organizations in the furtherance of its function.

### Council on Foods and Nutrition

Throughout the year 1942 the Council on Foods and Nutrition has been in constant touch with developments in the tremendously important food problems that have arisen in connection with the present world conflict and especially with those that concern the feeding of the civilian population. The Council has aided various governmental agencies in every possible way to meet these problems. With food rationing becoming more and more strict it has become necessary to devote more attention to methods of meeting nutritional requirements and the special needs of infants and of adults on special diets such as those suitable for use in the treatment of diabetes and peptic ulcer. The Council is keeping constantly in touch with governmental agencies charged with the promulgation and enforcement of orders pertaining to foods.

In cooperation with the Council on Industrial Health a Cooperative Committee on Nutrition in Industry has been established for the purpose of keeping physicians informed of newer developments in this special field. This committee already has held one meeting and helped arrange a program on the subject, some papers from which recently have been published in *THE JOURNAL*.

The activities of the Council on Foods and Nutrition during the year have been unusually numerous but mention will be made only of those matters that are of more immediate interest in the field of nutrition. There has been a crystallization of opinion about the fortification of foods with vitamins and minerals, or both, and the policies adopted by governmental agencies have been largely in harmony with those which have been painstakingly developed by the Council during the last several years. It is hoped that the enrichment of flour and bread which has now been made compulsory, will contribute importantly to maintaining the health of the civilian population. The Council adopted policies approving of the restorative addition of vitamins and minerals to processed breakfast cereal foods and in this connection has sponsored some original investigations to guide the Council and the industries concerned. Consideration has been given to the question of fortification of canned strained or chopped foods intended for the feeding of infants, small children and invalids, and it was decided that such fortification was unnecessary and hence would not be approved.

The scarcity of some items has brought to the attention of the Council a number of problems pertaining to the substitution of food ingredients. Much vitamin D milk which previously was prepared from a concentrate obtained from cod liver oil now is made with the use of other sources of vitamin D. On considering the evidence, the Council approved of a number of specific types of vitamin D milk but continues its require-

ments that the source as well as the unitage of the vitamin D be declared on the bottle caps. Manufacturers of ice cream have inquired about changes in the formulas of their products, and the Council has maintained the view that the quality, especially the nutritional quality, should be maintained, and that it would be preferable to produce less of an item rather than to diminish its food value.

#### COUNCIL REPORTS

In a detailed report which recently has been published, the Council has called attention to the desirability of maintaining "nutritional standards" in the formulation of mixed juices, frequently referred to as vegetable juice cocktails. The Council does not approve of juices of inferior nutritive value, which often are obtained when a product, such as tomato juice, is diluted for flavoring purposes with some other material.

A report was prepared and published on the comparative nutritional values of butter and oleomargarine. The evidence indicates that no nutritional disturbances accrue if oleomargarine is substituted for butter in the ordinary mixed diet of adults provided the oleomargarine supplies at least 9,000 units of vitamin A to the pound.

The nutritional problems frequently presented by sugar and manufactured food products containing large proportions of sugar were carefully studied and reports made. While sugar is a valuable food, the tendency of people to eat considerable quantities of the substance has placed an added burden on the other foods in the diet because sugar makes no contribution to the dietary requirements except for the calories which it supplies. Restriction of the use of sugar under wartime conditions would appear to be conducive to improved health if the calories previously consumed in the form of this food are replaced to an appropriate extent by foods that make a definite contribution to the nutritive requirements of the body. Consideration was given to the question of adding saccharin to foods and the Council has concluded that this practice is undesirable except for the production of special purpose foods specifically intended for dietary use by persons who for medical reasons, must restrict their carbohydrate intake. The Council also concluded that there is insufficient evidence to warrant the inclusion of sorbitol, a carbohydrate substitute, in ordinary foods.

In cooperation with the Council on Pharmacy and Chemistry, a report was published on the proper use of vitamins in mixtures. The principles introduced in this report already have served a useful function in the commercial formulation of these products. In cooperation with the Council on Industrial Health a report was prepared which discusses the pros and cons of the administration of vitamins to industrial workers.

#### OTHER ACTIVITIES

In conjunction with the Food and Nutrition Board of the National Research Council an exhibit was prepared on nutritional deficiency diseases. A pamphlet entitled "Food Charts: Foods as Sources of the Dietary Essentials" was also prepared. These activities have aroused considerable interest on the part of both physicians and the general public.

Under the auspices of the Council there has been published in THE JOURNAL a series of articles on foods and nutrition by leading experts in the field. This series of articles is now almost completed and will be reprinted in book form as a Handbook of Nutrition.

#### Summary

The Council on Foods and Nutrition during 1942 has kept in constant touch with developments in connection with food problems that have arisen as a result of the war and has aided governmental agencies in every possible way to meet these problems.

There has been a crystallization of opinion during the past year concerning the fortification of foods with vitamins and minerals, and policies adopted by governmental agencies have been largely in harmony with those of the Council.

The Council has given consideration to a number of problems pertaining to the substitution of food ingredients and has maintained in some instances that it would

be preferable to produce less of an item than to diminish its nutritional quality through substitution.

A Cooperative Committee on Nutrition in Industry has been established in cooperation with the Council on Industrial Health.

Reports of the Council published during the year included a report calling attention to the desirability of maintaining nutritional standards in the formulation of mixed vegetable juices, another on the comparative nutritional values of butter and oleomargarine and, in cooperation with the Council on Pharmacy and Chemistry and the Council on Industrial Health respectively, reports on the proper use of vitamins in mixtures and the administration of vitamins to industrial workers.

A series of articles on foods and nutrition by leading experts in the field have been published in THE JOURNAL under the auspices of the Council and will be reprinted in book form as a Handbook of Nutrition.

#### Council on Physical Therapy

The Council on Physical Therapy believes that because of the advances made since the conclusion of World War I when physical therapy proved to be of great value for rehabilitating men disabled in combat, physical therapeutic procedures will be employed even more widely and to greater advantage during and following the present conflict. Therefore the Council considers that its most useful function in the present war emergency is the presentation of useful, reliable and factual information about physical therapeutic methods for the attention of civilian army and navy physicians confronted with the task of rehabilitating the disabled soldier and much of the Council's activities during 1942 have been directed toward that end.

Because of the restrictions the War Production Board has placed on raw materials manufacturers of physical therapy equipment have been forced to limit the development of new products. In some instances manufacturers sell their entire output to the government and in other instances manufacturers have converted all the resources of their plants to the fabrication of materials of war. For these reasons fewer articles have been submitted to the Council for its consideration. The respite thus afforded in the investigation of apparatus has permitted the Council to intensify its study of problems pertaining to the application of physical therapy in the practice of medicine, particularly in military medicine. Government agencies solicit the advice of the Council on physical therapeutic procedures and apparatus and the problems thus presented have been carefully considered. Many other inquiries have come from members of the profession and from the public and these too have been answered with the most reliable information at hand.

#### MANUAL ON PHYSICAL THERAPY

In cooperation with the Subcommittee on Physical Therapy of the National Research Council, the Council prepared a Manual on Physical Therapy, a booklet which describes the application of physical therapeutic agents in the treatment of the injured soldier. The Council is now cooperating with the American Occupational Therapy Association and the subcommittee of the National Research Council in the preparation of a Manual on Occupational Therapy which gives valuable suggestions to the medical officers in the armed forces and to the general practitioner about the role of occupational therapy in the rehabilitation of war injured.

#### COUNCIL CONSULTANTS

The field of physical therapy embraces many specialized fields and the Council is fortunate in having groups of consultants who advise the Council on the problems arising in special fields.

**Education**—Since the Council believes that 90 per cent of the clinical value of physical therapy is dependent on intelligent application of exercise, massage and heat, proper instruction of the physical therapy technician is of paramount importance. The Consultants on Education have given valuable advice regarding standards of education and experience for physical therapy technicians. Fortified with this information the Coun-

cil has cooperated with the Council on Medical Education and Hospitals in revising the standard curriculum for schools for physical therapy technicians. The American Physiotherapy Association and the American Registry of Physical Therapy Technicians of the American Congress of Physical Therapy have contributed valuable assistance.

The Council authorized publication of an article entitled "The Responsibility of Medical Schools to Teach Physical Therapy."

**Artificial Limbs**—Participating with a group of specialists from the Association of Limb Manufacturers of America and with qualified surgeons having special information regarding amputations, the Council recorded its studies in the Handbook on Amputations recently published. This handbook gives useful information for the general surgeon regarding the proper site of amputation, the psychology of the patient, physical therapy procedures to pursue following amputation and training in the most efficient utilization of artificial limbs.

**Audiometers and Hearing Aids**—Manufacturers of hearing aids are not restricted as severely in the procurement of raw materials as are the manufacturers of other physical therapy equipment. With the help of the Consultants on Audiometers and Hearing Aids, the Council has continued to examine hearing aids and to publish reports. In conjunction with the consultants, the Council has revised and published the Minimum Requirements for Acceptable Audiometers and is now considering the revision of the minimum requirements for acceptable hearing aids.

An important contribution of the consultants has been the publication of a Tentative Standard Procedure for Evaluating Percentage Loss of Hearing in Medicolegal Cases. This article is the result of four years of careful study, during which all available known methods for determining the loss of hearing were examined and carefully scrutinized. It is believed by the Council that this contribution will be of great importance to the practice of medicine.

A survey of the work of the consultants was reviewed in the article "Five Years of Progress in the Field of Audiometers and Hearing Aids," which was published in THE JOURNAL. The Council appreciates the cooperation and advice which it has received from such organizations as the American Academy of Ophthalmology and Otolaryngology, the American Otological Society, the American Laryngological, Rhinological and Otolological Society and the American Society for the Hard of Hearing.

**Respirators**—Problems concerning the employment of respirators for producing artificial respiration over long periods of time were considered by the Consultants on Respirators and valuable suggestions were offered. To aid localities with no adequate supply of respirators, the Council published a report, "Simple Workable Respirator," giving specifications and directions for a homemade respirator.

**Ophthalmic Devices**—At its annual meeting in December 1942 the Council voted to reorganize its Committee on Ophthalmic Devices and defined its scope more clearly. Devices to be considered by this group of consultants are charts for testing vision and muscle balance, charts and instruments for orthoptic training, apparatus for applying heat to the eyes, diagnostic instruments of an optical nature and special or tinted lenses for which specific therapeutic claims are made.

#### ARTIFICIAL RESPIRATION

The Council continued its investigations and surveys in the field of artificial respiration, and evidence on both manual and mechanical artificial respiration has been accumulated. The survey of this problem, which is to be carried on over a period of five years, has been in progress but three years, and a complete report cannot yet be made.

#### ULTRAVIOLET RADIATION FOR DISINFECTING PURPOSES

Careful study has been given to the use of ultraviolet radiation for disinfecting purposes, and a statement declaring the Council's stand on the acceptance of ultraviolet lamps for this purpose has been published. The Council will consider for acceptance ultraviolet lamps for such use in operating rooms and in clinics and cubicles in hospitals when such places are

under the direction of physicians. The Council does not accept lamps claimed to be useful for sterilizing solids and liquids. The acceptance applies only to the disinfecting of air under controlled conditions.

#### "APPARATUS ACCEPTED"

The booklet "Apparatus Accepted" has been brought up to date and is available for distribution in its revised form. It contains a list of apparatus investigated and accepted by the Council.

#### RESEARCH

Through the Council's Committee on Research grants were made available for research to determine experimentally the minimum number and forms of electric current best suited for stimulation of normal and paralyzed muscles and to continue the survey of different methods of artificial respiration.

Twenty one reports of the Council on Physical Therapy were printed in THE JOURNAL in 1942.

The members of the Council on Physical Therapy and the Council's consultants who receive no remuneration have given most generously of their time and effort in promoting the work of the Council.

#### Summary

During 1942 the Council on Physical Therapy concentrated its efforts on reviewing the field of physical therapy and on making available reliable information about physical therapy in the treatment and rehabilitation of men disabled in combat. Because of the War Production Board restrictions, less physical therapy apparatus was submitted for consideration.

With the assistance of other groups, the Council prepared the Manual of Physical Therapy and the Handbook on Amputations, which have proved to be of great help to medical officers in the armed forces as well as to civilian practitioners. The Handbook on Occupational Therapy, now in preparation, should be a valuable guide to all who are interested in rehabilitation.

Important contributions of the Council's groups of consultants during 1942 were assistance in revising the curriculum for schools for physical therapy technicians, preparation of the Handbook on Amputations, investigation of audiometers and hearing aids, and published specifications for a homemade respirator.

Application of ultraviolet radiation for disinfecting purposes was studied, and a statement of the Council's position on the problem was published.

The booklet "Apparatus Accepted" was revised during the year.

Grants were made available for research on problems vital to physical therapy.

#### Council on Industrial Health

##### DEVELOPMENT OF INDUSTRIAL HEALTH SERVICE

As experience accumulates the Council on Industrial Health believes that any considerable spread of industrial health service particularly into smaller industrial units, or substantial elevation of medical standards in industry will depend on four major activities, namely creation of public interest, clarification of objectives, industrial medical education and improved industrial health organization in medical societies.

**Creation of Public Interest**—The greatest single obstacle to industrial medical development is lack of information about the health and economic benefits of preventive industrial medicine on the part of employers and employees.

It was recommended at the Atlantic City session in 1942 that an agency for public information preferably attached to the Subcommittee on Industrial Health and Medicine of the Office of Defense Health and Welfare Services be created to acquaint industrialists with the advantages of medical service in industry. This recommendation was approved by the House of Delegates but it has not been feasible to operate in this fashion and an alternative suggestion has been to the effect that public instruction should emanate from the Council on Industrial Health. It is the present intention that the staff of the Council shall prepare educational material for publication in THE JOURNAL and

in HYGEIA for redistribution through the AMERICAN MEDICAL ASSOCIATION NEWS into suitable channels of public information.

Contact has been maintained with employer associations. The National Association of Manufacturers continues to conduct conferences on industrial health for employers in selected areas, and the Council undertakes to supply names of physicians in these areas who may be willing to assist in this kind of educational service. The Chamber of Commerce of the United States has created a Health Advisory Council, and one of its major functions will be concerned with industrial health. The Council on Industrial Health has been consulted in the preliminary plans and is represented on the Advisory Council itself. It is expected that through this agency trade associations may be reached as well as state and local chambers of commerce.

The Council believes that there should be closer contact with labor organizations and that effort should be made to enlist their cooperation not only in establishing and maintaining preventive medical services within plants but also in the development of programs of health education covering nonoccupational disability.

*Clarification of Objectives of Industrial Health Service*—Since its inception, the Council on Industrial Health has tried to define as concisely as possible the purposes of industrial health service.

The essentials of an industrial health service are:

1. A competent physician who takes genuine interest in applying the principles of preventive medicine and hygiene to employed groups and who is willing to devote regular hours to such service in the working environment.

2. Industrial nurses with proper preparation, acting under the physician's immediate supervision or under standing orders developed by him or by the committee on industrial health of the county medical society.

3. Industrial hygiene service directed at improvement of working environment and control of all unhealthful exposures to be provided by physicians and others with guidance and assistance from the specialized personnel in state and local bureaus of industrial hygiene.

4. A health program which should include prompt and dependable first aid and emergency and subsequent medical and surgical care for all industrially induced disability; health conservation of employees through physical supervision and health education; close correlation with family physicians and community health agencies for early and proper management of nonoccupational sickness and injury; and good records of all causes of absence from work as a guide to the establishment of preventive measures.

*Industrial Medical Education*—Better opportunities for training have always been major objectives in the program of the Council. If there is to be greater demand for health conservation of the working population, physicians must be prepared to meet it. Educational activity in industrial health at the present time includes undergraduate and postgraduate study, intensive short courses and longer courses.

Considerable improvement has occurred in the kind and amount of industrial health instruction received by undergraduate medical students. A syllabus has been distributed by the Council to all approved medical schools in the United States and Canada and has been favorably received. This syllabus will be revised and redistributed in accordance with advances made in the field.

Introductory and refresher courses for the profession at large have usually been of one day's duration and have been offered in fifteen states. Contact has been established with the Associated State Postgraduate Committees of the State Medical Societies to extend this kind of activity.

Some experimentation is taking place with respect to intensive short courses under medical school sponsorship alone and in company with county and state medical society committees on industrial health. Response so far has been encouraging.

Opportunities for extended training by means of longer courses have been limited to a few professional schools. Until much greater development occurs along these lines, the status of industrial health as a specialty classification will be greatly retarded.

*Improved Industrial Health Organization in Medical Societies*—The Council has continued to take advantage of the structure of the American Medical Association to promote better medical organization for industrial health. All constituent state medical associations with the exception of Delaware, New Mexico and Vermont now have cooperating committees on industrial health. Some of them are doing excellent work, while others are committees in name only. Future success will depend on the reorganization of inactive committees and more comprehensive programs where progress is being made. Regular contact is maintained with these committees through bulletins, correspondence and field activity.

Some of the state committees on industrial health have met with considerable success in establishing cooperating committees in the county medical societies, a movement which contains the elements of genuinely successful organization. Full instructions for the guidance of these county society committees have been prepared and published by the Council.

There has been good progress in the relationship of the Council to the sections of the Scientific Assembly of the American Medical Association. Cooperating committees have been formed in all of the sections concerned. Some have already performed extremely valuable services, particularly those representing the Sections on Obstetrics and Gynecology, Dermatology and Syphilology, and Ophthalmology, while others are still in developmental stages. These agencies can be of immense assistance in educational and organizational activities.

The joint committee on nutrition in industry, composed of representatives of the Council on Industrial Health and the Council on Foods and Nutrition, has reviewed recent developments and will soon issue specific reports and recommendations. A symposium on this subject was sponsored by the joint committee at the fifth Annual Congress on Industrial Health.

A joint committee with the Council on Pharmacy and Chemistry is called for in a recent resolution of the Council on Industrial Health with a view to preparing and publishing an industrial medical formulary.

It is proposed to create a liaison committee with the Council on Physical Therapy as a means of maintaining close contact with agencies in the field of rehabilitation and for other purposes of report and procedure.

#### REPLACEMENT OF MEDICAL PERSONNEL IN ESSENTIAL WAR INDUSTRY

A special activity of the Council during the past year stems from requests of the War Participation Committee and the Procurement and Assignment Service to develop a plan for recruitment and placement of medical volunteers for service in essential war industry. The Council's plan included a canvass by county medical society committees on industrial health of available health resources in industrial areas and especially of physicians already serving or willing to serve in industry, of county and state facilities for specialized industrial hygiene consultation and of the existing industrial nurse supply. The plan also included adjustment to additional requirements by notifying industry that if a plant needs additional medical service application should be made to the county medical society committee on industrial health, which in turn will decide whether the need is valid and will attempt to meet the need locally, that if no local resources are available, the state chairman of procurement and assignment with the help of the state committee on industrial health will attempt to locate and assign the nearest competent volunteer, or that, if no resources exist in the state, arrangements may be made for intensive postgraduate training of volunteers having no previous training or experience or out of state volunteers may be secured by application to the Council on Industrial Health. The details of this procedure have been called to the attention of the state agencies concerned.

#### COMMITTEES OF THE COUNCIL

The Committee on Physical Examinations has prepared an outline of physical examinations in industry, which will shortly be ready for publication.

In addition to encouraging physicians to report occupational diseases, the Council expects, through its Committee on Occupational Disease Reporting, to give much more attention to



absenteeism studies as a basis for clinical investigation of morbidity and mortality in the working population

The Committee on Research is attempting to establish working relationships with similar committees of the sections of the Scientific Assembly for clinical investigation into medical and surgical aspects of industrial health service

Cash and medical benefits for industrial disability in the opinion of the Council's Committee on Workmen's Compensation comprise only one phase of workmen's compensation. Additional effort should be made to incorporate prevention and rehabilitation into a well rounded program. Steps have already been taken to interest compensation administrators and rehabilitation officials in a cooperative program with the Council as a means of returning disabled workers to a self sustaining basis as quickly as possible. It is the intention of the committee to prepare for publication reports on the best prevailing medical opinion concerning medical aspects of workmen's compensation administration

#### INSURANCE RELATIONSHIPS

The Council has met from time to time with the Joint Claims Committee of the Stock and Mutual Casualty Insurance Companies and it has been agreed that some conference machinery should be established between the two bodies for regular discussion of matters of mutual interest

#### INDUSTRIAL NURSING

At the present time an Outline of Procedure for Nurses in Industry is being prepared which will consist mainly of standing orders to be used as a guide by industrial nurses without regular medical supervision

#### INDUSTRIAL MEDICAL SERVICE PLANS

The Council is impressed with the rapid growth of industrial medical service plans and believes that information about them ought to be collected and made available to the profession as quickly as possible

#### Summary

Four major activities must be energetically pursued if industrial health service is to become widespread and if standards of medical service in industry are to improve. These are creation of public interest, clarification of industrial health objectives, improved industrial medical training and better local organization for preventive industrial medicine, surgery and hygiene

The ramifications of industrial health service are widespread and, if the clinical, economic and social problems involved are to be met competently, the interest of all elements and established agencies in medicine must be secured and effectively employed. Cooperation has been requested from state and county medical societies, specialty groups and the councils and bureaus of the American Medical Association

The Council on Industrial Health has undertaken to organize programs which will induce physicians to take more interest in adequate service for small plants and to develop a means for staffing essential war industry on a volunteer basis

Committees of the Council are engaged in studies of physical examination in industry, occupational disease reporting, workmen's compensation and essential research

Nutrition of the industrial worker is receiving much attention from government, from employers and from workers

Medical service plans are affecting the whole field of professional relations in industry, and the Council on Industrial Health believes that data ought to be available concerning these plans

Contact has been maintained with agencies of the federal government and with insurance, industrial and professional groups interested in industrial health. Cooperation from labor will be sought in the inauguration and maintenance of preventive medical service in industrial plants as well as of health education in general

#### Bureau of Health Education

The impact of war on the work of the Bureau of Health Education has begun to be apparent. Increasing travel difficulties indicate that 1942 will be the last year for the duration in which the Director of the Bureau can do extensive traveling

There was a slight shrinkage in the total volume of mail handled by the Bureau during 1942 which is accounted for by a reduction in official communications with physicians, medical societies and public health agencies and a decline in radio audience mail. Question and answer correspondence showed no significant fluctuation

The arrangement continues whereby the office work of the Committee on American Health Resorts is carried on in the Bureau of Health Education by the Director and a stenographer assigned to the committee. The Bureau has recently been assigned the responsibility of cooperating with the Association's new Committee on Student Health

#### BUREAU PUBLICATIONS

Thirty-eight items were prepared in the Bureau for publication in *THE JOURNAL* and seventeen for publication in *HYGIEA*. Twenty-nine articles prepared in the Bureau appeared in publications other than those of the American Medical Association

#### RADIO

The second series of radio broadcasts under the title *Doctors at Work*, begun in November 1940 was completed during the annual session of the American Medical Association at Atlantic City in June. This was the eighth consecutive year of coast to coast network dramatized broadcasts. It continued to its close with every indication of enthusiastic acceptance by physicians, nonmedical radio listeners, radio reviewers and the National Broadcasting Company

For 1942-1943 a new type of program was decided on with a title which would link it with the war situation and with the successful 'Doctors at Work' broadcasts. The new program was entitled 'Doctors at War'. It was found advisable to adopt a presentation similar to that of the March of Time. Owing to network conflicts with opera, postseason football games and government broadcasts related to the war it was not possible to start 'Doctors at War' until Dec 26 1942. The time for the program was the same as for the last series of 'Doctors at Work' namely Saturday afternoons at 5 p m Eastern War Time

Use of the radio library service maintained by the Bureau for local broadcasting showed a slight increase over 1941. Twelve county medical societies used material from this radio library for the first time in 1942. The library now contains 753 titles a reduction from 919 in 1941. Conditions due primarily to the war have interfered with local broadcasting. This is a time when broadcasts by the medical profession are of special importance, and the Bureau hopes to furnish transcribed programs for local use as a means of helping to take up the slack and to make up for curtailed travel in 1943

The Director delivered sixteen radio talks over local stations outside of Chicago while traveling, and the Assistant Director delivered one

At the Atlantic City session three local broadcasts were arranged, plus one broadcast each on the networks of the National Broadcasting Company, the Columbia Broadcasting System and the Blue Network. One of these local broadcasts was of round table type

#### MEETINGS AND CONFERENCES

The Director and the Assistant Director traveled 32,041 miles to address audiences or attend meetings in twenty-two states. Twenty-seven medical audiences, 147 lay audiences and 42 professional audiences other than medical were addressed, with a total attendance of 62,724. Fifty-eight conferences and meetings were attended

Increasing costs, difficulties and travel delays consequent on the war situation make necessary a reevaluation of the Bureau's activities. It appears advisable to turn to radio to replace travel

#### HYGIEA LOAN CLIPPING COLLECTIONS

Withdrawal of physicians from local communities has affected the demand for clipping loan collections, which in 1942 were



sent to only 265 physicians in 36 states and Canada. This is an activity which probably will be maintained "for the duration" at a low level.

#### HEALTH PUBLICATIONS

As a result of a large cut in the Association's paper quota consequent on the war situation, a careful review was made of the pamphlet situation. There was a total distribution of 365,787 pamphlets including 148,625 *HYGEIA* reprints, in 1942. This is the second successive year in which the distribution of pamphlets has increased enormously, the distribution in 1940 being 272,211. Since many of these pamphlets are purchased for use in schools the circulation of this printed matter is greater than the number of copies distributed. No estimate can be made of the total number of readers.

The health posters developed from 1938 to 1940 continue to be in demand. Seven hundred sets were sent out in 1942 making a total of 5,078 sets or 40,624 individual posters distributed since 1938.

#### SYMPOSIUM ON HEALTH PROBLEMS IN EDUCATION

The Symposium on Health Problems in Education customarily arranged in conjunction with the annual session of the American Medical Association, was omitted in 1942 because a previous symposium held at Atlantic City had been disappointing as to attendance. A symposium was held in connection with the annual meeting of the American Association of School Administrators in San Francisco in February 1942 sponsored by the Joint Committee on Health Problems in Education of the National Education Association and the American Medical Association with the cooperation of the American Association for Health Physical Education and Recreation, the Department of Home Economics and the Department of Science Instruction of the National Education Association.

#### COOPERATIVE RELATIONSHIPS

*Joint Committee on Health Problems in Education of the National Education Association and the American Medical Association*—The Joint Committee met at New Orleans in April in conjunction with the annual meeting of the American Association for Health Physical Education and Recreation. The meeting dealt mainly with questions of health education, healthful curriculum planning and specific problems in education with particular reference to food fatigue and activity. On the suggestion of the Association for Health Physical Education and Recreation, a committee was appointed to attempt to draft a statement dealing with the importance of exercise in relation to health and setting forth its benefits, limitations and dangers according to age, sex and physical condition. The Director of the Bureau was invited to participate with this committee and such participation was authorized by the Board of Trustees which also authorized the Director to call for consultation on Drs. Henry A. Christian, Brookline, Mass.; John S. Coulter, Chicago; Peter J. Steincrohn, Hartford, Conn.; and A. C. Ivy, Chicago. This statement was not completed as of the end of 1942.

Dr. W. W. Bauer, Director of the Bureau of Health Education, was reelected to membership on the Joint Committee for a five year term.

*United States Children's Bureau Advisory Committee*—No meeting of this committee was held during the year.

*American Association of School Administrators*—Although the Yearbook Commission which prepared the yearbook *Health in Schools* has finished its work, the benefits of association with this project continue to be observed. Membership on this commission gives the Director of the Bureau of Health Education improved recognition in his dealings with school administrators. Invitations to participate in educational conferences, meetings of state education associations and the national organizations of educators appear to be increasing as a result of this project. The yearbook itself, which was published early in 1942, has met with unqualified and enthusiastic acceptance.

*National Committee for Boys and Girls Club Work*—This work proceeds routinely with nothing of particular interest to report in 1942.

*National Congress of Parents and Teachers*—The most significant development in 1942 was the modification of the health and

Summer Round-Up program taking cognizance of the scarcity of doctors and nurses in home communities and endeavoring to minimize the demands on the time of these professional persons without losing the interest and impetus which has been built up by Parent-Teacher organizations through years of effort.

*Other Organizations*—The following organizations on which the Director of the Bureau represents the American Medical Association, were inactive during the year though not officially discontinued: Advisory Board, American Camping Association, Committee on Public Health, American Film Center, Advisory Committee, Community Nursing Service, National Organization for Public Health Nursing, Accident Prevention Conference, U. S. Department of Commerce.

The Committee on Professional Education of the American Public Health Association rendered a report in 1942 and was discharged. This report of the committee has now been adopted by the Governing Council of the American Public Health Association. It outlines educational and personal qualifications for health educators and states broad definitions of their functions under different circumstances.

The National Health Council Committee for the Study of Voluntary Health Agencies met at St. Louis during the meeting of the American Public Health Association and received progress reports. Thus far the study appears to deal mainly in generalities.

The National Conference for Cooperation in School Health Education met in December pursuant to the call of its executive committee which met in November. The Director of the Bureau attended the latter meeting but was prevented by illness from attending the conference. The conference confirmed the action of the executive committee which recommended that the conference must either procure funds to carry out its work or disband since there is no profit in continuing to meet merely for an exchange of views out of which nothing constructive could grow because of lack of funds and personnel for development. The conference voted to attempt to secure a grant or funds.

The Bureau has cooperated with twenty-nine agencies of the federal government or has furnished information to them during the year.

The Assistant Director of the Bureau has been appointed a member of the First Aid Medical Advisory Committee of the Chicago Chapter, American Red Cross.

#### MISCELLANEOUS

The Bureau was not called on during 1942 for active cooperation with the American Medical Association Committee for the Protection of Medical Research except to distribute to senior students in seventy-one medical schools pamphlets on animal experimentation accompanied by pamphlets on medical economics.

The Bureau continued its cooperation with the Women's Auxiliary to the American Medical Association in its various projects.

The Director of the Bureau with the assistance of several members of the headquarters personnel furnished to Dr. L. D. Bristol for the Fuel Rationing Division of the Office of Price Administration a review of the literature relating to health and comfort temperature zones in homes, institutions, hospitals, commercial and industrial establishments, offices and other indoor places.

The Assistant Director of the Bureau was placed in charge of equipping a first aid and recovery room for the benefit of employees in the Association's building. This first aid room will also serve to fulfill requirements of the Office of Civilian Defense in case of enemy action. The Assistant Director is in charge of first aid under the Office of Civilian Defense in the headquarters building.

The Bureau continued to promote periodic health examinations during 1942.

#### Summary

Increasing travel difficulties indicate that 1942 will be the last year for the duration of the war in which the Director or the Assistant Director of the Bureau of Health Education can do extensive traveling.

Another result of the war has been a slight reduction in the volume of mail handled by the Bureau.

Office work for the Association's Committee on American Health Resorts continues to be carried on in the Bureau and, in addition, the Director of the Bureau has recently been assigned the responsibility of cooperating with the new Committee on Student Health.

The American Medical Association's radio broadcasting program is conducted under the supervision of the Director of the Bureau. A new type of program entitled "Doctors at War" was started for 1942-1943 and has received much favorable comment. There was a slight increase in the use of the radio library service maintained by the Bureau, although war conditions have interfered with local broadcasting. The Bureau hopes to furnish transcribed programs for local use in 1943. The usual radio programs were successfully put on during the annual session of the Association at Atlantic City.

The distribution of Bureau pamphlets, including reprints from *Hygeia*, continues to increase, and the demand for the health poster sets sent out by the Bureau on request is well maintained.

Cooperative relationships were continued in 1942 between the Bureau of Health Education and other organizations, including the Joint Committee on Health Problems in Education of the National Education Association and the American Medical Association, the U. S. Children's Bureau Advisory Committee, the American Association of School Administrators, the National Committee for Boys and Girls Club Work, the National Congress of Parents and Teachers, the National Conference for School Health Education, the Woman's Auxiliary to the American Medical Association and a number of other groups as well as twenty-nine official agencies of the federal government.

The Director of the Bureau, with the assistance of others of the headquarters personnel, furnished a review of the literature relating to health and comfort temperature for the use of the Fuel Rationing Division of the Office of Price Administration.

#### Bureau of Legal Medicine and Legislation

The preparation of an adequate index to the third volume of *Medicolegal Cases* was completed during the year and this volume, containing abstracts of more than eight hundred court decisions of medicolegal interest that were published originally in *THE JOURNAL* during the calendar years 1936-1940 is now available. The preservation of these abstracts in book form as recommended in a resolution adopted by the House of Delegates in 1932, makes readily available an important grouping of court decisions of medicolegal significance, indexed primarily so as to reflect the medical issues involved.

#### LAWS REGULATING THE USE OF BARBITURATES

In the annual report of the Bureau for 1940 it was pointed out that twenty-seven states had at that time enacted laws to prevent promiscuous sales of the barbiturates, twenty-five of which limited sales to sales on prescription. The House of Delegates recommended that efforts be made to stimulate the remaining states to enact similar legislation.

During 1942 the legislatures of only eight states were in regular session. In seven of these states legislation of the type under consideration had already been enacted. The remaining state, Louisiana, took no action with respect to the matter. In 1943 the legislatures of forty-two states have met to date. Later on the legislatures of three other states will convene. The Bureau has undertaken to carry out the recommendation of the House of Delegates by communicating with the secretary of the state medical association of each state lacking adequate legislation to prevent the misuse of the barbiturates. In two of the states from which replies were received, Arizona and South Dakota, evidence was supplied indicating that the sale of the preparations was already on a prescription basis by reason of regulations that had been promulgated by the proper enforcement agency and that additional legislation was therefore unnecessary.

In many of the states the medical associations decided to postpone action with respect to this particular legislation until the present war emergency has passed because of the pendency of many acute problems intimately associated with the war effort. In four states however, Massachusetts, Michigan, Missouri and North Dakota, legislation is now pending to effectuate the recommendation of the House of Delegates. In Connecticut amendatory legislation has been introduced further circumscribing the use of the barbiturates by preventing the refilling of prescriptions except in accordance with the written direction of the prescribing physician and by limiting the dispensing of the barbiturates by a physician to emergency use only. This bill also clarifies existing law so as to make certain that the barbiturates may not be dispensed except on prescription. The Bureau will continue its efforts to stimulate legislative action in this field.

#### MEDICAL LICENSURE AND THE WAR

Many problems of medical licensure have arisen because of the war. One was precipitated by the acceleration of medical courses so that students may graduate after three calendar years of study. There were provisions in medical practice acts of a number of states that prevented the licensure of applicants whose course of medical instruction covered such a short period of time. The Bureau undertook a study of all the medical practice acts and prepared a memorandum covering the results of its study which indicated in short, that there were nine states Georgia, Illinois, Kansas, Maryland, Michigan, Nebraska, New Jersey, South Carolina and Virginia in which graduates after thirty-six months of study could not qualify for licensure. During this study the Bureau collaborated closely with the Federation of State Medical Boards of the United States.

The Bureau and the Federation brought the situation to the attention of the state medical associations and the state medical licensing agencies of the nine states involved, urging that amendatory legislation be promptly enacted so that the graduates after the accelerated courses would not be penalized by inability to obtain licensure. In New Jersey, South Carolina and Virginia necessary legislation has been enacted. In Georgia no legislation to deal with the matter has been proposed. In the opinion of the medical examining board of that state none is necessary despite the fact that the medical practice act requires at least forty-two months to have elapsed between the beginning of the student's first course of medical lectures and the date of his graduation. In the remaining states appropriate legislation has been introduced with the exception of Illinois, where the legislative committee of the state medical society is preparing a draft of legislation.

Another licensure problem has been precipitated by the development of critical areas in some of the states, areas that have been depleted of the services of physicians by demands of the Army and Navy and areas in which there has been a sudden influx of population. The shortage in such areas in many instances, it is said, cannot be met by the relocating of physicians from other sections of the state involved and it has been necessary to consider the interstate relocation of physicians. Such a process has given rise to the need of providing medical licensure speedily to such relocated physicians. Following a meeting of the Executive Council of the Federation of State Medical Boards of the United States and the Directing Board of the Procurement and Assignment Service for Physicians, Dentists and Veterinarians of the War Manpower Commission held in Washington, it was suggested as an expedient that legislation be enacted by the several states under which temporary permits could be issued to such out of state physicians as were willing to be relocated.

That temporary licensure even as an expedient to serve a desirable end is fraught with danger to established standards must be recognized, and considerable opposition has developed to the suggested expedient because of that recognition. It is felt by many that if the customary reciprocity procedures could be geared or adapted to provide licensure promptly for the relocated physician who has been found qualified by the examining agency of another state then the needs of critical areas could be expeditiously met without undermining the licensure standards that have been constructed over a period of many years.

In states maintaining no reciprocal relations with other states another solution must be sought, for civilian areas distressed by reason of the absence of medical care must be supplied that care either by action in or by the states themselves or in some other manner.

In seven states, Delaware, Kansas, Maine, Maryland, Nevada, Pennsylvania and Vermont, legislation is pending, modeled generally after the draft prepared during the December Washington conference, providing for the issuance of temporary permits or licenses to supply critical areas with needed physicians. Having the same objective in view is a pending bill in Congress relating to the District of Columbia. In the state of Washington legislation has been offered by means of which temporary licenses may be issued valid only until the next ensuing meeting of the examining board. In California a pending bill will speed up the reciprocity procedure so that there will result no unnecessary delay in providing licensure for the relocated physician.

In New Jersey legislation suggests a different approach to the problem of supplying medical care for critical areas. It provides that whenever the governor shall determine that inadequacies of medical facilities or personnel arising out of conditions created by the national emergency exist in any area he may on the recommendation of the commissioner of health designate that area as an emergency one. The state commissioner of health will then be empowered, in cooperation with the local board or boards of health and other state, local or federal health or welfare agencies, to designate, appoint or employ for service therein such necessary medical and health personnel as may be required to meet the existing inadequacies. A somewhat similar approach is suggested by a Colorado bill which would authorize the state board of health to declare emergency areas. In such a declared emergency area all full time state, county and municipal public health officers who are graduates of medical, dental or nursing schools approved by the state board of health and who possess licenses to practice in any state will be authorized during the emergency to engage in practice in Colorado regardless of whether or not they hold Colorado licenses. Such public health officers will be permitted to make charges for all services of a private nature the fees to be deposited in the general fund of the state or in the general fund of a political subdivision, depending on whether services were rendered by an officer of the state or of the subdivision.

Under existing law in New Jersey a qualified physician of another state may be permitted to take charge of the practice of a New Jersey licensee during the latter's absence from the state. A pending bill proposes that such permission may be granted for a period of not less than two weeks nor more than four months and that the board of medical examiners in its discretion may extend such permission for further periods of two weeks to four months but not to exceed in the aggregate one year.

Another licensure problem will arise if plans now being formulated to accelerate premedical education are carried through. Medical practice acts in a number of states require that an applicant for licensure must present evidence of having completed two years of college work before beginning his professional course. It would seem obvious that, if premedical education is shortened to less than two years, changes will become necessary in the state laws to avoid a licensure problem. While it is possible that in some of these states administrative discretion may be lodged with the examining and licensing agency, such discretion may not be exercised in all the states.

There was at one time too a suggestion that the internship period be reduced, for the duration of the war, from one year to nine months. In ten states medical practice acts require that an applicant must have completed an internship of at least twelve months. A similar requirement obtains in other states, not by reason of any statutory provision but because of rulings of state boards. In the latter group of states, additional legislation would not be necessary because the matter could be adjusted by a change in board rulings. In the former group, however, amendatory legislation would be required. In two states, Delaware and Pennsylvania, bills have been introduced to reduce, for the duration of the war, the required period of internship from twelve months to nine months. This legislation does not

stem from the suggestion that has been made to reduce generally the period of internship to speed up the process of the education of physicians but from situations that have developed in hospitals by reason of the acceleration of medical courses generally. The Delaware bill has become a law.

Twenty-three states have enacted laws imposing on physicians the duty to renew their licenses annually in order to keep them in effect and to pay an annual registration fee. One other state, Missouri, provides for a biennial registration. A number of the states have recognized that injustice may be done to physicians in service who by reason of absence on duty with the military forces will be unable strictly to comply with these laws. To obviate such an injustice legislation has been proposed to exempt from the registration requirements physicians in the armed forces. Such legislation is pending in California, Colorado, Idaho, Kansas, Minnesota, Missouri, Nebraska, Pennsylvania and Washington.

#### COURSES IN MEDICAL JURISPRUDENCE

A survey has been initiated to assemble in the files of the Bureau authentic and detailed information with respect to the courses in medical jurisprudence now being offered in the accredited medical schools in the United States. Inquiries have been directed to the deans of such schools and the responses have been most gratifying, replies having been received to date from fifty-seven of the seventy-six schools. In many instances complete outlines of courses have been furnished and in others complete texts of the material used in the courses.

The purposes of the survey which is continuing, have been threefold: (1) to ascertain the extent to which the subject is now being taught; (2) to obtain detailed information on which to predicate the development of a program of study better to fit the young physician to meet contacts with the law in its various relations; and (3) to facilitate the distribution of source material to libraries of medical schools that may advantageously be used in connection with courses in medical jurisprudence. It is appreciated that the time is not propitious to urge now that additional emphasis be given to the subject in medical schools; other needs are more vitally urgent and compelling. The material that has been assembled, however, together with other data that it is hoped may become available will be carefully studied and compiled. It constitutes basic information on which to predicate recommendations later on.

#### LEGAL MEDICINE IN PHILADELPHIA

The Bureau has noted with considerable interest an important development in Philadelphia in the field of legal medicine consisting of an initial series of lectures on legal medicine under the direction of the coroner, Dr. H. M. Goddard, and under the sponsorship of the Philadelphia County Medical Society, the six medical and two law schools of the city, the Bar Association, the District Attorney's office and the Philadelphia College of Pharmacy and Science. The lectures are given at the headquarters of the county medical society and are open without charge to all students of the city's medical, law and pharmacy schools and of the police college, and to all physicians and lawyers. The initial series of lectures was well attended and received. Plans are being made to present a second series in the fall and possibly to repeat the program annually. Integrating as they do the various interests of the community that should be concerned with the development of sound knowledge on the subject of legal medicine, these symposiums may well set a pattern worthy of emulation elsewhere.

#### CERTIFICATION OF CHECKS IN PAYMENT OF NARCOTIC TAX

The House of Delegates at its Atlantic City 1942 session adopted a resolution in protest of the requirement that checks in payment of the annual tax of one dollar imposed on physicians by the Harrison Narcotic Act be certified, urged that the Association take steps for the elimination of the requirement and suggested that copies of the resolution be sent to important national dentist, veterinary, pharmacist, manufacturing chemist and banker organizations. Copies of the resolution were sent to the American Veterinary Medical Association, the American Pharmaceutical Association, the American Pharmaceutical

Manufacturers' Association, the American Drug Manufacturers' Association, the American Chemical Society, the American Bankers' Association and the American Dental Association. Three of the associations named merely acknowledged receipt of the communication, no replies were received from the others.

Collectors of internal revenue may, by law, receive uncertified checks in payment of certain taxes, such as income war profits and excess profit taxes. Section 3656(b) Internal Revenue Code, sets forth the conditions under which uncertified checks may be accepted by the several collectors in the following language:

Collectors may receive uncertified checks in payment of income war profits and excess profit taxes and any other taxes payable *other than by stamp* during such time and under such rules and regulations as the Commissioner with the approval of the Secretary shall prescribe (Italics supplied)

The Harrison Narcotic Act tax is paid by stamp and therefore under the existing law collectors of internal revenue are not authorized to receive uncertified checks in payment thereof. In the hope, however, that there was some possibility of the exercise of administrative discretion in the matter the Bureau addressed a letter to the Commissioner of Internal Revenue calling attention to the resolution adopted by the House of Delegates and to the fact that the present requirement is a source of irritation to physicians. It was suggested that if there was a practical way by which the matter could be adjusted administratively the reaction would be most beneficial. It was suggested to the Commissioner too that if uncertified checks could be accepted in payment of the tax and the delivery of the tax stamps held up until the checks have cleared the source of irritation would be removed and the collectors of internal revenue would, at the same time, be afforded protection to the same extent as they are at the present time. The Office of the Commissioner of Internal Revenue, however, not unexpectedly advised the Bureau that in the absence of a change in the law it would be unable to authorize the collectors to accept uncertified checks in payment of the narcotic tax.

In order to accomplish the results suggested in the resolution adopted by the House, it will be necessary to secure the enactment by Congress of amendatory legislation and, since such legislation, to be consistent, must abrogate the certification requirement with respect to all taxes paid by stamps, the probability of the Congress acquiescing in the suggested change would seem to be remote.

#### THE NEW FEDERAL INCOME AND VICTORY TAX

The revenue act of 1942 was approved by the President on Oct 21, 1942. It greatly increased the tax burden of physicians along with other federal income tax payers. It effected no changes, however, in the deductions that a physician may claim for professional expenses. A detailed statement of the provisions of the new law was prepared by the Bureau and published in the Jan 30, 1943 issue of THE JOURNAL to aid physicians in the execution of their returns, particular emphasis being placed on the requirements of the law in relation to physicians in service.

In the annual report for the Bureau for last year, attention was directed to an injustice that had existed for a number of years in the manner in which uncollected accounts on the books of a physician at the time of his death have been treated for income tax purposes. Efforts were made by the Bureau to correct that unjust situation. The efforts met with success. Hereafter such unpaid accounts will not be considered as part of the income of the decedent for the year of death, as has heretofore been the case, but will be taxable when paid as a part of the income of the person who received the money. This change in the law will relieve the estates of deceased physicians of a tax burden that might easily impose a very severe hardship.

A new provision appears in the act under which a taxpayer may deduct amounts expended for medical, dental and hospital care to the extent that such expenses exceed 5 per cent of the net income of the taxpayer but not in excess of \$2,500 in the case of the head of a family or \$1,250 in the case of other individual taxpayers. Prior to this new federal provision the income tax laws of two states, Idaho and Minnesota, specifically

authorized the deduction of such expended amounts. The Idaho law authorized the deduction of amounts in excess of \$100. The Minnesota law contained no limiting phraseology as to the amount to be deducted. Since the federal authorization was enacted legislation has been proposed in New York, Oklahoma and Wisconsin to authorize the deduction of an unlimited amount and in Iowa to authorize the deduction of amounts similar to those authorized in the federal act.

The new revenue act imposes a 5 per cent victory tax on individuals applicable to income received after Dec 31, 1942. Physicians generally need not be concerned with the payment of this tax until they file their returns on or before March 15, 1944 unless in the meantime a pay as you go system of the collection of federal income taxes is made effective. Beginning Jan 1 1943 however, physicians who were employers have been required to withhold the tax from wages paid in excess of \$12 a week or \$624 a year. Physicians who have been employees have had the tax withheld from their salaries. To apprise the medical profession of the obligations imposed on it by this new victory tax the Bureau prepared a summary of its requirements, which was published in the Dec 5, 1942 issue of THE JOURNAL.

#### SCIENTIFIC TESTS FOR INTOXICATION

Laws are in force in Indiana, Maine and New York that give recognition to the reliability of chemical tests to determine intoxication by specifically providing for the admission in evidence of the results of such tests. The courts too, even in the absence of specific legislation, have admitted the results in evidence in cases in which the suspected drunken person has voluntarily submitted to the test, on the general ground that the testing procedure has passed beyond the twilight zone of the experimental into the realm of demonstrable scientific dependability. Several cases involving the admissibility of this type of evidence have arisen in Iowa, others in Arizona, Massachusetts and Texas.

In the absence of consent to the tests, a few courts have declined to admit the evidence on the ground that if admitted the constitutional rights of the defendant would be impaired. Whether or not in reaching this conclusion these courts have made correct decisions cannot be debated here yet it can be said that some writers have taken issue with the legal philosophy followed by such courts. In order that full advantage may be taken of chemical tests to determine intoxication in meeting the drunken driver problem it would seem obvious that ways must be found to make the tests compulsory. None of the laws that have been enacted contain a compulsory feature nor do any of the bills that are currently pending in the legislatures of Illinois, Iowa, Nebraska and Wisconsin.

In 1942 the Committee on Tests for Intoxication of the National Safety Council appointed a special committee to study and recommend appropriate legislation in the field of tests for intoxication. A member of the Bureau's staff served on this special committee which has spent many months in reviewing critically a number of possible approaches to the problem through legislation. Through the efforts of this special committee it is hoped that final drafts of legislation will be formulated that can be recommended for enactment in the several states.

#### PRIVILEGED STATUS OF PHYSICIAN-PATIENT RELATIONSHIP

The American Law Institute at its May 1942 meeting adopted a Model Code of Evidence for submission to the several states for enactment. The second tentative draft of this code omitted all reference to a privileged status to be accorded the physician-patient relationship. The reasons assigned for the rejection of the status were, in effect, that such a privilege was not in the public interest that it fostered fraud by suppressing valuable testimony and that there was no evidence that the privilege tended to improve the public health.

The Bureau filed a brief with the Institute objecting to the omission, and a staff member of the Bureau attended the meeting of the Institute at which the code was to be considered for final adoption and presented reasons why the code should contain a provision according a privileged status to the relationship. It was pointed out that a privileged status is desirable because it inspires confidence in the patient to make a full dis-

closure to his physician of his symptoms and conditions and that such a disclosure is necessary to enable the physician adequately to perform his functions. The Institute was asked to reconsider the rejection of the privilege, to study the problems involved and to attempt to evolve a solution that would eliminate whatever abuses existed without at the same time impeding and hampering the medical profession in making available to the public the benefits of the art and science of medicine to the fullest extent. After a full discussion of the subject the Institute voted to include in the code a section dealing with the physician-patient relationship under which physicians may not, in the absence of the patient's consent be compelled or permitted to testify, in any state that adopts the code with respect to information obtained by him by virtue of the relationship subject to certain limitations and exceptions.

Among other things the privilege may be asserted by or on behalf of the patient only in a civil action or in the prosecution for a misdemeanor. The communication involved must have been confidential and reasonably believed by the patient or the physician to be necessary or helpful to enable the physician to make a diagnosis of the patient's condition or to prescribe or render treatment. No privilege will exist if the services of the physician were sought or obtained to aid any one to commit or to plan to commit a crime or a tort or to escape detention or apprehension after the commission of a crime or a tort. There will be no privilege as to any relevant communication (a) on an issue of the patient's condition in an action to commit him or otherwise place him under the control of another because of an alleged mental incompetence or in an action in which the patient seeks to establish his competence or in an action to recover damages on account of conduct of the patient which constitutes a criminal offense other than a misdemeanor or (b) on an issue as to the validity of a document as a will of the patient, or (c) on an issue between parties claiming succession from a deceased patient. There will be no privilege in an action in which the condition of the patient is an element or factor of the claim or defense of the patient. The privilege does not apply with respect to information which the physician or the patient is required to report to a public official or information required to be recorded in a public office unless the statute requiring the report or record specifically provides that the information shall not be disclosed.

The privilege will be terminated if the patient, his guardian or personal representative has caused the physician, his agent or servant to testify in any action to any matter of which the physician, his agent or servant gained knowledge through the communication.

The code defines a "confidential communication between physician and patient" to mean—

such information transmitted between physician and patient including information obtained by an examination of the patient as is transmitted in confidence and by a means which so far as the patient is aware discloses the information to no third persons other than those reasonably necessary for the transmission of the information or the accomplishment of the purpose for which it is transmitted.

This Model Code of Evidence, having been adopted by the Institute, will no doubt be recommended for enactment in the several states. In those jurisdictions in which a privileged status is now accorded the physician-patient relationship state medical associations may well compare the existing law with that proposed by the code.

#### STATE LEGISLATION

The legislatures of only eight states met in regular session during 1942. In addition there were special sessions held in thirteen states, two of which also held two special sessions. Little legislation of medical interest was enacted. A brief reference to the more important measures, from the medical point of view, that were enacted follows.

**Medical Practice Acts**—Five measures proposing amendments to existing medical practice acts were adopted in three states. As previously pointed out, enactments in New Jersey and Virginia amended existing laws so that graduates after accelerated

medical courses may obtain licenses. A new New York law provides that nothing in the medical practice act shall prevent the practice of medicine by an intern while serving in a state hospital or in a hospital of a political subdivision of the state. Another New York law provides that in the counties comprising the city of New York the filing fee for a license to practice medicine is to be \$2 instead of the previous \$1. A new Virginia law increases the per diem fee to be received by members of the board of medical examiners except the secretary from \$8 to \$10 and increases the salary of the secretary of the board from \$1,000 to \$1,500.

**Osteopathic Practice Acts**—An amendment to the Arizona osteopathic act was adopted which defines osteopathy as 'that system of treatment and healing of abnormalities of the human mind and body as taught and practiced in the standard colleges of osteopathy recognized by the American Osteopathic Association' and which provides that no osteopathic practitioner may practice major surgery unless he has had subsequent to his fulfillment of all other requirements of the act at least two years of surgical internship in a hospital or hospitals approved either by the American Osteopathic Association or by the American Medical Association and then only in osteopathically owned or controlled hospitals or institutions.

**Chiropody Practice Acts**—An amendment to the New Jersey chiropody act was enacted which defines chiropody as 'The diagnosis of any ailment of the human foot or the treatment thereof by any one or more of the following means: local medical, mechanical, minor surgical, manipulative and physiotherapeutic or the application of external medical or any other of the aforementioned means except minor surgical to the lower leg and ankle for the treatment of a foot ailment, not including however the treatment of tuberculosis, osteomyelitis, malignancies, syphilis, diabetes, tendon transplantations, bone resections, amputations, fracture dislocations, the treatment of varicose veins by surgery or injection, the administration of anesthetics other than local, the use of radium, the use of x-ray except for diagnosis or the treatment of congenital deformities by the use of a cutting instrument or electrosurgery. The term local medical hereinbefore mentioned shall be construed to mean the prescription or use of a therapeutic agent or remedy where the action or reaction is intended for a localized area or part.

**Premarital Examination Laws**—The Maine premarital examination law was amended to permit a certificate of freedom from a venereal disease to be issued by a physician who is a graduate of a class A medical school and who is licensed to practice in any state. The previous Maine law limited the physicians who could issue such a certificate to physicians licensed to practice in Maine.

**Narcotic Drugs**—Amendments to existing uniform narcotic drug acts were adopted in Kentucky and New York. The new Kentucky law amended the exemption section of the act by limiting its applicability to the administering, dispensing or selling at retail of any medicinal preparation that contains in one fluid ounce, or if a solid or semi-solid preparation in one avoirdupois ounce, not more than one grain of codeine or of any of its salts. The New York amendment exempts from the provisions of the narcotic drug act the administering, dispensing or selling at retail of Stokes expectorant or brown mixture in a quantity of not more than 4 ounces to one person at one time, or any medicinal preparations other than Stokes expectorant or brown mixture that contains in 1 fluidounce or if a solid or semisolid preparation, in 1 avoirdupois ounce, not more than 1 grain of codeine or of any of its salts.

**Dangerous Drugs**—The Virginia law prohibiting the sale of stated hypnotic or somniferous drugs except on the prescription of a licensed physician, dentist or veterinarian was amended to include sulfanilamide, sulfathiazole, sulfapyridine, sulfadiazine, sulfaguanidine and any sulfanilamide derivatives by whatsoever trade name or designation, any related compound preparation, mixture or salt thereof, any salt or derivative thereof, and any preparation or mixture containing any of them.

**Nurses**—An amendment was adopted to the nursing practice act of New York which provides that nothing therein shall be construed until one year following the cessation of hostilities as prohibiting the practice of nursing by other than registered or practical nurses.

**Venereal Diseases**—A new Michigan law requires physicians to report all cases of venereal diseases coming under their professional observation. The state health commissioner is authorized to make rules and regulations for the care, treatment, hospitalization and isolation of persons afflicted with venereal diseases, but such persons shall have the right to select the physician or mode of treatment of their own choice. A person, however, neglecting to submit to treatment may be forcibly detained and subjected to treatment.

**Cash Sickness Insurance**—A new Rhode Island law creates a cash sickness compensation fund from which eligible employees (quite generally employees subject to the unemployment compensation act of the state) will be paid weekly benefits not exceeding \$18 during such period up to twenty weeks as they are unable to perform any services for wages because of physical or mental disabilities. To create this fund employers of eligible workers are required to deduct 1 per cent from the first \$3,000 of each employee's wages. This law is the first of its type to be enacted in the United States.

#### FEDERAL LEGISLATION

**Seventy-Seventh Congress**—The second session of the Seventy-Seventh Congress adjourned Dec. 16, 1942. Few measures of medical interest were enacted during the session other than those associated with the general war effort. Federal funds to the extent of \$5,000,000 were made available for loans to students pursuing accelerated medical courses and certain other designated technical courses. Legislative action was completed on a Treasury Department initiated measure to regulate the growing of the opium poppy in the United States and to provide for the manufacture of opium from the plants. The growing of the opium poppy, particularly in certain Western States, had become widespread and while the opium poppy was grown principally to supply a demand for poppyseed, the price of which had advanced from around 6 cents a pound to 50 cents a pound because of an inability to obtain the seeds from the normal sources abroad, the new venture did bring in its wake a distinct problem to law enforcement officials to prevent the diversion into illicit channels of opium obtainable from the opium poppy. The war too had greatly diminished the sources of supply for opium and the new law provides through a system of licenses a method by which the growing of the opium poppy may be regulated and by which in case of need opium may be manufactured in this country from the opium poppy that is grown, under the supervision of the federal government.

The employment by the military establishment of and the giving of a military status to female dietetic and female physical therapy personnel were authorized by another bill enacted late in December. This law too permits the employment of other technical and professional female personnel in categories required for duty outside the continental United States.

The Soldiers' and Sailors' Civil Relief Act was variously amended to provide additional civil relief for persons in military service. Of particular interest to the medical profession is a provision in the amendatory act under which leases entered into by persons who thereafter go into military service may be canceled. An analysis of the amendatory act was prepared by the Bureau and published in *THE JOURNAL* for Oct. 17, 1942.

Additional funds were made available to the United States Public Health Service for a continuation of a program to provide reserves of blood plasma in hospitals, the reserves being established to meet any wartime contingency caused by enemy action which may necessitate blood transfusions to civilians.

During the second session of the recently adjourned Congress the Bureau prepared monthly a factual analysis of federal legislation which was sent, in the form of a Federal Legislative Bulletin, to all state medical associations and to certain others. The purpose of the Bulletin is informative to give basic information concerning the measures before Congress having a

medical interest. The Bulletin will be continued. As heretofore while Congress is in session, the Bureau prepared weekly analyses of federal legislation which have been published in *THE JOURNAL*.

**Seventy-Eighth Congress**—The new Congress convened on January 6 of this year and immediately a flood of legislative proposals appeared many of which were identical with measures that failed of enactment in the Seventy-Seventh Congress. References to some of the more important of these proposals, important from a health standpoint, follow.

**Female Physicians in the Medical Corps of the Army and Navy**—Companion bills S. 720 introduced by Senator Johnson, Colorado, and H. R. 1857, introduced by Representative Sparkman, Alabama, provide for the appointment of female physicians and surgeons in the Medical Corps of the Army and Navy. During the present war and for six months thereafter this legislation proposes there shall be included in the Medical Departments of the Army and Navy such licensed female physicians and surgeons as the Secretary of War and the Secretary of the Navy may consider necessary. Female physicians so appointed will be commissioned in the Army of the United States or the Naval Reserves and will receive the same pay and allowances and be entitled to the same rights, privileges and benefits as members of the Officers' Reserve Corps of the Army and the Naval Reserve of the Navy, with the same grade and length of service. Appointees may be assigned only to duty in hospitals or other stations where female nurses are employed but this suggested limitation has met with the opposition of the War Department and it is possible that the limitation will be stricken from the measure. The Secretary of War has indicated he has no objection to the enactment of the bill and present indications point to early action with respect to this matter.

Under another bill to establish a Women's Army Auxiliary Corps for service in the Army of the United States, it would be possible to commission female physicians in the Army. That corps at the present has been described as a body of uniformed civilians which performs its duties with the Army but is not a part of it. The House Committee on Military Affairs, however, has agreed to amend this bill so as to exclude physicians and nurses from the WAAC and if female physicians are to be commissioned in the Army, other legislation must provide for it.

**Medical Care for Wives and Infants of Enlisted Men**—President Roosevelt on February 1 submitted to Congress a supplemental estimate of appropriation for the Children's Bureau in an amount of \$1,200,000 to be used during the fiscal year 1943 in making grants to states to provide medical nursing and hospital maternity and infant care for wives and infants of enlisted men in the armed forces of the United States of the fourth, fifth, sixth or seventh grades. The requested appropriation has been included in a deficiency appropriation bill.

This new appropriation will permit a continuation, for the fiscal year 1943 of the program that was initiated by the Children's Bureau at the request of state health officers and financed so far by allotments totaling \$390,177 from funds available under the maternal and child health section of the Social Security Act. Reports received by the Children's Bureau indicate that from August 1942 to February 1943 in the twenty-one states reporting a total of 2,840 obstetric cases have been authorized for medical and hospital care under the program and the Children's Bureau has estimated from the requests for funds received that the amount submitted as a supplemental estimate by the President will be needed to finance the program during the remainder of the present fiscal year.

Legislation has been introduced to authorize an additional appropriation for each fiscal year during the period of the present war and for six months thereafter, but not in excess of \$6,000,000 in any one year.

**Attendance of Personnel of the Army as Students at Educational Institutions**—Legislative action has been completed on a bill under which during the present war and for six months thereafter personnel of all components of the Army of the United States may be detailed as students at technical pro-



fessional and other educational institutions, or as students, observers or investigators at industrial plants hospitals and other places. A law that was enacted by the Seventy-Seventh Congress authorized the detail as students of personnel of all components of the Army of the United States at technical professional and other educational institutions but restricted the number of students so detailed not to exceed 2 per cent of the officers and 2 per cent of the enlisted men of the Army and implied that they should be distributed proportionately among the various branches of the Army.

The House Committee on Military Affairs pointed out in its report on the bill recently passed that modern warfare requires that our army be furnished a continuous flow of personnel trained along scientific and engineering lines, that to meet this requirement the War Department has established a specialized training program, and that the restrictions imposed by the law passed last year would hinder the development of the program.

*Federal Medical Academies*—Two proposals have been submitted to the Congress under which federal medical academies would be established for the instruction of physicians for the armed forces or for the United States Public Health Service. One of these proposals, H. R. 691, was introduced by Representative Dickstein of New York and is pending in the House Committee on Military Affairs. This bill provides for the creation in each corps area of the United States of a medical training school for the instruction of physicians for the armed forces and for the United States Public Health Service. Each training school, it is proposed, will have a minimum of 295 students to be selected by members of Congress. On satisfactory completion of the course, the bill provides, candidates will be commissioned in the Army or Navy or in the United States Public Health Service, or any other service which may require their services. They must continue in such service for at least ten years unless the Secretary of War or the Secretary of the Navy, or the Surgeon General of the United States Public Health Service, as the case may be, shall certify that there is no further need for their services.

The other bill was introduced by Senator Thomas of Oklahoma, S. 655, and is pending in the Senate Committee on Military Affairs. It proposes to establish a United States Medical Academy to be operated under the supervision of the President for the training and instruction of persons in the manner which will best fit them for the performance of service as commissioned officers in the medical branches of the military and naval forces of the United States. In determining the manner in which the Academy will be operated, the President will, the bill provides, follow the rules, regulations and practices in effect with respect to the United States Military Academy at West Point or the United States Naval Academy at Annapolis. Persons who will receive training and instruction in the academy will be appointed by the President but they will be selected in the same manner, in the same number and by the same persons as in the case of midshipmen at the United States Naval Academy.

*Reorganization of the United States Public Health Service*  
*Temporary Promotions*—Companion bills are pending to effect a reorganization of the United States Public Health Service, S. 400, introduced by Senator Thomas, Utah and H. R. 649, introduced by Representative Bulwinkle, North Carolina, and referred respectively to the Senate Committee on Education and Labor and to the House Committee on Interstate and Foreign Commerce. These bills, introduced at the request of the Federal Security Agency, propose that the United States Public Health Service shall consist of the Office of the Surgeon General, the National Institute of Health and two bureaus to be known as the Bureau of Medical Services and the Bureau of State Services. The Surgeon General of the United States Public Health Service, under the supervision and direction of the Federal Security Administrator will be authorized to assign to the Office of the Surgeon General, to the National Institute of Health and to the two bureaus, respectively, the several functions of the Public Health Service and to establish such divisions, sections and other units as may be necessary.

The director of the National Institute of Health and the chiefs of each of the bureaus established will be commissioned medical officers detailed by the Surgeon General from the regular corps and while so detailed will be assistant surgeon generals and will have the same grade and receive the same pay and allowances as the assistant to the Surgeon General. Medical officers below the grade of medical director may be detailed by the Surgeon General from the regular corps to serve as chiefs of divisions, and not more than six of such officers at one time while so detailed shall have the temporary grade and receive temporarily the pay and allowances of a medical director.

The record of each commissioned officer of the regular corps initially appointed above the grade of assistant surgeon after the first three years of service in such grade, will be reviewed under regulations approved by the President, and any such officer who is found to be unqualified for further service will be separated from the service and paid six months pay and allowances. Original appointments in the commissioned corps of the Public Health Service may be to a junior grade which will correspond to that of a second lieutenant in the Medical Department of the Army and persons so appointed will be entitled to the same pay and allowances as second lieutenants in the Medical Department of the Army. After not less than two years of service each such appointee may be examined under regulations prescribed by the President and on such examination will be either promoted to the grade of assistant surgeon or be separated from the service. In the absence or disability of the Surgeon General and the assistant to the Surgeon General, or in the event of a vacancy in the office of both, the assistant surgeon generals will act as Surgeon General in the order of their designation for such purpose by the Surgeon General.

Provision has been made for temporary promotions in the United States Public Health Service by an amendment that was adopted to the deficiency appropriation bill H. R. 1975. The amendment provides that during the existing war and for six months thereafter any commissioned officer of the regular corps of the Public Health Service may be appointed to higher temporary grade with the pay and allowances thereof without vacating his permanent appointment, and that reserve officers of the Public Health Service may be distributed in the several grades without regard to the proportion which at any time obtains or has obtained among the commissioned officers of such service. Similar authority exists for temporary promotions in the Navy, Army, Coast Guard and Coast and Geodetic Survey.

*Pharmacy and Chiropractic Corps in Army*—Pending legislation would strike from the National Defense Act all reference to the Medical Administrative Corps and in place thereof make provision for a Pharmacy Corps in the Medical Department of the Regular Army, to be composed of seventy-two officers. Companion bills have been introduced to accomplish this result, S. 216, introduced by Senator Reynolds, North Carolina, and H. R. 997, introduced by Representative Durham, North Carolina, and pending respectively in the Senate and House Committees on Military Affairs. Appointments in the Pharmacy Corps, it is proposed, will be made in the grade of second lieutenant from pharmacists between the ages of 21 and 32 years who are graduates of recognized schools or colleges of pharmacy requiring four years of instruction for graduation under such regulations and after such examinations as the Secretary of War shall prescribe. An officer of the Pharmacy Corps will be promoted to the grade of first lieutenant after three years of service, to the grade of captain after six years of service, to the grade of major after twelve years of service, to the grade of lieutenant colonel after twenty years of service, and to the grade of colonel after twenty-six years of service.

There is considerable evidence that the sponsors of this proposal are energetically promoting its enactment. There have been inserted in the *Congressional Record*, for instance, from time to time copies of or references to memorials from state legislatures urging that the Congress promptly pass the legislation. Such memorials have been forwarded to Congress by



the legislatures of the states of California, Indiana, Iowa, Montana, New Hampshire, North Carolina, Oklahoma, Washington and, no doubt others.

The creation of a Chiropody Corps in the Medical Corps of the United States Army is the objective of two pending bills, S 654, introduced by Senator Reynolds, North Carolina and H R 1990 introduced by Representative Hoch, Pennsylvania. This legislation contemplates that the Surgeon General of the Army shall appoint qualified officers in the proposed Chiropody Corps in like number to that established by law for the Dental Corps and that such officers shall have the rank, pay, promotion and allowances as well as the retirement provisions of officers of corresponding grades in the Dental Corps. Appointments in the Chiropody Corps will be made in the grade of first lieutenant and all appointees will be required to take similar physical examinations as provided for the appointment of officers in the Medical Corps, and a professional examination which will include tests of skill in practical chiropody and proficiency in the usual subjects taught in a standard chiropody college. An officer of the Chiropody Corps will be promoted to the grade of captain after three years of service to the grade of major after twelve years of service, to the grade of lieutenant colonel after twenty years of service, and to the grade of colonel after twenty-six years of service. This legislation too would permit the establishment of a Chiropody Reserve Corps within the Medical Corps in accordance with the provisions of the National Defense Act with rank, promotion pay and allowance equivalent to that of the Dental Corps.

*Exsection in the District of Columbia*—There are pending, respectively, in the Senate and House Committees on the District of Columbia companion bills to prohibit experiments on living dogs in the District S 434, introduced by Senator Langer, and H R 33, introduced by Representative Burdick, both of North Dakota. These bills are identical in phraseology and provide that it shall be a misdemeanor for any person to experiment or operate in any manner whatsoever on any living dog, for any purpose other than the healing or curing of the dog, in the District of Columbia. Any person convicted of a violation of the proscription will be subject to a fine of not less than \$100 nor more than \$500, or imprisonment for a term of not less than three months nor more than one year, or both.

*Chiropactors and the United States Employees Compensation Act*—On the day after the new Congress convened, Representative Tolan, California, reintroduced his bill, H R 786 which if enacted would give chiropactors the right to treat the beneficiaries of the United States Employees Compensation Act. A companion bill, S 345, was introduced by Senator Murdock, Utah, for himself and Senator Gillette, Iowa. These bills are pending, respectively, in the House Committee on the Judiciary and in the Senate Committee on Education and Labor. At the time this report is being prepared, no action has been taken on either bill.

*Cancer Control Trench Fever Experiments Influenza Epidemic*—Representative Rogers, Massachusetts, proposes by H R 661, pending in the House Committee on Interstate and Foreign Commerce, to authorize a federal appropriation for the first year of the operation of the bill in the amount of \$2,300,000, and for each fiscal year thereafter such sum as may be necessary, to enable the United States Public Health Service to assist states, counties, cities or other political subdivisions to extend and improve measures through public and private institutions and organizations for the diagnosis, treatment and control of cancer. The measure contemplates the establishment of hospitals, diagnostic clinics and other facilities for the diagnosis and treatment of persons suffering from cancer or suspected of suffering from the disease. The sums to be appropriated will be allotted to such states as have plans for the control of cancer that have been approved by the Surgeon General of the United States Public Health Service. To the extent that facilities may be available, not to exceed 100 persons suspected of having cancer or known to have that disease may be cared for in hospitals operated by the United States Public Health Service for purposes of diagnosis, treatment and clinical study.

A bill introduced by Representative Lane, Massachusetts, and pending in the House Committee on Military Affairs, H R 1391, proposes to authorize the President to issue an appropriate medal and ribbon to be awarded to designated members of the armed forces of the United States during the World War who acted as voluntary subjects for experiments during the trench fever investigations in France.

Another bill H R 655 introduced by Representative Ludlow, Indiana, and pending in the House Committee on Commerce, Weights and Measures, would authorize the Secretary of the Treasury to cause to be struck a medal of appropriate design with suitable emblems, devices and inscriptions to be determined by the Secretary of the Treasury, or a certificate suitable for framing, to commemorate the faithful nursing of the women who voluntarily offered their services and who served with the Army during the influenza epidemic of 1918.

*Extension of the Social Security Program*—The President has submitted to the Congress the Report of the National Resources Planning Board copies of which are not available as this report is being prepared. That the report contains much of important concern to the medical profession, however, is evident from the discussions of it that have appeared in the newspapers. Apparently the board recommends far reaching expansions in the Social Security program, expansions to include permanent and total disability insurance, action by the federal government in cooperation with the medical profession to enable every person to budget medical expenses over a reasonable period, federal aid in developing a system of regional and local hospitals and other measures to assure "adequate medical and health care for all regardless of place of residence or income status." Initial reaction on the part of Congress to the board's report as reflected in the newspapers, presages extended consideration of the recommendations. An analysis of the parts of the report of interest to medicine will be carefully prepared when the report becomes available.

In the meantime there are pending in Congress many proposals to extend and expand the Social Security Act. Patterned after the Ehot bill introduced in the Seventy-Seventh Congress and analyzed by the Bureau in THE JOURNAL, Sept 26, 1942 is a Senate bill, S 281 introduced by Senator Green, Rhode Island. This bill, pending in the Senate Committee on Finance would, among other things, provide insurance benefits for workers permanently and totally disabled and hospitalization benefits and would authorize the Social Security Board to 'make provisions for the furnishing of medical, surgical, institutional rehabilitation or other services to individuals entitled to disability benefits if such services will aid in enabling the individuals to return to gainful work. Individuals who are hospitalized would be entitled to a hospital benefit of not less than \$3 a day and not more than \$6. In lieu of the payment of the hospital benefit directly to the individual, the Social Security Board might make arrangements with accredited hospitals for the payment of the reasonable cost of hospital service. No committee action has been taken on this bill.

Other measures would extend the old age and survivors' insurance benefits to employees of religious, charitable, scientific, literary and certain other corporations or associations, would provide for aid to permanently and totally disabled individuals, would extend the old age benefits provisions to male or female registered, graduate, undergraduate or practical nurses in respect of their employment outside of religious, charitable and other nonprofit institutions, would provide grants to states for aid to the physically handicapped and would create a Joint Committee on Social Security to be composed of designated members of the Senate Committee on Finance and of the House Committee on Ways and Means to make studies with respect to the needs and advisability of modification or enlargement of the present social security program and to consider proposals submitted to Congress in connection therewith. No action has been taken on any of these proposals.

*Construction of Hospital Facilities*—The creation of a special committee of the House of Representatives is proposed by a pending resolution, H Res 147, submitted by Representative O'Connor, Montana, to (1) investigate the hospital problem throughout the United States including a survey of all hospital

beds available to all persons engaged in warfare, (2) investigate the use of existing civilian hospital facilities (3) study the hospital problem in the United States as a whole as affecting not only war industries but industries in general and (4) report in writing to the Congress the results of such investigations together with recommendations. This resolution is pending in the House Committee on Rules.

The construction of marine hospitals in California, Florida and Oregon is proposed by other legislation. Eight bills have been introduced providing either for the enlargement of existing veterans hospitals or the construction of new hospitals in Connecticut, Florida, Michigan, Pennsylvania, Rhode Island and Washington. A general veterans hospital construction measure has been introduced by Representative Rogers of Massachusetts which would authorize such sums as may be necessary to enable the Administrator of Veterans' Affairs to provide additional hospital and outpatient dispensary facilities for persons entitled to hospitalization and medical treatment under the laws administered by the Veterans' Administration to care for the rapidly increasing load of disabled war veterans and to enable the Veterans' Administration to care for its beneficiaries in Veterans' Administration facilities rather than in contract temporary facilities and other institutions. This bill H. R. 667 is pending in the House Committee on World War Veterans Legislation.

Another measure which has the approval of the Senate Committee on Naval Affairs, would appropriate the sum of \$2,000,000 to expand the facilities for hospitalization of dependents of Naval and Marine Corps personnel and for certain other persons. As explained by the Senate committee the dependents of Army, Navy and Marine Corps personnel are now entitled by law to hospital and dispensary care. Hospitalization of dependents is restricted to acute medical and surgical conditions exclusive of nervous, mental or contagious diseases or those requiring domiciliary care. Existing facilities have been adequate for this service to dependents in peacetime but an expansion of such facilities is necessary to provide the service during a period of war. This bill too will authorize the hospitalization in naval hospitals of certain classes of civilians outside the continental United States. A companion bill, H. R. 1936 has passed the House.

*Vocational Rehabilitation—Civilian War Benefits*—On Oct. 9, 1942 President Roosevelt in a special message to the Seventy-Seventh Congress, advocated an expanded rehabilitation program in relation both to veterans and to civilians who are physically handicapped. A number of bills were introduced in that Congress but no action taken on them. In the present Congress many bills of this character are pending. One, extending the benefits of vocational rehabilitation to veterans of the present war, has passed the Senate and House (S. 786). Another measure submitted by Senator La Follette of Wisconsin S. 838 relates to the rehabilitation of persons disabled in war industries or otherwise the rehabilitation to be furnished under the supervision of a Rehabilitation Service to be established in the Federal Security Agency. Under this bill the Federal Security Administrator will be authorized to make rehabilitation services available to certain civilians who are disabled as a result of activities connected with the war effort by certifying such civilians to a state where such services will be provided under a state plan at federal expense. The bill too amends existing law under which federal aid is now furnished to the states for vocational rehabilitation programs. It would increase federal aid to the states.

To the extent and for such period as adequate rehabilitation services are not made available by a state, the bill would authorize the Federal Security Administrator to provide such needed services through contractual arrangements with public and private agencies and individuals. Except in the case of individuals certifiable as war disabled civilians, no physical restoration or repair, medical care, prosthetic or other devices or training allowances may be provided by a state plan to an individual unless it has been determined that he needs financial assistance with respect thereto. In those instances in which the bill would authorize the Administrator of the Federal Security

Agency to supply rehabilitation services, that official will be required to provide the physical restoration and repair, physical and occupational therapy, and hospitalization and medical care solely through contractual arrangements made by him with public and private agencies and private individuals. He would have no authority to construct, lease or otherwise acquire or operate any hospital, clinic or other medical facility. No person employed by the administrator under the authority contained in the bill will be authorized to engage in rendering medical or hospital care or treatment to any individual.

A number of bills have been introduced to provide benefits for civilians who sustain war injuries and for civilian defense workers who are injured while in the performance of duty or who contract a disease proximately caused by the performance of stated duties. One of these S. 450 introduced by Senator Pepper, Florida proposes benefits for the injury, disability, death or enemy detention of civilians in the form of monetary payments and the supplying of medical services. The administrator of the Federal Security Agency would be authorized to supply doctors and nurses, services, drugs and other medicines, prosthetic and other appliances, hospitalization and other reasonable services for treatment and care to the extent that he may prescribe in regulations. The actual cost of such benefits may be paid directly or by way of reimbursement to any person entitled to such benefits or may be paid to the person furnishing such benefits. The bill provides that the administrator may use any private facilities or such government facilities as may be available for the treatment and care of any persons entitled to benefits provided in the bill. No action has been taken on this bill or any other of the pending bills having a similar objective.

*Mobilization of Scientific Resources*—Predicated on the premise that the full development and application of the nation's scientific and technical resources are necessary for the effective prosecution of the war and for peacetime progress and prosperity a number of bills are pending in the Congress under which an Office of Scientific and Technical Mobilization would be established to mobilize the scientific and technical resources of the nation. While these proposals apparently relate primarily to industrial research and problems, they are framed in broad language and may, if enacted influence the future of scientific research conducted in educational institutions that relate primarily to medicine.

The federal agency to be created by one of the bills S. 702 sponsored by Senator Kilgore of West Virginia would be authorized in regard to scientific and technical facilities and personnel to mobilize, assemble, coordinate, develop and encourage and protect research, provide guidance and standardize. Physicians and dentists are excluded from the term "scientific and technical personnel" but corporations, whether operating for profit or not, associations, schools, colleges and universities are expressly brought within the field of operation of the bill.

To finance this program an initial appropriation of \$200,000,000 is suggested and thereafter such sums as may be necessary. Legislation similar to that pending was submitted to the Seventy-Seventh Congress and extensive hearings held but no action taken. The Kilgore bill has broad implications and merits continued and careful study.

*Miscellaneous*—This report would be unduly extended if other than the briefest reference was made to other proposals of interest to medicine that have been submitted to Congress. It must suffice to say, in conclusion that a large number of bills suggest additional benefits to veterans of World War I and similar benefits to veterans of World War II. Others contemplate service pensions for contract surgeons of the Spanish-American War, water pollution control, prevention or alteration of fingerprints, medical and hospital care for certain civilians, education and employment of physically handicapped persons, identification insignia for rejectees with physical defects and income tax exemption of persons in military service. To paraphrase an old adage Many are introduced but few are passed.

## Summary

**Medicolegal Abstracts**—An adequate index to Medicolegal Cases, Volume Three, has been completed and the book is now available

**Barbiturates**—Efforts are continuing to stimulate the enactment of legislation limiting the sales of the barbiturates to sales on prescriptions

**Medical Licensure and the War**—Many licensure problems have arisen in connection with the acceleration of medical courses, the relocation of physicians, the proposed acceleration of premedical education and the suggestion for shortening the internship period. Annual registration requirements may impose hardships on physicians in service. These problems have received the attention of the Bureau

**Courses in Medical Jurisprudence**—A survey has been initiated to assemble data concerning courses in medical jurisprudence offered in accredited medical schools. This study will be continued

**Legal Medicine in Philadelphia**—An important development in Philadelphia in the field of legal medicine occurred during the year that may well set a pattern worthy of emulation elsewhere

**The Narcotic Tax**—The requirement that checks in payment of the tax imposed on physicians by the Harrison Narcotic Act be certified results from a law enacted by Congress and can be modified only by amendatory legislation

**The New Income and Victory Tax Law**—The Revenue Act of 1942 imposes an additional tax burden on physicians but effects no change in the deductions that may be claimed for professional expenses. The injustice heretofore existing in the treatment of uncollected accounts on the books of a taxpayer at the time of death has been eliminated. A new provision authorizes taxpayers to deduct medical expenses. The new victory tax provisions impose additional obligations on physicians

**Scientific Tests for Intoxication**—Scientific tests for intoxication have received recognition by the legislatures and by the courts. A special committee of the National Safety Council has been created to formulate a model law, and a member of the Bureau's staff is serving on that special committee

**The Physician-Patient Relationship**—The Model Code of Evidence adopted by the American Law Institute recognizes the privileged status of the physician-patient relationship

**State Legislation**—Little legislation of medical interest was enacted by state legislatures in 1942. Medical practice acts were amended in New Jersey, New York and Virginia. In Arizona the osteopathic act was amended to permit the practice of surgery by osteopaths in hospitals osteopathically owned or controlled. A new definition of chiroprody was enacted in New Jersey. The premarital examination law of Maine was amended to authorize out of state physicians to execute certificates of freedom from disease. Narcotic drug acts in Kentucky and New York were amended further to restrict the sale of attenuated preparations. The sulfonamide compounds were put on a prescription basis in Virginia. The nursing practice act of New York was modified for the duration of the war. Venereal diseases were made reportable in Michigan and a cash sickness insurance program was adopted in Rhode Island

**Federal Legislation**—During the second session of the Seventy-Seventh Congress laws were enacted authorizing federal loans to students in medical and certain other schools, regulating the growing of the opium poppy and the manufacture of opium, providing for the employment of female dietetic and female physical therapy personnel in the Army, authorizing the cancellation of leases executed by persons who thereafter enter the armed forces, and continuing the program to provide blood plasma reserves. The publication of the Federal Legislative Bulletin was continued

Pending in the Seventy-Eighth Congress are bills for the commissioning of female physicians in the Army and Navy. Appropriations have been made available to supply medical care to wives and infants of enlisted men. The attendance of an unlimited number of personnel of the Army as students at educational institutions has been authorized. The construction of federal medical academies is the objective of pending bills. The creation of Pharmacy and Chiropody corps in the Army has been proposed

The reorganization of the United States Public Health Service is contemplated by bills introduced at the request of the Federal Security Agency. Animal experimentation in the District of Columbia will be unlawful if proposed legislation is enacted. The Tolan bill to authorize chiropractors to treat the beneficiaries of the United States Employees' Compensation Act has been reintroduced. Additional funds for cancer control and the recognition of services rendered in the trench fever experiments and in the influenza epidemic are proposed by bills awaiting action

A broad expansion of the Social Security program is suggested in the Report of the National Resources Planning Board. Pending legislation would authorize benefits, including medical care, for the permanently and totally disabled, would make available hospitalization benefits, would bring within the provisions of the Social Security Act employees now excluded therefrom and would in other ways broaden the benefits available at present

Other legislation would increase hospital facilities in marine hospitals for veterans, for dependents of Naval and Marine personnel and for certain civilians

A broadly expanded program for vocational rehabilitation of disabled persons has been advocated by the President, and legislation to effect that end is before Congress for consideration. Legislative action has been completed to provide for vocational rehabilitation of veterans of World War II. Pending legislation would provide benefits, including medical care, for civilians who sustain war injuries and for civilian defense workers

The mobilization of the scientific resources of the nation is the objective of pending legislation which merits careful and continued study. Other Congressional bills would provide additional benefits for veterans, service pensions for contract surgeons of the Spanish-American War, water pollution control, medical and hospital care for certain civilians, prevention of alteration of fingerprints, education and employment of physically handicapped persons, identification insignia for rejectees, and income tax exemption of persons in military service

## Bureau of Medical Economics

Early in 1940 the Office of the Surgeon General of the Army, anticipating the demands that would be made for medical personnel should a national emergency develop, prepared a tentative procurement plan and presented it to the House of Delegates of the American Medical Association at its annual session held in New York in June of that year. The plan, which was endorsed in principle by the House of Delegates, contained the following items:

- 1 The American Medical Association to be asked to conduct a survey of the medical profession through its state and local activities

- 2 Each local or county society to canvass its members to determine, of those who expressed a willingness to serve, who should be available for the military service and who, on account of their age, physical disability or commitment in civil capacities, should remain at home

- 3 The county society to give to each one who expressed his willingness to serve, even though he might be selected to remain at home, a button similar to that which was designed for the Volunteer Medical Service Corps during the last war

- 4 The county society to list those who were selected for the military service according to their professional qualifications listing as surgeons, psychiatrists, and so on, only those who

were members in the national specialists' organizations. Also to select from those who were to remain at home qualified men for examination boards.

5 The state societies to maintain an available roster of members.

6 The American Medical Association to maintain a numerical roster of availability by states.

7 The Medical Department of the Army to have one or more selected officers on duty at the headquarters of the American Medical Association in Chicago.

8 The War Department, corps areas or regional officers to call on the American Medical Association for physicians or specialists as and when required.

9 The American Medical Association to call on the states according to their quotas, for the physicians required.

10 Each state, in turn, to call on its local societies for its quota of physicians.

At the same session of the House of Delegates a resolution calling for the creation of a Committee on Medical Preparedness was introduced by Dr. Arthur W. Booth, chairman of the Board of Trustees and was adopted by the House of Delegates. Authorization of this Committee on Medical Preparedness and the endorsement of the Surgeon General's plan for procurement demonstrated again the willingness of the American Medical Association to place its records and resources at the disposal of the federal government for whatever service might be helpful to the Surgeon Generals of the Army, Navy and Public Health Service in a national emergency.

#### CENSUS OF PHYSICIANS

Ever since 1909 the American Medical Association has published at short intervals information which has been essentially a census of the medical profession but the census growing out of the creation of the Committee on Medical Preparedness was the most complete and far reaching of any heretofore attempted. The Bureau of Medical Economics was designated as the agency to conduct the census and from its headquarters sent out, during the summer of 1940, special questionnaires to the entire medical profession of the United States. These questionnaires when returned to the Bureau of Medical Economics, were the source of the detailed and highly valuable data suggested. The process of collecting this census information extended through the second half of 1940 and through much of the year 1941. At the close of 1941, either a completed schedule had been received or an incomplete schedule had been prepared and filed for every known physician in the United States, both continental and territorial, including the Philippines. The original list of physicians, which was completed sometime before the close of 1941, has since undergone frequent and extensive revisions to meet the wartime requirements of the Army, the Navy and the civilian population.

In addition to the greatly enlarged staff working on this material, first in sending it out and then in editing and processing it as it was returned to the Bureau, members of the state medical associations and county medical societies and chairmen of the state committees on medical preparedness gave most valuable and indispensable assistance throughout the conduct of the census. In view of the countless hours this work took from their medical practice, these men deserve the sincere appreciation of the entire medical profession.

During the years 1940 and 1941 it was necessary, to meet the rapidly changing conditions to make extensive changes in the personnel of the clerical staff of the Bureau of Medical Economics. As it became evident that an increasingly larger percentage of the work of the temporary staff of the Bureau of Medical Economics would need to be devoted to military affairs, a more equitable arrangement of administrative and financial details was effected through conference with Col. Charles G. Hutter, M. C., who had been detailed to the American Medical Association as liaison officer by the surgeon of the Sixth Corps Area.

#### PROCUREMENT AND ASSIGNMENT SERVICE

The Procurement and Assignment Service for Physicians, Dentists and Veterinarians, which was established with the approval of the President of the United States as a part of the Office of Defense Health and Welfare Services, was organized

in October 1941. In order that the information that had been assembled in the Bureau of Medical Economics by the Committee on Medical Preparedness might be fully utilized by the Procurement and Assignment Service, the Bureau was named the Consultant Office of the Service, and the director of the Bureau was designated as supervisor of that office. This arrangement continued from October 1941 until near the close of 1942 when it was deemed advisable to effect a physical separation of the office of the Procurement and Assignment Service and the Bureau of Medical Economics. Accordingly, after the Bureau of Medical Economics had carried on its own work for two and one-half years with a minimum of personnel, a branch office of the Procurement and Assignment Service was established at the American Medical Association headquarters with Lieut. Col. Harold C. Luthi, M. C., who had succeeded Col. Charles G. Hutter as liaison officer of the Sixth Corps Area in charge.

The census of physicians conducted by the Committee on Medical Preparedness is a reservoir of most interesting and valuable data relating to the prewar medical profession of the United States but for the duration this reservoir will have to be left very largely unstudied except as it pertains to the present needs of the armed forces and the civilian population. However, as the work progressed from the period of census taking in 1940 and 1941 to the establishment of the Procurement and Assignment Service certain facts became evident. All the original estimates of the number of physicians required for all purposes in the war effort had to be increased, some highly important specialist groups were greatly overtaxed, maintenance of arbitrary quotas was both difficult and unwise, and the civilian population would be compelled to accustom itself to a smaller quantity and a different type of medical care.

Although the census was conducted for the first year against the background of the European war, had the war not come to this country the census would still have been of the great value suggested earlier in this report since it gave the American medical profession detailed information about every physician in this country. The size of the task, however, greatly limited the other work of the Bureau of Medical Economics during the latter half of 1940 and all of 1941.

Beginning with Pearl Harbor the American Medical Association along with other groups in the country, turned its energies to the war effort. In spite, however, of the tremendous task of analyzing and digesting the mass of data contained in the census and in spite of the added pressure of work caused by the creation in the Bureau of the Consultant Office for the Procurement and Assignment Service the Bureau of Medical Economics was able to continue that phase of its peacetime work which had to do with the analysis of prepayment plans for medical care.

#### PREPAID MEDICAL SERVICE

From time to time in the past several years the Bureau of Medical Economics has prepared for the medical profession descriptive material and critical analyses of different types of medical organizations designed to meet a variety of needs and conditions. These descriptive and analytic accounts have been published for the information and use of any interested individuals or groups. Among the subjects covered are "Contract Practice," "New Forms of Medical Practice," "Medical Service Plans," "Group Medical Practice," "Medical Care for Migratory Workers" and "Organized Payments for Medical Services." These descriptive and analytic reports apply to a considerable number and variety of actual operating arrangements.

Medical societies in different parts of the United States have repeatedly helped to develop methods to solve some particular problem. The part played by medical societies in the organization and operation of medical service plans should be mentioned in this category. The unit method of payment used by the medical service bureaus of the state of Washington appears to have been one of the earliest arrangements of the kind in the United States.

It is important to note that in Washington and Oregon medical service bureaus using a unit system arrangement for prepayment were developed by medical societies in an effort to overcome evils that had grown up under contract practice of an earlier date.

This unit method of payment has been fully described in "Organized Payments for Medical Services." It is important to note here that much of the success of the Washington plan, as it was called at that time, rested on

1 A voluntary association of physicians known as the "county medical service bureau"

2 A nonprofit corporation the county medical service corporation which contracted with employers to provide medical and surgical care and other services for its employees

3 An agreement between the corporation and the physicians of the county medical service bureau for the provision of medical and surgical services

By the summer of 1941 some twenty state medical societies had taken steps toward the introduction of a medical service plan to operate over the entire state. In Washington and Oregon, while there is some statewide supervision the initiative remains with the county medical societies that have organized medical service bureaus

The following organizations were developed with the active support of the respective state medical societies after intensive studies had been conducted and with earnest desire to develop truly helpful plans

California	California Physicians Service San Francisco
New York	Medical and Surgical Care Inc. Utica
	Medical Expense Fund of New York Brooklyn
	Western New York Medical Plan Inc. Buffalo
New Jersey	Medical Surgical Plan of New Jersey Newark
Michigan	Michigan Medical Service Detroit
Pennsylvania	Medical Service Association of Pennsylvania, Harrisburg
Colorado	Colorado Medical Service Denver
North Carolina	Medical Service Association of North Carolina Durham
Massachusetts	Massachusetts Medical Service Boston

In 1935, when the Bureau of Medical Economics presented its report to the House of Delegates on the number and nature of social experiments then being conducted by the medical profession, some two hundred or more different methods had been proposed for the organization of such services. The experiments were so diverse that even an enumeration was considered difficult.

Although many of the details of organization and administration must differ widely, there are some fundamentals that ought to characterize all medical service plans. A part of the Special Report of the Bureau, approved by the House of Delegates in 1935, seems no less applicable today than at that time

#### UNDESIRABLE TENDENCIES IN SOME PLANS

"In designing the operating plans to provide medical care for the low income groups, county medical societies may well consider the dangerous, destructive and unethical tendencies which even the most carefully conceived and constructed plans may assume. Some of these may follow an incomplete or inaccurate preliminary estimate of the medical situation, some may result from the unpredictable factor of human nature, others may follow as the natural outcome of changes in the general economic conditions entirely beyond the control of the medical profession. Regardless of the causative factors, which may vary in different communities, county medical societies must be prepared to recognize and deal with complications affecting the organization of medical care under the specifications of a county plan just as their members are trained to deal with complications which often occur to change the course of the diseases which they treat. Some of these dangers and complications are

#### DANGERS TO BE AVOIDED

"1 The adoption and operation of a medical plan where it is unnecessary

"2 The stimulus aroused by good plans among irresponsible organizers to develop and operate imitations and counterfeits

"3 The establishment in medical practice of dangerous patterns following the adoption of undesirable types of plans

"4 The compromise of medical societies in the corporate practice of medicine or in the operation of insurance companies as a result of an insufficient study of state statutes and case law

"5 Failure, in the operation of a plan, to conform to the Principles of Medical Ethics

"6 The almost inevitable transition of voluntary insurance plans into compulsory contributory sickness insurance systems operated by the state

"7 The difficulties involved in the failure adequately to provide for complete control of medical affairs by the medical profession

"8 The freezing of medical fees at a point below that which is consistent with good medical care

"9 Failure to bear constantly in mind that a medical society plan is an experiment in the methods of distributing medical service and that it may have only a temporary usefulness, may need frequent or drastic modifications or may need to be discarded entirely

"10 Medical society plans must not be considered or accepted as a substitute for the regular practice of medicine as applied to the majority of people. If it is believed such plans may be useful they should be considered merely as supplementary facilities in the distribution of medical service. They should be used only so long and in such a manner as they serve efficiently to make more easily available to low income groups a high quality of medical care

#### VITAL FACTORS TO BE RECOGNIZED AND PROTECTED

"Regardless of the sincerity of those who devise and operate a good medical plan, such a plan may only stimulate counterfeits promoted by irresponsible people. Competition between medical plans inevitably reduces the quality of the service and disturbs the public confidence

The Medical Profession, in its professional associations, is the only possible body that can organize the supply and distribution of that service without harmful effects on, and possible destruction of, that service itself. This principle has already been accepted in all countries by the establishment of systems of licensure, medical education and other standards of medical service set up by the profession to protect the public. It is recognized in the decisions of courts restricting the furnishing of such service to those who have met professional standards and in the rulings that expert evidence concerning medical matters can be given only by those who have met such standards

"This situation is not changed in any essential way by the fact that the progress of medical science and art has caused the creation of many subsidiary organizations and much mechanical and scientific equipment. All these things center around and are dependent on the medical profession. The 'point of production' of medical service is where the individual physician meets the individual patient. Hospitals are built and conducted to create the best possible environment for that contact. Laboratories are maintained to improve the conditions of that contact. Nurses, social workers and others concerned have a similar function

"It therefore follows that in any plan to improve the adjustment of the relations between these two economics the medical profession must retain a central position in all that concerns the valuation and delivery of medical service. There is another practical reason why this must be true. While each of the other elements involved plays an important part, the common element without which no one nor all of them can function in the delivery of service is the physician. Just as he is the central and the essential element at the point of production of medical service, so he must exercise a position of leadership and control in any reorganization of the methods of giving that service. The profession needs, and will always welcome, the cooperation and advice of all elements affected in health problems, but just as the individual physician must constantly assume the tremendous responsibility of decisions that involve life and death with individual patients, so the profession as a whole must assume the leadership and responsibility in the organization of medical service in the community"

Two types of reports can be prepared to show the nature and growth of medical service plans. Each has its value, but the one which deals with specific phases of organization and administration should be more helpful to administrators in widely separated areas having very different problems. It is proposed in supplemental reports, therefore, to keep these discussions as informal as possible and to reduce to a minimum the statistical tables and analyses which do not have a direct

relation to the descriptive part of the reports. It is hoped, on the other hand, to be able to include, with the assistance of experienced field staffs, explanations of the reasons for the differences in administrative procedures.

#### EXPERIENCE WITH MEDICAL SERVICE PLANS

The comparatively short experience of medical society service plans has already taught many valuable lessons. These lessons are offered here in tentative form for study and as aids to further experimentation.

Comparatively little can be learned from plans controlled by other than medical agencies or from many elaborate studies of the costs of medical service. Some medical society plans have been required to give subscribers three or four times as much medical service as the Committee on the Costs of Medical Care estimated would be needed. Actuarial calculations based on the experience of lay-managed groups, cooperative or industrial plans or foreign experience with compulsory sickness insurance are often misleading. Some of these organizations may balance their books, to some extent at least, by restricting the amount or lowering the quality of the medical care given usually without the full knowledge of the subscribers.

A medical society plan cannot so deceive its subscribers. The first sentence of the 'Ten Principles,' adopted in 1934 by the House of Delegates of the American Medical Association, reads:

All features of medical service in any method of medical practice should be under the control of the medical profession. Professional control involves responsibility for the quality of the medical service. This responsibility must not be evaded in any plan organized and operated by a medical society.

There are many 'unknown quantities' in the equation that must be solved to insure even the financial stability of a medical society prepayment plan. Existing morbidity statistics and theoretical estimates of medical service needed, drawn from private practice or lay-managed prepayment plans, are not a sound basis for such calculations. Most of the unknown quantities are human characteristics, calling for a knowledge of social psychology as well as of mathematics. We can now at least list and examine some of these.

1 The offering of a prepayment medical service the quality of which is guaranteed by the medical profession increases the demand for medical care much more than any one anticipated. Compulsory sickness insurance and lay administered medical service plans do not create a demand for medical service even among their subscribers, which is as adequate to the need as does private practice. This has been shown in morbidity and mortality statistics and in the failure to discover incipient disease among those served by such schemes. Economic inhibitions perhaps cause some persons to demand less medical service from private practice than they sometimes need. Malingering and excessive demands for unnecessary medical care under various forms of sickness insurance have often been described. Professionally administered plans, as will be pointed out later, suffer from a somewhat different aspect of this same weakness.

The demand for services under prepayment plans may show a different pattern from what has been established in private practice. The report of the Michigan Medical Service surgical plan for 1941 reveals that the largest 'number of patients per thousand enrolled' demanded service through the months of April to August inclusive, a condition contrary to the generally accepted seasonal variation in illness. Hospital insurance plans have an excess of hospitalization during vacation periods. Such phenomena are illustrations of the well known but often overlooked fact that need and demand for medical services are not the same. Calculations of the cost of medical care that omit this fact are misleading.

2 The reaction of the public as shown in sales resistance has an important effect on the success of the plan. Premiums must be within the limits of the valuation placed by the average person on the preservation of his health. Few persons have made the sort of calculations of the money value of medical service which all consumers are erroneously supposed to make for all the goods they desire to purchase. Such calculations are harder to make for medical services than for tangible goods. Sickness and injuries are seldom foreseen, and their seriousness and dura-

tion cannot be foretold. Specific, definite medical benefits cannot readily be promised or price tagged.

3 Actuaries, physicians or consumers cannot determine accurately the effect of various contract provisions on the minds of possible purchasers of prepayment medical care. What will be the exact effect of the exclusion of preexisting conditions, for example, on the cost of the plan or the health of the subscriber? Will such provisions make selling the plan easier or more difficult? It will take experience and analysis to determine the financial medical and psychologic effects of such a comparatively simple factor as a 'deductible clause' requiring payment for the first visit or of a cash limit on the amount of service given during a year.

4 Some subscribers to a prepayment plan will always be trying to 'get something back' for their money. If this tendency becomes contagious it may throw the most careful actuarial calculations out of line. This human characteristic may be met in many ways, some of which are a brusque refusal of requested care, setting up rules and restrictions, or perhaps worst of all giving superficial diagnosis and treatment to all in the effort to spread the medical resources. Some or all of these methods are almost standard practice under compulsory sickness insurance. None is suited to a professionally administered plan. Experience with some of the Farm Security Administration plans possibly offers a suggestion. Here financial resources make it necessary to limit the amount spent for medical services. This fact has sometimes been explained by the administrators and ways pointed out by which the available medical care can be made most helpful to all the subscribers. A similar campaign of public education is now being conducted by state and county medical societies to make the best possible use of the reduced civilian medical resources during the war. It may be well to borrow the lesson of these experiments, but always remembering entirely frank with the subscriber.

There is danger in this method also. It may cause subscribers to neglect seeking medical care when needed. It may lead administrators of medical care plans to follow the example of compulsory sickness insurance and lay-administered plans and assume that it is the function of managers of medical plans to guard medical service from subscribers. The objective should be to guard against abuse and encourage use—a narrow path hard to follow, but the only one that makes the available medical service most valuable to those who need it.

5 Some physicians assured of payment through a medical plan may perform unneeded surgical procedures that may be of little benefit to the patient. The solution of this problem is a professional responsibility. A medical society that dodges it has failed in one of its fundamental functions in relation to medical service plans. Some medical society plans have met this problem through 'medical directors,' 'medical advisory committees' or similar agencies that have the courage to meet the situation and are backed by fearless and efficient medical organizations. Failure to curb this tendency promptly not only may destroy the financial stability of a medical service plan but may greatly weaken public respect for the profession.

6 The type of clientele served, while less significant in determining conditions of success of service plans, does have an important if sometimes indirect influence. Will that clientele be dominantly industrial, commercial, rural, in occupational groups or widely dispersed? Since group enrolments seem essential to avoid adverse selection, the character of the group, especially with regard to sex, age and environment, must be considered. The wide diversity which exists in these respects in the United States shows how impossible it is to construct a 'model plan' or to lay down many generalities applicable to all plans even in such a limited group of states as, for example, Massachusetts, Mississippi, North Dakota and Texas.

Little consideration has been given as to how comprehensive prepayment medical plans should or may become. Existing plans have been largely confined to industrial groups in urban centers. They must be far wider in coverage if they are to occupy the field to such an extent as to obviate universal compulsory action by government. Restricted coverage is probably desirable and necessary in the early stages, but, as with almost every social institution the problem of where it is going must



never be lost from view. California Physicians' Service has already extended its scope into several new fields. It supplies medical care to migratory workers and groups of assisted farmers under the Farm Security Administration, to an experimental rural plan of the Interbureau Coordinating Committee on Post War Programs and the U. S. Department of Agriculture, to a housing project, to war industries, and has considered entering the field of university health care. The New Jersey medical plan is organized for similar extensions of scope but has not been in existence long enough to permit any conclusions.

Every expansion into a new field will include subscribers whose income, environment and customs cause them to place different values on medical care. New methods of approach and perhaps of organization and of administration and service may have to be developed.

7 Closely allied to the problem of expansion is that of income. In the beginning there seemed to be unanimous approval of the ninth of the 'Ten Principles' which reads 'Systems for the relief of low income classes should be limited strictly to those below the 'comfort level' standard of incomes.' Opinions differed on the income indicating a 'comfort level' but the first plans usually placed it somewhere between \$2,000 and \$3,000 per family annually. The selling program soon met the fact well known to sociologists, that every group including the employees of an industry has a solidarity which resists efforts to break it up into income or other groups. The 'key men' in all the minor groups of an industry, who are also the 'key men' in any selling program had no interest in a plan which excluded them. Consequently some of the recently organized plans have set up no income limits. Whether such a cutting of the Gordian knot is a solution remains to be determined.

8 The question of income limits has a bearing on the comparative desirability of 'indemnity' or 'service' benefits. Experience has as yet given no decisive answer to this question but the tendency to change from a 'complete' to a 'surgical' service has led to a proposed combination of the two plans to meet the other problem of income limits. When, under the 'surgical' plan, service is given to hospitalized patients, the distinction is based on whether ward or private room care is elected by the patient. The contract covers service in wards and the patient who takes a private room is assumed to be able to contribute something in payment for his care, just as he does for his private room under the terms of hospital insurance. Therefore, while the prepayment covers the full cost of service in a ward, it is paid only as an 'indemnity' toward the cost of service in a private room, and the physician is entitled to make an additional charge.

#### COMPLETE SERVICE VS SURGICAL PLAN

Perhaps the difficulty of calculating the actuarial effect of the human elements involved is one reason why most of the original 'complete medical service' plans are changing to plans limited to surgical and obstetric care for hospitalized patients. It early became evident that an unlimited medical care plan involved a greater expense than can be met by any premiums the public is at present willing to pay. In the case of those for whom the plans were especially designed, this cost is perhaps more than they can pay without restricting other expenditures, some of which may be as necessary to health maintenance as medical service. There was also difficulty in controlling excessive demands, often for unneeded service and of too great willingness by a few physicians to grant such demands.

The 'surgical and obstetric' plans simplify many of these problems. Restricting service to hospital patients selects 'catastrophic' cases and eliminates most 'minor' diseases. It is not a perfect screen for this purpose. Surgical and obstetric procedures in hospitals are more specific than general treatment at home, and more easily fit into actuarial calculations. Much can be said for the argument that such a plan really meets the most urgent needs of the subscribers. Treatment of minor illnesses (the 'bagatelle diseases' that plague all systems of compulsory sickness insurance) usually do not require an expense beyond the resources of a moderate income. Such restricted service corresponds to the customs and environment of the urban industrial worker who looks to hospital treatment for serious sickness. Limiting care to hospitalized patients also makes it

possible to reduce overhead cost by arrangements with existing hospitalization plans for solicitation and record keeping. This interlocking of administrative work has led to some conflicts and difficulties and has encouraged movements on the part of hospital groups to include medical service in hospitalization plans.

In spite of the adoption of surgical plans, it seems to be recognized that they do not fully meet the need of subscribers for medical care. Such plans do not cover all the 'catastrophic' diseases. They limit medical care plans largely to urban districts, since hospitals are less available and less patronized in rural districts and rural towns. They do not provide for preventive measures like the early diagnosis of incipient disease and tend to discourage prompt use of medical service when it may be most useful. No one disputes these defects, and they afford no indictment of such plans. Complete medical service remains the ideal, but to urge its immediate installation may be a counsel of unattainable perfection.

The public has not yet been educated to recognize the value and the cost of a complete service, medical and surgical, and it has been deceived as to cost by the propaganda for compulsory sickness insurance and for lay-administered plans. Many such plans have led their clients to believe that comprehensive service is being given by existing schemes, or could be given by proposed plans for much less than its actual cost.

The first step, the omission of which has caused some stumbling, would seem to be more adequate education of the public to the real values of a complete medical service, with greater emphasis on its actual cost. That this ideal has not been overlooked even by medical societies that have started with a limited plan is seen from the following statement in the Report of the Special Committee to the Massachusetts Medical Society house of delegates. Your committee urges a gradual approach to our ultimate ideal—total medical coverage by a comprehensive policy—through well defined initial steps of partial coverage."

#### SOME THINGS LEARNED

A prepayment plan for medical care is complex. It touches closely nearly all emotions, prejudices and customs in our society. It lacks the experience and evolution common to most social institutions. Compulsory sickness insurance systems in every country, and throughout their entire history, have been subject to continuous changes. In spite of their anchorage to legislation and government regulation none as yet show any signs of approaching equilibrium. It is therefore not surprising that plans of such duration as those of medical societies in the United States are still largely experimental.

A few questions seem to have found at least a temporary answer. A longer educational period is necessary before a complete medical service can be furnished with financial security. Several quantities in the equation "premiums = cost of service" are still unknown, but experiments are searching out and measuring most of these without endangering the financial structure. We know that there must be some flexibility in income limits. Selling is a bigger problem than anticipated, there is no such public demand for prepayment of medical services as advocates of private and government schemes have claimed. Professional supervision of all the standards of medical service must be made one of the dominant features of prepayment services as it has always been of private practice. The protection of the subscribers, the financial security of the plans and the honor of the profession demand this.

In nearly every country in which free discussion is permitted the organization of medical care is one of the most debated subjects. The effect of proposals of the medical profession on any development depends on their definiteness and the unity and promptness with which they are presented.

#### MEDICAL SERVICE PLANS OF THE FARM SECURITY ADMINISTRATION

The medical care plan is only a part of the general program of the Farm Security Administration which was started in 1935 with the announced purpose of "helping low income farmers to get a greater degree of independence and security." This general program is based on a system of federal loans accompanied by assistance in farm management and in the organization of local resources.



The first plans were started after only a minimum of consultation with organized medicine and varied widely in many of their features. A few were legal corporations, some were "farmer cooperatives" dealing with medical societies and occasionally with salaried physicians. Sometimes loans were issued to individual families to pay for specific services. Contracts were, in some localities, made with groups of physicians. This diversity involves no criticism. Given the existing state of knowledge or, better, ignorance of the factors involved in the problem of organizing any general plan of providing medical service, it was necessary to proceed by "trial and error" with a certainty that there will be no lack either of "trials" or of "errors" on the part of those conducting the experiment. These experiments did demonstrate that any successful plan of medical care must rest on constant consultation and close cooperation with the physicians who give that care and with the medical societies which alone represent the medical profession.

The Farm Security Administration has now adopted a policy of close cooperation with state and county medical societies and is pledged not to introduce any plan against the opposition of these groups.

The House of Delegates of the American Medical Association has laid down the principles which determine its policy. The first of these is the foundation of all the others. It reads: "All features of medical service in any method of medical practice should be under the control of the medical profession." No complaints that this principle is infringed in any Farm Security Administration plan have been reported. This would seem to be the most general and basic test of the acceptance by the medical profession of any of the present plans of payment for medical service. All other phases may be subject to bargaining and compromise, but any yielding of control of the standards of medical care to those who are unqualified to exercise that control is a betrayal of the trust which has been confided to the medical profession.

#### VITAL REPORTS AND RECORDS

Each decennial census of the United States provides an unusual wealth of data, the most complete and reliable statistical data of the decade. Ordinarily the census data are accompanied with a detailed explanation which greatly enhances the value of the tabulations. Much of the census bureau work is of such great importance in many fields that the loss or interruption of even a relatively small part of the basic tables and discussion may be irreparable. In view of their value and importance in many fields, it is hoped that it will not become necessary to discontinue the compilation and publication of these basic statistical tables because of lack of funds.

Since vital records and reports are dependable and helpful just to the extent that such records are complete, accurate and honestly made, any vital records system is valuable to this and succeeding generations only to the extent that integrity becomes a part of such records and reports and the subsequent use of them.

#### Summary

The census of physicians begun in 1940 by the Bureau of Medical Economics was given over entirely to army and civil service personnel at the close of the calendar year 1942.

Reasonably complete information is now available pertaining to ten medical service plans, most of which are organized to operate over statewide areas. The exceptions are in New York, in which state three organizations are operating although even more have made a start at different times.

The demand for prepaid medical care, with quality guaranteed by the medical profession, is increased when offered on a prepayment basis.

Public reaction shown as sales resistance has an important bearing on the success of various kinds of medical service.

Actuaries, physicians or consumers cannot determine accurately the full effect of various contract provisions on the minds of possible purchasers of prepaid medical care.

Some subscribers to prepayment plans will always try to get something back for the dues or rates charged.

Some physicians when assured of payment for services will engage in surgery that may be of little value to the patients treated.

Closely allied to the problem of expansion of the plans is that of the income level of the subscribers.

The question of income limits has a bearing on the relative desirability of "indemnity" or "service" benefits.

The public has not been educated to recognize the value and the cost of a complete service, medical and surgical.

Professional supervision of all the standards of medical service must be made one of the dominant features of prepayment services as it always has been of private practice.

The medical service plans which were started in about 1935 with the announced "purpose of assisting low income farm families to get a greater degree of independence and security" are being conducted in accordance with the principle that "all features of medical service in any method of medical practice should be under the control of the medical profession."

Unless a sufficient amount of money is made available to the census bureau, it is feared that some important basic census publications cannot be made available for even limited distribution.

#### Bureau of Investigation

During 1942 the Bureau of Investigation continued its part in the educational activities of the American Medical Association. The work of the Bureau consists primarily in receiving and dispensing information concerning "patent medicines" quacks, frauds, fakes and faddists to physicians, lawmen, government agencies, Better Business bureaus, business corporations, newspapers, radio stations and high school and college students who are making studies of such material.

Since the enactment of the Food Drug and Cosmetic Act of 1938 and the Wheeler-Lea Amendment to the Federal Trade Commission Act there has been a gradual decrease in the number of inquiries received by the Bureau particularly from physicians. This is most largely due to the fact that in accordance with the provisions of the new laws active ingredients are declared on labels. On the other hand inquiries from students and teachers have doubled presumably because of the increased amount of consumer study being conducted in both the high schools and the colleges of the nation. Education of this age group would seem to be a far greater service than the supplying of physicians with the names of ingredients of remedies. Inquiries from Better Business bureaus, newspapers and magazines and government agencies have been constant since the enactment of the legislation referred to. Items inquired about during 1942 totaled 8,400, the leading specific subjects of inquiry being in regard to a cathartic, a cold remedy, an antacid, aspirin and a headache cure. These leading subjects represent less than 38 per cent of the total number of subjects about which inquiries were received.

The Bureau of Investigation contributed eight original articles to THE JOURNAL during 1942 and in addition seven presentations of abstracts of Cease and Desist Orders and ten of abstracts of Stipulations issued by the Federal Trade Commission, nine articles containing abstracts of Notices of Judgment issued by the Food and Drug Administration and twelve articles containing abstracts of Fraud Orders issued by the United States Post Office Department. The original articles referred to were prepared largely by the Director, who also prepared various other items for publication in THE JOURNAL, while the articles consisting of abstracts of various actions of federal agencies were prepared by the Assistant Director.

During the year 1,775 pamphlets issued by the Bureau were distributed, and lantern slides and a film strip of these slides were supplied to physicians and educators on request.

The Director of the Bureau made nine addresses to lay audiences and professional groups during the year. The Bureau has continued its efforts to be helpful to various agencies of

government and to civic organizations and has made information in the files of the Bureau available to officials concerned with various phases of the war effort. In addition, the Director of the Bureau has aided the Council on Pharmacy and Chemistry as editorial supervisor of *Useful Drugs*, *The Epitome of the U. S. Pharmacopoeia* and *National Formulary* and the *A. M. A. Internists' Manual*. He has continued in the capacity of secretary of the Association's Committee on Cosmetics and has completed one year of service as Assistant to the Secretary of the Association.

#### Summary

During the past year the Bureau of Investigation has continued its efforts to maintain the work which was instituted in 1906, supplying to the profession and the public information obtained from all possible sources with regard to subjects which fall under its purview. As the result of recent federal legislation, inquiries from physicians have lessened, but inquiries from students have gradually risen in a four year period from 12 per cent to 28 per cent. The importance of education of this age group is self evident.

The Director made nine talks and addresses to professional and lay audiences during the year and cooperated as fully as possible with representatives of various government agencies and civic organizations. Contribution of articles to *The Journal* by the Bureau was maintained at the same level as during the previous year.

#### Bureau of Exhibits

The Bureau of Exhibits during the year 1942 continued its activities in graduate medical education with the Scientific Exhibit at the Atlantic City session, with exhibits from the Association headquarters at state medical meetings and other scientific meetings and with medical motion pictures. Health education for lay groups was carried on with health exhibits from the Association headquarters and with motion pictures.

#### THE SCIENTIFIC EXHIBIT

The Scientific Exhibit at the Atlantic City session exceeded all expectations both in the number of exhibits available and in the caliber of the work presented. The difficulties of preparation and transportation of exhibits and the problem of participants suddenly called into active military service or kept at home by an excess of work interfered less than had been anticipated. A considerable number of exhibitors who already were in the service of the armed forces were able to attend the Atlantic City meeting and demonstrate their exhibits. The emphasis of the Scientific Exhibit, however, was not primarily on the war but more on the problems of the physician in general practice.

The 1942 annual session was noted for the participation of physicians from Latin American countries. There were eighteen exhibits listed from those countries, including five from Argentina, four from Brazil, one from Chile, two from Colombia, one from Peru, two from Mexico and three from Cuba. Because of transportation difficulties only thirteen exhibits were actually shown, and of these one received a gold medal and one a certificate of merit. Certificates of participation were presented to the remaining eleven exhibitors.

The problems of medicine in wartime were presented by members of the United States Army, the United States Navy, the United States Public Health Service, the Selective Service System, the Office of Civilian Defense and the Procurement and Assignment Service. Other government agencies were represented by members of the Bureau of Mines and the Children's Bureau.

Features of the meeting were two special exhibits sponsored by the Committee on Scientific Exhibit of the Board of Trustees. The special exhibit on fractures was shown for the thirtieth time over a period of seventeen years and attracted even larger audiences than in previous years. Dr. Kellogg Speed, Chicago, was chairman of the special exhibit committee. The special exhibit on backache was shown for the third time and proved more popular than ever. The exhibit was presented

with the cooperation of a large committee, of which Dr. Frank R. Ober, Boston, was chairman.

Each of the sixteen sections of the Scientific Assembly sponsored groups of exhibits dealing with the various specialties of medicine as they are encountered by the physician in general practice. Each section appointed a representative to the Scientific Exhibit to act in an advisory capacity and to assist with the program. These section representatives were of inestimable help and deserve much credit for the high quality of material obtained.

Motion pictures were shown continuously throughout the week in four motion picture theaters. No films were shown in exhibitors' booths, thus preventing the blocking of aisles. Each film was shown once each day on a regular schedule.

Awards were made to forty-three exhibits, including six medals, twelve certificates of merit, twelve honorable mentions, eleven certificates of appreciation and two special certificates of merit. The Committee on Awards, of which Dr. Harold S. Diehl, Minneapolis, was chairman, performed its task with perseverance and credit.

#### ASSOCIATION EXHIBITS

Association exhibits include exhibits which depict the activities of the various councils and bureaus of the Association and closely allied subjects in which those departments are interested. During the year nineteen new exhibits were produced and two old exhibits discontinued, making fifty-six exhibits now available for loan purposes. There are twenty-five medical exhibits for use at medical and other scientific meetings, twenty-one health exhibits for fairs and expositions, and ten exhibits which can be used for either group. Medical exhibits were sent to twenty-three meetings in twelve states. Many of the meetings used two or more exhibits, making the total medical exhibits lent during the year forty-four. A considerable number of reservations for exhibit material were canceled because of cancellation of meetings or unexpected curtailment of programs. Health exhibits were presented on thirty-five occasions in seventeen states, a total of forty-nine exhibits being used. Many of the state fairs and other large gatherings which ordinarily use much exhibit material were canceled in 1942, thus reducing the demand for exhibits.

Active cooperation with museums has been continued in accordance with the action of the House of Delegates at the New York session. Permanent exhibits have been maintained at the Cleveland Health Museum, the Chicago Museum of Science and Industry and the Toledo Museum of Science. At the Cleveland and Chicago museums the question and answer service, which was established in 1940, has been as popular as ever. Answers to questions are sent by mail through the cooperation of the Bureau of Health Education. The American Museum of Health in New York has postponed opening permanent quarters until after the war, but the exhibit material from the American Medical Association which was shown at the New York World's Fair has been lent to the Cleveland Health Museum for display. Other museums with which the Bureau has cooperated in health displays include the Public Museum at Grand Rapids, Mich., the Valentine Museum at Richmond, Va., and the Tower of Health at Madison, Wis.

#### MOTION PICTURES

Motion pictures fall into two groups, medical films for medical societies and other scientific groups and health films for lay groups. Numerous requests are received for information concerning such films, and much time is consumed in keeping files up to date. Several hundred new medical pictures, only a small proportion of which are available for general distribution, are made each year. Health films are sponsored by many national and state organizations. The total number of health films for public showing is much smaller than the list of medical films.

The Bureau of Exhibits has prepared no general list of motion pictures, but, as requests are received for information concerning pictures on specific subjects, lists are compiled according to the needs of the inquirer. The film library now consists of twenty-six titles, three of which were added during the last year. There are seven on physical therapy and six on anes-

thesia, miscellaneous subjects making up the remainder. Six of the pictures are suitable for public showings. It will be necessary to add materially to the list of films during the coming year to meet the demand from county medical societies. During the year two hundred and forty-five films were sent out to one hundred and fifty meetings in thirty states. Army camps are using motion pictures to an increasing extent for groups of medical officers.

#### PUBLICATIONS

Booklets and pamphlets prepared by various special exhibit committees under the sponsorship of the Bureau of Exhibits include the Primer on Fractures, Fundamentals of Anesthesia, Varicose Veins and Food Charts. Many thousands of copies have been distributed. The fifth edition of the Primer on Fractures is being prepared for publication in 1943.

#### Summary

The Scientific Exhibit at the Atlantic City session was notable for the participation of physicians from the Latin American countries and for the presentation of war problems by the Army, Navy and other governmental agencies. There was a total of two hundred and sixteen exhibits, including special exhibits on fractures and backache, and demonstrations on poliomyelitis and diabetes. Four motion picture theaters were in continuous operation, showing seventy-eight films each day.

Association exhibits for loan purposes were sent out ninety-one times to fifty-eight meetings in nineteen states. During the year nineteen new exhibits were added, making a total of fifty-six now available for loan. Museums continued to be the recipients of loan exhibits, active cooperation being maintained with such institutions in six states. Motion pictures in the film library number twenty-six. They were sent out two hundred and forty-five times to one hundred and fifty meetings in thirty states. Many hundreds of requests for information concerning motion pictures on particular subjects were answered. Books and pamphlets prepared originally for use in the Scientific Exhibit have been distributed through the Order Department, the most popular being the Primer on Fractures, Fundamentals of Anesthesia and Food Charts.

#### Committee on Student Health

In compliance with suggestions offered by government officials, the Board of Trustees has appointed a Committee on Student Health. The members of this committee are Dr. Joseph E. Raycroft, Princeton, N. J., chairman, Dr. Ruth E. Boynton, Minneapolis, Dr. Arlie V. Bock, Cambridge, Mass., Dr. Frank B. Kelly, Chicago, and Dr. O. N. Andersen, Stanford University, Calif.

This committee has had two meetings, one in Washington and one in Chicago, and is now engaged in formulating working plans.

#### Committee on Conservation of Vision

The following Committee on Conservation of Vision has been appointed by the Board of Trustees: Dr. Conrad Berens, New York City; Dr. J. V. Cassidy, South Bend, Ind.; Dr. E. C. Ellett, Memphis, Tenn.; Dr. Harry S. Gradle, Chicago; Dr. R. S. Irvine, San Francisco; and Dr. Lawrence T. Post, St. Louis.

Because of existing conditions incident to the war, this committee has not completed its plans. When it is possible for the committee to perfect the necessary organization of committees in various states and compile necessary data, official reports will be submitted to the Board of Trustees and, through the Board, to the House of Delegates.

#### Supplementary Report

A supplementary report dealing with various matters referred to the Board of Trustees by the House of Delegates, which cannot be prepared in time for inclusion in the Handbook, will be submitted to the House of Delegates at this meeting. Other

matters referred to the Board of Trustees are covered in sections of this Report of the Board of Trustees pertaining to the activities of councils and bureaus.

Respectfully submitted

ROGER I. LFF, Chairman  
ERNEST C. IRONS, Secretary  
WILLIAM F. BRAASCH  
E. L. HENDERSON  
RALPH A. FENTON  
JAMES R. BLOSS  
C. W. ROBERTS  
EDWARD M. PALETTE  
R. L. SENSIVICH

### ADDENDA TO REPORT OF BOARD OF TRUSTEES

#### Report of the Committee on Scientific Research for 1942

In 1942 thirty-one new grants have been made, amounting to \$14,980 in response to forty applications. Thirty-five grants have been closed. In all cases full accounting has been made of the finances. In the case of twenty-four of these grants reports of results of the work have been published or arrangements made for their publication. In the case of eleven closed

#### FINANCIAL STATEMENT FOR 1942

Balance Jan 1, 1942	\$ 9,404.61
Appropriation for 1942	13,700.00
Special Cardiac Research Fund	1,000.00
Refund grant 445	61.70
Refund grant 481	15.22
Refund grant 510	58.38
Refund grant 548	9.21
Refund grant 584	128.21
Refund grant 595	149.86
Refund grant 505	79.40
Refund grant 618	13
Refund grant 619	350.00
Refund grant 614	57.39
Refund grant 643 (Cardiac Fund)	446.57
Refund grant 645	200.00
	\$25,659.68

#### GRANTS AND EXPENSES PAID IN 1942

Grant 623 Catharine Macfarlane	\$2,500.00
Grant 624 Hans Popper	300.00
Grant 625 David Rodmiche	500.00
Grant 626, Peter P. H. de Bruyn	400.00
Grant 627 Francis J. Braceland	500.00
Grant 629 Daniel J. Glomset	500.00
Grant 630 Wesley W. Spink	300.00
Grant 631 I. R. Cerecedo	500.00
Grant 632 A. M. Jassek	300.00
Grant 633 Oliver P. Jones	250.00
Grant 634 I. M. Tarlov	500.00
Grant 635 Reginald Fitz	200.00
Grant 636 A. McGhee Harvey	500.00
Grant 637 John R. Payne	620.00
Grant 638 Charles W. Turner	600.00
Grant 639 Ben Vidgoff	350.00
Grant 640 Barnett Sure	400.00
Grant 641 Paul Thomas Young	500.00
Grant 642 Deborah V. Dauber (Cardiac Fund)	500.00
Grant 643 Milton Mendlowitz (Cardiac Fund)	500.00
Grant 644 Jacob Rabinovitch	240.00
Grant 645 Robert M. Virtune	200.00
Grant 646 Frederick M. Allen	500.00
Grant 647 Walter Schiller	250.00
Grant 648 Meyer M. Harris	250.00
Grant 649 Arthur H. Smith	200.00
Grant 650 Tuberculosis Committee Minnesota State Medical Association J. A. Myers Chairman	1,000.00
Grant 651 Roger M. Reinecke	300.00
Grant 652 Oliver P. Jones	570.00
Grant 653 Ulrich Friedemann	750.00
Clerical expense	600.00
Committee travel expense	287.70
	\$15,867.70
Balance December 31, 1942	\$ 9,791.98

grants (nine grantees) no results have been published. On account of the war three grants were closed shortly after payment (grants 639, 642 and 645, 1942). The work under forty-one grants prior to 1942 is incomplete in most cases active

work is in progress and in many cases reports have been published. In some cases work has been interrupted by war service. Certain research aided by grants from the committee is now carried forward by governmental agencies. During the year, unexpended balances of twelve grants have been refunded.

**Special Cardiac Research Fund**—A donor, who must remain unnamed, has placed a special fund of \$1,000 in charge of the committee to aid cardiac research by young physicians in medical practice (see grants 642 and 643, 1942).

The financial summary for 1942 is presented, also brief accounts of the grants closed during the year, of pending grants from previous years and a list of the grants made in 1942.

Respectfully submitted

#### COMMITTEE ON SCIENTIFIC RESEARCH OF THE AMERICAN MEDICAL ASSOCIATION

E. W. GOODPASTURE, Nashville, Tenn.  
Term expires 1947

LUDWIG HIKTOIY, Chicago  
Term expires, 1946

MARTIN H. FISCHER, Cincinnati  
Term expires, 1945

N. W. JONES, Portland, Ore.  
Term expires, 1944

JOHN J. MORTON, Rochester, N. Y.  
Term expires 1943

#### GRANTS OF COMMITTEE ON SCIENTIFIC RESEARCH NEW GRANTS—1942

Grant 623 Catharine Macfarlane Women's Medical College of Pennsylvania \$2500 value of periodic pelvic and breast examination in detecting cancer. See grants 494 and 536 1938 and 1939.

Grant 624 Hans Popper Cook County Graduate School of Medicine Chicago \$300 vitamin A in tissues. See grant 604 1941.

Grant 625 Fred Rodhe University of Chicago \$500 study of chemotherapeutic agents on intestinal flora in infectious conditions.

Grant 626 Peter P. H. de Bruyn University of Chicago \$400 study of osteogenic substance in laying birds.

Grant 627 Francis J. Braceland Loyola University School of Medicine Chicago \$500 carbohydrate disturbances in schizophrenia.

Grant 628 Robert P. Ball Columbia University \$500 roentgen pelvimetry. Grant not paid because grantee entered military service.

Grant 629 Daniel J. Glomset Des Moines Iowa \$500 cardiac conduction—disturbances of ventricular conduction.

Grant 630 Wesley W. Spink University of Minnesota \$300 nutrition and immunology of staphylococci.

Grant 631 L. R. Cerecedo Fordham University \$500 vitamin B deficiency of rats and mice.

Grant 632 A. M. Lassek Medical College of South Carolina \$300 retrograde degeneration in the pyramidal tract. See grant 593 1940.

Grant 633 Oliver P. Jones University of Buffalo \$250 effect of antianemic principle on embryonic blood cells.

Grant 634 I. M. Tarlov Jewish Hospital Brooklyn \$500 study of plasma clot in suture of nerves in monkeys.

Grant 635 Reginald Fitz Peter Bent Brigham Hospital Boston, \$200 how does hyperthyroidism begin clinically?

Grant 636 A. McGhee Harvey Vanderbilt University School of Medicine, \$500 secretion of thymus.

Grant 637 John R. Paine University of Minnesota \$620 study of oxygen poisoning.

Grant 638 Charles W. Turner University of Missouri \$600 mechanism of lactation.

Grant 639 Ben Vidgoff University of Oregon Medical School \$300 morphology of endocrine and secondary sex organs in male white rat.

Grant 640 Barnett Sure University of Arkansas \$400 vitamin B complex. See grant 601, 1941.

Grant 641 Paul Thomas Young University of Illinois \$500 appetite and food preferences in the rat. See grant 619 1941.

Grant 642 Deborah V. Dauber Michael Reese Hospital \$500 atherosclerosis in the chick (Cardiac Research Fund).

Grant 643 Milton Mendlowitz Mount Sinai Hospital New York \$500 digital circulation (Cardiac Research Fund).

Grant 644 Jacob Rabinovitch Jewish Hospital Brooklyn \$240 effect of heparin on thrombosis.

Grant 645 Robert M. Virtue University of Denver \$200 sulfur metabolism in cystinuric dogs.

Grant 646 Frederick M. Allen New York Medical College \$500 local refrigeration in surgery. See grant 615 1941.

Grant 647 Walter Schiller Cook County Hospital Chicago \$250 ovarian tumors. See grant 532 1939.

Grant 648 Meyer M. Harris New York State Psychiatric Hospital \$250 further research on muscular disease. See grant 606 1941.

Grant 649 Arthur H. Smith Wayne University College of Medicine Detroit \$200 metabolism of citric acid. See grant 606 1941.

Grant 650 Tuberculosis Committee Minnesota State Medical Association I. A. Myers chairman \$1000 tuberculosis survey of Meeker County Minn.

Grant 651 Roger M. Reinecke University of Minnesota \$300 carbohydrate metabolism of the kidney.

Grant 652 Oliver P. Jones University of Buffalo \$570 erythropoietic action of extract of human stomach. See grant 633 1942.

Grant 653 Ulrich Friedemann Jewish Hospital Brooklyn \$750 types of tetanus toxin. See grant 583 1940.

#### STATE OF GRANT AIDED WORK

##### 1 GRANTS CLOSED DURING THE YEAR

##### A RESULTS PUBLISHED OR READY FOR PUBLICATION

Grant 474 1937 Marion Fry Woman's Medical College of Pennsylvania \$75 biochemistry of strontium. See grant 552 1939. Fay Marion Andersch M. A. and Behrmann V. G. The Biochemistry of Strontium. *J. Biol. Chem.* **144**: 383 1942.

Grant 445 1937 Paul M. Levin Johns Hopkins University \$250 cerebral efferent tracts in primates. Refund \$61.70. Levin P. M. A. Nervous Structure in the Pineal Body of the Monkey. *J. Comp. Neurol.* **68**: 405 1938. Levin P. M. and Bradford F. K. The Efferent Origin of the Corticospinal Tract in the Monkey. *ibid.* **68**: 411 1938.

Grant 503 1938 R. C. Robb Syracuse University College of Medicine \$800 diseases in twins. The results will be published in a monograph.

Grant 510 1938 Erma A. Smith Iowa State College \$150 influence of various substances on gastrointestinal motility. Refund \$58.38. Smith Erma A. and Penrod K. E. Gastrointestinal Motility in the Albino Rat After Administration of Amphetamine Sulfate. *Proc. Soc. Exper. Biol. & Med.* **47**: 418 1941.

Grant 532 1939 Walter Schiller Cook County Hospital Chicago \$200 ovarian tumors. Schiller Walter. Liver Cell Fat Necrosis Caused by Pancreatic Reflux. *Surg. Gynec. & Obst.* **72**: 70 1941. Schiller Walter. The Histogenesis of Ovarian Mesonephroma. *Arch. Path.* **33**: 443 1942. See grant 647 1942.

Grant 539 1939 Albert V. Hardy Columbia University \$500 Shigella dysenteriae. Hardy A. V. The Mouse Mucin Test in the Study of Shigella to be published in *Public Health Reports*.

Grant 552 1939 Marion Fay Woman's Medical College of Pennsylvania \$250 biochemistry of strontium. See grant 474 1937. Fay Marion. Behrmann V. G. and Buck D. M. The Parathyroids and the Clearance of Inorganic Phosphate. *Am. J. Physiol.* **136**: 716 1942.

Grant 560 1939 B. S. Kline and H. P. Lankelma Western Reserve University \$500 chemical study of antigens. Wellman J. W. and Lankelma H. P. Purification of the Antigen of Syphilis. *Ven. Dis. Inform.* **22**: 12 1941.

Grant 562 1939 Joseph H. Roe George Washington University \$350 vitamin C requirements of man. Kuether Carl A. and Roe J. H. Determination of Ascorbic Acid in Whole Blood. *Proc. Soc. Exper. Biol. & Med.* **47**: 467 1941. Roe J. H., Hall J. M. and Dyer H. M. Relation of Nutrition to Gastric Function II. The Effect of Vitamin C Deficiency. *Am. J. Digest. Dis.* **5**: 261 1941. See grant 507 1938. Report of Committee for 1940.

Grant 579 1940 Harry C. Rolnick Michael Reese Hospital Chicago \$200 effect of trauma on the response of the kidney to sudden blockage. Sobin S. S., Aronberg L. M. and Rolnick H. C. The Nature of the Renal Lesion Caused by the Sulfonamides and Its Prevention with Urea. Accepted for publication by *American Journal of Pathology*.

Grant 585 1940 Howard Curl University of Tennessee \$400 roentgenologic study of the normal gallbladder. Curl Howard. High Fat Diet Preceding Cholecystography: A Review of the Literature and Experimental Studies on Filling the Normal Gallbladder. *J. A. M. A.* **119**: 607 1942.

Grants 590 and 597 1940 David Polowe Paterson N. J. \$150 and \$100 pancreatic function test. See grant 597 1940. Polowe D., Rati H. D. and Bullowa J. G. M. Measurement of Blood Amylase Activity by Cuprous Oxide Precipitation. *Am. J. Clin. Path.* **12**: 62 1942.

Grant 593 1940 A. M. Lassek Medical College of the State of South Carolina \$300 origin of the pyramidal tract in the monkey. Lassek A. M. The Effect of Pre and Postcentral Cortical Ablations on the Fibers of the Pyramids in Monkeys. *J. Ner. & Ment. Dis.* **95**: 721 1942. See grant 632 1942.

Grant 596 1940 Israel Davidsohn Mount Sinai Hospital Chicago \$400 bacteriogenic hemagglutination. See grant 569 1940. Davidsohn I. and Tohrsky B. Bacteriogenic Hemagglutination II. *J. Immunol.* **43**: 213 1942.

Grant 600 1941 W. R. Tweedy Loyola University School of Medicine Chicago \$125 effect of magnesium deficient diet on serum phosphatase activity in albino rat. Snyder F. H. and Tweedy W. R. The Effects of a Magnesium Deficient Diet on the Serum Phosphatase Activity in the Albino Rat. accepted for publication by *Journal of Biological Chemistry*.

Grant 601 1941 Barnett Sure Agricultural Experimental Station Fayetteville Ark. \$600 new factor in vitamin B complex essential for reproduction and lactation. See grant 640 1942. Sure Barnett. Dietary Requirements for Fertility and Lactation. *XXX Role of p-Aminobenzoic*

Acid and Inositol in Lactation *Science* **94** 167 1941 Dietary Requirements for Fertility and Lactation XXIX The Existence of a New Dietary Factor Essential for Lactation *J Nutrition* **22** 499, 1941

Grant 604 1941 Hans Popper Cook County Graduate School of Medicine Chicago \$350 study of vitamin A and lipoids by fluorescence microscopy See grant 624 1942 Meyer Karl A Popper Hans and Ragins A B Histologic Distribution of Vitamin A in Biopsy Specimens of the Liver *Arch Surg* **43** 376 1941 Popper Hans and Chinn Herman Changes of Vitamin A Distribution in Choline Deficiency *Proc Soc Exper Biol & Med* **49** 202 1942 Popper Hans and Brenner Sadie The Fate of Vitamin A Stores During Depletion Value of the Histologic Demonstration of Vitamin A *J Nutrition* **23** 431 1942 Cornbleet Theodore and Popper, Hans Properties of Human Skin Revealed by Fluorescence Microscopy The Normal Skin The Vitamin A Content of the Skin *Arch Dermat & Syph* **46** 59 1942 Popper Hans Steigmann Frederick and Dymowicz H A Distribution of Vitamin A in Experimental Liver Damage *Proc Soc Exper Biol & Med* **50** 266 1942 Meyer K A Popper Hans, Steigmann Frederick, Walters W H and Zevin Sol Comparison of Vitamin A of Liver Biopsy Specimens with Plasma Vitamin A in Man *ibid* **49** 589 1942

Grant 606 1941 Meyer M Harris Psychiatric Institute New York \$250 food factors in muscular disease See grant 648 1942 Harris M M Negative Therapeutic and Metabolic Effects of Synthetic Alpha Tocopherol (Vitamin E) in Muscular Dystrophy *Am J M Sc* **202** 258 1941

Grant 610 1941 H O Burdick Alfred University Alfred N Y, \$125 the effect of desoxycorticosterone acetate on pregnancy Burdick H O Effect of Progesterone on the Ovaries and Embryos of Mice in Early Pregnancy *Endocrinology* **30** 619 1942

Grant 614 1941 George Gomori University of Chicago \$400 enzymes in tissue sections Gomori George Histochemical Reactions on Lipid Aldehydes and Ketones accepted for publication by *Proceedings of the Society for Experimental Biology and Medicine* Calcification and Phosphatase accepted for publication by *American Journal of Pathology*

Grant 615 1941 Frederick M Allen New York Medical College \$500 reduced temperatures in surgery Allen F M Reduced Temperatures in Surgery III Experiments on Pelvic and Abdominal Refrigeration with Especial Reference to Traumatic and Military Surgery *Am J Surg* **55** 451 1942 See grant 646 1942

Grant 618 1941 H M Weaver Wayne University College of Medicine \$200 pain on distention of the stomach Refund \$0.13 Weaver H M Pathways for Pain from the Stomach in the Dog accepted for publication by *Archives of Neurology and Psychiatry*

Grant 622 1941 Timothy Ierry Office of Medical Examiner Boston \$75 illustrations for article on atherosclerosis See grant 471 1937 Ierry Timothy The Genesis of Atherosclerosis *Arch Path* **32** 507 1941

#### B No Results Published

Grant 254 1932 J Lisle Williams Rush Medical College Chicago \$200 decreased dextrose tolerance in acute infectious diseases

Grants 310 1934 and 462 1937 Iry Martin Johns Hopkins University \$150 and \$200 gastric juice The research is receiving support from other sources

Grant 355 1935 Royall M Calder San Antonio, Texas \$150 mechanism of pneumococcal inflammation

Grant 480 1937 Amy J Daniels State University of Iowa \$250 relation of fluorine to physiologic function Illness prevents completion of the work

Grants 527 1938 and 577 1940 Alexander Levy University of Oregon Medical School \$300 and \$200 collateral circulation in occlusion of the coronary arteries

Grant 542 1939 Kendall B Corbin University of Tennessee \$200 alterations in the hip after deafferentation No changes were noted in partially deafferented shoulder or hip joints of monkeys kept for periods varying to as long as eighteen months in duration The monkeys gradually died of tuberculous infection Under the circumstances and because of the possibility that positive results might appear in animals kept for a longer time it is thought best to postpone publication of the results until further experiments can be carried out

Grant 639 1942 Ben Vidgoff University of Oregon Medical School \$350 morphology of endocrine and secondary sex organs of male white rat Grant returned because increase in teaching prevents research

Grant 643 1942 Milton Mendlowitz Mount Sinai Hospital New York \$500 digital circulation (Special Cardiac Research Fund) Grantee in military service Refund \$446.57

Grant 645 1942 Robert M Virtue University of Denver \$200 sulfur metabolism in cystinuric dogs Grant returned because necessary animal quarters could not be obtained

#### 2 WORK IN PROGRESS

Grant 441 1937 Edward S West and G E Burget University of Oregon Medical School \$350 diuretic action and chemical metabolism of sorbitol Todd W R Myers J and West E S On the Metabolism of Sorbitol and Mannitol *J Biol Chem* **127** 275 1939

Grant 479 1937 Tracy J Putnam Boston City Hospital \$200 injuries to the cervical portion of the cord

Grant 481 1937 Warren O Nelson Wayne University College of Medicine \$200 synthetic androgenic substances

Grant 504 1938 Wallace M Yater Georgetown University Medical School \$500 histopathology of bundle branch block

Grant 518 1938 Harold D West Meharry Medical College \$100 synthesis of dithrombin See grant 559 1939

Grant 522 1938 Ludwig A Imge Stanford University School of Medicine, \$500 relation of sex hormones to tumor growth

Grant 533 1939 Hardy A Kemp and W M Fisher Baylor University \$500 venom of southern and southwestern scorpions

Grant 536 1939 Catharine Macfarlane Woman's Medical College of Pennsylvania \$1900 value of periodic pelvic examination in detecting cancer of the uterus See grants 494 1938 and 623, 1942 Macfarlane Catharine, Letterman Ruth S and Sturges Margaret C Report of an Experiment in the Control of Cancer of the Uterus *Quart Rev New York City Cancer Committee* 1941 Macfarlane Catharine Progress Report on Experiment in Control of Cancer of the Uterus *Connecticut State M J* **5** 814 1941 Macfarlane Catharine Precancerous Lesions of Uterine Cervix *M Woman's J* July 1941 Scott Eleanor Analysis of Lesions of the Cervix Discovered in Periodic Pelvic Examinations of 955 Women *M Woman's J* December 1941 Macfarlane Catharine, Sturges Margaret C and Letterman Ruth S Report of an Experiment in the Control of Cancer of the Uterus *Pennsylvania M J* **15** 348 1942

Grant 541 1939 Henry Laurens Tulane University \$350 lowering of arterial pressure by carbon arc radiation See grant 498 1938 Laurens Henry and Graham J S The Influence of the Pressure Lowering Effect of Carbon Arc Radiation *M Rec* **151** 146 1941

Grant 557 1939 W D Armstrong University of Minnesota \$500 calcification of bone in vitro Armstrong W D Sperling Louis and Litow Sidney Effect of Phosphoric Acid Esters on Fracture Healing *Proc Soc Exper Biol & Med* **49** 169 1942 Sperling Louis Armstrong W D and Litow Sidney The Influence of Sodium Beta Glycerol Phosphate on the Healing of Experimental Fractures *J Bone & Joint Surg* **24** 781 1942

Grant 559 1939 Harold D West Meharry Medical College \$50 synthesis of dithrombin See grant 518 1938

Grant 567 1940 Armand J Quick Marquette University \$275 conversion of prothrombin to thrombin Quick A J Prothrombin Concentration of the Blood in Various Species *Am J Physiol* **122** 239 1941 Quick A J Effect of Air Currents on Plasma Prothrombin *Proc Soc Exper Biol & Med* **50** 317 1942

Grant 570 1940 William H Sweet University of Chicago \$300 course of nerve fiber tracts of the temporal lobe

Grant 571 1940 Joseph T King University of Minnesota \$280 anatomic effect of tissues on the action of sulfanilamide Jensen N K and Nelson M C Local Sulfanilamide in Compound Fractures *Surg Gynec & Obst* **75** 34 1942

Grant 574 1940 A C Irtan Louisiana State University \$300 absorption and metabolism of amino acids Irtan A G and Doty J R The Heat Production and Blood and Urine Constituents After Administration of L(-) Histidine to the Dog *J Nutrition* **21** 25 1941

Grant 576 1940 Edward S West University of Oregon Medical School \$250 solution of vesical calculi

Grant 582 1940 Charles W Greene Stanford University \$500 physiology of the coronary system in monkeys

Grant 583 1940 Ulrich Friedemann Jewish Hospital of Brooklyn \$300 genesis of tetanus Friedemann Ulrich Hollander A and Farlow I M Investigations of the Pathogenesis of Tetanus III *J Immunol* **10** 325 1941 See grant 653 1942

Grant 584 1940 Oscar V Batson University of Pennsylvania \$200 nystagmus

Grant 591 1940 Percival Bailey University of Illinois \$500 effects of electrolytic lesions in the periaqueductal gray matter of the Macacus monkey Bailey Percival and Davis F W Effects of Lesions of the Periaqueductal Gray Matter in the Cat *Proc Soc Exper Biol & Med* **51** 305 1942 The Syndrome of Obstinate Progression in the Cat *ibid* p 307

Grant 594 1940 I L Chirikoff University of California \$350 phospholipid metabolism and blood regeneration as measured by radioactive phosphorus

Grant 595 1940 Arthur C Allen Mount Sinai Hospital New York \$250 effect of chemicals on vegetations of experimental endocarditis Refund \$148.86

Grant 599 1941 William H Welker University of Illinois College of Medicine \$350 water soluble proteins

Grant 603 1941 Norris J Hechel Rush Medical College Chicago \$250 effect of sex hormones on seminal fluid

Grant 605 1941 Harry G Day Indiana University \$400 physiologic significance of zinc

Grant 607 1941 Fritz Levy Davis Memorial Hospital Elkins W Va \$250 study of marrow cells

Grant 608 1941 Everett J Evans Medical College of Virginia \$500 problems in surgical shock

Grant 609 1941 C E Cain Bronner University of Illinois College of Medicine \$300 bacterial metabolism

Grant 611 1941 M R Todd University of Oregon Medical School \$200 the physiologic effects of canine distemper vaccine

Grant 612, 1941 Roland K Meyer University of Wisconsin \$500 antihormones Meyer R K Kupperman H S and Finerty J C Increase in Gonadotropic Content of Pituitary Glands of Female Rats Treated with Antigonadotropic Serum *Endocrinology* **30** 662 1942

Grant 613 1941 Robert W Virtue University of Denver \$200 formation of cholic acid See grant 499 1938 report for 1940

Grant 616 1941 Robert S Dow University of Oregon Medical School \$250 effects of clotting in cerebral veins

Grant 617 1941 Mary Juhn, University of Maryland College of Medicine \$500 tests of applicability of further germ reaction to tumor diagnosis

Grant 620 1941 T T Chen University of California, \$150, illustrations of malarial parasites

Grant 619 1941 Paul Thomas Young, University of Illinois \$500 appetites and food preferences in the rat See grant 611 1942

Grant 621 1941 William M Cahill Wayne University College of Medicine \$175 self selection of food in relation to tumor growth

### Report of the Committee on Therapeutic Research

The Committee on Therapeutic Research, a standing committee of the Council on Pharmacy and Chemistry, encourages scientific investigations in the field of therapeutics by providing funds for the prosecution of necessary research.

During the year 1942 the committee issued twenty-seven new grants. A detailed list of these grants, together with a list of publications during 1942 and of unexpended grants made before Jan 1, 1942 are included in this report.

The following is a list of the investigations conducted with the assistance of grants made by the Committee on Therapeutic Research, reports of which were published during 1942.

Chemotaxis Morton McCutcheon *Irish Path* 74 167 (July) 1942

The Fundamental Characteristics of Local Anesthetics R Beutner B Calsenick and I Lapissohn *Anesthesiology* 6 673 (Nov) 1942

The Vasomotor Components in the Vascular Reactions in the Finger to Cold Alrick B Hertzman and Laurence W Roth *Am J Physiol* 136 669 (June) 1942

The Reactions of the Digital Artery and Minute Pad Arteries to Local Cold Alrick B Hertzman and Laurence W Roth *Am J Physiol* 136 680 (June) 1942

The Absence of Vasoconstrictor Reflexes in the Forehead Circulation Effects of Cold Alrick B Hertzman and Laurence W Roth *Am J Physiol* 136 692 (June) 1942

A Therapeutic Incompatibility Between Sulfapyridine and Quinine Ben King Harned and Vera V Cole *J Pharmacol & Exper Therap* 74 42 (Jan) 1942

The Effects of a Diet Deficient in Vitamin B on the Toxicity of Sulfapyridine Vera V Cole and Ben King Harned *Federation Proc* 1 147 (March) 1942

Effect of Estrone on Prothrombin Content in Pituitary and Blood of Male Rabbits Joseph Meites and C W Turner *Proc Soc Exper Biol & Med* 40 190 1942

Lactogenic Content of Pituitaries of Pseudopregnant Rabbits Joseph Meites and C W Turner *Proc Soc Exper Biol & Med* 40 193 1942

Prothrombin Abraham White Roy W Bonsnes and C N H Long *J Biol Chem* 143 447 (April) 1942

Statistical Studies on the Effects of Anesthetics in the Intravenous Cat Method of Standardizing Digitalis Harald G O Holck E I Smith R H Shuler R Van Norman D R Mathieson and J Dahlstedt *Federation Proc* 1 154 (March) 1942

Effects of Testosterone Acetate and Propionate and of Estradiol Dipropionate on the Resistance of the Rat to Exipal Sodium Arostal Pernston and Pentobarbital Sodium Harald G O Holck Donald R Mathieson Edwin I Smith and Lewis D Fink *J Am Pharm A* (Scient Ed) 31 116 (April) 1942

The Effect of Some Organic Solvents on the Hormones of the Posterior Lobe of the Hypophysis John A Vachulis *Federation Proc* 1 170 (March) 1942

Effects of Cocaine and Sympathomimetic Amines on Humoral Transmission of Sympathetic Nerve Actions W S Lawrence M C Morton and M L Tainter *J Pharmacol & Exper Therap* 75 219 (July) 1942

Tryptophan Metabolism Raymond Borchers Clarence P Berg and Newton E Whitman *J Biol Chem* 145 657 (Oct) 1942

The Arsenic Analogue of Choline as a Component of Lecithin in Rats Fed Arsenocholine Chloride A D Welch and R L Landau *J Biol Chem* 144 581 (Aug) 1942

Effects of Asphyxia Anoxia and Myocardial Ischemia on the Coronary Blood Flow Harold D Green and Rene Wegria *Am J Physiol* 135 271 (Jan) 1942

Relative Increase in Chloride Excretion in the Dog After Graded Doses of Mercurial Diuretics Charles C Roby and Carl Pfeiffer *Am J Physiol* 135 591 (Feb) 1942

Influence of Diet on Action of the Sulfonamide Drugs Esther M Kreisheimer Roberta Hafkesbrung and Grace E Wertenberger *Proc Soc Exper Biol & Med* 51 143 1942

Emetic Responses of Glycosides as Evidence of Their Cumulation and Synergistic Action in the Central Nervous System Melvin Dresbach *Federation Proc* 1 22 (March) 1942

Redistribution of Body Fluids After Glucose Injections in Rats with Adrenocortical Transplants Leland C Wyman and Caroline tum Suden *Endocrinology* 31 295 (Sept) 1942

The Pharmacological Actions of Parenterally Administered Magnesium Salts A Review Paul K Smith Alexander W Winkler and Hebbel E Hoff *Anesthesiology* 3 323 (May) 1942

Absence of Beneficial Effects from Injections of Desoxycorticosterone Acetate and of Cortical Adrenal Extract in Experimental Anuria Alexander W Winkler Paul K Smith and Hebbel E Hoff *J Clin Invest* 21 419 (July) 1942

Intravenous Magnesium Sulfate in the Treatment of Nephritic Convulsions in Adults Alexander W Winkler Paul K Smith and Hebbel E Hoff *J Clin Investigation* 21 207 (March) 1942

Heparin as an Antidote to Trypsin in the Rat Carl A Dragstedt J A Wells and M Rocha e Silva *Federation Proc* 1 149 (March) 1942

Inhibitory Effect of Heparin on Histamine Release by Trypsin Antigen and Protease Carl A Dragstedt J A Wells and M Rocha e Silva *Proc Soc Exper Biol & Med* 51 191 1942

A Comparison of the Disposition of Injected Glucose in Two Strains of Rats James M Orten and George Sayers *J Biol Chem* 145 123 (Sept) 1942

The Direct Mammotrophic Action of Lactogenic Hormone William R Lyons *Proc Soc Exper Biol & Med* 51 308 1942

Further Ballistic Studies on Cardioaortic Hydraulic Models Philip Dow and W F Hamilton *Federation Proc* 1 21 (March) 1942

The Recoil Curves of the Circulation in Three Dimensions W F Hamilton and Philip Dow *Federation Proc* 1 36 (March) 1942

Blood Pressure Studies in Patients Undergoing Convulsive Therapy Hervey Cleckley W P Hamilton R A Woodbury and P P Volpitta *South M J* 35 375 (April) 1942

The Effects of Metrazol on the Blood Pressure of Man and Dog W P Hamilton R A Woodbury Hervey Cleckley and P P Volpitta *Hosp Bull (U of Ga)* 4 13 1942

Cure of Experimental Staphylococci Meningitis Ward J MacNeal Martha Jane Spence and Anne Blevins *Proc Soc Exper Biol & Med* 50 176 1942

Staphylococemia 1931 1940 Five Hundred Patients Ward J MacNeal Frances C Irisbee and Margaret A McRae *Am J Clin Path* 12 281 (June) 1942

Mechanism of Pentothal Sodium Antidiuresis Herbert Silvette *Arch Int Med* 70 567 (Oct) 1942

Influence of Repeated Daily Exposure to Low Barometric Pressure on Urine Output Herbert Silvette *Proc Soc Exper Biol & Med* 51 199 1942

Effect of Alcohol on Postpituitary Antidiuresis Herbert Silvette *Federation Proc* 1 166 (March) 1942

Effect of Epinephrine and Pitressin on the Coronary Artery Inflow in Anesthetized Dogs Harold D Green Rene Wegria and Norman H Boyer *J Pharmacol & Exper Therap* 76 378 (Dec) 1942

Sulfonamides and the Blood pH Grace E Wertenberger *Proc Soc Exper Biol & Med* 51 145 1942

During 1942 the following grants were made

Grant 466 Dr R H Rigdon associate professor of pathology University of Tennessee \$100 to prepare a movie of a clinical case of malaria with the pathologic changes

Grant 467 Dr R C de Bodo associate professor of pharmacology New York University College of Medicine \$500 the antidiuretic action of the narcotics

Grant 469 Dr Harry Beckman professor of pharmacology Marquette University School of Medicine \$250 the possibilities of massive continuous therapy in malaria

Grant 470 Dr Herbert Silvette assistant professor of pharmacology University of Virginia Medical School \$275 the effect of low atmospheric pressures on the action of drugs

Grant 471 Dr W F Hamilton professor of pharmacology and physiology University of Georgia School of Medicine \$125 the cardiovascular pressures in unanesthetized animals and in man by means of the hypodermic manometer

Grant 472 Dr Robert V Brown associate professor of physiology and pharmacology University of North Dakota \$150 action of pilocarpine on bile secretion

Grant 473 Dr Richard C de Bodo associate professor of pharmacology New York University College of Medicine \$500 temporary and permanent effects of insulin on carbohydrate metabolism with special reference to its effects on epinephrine hyperglycemia and liver glycogenolysis

Grant 474 Dr Arthur C DeGraff professor of therapeutics New York University College of Medicine \$400 effectiveness of sodium thiosulfate and sodium formaldehyde sulfoxalate in treatment of cardiac arrhythmias induced experimentally by mercurial diuretics

Grant 475 Dr Esther M Kreisheimer professor of physiology Woman's Medical College of Pennsylvania \$250 effects of sulfonamide drugs on certain phases of carbohydrate metabolism and blood pH

Grant 476 Dr Roberta Hafkesbrung associate professor of physiology Woman's Medical College of Pennsylvania \$200 effects of various sulfonamide drugs on the electrocardiograms of dogs

Grant 477 Dr Harold C Hodge assistant professor of biochemistry and pharmacology University of Rochester School of Medicine and Dentistry \$200 acute toxicity of choline

Grant 478 Dr Stacy R Mettler associate professor of medicine University of California Medical School \$400 the pH factor in blood transfusion and other immunologic aspects of blood grouping

Grant 479 Dr Mayo H Soley assistant professor of medicine and pharmacology University of California Medical School \$350 treatment of patients with toxic diffuse goiter by means of radioactive iodine

Grant 480 Dr J Murray Luck professor of biochemistry Stanford University \$500 concentration of the B vitamins in liver of the soupfin shark

Grant 481 Dr W J MacNeal director of the laboratories of bacteriology New York Post Graduate Medical School and Hospital \$250 bacteriophage phenomenon and therapeutic application of bacteriophages

Grant 482 Dr W J MacNeal director of the laboratories of bacteriology New York Post Graduate Medical School and Hospital \$400 the therapy of experimental viridans endocarditis

Grant 483 Dr Donald Slaughter professor of pharmacology and physiology University of Vermont College of Medicine \$150 effects of sulfonamides on the regeneration of visual purple

Grant 484 Drs Alfred Goerner associate professor of biological chemistry Long Island College of Medicine and M Margaret Goerner pathologist Brooklyn Thoracic Hospital \$400 toxic action of carcinogenic compounds on liver tissues

Grant 485 Dr Carl W Walter laboratory of surgical research Harvard Medical School \$250 for construction of a hydrogen ion potentiometer to be used for studies on (a) the mobilization and deposition of bone calcium by electrolysis (b) animal tissue response to metallic magnesium and its alloys

Grant 486 Dr Lawrence W Smith professor of pathology Temple University School of Medicine \$480 the effects of chlorophyll and other substances on tissue cultures and wound healing

Grant 487 Dr Harold Holck associate professor of pharmacology University of Nebraska College of Pharmacy \$175 the relation of sex to drug action

Grant 488 Dr L R Kaufman director of surgery New York Medical College \$125 circulatory competence of the gut in cases of intestinal obstruction

Grant 489 Dr L R Kaufman director of surgery New York Medical College \$100 use of enzyme mixture for dissolving slough

Grant 490 Dr Andrew F Burton assistant professor of pharmacology Howard University School of Medicine \$698 the distribution of sulfanilamide and the toxic effects of quinine

Grant 491 Dr Fred D Weidman vice dean for dermatology and syphilology University of Pennsylvania Graduate School of Medicine \$500 the control of dermatophytosis and value of living *Bacillus subtilis* cells

Grant 492 Dr Abraham White assistant professor of physiologic chemistry Yale University School of Medicine \$200 the hormones of the anterior pituitary gland

The following grants were issued before Jan 1 1942 In some cases the grant has expired and an unexpended balance remains or the work is not yet completed or not yet published

Grant 164 E L Jackson associate professor of pharmacology Emory University School of Medicine \$200 to investigate the antagonism between sodium barbital and insulin

Grant 232 George R Cowgill associate professor of physiology chemistry Yale University School of Medicine \$250 to investigate the heart in vitamin B deficiency

Grant 238 Roy R Kracke professor of pathology Emory University School of Medicine \$250 to investigate the effect of the oxidation products of aminopyrine and related drugs on the leukocyte counts of rabbits

Grant 264 Detlev W Bronk Johnson professor of biophysics University of Pennsylvania School of Medicine \$200 to investigate the action of various drugs on the autonomic centers

Grant 280 John P Peters professor of medicine Yale University School of Medicine \$200, to investigate by means of intravenous pyelography the state of the ureters and kidneys in a large series of patients after delivery and subsidence of acute signs of toxemia

Grant 297 Melvin Dresbach Harvard University School of Medicine \$250 to investigate the emetic effect of some of the digitalis bodies

Grant 306 Edwards A Park professor of pediatrics Johns Hopkins University School of Medicine \$75 to investigate rickets in the rat and the effect of solution of parathyroid on the circulation of the bone

Grant 355 Peter K Knoefel associate professor of pharmacology University of Louisville School of Medicine \$150 to investigate the action of amines of the epinephrine series and of related substances on the central nervous system

Grant 356 John B Lagen research associate in medicine University of California Medical School \$150 to investigate the potassium and sodium ions in the blood of asthmatic patients and in anxiety states

Grant 375 Joseph Seifter Department of Pharmacology Western Reserve University School of Medicine \$250 to investigate the pharmacology of metal alkyls

Grant 391 A R McIntyre professor of physiology and pharmacology University of Nebraska College of Medicine \$100 to investigate ourban and cardiac muscle and metabolism

Grant 404 Carl Pfeiffer Department of Pharmacology Wayne University College of Medicine, \$300 to investigate caffeine withdrawal headaches

Grant 408 Ephraim Shorr assistant professor of medicine Cornell University Medical College \$300 to investigate the effect of progesterone on the vaginal smear

Grant 411 Linn J Boyd professor of pharmacology New York Medical College \$300 to investigate the effects of hypnotics on mercurial diuretics

Grant 412 Anne Forbes Massachusetts General Hospital Boston \$400 to investigate the effect of various endocrine diseases and the administration of various endocrine products on the 17 ketosteroid secretion in the urine

Grant 413 Claude E Forkner New York Hospital Department of Medicine \$300 to investigate bronchiectasis etiology and treatment

Grant 417 H E Hoft assistant professor of physiology A W Winkler instructor in medicine and P K Smith research assistant in pharmacology and toxicology Yale University School of Medicine \$250 to investigate the action of ions

Grant 419 Thomas H McGavack New York Medical College \$300 to investigate the action of lipocac and pancreatic extracts

Grant 423 Treat B Johnson professor of organic chemistry Yale University School of Medicine \$250 to investigate pyrimidines

Grant 430 J P Simonds Department of Pathology Northwestern University Medical School \$100 to investigate the selective action of different types of poisons on the kidneys

Grant 437 M L Tainter professor of pharmacology Stanford University School of Medicine \$250 to investigate sympathomimetic amines

Grant 438 George I Munson assistant professor of physiology Wayne University College of Medicine \$200 to investigate the effect of certain drugs on the strength of skeletal muscle

Grant 442 Morton McCutcheon associate professor of pathology University of Pennsylvania School of Medicine \$150 to investigate cellular locomotion

Grant 443 A B Baker assistant professor of neuropsychiatry and neuropathology and Raymond N Bacter professor of pharmacology, University of Minnesota Medical School \$500 to investigate toxic effects of sulfanilamide and derivatives on nervous system and effect of vitamin B complex in prevention of such injuries

Grant 445 Paul I Javits professor of physiological chemistry and John R Trotter instructor in physiological chemistry University of Arkansas School of Medicine \$300 to investigate ocular manifestations of tryptophan deficiency

Grant 446 Carl A Drysdale professor of pharmacology Northwestern University Medical School \$100 to investigate the effect of heparin on in phylactic and related phenomena

Grant 449 Arch B Hartman professor of physiology St Louis University School of Medicine \$500 to investigate peripheral circulation

Grant 450 Linn J Boyd professor of pharmacology and David Schiffrer associate clinical professor of medicine New York Medical College \$50 to investigate the effect of triphenyltin in paroxysmal tachycardia

Grant 453 Amleto S Marrazzi assistant professor of pharmacology New York University College of Medicine \$500 to investigate sympathomimetic amines

Grant 454 W I Mendenhall professor of pharmacology and Albert J Hummer assistant professor of pharmacology Boston University School of Medicine \$50 to investigate the quantitative determination of theophylline

Grant 455 Frederick H Pratt professor of physiology and Marion A Reel instructor in physiology Boston University School of Medicine \$100 to investigate the effect of cardiac drugs on the denervated lymphatic heart

Grant 456 H Morrow Sweeney professor of physiology and pharmacology University of South Dakota \$100 to investigate the effects and mode of action of certain drugs with analgetic properties namely amphetamine and metrazol after morphine and sodium pentobarbital respectively

Grant 457 Edward C Wynn assistant professor of physiology Boston University School of Medicine \$372.50 to investigate the factors controlling the growth and functional efficiency of transplanted adrenal cortical tissue

Grant 458 George Fahr professor of internal medicine University of Minnesota \$100 to investigate the effect of lanthanide C on certain types of heart disease

Grant 459 Mary F O Sullivan Bellevue Hospital \$100 to investigate the therapeutic effect of a radical in muscular dystrophy

Grant 462 B K Harned professor of pharmacology and Hughbert C Hamilton associate professor of physiology Women's Medical College of Pennsylvania \$288 to investigate the effects of bromide administered to pregnant rats on the learning ability of the offspring

Grant 464 A J Nedzel associate professor of pathology University of Illinois College of Medicine \$300 to investigate the response of the animal body to drugs under different environmental conditions

Grant 465 L N Katz director of cardiovascular research Michael Reese Hospital \$200 to investigate the action of various steroids on capillary permeability

## TREASURER'S REPORT

### Report of the Treasurer of the American Medical Association for the Year Ended December 31, 1942

Investments (At Cost) as at January 1 1942	\$2 421 942 99
Bonds Purchased (At Cost)	239 904 49
Less	\$2 661 847 48
Bonds Called Matured or Sold	120 538 32
Investments as at December 31 1942	\$2 541 309 16
Balance for Investment January 1 1942	\$ 286 718 14
Interest Received on Investments—Year 1942	75 585 92
Less	362 304 06
Bonds Purchased (At Cost Plus Accrued Interest \$1 103 34)	241 007 83
Uninvested Funds December 31 1942	121 296 23
Invested and Uninvested Funds as at December 31 1942	\$2 662 605 39

## DAVIS MEMORIAL FUND

Balance in Fund January 1 1942	\$7 519 76
Interest Earned on Bank Balance—Year 1942	94 27
Funds on Deposit as at December 31 1942	\$7 614 03

HERMAN L KRETSCHMER Treasurer



## AUDITOR'S REPORT

January 29, 1943

To the Board of Trustees,

American Medical Association, Chicago, Illinois

Dear Sirs:

We have examined the Balance Sheet of the American Medical Association, Chicago, Illinois, as of December 31, 1942, and the statement of income for the year ended on that date, have reviewed the system of internal control and the accounting procedures of the Association and, without making a detailed audit of the transactions, have examined or tested accounting records and other supporting evidence, by methods and to the extent we deemed appropriate except as hereinafter stated regarding confirmation of receivables and observation of the inventory taking.

The cash and bank balances have been confirmed by count or by certificates from the depositories. The United States government and other marketable securities were confirmed by an acknowledgment from the Continental Illinois National Bank and Trust Company of Chicago, where the securities are held for safekeeping.

We did not independently confirm the accounts receivable by communication with the debtors. The accounts receivable were reviewed as to age and collectibility and, in our opinion, the balances are fully realizable. We reviewed the plan and system of control adopted for inventory taking but we did not observe the taking of the inventories nor did we make tests of the physical existence of the quantities recorded.

Expenditures charged to property and equipment accounts during the year in our opinion, were properly capitalized as representing additions or improvements. The provision for depreciation for the year appears to be adequate.

In our opinion, subject to the exceptions set forth in paragraph three, the accompanying Balance Sheet and related statement of income present fairly the position of the American Medical Association at December 31, 1942, and the results of the operations for the year based on the accounting procedures employed by the Association regarding which the following observations are submitted:

(a) In accordance with the established practice of the Association the accounts as stated do not include (1) unrecorded assets in respect of accrued interest on bond investments, and membership dues unpaid and (b) provision for accrued property taxes for the year 1942, and sundry unpaid bills and wages.

(b) Subscriptions paid in advance are stated at an estimated amount which is based on cash received in December 1942 on account of 1943 subscriptions. This procedure conforms to the method used in prior years.

(c) Advance payments on publications include an estimated amount (\$131,027.29) for prepaid subscriptions to *HYGEIA*, and the amount (\$15,075.81) received in advance for January 1943 advertising, directory information sales and service.

We have received a letter from Messrs Loesch Scofield Loesch and Burke, attorneys for the Association, regarding litigation pending against the Association or its officers at December 31, 1942, which states that the following law suits had been filed:

Jean Paul Fernel—\$1,000,000 (libel)

William E. Balsinger—\$100,000 (libel)

Muriel Longini—\$1,000 (claim)

Wayne County Association of Physicians and Surgeons of Osteopathic Medicine, Inc.—\$100,000 (slander)

The attorneys state that in their opinion all of these suits will be defeated. The letter states also that the Supreme Court has affirmed the judgment of conviction against the Association in the case filed by the United States charging conspiracy in restraint of trade, the judgment was that the Association be sentenced to pay a fine of \$2,500.

Fidelity insurance is carried against the undermentioned officers and employees, in the amount stated:

Dr. Olin West, Secretary and General Manager	\$10,000.00
Dr. Herman L. Kretschmer, Treasurer	10,000.00
E. A. Hoffman, Cashier	10,000.00
J. E. Hartigan, Assistant Cashier	2,000.00
Sundry Employees (thirteen \$1,000 each)	13,000.00
Total Fidelity Insurance	<u>\$45,000.00</u>

We have pleasure in reporting that the books are well maintained and that every facility was afforded us for the proper conduct of the examination.

Yours truly,

PEAT, MARWICK, MITCHELL &amp; CO

## INDEX TO STATEMENTS

	Exhibit A B	Schedule
Balance Sheet as of December 31, 1942		
Income Account for the year ended December 31, 1942		
Journal Operating Expenses for the year ended December 31, 1942		1
Association and Miscellaneous Expenses for the year ended December 31, 1942		2

EXHIBIT 'A'  
BALANCE SHEET

AS OF DECEMBER 31, 1942

ASSETS		
Property and Equipment—at cost		\$ 328,773.98
Land		
Buildings	\$1,375,349.31	
Machinery and printing equipment	502,803.53	
Office and laboratory equipment	196,654.35	
	<u>2,074,807.19</u>	
Less—Reserve for depreciation	959,006.61	1,115,800.58
Type metal (book inventory)—at average cost		23,356.18
Total Property and Equipment		<u>1,467,930.74</u>
Marketable Securities—at cost (valuation based on market quotations \$2,590,837.19)		
United States Government securities	1,823,816.81	
Railroad, municipal, industrial and public utility bonds	717,492.30	2,541,309.16
Representing investments of		
General fund	666,309.16	
Association reserve fund	350,000.00	
Retirement reserve fund	125,000.00	
Building reserve fund	450,000.00	
Depreciation reserve fund	950,000.00	
Cash held by Treasurer for Investment		121,296.23
Cash in Bank and on Hand		555,245.55
Accounts Receivable		
Advertising	92,538.72	
Reprints	3,085.38	
Directory 17th Edition—estimated realizable balance	35,450.80	
Directory Report Service 18th Edition	1,062.11	
Miscellaneous accounts receivable	2,305.97	134,441.03
Inventories of Materials, Supplies, Work in Progress and Publications		154,139.72
Expenditures on Publications in Progress		39,244.22
Prepaid Expenses, Deposits and Advances		
Insurance, etc.	9,661.51	
Deposits and advances	6,907.84	16,569.37
Total		<u>\$5,030,178.02</u>
LIABILITIES		
Accounts Payable		\$ 15,027.02
Co-operative Medical Advertising Bureau		13,601.46
Miscellaneous		
Total Accounts Payable		<u>28,628.48</u>
Subscriptions Paid in Advance		144,231.12
Advance Payments on Publications		146,103.10
Net Worth		
Association reserve	\$ 350,000.00	
Building reserve	450,000.00	
Retirement reserve	125,000.00	
Capital account		
Balance December 31, 1941	\$3,480,799.98	
Add—Net income for the year ended December 31, 1942	330,415.34	
	<u>3,811,215.32</u>	
Deduct—Amount transferred during year to Retirement Reserve Fund	25,000.00	3,786,215.32
Net Worth December 31, 1942		<u>\$4,711,215.32</u>
Total		<u>\$5,030,178.02</u>

EXHIBIT 'B'  
INCOME ACCOUNT

FOR THE YEAR ENDED DECEMBER 31, 1942

Journal	
Gross Earnings	
Fellowship dues and subscriptions	\$ 804,319.66
Advertising	1,036,571.59
Jobbing	8,358.58
Reprints (Loss)	1,876.96
Books	15,026.82
Insignia	5,330.90
Miscellaneous Sales	12,405.21
Gross Earnings from Journal	<u>1,880,135.80</u>
Operating expenses—Schedule '1'	1,108,492.08
Net Earnings from Journal	<u>771,643.72</u>

Association Income		
Income from investments	\$ 74,482 58	
Miscellaneous income	20,653 84	
	<u>\$ 95 136 42</u>	
Less—Net loss on investments sold or called	35 92	95,100 50
		<u>866,744 22</u>
Gross Income		
Association Expense—Schedule '2	467 974 57	
Miscellaneous Expenses—Schedule "2	68 354 31	536 328-88
	<u>\$ 330 415 34</u>	
Net Income		

## SCHEDULE '1

## JOURNAL OPERATING EXPENSES

FOR THE YEAR ENDED DECEMBER 31, 1942

Wages and salaries	\$ 548 302 57	
Editorials news and reporting	8 607 84	
Paper—Journal stock	259 037 98	
Paper—miscellaneous	3 644 16	
Electrotype and engravings	7 567 27	
Binding	419 90	
Ink	8 672 97	
Postage—first class	29 480 36	
Postage—second class	66 266 17	
Journal commissions	21 818 37	
Collection commissions	155 91	
Discounts	37 672 78	
Express and cartage	6 614 32	
Exchange	1 874 79	
Office supplies	9 078 36	
Telephone and telegraph	4 088 54	
Office printing	13 101 63	
Power and light	15 067 33	
Factory supplies	19 629 94	
Repairs and renewals—machinery	2 862 33	
Insurance and taxes	26 049 05	
Group hospital insurance	2 771 26	
Building expenses	51 336 57	
Fuel	9 299 76	
Miscellaneous operating expenses	21 178 00	
Loss on metal gross sales	989 51	
Loss on sales of equipment and bad debt recoveries (net credit)	470 34	
	<u>1,175 117 33</u>	
Depreciation (based on estimated remaining life)		
Buildings	\$23 262 90	
Machinery	14 650 15	
Type and factory equipment	1 352 63	
Furniture and equipment	7 085 99	46 351 67
Total		<u>1,221,469 00</u>
Deduct—Proportion of overhead expenses charged to other publications and departments		112 976 92
Total Journal Operating Expenses		<u>\$1 108 492 08</u>

## SCHEDULE '2'

## ASSOCIATION AND MISCELLANEOUS EXPENSES

FOR THE YEAR ENDED DECEMBER 31, 1942

Association Expenses		
Association	\$111 107 77	
Health Education	38 346 98	
Pharmacy and Chemistry	54 569 35	
Chemical Laboratory	18 180 03	
Medical Education and Hospitals	70 444 01	
Therapeutic Research	7 630 54	
Legal Medicine and Legislation	31 843 18	
Bureau of Investigation	16 503 73	
Bureau of Medical Economics	27 155 07	
Council on Foods and Nutrition	19 526 78	
Physical Therapy	17 104 84	
Council on Industrial Health	21 863 31	
Bureau of Exhibits	13 305 27	
Association Exhibits	5 229 26	
Committee on Medical Preparedness	14 497 99	
Laboratory Depreciation (based on estimated remaining life)	666 46	
Total Association Expenses	<u>\$467 974 57</u>	
Miscellaneous Expenses		
Legal and investigation	\$ 64 449 71	
Sundry publications (net)	3 904 60	
Total Miscellaneous Expenses	<u>\$ 68 354 31</u>	

## REPORT OF THE JUDICIAL COUNCIL

To the Members of the House of Delegates of the American Medical Association

The report of the Judicial Council will be submitted separately

## REPORT OF THE COUNCIL ON MEDICAL EDUCATION AND HOSPITALS

To the Members of the House of Delegates of the American Medical Association

The Council on Medical Education and Hospitals during the past year has been confronted with many perplexing problems in medical education

## MEDICAL EDUCATION AND THE WAR EFFORT

As a preparedness measure the medical schools had early increased the size of their entering classes by approximately 10 per cent

On the entry of this country into the war the importance of providing as soon as possible an adequate supply of physicians for both the military and the civilian population was apparent. Thus the first step in this direction was the adoption by the medical schools of the country, with but three exceptions of an accelerated program providing for the completion of the usual four year medical course in three calendar years. It has been estimated that this program provides for the graduation of 4455 students by March 31, 1943. By the end of the present year approximately 5380 additional students will complete their medical college courses. The majority of medical students are at present in the Army or Navy Reserve Corps or in the advanced R O T C and will be eligible for commissions on graduation. However, all will be allowed one year from the date of their graduation to complete a year's internship in a hospital before being called to active duty.

In November 1942 the Council on Medical Education and Hospitals recommended that for the duration of the war the required premedical education including satisfactory courses in physics, biology and chemistry including organic chemistry, be included within two calendar years of instruction. Such a program is being adopted by practically all the medical schools of the country.

Although medical schools have been advised not to lower the standards of medical education in connection with their contribution to the war effort, it has been necessary for them to release for military duty many of their prominent faculty members while others are devoting their time to war research. Thus with greatly depleted staffs the medical schools are facing the difficult task of both increasing and speeding up the production of competent physicians.

The lowering of the draft age to 18 years and the program of the Army and Navy to place selected premedical and medical students on active duty to continue their medical education have introduced new problems. One of the greatest of these is that involving the present large pool of students who are at various levels of their premedical programs. Only a relatively small number of this group can be accommodated in the 1943 and 1944 entering classes of the medical schools of the country. In general, the 1943 entering classes have already been filled and the medical schools are now proceeding with the selection of students for their 1944 entering classes.

At present it would appear that the entire collegiate program of the Army is somewhat as follows:

Young men 18 years of age who are physically qualified will be inducted into the Army as privates and will be sent to camp for a preliminary period of training. During the period they are at camp they will be permitted to make application for assignment to a Specialized Collegiate Training Program. Students will probably be chosen for such programs on the basis of certain tests and decisions made by boards to be appointed for this purpose. All students assigned to such specialized collegiate training programs will be assigned to colleges with which the Army has contracts.

The Council on Medical Education and Hospitals in February 1943 approved the basic pattern of the proposed pre medical curriculum of the Army Specialized Training Program

The premedical curriculum of the Navy, which will be offered in colleges with which the Navy has contracts, as at present arranged differs in certain respects from that of the Army and calls for a longer period of premedical study.

It is understood that the medical schools will participate in the selection of students for admission to the various medical schools.

The medical school curriculums under the Army and Navy training programs will remain entirely under the supervision of the individual schools, and it is understood that all approved medical schools may receive both Army and Navy men as students.

During their premedical and medical courses these students will be on active duty, subject to military regulations, and will be entirely supported by the federal government.

It is understood that premedical and medical students who now hold commissions in the Medical Administrative Corps of the Army may, if they desire, remain in their present status and proceed with their program of medical education at their own expense. It is understood that the Navy offers similar opportunities to students holding commissions Ensign H-V (P).

Officials of the government and officers of the armed forces presented before the Annual Congress on Medical Education and Licensure in February 1943 various aspects of medical education and the war.

The Army and Navy programs do not make provision for the training of physicians for civilian practice. However, it is understood that these programs will not involve the complete facilities of all the medical schools of the country and that a certain number of women and physically disqualified men may undertake the study of medicine as civilians and on their own financial resources.

#### SHORTAGE OF INTERNS AND RESIDENT PHYSICIANS

The Council is acutely aware of the difficulties the hospitals of the country are encountering in connection with the shortage of interns, the curtailment in the use of second year interns and the inability to obtain residents. The shortage of interns is not entirely due to the exigencies of war. The number of available internships has exceeded the annual output of medical graduates for a number of years, but some of the resultant vacancies have been filled by second year interns. The present requirement that an internship for physically qualified graduates shall not exceed twelve months has resulted in an additional increase in the number of unfilled internships. It has been suggested that all hospitals cooperate in an effort to maintain an equitable distribution of interns by limiting their appointments to actual minimum needs. The assignment of many routine procedures to nursing and technical personnel will conserve the intern's time for essential hospital and educational needs.

The Council has recently approved the acceptance of graduates of Latin American schools as interns and residents, the responsibility for the evaluation of the credentials of each applicant to rest with the hospital involved. Similarly, graduates of European medical schools may be appointed if their qualifications are found by the hospital to be satisfactory.

Graduates of medical schools in the United States who are not eligible for military service are not officially restricted as to the length of internship. Yet they are urged to complete their training as early as possible so as to be available for essential civilian needs.

In regard to residents, the Procurement and Assignment Service in February 1943 stated, 'Interns who have already had a year of hospital service must be considered as residents for the duration of the war. Although the Army and Navy appreciate the importance of graduate training in the various specialties of medical practice, they do not feel that they can at the present time defer calling interns to active duty in order that they may continue specialization in civilian hospitals. Therefore the only justification for the continuation of residencies and fellowships during the war is that they are essential for the provision of adequate medical care for the hospital patients or for the clinical training of medical stu-

dents.' In 1942 the Procurement and Assignment Service stated that in general the essential number of residencies should be less than 50 per cent of the number that hospitals had before the war and for 1943 this number must be reduced still more.

When residency vacancies exist it has been recommended that they be filled from the following groups in order: (1) women physicians, (2) physicians ineligible for military service, (3) qualified graduates of foreign medical schools.

The Procurement and Assignment Service suggests that no request for deferment of interns who hold commissions in the Army or Navy should be made until the possibilities of filling minimum essential residencies from the aforementioned groups have been exhausted. However, it is essential that a sufficiently adequate and competent group of residents be made available for the clinical teaching services of the medical schools.

During the past year the Council, at the request of the Procurement and Assignment Service, made a survey of the hospitals of the country in an effort to secure the names, military status and addresses of all interns and residents who completed their hospital service in 1942.

The Council has appointed a committee to confer with representatives of the American Hospital Association and the Association of American Medical Colleges in regard to the many perplexing problems relating to hospital internships and residencies.

#### POSTWAR GRADUATE EDUCATION

To help the expected demand for graduate training by large numbers of physicians on the cessation of hostilities, the Council is planning to make a survey of all potential and available facilities for graduate training in connection with hospitals, undergraduate and graduate medical schools, clinics, departments of health and other agencies interested in graduate or postgraduate education.

#### INTER-AMERICAN RELATIONS

The Council has endeavored to cooperate in the field of inter-American relationships in graduate medical education. A copy of the Educational Number of THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION in which are listed all the approved internships and residencies in the United States was sent to each of the South American schools in November 1942. The Council will offer no objection to any hospital in the United States accepting a graduate of a South American school as an intern or resident provided the responsibility for evaluating the previous training of the applicant is assumed by the hospital. An attempt is being made to get more definite information with regard to the standards of medical education in the South American schools. The Council has never been in a position to inspect any medical school outside the continental limits of the United States and has therefore not considered it justifiable to attempt to evaluate them in any way. It may be that there may develop opportunities for the Council to be of service to the South American schools beyond that indicated.

#### COOPERATION WITH OTHER AGENCIES

In February 1942 the Executive Council of the Association of American Medical Colleges, meeting with the Council on Medical Education and Hospitals and the Board of Trustees of the American Medical Association, approved the establishment of a liaison committee to consider matters of mutual interest. This committee was given official status by the Association of American Medical Colleges at its meeting Oct. 26-28, 1942. The first official meeting of this liaison committee was held on Feb. 13, 1943 and various matters of mutual interest were discussed and recommendations made. It is believed that the functioning of this committee will prove to be of distinct advantage to medical education.

A joint meeting of the Council on Medical Education and Hospitals and the Advisory Board for Medical Specialties was held on Feb. 14, 1943. The topics discussed included specialty credit for army service and postwar graduate training for large numbers of physicians.

## MEDICAL SCHOOLS

As of March 1, 1943 sixty-six four year medical schools are named on the approved list of medical schools maintained by the Council on Medical Education and Hospitals. Two of these institutions are in a probationary status. Approval of one school was restored during the year. Rush Medical College, which offered clinical courses only, discontinued undergraduate teaching in June 1942.

Ten schools of the basic medical sciences are included on the approved list, two of them on probation. One of the schools of basic medical sciences has practically completed its development into a complete medical school and two others are imitating similar developments. One of these the University of Utah School of Medicine, is offering junior work beginning in March 1943. Still another school of the basic medical sciences is planning to establish a four year program in affiliation with medical schools outside the state.

The secretary, accompanied by a representative of the Association of American Medical Colleges, visited eight medical schools during 1942.

## HOSPITALS AND TECHNICAL SCHOOLS

A summary of the Council's activities relating to hospitals and technical schools for the year ended Feb 28, 1943, including hospital registration, hospitals approved for intern training, for residencies and fellowships in the specialties, as well as the status of technical schools, follows:

*Hospital Register*

Hospitals registered March 1 1942	6 358
Registered during the year	155
Closed or transferred to unclassified file	168
Hospitals registered March 1, 1943	6 345

*Approved Internships*

Hospitals approved March 1 1942	732
Approved during year	27
Removed from approved list	16
Hospitals approved, March 1 1943	743

*Approved Residencies and Fellowships*

Hospitals approved March 1 1942	632
Approved during year (residencies)	43
Removed from approved list (residencies)	9
Hospitals approved March 1 1943	666

## TECHNICAL SCHOOLS

*Approved Schools for Clinical Laboratory Technicians*

Approved schools March 1 1942	174
Approved during year	56
Removed from approved list	3
Approved schools March 1 1943	227

*Approved Schools for Physical Therapy Technicians*

Approved schools March 1 1942	16
Approved during year	7
Removed from approved list	1
Approved schools March 1 1943	22

*Approved Schools of Occupational Therapy*

Approved schools March 1 1942	6
Approved during year	1
Removed from approved list	0
Approved schools, March 1 1943	7

INSPECTIONS OF HOSPITALS TECHNICAL  
SCHOOLS AND SPAS 1942*Hospitals*

Intern training	107
Residency and fellowships	95
Intern training and residencies	82
Registration	24

Total 308

Individual residencies and fellowships investigated 393

*Technical Schools*

Clinical laboratory schools	80
Physical therapy schools	13
Occupational therapy schools	1

Total 94

Medical record librarian schools 9

Spas and health resorts 5

Total number of days in the field 419

## CENSUS OF HOSPITALS

The Twenty-Second Annual Census of Hospitals covered the year 1942 and was reported in the Hospital Number of THE

JOURNAL, March 27, 1943. Some significant points brought out in this survey are mentioned in the following paragraphs:

Registered hospitals number 6,345, 13 fewer than in 1941. The capacity of these hospitals was 1,383,827 beds, or 59,446 more than in 1941. The total number of patients admitted, not counting newborn infants, was 12,545,610, equal to nearly 10 per cent of the entire population of the United States. Information was obtained from more than 99 per cent of the hospitals including 1,038 hospitals approved for internships and/or residencies in specialties. This group of approved hospitals offers 7,959 internships and 6,363 residencies, assistant residencies and fellowships. At the time of reporting in January 1943 they had a total of 5,567 interns and 4,452 residents on duty.

In this census the first complete survey of blood banks and plasma banks in hospitals was made, and 610 hospitals reported that they had blood banks, 1,741 plasma banks and 546 both blood and plasma banks, while 2,457 have such facilities readily available.

Births in hospitals in 1942 totaled 1,670,599. This evidently is well above one half of all births in the entire country. The proportion of births occurring in hospitals varies from 15.8 per cent in Mississippi to 92.2 per cent in New Jersey.

Statistics by states were also published to show the percentage of the population hospitalized, the number of operations, the percentage of patients operated on, the number of deaths and the number and percentage of necropsies.

Data were also included regarding administrative nursing and technical personnel in hospitals. In the nursing schools 98,166 students were enrolled as compared with 93,977 in 1941.

The Hospital Number supplied detailed information with regard to technical schools approved by the Council. Those include 227 schools for the training of laboratory technicians, 22 schools for physical therapy technicians and 7 schools of occupational therapy. Studies of initial training courses for medical record librarians were also reported.

## CONTINUATION COURSES

Opportunities for continuation courses for practicing physicians offered in quarterly periods were published in THE JOURNAL of July 25, Oct 17 and Dec 26, 1942 and March 20, 1943.

ESSENTIALS OF AN ACCEPTABLE SCHOOL FOR CLINICAL  
LABORATORY TECHNICIANS

The Council recommends that the Essentials of an Acceptable School for Clinical Laboratory Technicians, Section III, Faculty, paragraph 2, first sentence, be modified to read: "In laboratory practice the enrollment should not exceed two students to each member of the teaching staff." The Council desires ratification by the House of Delegates.

ESSENTIALS OF AN ACCEPTABLE SCHOOL FOR PHYSICAL  
THERAPY TECHNICIANS

A subcommittee of the Council is now drafting a revision of the Essentials of an Acceptable School for Physical Therapy Technicians, which will be presented to the House of Delegates at its forthcoming session for ratification.

COOPERATION WITH COMMITTEE ON AMERICAN  
HEALTH RESORTS

At the meeting of the Council on Feb 15, 1942 the Committee on American Health Resorts submitted a request that the Council on Medical Education and Hospitals aid in the study of health resorts by having its staff of inspectors visit spas seeking recognition by the committee. After a preliminary survey of two institutions to determine the feasibility of such a program, the Council has proceeded with the inspection of health resorts. Five institutions have thus far been visited and others will be visited as far as the present personnel of the Council will permit.

## SCHOOLS FOR TRAINING OF MEDICAL RECORD LIBRARIANS

In June 1942 a resolution was introduced to the House of Delegates requesting that the American Medical Association inspect and approve or disapprove present and future schools for the training of medical record librarians. This matter

was referred to the Board of Trustees, which subsequently voted that the Council on Medical Education and Hospitals be asked to supervise the inspection of such schools. In accordance with this request the Council has completed a survey of ten medical record librarian schools. A subcommittee of the Council is preparing minimum Essentials of an Acceptable School for Medical Record Librarians, which the Council hopes to present to the House of Delegates for ratification at its next meeting.

#### COUNCIL PUBLICATIONS

Major publications during 1942 and thus far in the present year include

Hospital Service in the United States  
State Board Number of THE JOURNAL  
Medical Education in the United States and Canada  
Compilation of Papers Read at the Annual Congress on Medical Education and Licensure  
Choice of a Medical School  
Approved Colleges of Arts and Sciences  
Schools for Clinical Laboratory Technicians  
Schools for Physical Therapy Technicians  
Schools of Occupational Therapy

#### SECRETARY OF THE COUNCIL

The Council is pleased to announce the appointment of Dr. Victor E. Johnson, Dean of Students at the University of Chicago School of Medicine, as Secretary of the Council on Medical Education and Hospitals. Dr. Johnson will assume the responsibilities of the secretariate beginning July 1, 1943.

#### IN APPRECIATION

The Council has met with government and military officials a number of times during the year and wishes to express its appreciation for their recognition of the importance of maintaining adequate educational standards in these difficult times and also for their readiness in supplying data for the Educational Number of THE JOURNAL and for their personal presentations at the Annual Congress on Medical Education and Licensure.

The Council is also deeply grateful to the executive officers of medical schools, hospitals and licensing boards and technical schools for their cordial cooperation in supplying the various data needed for the annual compilation of statistics and for the maintenance of its records.

Finally, the Council desires to express its appreciation to the officers and trustees of the American Medical Association for their whole hearted cooperation and assistance in the conduct of the various activities of the past year.

Respectfully submitted

RAY LYMAN WILBUR, Chairman  
RUSSELL L. HADEN  
CHARLES GORDON HEYD  
J. H. MUSSER  
HARVEY B. STONE  
REGINALD FITZ  
H. G. WEISKOTTEN, Secretary

#### REPORT OF THE COUNCIL ON SCIENTIFIC ASSEMBLY

*To the Members of the House of Delegates of the American Medical Association*

#### CANCELLATION OF 1943 ANNUAL SESSION

Conditions incident to the prosecution of the war effort of the nation made it necessary to cancel the annual session of the Association, which was scheduled to be held in San Francisco in 1943. For that reason, no meetings of the Scientific Assembly will be held during the current year.

The usual meetings of the Council on Scientific Assembly were held during the last annual session in Atlantic City, and the regular annual meeting was held in Chicago on Dec. 4, 1942. At the same time the annual Conference of Section Secretaries with the Council was held, and plans were made whereby the officers of the sections would cooperate with the Editorial Department in maintaining the quality and quantity of scientific

material for publication in THE JOURNAL. The large number of scientific papers presented at each annual session of the Scientific Assembly and thereby made available for publication in THE JOURNAL will not be available for publication in 1943 or in the first part of the succeeding year. The secretaries and other officers of the scientific sections have generously and enthusiastically offered their active cooperation in a plan designed to procure suitable material of timely interest.

#### CONTINUANCE OF SERVICE OF SECTION OFFICERS

As there will be no meetings of the scientific sections in 1943 the elected officers of these sections will continue to serve in their present capacities until their successors are elected and installed, in accordance with the provisions of the Constitution and By-Laws.

#### SESSION FOR GENERAL PRACTITIONERS

In accordance with the action of the House of Delegates at the annual session in 1941, two sessions for general practitioners were held in the Section on Miscellaneous Topics at the Atlantic City session. These sessions were well attended and the programs presented were well received. It is the purpose of the Council on Scientific Assembly to arrange for similar sessions for general practitioners to be held in the Section on Miscellaneous Topics at the next annual session of the Association.

#### WARTIME GRADUATE MEDICAL MEETINGS

In compliance with recommendations offered by the Council on Scientific Assembly to the Board of Trustees, provision has been made for wartime graduate medical meetings to be held at concentration centers where large numbers of medical personnel are on active duty with the military forces. These courses are to be offered through a joint committee representing the American Medical Association, the American College of Physicians and the American College of Surgeons. The Surgeon Generals of the U. S. Army, U. S. Navy and U. S. Public Health Service have cordially endorsed this undertaking and have graciously offered active cooperation toward its success.

The joint committee is composed of Dr. Edward L. Bortz of Philadelphia, Chairman, a member of the Council on Scientific Assembly, Dr. William B. Breed of Boston and Dr. Alfred Blalock of Baltimore. The committee has organized a Board of National Consultants composed of prominent physicians who will cooperate in the preparation of teaching schedules and who will also cooperate with regional committees in working out local programs and in securing contributors. The programs will be submitted to the Surgeon Generals of the Army, Navy and Public Health Service and the commanding officers of the various army corps commands and naval districts. Section committees, representing twenty-four sections of the country, will be responsible for arranging for the presentation of the teaching programs, will aid in the selection of teachers within their respective territories and will be requested to attend to other important details.

Physicians residing in communities near military concentration centers will be quite at liberty to attend these Wartime Graduate Medical Meetings.

#### IN APPRECIATION

The Council on Scientific Assembly desires to express its appreciation of the splendid service rendered by the officers of the scientific sections and to extend its thanks to Fellows of the Association and invited guests who contributed to the scientific programs that were offered at the last annual session of the Association.

Respectfully submitted

A. A. WALKER, Chairman  
EDWARD L. BORTZ  
J. GURNEY TAYLOR  
FREDERICK A. COLLIER  
CLYDE L. CUMMER  
JAMES E. PAULLIN, President-Elect  
MORRIS FISHER, Editor THE  
JOURNAL  
OLIN WEST, Secretary

} Ex officio

## OFFICIAL NOTES

## DOCTORS AT WAR

Radio broadcasts of Doctors at War by the American Medical Association in cooperation with the National Broadcasting Company and the Medical Department of the United States Army and the United States Navy are on the air each Saturday at 5 p. m. Eastern War Time (4 p. m. Central War Time, 3 p. m. Mountain War Time, 2 p. m. Pacific War Time). An exception is the Chicago area, where the broadcasts are heard by transcription at 10:30 p. m. Saturdays over Station WMAQ. Unless otherwise indicated each program is summarized by Dr. W. W. Bauer, Director, Bureau of Health Education.

The titles and guest speakers for the next four programs are as follows:

- May 1 'Jungle Death'  
Speaker: Brig. Gen. C. C. Hillman, Chief of the Professional Services Office of the Surgeon General, United States Army
- May 8 'Drugs March to War'  
Speaker: Dr. Austin E. Smith, Secretary, Council on Pharmacy and Chemistry
- May 15 'High Air'

May 22 'Flash Burns'

Speaker, Rear Admiral Ross T. McIntire, M. C., Surgeon General, United States Navy

## BEFORE THE DOCTOR COMES

The American Medical Association program on Radio Station WLS (890 kilocycles) entitled "Before the Doctor Comes" will be on the air every Thursday morning at 9:45 up to and including May 27. Mrs. June Merrill will interview Dr. W. W. Bauer, Director, Bureau of Health Education, Dr. Edwin P. Jordan, Assistant Editor of THE JOURNAL, or Dr. Austin E. Smith, Secretary, Council on Pharmacy and Chemistry, on common home health problems. The titles for the next four programs are:

- April 29 'What to Do About Bleeding'  
(Jordan)
- May 6 'What to Do About Foreign Bodies in the Nose, Ears, Throat or Eyes'  
(Smith)
- May 13 'Growing Pains'  
(Bauer)
- May 20 'Nervous Habits'  
(Bauer)

## MEDICAL LEGISLATION

## MEDICAL BILLS IN CONGRESS

*Changes in Status*—The President has signed the Spirkman bill, H. R. 1857, providing that during the present war and for six months thereafter there shall be included in the Medical Departments of the Army and Navy such licensed female physicians and surgeons as the Secretary of War and the Secretary of the Navy may consider necessary. Those appointed will be commissioned in the Army of the United States or the Naval Reserve and will receive the same pay and allowances and be entitled to the same rights, privileges and benefits as members of the Officers' Reserve Corps of the Army and the Naval Reserve of the Navy with the same grade and length of service. H. Res. 189 has been favorably reported by the House Committee on Printing, to authorize the printing as a document of a revised edition of House Document No. 151, Seventy-Seventh Congress, entitled "A Digest of State Laws Affecting the Hard of Hearing and the Deaf," compiled by the State Law Index Section of the Legislative Reference Service of the Library of Congress.

*Bill Introduced*—S. 1007, introduced by Senator Hill, Alabama, provides that during the present emergency and for six months thereafter the Chief of the Dental Division, Surgeon General's Office, Army of the United States, shall have the rank, pay and allowances of major general and that there shall be officers of the Dental Corps promoted to the grade of brigadier general at the ratio of one for each six officers of the Medical Corps promoted to like grade.

## DISTRICT OF COLUMBIA

*Bills Introduced*—H. R. 2464, introduced, by request, by Representative Randolph, West Virginia, proposes to amend existing law relating to the registration of births in the District of Columbia. H. R. 2465, introduced, by request, by Representative Randolph, West Virginia, proposes to redefine the powers and duties of the Board of Public Welfare of the District of Columbia and to establish a Department of Public Welfare.

## STATE MEDICAL LEGISLATION

## California

*Bills Introduced*—A. 573, to amend the business and professions code, proposes to prohibit the board of osteopathic examiners from issuing any drugless practitioners' certificates and to authorize persons holding drugless practitioners' certificates to continue to practice under the authorization of such certificates and to renew them from time to time. A. 667, to amend

the health and safety code, proposes, among other things, to add thyroid to the list of drugs which may be sold only on the written prescription of a member of the medical, dental or veterinary profession who is licensed by law to administer such drug and to prohibit the sale of any drugs, medicines or other substances intended to be used for the cure or treatment of gonorrhea, syphilis, chancroid, lymphogranuloma inguinale or granuloma inguinale except on written order of a duly licensed physician.

## Connecticut

*Bill Introduced*—H. 1265 proposes to make both husband and wife liable for reasonable and necessary services for hospital expenses rendered the husband or wife or a minor child living with the parents.

## Florida

*Bill Introduced*—H. 10, to amend the naturopathic practice act proposes, among other things, (1) to increase the course of study in an approved naturopathic school from three to four years, eliminating the prior requirement that no two of such courses may be given in the same year, (2) to require naturopaths, at the time of the annual renewal of their license to present satisfactory evidence that they have attended the two day educational program conducted by the Florida Naturopathic Physicians Association, Inc., or its equivalent, (3) to provide for the termination of a license to practice naturopathy in the event that the holder thereof fails to renew said license annually and (4) to require naturopaths to register their licenses with the state board of health.

## Maine

*Bill Enacted*—H. 1352 was approved, April 9. To amend the law relating to infectious and communicable diseases, it requires every physician, within forty-eight hours of the time the fact comes to his knowledge, to report in writing to the state bureau of health any person known by said physician to have any of the following infectious and communicable diseases: syphilis, gonorrhea, chancroid and lymphogranuloma venereum. The law also authorizes the state bureau of health to detain and examine any person believed to be infected with one of the aforementioned diseases and so conducting himself as to expose others to the dangers thereof.

## Massachusetts

*Bill Introduced*—H. 79, to authorize the inspection of colleges, universities and medical schools, was amended in the house to authorize also an inspection of the premedical collegiate work at colleges and universities and to provide that such inspection shall be made not more than once in every four years.

### Missouri

*Bill Introduced*—S 112, to amend the law relating to narcotic drugs, proposes to fix the annual license fee for physicians, dentists, veterinarians, surgeons and other practitioners lawfully entitled to administer such drugs in the course of their professional practice at \$1 per annum

### New Jersey

*Bill Enacted*—A 94 has become chapter 74 of the Laws of 1943 To amend the medical practice act, it exempts therefrom persons taking charge temporarily on written permission of the board, of the practice of a lawfully qualified physician in the state and sets forth conditions under which the board may grant such temporary permission

### Oklahoma

*Bills Enacted*—H 37 was approved, March 18 It authorizes state and local health officers to examine arrested persons to determine whether or not they are infected with a venereal disease, to detain such persons until the results of the examination are known and, if found infected, to quarantine such persons for the purpose of treatment H 249 was approved, April 12 It creates a special indemnity fund out of which physically impaired employees would receive compensation for additional disability occurring in the course of employment Physically impaired person is defined as a person who has suffered the loss of the sight of one eye, the loss by amputation of some member of his body, or the loss of the use or partial loss of the use, of a specific member such as is obvious and apparent from observation or examination by an ordinary layman, that is, a person who is not skilled in the medical profession

### Pennsylvania

*Bill Enacted*—H 504 has become act No 24 of the Acts of 1943 It exempts physicians in the armed forces or merchant marine from being required to renew their licenses during the term of such service and authorizes such persons to apply for renewal thereof at any time within one year after their discharge

### Rhode Island

*Bills Introduced*—S 177 to amend the law relating to cash sickness insurance, proposes to exempt from the provisions thereof employees who adhere to the teachings of any church, sect or denomination and depend for healing on prayer or spiritual means in the practice of religion H 668 proposes an appropriation to be expended for the hospitalization of wives and children of men in the armed services below the grade of commissioned officer who are unable to pay for such hospital care H 841 proposes to require an examination of the feet of all school children at least once each year by a licensed chiropractor, who shall report all defects which, if neglected, might unfavorably influence the child's health or physical efficiency

### South Carolina

*Bills Introduced*—S 448 and S 518 propose a resolution looking to the appointment of a committee to examine into the advisability of establishing a cancer clinic and hospital in the state H 500, to amend the chiropractic practice act, proposes that licentiates be graduates of a recognized school or college of chiropractic and have received a minimum of four years, totaling thirty-six hundred hours, training in such school or college

### South Dakota

*Bills Enacted*—S 129 was approved, March 8 It exempts from the basic science act persons engaged in the practice of hydrotherapy H 32 was approved, February 9 It provides that osteopaths be required to renew their certificates to practice annually and to submit evidence, at the time of such renewal, of attendance of at least two days at the annual educational program conducted by the South Dakota state osteopathic association during the preceding year

### Texas

*Bill Introduced*—H 651 proposes to authorize a county to erect, equip and operate a hospital for the care and treatment of the sick, infirm or injured

### Utah

*Bill Enacted*—H 49 was approved, March 16 It provides that persons who have entered the military service of the United States during the present war emergency shall be relieved from renewing their licenses annually and from paying an annual renewal fee for such licenses during the period of such service and for six months after its termination

### Vermont

*Bills Enacted*—H 50 was approved, March 18 It amends the medical practice act by repealing the section setting forth the requirements for admission to practice and substituting therefor an authorization that the board shall make rules and regulations covering requirements for admission to practice medicine and surgery H 131 was approved, March 16 It amends the osteopathic practice act by authorizing a recognized school of osteopathy to give a course of thirty-six months rather than a four year course of at least five months in each year H 151 was approved, March 22 It amends the premarital examination law by authorizing the execution of the required certificate by an osteopath and by a member of the medical corps of the army, navy or public health service as well as by a person licensed to practice medicine and surgery

### Washington

*Bills Enacted*—S 76 has become chapter 108 of the Laws of 1943 It exempts members of the armed forces from being required to continue in full force and effect their license to practice a profession in the state and provides that the renewal of such license may be made within six months after an honorable discharge S 218 has become chapter 75 of the Laws of 1943 It authorizes the director of licenses, during the present emergency, to grant temporary certificates to practice medicine and surgery to physicians duly licensed and qualified to practice under the laws of some other state and proposes that such temporary license shall be valid from the date of issuance until the next regular examination given by the board of examiners S 301 has become chapter 240 of the Laws of 1943 To amend the law relating to dentistry it provides that every diagnosis and examination of the normal and abnormal structures, parts or functions of the human teeth the alveolar process, maxilla, mandible or soft tissue adjacent thereto be declared to be the practice of dentistry but provides that this act shall not be construed as preventing a regularly licensed physician and surgeon from making any such diagnosis interpretation or explanation H 41 has become chapter 197 of the Laws of 1943 It authorizes the establishment of emergency health and sanitation areas and sets forth certain regulations applicable to the state board of health in connection therewith H 127 has become chapter 214 of the Laws of 1943 It makes it unlawful for any person to maintain or operate a maternity home without a license and defines maternity home as any place where women go to be delivered of children

### West Virginia

*Bills Enacted*—S 30 was passed over the governor's veto, March 13 It authorizes state boards of examination or registration to remit all annual license or registration fees required to be paid by any licensee during the time such licensee is serving with the armed forces of the United States and to retain the name of such licensee in good standing during said period S 36 was approved, March 19 It provides for the creation of a division of cancer control in the state department of health to administer provisions relating to the diagnosis, treatment and care of persons suffering from cancer, including the conduct of an educational program the establishment of cancer clinics in general hospitals throughout the state and the furnishing of tissue diagnostic service to all patients S 85 was approved, March 9 It authorizes the board of governors of the West Virginia University to establish a four year medical course to be given either at the university or in part at other universities and medical colleges outside the state S 141 was approved, March 19 It authorizes the inclusion within an accident and health insurance policy of indemnity for expenses for hospitalization, medical and surgical examination or treatment, nursing care or ambulance transportation of the policyholder, his spouse or his children H 120 became law, without the governor's



approval, March 18. It authorizes the formation of a nonprofit, nonstock hospital service corporation for the purpose of furnishing medical service and hospital service to persons who become subscribers with such corporation. Medical service shall consist of medical and surgical care as specified in the subscriber contract and must be provided by duly licensed doctors of medicine. Hospital service shall consist of hospital care as specified in the subscriber contract and must be provided by a hospital which is maintained by a corporation organized for hospital services under the law of the state or such other hospitals as shall be designated by the state department of health and hospitals of other states subject to the supervision of such other state or convalescent care provided for by a convalescent institution. The law is to expire Feb. 28, 1945 unless sooner repealed. H. 230 was approved, March 18. It provides, among other things, that every physician who examines or treats a person having syphilis, gonorrhea or chancroid shall instruct such person in measures for preventing the spread of the disease and inform such person of the necessity of taking treatment until cured. If the person fails to report for treatment, the physician must make a report of such fact to the local health officer.

#### Wisconsin

*Bills Introduced*—S. 253 and S. 279, to amend the law relating to hospital service corporations, would authorize such corporations to provide hospital service in other than participating hospitals to subscribers and their dependents. Furthermore, the

subscriber would have the right to choose the particular participating hospital or service hospital in which he wished to be treated. S. 259 proposes to amend the premarital examination law so as to include females as well as males. S. 276, to amend the law relating to hospital service corporations, proposes to authorize such corporations to enter into contracts undertaking to provide for sickness or surgical services and to act as agents in enrolling persons or groups for such sickness or surgical services and indemnity benefits therefor. A. 140, proposing the creation of a bureau of criminal investigation would, among other things, require every physician, surgeon or other person authorized to engage in the practice of healing, whether licensed or not, to report to the proper police authorities all bullet wounds, gunshot wounds, powder burns or any other injury arising from or caused by the discharge of a gun, pistol or any other firearm, which wound he is called on to treat, dress or bandage. A. 380 proposes that any physician, surgeon or osteopath in charge of the medical treatment or hospitalization of any minor who has suffered any serious cranial or spinal injury, hemorrhage, laceration or concussion within fifteen days from the date of an injury shall make a report thereof to the local and state boards of health and the district school board. A. 601, to amend the workmen's compensation act proposes to authorize injured employees to select chiropractors or osteopaths not on the employer's physician panel and to make the employer liable for reasonable expenses incurred in treatment by such practitioners.

## WOMAN'S AUXILIARY

#### Arkansas

The Woman's Auxiliary to the Pulaski County Medical Society met February 17, at the home of Mrs. Pat Murphey. Mrs. Homer Higgins, chairman of the sewing committee, reported that in the past month her committee had put in four hundred and thirteen hours at the Camp Robinson Day Room furnished by the auxiliary and had in that time altered two hundred and sixty-seven garments for the men. Mrs. Charles A. Henry enlisted the services of enough volunteers to man for one week a grocery store to assist the grocer in acquainting customers with the food rationing plan. Mrs. R. T. Smith introduced Ensign Corabel Hamilton, who addressed the meeting on the activities of the Waves enlistment program now in progress in Arkansas.

#### Florida

A meeting of the Woman's Auxiliary to the Duval County Medical Society was held at the home of Mrs. Victor Hughes on January 14. Mrs. S. R. Norris introduced Lieut. Linda V. Barnes of New York who spoke on "The Life of a War." The defense chairman, Mrs. Charles Henley and Mrs. George Richardson, reported on the Halloween party given for the service men in October. Auxiliary members sold \$50.65 worth of tuberculosis seals at the Roosevelt Hotel booth in December and assisted with the blood bank to the amount of \$335.22. Mrs. F. W. Krueger, state president, talked on the objectives of the national auxiliary.

#### New York

Mrs. James F. Roohan has been reelected president of the Saratoga County medical society's auxiliary. Dr. William H. Ordway thanked the group for serving coffee and sandwiches to blood donors. Sewing is to be started for the hospital. Mrs. H. Dunham Hunt, who has taken over the work, has asked for more blankets to be used in the air raid shelters. The names of the owners will be attached to the blankets so that they can be returned later on. A gift of \$4.24 was received from the school children of Mechanicville, grade 8A3, for the air raid shelter equipment. The auxiliary is outfitting these shelters.

The second district branch meeting was held in Garden City, with the Suffolk County auxiliary as hostess. Mrs. J. Emerson

Noll, auxiliary state president, was guest of honor. Members from Kings, Queens and Nassau were present. Dr. George W. Cottis, president of the state medical society, spoke at the luncheon. Dr. Joseph Lawrence spoke on legislation. The general chairman was Mrs. George P. Bergmann, president of the Suffolk County auxiliary. A needlepoint footstool was given to the auxiliary on which \$100 was realized for charity.

#### Pennsylvania

Sixty members of the Berks County Medical Society and its women's auxiliary met at the Womansing Club Reading for an evening of fellowship and music. Dr. Wellington A. Lebkicker, president of the medical society, and Mrs. Chester K. Kistler, vice president of the auxiliary, received the guests. A program of music was presented by Dr. Charles A. Haff and three artists from Northampton. Mrs. Jessie Foster Roca of Pittsburgh, granddaughter of Stephen C. Foster, was introduced and I. Bennett Nolin, Reading lecturer and traveler spoke on "Reminiscences of a Historical Town."

The Chester County auxiliary met at a covered dish luncheon at the home of Mrs. Oscar J. Klevan, West Chester. Mrs. C. Remold Noyes spoke on "What Kind of a Peace Do We Want."

#### Texas

The Bexar County auxiliary observed its Army Day program recently at the Medical Library Building, San Antonio. Col. George E. Berch, commanding officer of Brooke General Hospital, talked about Army hospitals. The Gray Ladies of the Red Cross hospital and recreation corps were honor guests. Members of the auxiliary brought gifts for the Gray Ladies to use as prizes in games which they conduct for soldiers in hospitals. Mrs. G. P. Robertson, a member of the Gray Ladies Corps, spoke briefly of the activities of the corps. The program was presented under the direction of Mrs. I. T. Cutter, chairman of the Gray Ladies Corps.

#### Washington

At the annual meeting of the executive board a resolution was adopted making Daisy Seabris Mosiman, of Seattle, an Honorary Life Member of the Woman's Auxiliary to Washington State Medical Association. Mrs. Mosiman formerly was President of the Woman's Auxiliary to the American Medical Association.

## Medical News

(PHYSICIANS WILL CONFIR A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST SUCH AS RELATE TO SOCIETY ACTIVITIES NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH)

### CALIFORNIA

**Annual Heart Meeting**—The California Heart Association will hold its annual meeting at the Biltmore Hotel Los Angeles, May 1, with Lieut Comdr Harold Rosenblum M C U S Navy Reserve Oakland, presiding. Among the speakers will be Dr Wilbur A Beckett Los Angeles, on "Acute Gout Caused by Amorphous", Dr Samuel J McClendon San Diego "The Incidence of Acute Rheumatic Fever in South western United States", Lieut Comdr Richard F McLaughlin M C U S Navy Reserve, Oakland "Rheumatic Infection in a Platem Area", and Dr Jacob S Krasman and Capt Meyer Friedman M C U S Army San Francisco "Hypertension in Only One of Identical Twins". Guest speakers will be Drs George Blumer New Haven, Conn, and Alvin G Foord Pasadena.

### CONNECTICUT

**State Medical Meeting**—The one hundred and fifty-first annual meeting of the Connecticut State Medical Society will be held at the New Haven Lawn Club May 25-27 under the presidency of Dr Roy L Lark Middletown. Among the speakers will be

Dr Thomas Duckett Jones Boston Rheumatic Fever and Rheumatic Heart Disease  
Dr George H Gehrmann Wilmington Del Medicine in Wartime Industry  
Dr James C McCann Worcester Mass Prepaid Medical Service Plans  
Dr James E Pullin Atlanta Ga President Elect of the American Medical Association The Contribution of the Medical Profession in the Present War Effort  
Dr Joseph Stokes Jr Philadelphia Practical Applications of Air Sterilization  
Dr Marion E Kenworthy New York The Dynamic Use of Psychiatric Principles in the Present Emergency  
Dr Walter W Williams Springfield Mass Sterility  
Dr John D Currence New York Arthritic and Rheumatic Conditions Amenable to Physical Therapy  
Dr Willard C Rappleye New York Medical Education in Wartime  
Dr H Jackson Davis Albany N Y Public Medical Care for Indigents  
Dr Reginald H Smithwick Boston The Surgical Treatment of Hypertensive Disease  
Brig Gen David N Walker Grant M C U S Army Medical Services to the Air Forces—U S A  
Comdr Bartholomew W Hogan M C U S Navy Navy Medical Corps in Wartime  
Dr Moses H Lurie Boston Deafness in the War and in the War Industries  
Dr Ramon Castroviejo New York Comments on Ophthalmic Surgery  
Major Allston I Fogg M C Army of the United States Orthopedic Regulations for Induction  
Dr Felix G Fleischner Greenfield Mass Roentgenologic Aspects of Atypical Pneumonitis and Related Conditions  
Dr Alan R Moritz Boston Special Evidentiary Objectives of Medical Autopsies  
Dr Clay Ray Murray New York Surgical Treatment of the Hand in the General Practitioner's Office

At a meeting of the house of delegates on the first day the program will be devoted to a round table discussion of "Prepaid Medical Service". Other groups meeting at this time will be the Connecticut Hospital Association, American Association of Medical Social Workers Connecticut Occupational Therapy Society, the Society of Medical Record Librarians and the Women's Medical Society.

### ILLINOIS

**Conference on Industrial Health**—The division of industrial hygiene of the state department of public health sponsored a conference in La Salle, April 8. Among the speakers were

Dr Milton H Kronenberg Chicago Objectives of the Conference  
Dr Paul A Brehm Madison Wis Absenteeism in Industry—Its Causes and Control  
Dr Oscar A Sander Milwaukee Tuberculosis in Industry  
Dr Edward C Holmblad Aurora How the Small Plant Can Conduct a Health Program  
Mr Harry Guilbert director bureau of safety and compensation Pullman Company Chicago A New Era for Health and Safety in Industry  
Dr Chauncey C Maher Chicago What About the Health of the Executive? Is His Heart Next?

Dr John L Rock, Oglesby, chairman of the industrial health committee of the La Salle County Medical Society, presided at the morning session and Dr Orrie C Yoder, Peru president of the society, at the evening session.

### CHICAGO

**Second Cancer Forum**—The Chicago Cancer Committee Inc will hold the second of its series of forums for the public on cancer in the John B Murphy Memorial Auditorium at the American College of Surgeons, April 27. "Facts About Cancer" will be the theme of the forum with the Rev Harrison Ray Anderson DD pastor of the Fourth Presbyterian Church, acting as moderator. Dr Ludwig Hektoen chairman of the cancer committee, will present the introduction. The speakers will include

Dr Bowman C Crowell The Course of Cancer  
Dr Josiah J Moore The Causes of Cancer  
Dr Herbert E Schmitz The Diagnosis of Cancer  
Dr John A Wolfer The Curability of Cancer  
Dr Frederick W Merrifield What the Patient Can Do About It

**Annual Public Health Meeting**—The third annual public health conference of the Illinois Public Health Association will be held at the Hotel La Salle, May 14-15 with W P Shahan Springfield president acting as chairman. One session will be devoted to war trends in public health consideration to be given to maternal and child health day care for war workers children, nutrition in the school, high school physical fitness industrial hygiene and civilian venereal disease control. Dr Roland R Cross director of the state department of public health Springfield will be toastmaster at the banquet with Dr Herman N Bundesen Chicago Gov Dwight H Green (tentative) and Dr Robert Hughes Parry medical officer of health for the city and port of Bristol and professor of preventive medicine at the University of Bristol, England who will discuss "Shelter Life in the Blitzed City". Among the speakers at the administrative session will be Lieut Col E Mann Hartlett M C U S Army, on "Public Health Needs Revealed by Selective Service Examinations", Dr G Foord McGinnes, St Louis "Administrative Responsibilities of the American Red Cross in Relation to Public Health" and Howard J Shaughnessy PhD, Chicago "The Plasma Distribution Program of the Illinois Department of Public Health". A technical session will be devoted to industrial sanitation and house keeping in industry the sanitary engineer in public health during wartime public health milk control during wartime duration of passive protection of hyperimmune western equine encephalomyelitis serum and laboratory studies of epidemic keratoconjunctivitis.

### IOWA

**Public Health Meeting**—The seventeenth annual session of the Iowa Public Health Association will be held, April 27-28 at the Hotel Kirkwood Des Moines. Dr Robert Hughes Parry medical officer of health of the city and port of Bristol England, will discuss "Some Wartime Health Problems". Other speakers will include Dr Felix J Underwood, Jackson secretary and executive officer of the Mississippi State Board of Health, on "Public Health Today", Dr Walter C Alvarez Rochester, Minn "Problems of Constitutionally Frail People", Byron J Olson, Bethesda Md, passed assistant surgeon, U S Public Health Service "Report of the Field Study and Lung Calcification in Iowa", and H A Whittaker, B A, Minneapolis "Some Problems in Sanitation".

**Center to Process Plasma**—The Serum-Plasma Center of the state department of health Des Moines, has announced its readiness to cooperate with participating hospitals of Iowa in the preparation of pooled plasma. The center will receive citrated blood from hospitals, prepare plasma and return the finished product to hospitals that participate in the work. The center has been cooperating in the procurement and distribution of pooled normal human plasma and serum with the Emergency Medical Service of the Office of Civilian Defense with hospitals that maintain a blood plasma bank and with organizations and groups that sponsor blood donor programs. Until further notice the actual cost to a participating hospital will be \$3.50 for each 250 cc unit of plasma prepared from bottles of citrated blood. The purpose of the department's Serum-Plasma Center is to offer its facilities to hospitals which desire to secure at minimum cost safe, sterile plasma adequate for their needs.

### MAINE

**New Chairman of Procurement and Assignment**—Dr Roland L McKay, Augusta, has been appointed state chairman for physicians in the war procurement and assignment service for physicians, dentists and veterinarians to succeed Brig Gen John G Towne, M C, U S Army, retired, Waterville. General Towne will continue to serve as medical adviser for the Maine Selective Service.

## NEBRASKA

**Changes in the Faculty at University**—Dr John Hewitt Judd, associate professor of ophthalmology, has been named chairman of the department of ophthalmology at the University of Nebraska College of Medicine, Omaha. Other changes include the following promotions:

Dr Harold Gifford Jr. to associate professor of ophthalmology  
 Dr David P. Findley to assistant professor of gynecology and obstetrics  
 Dr Harley E. Anderson to assistant professor of obstetrics  
 Dr Robert J. Stearns to associate professor in gynecology  
 Dr Charles P. Baker to assistant professor in pathology and bacteriology

Dr Herman F. Johnson to associate professor of orthopedics and surgery in charge of the division of fractures

## NEW YORK

**Rabies in a Squirrel**—A cement finisher in Rockland County was recently bitten by a squirrel when he reached into a tool box. A second workman sprang to his aid and was also bitten. Subsequently laboratory examination gave evidence that the common gray squirrel was rabid and the 2 workmen were given injections of antirabic vaccine.

**Postgraduate Education**—On May 21 a graduate lecture on 'Sulfonamide Therapy' will be presented before the Cortland County Medical Society, Cortland, under the auspices of the state medical society and the state department of health. Dr Charles D. Post, professor emeritus of clinical medicine, Syracuse University College of Medicine, will be the lecturer. Dr Norman H. Plummer, New York, gave a similar lecture for the Putnam County Medical Society in Carmel, April 7. Dr Earle B. Mahoney, Rochester, lectured on "Plasma Therapy and Whole Blood Transfusion," April 6, under the same auspices at a joint meeting of the Onondaga County Medical Society and the Syracuse Academy of Medicine.

**State Medical Meeting**—The Medical Society of the State of New York will hold its annual session at the Hotel Statler, Buffalo, May 3-6, under the presidency of Dr George W. Cottis, Jamestown. Included among the out of state speakers will be:

Dr George Baehr, chief medical officer, Office of Civilian Defense, Washington, D. C. British and American Experiences in Civil Defense  
 Dr Maurice H. Seevers, Ann Arbor, Mich. The Narcotic Properties of Carbon Dioxide  
 Capt. Barnett A. Greene, M. C. Army of the United States. Prolonged Intravenous Pentothal Anesthesia for Military Surgery  
 Dr Louis Schwartz, Bethesda, Md. Occupational Accidents  
 Drs. Joseph C. Yaskin, Helena, E. Riggs and Anthony S. Tornay, Philadelphia, and Henry Alsop, Riley, New York. Bilateral Blindness Due to Lesions in Both Occipital Lobes  
 Dr Francis Heed, Adler, Philadelphia. Gas Injuries  
 Dr Harry S. Gradle, Chicago. Early Recognition and Management of Glaucoma  
 Dr Chevalier L. Jackson, Philadelphia. Treatment of Cancer of the Larynx by Surgery and Irradiation  
 Dr David E. Robertson, Toronto. Use of Sulfonamides in Treatment of Acute Osteomyelitis in Children  
 Lydia J. Roberts, Ph.D., Chicago. Scientific Basis for Our Present Dietary Standards  
 Lieut. Col. Thomas T. Mackie, M. C. U. S. Army. Tropical Diseases—A Postwar Health Problem  
 Lieut. Col. Paul F. Russell, M. C., Army of the United States. Military Malaria Control  
 Lieut. Col. Claude S. Beck. The Principles Concerning the Surgical Approach to the Treatment of Angina Pectoris  
 Dr Joseph H. Pratt, Boston. Advances in Diagnosis and Treatment of Pancreatic Disease  
 Dr Robert E. Gross, Boston. Surgical Treatment of Patent Ductus Arteriosus  
 Raymond A. Vonderlehr, assistant surgeon general, U. S. Public Health Service, Washington, D. C. Syphilis Control at the Beginning of World War II  
 Lieut. Comdr. Leo A. Shifrin, M. C. U. S. Naval Reserve. Venereal Diseases—A Navy Problem  
 Major William Bisher, M. C. Army of the United States. Venereal Disease Control as Applied to the Army  
 Dr Jessie Wright, Pittsburgh. Problems in Early Physical Treatment of Poliomyelitis  
 Lieut. Sidney H. Licht, M. C. Army of the United States. Fever and Sulfadiazine Therapy in Refractory Gonorrhea

The program will also include symposiums on plasma, medical services in industry, carcinoma of the colon and rectum, electroshock therapy, rheumatic fever and venereal diseases with regard to the armed forces. In addition there will be a round table discussion on anesthesiology as applied to war casualties.

## New York City

**Committee on Cardiovascular Diseases in Industry**—The New York Heart Association has formed a committee on cardiovascular diseases in industry to advise concerning the employment of persons with cardiovascular diseases. It is planned to use the facilities of the New York Heart Association, which consists of sixty-six cardiac clinics, in furthering this work. Dr Clarence E. de la Chapelle is chairman of the

committee. Other members are Drs. Donald B. Armstrong of the Metropolitan Life Insurance Company, Oswald F. Hedley, surgeon of the U. S. Public Health Service, Ada Chree Reid of the Metropolitan and Cassius H. Watson of the American Telephone and Telegraph Company. It is planned to add to the committee as the need arises. Although the committee was originally formed for the purpose of dealing with cardiac problems in industry in New York, it is not intended to limit the scope of its activities to that locality.

**New Merchant Marine Polyclinic**—A clinic was to be opened in March for seamen sailing on Netherlands vessels, the *New York Times* reported recently. The clinic will be housed on the eighth floor of 61 Broadway, the offices of the Netherlands Shipping Committee, and will include a suite of fourteen rooms. Service will be given to about 20,000 men serving under the Dutch flag, most of whom will be passing through the Port of New York. The clinic will have facilities for diagnosis and outpatient treatment and an arrangement with New York physicians and hospitals for additional treatment when required. Dr Frans E. van der Gugen, a graduate of the University of Leyden, chief medical officer of the Netherlands Shipping Committee, will be in charge of the clinic. In a statement to the press he is reported to have said that "the service is considered a very essential one for the proper maintenance of full health standards for the men on our ships. Before the war each individual steamship company had its own medical department at its home port, but since Holland was occupied by the Germans these have, of course, been unavailable. This handicap has been further complicated by the greater incidence of psychologic problems brought on by the war, both through the men's lack of home contacts and the removal of customary means of obtaining consultation and treatment for minor ailments, causing bewilderment and mental distress."

## OKLAHOMA

**Personal**—Robert H. Graham, Oklahoma City, has returned to his position as executive secretary of the Oklahoma State Medical Association after four months in Washington, D. C., as adviser to the Office of Procurement and Assignment. Dr. James O. Asher, Oklahoma City, has been appointed medical superintendent of Western Oklahoma Charity Hospital, Clinton. Dr. Willard H. Smith, Clinton, resident surgeon has been acting superintendent of the hospital since Lieut. C. E. Griffith left several months ago to enter the army. Joseph B. Goldsmith, Ph.D., associate professor of histology and embryology at the University of Oklahoma School of Medicine, Oklahoma City, has been granted a leave of absence to enter the army as first lieutenant in the sanitary corps. Ruth Alden McKinney, Ph.D., formerly of the Institute of Pathology of the Western Pennsylvania Hospital, Pittsburgh, has been appointed instructor in clinical pathology, effective March 1, to succeed Dr. Erik Eselius, resigned.

## PENNSYLVANIA

**Survey of Industrial Plants**—The bureau of industrial hygiene of the state department of health recently conducted a survey in Dauphin County of eighty-four industrial plants with 18,933 employees. The work revealed that full time physicians are employed in none of the plants but part time physicians are employed in seven plants. Full time nursing service is available in four plants and part time service is furnished in three plants. Preemployment examinations are required in sixteen plants and periodic examinations are given in sixteen plants. Ten plants are inspected regularly for hazardous conditions by the plant physician, twenty-two plants spent less than \$100 on their medical programs, other than compensation cases, during the year 1941. Forty-two of the remainder had no record of expenditure of this type. Plant medical departments handled about 6,200 cases during 1941. Twenty-four plants have a sick benefit association and thirty plants have a hospital insurance plan, twenty-three plants signified their interest in having a physician make health talks to their employees, only ten organizations stated that an industrial hygiene survey had been made in their plant during the past two years but seventy-five expressed interest in having a survey made. Ten plants have venereal disease control programs, eight plants have dispensaries and two plants have cafeterias.

## Philadelphia

**Shmookler Memorial Lecture**—Dr. Foster Kennedy, professor of clinical medicine (neurology), Cornell University Medical College, New York, will deliver the H. B. Schmookler Memorial Lecture at the Mount Sinai Hospital, May 3. His subject will be "Neuroses in Warfare."

**Universities Share in Bequest**—The residue of the estate of Major Henry Reed Hatfield valued at one million dollars has been bequeathed, after the payment of \$226,000 in specific bequests to charities, to the University of Pennsylvania and to Jefferson Medical College of Philadelphia.

**Drug Stores Close Earlier**—Six hundred pharmacists in Philadelphia assembled in mass meeting on March 25 and unanimously agreed to adopt a schedule of earlier closing hours as submitted and endorsed by the Philadelphia Association of Retail Druggists. Effective April 15 all stores will close Monday through Friday at 10 p. m., Saturdays at 11 p. m. and Sunday, optional, 1 p. m. or at 6 p. m. for the night. Assurances were given that at all times pharmacists would respond to emergency calls, but physicians are requested to send in their evening prescriptions as early as possible or to have them delivered the following morning. According to *Philadelphia Medicine*, this movement will become national as a part of the Government's Victory Business Plan.

### SOUTH DAKOTA

**Dr Giedt Acting Superintendent of Health**—Dr. William R. Giedt, Vermillion, assistant state health officer and formerly assistant professor of pathology at the University of South Dakota School of Medical Sciences, is now acting superintendent of the state board of health. He will serve until a permanent selection is made to succeed Dr. John F. D. Cook, Pierre, who died on January 27. Dr. Giedt has served as director of laboratories of the state board of health.

### TEXAS

**Personal**—Frank M. Stead, Ph.D., formerly of the Los Angeles City Department of Health, has been appointed assistant professor of preventive medicine at the University of Texas Medical Branch, Galveston.

**Change in Dates of State Meeting**—The State Medical Association of Texas will meet in Fort Worth May 5-6, instead of May 3-6. The session this year will include only a meeting of the house of delegates.

**Hospital News**—A new 60 bed wing has been opened at Hendrick Memorial Hospital, Abilene, to meet the demand for facilities that arose when Abilene became an army town. The new wing together with an extension of the north wing of the existing building and remodeling at various points cost about \$150,000. The project was financed largely by federal funds under the Lanham Act. Local funds amounted to more than \$35,000.

**Five Year Child Health Program**—The William Buchanan Foundation of Texarkana has given the University of Texas Austin \$200,000 for a five year program on child health. The details were concluded at a meeting in Galveston recently between Dr. Stanley J. Seeger, Texarkana, president of the foundation, and Chauncey D. Leake, Ph.D., dean of the university's medical branch, Galveston. To be launched within the near future, the program will be worked out in conjunction with the department of pediatrics of the medical branch, correlating the activities of the department and other state and national agencies. Its purpose is to afford the profession in Texas with an opportunity to maintain the latest methods in connection with the promotion of child health, especial attention to be given to the problems of the adolescent in wartime.

### VIRGINIA

**Rheumatic Fever Demonstration**—About 150 children in Richmond and adjoining counties have been diagnosed as having rheumatic fever during a demonstration that has been conducted for the past two years by the state department of health. The children are being cared for in their own homes or hospitals and convalescent homes set up in the Richmond area. A diagnostic clinic provided with modern equipment and manned by specially qualified clinicians is operated by the state department of health in cooperation with the outpatient department of the Medical College of Virginia, Richmond. According to Dr. Irl C. Riggan, Richmond, state health officer, it is expected that adequate care for these children eventually will become available throughout the state.

### WASHINGTON

**Personal**—Robert H. Fishbach, passed assistant surgeon, U. S. Public Health Service Reserve formerly of Hawaii has been appointed director of the Lewis-Pacific Counties Public Health Department.—Dr. Harold B. Stout, Brewster, has been named health officer of Pateros.—On February 17 the Spokane County Medical Society held a banquet in honor of Dr. Erich T. Richter, Spokane, who is in his fifty-second year in the practice of medicine.

### GENERAL

**Wartime Hospital Conference**—The executive board of the Catholic Hospital Association of the United States and Canada announces a wartime conference at the William Penn Hotel, Pittsburgh, June 11-14.

**Inter-State Postgraduate Meeting**—The Inter-State Postgraduate Medical Association of North America will hold a four day instructional course at the Palmer House, Chicago, October 26-29, constituting the twenty-eighth annual meeting.

**Gorgas Hospital Requests Scientific Material**—The Gorgas Hospital, Ancon, Canal Zone, which has recently reorganized its library, is interested in securing lists of publications in the field of medicine and allied sciences and also scientific films. All communications should be directed to Major Aubrey LeV. Bradford, M. C., U. S. Army, assistant to the superintendent of the hospital.

**International College of Surgeons**—The fourth International Assembly of the International College of Surgeons will be held at the Waldorf Astoria Hotel in New York, June 14-16 in conjunction with the eighth assembly of the United States chapter. The program will be devoted to war surgery and rehabilitation. Dr. Fred H. Albee, New York, is president of the international college and Dr. Thomas A. Shallow, Philadelphia of the national chapter. Additional information may be obtained from Dr. Max Thorek, Chicago, the international executive secretary.

**Meetings Canceled**—The 1943 annual meeting of the National Tuberculosis Association has been canceled. A meeting of the board of directors has been called at the Hotel Statler, St. Louis, May 5-6, to transact necessary business. On May 5 there will also be business sessions of the council of the American Trudeau Society, the medical section of the National Tuberculosis Association, and the executive committee of the National Conference of Tuberculosis Secretaries. The same evening Dr. James Burns Amberson Jr., New York, will give his presidential address, and the award of the Trudeau Medal for 1943 will be made.—The American Association for the Study of Allergy has canceled its 1943 meeting.

**Association for Advancement of Science**—Dr. Paul D. Lamson, professor of pharmacology, Vanderbilt University School of Medicine, Nashville, Tenn., was chosen vice president in charge of Section N (medical sciences) of the American Association for the Advancement of Science. The election of officers for 1943 was delayed because of the cancellation of the New York meeting. The section officers and other members were chosen by a mail ballot. In the second ballot necessary for the office of president, since no person received a majority vote, Isaiah Bowman, LL.D., president of Johns Hopkins University, Baltimore, was chosen president of the association to succeed Arthur H. Compton, LL.D., University of Chicago.

**Dr. Charles Huggins Receives First Mayer Award**—Dr. Charles B. Huggins, professor of surgery (urology) at the University of Chicago School of Medicine, has been chosen as the first recipient of a \$2,000 prize given by Charles L. Mayer and administered by the National Science Fund of the National Academy of Sciences. The award was offered for the most outstanding contribution made during 1942 to present day knowledge of factors affecting the growth of animal cells with particular reference to human cancer, and as a new type of prize for the advancement of fundamental scientific research administered under a new type of philanthropic foundation (*THE JOURNAL*, Dec 5, 1942 p. 1150). Specifically the award went to Dr. Huggins for his studies on the human prostate, with special relation to the cancers taking origin from this gland. The prize will be presented to Dr. Huggins at the annual dinner of the board of directors of the National Science Fund later this spring. A second Charles L. Mayer award of \$2,000 for an outstanding study in the same field in 1943 will be given. Entries and recommendations for consideration for the award should be in the office of the National Science Fund, 515 Madison Avenue, New York, by Jan 15, 1944. The advisory committee assisting the science fund in selection of the prize winner is interested primarily in fundamental studies on the factors influencing growth of animal cells rather than applications to any particular aspect of normal or abnormal growth.

### LATIN AMERICA

**Society Meetings**—All the phthisiologic societies of Argentina plan to hold a reunion in Rosario in May. "The Treatment of Empyema" and "Intestinal Tuberculosis" will be discussed.—The first special meeting of leprologists is to be held in Buenos Aires, May 1, in accordance with plans agreed on at a meeting of the Association of Argentinian Dermatologists and Syphilologists in 1942.

## Foreign Letters

### LONDON

(From Our Regular Correspondent)

March 6 1943

#### The Beveridge Scheme

A debate of three days on the Beveridge scheme in the House of Commons has been followed by one of two days in the House of Lords. The situation is well summarized by the *Times*, which describes the government as morally, if not financially, committed to a far reaching program of social advance that includes state financed children's allowances, a national medical service of free treatment for all, a unified social insurance system embracing every section of the community and important changes in old age pensions, widows' pensions and funeral benefit insurance. The scheme is certainly the most comprehensive ever presented by any British government. It has the approval of all the political parties, and criticisms are few and slight, but an acute difference has arisen with the Labor party as to procedure.

#### THE MEDICAL SERVICES

In the House of Lords Lord Dawson (consulting physician to the London Hospital) defined the attitude of the medical profession toward the replanning of medical services, which it had been studying closely for two years. The realization of hopes as regards medicine must be very slowly carried out. They should go step by step in agreement with the different parties. But certain matters were ready to be tickled now. The first was the great importance of bridging over the gap in theory and practice between preventive and curative medicine. They had remained detached because of the gap in their development, which had been disadvantageous to both. Hospital practice and general practice must comprise the care of public and individual health. Health officers must come out of their obscurity and come on to the staff of hospitals and meet regularly their medical colleagues. Medical education must be altered so that a student in the earliest days was told that the building up of health must take the first place. The practice of medicine must become increasingly institutional. Team work was a necessity. The care of child health should take precedence over almost everything else at this moment, because we wanted the children and wanted them well.

We could not construct a great healing service, such as he hoped, except under the skilled guidance of the medical profession. The medical profession could not be expected to be moved about and take its orders from the laity. Under the authority of Parliament, the profession wanted self determination, just as the judicial bench, bar and church looked after their own affairs without let or hindrance. Just as the profession was taking a prime responsibility in putting the proposals forward, so it would expect to take an equal part in their guidance. The medical profession had the difficulty that in order to do good planning it must have collectivism, but it must also have 100 per cent individualism in personal relations.

#### The Sterilization of Sulfanilamide Powder

The report of a fatal case of tetanus, possibly due to infection from the container of a sulfonamide powder, has led to the calling of a conference of clinicians, bacteriologists and representatives of British chemical manufacturers to consider methods of sterilizing sulfonamide powder for local application, as has already been done in the United States. It has been shown that if sulfanilamide powder contaminated with tetanus spores

is implanted in animals the drug does not prevent the development of tetanus. At a conference recently held between representatives of the Medical Research Council and the Association of British Chemical Manufacturers it was agreed that the Hinson, Westcott and Dunning procedure, adopted in the United States, was suitable for British manufacturers and that the powder thus sterilized should be issued in sterile packages of 5 Gm. But as this procedure would take some time to put into full effect and could not in any event be applied to existing stocks held in hospitals and at aid posts, the conference considered methods suitable for small scale sterilization. It was thought that lack of uniformity in results reported by investigators for a particular method which theoretically should have proved satisfactory was due to minor variations in technique and especially to the known variability of different commercial preparations of sulfanilamide powder as to chemical purity and physical properties. Thus the thermostatic control of a hot air oven without a check on the temperature of the powder itself, was insufficient. Color and discoloration on heating might depend on the purity, moisture content and particle size of the powder. It was agreed that a powder should not show more than slight discoloration after heating at 150 C for an hour.

For small scale sterilization of sulfanilamide in hospitals three alternative methods were recommended. 1 Dry heat at 150 C for one hour in a paraffin bath using half filled test tubes plugged with sterilized cotton wool and flaming the upper portion of the tubes. 2 Dry heat at 150 C for one hour in an electric oven, with precautions to ensure even heating throughout. 3 Autoclaving in a dressing sterilizer by the technique and with the precautions proposed by W. I. Buckland. For each of these methods to be satisfactory the sulfanilamide powder should not cake or be more than slightly discolored. The recommendations relate only to sulfanilamide, but the paraffin bath technique has been recommended by its author Berry, as suitable for sulfathiazole in hospital practice.

#### The Ministry of Health's Publicity Campaign Against Venereal Diseases

In a previous letter to *THE JOURNAL* the Ministry of Health's campaign against venereal diseases by an advertisement in the newspapers throughout the country showing their dangers and what those who contracted them should do has been described. Another measure is distribution through the local authorities of three pamphlets prepared by the Central Council for Health Education which are entitled "What Are the Venereal Diseases?" "Facts of Sex for Men" and "Women in Wartime." The nature of syphilis and gonorrhea is briefly explained. The danger of promiscuous sexual intercourse is pointed out, as well as the importance of early treatment. With regard to the danger of becoming the parent of an illegitimate child, men are told that no birth control methods are 100 per cent certain. Those who go overseas are informed that the licensed or tolerated brothels which exist in some countries are hotbeds of disease. To women it is pointed out that the old idea of their place being in the home is disappearing and that the war has tremendously hastened this movement. As a result of it they are working with men more closely and constantly than ever before. The resulting danger and the proper place of sex in life are stated. The danger of exciting men's sexual desire by allowing physical contacts is emphasized. In any case of doubt or difficulty they should consult their doctor or medical officer. Advice can also be obtained in the strictest confidence from the Central Council for Health Education, whose address is given.

## Deaths

**Edmund Janes Doering** \* Chicago, Chicago Medical College, 1874, president of the Chicago Medical Society 1886-1887, past president of the Chicago Gynecological Society and the Chicago Medical Legal Society, a governor of the Institute of Medicine of Chicago, a lieutenant colonel in the medical corps of the U S Army in 1918 and since 1922 colonel in the medical reserve corps, served as a surgeon in the U S Marine Hospital Service, in 1918 president of the U S Examining Board of the Medical Reserve Corps, in 1919 was appointed senior surgeon in the U S Public Health Service, appointed district medical officer for Illinois, Michigan and Wisconsin of the Federal Board for Vocational Education in 1919, chief consultant of the U S Veterans Bureau, a founder and fellow of the American College of Surgeons, president of the Illinois division of the medical reserve corps of the U S Army and honorary president of the Chicago chapter, governor of the Military Order of the World War and in 1930 was commander of the Chicago chapter, governor of the National Reserve Officers' Association, 1922-1923, and honorary president of the medical chapter, consulting physician to the Chicago Lying In and Michael Reese hospitals, in 1936 was a member of the board of public health advisers in the Illinois Department of Public Health, in 1916 received the honorary degree of master of science from Northwestern University, editor of the *Chicago Medical Recorder* for many years, aged 88, died March 1, of coronary sclerosis.

**Ralph Leonidas Byrnes**, Los Angeles State University of Iowa College of Medicine, Iowa City, 1906, specialist certified by the American Board of Internal Medicine, fellow of the American College of Physicians, formerly professor of bacteriology and pathology at the University of Utah School of Medicine, Salt Lake City, professor of pathology, bacteriology and clinical microscopy at the University of Southern California 1915-1916, professor of diseases of the chest at the College of Medical Evangelists from 1919 to 1923, director of the Utah State Board of Health and Laboratory from 1911 to 1915, member of the American Public Health Association, past director and chairman of the committee of the Los Angeles Academy of Criminology, first lieutenant in the Utah National Guard from 1912 to 1915, served as captain, major, surgeon and president of the board of tuberculosis examiners in military camps in the United States from 1917 to 1919, founded an endocrine and mental hygiene clinic, Belvedere Health Center, Los Angeles County Health Department, in 1930, on the staffs of the Los Angeles General, White Memorial and California Lutheran hospitals, aged 64, died, February 16, of coronary thrombosis.

**Walter Joseph Wherry**, Omaha, University of Nebraska College of Medicine, Omaha 1935, member of the Nebraska State Medical Association, Omaha-Council Bluffs Ophthalmological and Otolaryngological Society, Omaha Mid-West Clinical Society and the American Academy of Ophthalmology and Otolaryngology, specialist certified by the American Board of Otolaryngology and assistant secretary-treasurer, instructor in otolaryngology at his alma mater, member of the staffs of the University of Nebraska Hospital, Douglas County Hospital and St. Catherine's Hospital, on the visiting staffs of the Bishop Clarkson Memorial Hospital and Nebraska Methodist Hospital and Deaconess Home, son of the late Dr. William P. Wherry, aged 37, died, April 1, of hypernephroma.

**Thomas Arthur Clay** \* Paterson, N. J., Columbia University College of Physicians and Surgeons, New York, 1903, fellow of the American College of Surgeons, past president of the Passaic County Medical Society, in 1908 county coroner, from 1906 to 1913 was medical inspector of the city public schools, formerly member of the board of health and city health officer, served in the medical corps of the U S Army during World War I, from 1923 to 1928 director of the Paterson Clinic of the state rehabilitation commission, chairman of the American Red Cross, served on the staffs of the Hope Dell Hospital, Preakness, St. Joseph's Hospital and the Paterson General Hospital, where he died, March 13, of cirrhosis of the liver, aged 63.

**James Willis Candee**, Utica, N. Y., New York Homeopathic Medical College, New York, 1879, member of the Medical Society of the State of New York, at one time secretary of the state board of homeopathic medical examiners, for eight years health commissioner of Syracuse, served as consulting physician at the Syracuse Homeopathic Hospital

and trustee of the Syracuse Homeopathic Free Dispensary, for four years served as supervisor of the town of Forestport, aged 87, died, February 15, in the Masonic Soldiers and Sailors Memorial Hospital of chronic endocarditis and arteriosclerosis.

**David Lawrence Satenstein**, New York, Columbia University College of Physicians and Surgeons, New York, 1902, associate clinical professor of dermatology and syphilology at the New York Post-Graduate Medical School, Columbia University, specialist certified by the American Board of Dermatology and Syphilology, member of the American Dermatological Association, served on the staffs of the Jewish and Adolph hospitals, Brooklyn and the Far Rockaway (N. Y.) Hospital, aged 63, died, February 25, in the New York Post-Graduate Medical School and Hospital of coronary thrombosis.

**Bloxham Edward Alsobrook**, Okeechobee, Fla., Atlanta (Ga.) College of Physicians and Surgeons, 1910, formerly associated with the Indian Service, local surgeon for the Florida East Coast and Seaboard Air Line railways, aged 62, died, February 13, in the Arcadia (Fla.) General Hospital of uremia.

**James McAllister Anderson**, St. Petersburg, Fla., Western Pennsylvania Medical College, Pittsburgh, 1902, member of the Florida Medical Association, at one time on the staffs of the Western Pennsylvania and Pittsburgh hospitals, Pittsburgh, on the staffs of the Mound Park and St. Anthony's Hospital, aged 69, died, February 7, of myocarditis.

**Albert George Aschauer**, Springfield, Ill., College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1909, member of the Illinois State Medical Society, served during World War I, aged 63, died, March 6, in St. John's Hospital of pyloric ulcer.

**John Henry Ash**, Quincy, Mass., Harvard Medical School, Boston, 1895, member of the Massachusetts Medical Society, for many years a medical examiner for the Metropolitan Life Insurance Company, formerly the city school committeeman, served as a trustee of the Thomas Crane Public Library and as city physician, served on the staff of the Quincy City Hospital, aged 72, died, February 15, of chronic myocarditis.

**John Anthony Badgley**, Joliet, Ill., Rush Medical College, Chicago, 1880, member of the Illinois State Medical Society, in 1938 received a fifty year medal from the state medical society, formerly medical director of the DeKalb (Ill.) County Tuberculosis Sanatorium, aged 87, died, February 20, in St. Joseph's Hospital of pneumonia.

**Louis Bagby** \* Vinita, Okla., University Medical College of Kansas City, Mo., 1900, past president and secretary of the Craig County Medical Society, served on the staff of the Vinita Hospital, president of the First National Bank, aged 67, died, February 15, of coronary thrombosis.

**Frank Gould Bryant**, Scranton, Pa., College of Physicians and Surgeons, Baltimore, 1895, served as fire and police surgeon of Scranton, medical inspector for the school district for fifteen years, at one time director of public health in Scranton, aged 70, died, February 28, of carcinoma of the prostate.

**James Adam Carnes** \* Navarre, Ohio, University of Pennsylvania Department of Medicine, Philadelphia, 1907, fellow of the American College of Surgeons, served on the surgical staffs of the Massillon (Ohio) City Hospital and the Aultman Hospital, Canton, chief surgeon of the Central Alloy Division of the Republic Steel Corporation of Canton and Massillon, aged 57, died, February 13, of coronary occlusion.

**Edward J. Carney**, Durand, Mich., Rush Medical College, Chicago, 1901, member of the Michigan State Medical Society, past president of the Shiawassee County Medical Society, for many years city health officer, past president of the chamber of commerce, served as president of the village of Durand, member of the staff of the Durand Hospital, where he died, February 15, of coronary thrombosis, aged 68.

**Edward Francis Carroll**, Riverside, R. I., Harvard Medical School, Boston, 1894, served as postmaster, member of the school committee and the city police commission of Providence, aged 71, died, February 15, of heart disease.

**Walter Marion Caton**, Mason City, Ill., Kansas City (Mo.) Medical College, 1901, University of Kansas School of Medicine, Kansas City, Kan., 1909, member of the Illinois State Medical Society, formerly on the staff of the Lincoln (Ill.) State School and Colony, aged 70, died, February 16, in Lincoln of coronary thrombosis.

**John Wesley Cunningham**, Eldersville, Pa., Memphis (Tenn.) Hospital Medical College, 1906, member of the Medical Society of the State of Pennsylvania, served as a major



in the medical corps of the U S Army during World War I, aged 72, died, February 5, in the Ohio Valley Hospital, Steubenville, Ohio, of carcinoma of the tongue with metastasis

**Charles Webster Didenhover**, Baltimore, University of Maryland School of Medicine, Baltimore, 1894, at one time police coroner for the northern district, aged 70, died, February 14, in the Union Memorial Hospital of cerebral hemorrhage

**Mary Hughes Elliott** \* Spencer, W Va, National University of Arts and Sciences Medical Department, St Louis, 1914, Bennett Medical College, Medical Department of Loyola University, Chicago, 1916, served overseas during World War I, aged 62, served on the staffs of the Larned (Kan) State Hospital and the Spencer State Hospital, where she died, February 25, of coronary occlusion

**Harry Fleming Fisher**, Braddock, Pa, Western Pennsylvania Medical College, Pittsburgh, 1892, member of the Medical Society of the State of Pennsylvania, on the staff of the Braddock General Hospital, aged 73, died, February 9, of coronary thrombosis

**Asbury Coke Graves**, Pittsburg, Kan University of Nashville (Tenn) Medical Department 1882, Vanderbilt University School of Medicine, Nashville, Tenn, 1883, formerly mayor of Pittsburg, at one time a member of the House of Representatives of Kansas, served on the staff of the Mount Carmel Hospital, a consulting eye surgeon to the Kansas City Southern Railway, aged 86, died, February 13, of cerebral hemorrhage

**Charles Burley Ham**, Toledo, Ohio, Bellevue Hospital Medical College, New York, 1889, aged 82, died, February 26, of cerebral hemorrhage

**William Stephen Hamlett**, Baird, Texas, Kentucky School of Medical, Louisville, 1898, aged 81, died, February 12, in the Callahan County Hospital following an operation for urinary retention caused by prostatic disease

**Martin Passmore Hamrick**, Olive, Calif, University of Pennsylvania School of Medicine, Philadelphia, 1911, served during World War I, formerly a captain in the medical corps of the U S Army, on the resident staff of the Riverside (Calif) County Hospital, aged 57, died, February 15, in the Veterans Administration Facility, West Los Angeles, of cerebral hemorrhage

**William McIntire Harsha**, Chicago, Chicago Medical College, 1883, member of the Illinois State Medical Society, in 1905 member of the House of Delegates of the American Medical Association, professor of surgery emeritus at the University of Illinois College of Medicine a founder and fellow of the American College of Surgeons, president of the Chicago Surgical Society, 1916-1917 emeritus member of the Institute of Medicine of Chicago, formerly surgeon to St Luke's Hospital, aged 87, died, February 26, of uremia

**William Anthony Herman**, New York, Georgetown University School of Medicine, Washington, D C, 1930, served as a member of the staffs of the Roosevelt and Doctors hospitals, aged 41, died, February 17, in the Lenox Hill Hospital of pneumonia

**Joseph Ellis Hoffman**, Philadelphia, University of Pennsylvania Department of Medicine, Philadelphia, 1883, aged 88, died, February 16, of cerebral hemorrhage

**Henry G Hughes**, Schenectady, N Y, University of the City of New York Medical Department, New York, 1890, member of the Medical Society of the State of New York, past president of the Schenectady County Medical Society, formerly served as physician and surgeon for the Holland American Steamship Line, Panama Railroad Steamship Line and as chief surgeon of the Guayaquil and Quito Railroad Company of Ecuador, South America, aged 75, died, February 17, of coronary disease

**George W Kehl** \* Reading, Pa, University of Pennsylvania Department of Medicine, Philadelphia, 1893, in 1910 president of the Berks County Medical Society, fellow of the American College of Surgeons, for many years chief surgeon of the Reading Hospital, where he later became a consulting surgeon, aged 71, died, February 10, of bronchogenic carcinoma

**Charles Henry Krause**, St Louis Homeopathic Medical College of Missouri, St Louis, 1893 vice president and treasurer of the Columbia Quarry Company, aged 69, died, February 8, in St Anthony's Hospital of heart disease

**Louis Lefrak** \* New York, Long Island College Hospital Brooklyn, 1908, specialist certified by the American Board of Radiology, Inc, member of the Radiological Society of North America, Inc, and the American College of Radiology, clinical

assistant 1921-1922 and instructor 1923-1924, department of roentgenology, New York Post-Graduate Medical School and Hospital, aged 68, died, February 21, of heart disease, following a prostatectomy

**Edward Joseph Leonard** \* Boston, Georgetown University School of Medicine, Washington D C, 1926, instructor in medicine at the Tufts College Medical School, aged 41, on the staffs of St Margaret's Hospital and the Carney Hospital, where he died February 14, of coronary thrombosis

**Van Buren Martin**, Piquette, Miss, Medical Department of Tulane University of Louisiana New Orleans 1898 member of the Mississippi State Medical Association, examining physician for the Selective Service System for local draft board number 1 of Pearl County formerly bank director, superintendent and owner of a sanatorium bearing his name, aged 75, died, February 27, in the Toussaint Infirmary New Orleans of heart disease

**Floyd Napoleon Moore**, Austin Texas, Baylor University College of Medicine Dallas 1928 member of the State Medical Association of Texas and the American College of Chest Physicians, medical director of the Austin Travis County Sanatorium member of the Austin Junior Chamber of Commerce, aged 44, died, February 25, of coronary thrombosis

**Marion W Murphy** \* Ringgold, Ga Atlanta Medical College, 1892, president of the Bank of Ringgold, aged 81, died, February 25, of coronary occlusion

**Samuel Gaines Northrup**, Houston Texas, Medical Department of Tulane University of Louisiana, New Orleans, 1888 aged 81, died, February 20 of heart disease

**Clell Ping**, Summersville, Ky St Louis College of Physicians and Surgeons, 1923 member of the Kentucky State Medical Association, aged 43 died February 23 of cerebral hemorrhage

**Marion Pinson**, Mett, Ky, Georgia College of Eclectic Medicine and Surgery Atlanta 1892, at one time a school teacher, aged 83, died, February 26 in Zebulon of cerebral hemorrhage

**John D Poe** \* St Louis St Louis University School of Medicine, 1903, served on the staffs of the Evangelical Deaconess Home and Hospital and St John's Hospital, aged 68, died, February 26, in Miami, Fla, of pneumonia

**Henry Jacob Pool** \* Port Clinton Ohio, University of Wooster Medical Department Cleveland, 1902 fellow of the American College of Surgeons member of the Radiological Society of North America, Inc, aged 67, died, February 17, of cardiovascular disease

**Michael Thomas Reynolds** \* Brooklyn Columbia University College of Physicians and Surgeons, New York, 1901, fellow of the American College of Surgeons, served on the staffs of the Mary Immaculate Hospital Jamaica, N Y, and St Mary's Hospital, aged 64, died, February 27, in St Vincent's Hospital, New York, following an operation on the gall-bladder

**Henry Towne Safford**, El Paso Texas, Sterling Medical College, Columbus, 1896 member of the State Medical Association of Texas and the American Society of Anesthetists, Inc, in 1942 was elected the first honorary member of the Texas State Association of Medical Anesthetists, aged 75, member of the executive committee of the Providence Hospital, where he died, February 18, of heart disease

**Elmer Emmett Sherman**, Keosauqua, Iowa, College of Physicians and Surgeons, Keokuk, 1898, member of the Iowa State Medical Society, aged 81, died, February 12, in the Iowa Methodist Hospital, Des Moines, of chronic heart disease

**Neulan B Smith**, Ellisville, Miss, Medical Department of Tulane University of Louisiana, New Orleans, 1894 while a resident of Laurel served as a member of the board of aldermen of the city and as a member of the board of trustees of the city schools, aged 72, died, February 22, of heart disease

**Henry Smoyer**, North Tonawanda, N Y, Niagara University Medical Department Buffalo, 1895, member of the Medical Society of the State of New York, on the staff of the De Graff Memorial Hospital served as mayor, city treasurer and school physician for ten years town health officer of Wheatfield, aged 72, died, February 18 of aortic stenosis and arteriosclerosis

**John Willis**, Warramassa N J, University and Bellevue Hospital Medical College, New York 1907 served during World War I, formerly chief anesthetist at the Christ Hospital and on the staff of the Jersey City Hospital, Jersey City, served for two years as school physician at the Ocean Township, aged 64, died, February 17, of cerebral hemorrhage



## Correspondence

### INTELLECTUAL WORKERS AND PHYSICAL EXERCISE

To the Editor — A little belatedly I wish to compliment you on the editorial "Intellectual Workers and Physical Exercise," which appeared in the January 13 issue of THE JOURNAL. The point of view expressed seems particularly desirable at this time when so many of our university departments of physical education are being asked to take over the activity aspects of the military program. I hope a good many men in my profession read it and profit from the thought involved. We here at the Ohio State University are proceeding rather carefully to the fulfillment of our obligations in this connection, and we desire most earnestly to fit the program of physical education for men in uniform rationally and appropriately into their preparation. We are taking the position that it is not our business to devise a program of exercises which will "toughen" these men in any extraordinary fashion, but on the contrary we hope to emphasize a high quality of instruction in useful motor skills and to devise a program which will be as far as possible based on the capacity of the soldier or sailor to receive such physical education as his age and physical condition permits without jeopardizing his ability to profit most from his other responsibilities while on the campus.

It has been my observation that intensive calisthenic or conditioning exercises are not altogether suitable but in their place may be used sound instruction in certain military skills, such as swimming, and a wise selection of games and sports which will have some purpose and interest involved therein and which will at the same time provide a desirable psychologic preparation in the use of initiative and resourcefulness in combat situations.

It is particularly gratifying to us, therefore, to note how closely we agree with what I gather to be the basic view expressed in this editorial.

D OBERTEUFFER, Columbus, Ohio

Professor of Physical Education, Ohio State University

### "ANDROGENS AND TESTICULAR IRRADIATION IN CANCER OF THE PROSTATE"

To the Editor — The communication of Huggins entitled "Androgens and Testicular Irradiation in Cancer of the Prostate" (THE JOURNAL, January 9, p 147), seems to me to be misleading. He states that my quotation "The theorem of possible relationship of some factor in the testicle, probably androgenic, to carcinoma of the prostate was promulgated by me eight years ago" (THE JOURNAL, Dec 5, 1942, p 1120) refers apparently to an oral promulgation rather than to a publication, since no reference to it could be found among my publications cited in the *Quarterly Cumulative Index Medicus* before 1941.

Before the then Southwestern Branch of the American Urological Association, at the meeting held in St Louis on Oct 22, 23 and 24, 1934, in the discussion of a paper by Dr Robert C Cone of Galveston, Texas, entitled "Prostatic Carcinoma with

Complications," the theorem of possible relationship between carcinoma of the prostate and testicular hormones was presented and the course of 2 cases recited in which planned irradiation had been given with 650 kilovolts potential in castration dosage to the testicles during the years 1933 and 1934. The scientific proceedings of this meeting were not published.

Referring to my paper read before the American Urological Association in May 1941 (*J Urol* 46 1007 [Nov] 1941), it is set forth that the cases reported were from "the five year period immediately ending in December 1938," and, further, it is stated that at the time of the report "the longest time of survival is seven years." It takes no great amount of mental gymnastics to deduce that the five year period began in 1933 and that the patient surviving longest had his treatment in 1934. Coincidentally, in the series of cases presented by Huggins on the same program in 1941 the clinical effects of surgical castration were observed over a period of only twenty months (*J Urol* 46 997 [Nov] 1941).

The concept of a possible hormonal relationship to carcinoma of the prostate enunciated by me in 1934 was well known to a number of urologists, who evinced a decided interest in the theorem.

I would not detract from the excellent corollary work done by Dr Huggins in pursuit of the proof of this concept, and to Dr Huggins must go priority in publication of this proof.

Pertinent to the article by Huggins entitled "Effect of Orchiectomy and Irradiation on Carcinoma of the Prostate" (*Ann Surg* 115 1192 [June] 1942), he concludes "Roentgen irradiation of the testes in the doses stated is inadequate as a therapeutic agent in human prostatic cancer." In support of this conclusion he cites the 2 patients "in whom roentgen therapy was applied to both the pelvis and testes." A careful review of the histories of both cases reveals that in neither case was roentgen therapy applied directly to the testes as a planned therapeutic procedure. Further, the illustration (fig 8) depicting the microscopic appearance does not carry the same case number as either of the cases cited. And the description "Histologic appearance of the testes eighty-seven days following completion of extensive irradiation with roentgen ray" does not conform to the described procedure in the case reports. There is no expression or knowledge purveyed of any given amount of x-ray absorption, rather, this factor is entirely assumptive.

Until Dr Huggins will conduct a parallel series of roentgen and surgical castration cases, he is not in a position to pronounce a negative dictum relative to planned testicular irradiation.

As Huggins states (p 1192), "Thus, it is clear that there are many failures in the treatment of prostatic carcinoma by orchiectomy," so it can be said of irradiation castration that there will be a comparative mortality the first year but the late failures, both mortality and morbidity, are not so manifest.

The contention that interstitial cells are not affected by irradiation is open to question, and whether the interstitial cells are responsible for the carcinogenic related factor is also conjectural. It is irrefutable, however, that this factor in the testicle is sufficiently depressed by roentgen therapy to establish its adequacy as a potent therapeutic agent in human prostatic cancer.

ARBOR D MUNGER, M D, Lincoln Neb

## Medical Examinations and Licensure

### COMING EXAMINATIONS AND MEETINGS

#### BOARDS OF MEDICAL EXAMINERS BOARDS OF EXAMINERS IN THE BASIC SCIENCES

Examinations of boards of medical examiners and boards of examiners in the basic sciences were published in *THE JOURNAL* April 10 page 1241

#### NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS *Parts I and II* August 24 *Part III* June and also at various times at various centers having 5 or more eligible applicants Sec Dr J S Rodman 225 S 15th St Philadelphia

#### EXAMINING BOARDS IN SPECIALTIES

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY *Written* Philadelphia Sept 27 *Oral* Philadelphia Nov 56 Final date for filing application is August 16 Sec Dr C Guy Lane 416 Marlboro St Boston

AMERICAN BOARD OF OPHTHALMOLOGY *Parts I and II* New York City June 45, October 89 Sec Dr John Green 6830 Waterman Ave St Louis

AMERICAN BOARD OF PEDIATRICS *Written* Locally Oct 8 *Oral* New York Nov 2021 Final date for filing application is Aug 1 Starting July 1 1943 Group I will be abolished Sec Dr C A Aldrich 707 Fullerton Ave Chicago

## Bureau of Legal Medicine and Legislation

### MEDICOLEGAL ABSTRACTS

**Accident Insurance Death from Coronary Occlusion Precipitated by Strain of Dancing Not Due to "Accidental Means"**—The insured, an able bodied man of 55, about once every two weeks was wont to dance at a meeting of a dancing club to which he belonged, continuously for approximately three hours. During the latter part of the evening of Dec 21, 1940, at a meeting of the club and while the insured was dancing a fast fox trot, he complained to his partner of a pain in his left side and shoulder and he was forced to cease dancing. His son took him to a hospital immediately but the insured died as they arrived at the hospital. According to the attending physician, death resulted from a coronary occlusion or blood clot, which means, so the physician stated, "a blocking of the arterial blood vessels." Specifically, this physician testified

It must have been a thrombosis or a thrombus formed at the entrance to the coronary artery and the violent exercise of dancing increased the flow of blood and forced the clot that had formed there into the coronary artery and produced a complete block.

Suit was instituted on a policy of insurance that provided stated benefits for loss of life "from bodily injuries sustained through purely Accidental Means independently and exclusively of disease and all other causes." From an adverse judgment, the insurance carrier appealed to the Supreme Court of Washington.

The court was called on to determine whether or not death resulted from bodily injuries sustained through purely accidental means and whether or not the bodily injuries which caused death were sustained through accidental means independently and exclusively of disease. If the answer to either question was no, there could be no recovery on the policy of insurance. To support recovery the claimants, apparently the widow and son of the insured, cited a number of cases decided by the Supreme Court of Washington in which recovery had been allowed against insurers for injuries allegedly caused by accidental means. The court, however, did not find any of its previous decisions precisely in point in the present controversy. An examination of those cases, said the court, demonstrates that an unusual unforeseen agency or happening was present and unexpectedly caused the injury which brought about death in each of those cases and brought the facts within the provisions of the policy of insurance sued on. The rule stated in those cases

is that generally death will be regarded as resulting from accidental means when it arises from an unanticipated event which happens as by chance or which does not take place according to the usual course of things. We adhere to that rule but we cannot extend that rule to include all injuries which may be caused to holders of accident insurance. In the present case, the insured was doing an ordinary and customary act in his usual way and no unexpected event interposed itself to cause injury. The dance was described as a fast fox trot. That dance so far as the facts indicate was no different from any other modern lively dance and called for no violent action other than that which was incident to the activity of dancing and was readily foreseeable by the insured. The insured's death was not caused by an unexpected event which happened by chance. True death is in most instances unexpected but to hold that all unexpected deaths are accidental and that insurance companies which insure against accidental death are liable on that ground alone would amount to a rewriting of such policies by the courts and put into each of those policies an intent that was never conceived by either the company or the insured at the time the policies were written. That the courts cannot do. Courts may only determine the legal effect of contracts. The judgment against the insurance company was accordingly reversed.—*Hodges v. Mutual Ben Health & Accident Assn of Omaha* 131 P (2d) 937 (Wash., 1942)

**Venereal Prophylactics Alleged Violation of Washington Act Forbidding Sale of Venereal Prophylactics at Wholesale or Retail Except by Licensees of Board of Pharmacy**—A Washington statute (Rem Rev Stat, Sec 10146-2 Laws, 1939, chap 192 sec 2) makes it unlawful for any person to sell any venereal prophylactic at wholesale or retail without having respectively a valid and subsisting wholesale dealer's or retail dealer's license issued by the state board of pharmacy. The defendant drug company was charged with violating this act by the sale at wholesale of two gross of prophylactics without possessing a wholesale dealer's license. The only evidence adduced to sustain the charge was the testimony of an inspector for the state board of pharmacy to the effect that he purchased two gross of prophylactics from the defendant drug company and that at the time of the purchase he was not a person who sold or intended to sell prophylactics directly to the user. From a judgment of conviction the defendant appealed to the superior court King County, which affirmed the conviction. The defendant then appealed to the Supreme Court of Washington, challenging the sufficiency of the evidence to sustain the conviction.

The Supreme Court was of the opinion that the state failed to prove that the defendant drug company was guilty of the crime of selling prophylactics at wholesale. The statute, said the court which the state charged the defendant with having violated defines the meaning of the term "wholesale." We may not go beyond the scope of that definition to determine the meaning of the word "Wholesale," the statute provides "shall mean a sale by a manufacturer, wholesale dealer, distributor or jobber to a person who sells, or intends to sell, direct to the user, and 'wholesale dealer shall mean such a manufacturer, wholesale dealer, distributor or jobber' (Rem Rev Stat, Sec 10146-1, Laws, 1939, chap 192 sec 1). The sale to the inspector for the state board of pharmacy was not a sale at wholesale within the meaning of that statute since the inspector did not sell or intend to sell direct to a user. It is not material at what price the prophylactics were sold by the defendant drug company, neither is the amount sold of any importance, as under the statute price does not nor does the amount sold, determine the nature of the sale. Even if the defendant drug company made the sale to the inspector believing that the purchaser was buying the prophylactics for resale, that belief would not bring the defendant within the statute. We cannot, continued the court, follow the argument that, since the defendant drug company believed that the inspector was purchasing the prophylactics for resale, therefore, the defendant is guilty of the crime charged. An essential element of the crime charged is that the buyer of the prophylactics was a seller or intended to sell what he bought from the defendant drug company.

That element is lacking. Unless the buyer of the prophylactics from the defendant company was a person "who sells, or intends to sell, direct to the user," the transaction was not a sale at wholesale under the statute.

Holding that the state had failed to prove that the defendant company sold prophylactics at wholesale in violation of the statute, the Supreme Court reversed the judgment of conviction and remanded the cause with directions to dismiss—*State v. Northwest Drug Co., Inc.* 131 P. (2d) 956 (11 Ash, 1912)

## Society Proceedings

### COMING MEETINGS

HOUSE OF DELEGATES OF THE AMERICAN MEDICAL ASSOCIATION CHICAGO BEGINNING JUNE 7 DR OFFICE WEST 535 NORTH DEARBORN ST CHICAGO SECRETARY

American Association of Genito-Urinary Surgeons Stockbridge Mass June 10-12 Dr Charles C Higgins 2020 East 93d St Cleveland Secretary

American Association of Industrial Physicians and Surgeons Rochester N Y May 25-27 Dr I C Holmblad 28 East Jackson Blvd Chicago Managing Director

American Association on Mental Deficiency New York May 12-15 Dr Neil A Davton Mansfield Training School Mansfield Depot Conn

American College of Radiology Chicago June 6 Mr Mac I Cahill 540 North Michigan Blvd Chicago Executive Secretary

American Gynecological Society Hershey Pa May 31-June 2 Dr Howard C Taylor Jr 842 Park Ave New York Secretary

American Neurological Association New York May 6-7 Dr Henry A Riley 117 East 72d St New York Secretary

American Ophthalmological Society Hot Springs Va May 31-June 2 Dr Walter S Atkinson 129 Clinton St Watertown N Y Secretary

American Psychiatric Association Detroit May 10-13 Dr Winfred Overholser St Elizabeth's Hospital Washington D C Secretary

American Psychoanalytic Association Detroit May 9-11 Dr Leo H Barmeier General Motors Bldg Detroit Secretary

American Society of Clinical Pathologists Chicago June 4-6 Dr Alfred S Giordano 531 North Main St South Bend Ind Secretary

American Surgical Association Cincinnati May 13-14 Dr Warfield M Firor Johns Hopkins Hospital Baltimore Secretary

Arizona State Medical Association Tucson April 30-May 1 Dr Frank J Milloy 112 North Central Avenue Phoenix Secretary

California Medical Association Los Angeles May 2-3 Dr George H Kress 450 Sutter St San Francisco Secretary

Connecticut State Medical Society New Haven May 25-27 Dr Creighton Barker 258 Church Street New Haven Secretary

Georgia Medical Association of Atlanta May 11-14 Dr Edgar D Shanks 478 Peachtree St N E Atlanta Secretary

Illinois State Medical Society Chicago May 18-20 Dr Harold M Camp 224 South Main St Monmouth Secretary

Iowa State Medical Society Des Moines April 29-30 Dr Robert L Parker 3510 Sixth Avenue Des Moines Secretary

Maryland Medical and Chirurgical Faculty of Baltimore April 27-28 Dr W Houston Toulson 1211 Cathedral St Baltimore Secretary

Massachusetts Medical Society Boston May 24-26 Dr Michael A Tighe 8 Fenway Boston Secretary

Minnesota State Medical Association Minneapolis May 17-19 Dr B B Souster 493 Lowry Medical Arts Bldg, St Paul Secretary

Mississippi State Medical Association, Jackson May 11-13 Dr T M Dye Clarksdale Secretary

New Hampshire Medical Society, Manchester May 11 Dr Carleton R Metcalf 5 South State St Concord, Secretary

New Jersey Medical Society of Newark May 25-26 Dr Alfred Stahl 55 Lincoln Park Newark Secretary

New York Medical Society of the State of Buffalo May 3-6 Dr Peter Irving 292 Madison Ave., New York Secretary

North Carolina Medical Society of the State of Raleigh May 10-12 Dr Roscoe D McMillan Red Springs Secretary

North Dakota State Medical Association Bismarck May 10-11 Dr L W Larson 221 Fifth Street Bismarck Secretary

Oklahoma State Medical Association, Oklahoma City May 11-12 Dr Lewis J Moorman, 210 Plaza Court Bldg Oklahoma City Secretary

Rhode Island Medical Society, Providence, June 2-3 Dr William P Buffum 122 Waterman St, Providence Secretary

West Virginia Medical Association Charleston May 17-18 Mr Charles Lively 1031 Quarrier St Charleston Executive Secretary

## CENTRAL SOCIETY FOR CLINICAL RESEARCH

Fifteenth Annual Meeting held in Chicago Nov 6 and 7 1942

The President, DR ARLE R BARNES, Mayo Clinic, Rochester, Minn., Presiding

(Continued from page 1308)

### Influence of Diet Deficient in the Vitamin B Complex on Work Output of Trained Subjects

Drs E E FOLTZ, CLIFFORD J BARBORKA and A C IVY, Chicago. Four medical students were provided with board and room in a hospital. The subjects came to the laboratory for a workout on the bicycle ergometer three times each week. The standard rate of work was 1,235 kilogrammeters per minute with a pedaling rate of 54 revolutions per minute. The subjects worked to complete fatigue, rested ten minutes, then worked to complete fatigue again. Double work periods were used because it was felt that the results obtained were more accurate than those resulting from single work periods. The subjects trained for from nine months to one year, during which time they were on a normal adequate diet. They then received a diet deficient in the vitamin B complex containing approximately 0.51 mg of thiamine and 0.78 mg of riboflavin a day. This diet was continued for two months, after which the fat content of each diet was reduced 50 per cent and an isocaloric amount of carbohydrate was added. This diet was continued three weeks. The subjects then received the original deficient diet supplemented with 25 Gm daily of a yeast concentrate. This provided each subject with a daily intake of 15 mg of thiamine, 5.25 mg of riboflavin, 50 mg of niacin, 5 mg of pyridoxine and 25 mg of pantothenic acid in addition to his deficient diet. Vitamin studies of the blood and urine were followed throughout the experiment.

All subjects showed decreased work output on deficient diets. When they were given the yeast concentrate a prompt increase in their total work output occurred. While the subjects were on deficient diets they at no time showed any objective evidences of a vitamin B deficiency with the exception of a slight increase in irritability. The blood levels of thiamine were normal throughout. However, the twenty-four hour urinary excretion of thiamine during this time varied from 5 to 35 micrograms. The subjects complained of lack of pep and of anorexia, leg pain occurred sooner during the work periods. The percentage of recovery was not significantly affected.

### DISCUSSION

DR EMMET B BAY, Chicago. I should like to ask the authors if the blood pyruvate was the same after exercise as in the resting period. I understood that it did not vary on different diets. The figures shown would represent a great increase over what I understand to be the normal resting levels.

DR E E FOLTZ, Chicago. The pyruvic acid values were those obtained following exhaustion. I did not have graphs showing them following rest.

### Nutritional Deficiency and Resistance to Infection in Monkeys

DR H E WILSON, S SASLAW, PH D, J L SCHWAB, PH D, DR O C WOOLPERT and DR C A DOAN, Columbus, Ohio. Monkeys were isolated and divided into four diet groups. 1 Diet 1, vitamin B free basic diet consisting of sucrose, casein, vegetable oil, cod liver oil and salt mixture with the addition of thiamine hydrochloride, riboflavin, pyridoxine, nicotinic acid, calcium pantothenate and ascorbic acid. 2 Diet 2, all of the constituents of diet 1 with the addition of choline chloride, pimeic acid, glutamine, inositol and sodium paraminobenzoate. 3 Diet 600 (modified Goldberger), and 4, control diet consisting of the vitamin B free basic diet with the addition of ascorbic acid and crude liver extract administered parenterally. All 4 monkeys on the control diet thrived. All 32 in the other three groups showed progressive weight loss followed by lethargy, dryness of the coat and finally anorexia and weakness. Four monkeys on diet 600 showed a relatively rapid clinical decline and also exhibited extensive ulcerated oral lesions, which began to develop between the twenty-first and thirty-third diet days.

Minor degrees of transitory gingivitis appeared in about half the monkeys on diets 1 and 2 between the twenty-first and forty-fourth diet days, many of which lesions healed spontaneously.

All 32 animals in the three diet deficient groups exhibited an appreciable and progressive leukopenia, which appeared after six to eleven weeks in the monkeys on diet 600 and after four to fifteen weeks in those on diets 1 and 2. Significant degrees of anemia developed in less than half of these animals.

Eight of the nutritionally deficient animals were inoculated under light ether anesthesia with influenza virus type A. Five died in from two to eleven days. Influenza virus A was recovered from the lung filtrates of 3 animals. There were no deaths in 27 similarly inoculated monkeys on adequate diets.

Six animals while on the limited diets were inoculated with *Streptococcus hemolyticus* group C. Following inoculation an abortive ineffective, minimal leukocytosis was observed, in sharp contrast to the pronounced, sustained effective leukocytosis previously reported as developing in control monkeys on adequate diets. Of these 6, 3 developed facial erysipelas and 5 died with generalized septicemia seven to thirteen days after inoculation. Of 32 monkeys on normal diets receiving similar inoculations, 2 died with a streptococcal septicemia fifteen and twenty-one days afterward.

The humoral antibody responses to both streptococcus and virus did not differ essentially in time or titer in any of the groups from that observed in normal monkeys. Bone marrow studies have shown a relative and absolute hypoplasia in the myeloid elements in the infected monkeys dying with peripheral leukopenia.

Certain monkeys on diets 1 and 2, developing leukopenia and, given liver extract or yeast autolysate residue containing folic acid, showed hematologic and clinical recovery. Others which had apparently progressed to an "irreversible phase," succumbed to spontaneous infection despite all resuscitative measures.

Of the 19 animals which were not experimentally infected while on the leukopenia producing diets 10 succumbed with spontaneous infections, 7 died with dysentery (*Shigella paradyenteriae*) between the eighty-fifth and one hundred and eightieth diet days and 1 died of *Staphylococcus aureus* septicemia, 1 of pneumonia due to *Friedlander's bacillus* and 1 with hemolytic streptococcus pneumonia.

#### Influence of Thiamine on Induced Hyperthyroidism

DR RAY D. WILLIAMS and EDWARD C. KENDALL, PH.D., Rochester, Minn. Two physically healthy women, maintained continuously on a basal diet providing only 0.22 mg. of thiamine per thousand calories but adequate in all other respects received large doses of desiccated thyroid gland (subject 1, 0.6 Gm. a day; subject 2, 0.5 Gm. per day) for 241 days. Besides the periods of preliminary and subsequent observation the study was divided into three periods: thiamine hydrochloride was liberally provided during the first period of twenty-two days, it was restricted to 0.45 mg. a day during the second period of one hundred and thirty-six days; it was provided in increasing amounts during the third period of eighty-one days. The basal metabolic rates of the subjects rose to approximately +25 per cent during the initial period of administration of thiamine and desiccated thyroid. The rates of the two subjects fell to levels as low as -8 per cent and +11 per cent respectively during the period of restriction of thiamine but they rose consistently to levels of +25 and +30 per cent respectively in the third period when thiamine was again provided. Throughout the period of administration of desiccated thyroid the concentrations of pyruvic acid and lactic acid in the blood after administration of dextrose were high, but they were higher during the period of restriction of thiamine.

The conclusion appears justified that the thyroid hormone is less effective in promoting metabolic activity of the organism in a state of thiamine deficiency than it is when the intake of thiamine is adequate. Data of this study may be interpreted

as additional evidence that the function of the thyroid hormone is primarily to mobilize metabolites for oxidation by enzyme systems of the organism and only indirectly to increase the rate of oxidative processes. It might be inferred that deficiency of thiamine may be a contributory cause of low metabolic rates of unknown etiology. If low metabolic rates of a given subject were caused by deficiency of thiamine, it might be expected that a rise of metabolic rate would follow administration of thiamine. However, a rise of metabolic rate could occur only if the functional capacity of the thyroid gland was adequate. It is not improbable that thiamine deficiency of long standing induces irreversible changes in the thyroid gland as in nervous structures. The gland may become exhausted from prolonged stimulation or atrophied from disuse.

#### Relationship of Estrogens to Certain Signs in Hepatic Diseases, Pregnancy and Vitamin B Complex Deficiency Syndromes

DR WILLIAM BENNETT BEAN, Cincinnati. During the past five years a study has been made of the acquired arterial "spider" of the skin and a number of related phenomena which may occur during the course of diseases of the liver, pregnancy, and in persons with B complex deficiency syndromes as well as in certain apparently normal ones. Data have been accumulated on 251 cases which have been followed for weeks, months or years. Among the associated stigmas observed are palmar erythema, telangiectases of the nasal oral and rectal mucous membrane, aneurysmal dilatations of the conjunctival vessels and vascularization of the skin of the nose. Seen less frequently were aberrations of menstrual function including amenorrhea and after the menopause a return of irregular bleeding. Impotence, testicular atrophy and a transitory or permanent depilation of the pubic, axillary and thoracic hair were found in some males. These signs appeared in various combinations.

These observations attracted attention to the relation of estrogenic function and hepatic dysfunction to the vascular changes in the skin. A preliminary study of administering estrogenic 17-ketosteroids in cirrhosis in "remission" indicated that many of these manifestations might be related to a protracted increase of circulatory estrogens such as occurs in pregnancy and in chronic liver disease when these substances are not sufficiently destroyed, altered or excreted by the liver.

Points in the differential diagnosis of vascular "spiders" and the lesions of hereditary hemorrhagic telangiectasia (Osler's disease) include characteristic differences in gross morphology, histology, distribution, local intravascular pressure, bleeding tendency and the clinical course of the two distinct conditions.

These studies suggest that cutaneous arterial "spiders," palmar erythema and certain other phenomena which occur frequently in cirrhosis and pregnancy result from a prolonged action of estrogens.

#### DISCUSSION

DR C. J. WATSON, Minneapolis. I should like to ask Dr. Bean if he has any explanation for the strict localization of these lesions to the upper part of the body. From my experience and what I have found in the literature they seem to be limited, as in Dr. Bean's cases, to the upper part of the body.

DR PHILIP S. HILCH, Rochester, Minn. Dr. Bean's statement that cutaneous arterial spiders and palmar erythemas occur frequently in cases of hepatic cirrhosis and in cases of pregnancy is of special interest to me because pregnancy and hepatitis with jaundice are two conditions which may promote a dramatic amelioration of rheumatoid arthritis. I have seen several cases of severe rheumatoid arthritis with a striking erythema of all the terminal phalanges and other cases with palmar erythema, the so-called liver palm. I have not seen vascular spiders in rheumatoid arthritis, but curious lines of telangiectasia across the lower anterior chest are often seen in patients with ankylosing spondylitis (and admittedly also in

certain "normal" persons) It is difficult to know what these observations signify Do they suggest again that rheumatoid arthritis is somehow related to an abnormal hepatic or estrogenic function?

DR ARMAND QUICK, Milwaukee Do these tissues bleed more frequently than in true Osler's disease or hereditary telangiectasis?

DR WILLIAM BENNETT BLAN, Cincinnati Out of about 3000 "spiders" I have seen 11 on the body below the umbilicus, 1 on the toe a couple on the dorsum of the foot, 2 about the knee and others on the thigh and buttocks so that the statement that they do not occur on the lower extremity is not true Why the most usual distribution is in the upper portion of the body I do not know I do not think there is a causal relationship to the drainage area of the superior vena cava as suggested by Eppinger I have seen palmar erythema in patients with the painful shoulder and hand syndrome following acute infarction of the heart No one seems to know just what causes it We know there may be a costal fringe of vessels in tuberculosis but it may occur in the healthy too Hemorrhage is almost a necessary factor in the diagnosis of hereditary hemorrhagic telangiectasis It occurs in less than 5 per cent of vascular spiders, though it may happen readily in the lesions on the mucous membrane are rather large and superficial In hereditary telangiectasis there is atrophy or loss of muscular coat of the artery whereas in vascular spiders there is hypertrophy of the muscular coat of the artery with a good many 'glomus' cells resembling the pericytes of Zimmermann Vascular spiders are distinctly not arteriovenous shunts in the sense that a glomus is

#### Causes of Drop of Plasma Vitamin A Level in Liver Disease

DR HANS POJPER and FREDERICK STEIGMANN, Chicago We compared the vitamin A concentration in the plasma with that of liver biopsy specimens chemically and by fluorescence microscopy in 76 cases (peptic ulcers gallbladder disease with and without jaundice carcinomas of the stomach cirrhosis and biliary tract cancers) In addition the plasma vitamin A level in 24 nonsurgical cases of liver disease was determined Plasma vitamin A levels of zero were found in almost all cases of cirrhosis with jaundice and in 66 per cent of the cases of secondary hepatitis due to malignant obstructive jaundice Occasionally vitamin A levels of zero were also found in cirrhosis without jaundice, in cases of secondary hepatitis from incomplete obstruction and in cases of acute hepatitis The average plasma vitamin A level was higher in cirrhotics without jaundice than in those with jaundice, and higher in obstructive jaundice without than with hepatitis Although the hepatic vitamin A concentration showed similar tendencies, the variations were not always as definite Often this resulted in great discrepancies between the low or zero vitamin A concentration in the plasma and the only slightly reduced vitamin A in the liver In these cases the normal fluorescence microscopic distribution of vitamin A in the liver was much disturbed and this disturbed pattern suggested impaired release of vitamin A from the liver to the blood as the cause of the discrepancy mentioned In rats intoxicated with carbon tetrachloride and then put on a vitamin A deficient diet the vitamin A is similarly found stored longer in the pathologic sites Although faulty intestinal absorption of vitamin A is present in all types of liver disease (personal experiences in 52 cases confirmed older reports) it would not make itself felt in acute liver disease if the release of vitamin A from the liver was not impaired

#### DISCUSSION

DR G E WAKERLIN, Chicago Epinephrine by injection and also ethyl alcohol by mouth have been shown to mobilize vitamin A from the normal liver I think it would be interesting to study the effect of these two substances on the

mobilization of vitamin A from the livers of patients with hepatic disease and from the livers of animals with experimental hepatic damage

DR HANS POJPER, Chicago We consider the suggestion of Dr Wakerlin as to the use of alcohol a good one in view of the results of Clausen and his collaborators, who find increased release of vitamin A from the liver after alcohol ingestion Wald also found increased release after use of epinephrine Our examinations of pathologic livers did not indicate the occurrence of an increased release of vitamin A We will, however, accept the suggestion of Dr Wakerlin and investigate the influence of alcohol on the blood vitamin A level of patients with liver disease

#### Protective Value of Foods in Experimental Cirrhosis

DR JESSE L BOLLMAN, Rochester, Minn When extensive hepatic degeneration is produced in rats by repeated exposure to carbon tetrachloride the animals develop hypoprothrombinemia and die from hemorrhage into the gastrointestinal tract In these experiments adult male rats were fed 20 Gm daily of a basic diet containing 44 parts of lean meat, 44 parts of cracker meal 8 parts of lard, 4 parts of salt mixture and vitamin supplement With the uniform exposure to carbon tetrachloride vapor used in all experiments, these rats lived from thirty-two to forty-six days In another group of experiments one half of this mixed diet was replaced with isocaloric values of carbohydrate (cracker meal and sucrose), protein (meat) and fat (lard) Considering the duration of life of the rats on the mixed diet as representing a protective value of the diet of 100 the following protective values were obtained carbohydrate 146, protein 100 and fat 91 In another series three fourths of the mixed diet was replaced with isocaloric values of carbohydrate protein and fat With the protective value of the same mixed diet as 100, the following protective values were obtained carbohydrate 205, protein 104 and fat 59 All the diets used were adequate to maintain normal animals

The only organ that showed cellular degeneration other than that immediately associated with hemorrhage at the time of death during the carbon tetrachloride regimen was the liver Examination of sections of the liver showed extensive necrosis, some regeneration and distortion of the architecture of the liver typical of cirrhosis In animals studied at the time of death no definite differences in the extent of degeneration or cirrhotic changes in the liver were observed which could be ascribed to the different diets taken by the animals Examination of sections of liver taken from animals at comparable periods of the carbon tetrachloride regimen showed evidence of the protective effects of the diets The greatest amount of necrosis was present in the fat fed rats and the least in those fed carbohydrate Regenerative changes were most evident in the animals receiving the protein diet

#### DISCUSSION

DR SAMUEL SOSKIN, Chicago My associates and I have been doing some work similar to that of Dr Bollman, except that we have been using more acute exposure to carbon tetrachloride We do not wait until the animals die but examine them at various periods before death Although our results are not yet complete, it looks as if they will agree with Dr Bollman's in showing the protective action of carbohydrates Most of Dr Ravdin's results are based on the comparison of an intake of a superabundance of protein with a diet insufficient in protein While we all know that a diet rich in protein would be beneficial to persons suffering from protein deficiency, this has little to do with the use of a superabundance of protein in hepatic disease A more valid comparison is the use of a superabundance of a given foodstuff when the other elements of the diet are present in adequate amounts In Dr Bollman's work this comparison indicates the superiority of high carbohydrate intake as a life saving measure in carbon tetrachloride cirrhosis Our results support his

(To be continued)

## Current Medical Literature

### AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1932 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (\*) are abstracted below.

### American J. Obstetrics and Gynecology, St. Louis 45 1-182 (Jan) 1943 Partial Index

- Application of New Classification of Toxemias of Pregnancy in 318 Fetal Cases. P. T. Williams and E. Weiss. Philadelphia—p. 2.
- Clinical Experiments in Relation to Excretion of Estrogens. III. Urinary Estrogens in Normal Menstrual Cycle and in Case of Essential Dysmenorrhea. O. W. Smith, G. V. S. Smith and Sara Schiller. Brookline, Mass.—p. 15.
- Id. IV. Effect of Veratrum Viride on Urinary Estrogens in Pre-eclampsia. O. W. Smith, G. V. S. Smith and A. G. Gauld. Brookline, Mass.—p. 23.
- \*Histologic Appearance of Endometrium During Ictation Amenorrhea and Its Relationship to Ovarian Function. P. Topkins. Brooklyn—p. 48.
- Krukenberg Tumor. Critique with Report of Additional Four Cases Including Smallest on Record. S. M. Copland and S. H. Colvin. New Orleans—p. 59.
- \*Sulfanilamide and Sulfathiazole Therapy in Acute Salpingitis. D. N. Barrows and J. S. Labate. New York—p. 82.
- Missed Abortion. Analysis of Results Following Conservative Management. S. Lubin and R. W. Waltham. Brooklyn—p. 89.
- Treatment of Acute Inflammatory Pelvic Masses of Tubal Origin by Iontophoresis with Acetyl Betal Methyl Choline Chloride. Report of Ninety Four Cases. R. L. Craig and H. Kraff. New York—p. 96.
- Iatzko. Extraperitoneal Cesarean Section. Report Based on Study of Twenty Five Cases. H. C. Williamson and M. E. Goldblatt. New York—p. 103.
- Importance of Rest in Initiation of Breast Feeding. C. B. Darner and G. W. Hunter. Fargo, N. D.—p. 117.
- Vitamin B in Heartburn of Pregnancy. B. T. Hart. Winter Park, Fla.—p. 120.
- Addison's Disease Associated with Primary Amenorrhea. Case. E. H. Adler and S. B. Abrams. Cleveland—p. 123.
- Deaths from Perforation and Hemorrhage of Gastroduodenal Ulcer During Pregnancy and Puerperium. Review of Literature and Report of One Case. D. J. Sindewers, H. M. Podolsky, H. C. Saltzstein and A. A. Farberman. Detroit—p. 131.
- Histidine Test (Kapeller Adler) in Diagnosis of Pregnancy. M. J. Goodfriend and M. Daniel. New York—p. 140.

**Microscopic Appearance of Endometrium.**—Among 145 endometrial biopsies done six to thirty one weeks post partum of 28 normal lactating women during the period of lactation amenorrhea Topkins observed that 9 (6 per cent) showed progestational changes, all of these were associated with the onset of the first menstrual flow. Of the remaining 136 specimens 94 per cent showed estrogenic changes, and of these 20 were hypoplastic. During lactation the ovarian cycle is suppressed and its suppression results from suppression of the gonadotropic activity of the hypophysis. This has been shown by animal experimentation. The suppression of the pituitary gonadotropic activity in turn is due to the action of prolactin or to an internal secretion of the lactating mammary gland not as yet isolated.

**Sulfanilamide and Sulfathiazole Therapy in Acute Salpingitis.**—Barrows and Labate used sulfathiazole and sulfanilamide alternately in the treatment of 71 patients with initial attacks of acute salpingitis and 133 during an acute exacerbation of chronic salpingitis. Gonococcal endocervicitis and urethritis responded well to chemotherapy. All the positive spreads of patients became negative after treatment as judged by the reading of smears. The effectiveness of chemotherapy on gonorrheal lesions above the level of the internal os depends directly on the duration of the disease before therapy is begun and on the extent of tubal damage incurred. In 70 per cent of the patients with mild and 66 per cent of those with a moderate initial attack of less than five days complete resolution of adnexal masses was seen after one week of chemotherapy. There was no adequate response of primary salpingitis of a

duration of more than five days and of recurrent salpingitis in the moderate or severe groups. Permanent damage of the tubes may be prevented or minimized if chemotherapy is started within five days of an initial attack of adnexal disease.

### Journal of Lab and Clinical Medicine, St. Louis 28 381-530 (Jan) 1943

- Role of Contemporary Medicine in Current War Effort. J. R. Darnall—p. 383.
- Army's Medical Field Service School and Its War Training of Medical Officers. I. E. Hume, Carlisle Barracks, Pa.—p. 388.
- \*Management of Thoracic War Injuries. J. H. Forsee, I. M. Shifft, B. Burhan, I. J. Litzenberg and T. H. Burford—p. 418.
- Wounds of Warfare. I. A. Collier and J. M. Harris. Ann Arbor, Mich.—p. 441.
- Healing of Wounds. W. T. Bowers. Camp Gruber, Okla.—p. 451.
- War Wounds and Anaerobes. R. I. Pritikin—p. 462.
- Newer Concepts in Treatment of Burns with Suggestions for Management of Wartime Thermal Injuries. T. A. Fox—p. 474.
- Military Discipline Problem in Readjustment. I. S. Madigan and M. J. Farrell—p. 485.
- War Neuroses. N. Q. Brill—p. 489.
- Id. Experiences of 1914-1918. Lessons for Current Emergency. D. A. Thom. Boston—p. 499.
- Shell Shock and Effects of High Explosives. D. Denny Brown. Boston—p. 509.
- Alcoholism in Military Service. M. Moore—p. 515.
- \*Acute Respiratory Infection Resembling So Called Acute Pneumonia. Report of Forty Cases. J. B. Duggan and W. I. Powers—p. 524.

**Management of War Injuries to Thorax.**—Forsee and his associates state that an equally mobile system of evacuation and treatment soon after injuries are incurred is necessary to reduce fatalities from thoracic war injuries. This entails properly equipped medical installations which can function at the point of maximum casualties close to the battle front. The more important problems that enter the management of thoracic injuries, and that the authors discuss are the relation of the wound to the type of projectile, shock, hemorrhage, open pneumothorax, tension pneumothorax, interstitial pulmonary emphysema, massive collapse of the lung and contrecoup injury. "blast lung," ecchymotic rash, cardiac concussion, wounds of the heart and pericardium, cardiac resuscitation, acute and chronic emphysema, foreign bodies, combined abdominothoracic wounds, chemotherapy and anesthesia. All these factors are considered by the authors. In thoracic injuries the abnormal thoracic physiology must be corrected immediately, that is an open pneumothorax or sucking wound must be closed. Concomitant and later therapy must conform to the principles outlined in correcting the abnormal physiology. A tension pneumothorax must be relieved. The recognition of massive pulmonary collapse and treatment directed toward its reexpansion will greatly lessen the complications which frequently follow this condition. The anesthetic agents for extrapleural thoracic surgery are local (procaine hydrochloride), sodium pentothal, ether, nitrous oxide and oxygen with or without ether and cyclopropane. The anesthetics for intrapleural surgery are cyclopropane, nitrous oxide and oxygen ether, sodium pentothal and spinal nupercaine (1,500). Nitrous oxide, oxygen and ether and sodium pentothal should be used as near the front as necessity requires. Properly employed endotracheal anesthesia will be highly successful in the management of many wounds of the chest. Likewise the greater use of cyclopropane is advisable.

**Acute Respiratory Infection.**—An acute infectious disease of the respiratory tract with unusual pathologic pulmonary changes in 40 patients is described by Duggan and Powers. The condition closely resembles the pneumonia occurring in workers in the United States and abroad. The illness of most of the patients began as a simple acute infection with minimal respiratory and constitutional symptoms, a normal or slightly elevated leukocyte count and no abnormal physical signs. The diagnosis was usually roentgenographic and usually it could not have been made by any other means. The roentgenogram usually showed a small area of increased density most often located at the base or hilus of one lung. Abnormal physical signs in the lungs, manifested by crepitant rales, were not apparent until the peak of the severity of the disease had passed. Although the constitutional symptoms were not severe, convalescence was prolonged because of weakness. There is some evidence that the disease is caused by a filtrable virus. It is

apparently mildly contagious and is probably transmitted by casual contact. Lack of physical fitness, previous infections of the upper part of the respiratory tract, abnormal exposure or physical fatigue were not predisposing factors. The disease did not respond favorably to sulfonamide therapy. Many factors remain to be studied before the entire field of acute respiratory infections can be charted, and particularly is this true of those caused by a filtrable virus. The authors agree with Frances that this can be relieved only by clinical epidemiologic methods and that a comparison of the clinical differences in patients and epidemics with specific laboratory data will cause the various puzzling entities of respiratory disease to fall into their proper places.

### Oklahoma State Medical Assn Jour, Oklahoma City 36 1-46 (Jan) 1943

- Convulsions Encountered in General Practice T H McCarley McAlester —p 1
- Treatment of Burns J I Burton Oklahoma City —p 4
- Patent Ductus Arteriosus Report of Two Cases F T Joyce Chickasha —p 6
- Radiologist's Viewpoint in Treatment of Some Common Diseases E D Greenberger, McAlester —p 12

**Patent Ductus Arteriosus**—Joyce cites 2 cases of patent ductus arteriosus, 1 illustrates what may happen in such a case in which the operation has not been performed and 1 is an unusual case of dwarfism in which the operation should be done. It seems safe to assume that the death of the first patient, a man of 31, was caused by a complication of the treatment for a bacterial endarteritis which in turn was a complication of the patent ductus arteriosus. Had ligation been done early in life the contributing cause of death would have been removed and it seems likely that he could have lived longer with the aortic coarctation as many patients do with more severe coarctation. Congestive heart failure may have been forestalled for some time. It is questionable whether the retarded physical development of the second patient, a girl of 6 was related to the patent ductus arteriosus, as her stature was of the type seen in pituitary dwarfism. She was referred to a well known clinic for ligation of the ductus, but the operation was not advised, the only reason given was that she should be observed for a time—now, almost a year. Regardless of the etiology of the dwarfism, which in itself will not shorten her life, the possibility that subacute bacterial endocarditis will develop sooner or later remains. Every sore throat and infection of the upper part of the respiratory tract constitutes an obvious invitation for its development in her present condition. The unfortunate aspect of the case is that the parents returned home firmly convinced that the operation will never have to be done.

### Radiology, Syracuse, N Y 40 1-114 (Jan) 1943

- Bone Lesions in Acquired Syphilis C P Truog Detroit —p 1
- Diseases of Mediastinum and Associated Conditions Refresher Course L W Paul Madison Wis —p 10
- Post Thoracoplasty Roentgenogram with Special Reference to Posture J Gordon Ray Brook N Y and H K Taylor New York —p 42
- Roentgen Analysis of Upper Cervical Spine Injuries W N Palmquist Richmond Va —p 49
- Method for Localization of Foreign Bodies and New Instrument to Carry Out This Method V V Bourke Brooklyn —p 56
- Problem of Recovery from Radiation Effects F Ellinger Brooklyn —p 62
- Multiple Cassette Changer for Angiocardiography Device for Rapid Serial Radiography M M Schwarzschild New York —p 72

### Tennessee State Medical Assn Journal, Nashville 36 1-46 (Jan) 1943

- Prostatic Enlargement J C Pennington Nashville —p 1
- Special Ovarian Tumors Report of Series of Cases C H Long Johnson City and J Ziskind New Orleans —p 5
- Treatment of Burns by Use of Triple Dyes C C Trabue Nashville —p 13
- \*Perforating Wounds of Abdomen E L Rippey Nashville —p 20

**Perforating Wounds of Abdomen**—Based on data from a study of 527 cases of penetration of the peritoneal cavity by either a bullet or a knife, Rippey declares that explorations should be carried out whenever the point of exit or entrance of the knife or bullet is in the region of the abdominal cavity. The mortality from perforations resulting from bullets was four

times as high as when the perforation was the result of a knife blade. Hemorrhage is the greatest cause of shock, death will result unless hemorrhage is controlled and the blood volume is restored. In doubtful cases of injury to the peritoneum by the knife the wound should be examined in the emergency room and enlarged if necessary to ascertain its depth. If the blade has penetrated the fascia and muscle, further exploration is done in the operating room, under local anesthesia. The wound is enlarged and the muscle is retracted so that the peritoneum can be examined for evidence of injury. If the peritoneum has been penetrated the patient is given a general anesthetic and exploration is done through the diagnostic incision or else a standard incision that will allow careful examination of the abdominal organs is made. The mortality and the fatality rate of patients with wounds caused by knives or bullets increase steadily with the time that elapses from injury to operation. As to the use of sulfonamides intraperitoneally, patients do better if a concentration between 10 and 12 mg is maintained in the blood. The general average mortality for gunshot wounds for the nineteen years under consideration was 58.9 per cent whereas for 1941 it was 31.9. The 12.5 per cent mortality for wounds caused by the knife was lower than in any other series reviewed.

### Virginia Medical Monthly, Richmond 70 1 66 (Jan) 1943

- Symposium on the Sulfonamides W H Higgins interrogator Richmond —p 3
- Basis for Physical Therapy in Acute Poliomyelitis R L Bennett Warm Springs Ga —p 15
- Some Aspects of Cancer of Stomach J S Horsley Richmond —p 18
- Treatment of Burns with Special Reference to Use of Sulfadiazine J G Renne Pulaski —p 24
- Interrelationship of Dentistry and Otolaryngology G N Thrift, Richmond —p 30
- Intravenous Anesthesia in Obstetrics E Rucker Richmond —p 35
- Thrombosis of Cavernous Sinus Report of Case J W White Norfolk —p 37
- \*Gastroschisis Case Report D E Watkins Waynesboro —p 42
- Radio in Public Health Education D Groom Richmond —p 44
- Veneral Disease in Selective Service Rejectees M Romaine and W E Chapin Petersburg —p 46

**Gastroschisis**—Watkins cites the case of an infant who has lived for five weeks (May 6 1942) after repair of a gastroschisis. Gastroschisis is to be differentiated from abdominal hernia. In true gastroschisis the continuity of tissue in the abdominal wall, which permits direct communication between the abdominal cavity and the outside is absent. The author attributes the success in his case to the fact that there was less disproportion than usual between the everted viscera and the abdominal cavity and that dehydration was combated early and frequently by giving isotonic solution of sodium chloride subcutaneously. Also the use of prostigmine seemed to stimulate intestinal peristalsis, after which the baby began to retain feedings. The abnormality was repaired early that is before symptoms of shock and systemic effects had taken place. Further sulfanilamide, used in the abdominal cavity, lessened the degree of peritonitis as evidenced by the absence of wound infection.

### Western J Surg, Obst. & Gynecology, Portland, Ore 51 1-34 (Jan) 1943

- Prefrontal Lobotomy in Mental Diseases Case Report P G Flothow and F Lemere Seattle —p 1
- Rational Use of Oral Estrogens in Menopause S J Glas and G Rosenblum Los Angeles —p 4
- Abdominal Pain Simulating Acute Appendicitis Caused by Seminal Vesiculitis and Prostatitis W H Snyder Los Angeles —p 8
- Total Gastrectomy for Carcinoma Report of Successful Case J H Saint Santa Barbara Calif —p 10
- Abdominal Wound Suture Use of Figure of Eight Steel Wire in Emergency Surgery H M Nichols Portland Ore —p 17
- Perforated Peptic Ulcer O M Nesbet Portland Ore —p 21
- Physiologic and Bacteriologic Factors in Wound Healing W Marshall Appleton Wis —p 24

### West Virginia Medical Journal, Charleston 39 37-68 (Feb) 1943

- Urologic Considerations in Pediatrics M F Campbell New York —p 37
- Management of Chronic Arthritis J G Kuhns Boston —p 44
- Recent Drug Developments G A Bergy Morgantown —p 52
- Report of the State Nutrition Committee J L Blanton Fa —p 56



## FOREIGN

An asterisk (\*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

## Annals of Rheumatic Diseases, London

3 77-144 (Dec) 1942

Metabolism, Toxicity and Manner of Action of Gold Compounds Used in Treatment of Arthritis III. Complete Excretion Studies and Comparison of Intravenous and Intramuscular Administration of Some Gold Salts. R. H. Freyberg, W. D. Block and S. Levey.—p. 77.

Resistance in Rheumatism. W. Hughes.—p. 89.

Cultural Studies on Rheumatoid Arthritis and Rheumatic Fever. D. M. Angevine, S. Rothbard and R. L. Cecil.—p. 101.

Report on Test of Mestor's Specific Reaction in Rheumatic Cases. W. S. C. Cope and W. Stewart.—p. 107.

\*Five Hundred Cases of Myalgia in the British Army. M. Cood.—p. 118.

**Myalgia in the British Army**—Good discusses the 500 cases of myalgia that he saw in a main dressing station several inspection rooms and a rheumatism ward of a military hospital. Most of the patients were successfully treated by injection of procaine hydrochloride. Myalgia of the leg or legs was the most frequent complaint, next in frequency was that of the hip, the dorsal and lumbar region, the neck, arm, shoulder, abdomen and chest. Study of the individual muscles involved shows that the quadratus lumborum and trapezius were most frequently affected, the tensor fasciae latae, glutei, semimembranosus, tendinosus and sacrospinalis. Myalgia of the triceps, the adductors and extensors (except lateral vastus of the leg) was not encountered. The reason for the frequency of myalgia of certain muscles is suggested by Bramwell, who states that muscles which are of special importance as fixators in relation to maintenance of posture are predisposed. The primary cause (or causes) of rheumatic myalgias is not known. In 22.6 per cent of the 500 cases myalgia was traced to a recent or previous injury. In the discussion of the pathology of myalgia the conception of a diminished blood supply in the myalgic area is tentatively put forward. This would lead to oxygen want—local hypoxemia or hypoxia—which would account for the pain, paresthesia and loss of power, the symptoms of myalgia. A rapid, effective and permanent cure can be obtained by intramuscular injection into the myalgic spots of 1 to 2 cc of a solution made up of 1 Gm of procaine hydrochloride, 0.5 Gm of phenol and enough saline solution to make 100 cc. The result of a thorough and accurate injection is almost instantaneous relief of pain, relaxation of the spastic muscle and the absence of pain from pressure on the myalgic spot. The reaction of a patient with genuine myalgia to pressure on the myalgic spot is immediate pain and a single jerk of a part of his body.

## British Journal of Dermatology and Syphilis, London

54 313-344 (Dec) 1942

Dermatitis Due to Tyroglyphus Longior Gervais, Variety Castellani First in Cheese Dust. D. W. P. Thomas.—p. 313.

Dermatitis from Exposure to Tear Gas. J. T. Ingram.—p. 319.

## British Medical Journal, London

1 1-30 (Jan 2) 1943

Three Years of Military Psychiatry in the United Kingdom. J. R. Rees.—p. 1.

Observations on Injuries to Semilunar Cartilages in Service Patients. S. A. S. Malkin.—p. 6.

Mitral Systolic Murmurs. W. Evans.—p. 8.

\*Treatment of Chronic Ulcerative Colitis by Pneumoperitoneum. H. Neumann.—p. 9.

Some Observations on Biliary Pain. A. A. Douglas.—p. 10.

**Treatment of Chronic Ulcerative Colitis by Pneumoperitoneum**—Neumann has obtained excellent results in chronic, apparently intractable, cases of colitis by the establishment and maintenance over several months of a therapeutic pneumoperitoneum. The patient is not confined to bed except for a few days, and his hospitalization can be limited to a short time. The clinical indications for pneumoperitoneum were chronicity, diarrhea, pus, mucus and blood in stools and intractability. Refilling can be done once or twice a week, when pure oxygen is used the intervals are three or four days because absorption is more rapid. When air is used the intervals are six to eight days. Oxygen, because of its calming effect, is preferable for the first fillings for patients with major abdominal discomfort and frequent colic and for those with a higher grade of secondary anemia and dyspnea. The number of fillings

varies greatly, it may be necessary to continue treatment for three months or more. Only 1 of the author's 7 patients was treated for more than three months. The therapeutic action of pneumoperitoneum is probably partly due to activation of the visceral peritoneum and to "tuning it to a higher pitch" by the setting up of a permanent bland irritation to the peritoneal surface and partly to the mechanical action and the indirect influence on the autonomic nervous system. Pneumoperitoneum is free enough from danger for it to be performed by any practitioner even without the facilities of a clinic or a hospital.

## Lancet, London

1 35 64 (Jan 9) 1943

Sulfonamide Resistance in Gonorrhea. J. Petro.—p. 35.

Defects of Smell After Head Injury. A. D. Leigh.—p. 38.

Motility of Lining Stomach in Health and Disease. W. F. Anderson.—p. 40.

Carcinoma of Fetus Presenting as an Acute Condition Within the Abdomen. H. Payne and I. Jarrett.—p. 43.

Deficiency Anemias of Malnutrition. H. C. Trowell.—p. 43.

Dangers of Pentothal Sodium Anesthesia. A. R. Hunter.—p. 46.

**Sulfonamide Resistance in Gonorrhea**—Petro bases his definitions and observations on 956 cases of acute gonorrhea in naval ratings treated with sulfapyridine or sulfathiazole. Sulfonamide resistance in gonorrhea may be acquired, relative and absolute. An *in vivo* and *in vitro* investigation of 44 cases of male gonorrhea shows that 5 resistant strains and 1 relatively resistant strain of gonococci were responsible for the failure of 6 patients to respond to adequate sulfonamide treatment. Investigation of the female hosts of one sulfonamide resistant strain of gonococci supported the view that such a strain can be transmitted from one host to another. The development of resistant strains is probably favored by inadequate doses of a sulfonamide, haphazard tests of cure and the premature cessation of treatment in defaulters. Until new compounds effective against sulfonamide resistant strains are evolved or means for re-sensitizing these strains are found, treatment of patients infected with a sulfonamide resistant organism must be by irrigation or artificial fever.

**Deficiency Anemias of Malnutrition**—Trowell reviews the knowledge of nutritional macrocytic anemia, a common anemia in both sexes when the diet is deficient in extrinsic factor. The failure to recognize this anemia and its refractoriness to many forms of liver in the form and dosage found potent in pernicious anemia might cause confusion with achrocytic anemia, acholuric jaundice of the acquired variety and refractory and aplastic anemia. When iron deficiency anemia and nutritional macrocytic anemia are both present the resulting anemia presents a confused picture difficult to recognize. The term dimorphic anemia should be given to this combination. This may well be the most common deficiency anemia of the very poor, and the very poor are not confined to the tropics. Two deficiencies play a part in the etiology of dimorphic anemia. The blood smear shows dimorphism between the central and the peripheral parts of the smear, the sternal puncture reveals two deficiency types of erythropoiesis and two factors are necessary in its treatment: iron and liver.

## Practitioner, London

150 1 64 (Jan) 1943

Acute Tonsillitis. Diagnosis, Treatment and Complications. V. E. Negus.—p. 1.

Tracheotomy and Laryngotomy. A. Patten.—p. 7.

Common Causes of Hoarseness and Its Treatment. R. D. Owen.—p. 13.

Modern Methods of Diagnosis and Treatment of Diphtheria. W. M. Elliott.—p. 23.

Common Causes of Stridor in Infancy and Their Treatment. J. V. Braithwaite.—p. 31.

Hysterical Amnesia in Soldiers and Some Medicolegal Implications. W. L. Neustatter.—p. 35.

Chronic Bronchitis in the Aged. T. H. Howell.—p. 40.

Some Anal and Rectal Conditions. R. H. Franklin.—p. 42.

Note on Treatment of Chronic Arthritis with Calcium Aurothiomalate. M. B. Ray.—p. 49.

Psychology in General Practice. I. Introduction. Attitude of General Practitioner. M. Culpin.—p. 51.

## Tubercle, London

23 239 262 (Nov) 1942

Closed Suction Drainage of Tuberculosis Cavities. T. H. Sellors.—p. 239.

## Presse Medicale, Paris

50 169 192 (Feb 18 21) 1942

Some Points on the Histophysiology of Nerve Trunks of Interest to Surgeons (Remarks on an Article by Rene Leriche) A. Polard—p 169

\*New Remarks on the Remedy to Apply to the Grave Deficiency of the Present Diet in Phosphorus, Calcium and Vitamin D and the Urgency of This Remedy H. and M. Hinglais—p 171

Postoperative Acute Digestive Dilatation Disturbance of Digestive Permeability P. Suire—p 173

**Deficiency of Present Diet in Phosphorus, Calcium and Vitamin D**—H. and M. Hinglais say that a year ago on Feb 18 1941 they placed in the hands of the rationing committee a memorandum on the extraordinary impoverishment of the present diet in calcium phosphorus and vitamin D pointing out that the deficiency is enormous in all subjects over 6 years old. They also called attention to the prevailing misconception that vitamin D by itself can be of value in the absence of sufficient amounts of phosphate and calcium in the diet. This "factor of utilization" can never be substituted for the essential building and maintenance materials phosphorus and calcium. A plan of correcting the diet which was compatible with the present possibilities and realizable on a large scale in groups and families was presented by the authors but no attempt having been made to put it into practice they report that the deficiency in phosphorus and calcium reduces the resistance and burdens most heavily the future of the young generation. In one graph they show the calcium deficit for the different age groups and in another one the vitamin D deficit. The calcium and phosphorus deficits are comparatively slight in children up to 6 years old, but after that they grow because the ration becomes smaller as the need increases. Children between 6 and 10 years receive less than half, those between 12 and 14 less than a third and after 14 less than a tenth of their requirements. In pregnant and nursing women the deficiency is likewise considerable. This great deficiency in phosphorus and calcium is due to the total or almost total disappearance of milk and its products from the diet. Other foods are extremely low in calcium and phosphate. The systematic employment of calcium phosphate associated with a suitable dose of vitamin D constitutes the only available remedy to compensate for the lack of milk. It must be made a part of the daily diet. A table lists the required daily doses of phosphorus, calcium and vitamin D for the different age groups. The urgency of the problem of supplying particularly school children and young people with adequate amounts of phosphorus, calcium and vitamin D is proved by the increasing frequency of fractures of the neck of the femur in young adults, by the increase in rickets and in osseous and dental decalcifications.

## Archivos Argentinos de Pediatria, Buenos Aires

18 99-191 (Aug) 1942

Syndrome of Guillain Barre in Childhood Case A. Casaubon and A. Euglisi—p 99

Late Evolution of Apparent Obstetric Abdominal Hemiparesis E. Gaing, D. Aguilar Giraldes and A. J. Alurralde—p 105

Case of Congenital Malformation of Intestinal Tract E. Halac and J. J. Halac—p 110

Favorable Development of Child Now Aged 10 Who During Lactation had Malignant Lymphogranuloma P. R. Cervini, A. Di Bartolo and H. Weber—p 121

Phylactic Transfusion Its Concept and Application in Pediatrics V. Anello—p 133

\*Chronic Coryzas and Vitamins A. Vidal Freyre—p 142

**Chronic Coryzas and Vitamins**—The frequent observation of children who "always have a cold" and whose coryza does not respond to the various local treatments induced Vidal Freyre to try the nasal instillation of vitaminized oils. He used a vitamin A preparation. Five drops were instilled three times a day into each nasal fossa. The results were quite favorable. The treatment was completely successful in 18 of 41 cases; there was considerable improvement in 8 cases, moderate improvement was obtained in 8 and the treatment failed in 7 cases. The favorable effect can probably be explained by the protective action of vitamin A on the epithelium. It can be employed pure or in combination with small doses of vitamin D. Before treating a chronic rhinitis it is of course essential to determine the cause,

for it would be ridiculous to try to cure a diphtherial coryza with instillations of vitamin A. Syphilis and tuberculosis should be investigated, because these diseases may sustain focal infection. Spasmodic rhinitis or nasal asthma is another type of chronic coryza. Tonsillar hypertrophy and adenoid vegetations produce obstruction and favor and maintain all types of catarrhs of the upper respiratory passages. Their early extirpation is advisable. Disregarding these cases as well as the syphilitic coryzas, there still remains a large number of children with chronic nasal catarrh. For these the author recommends the local application of vitamin A.

## Arch. Urug. de Med., Cir. y Especialid., Montevideo

21 101-232 (Aug) 1942 Partial Index

\*New Sulfonamide Preparations in Therapy of Bacillary Dysentery F. Abente Haedo and A. Rodriguez Devincenzi—p 115

\*Genital Brucellosis in Man P. Puerriell, R. Rizzo and J. Espasandin—p 128

**Sulfonamide Compounds in Bacillary Dysentery**—Abente Haedo and Rodriguez Devincenzi report good results from sulfonamide preparations in 16 cases of bacillary dysentery. In all the diagnosis was confirmed by laboratory tests which showed bacilli of Flexner's group in the feces. The group included children and adults. The authors emphasize the importance of early diagnosis and early sulfonamide therapy. The first dose of the drug (sulfathiazole) should be large (2 or 4 Gm for adults and 0.75 or 1 Gm for children). The daily dose for adults is 1 Gm every four hours day and night without any interruption until recovery, which as a rule occurs within two or three days. The total daily dose for children who weigh less than 10 Kg varies between 0.15 and 0.4 Gm for each kilogram of body weight. The total dose is divided in six equal fractional doses, each of which is administered every four hours. In children weighing more than 20 Kg the first and daily doses for each kilogram of body weight are smaller than those given to children under 20 Kg of body weight. The first dose of sulfaguanidine both for adults and for children is 0.1 Gm for each kilogram of body weight, the following dose is 0.05 Gm for each kilogram of body weight every four hours day and night for the first two days and the same dose every eight hours for two more days. During and after treatment the patients should drink liquids freely. If good results are not manifested during the first week of the treatment it should be discontinued. In no case is the drug given for more than two weeks. Ascorbic and nicotinic acids, thiamine hydrochloride, vitamin A and liver extract should be administered in the course of the treatment. The patients should be carefully observed for the possible appearance of adrenal insufficiency, which is a serious complication and calls for immediate proper therapy.

**Genital Brucellosis in Men**—Puerriell and his collaborators report 6 cases of acute or chronic brucella epididymitis without orchitis in workers in refrigerator meat plants. The acute form of the disease began with symptoms of general infection and fever in the course of which acute funicular scrotal and testicular pain either local or irradiating to one or the four limbs appeared. Acute inflammation of one testis appeared early in the disease. It was found by palpation that the testis was of normal form and consistency whereas the epididymis was the seat of acute inflammation, which was more acute at the head and tail of the structure than at the body. Subacute vaginitis with effusion subacute prostatitis and vesiculitis existed in some cases. The chronic form of the disease appeared in patients who complained about asthenia of long duration or about repeated attacks of moderate fever. The genital symptoms were more or less mild. They appeared in course of one of the attacks of recurrent fever. The chronic genital disease was either unilateral or bilateral. Small painless nodules could be palpated in both testes. The biologic tests for Brucella (intradermal test for allergy and seroagglutination test) were strongly positive in all cases and remained positive throughout illness and convalescence. Therapy during the acute period and the recurrences consisted of rest, local heat and sulfanilamide.

## Book Notices

**Laboratory Directions in Biochemistry** By Victor C. Myers, M.A. Ph.D. D.Sc. Professor of Biochemistry, Western Reserve University, Cleveland. Paper Price \$3.50. Pp. 288 with 17 illustrations. St. Louis: C. V. Mosby Company, 1942.

Biochemistry has been recognized as an important subject in the medical curriculum for many years and, more recently, detailed work in this subject has been given in schools of dentistry. The present loose leaf manual of directions for laboratory work for a course of biochemistry in medical schools and in dental schools will be viewed with interest by many teachers of biochemistry. The author states that the directions were prepared originally for his students at the Albany Medical College in 1910. The original manual has been revised each year, and today the directions for laboratory work in biochemistry are thoroughly in keeping with newer developments of the subject. The directions for experiments are divided into sections on introductory biochemistry and clinical biochemistry and a course in practical laboratory work for dental students. An outline of the plan of lectures and laboratory work as presented at Western Reserve University is provided so that the suggested laboratory work may be easily correlated with other schedules of subject presentation. The introductory section deals with the biochemistry of carbohydrates, lipids, proteins, tissues, digestion and excretion. The clinical portion contains chapters on gastric analysis, the examination of duodenal contents, the chemistry of feces and the examination of the urine for clinical purposes and an extended section on the chemical analysis of blood. The laboratory program for dental students is somewhat shorter. In place of exercises on clinical biochemistry, attention is devoted to the analysis of saliva and the quantitative aspects of biochemistry and because some students may not have had sufficient training in this subject the author includes in the appendix a discussion of visual and photoelectric colorimeters and a series of experiments for students who have not completed a course in quantitative analysis. The manual is well written and suitably illustrated and it should be generally useful.

**The Art of Living in Wartime** By Marjorie Barstow Greenble. Cloth. Price \$2.50. Pp. 266. New York & London: Whittlesey House, McGraw-Hill Book Company, Inc., 1943.

The title of this delightful book might well have been simply "The Art of Living." Its wartime angles are distinctly timely and helpful, but its value will not be limited to wartime except to those who in the peace to come may be prevented from reading it by its title. It is a sound, sane, solid, helpful book, but it is much more. It gives the impression of growing out of a living experience in which life's problems have been faced with serenity and success. It manages to be inspiring without striving for effect and it achieves dignity without pomposity. The chapter titles are ingenious. Typical among them are "The Gallant Art of Facing It," "The Heroic Art of Overtime," "The Difficult Art of Taking It Easy," "The Discarded Art of Filial Piety," "The Fundamental Art of Love," "The Lusty Art of Keeping Fit" and "The Thankless Art of Doing One's Bit." In style and general approach it is reminiscent of David Grayson's "Adventures in Contentment" and similar writings keyed to a more tranquil age. It is packed with hope, courage, humor and helpfulness at a time when nothing is needed more. This is a book that will give the reader a lift. It should be especially good reading for persons whose maladjustments to wartime living threaten to have unfavorable repercussions on their emotional and eventually their physical and mental health. To any such patient the physician need not hesitate to recommend it.

**The Vitamins in Medicine** By Franklin Blecknell, D.M. M.R.C.P. and Frederick Prescott, M.Sc. Ph.D. A.I.C. Clinical Research Director, The Wellcome Foundation, London. Cloth. Price 45s. Pp. 662 with 121 illustrations. London: William Heinemann Medical Books Ltd., 1942.

This book is intended as a comprehensive survey of the vitamins with emphasis on the clinical aspect of the subject. The contents include chapters on vitamin A, vitamin B complex and its known factors, and vitamins C, D, E, F, K and P. Each vitamin is considered from the point of view of history, physi-

ology, sources and food tables, effects of cooking, storage, human requirements in health and disease, clinical and biochemical methods of detecting deficiencies and conditions in which it has been used clinically.

Unfortunately in an attempt to make the compilation complete these authors have included references to reports that are in need of considerable supporting evidence. In certain sections emphasis seems to be placed on a summary of experimental work rather than proved clinical facts as the title of the book suggests. Some readers will accept such references as an invitation for vitamin therapy in instances in which their use is not justified. Probably this must be expected in books that are intended as comprehensive surveys.

If this book is read for provocative thought much satisfaction will result. If it is used entirely as a guide for vitamin therapy in general practice occasional disappointment may result. However the contents of the book are well arranged and well indexed and cannot help but leave the reader acutely aware of vitamin deficiencies. Bibliographies at the end of each chapter contain the titles of over three thousand papers and supplement the value of the book as a reference and therapeutic guide.

**Manual for Managers of Rural and Other Small School Lunchrooms** Prepared and published by the Ohio Dietetic Association with the cooperation of the following agencies: Ohio State Department of Health, Ohio Department of Education, Division of Vocational Education, Ohio State University, School of Home Economics, Division of Institutional Management, Works Progress Administration, Committee from the Ohio Home Economics Association, Cleveland Health Council. Paper. Price \$1.00. Pp. 220. Cleveland: Ohio Dietetic Association, 1942.

This is an eminently practical manual in loose leaf form for managers of rural and other small lunchrooms. It has been prepared by a committee of the Ohio Dietetic Association with the cooperation of a number of health agencies. The greater part of the book is devoted to recipes for a large number of nourishing dishes. The ingredients are listed for serving twelve, twenty-five or fifty persons. Each recipe takes up one page. The method of preparation is described clearly, and at the bottom of the page there are menu suggestions showing the way in which the particular preparation may be used in a meal. The authors have not neglected to include an adequate index. The first part of the book contains discussions of such subjects as the educational possibilities of the school lunchroom, what a satisfactory lunch should consist of and how to select it. There is an interesting section on quantity cooking with a list of reference books appended. A chapter on equipment with numerous charts of arrangements of lunchroom and kitchen enhances the usefulness of the volume. Chapters on food purchasing, food cost accounting and food sanitation are also included.

**Tobacco and Health. Some Facts About Smoking** By Arthur H. Steinhilber, Professor of Physiology, George Williams College, and Florence M. Crumderman, Assistant in Biological Science, George Williams College. Third edition. Paper. Price 35 cents. Pp. 45. New York: Association Press, 1942.

This is a summary on effects of tobacco in relation to health, based on the theory that the average citizen given all the facts ought to be capable of making up his mind especially if he is told how the facts are developed. Following this theory the authors have taken the various phases of tobacco smoking and have set down what they conceive to be the facts for and against the use of tobacco in various forms. Typical of their approach is the handling of the question of smokers versus nonsmokers in athletics. In this section which constitutes chapter vii of the brief monograph they deal with performance in cross country runs by heavy smokers, moderate smokers, nonsmokers and the totals. These are all in favor of the nonsmokers. With respect to sprints they indicate that there is no difference between the performance of smokers and nonsmokers. In swimmers nonsmokers have the advantage. Then follows the physiologic explanation and the conclusion that "Smoking does 'cut the wind of an athlete'." Most chapters are followed by questions which lead to further discussion. There is an extensive bibliography, and every statement in the brief summary is documented according to the bibliography. This should be a useful teaching instrument.

## Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

### VACCINES AND TUBERCULOSIS

**To the Editor**—Has any vaccine been developed which would be suitable for vaccination against tuberculosis? If an effective vaccine has been developed I should appreciate your giving me the technic and materials used.

Herman I. Pifer, M.D., Winchester, Va.

**ANSWER**—Many vaccines have been developed for tuberculosis, but few have survived the experimental trials. Koch's old tuberculin was intended originally as a vaccine, but the huge doses frequently caused disaster to tuberculous patients. A long list of nonviable vaccines have been recommended, but the details are irrelevant. Ponderi, von Ruck, Deycke and many more less well publicized products came and have gone, with a large number of experimental varieties. Of the "living" vaccines (made of living bacilli) including Friedmann's, Selter's, Raw's and Calmette's, only the latter is still used. Calmette's BCG (named *Bacillus Calmette-Guerin* after the authors) is an avirulent bovine type of tubercle bacillus isolated twenty-five years ago and grown on bilated potato medium since. It has been used extensively in Europe and South America, but only a few in North America have given it an adequate trial, and the trials here have been largely experimental. Among those who have studied it here are Park, Watson, Ferguson, Aronson and Rosenthal.

There has been a heated controversy over the possible value of BCG. One group, consisting of Myers and Stewart, feels that sensitization is prone to lead to more "destructive" action on the tissues on reinfection and that primary infections are more benign and to be preferred. Furthermore, they reason that it is better to try to prevent infection by removal of contacts and better quarantine rather than attempt to build a dubious immunity. On the other hand, most experimental evidence supports the thesis that vaccination protects relatively against a later reinfection, that it isn't always possible to prevent tuberculous infection and that removal of contacts should be done first, but that when it is not possible, as in poor districts or in those exposed to tuberculosis, the vaccine will be a protection. They reason further that if one healed infection protects against a reinfection why shouldn't an avirulent and harmless bacillus as BCG be given to confer the protection rather than risk a virulent infection which may come at an inopportune time and place and may result in disease?

The vaccine BCG was originally made by the Pasteur Institute, Paris, under Calmette's direction, but it is not possible to get it from that source now. The manufacture of the vaccine is done only under the most stringent precautions to prevent a repetition of the now famous "Lubeck disaster" in Lubeck, Germany, where over 70 infants died because a virulent tubercle bacillus had accidentally contaminated the vaccine. The culture is grown on Sauton's medium and bilated glycerum potato medium. The bacilli are taken up from Sauton's medium, washed, weighed, diluted and administered either by mouth by subcutaneous injection or by the multiple puncture method of Rosenthal. The minute details of preparation, preservation, prevention of contamination and use had better be obtained from one of those using the vaccine, such as Aronson of the Henry Phipps Institute, Philadelphia, Rosenthal of the Municipal Tuberculosis Sanitarium, Chicago, or Watson of the Dominion government, Ottawa, Canada.

Park W. H. Kereszturi, Camille and Mishulow, Lucy. Effect of Vaccination with BCG on Children from Tuberculous Families. *THE JOURNAL* Nov. 18, 1933, p. 1619.

Watson E. A. Studies on *Bacillus Calmette-Guerin* (BCG) and Vaccination Against Tuberculosis. *Canad. J. Research* 9: 128 (Aug.) 1933.

Ferguson R. G. Activities in Provincewide Program for Control of Tuberculosis. *Canad. Pub. Health J.* 26: 130 (March) 1935.

Aronson J. D. and Dannenberg A. M. Effect of Vaccination with BCG on Tuberculosis in Infancy and in Childhood. *Am. J. Dis. Child* 50: 1117 (Nov.) 1935.

Rosenthal S. R. Studies with BCG. The Present Method of BCG Cultivation and Vaccine Production as Practiced at the Pasteur Institute and the Tice Laboratories. *Am. Rev. Tuberc.* 35: 678 (May) 1937.

Myers J. A. Tuberculosis Among Children and Young Adults. ed. 2. Springfield, Ill. and Baltimore. Charles C. Thomas. 1938. chapter IX, p. 126.  
Stewart C. A. Does a Primary Tuberculous Infection Afford Adequate Protection Against Consumption? *THE JOURNAL* April 8, 1933, p. 1077.  
Rosenthal S. R. The Multiple Puncture Method of BCG Vaccination. *Am. Rev. Tuberc.* 39: 128 (Jan.) 1939.  
Lubeck Catastrophe. General Review. *Brit. M. J.* 1: 986, 1931.

### HEMOPTYSIS AND METASTATIC ABSCESS WITHOUT RIB FRACTURE

**To the Editor**—A civilian employee at this post was driving a small Chisel truck when the wheels hit a beam causing the steering wheel to spin violently to the left. The force of this spin was communicated directly to his left hand and thence to his shoulder and back by reason of his effort to stop the motion with his extended arm. As a direct result of this forceful wrenching of his shoulder and back muscles he suffered immediate severe excruciating pain especially over the infraspinatus and the teres major as well as the posterior axillary muscles. There was a definite paresthesia down to the left wrist. We thought at first that he was a malingerer. Two days subsequently the man developed a temperature of 102 F. the pain remained and motion of the entire arm was considerably limited. There was hemoptysis on two occasions. After eight days there was some evidence of fluctuation over the scapula inferior to the spine. Paresthesia had disappeared and the temperature was still fluctuating. An incision was made over the fluctuating area and a large amount of dark brown purulent material was evacuated. The cavity was found to extend below the scapula where the ribs formed a part of its wall. Culture of the material revealed nonhemolytic streptococci to be the causative organism. Repeated roentgenograms of the ribs and scapula were negative. 1. What was the source of the hemoptysis forty-eight hours after the injury with negative lung findings? 2. Was the abscess caused by the breaking down of a subcutaneous hematoma or was it entirely hematogenous without relationship to the injury? 3. How could the possibility of the development of such a condition be anticipated so as to avoid charging the patient with malingerer?

M. D. New Jersey

**ANSWER**—This is an interesting case and it is difficult to answer the questions posed with assurance.

1. With regard to the hemoptysis without rib fractures and negative lung findings, it can only be surmised that the shock of the injury caused a minor damage to the finer bronchioles with a minute amount of hemorrhage.

2. The abscess seems definitely in the class of metastatic abscesses (see Christopher, Frederick, *Minor Surgery*, ed. 4 Philadelphia W. B. Saunders Company, 1940, pages 2 and 3, for three illustrative cases). A metastatic abscess presupposes an injury plus a distant focus of infection. It may be a boil or possibly even a throat infection (see also Sante, L. R. *Ann. Surg.* 89: 772 [May] 1920).

3. It would seem wise to avoid the charge of malingerer until a week or more has gone by in any case of injury. When it is definitely suspected, psychiatric aid is often of great benefit.

### DERMATITIS AND VENOUS STASIS

**To the Editor**—Is an underlying (sub)cutaneous phlebitis the cause of stasis dermatitis? This question is ignored in all textbooks.

T. S. Saunders, M.D., Portland, Ore.

**ANSWER**—Stasis dermatitis, often called varicose eczema, is not necessarily of uniform causation. It is most commonly seen in conjunction with severe stasis in the superficial venous system, whereas it is infrequently encountered after deep venous obstruction. It is practically never seen in patients with an acute phlebitis but it is true that chronic or even latent types of phlebitis, manifesting painful, thickened saphenous veins seem to be associated with stasis dermatitis. That venous stasis with consequent high capillary pressure and increased capillary permeability is an important factor is best shown by the fact that putting the patient to bed with elevated lower extremities or bandaging the leg with an elastic bandage often produces improvement.

This, however, is only part of the difficulty. Patients suffering from such dermatitis often have sensitive skins and may have hay fever or are sensitive to foods. Often the dermatitis may have started locally, over an inflamed vein, but becomes generalized, probably after scratching or rubbing the antigen into the systemic circulation. Then again there may be a ringworm infection between the toes acting as the origin of skin allergy. Much effort may have to be expended to track down the origin of such cutaneous allergies. Certain it is that venous stasis accentuates and helps to localize such skin reactions, but venous stasis alone does not account for the allergic manifestations and the great resistance to treatment, which should be directed equally toward the elimination of stasis and allergens of the most varied sorts.

## EROSIONS AND ULCERATIONS OF CERVIX

To the Editor—There have been various references in the literature to the iodine test for cervical carcinoma. Normal cervical mucous membrane is supposed to take a brown stain because of the glycogen, while tissue that remains white is supposed to be cancerous or precancerous. I have routinely painted the cervix with 3.5 per cent iodine in the cases I have had in the last few months. In most cases there is a sharply outlined area 1 to 4 cm in diameter that does not take the iodine stain. This area is usually larger but never smaller than any cervical 'erosion'. That is an ulcerated cervix or the columnar epithelium that lines the cervix does not seem to take the stain. The area which is outside the erosion which fails to take the iodine stain often appears otherwise to be healthy epithelium. Does this finding have any clinical significance? Certainly they are not all precancerous. Biopsies of eroded or roughened areas showed no demonstrable change except three. One was reported as leukoplakia grade 1, one leukoplakia with precancerous changes and the third as adenocarcinoma. I should like to know the significance of the pink so called erosion that is often seen surrounding the cervical os that increases and decreases in size with the menstrual cycle. It is often seen in women who have no history of pregnancy or cervical disease. M D Arizona

ANSWER—Persistence of a white unstained appearance on application of Gram's iodine solution is not diagnostic of cancer but is merely suggestive of areas which may merit biopsy study. Erosions, ulcerations and various leukoplakias, i.e. "white patches" all fail to take the iodine stain. It is therefore evident that the Schiller test really has only limited application.

An erosion is customarily defined as a reddened or congested area on the vaginal surface of the cervix covered by a layer of columnar epithelium. Most teachers of gynecology take exception to the assumption that these areas are "ulcerated". Notwithstanding the accepted definition of an erosion, study of these lesions reveals that a large percentage are actually devoid of an epithelial covering; the surface is often composed of granulation tissue infiltrated with polymorphonuclear leukocytes and extensively invaded by bacteria. Erosions present a salmon red or pink appearance. There may be only a small area surrounding the external os, or the greater portion of the vaginal surface of the cervix may be involved. The interior cervical lip is particularly subject to this lesion.

## PREGNANCY AND DIABETES—CESAREAN SECTION

To the Editor—I should like to know the present status of endocrine treatment in pregnancy for a person with diabetes. I should also like to know whether it is the present consensus that severe diabetes constitutes an indication for cesarean section especially for early cesarean section with a view to lowering fetal mortality. References on both of these points would be appreciated.

William F. Putnam, M.D., Lyme, N.H.

ANSWER—There is a certain amount of disagreement concerning the management of the pregnant patient with diabetes. This concerns the viability of the fetus rather than the mother, for whom all groups expect survival almost equal to that of nondiabetic mothers. As for the fetus, one group of workers maintains that adequate obstetric and diabetic care of the mother favors fetal survival and that nothing further is indicated. Others who also treat many diabetic patients think this is not the case, because, even with adequate diabetic and obstetric care, the fetal survival is still below 80 per cent. In one experience, based on 125 cases, the obstetric diabetic patients may be divided into two groups, according to their normal or abnormal hormonal pattern. If this is normal, the clinical course and the fetal survival approach that of nondiabetic pregnancies, but when it is abnormal the outcome is definitely otherwise.

Among 41 patients of the normal hormonal type the fetal survival was 95 per cent, which is comparable with that of nondiabetic fetal survivals. Among 27 patients in whom the pattern was abnormal and untreated the fetal survival was 61 per cent. Four of the ten deaths were stillbirths and six were neonatal (within twenty-four hours of delivery). Diabetic care was adequate in all.

The mother's clinical picture associated with the imbalance was either premature delivery or the development of preeclamptic toxemia which was mild, so far as the mother was concerned, but carried with it a high fetal mortality.

For the 57 patients with abnormal hormonal patterns for whom attempts were made through estrogen and progesterin therapy to restore the hormonal balance to normal, the fetal survival has been comparable to that of the normal hormonal pattern, 91 per cent.

Among these patients, weekly determinations for chorionic gonadotropin and pregnandiol are employed to anticipate premature delivery and preeclamptic toxemia. If the chorionic gonadotropin rises or the pregnandiol falls, standard endocrine therapy is used. Usually intramuscular injections of diethylstilbestrol, an average dose being 15 mg daily, and intramus-

cular injections of progesterone, the equivalent of 10 mg daily, are given. Treatment is adjusted according to the hormone levels.

If laboratory facilities are not available threatened premature deliveries should be treated with progesterone 10 to 50 mg. If the patient is gaining weight rapidly and develops edema, hypertension or albuminuria, estrogen and progesterin therapy may be employed, namely diethylstilbestrol 15 mg and proluton 10 mg intramuscularly. The dosage may be adjusted by symptoms.

For patients with abnormal hormonal balance even under treatment or with clinical signs of toxemia a premature delivery is indicated, and the time which has been selected is in the thirty-seventh week. Whether delivery should be by cesarean section or otherwise must be determined by conference between obstetrician and internist in each individual case. There is no absolute rule. Breech presentations, hydramnios and gigantism are clinical indications for cesarean section. Multiparous patients, those whose infants appear small and whose clinical course has been normal are candidates for normal delivery.

Although the infant of the diabetic mother appears premature its behavior is that characteristic of prematurity. Oxygen incubation, heat and postponement of feeding for twenty-four hours are routine in the writer's clinic. Dextrose is not believed to be indicated unless the blood sugar is still falling at the end of eight hours. It may be employed in 5 per cent solution.

Inhalation anesthesia at delivery and premedication are used in only minimal amounts.

## HEMOLYTIC ESCHERICHIA COLI IN FECES AND VACCINE THERAPY

To the Editor—Would you be kind enough to let me know the present status of hemolytic *Escherichia coli* from feces as a pathogen in various diseases? I have in mind an article by Niles and Torrey published some years ago on this subject. What is the present prevalent opinion with regard to the therapeutic value of treatment with vaccines prepared from such strains of organisms? Jacob Levine, M.D., Winston-Salem, N.C.

ANSWER—Hemolytic strains of *Escherichia coli* are commonly found in the feces of healthy persons. There is no proof that these strains give rise to a toxemia in simple colitis (irritable colon), ulcerative colitis, urticaria, angioneurotic edema, acne, acne rosacea, eczema, pruritus, fibrositis and ptychitis which is the list of conditions treated by Niles and Torrey (Niles, Walter L., and Torrey, John C. The Clinical Significance of *B. Coli Hemolyticus*, *Am J Hyg* 187:30 [Jan] 1934). Vaccines are not widely used at the present time in treating these diseases, and any benefit derived from them is probably nonspecific.

## SNAKES AND DESERT LIFE OF SOUTHWESTERN UNITED STATES

To the Editor—I am interested in any information regarding the types of animal life especially snakes to be found in the desert at Indio, Calif.

A. Abrams Major, M.C.A.U.S.

ANSWER—Gale B. Pickwell's book *Deserts* (New York, Whittlesey House, McGraw-Hill Company, 1939) is undoubtedly the best recent account of the desert life of southwestern United States. There is no good account of desert snakes as such, but the *Field Book of Snakes of the United States and Canada* by K. P. Schmidt and D. D. Davis (New York, G. P. Putnam's Sons, 1941) should be helpful. What Snake Is That? by Roger Conant and William Bridges (New York, D. Appleton Century Company, 1939) is less technical.

## SEBACEOUS CYSTS OF CHIN

To the Editor—In *Queries and Minor Notes* in *The Journal* Feb. 13, 1943, for treatment of a patient with many small sebaceous cysts about her chin incident to acne, you advised roentgen therapy, eight to ten treatments at weekly intervals with a dosage of 75 to 80 roentgens unfiltered, and stated that most cases of this type will respond to this form of treatment. The prescription as given is not properly descriptive as the quality (voltage) is not specified nor the focal distance. Aside from that I cannot conceive of any sebaceous cyst responding to such therapy except for a temporary improvement to cure a sebaceous cyst secondary to acne or to a blackhead the wall of the cyst must be destroyed or removed and this is accomplished by surgery. Roentgen therapy is very beneficial in pustular acne with which cystic acne is often associated, too frequently repeated x-ray treatments, given for cystic acne will result in permanent skin damage so that the patient will have the cysts plus a damaged atrophic skin. In twenty years of experience I have not seen a single sebaceous cyst cured by x-rays. I have seen several cases of permanent skin damage caused by ill advised roentgen therapy.

W. H. Whitmore, Commander, M.C., U.S. Navy, retired, Norfolk, Va.

JOURNALS ABSTRACTED IN THE CURRENT MEDICAL LITERATURE  
DEPARTMENT, JANUARY-APRIL 1943

Titles have been listed or abstracts made of important articles in the following journals in the Current Literature Department of THE JOURNAL during the past four months. Any of the journals except those starred, will be lent by THE JOURNAL to subscribers in continental United States and Canada and to members of the American Medical Association for a period not exceeding three days. Three journals may be borrowed at a time. No journals are available prior to 1933. Requests for periodicals should be addressed to the Library of the American Medical Association and should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Thus most of these journals are accessible to the general practitioner.

- American Heart Journal St Louis  
American Journal of Clinical Pathology Baltimore  
American Journal of Digestive Diseases Fort Wayne Ind  
\*American Journal of Diseases of Children A M A Chicago  
American Journal of Hygiene Baltimore  
American Journal of the Medical Sciences Philadelphia  
American Journal of Obstetrics and Gynecology St Louis  
American Journal of Ophthalmology Cincinnati  
American Journal of Pathology Ann Arbor Mich  
American Journal of Physiology Baltimore  
American Journal of Psychiatry New York  
American Journal of Public Health New York  
American Journal of Roentgenol and Radium Therapy Springfield Ill  
American Journal of Surgery New York  
American Journal of Syphilis Conor and Venereal Diseases St Louis  
American Journal of Tropical Medicine Baltimore  
American Review of Tuberculosis New York  
Anais brasileiros de ginecologia Rio de Janeiro  
Anales de la Facultad de medicina y clinica de la tuberculosis Buenos Aires  
Anales del Hospital de niños e Instituto de puercultura de Rosario Rosario  
Anesthesiology New York  
Annales Pédatriques Basel  
Annals of Internal Medicine Lancaster Pa  
Annals of Otolaryngology and Laryngology St Louis  
Annals of Rheumatic Diseases London  
Annals of Surgery Philadelphia  
Archiv für Gewerbepathologie und Gewerbehygiene Berlin  
Archiv für Gynäkologie Berlin  
Archiv für Krebslaufforschung Dresden  
\*Archives of Dermatology and Syphilology A M A Chicago  
Archives of Disease in Childhood London  
\*Archives of Internal Medicine A M A Chicago  
\*Archives of Neurology and Psychiatry A M A Chicago  
\*Archives of Ophthalmology A M A Chicago  
\*Archives of Otolaryngology A M A Chicago  
\*Archives of Pathology A M A Chicago  
Archives of Physical Therapy Chicago  
\*Archives of Surgery A M A Chicago  
Archivos americanos de medicina Buenos Aires  
Archivos argentinos de pediatria Buenos Aires  
Archivos de medicina infantil Havana  
Archivos de pediatria del Uruguay Montevideo  
Archivos uruguayos de medicina cirugía y especialidades Montevideo  
Arquivos de assistência a psicopatas do estado de Sao Paulo Sao Paulo  
Beiträge zur klinischen Chirurgie Berlin  
Boletín clínico Medellín  
Boletín del departamento de salubridad publica Mexico D F  
Boletín del Instituto de clinica quirúrgica Buenos Aires  
Boletín de los hospitales civiles Caracas  
Boletín de la Oficina sanitaria panamericana Washington D C  
Brain London  
British Heart Journal London  
British Journal of Children's Diseases Dorking England  
British Journal of Dermatology and Syphilis London  
British Journal of Experimental Pathology London  
British Journal of Ophthalmology London  
British Journal of Radiology London  
British Journal of Surgery Bristol  
British Journal of Tuberculosis London  
British Journal of Urology London  
British Medical Journal London  
Bulletin of the Johns Hopkins Hospital Baltimore  
Bulletin of the Los Angeles Neurological Society  
Bulletin of the New York Academy of Medicine New York  
California and Western Medicine San Francisco  
Canadian Medical Association Journal Montreal  
Canadian Public Health Journal Toronto  
Cancer Research Baltimore  
Cardiologia Basel  
Clinical Science London  
Connecticut State Medical Journal Hartford  
Delaware State Medical Journal Wilmington  
Der deutsche Militärarzt Berlin  
Dermatologica Basel  
Edinburgh Medical Journal  
Endocrinology Springfield Ill  
Gastroenterologia Basel  
Hawaii Medical Journal Honolulu  
Helvetica medica acta Basel  
Hospital Rio de Janeiro  
Illinois Medical Journal Chicago  
Journal of Allergy St Louis  
Journal of the Arkansas Medical Society Fort Smith  
Journal of Aviation Medicine St Paul  
Journal of Bone and Joint Surgery Boston  
Journal of Clinical Endocrinology Springfield Ill  
Journal of Clinical Investigation Boston  
Journal of Experimental Medicine New York  
Journal of the Florida Medical Association Jacksonville  
Journal of Hygiene London  
Journal of Immunology Baltimore  
Journal of the Indiana State Medical Association Indianapolis  
Journal of Industrial Hygiene and Toxicology Baltimore  
Journal of Infectious Diseases Chicago  
Journal of Investigative Dermatology Baltimore  
Journal of the Iowa State Medical Society Des Moines  
Journal of the Kansas Medical Society Topeka  
Journal of Laboratory and Clinical Medicine St Louis  
Journal Lancet Minneapolis  
Journal of Laryngology and Otolaryngology London  
Journal of the Maine Medical Association Portland  
Journal of the Medical Association of the State of Alabama Montgomery  
Journal of the Medical Association of Georgia Atlanta  
Journal of the Medical Society of New Jersey Trenton  
Journal of Mental Science London  
Journal of the Michigan State Medical Society Lansing  
Journal of the Missouri State Medical Association St Louis  
Journal of the Mount Sinai Hospital New York  
Journal of the National Cancer Institute Washington D C  
Journal of the National Malaria Society Tallahassee Fla  
Journal of Nervous and Mental Disease New York  
Journal of Neuropathology and Experimental Neurology Baltimore  
Journal of Neurophysiology Springfield Ill  
Journal of Nutrition Philadelphia  
Journal of Obstetrics and Gynaecology of British Empire Manchester  
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Pediatría práctica Sao Paulo  
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 Psychiatric Quarterly Utica N Y  
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 Public Health Reports Washington D C  
 Quarterly Journal of Medicine Oxford  
 Quarterly Journal of Studies on Alcohol New Haven Conn  
 Radiology Syracuse N Y  
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 Revista chilena de pediatría Santiago  
 Revista clínica de Sao Paulo Sao Paulo  
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 Revista de la Facultad de medicina Bogotá  
 Revista de medicina y cirugía de la Habana Havana  
 Revista de neuro psiquiatría Lima  
 Revista médica de Chile Santiago  
 Revista medica cubana Havana  
 Revista médica latino americana Buenos Aires  
 Revista médico quirúrgica de patología femenina Buenos Aires  
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Rhode Island Medical Journal Providence  
 Rocky Mountain Medical Journal Denver  
 Schweizerische medizinische Wochenschrift Basel  
 Semana medica Buenos Aires  
 South African Journal of Medical Sciences Johannesburg  
 Southern Medical Journal Birmingham, Ala  
 Southern Surgeon Atlanta Ga  
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The letters used to explain in which department the matter indexed appears are as follows: "BI," Bureau of Investigation, "E," Editorial, "C," Correspondence, "OS," Organization Section, "ab," abstracts, the star (\*) indicates an original article in THE JOURNAL.

This is a subject index and one should, therefore, look for the subject word, with the following exceptions: "Book Notices," "Deaths," "Medicolegal Abstracts" and "Societies" are indexed under these titles at the end of the letters "B," "D," "M," and "S." State board examinations are entered under the general heading State Board Reports, and not under the names of the individual states. Matter pertaining to the Association is indexed under "American Medical Association." The name of the author, in brackets, follows the subject entry.

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- EASTER** seals for crippled children 1103
- EASYLAX** O.D. 538—BI
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**SOCIETIES AND OTHER ORGANIZATIONS**

Acad—Academy  
Am—American  
A—Association  
Coll—College  
Conf—Conference  
Cong—Congress  
Conv—Convention  
Dist—District  
Hosp—Hospital  
Internat—International  
M—Medical  
Med—Medicine  
Nat—National  
Pharm—Pharmaceutical  
Phys—Physicians  
Rev—Revision  
Ry—Railways  
Soc—Society  
Surg—Surgery  
Surgs—Surgeons  
S—Surgical  
Alabama M A of the State of 774 1100  
Alcoholic Consultation Bureau 447  
Allegheny County (Pa) M Soc 61 448 1103  
Alpha Kappa Kappa Fraternity Xi Nu and Eta  
chapters 875  
Am Acad of Ophthalmology and Otolaryn  
gology 59 878  
Am Acad of Orthopaedic Surgs 141 611  
Am Acad of Pediatrics 62 272  
Am A for the Advancement of Science 204  
365 570 1405  
Am A for the Study of Allergy 1405  
Am A for the Study of Goller 141 776  
Am A of Anatomists 363 330 961  
Am A of Cereal Chemists 1234  
Am A of Immunologists 531  
Am A of Industrial Phys and Surgs 878  
Am A of M Social Workers 1403  
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Abdominal Surgs 448  
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Am A on Mental Deficiency Northeastern  
Section 139  
Am Board of Internal Med 141  
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Am Board of Orthopaedic Surg 961  
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Am Chemical Soc 1236 Chicago Section 611  
875 Pittsburgh Section 877  
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Am Foundation for Tropical Med 693  
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Am Soc of Biological Chemists 205  
Am Soc of Clinical Pathologists 693  
Am Soc of Immunologists 205  
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Am Standards A 1171  
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Am Urological A 611 776  
Am Women's Voluntary Services in New  
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Arizona State M A 1234  
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Asociación Médica Argentina 1234 Sociedad  
Argentina de biología de the 775  
A for the Advancement of Psychotherapy 203  
611  
A for the Study of Internal Secretions 271 330  
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British M A 272 533 1103  
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Brooklyn Acad of Med of 960  
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Buenos Aires Acad of the History of Med  
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Buenos Aires Institute of Nutrition at 1103  
Buffalo Dist Committee for Industrial Health  
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Buncombe County (N C) M Soc 364  
California Acad of Med 959  
California Board of M Examiners 269 1169  
California Heart A 1403  
California Historical Soc 959  
California M A 269 446 690 774 1298  
California Soc of Mental Hygiene 1296  
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Canada Health League of 1298  
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Catholic Hosp A 1405  
Central Mississippi M Soc 1101  
Central Neuropsychiatric A 1103  
Chicago Cancer Committee 531 1403  
Chicago Conf on the Health of Industrial  
Workers 139  
Chicago Heart A 608  
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Chicago Institute for Psychoanalysis 59  
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Chicago Laryngological and Otolological Soc 59  
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Cincinnati and Hamilton County (Ohio) Anti  
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Cleveland Acad of Med of 204 1102  
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Columbia County (N Y) M Soc 270  
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Foundation for the Study of Cycles 776  
Fox River Valley Manufacturers A 1100  
Fulton County (Ga) M Soc 446  
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George Williams Hooper Foundation for M Research 449  
Georgia Associated Industries of 1169  
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Georgia Pediatric Soc 59  
Georgia Warm Springs Foundation 449 1103  
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Hartford Tuberculosis and Public Health Soc 1100  
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Henry Phipps Institute 448  
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Hispanic Am M Soc 960  
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Idaho State Board of M Examiners 774  
Illinois Defense Council 59  
Illinois Industrial Commission of 609  
Illinois Institute for Psychoanalysis 269  
Illinois Manufacturers A 139  
Illinois Neuropsychiatric Institute 272  
Illinois Public Health A 1403  
Illinois Soc for Mental Hygiene 1296  
Indiana Roentgen Soc 202  
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Indianapolis M Soc 202 691  
Industrial Hygiene Foundation 449 1103  
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Internat Coll of Surg 1405  
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Iowa Anesthesiological Soc 875  
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Iowa State M Soc 875  
Iowa State Soc of M Women 875  
John and Mary R Markle Foundation 449 533  
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Kane County (Ill) M Soc 1100  
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Kennebec County (Me) M A 446  
Kentucky State M A 1169  
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Kings (N Y) M Soc of the County of 60 960 1170  
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Lake County (Fla) M Soc 1234  
Lancaster City and County (Pa) M Soc 140  
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Livingston County (Ill) M Soc 875  
Los Angeles County Civil Service Commission 269 530 774  
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Madison County (Ill) M Soc 875  
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Monroe (N Y) M Soc of the County of 1102  
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Nat Committee for Mental Hygiene 777  
Nat Conf of Governmental Industrial Hygienists 878  
Nat Conf of Tuberculosis Secretaries 1405  
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Naval M Research Institute 875  
Nebraska State M A 140 960  
Neuro Psychiatric Institute of the Hartford Retreat 1296  
Nevada State M A 1231  
Newcastle County (Del) M Soc 690  
New Jersey Acad of Med of Northern 691 976  
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New Orleans Graduate M Assembly 691  
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New York Acad of Med 60 270 609 692  
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New York Heart A 1104  
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New York Tumor Clinic A of the State of 1102  
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Northampton County (Pa) M Soc 693  
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North Carolina Tuberculosis A 1297  
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Numfeld Foundation 777  
Nutrition Foundation 110 1171 1298  
Ohio State Dental Soc 1102  
Ohio State M A 610 877 960  
Oklahoma State M A 61 692 877 1404  
Omaha Douglas County M Soc 609  
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Onondaga County (N Y) M Soc 10 77, 1104  
Oxford County (Me) M Soc 446  
Pacific Coast Oto Ophthalmological Soc 1103  
Pan Am Cong of Endocrinology 1103  
Pan Am Cong of Ophthalmology 878  
Passaic County (N J) M Soc 60  
Pennsylvania Tuberculosis Soc 110  
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Philadelphia Health A 1235  
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Piscataquis County (Me) M A 146  
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Pittsburgh S Soc 1235  
Planned Parenthood Federation of America 448 692  
Prince Georges County (Md) M Soc 139  
Providence M A 610  
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Research Council on Problems of Alcohol 365 447  
Rhode Island M Soc 364 610  
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Rochester (N Y) Acad of Med 1101  
Rochester (N Y) Dental Soc 692  
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San Francisco County M Soc 269  
San Francisco S Soc 269  
Science Service 204  
Science Talent Institute 777  
Seaboard M A 611  
Sedgwick County (Kan) M Soc 202 531

- Silver Bow County (Mont) M Soc 876  
Smith Reid Russell Soc 694  
Sociedad de Medicina de Montevideo Uruguay 777  
Sociedad Mexicana de Dermatología de Mexico City 76  
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Soc of Am Bacteriologists 531 North Central Branch 531  
Soc of Experimental Biology and Med 363 30  
Soc of Illinois Bacteriologists 531  
Soc of M Record Librarians Conn 1407  
Soc of Sigma Xi Iowa State Coll Branch of the 731  
South Carolina M A 776  
Southern S Cong 1101  
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Spencer County (Ind) M Soc 202  
Squibb Institute for M Research 533  
Stamford (Conn) M Soc 139  
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Syracuse (N Y) Acad of Med 60 775  
Tennessee State M A 610  
Texas A of Hosp Accountants 361  
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Texas League for Planned Parenthood 732  
Texas Radiological Soc 204  
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Tompkins County (N Y) M Soc 72 692  
Tophers (Kan) Institute for Psychoanalysis 1100  
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Tufts M Alumni A 876  
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Uruguayan Pediatric Soc 73  
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Washington County (Pa) M Soc 610  
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Western A of Industrial Hygiene and Surg 1102 1103  
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